United States
Department of
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Agricultural
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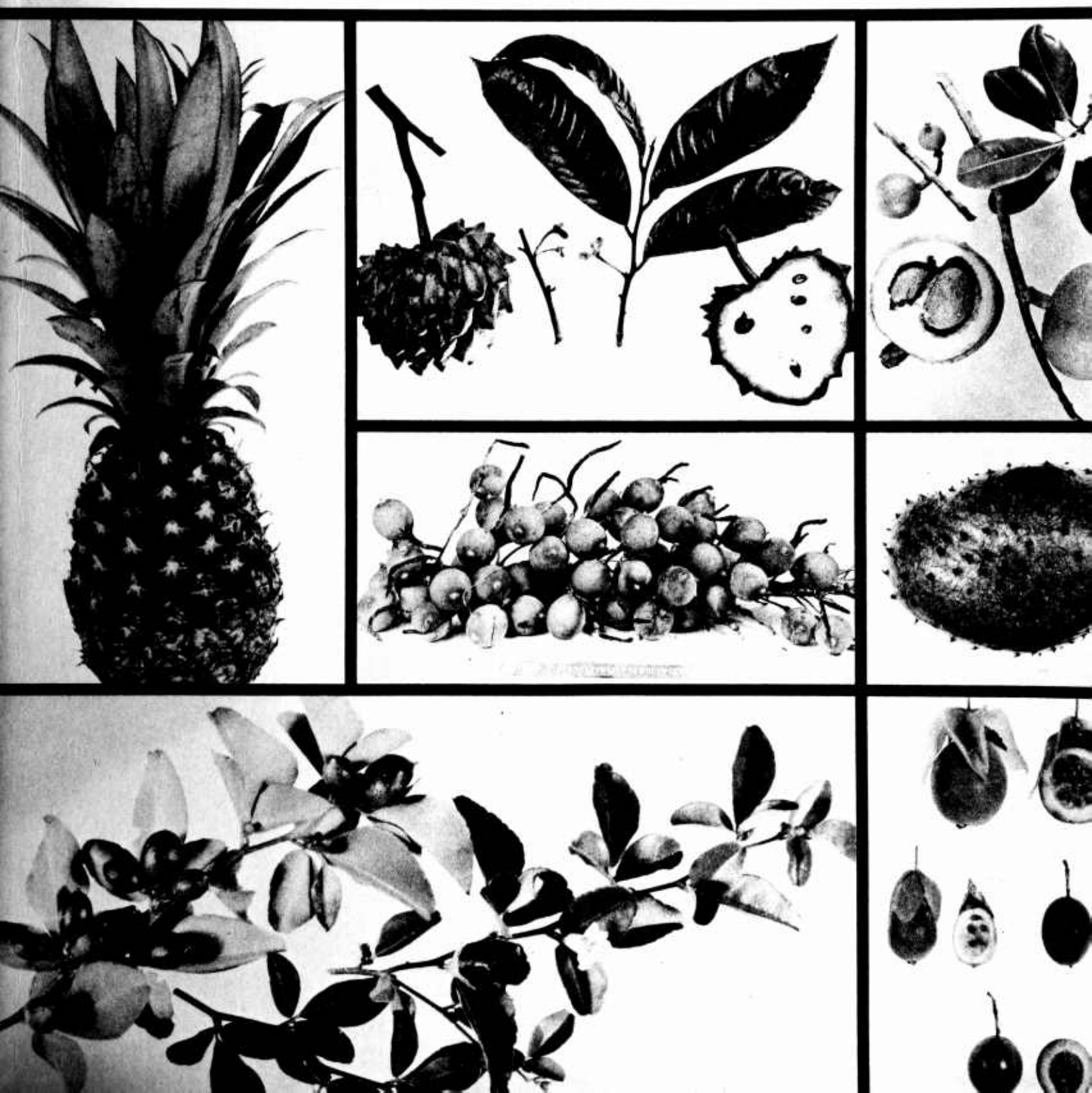
Agriculture
Handbook
No. 642

Perennial Edible Fruits of the Tropics

An Inventory

87



Abstract

Martin, Franklin W., Carl W. Campbell, Ruth M. Ruberté.
1987 Perennial Edible Fruits of the Tropics: An Inventory. U.S. Department of Agriculture, Agriculture Handbook No. 642, 252 p., illus.

The edible fruits of the Tropics are many in number, varied in form, and irregular in distribution. They can be categorized as major or minor. Only about 300 Tropical fruits can be considered great. These are outstanding in one or more of the following: Size, beauty, flavor, and nutritional value. In contrast are the more than 3,000 fruits that can be considered minor, limited severely by one or more defects, such as very small size, poor taste or appeal, limited adaptability, or limited distribution. The major fruits are not all well known. Some excellent fruits which rival the commercialized greatest are still relatively unknown in other parts of the Tropics and should be promoted. Introducing new fruits into a country is often difficult, however, and must be done legally. Obtaining information on the fruits and their sources is a first step, and this publication provides much of that information. This publication also lists the minor fruits as completely as can be done with the present state of knowledge.

Keywords: major tropical fruits, minor tropical fruits, tropical fruit cultivation, tropical fruit distribution, tropical fruit introduction, tropical fruits, tropical fruit utilization

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Acknowledgments

We owe first thanks to the botanists, horticulturists, and taxonomists throughout the world who have left written records of the fruits they encountered.

Second, we thank Richard A. Hamilton, who read and criticized the major part of the manuscript. His help was invaluable.

We also thank the many individuals who read, criticized, or contributed to various parts of the book. In alphabetical order, they are Susan Abraham (Indian fruits), Herbert Barrett (citrus fruits), José Calzada Benza (fruits of Peru), Clarkson (South African fruits), William C. Cooper (citrus fruits), Derek Cormack (arrangements for review in Africa), Milton de Albuquerque (Brazilian fruits), Enriquito D. de Guzmán (Philippine fruits), R. B. Drummond (African fruits), Victor Galan Sauco (Canary Island fruits), Charles B. Heiser (minor South American fruits), L. Antonio Lizana (South American, especially Chilean, fruits), Raul Mosqueda Vázquez (Mexican fruits), Sunit K. Mukherjee (Indian fruits), Melicia Mũnoz (South American, especially Chilean, fruits), and Robert K. Soost (citrus fruits).

Finally, we thank the typist, Migdalia Malavé, for her long hours of dedication.

United States Department of Agriculture

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An Inventory

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Issued April 1987

1. Introduction

No class of foods has as much general appeal as fruits. Although they are sometimes rich in vitamins, minerals, oils, starches, and even proteins, fruits are seldom consciously eaten for their nutritional value but for their beauty, texture, aroma, juiciness, and refreshing flavor. Fruits are usually not the main course. They are the desserts or the foods to be nibbled or devoured between meals.

How many species of fruits are there in the Tropics?[1] In our opinion there are thousands. Of these, 300 are major and 100 are excellent, but perhaps only 50 are already well known. Many tropical fruits are unknown to the temperate palate, and there are many still known in only a small part of the Tropics. There remains an immense task to know, to culture, to improve, to show, and to share tropical fruits with the world.

Figure 1.—Botanical fruits of several kinds.

[1]We define the Tropics as that area between the Tropic of Cancer and the Tropic of Capricorn (the Torrid Zone) with warm day and night temperatures throughout the year. For our purpose we include adjacent areas in the Temperate Zone with this climate (the subtropics), and we include highlands with temperate climates in the Torrid Zone.

What Is a Fruit?

In the botanical sense, all flowering plants (monocotyledons and dicotyledons) produce fruits (fig. 1). These are the results of reproductive growth, generally the structures developed from flowers or from clusters of flowers. Fruits may be only the reproductive organs of the plant or may include other parts of the flower, such as the receptacle, sepals, and pedicel. We use the word "fruit" in a more restrictive and popular sense.

We consider only edible fruits of tropical or subtropical origin. We do not include in this inventory certain Temperate Zone fruits grown in restricted areas of the Tropics, such as apples, peaches, and pears and their many relatives. Temperate Zone fruits in the Tropics are generally out of place and insignificant in their impact. But having said this, we realize that certain Temperate Zone fruits—grapes, for example—can be adapted to the Tropics, and we have included such selections.

We have further limited our selection to perennials. Thus, we do not consider the family Cucurbitaceae (fig. 2), although many have sweet fruits occupying the

Figure 2.—Fruits of annual herbaceous plants.

same position in the diet as any other fruit. On the other hand, we have included fruits of the family Solanaceae, although they are borderline by our definition. In addition, some might consider the Solanaceae to be "vegetables," but we could not find, based on use and perception, any such clear-cut distinction.

Fruits are often eaten raw, out of hand, but a few are eaten or are edible only when cooked. A cooked botanical fruit is often considered a vegetable. We have tried to eliminate botanical fruits that are used more as vegetables (fig. 3). Yet, there were traditional exceptions, including the breadfruit, clearly a fruit to everyone, yet used only as a vegetable.

We have wrestled with the concept of "nut" as opposed to "fruit" and "seed." Botanically, a nut is a hard, indehiscent one-seeded fruit (fig. 4). In horticulture, however, many fruits that are considered to be nuts do not fit this definition. Moreover, the exact distinction between seeds and nuts is vague, and we may have included certain seed-bearing species that others may not consider to be either fruits or nuts.

Figure 3.—Fruits used as cooked vegetables.

Figure 4.—Nuts and seeds of various kinds.

Although edibility was one of our prime criteria for including a selection, there are fruits that are considered edible by some and inedible by others. The distinction is fuzzy, and we cannot resolve the problem. We have preferred to err on the side of being inclusive in these cases.

Size was another of our criteria. We have excluded very small fruits that are hardly worth the effort of harvest, except in emergency, but we have included many that are so tasty that their omission would be an error.

The task of deciding which fruits to include was complicated by taxonomy. We have used the best sources of information available to us, but information is often lacking. For instance, experts are often confused by the variety of forms within broadly distributed species. Whether these forms are distinct species, in the sense that they are reproductively isolated from each other, or are only variants of one or more species often cannot be determined. Errors may also occur when the same form is given two or more names. In many cases we were not able to establish synonymy, and we believed it better to include too many names rather than too few.

Major and Minor Fruits

We have attempted to classify fruits as major (chapter 2 and part of 3) and minor (part of 3 and chapters 4–7), often a difficult task. Major fruits have often been introduced from one region to another and are frequently well known. They are usually large, but when small, they are of high quality. They may be marketed internationally, or they may be economically important only in certain regions. On the other hand, they may have little or no economic importance; nonetheless, we have considered them to be major if they are widespread, well known, or often used.

In contrast, minor fruits are usually not widely distributed. They are often small. They may only grow wild and have little or no potential for cultivation and marketing. Most probably merit neglect, but some may have the potential to be improved and developed into a major fruit. Certainly, different cultures interpret edibility in different ways. But throughout primitive cultures a very wide variety of fruits was sampled. Thus, knowledge of minor fruits is large on all tropical continents. We have listed approximately 2,800 minor fruits—800 for the Americas, 1,200 for Africa, 500 for Southeast Asia, and 300 for India.

We have segregated the major and minor fruits in separate chapters because we believe most people will want more information on the major fruits than on the minor fruits. However, with respect to Rutaceae, the citrus family, we have placed major and minor fruits in one chapter because of the intimate relationships among them and the difficulty of making a clear separation.

Major fruits listed in chapters 2 and 3 are not included in any regional list of minor fruits, even though they may indeed be minor in some of those. On the other hand, minor fruits occurring in more than one region are listed in all appropriate chapters.

Of the major fruits listed in chapters 2 and 3, we consider the 19 most important to be cashew, pineapple, papaya, sweet orange, lemon, grapefruit, avocado, Brazil nut, breadfruit, banana, guava, mango, coconut, oil palm, date, yellow passion fruit, macadamia nut, litchi, and cacao. Do these fruits have anything in common that might point to winners among less known fruits?

Geographical origin seems to be related to greatness (fig. 5). The most important tropical fruits come from South America and Asia. Only the date palm comes

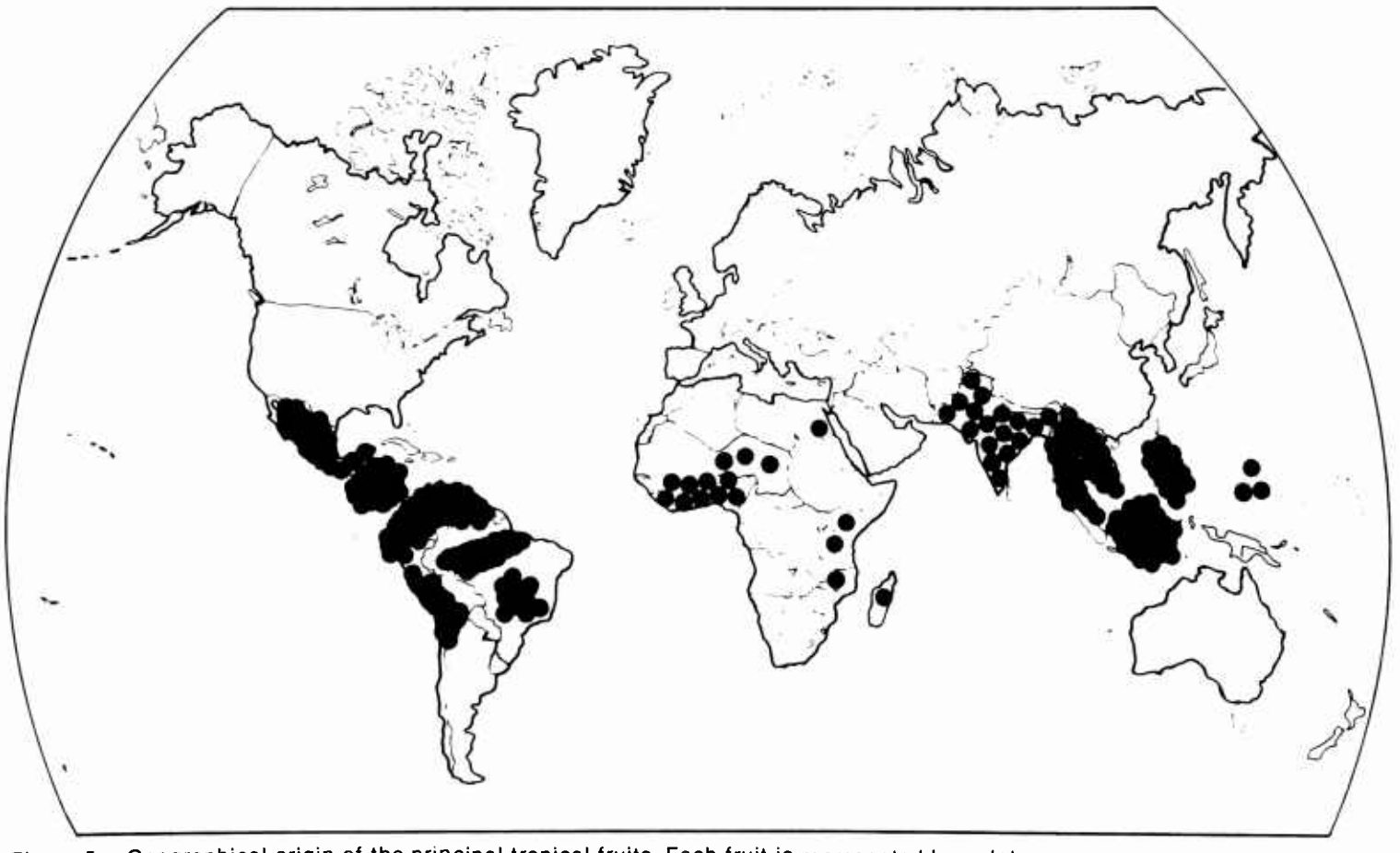

Figure 5.—Geographical origin of the principal tropical fruits. Each fruit is represented by a dot.

from Africa, and it is really subtropical in origin. This is surprising considering the great number of native fruits in Africa, many of which are of considerable local importance. We believe that the fruits still to become great will be found in South America and Southeast Asia (see chapters 4 and 6).

From a taxonomic standpoint, our selection of the greatest fruits is not restricted to a few families or to closely related families. Two families, Palmae and Rutaceae (*Citrus*), are represented by three species each, and one family, Anacardiaceae, is represented by two. It is noteworthy that the pineapple, which we consider to be one of the greatest fruits, is also one of the very few edible fruits in the family Bromeliaceae.

Good shipping and keeping qualities probably help make fruit important. Although many of the great fruits do not keep well when ripe, they can be picked mature, shipped long distances, and then ripened. Others, such as guava, are normally picked when nearly ripe and are seldom shipped, although products made from them are shipped everywhere. Still, some important fruits (breadfruit, for example) do not play an important role in commerce.

Figure 6.—Banana, the greatest and most ubiquitous tropical fruit.

Probably, ease of cultivation is an important factor in making a fruit great. Some of the best are grown not only in great plantations but also in dooryards—for example, banana (fig. 6), mango (fig. 7), and citrus. Some great fruits are more difficult to grow, however, or are not widely adapted—for example, pineapple (fig. 8), Brazil nut, and cacao.

We are convinced that some fruits are great because of circumstance. These have been selected purposefully by man for development and have been systematically grown and marketed. The banana and citrus fruits are examples.

Figure 7.—Mango, a peach of a fruit for the Tropics.

Production of Major Fruits

Estimating production of most fruits is difficult, for very important fruits are produced in quantity in dooryards throughout the Tropics, where they are both used and wasted extensively. Statistics are often meaningless except for fruits that are widely exported. It is conventional to rely on statistical data developed by the Food and Agriculture Organization (FAO) of the United Nations as the most reliable data available, but the limitations should be recognized. The fairly recent statistics below show the comparative productions of some of the best fruits from the Tropics and Temperate Zone.

	Annual production (1,000 tons)	Principal producing countries
Apple	21,500	France, United States, Germany
Pear	7,100	Italy, Afghanistan, United States
Peach and nectarines	6,100	France, Spain, Japan, United States
Plum	4,600	Yugoslavia, Romania, United States
Orange	28,900	United States, Brazil, Mexico
Tangerine	6,400	Japan, Portugal, Greece
Lemon, lime	4,000	Italy, United States, India
Grapefruit	3,700	United States, Israel
Avocado	1,000	Mexico, Dominican Republic, Brazil, United States
Mango	11,800	India, Philippines
Pineapple	4,300	United States, Thailand, Philippines
Banana	35,800	Brazil, India, Ecuador

For the majority of the tropical fruits no production statistics are available.

On the basis of FAO data, and probably also when backyard consumption is taken into account, the most important of the tropical fruits is the banana. In spite of its soft structure and poor keeping qualities, the banana is widely known by many millions of persons who have never seen a banana plant (fig. 6). Bananas are produced in almost if not all tropical countries and are extremely widely adapted and versatile. The bananas seen in the Temperate Zone, represent only three to four varieties of the dozens of banana varieties known in the Tropics.

Very close to the banana, or even surpassing it in production when taken together, the citrus fruits are extremely important. A good proportion of these are produced in subtropical and even in temperate climate. The versatility of the genus is such that Japan is a major producer of tangerines, and Italy of lemons. There are few households throughout the world that have never known a citrus fruit.

Figure 8.—Pineapple, variety Sugar Loaf, a great fruit everywhere.

Figure 9.—Avocado, in many forms, is great in the Tropics and even the warm Temperate Zone.

Apples, of course, are very important, but the majority are produced in the Temperate Zone. Mangoes (fig. 7) are tropical fruits that are still underutilized. Most of the production in India is for local consumption. Other outstanding fruits in international commerce are pineapples (fig. 8) and avocadoes (fig. 9). The date (fig. 10) is really a subtropical or warm temperate fruit.

Figure 10.—Date, a great fruit for the dry subtropics.

Fruits With Outstanding Nutritional Content

Fruits contribute to the diet, chiefly by adding vitamins. Many fruits are very good sources of provitamin A, or carotene, often associated with yellow color. (There are no other external clues about the nutritional value of fruit.) Others supply more than adequate amounts of vitamin C. They may contain small amounts of biotin and pantothenic acid, but the principal B vitamins—thiamine, riboflavin, and niacin—are usually not found in useful amounts. Nuts are usually good sources of vitamin E and often of the B vitamins, and they are sources of proteins and oils as well. The fruits with the best nutritional content are as follows:

- *The banana.* When cooked green, it contains principally starch. As it ripens, the percentage of starch decreases and the percentage of sugar increases until, when fully ripe, almost all of the carbohydrate is in the form of sugars. The banana contains useful amounts of vitamin B_6 and riboflavin. Bananas are easy to digest, especially when completely ripe.

- *Citrus fruits of all kinds.* They are excellent sources of vitamin C, and the orange and other orange-colored citrus fruits are fair sources of provitamin A and good sources of calcium.

- *The avocado.* It is a very good source of highly digestible oil containing unsaturated fatty acids. Some varieties are good sources of phosphorus and riboflavin and excellent sources of vitamin A. Some varieties also contain useful amounts of protein.

- *The mango.* It is usually an excellent source of provitamin A but a variable source of vitamin C; as mangoes mature, vitamin C content decreases.

- *The guava.* It is an excellent source of vitamin C and iron and a good source of niacin.

- *The passion fruit.* It is an excellent source of provitamin A and perhaps the best fruit source of niacin. Its vitamin C content is fair.

- *The papaya.* It is a good source of provitamin A and ascorbic acid and, surprisingly, a fair source of calcium.

- *The coconut.* One of the best fruits with respect to protein, the coconut is an excellent source of oil, which unfortunately is mostly composed of saturated fatty acids. Its phosphorus content is high, and its iron content is excellent, but its vitamin B content is very low for a seed.

- *The macadamia nut.* An outstanding source of protein, oil, phosphorus, iron, thiamine, and riboflavin and a fair source of calcium and niacin. This is perhaps the most nutritious of all nuts.

- *The acerola.* This small berry contains more vitamin C than any fruit known.

- *The tamarind.* Its pulp is a very good source of calcium and phosphorus and an unusually good source of riboflavin.

- *The durian.* This little known fruit is a good source of iron and niacin as well as carbohydrates.

- *The canistel.* A fair source of protein and provitamin A, this fruit is one of the richest sources known of sugars.

Problems of Introducing New Fruits

The problems associated with introducing a new fruit into a region are numerous. The first problem is finding high-quality germplasm for introduction. A good beginning is to ask farmers, gardeners, nurserymen, agricultural extension agents, professors, and scientists at agricultural experiment stations around the tropical world about indigenous species or varieties desired. Most persons interested in rare and unusual fruits maintain a network of useful connections. One has to become part of this network. Joining organizations such as the Rare Fruit Council International (see later) is one way of getting in touch with knowledgeable people.

It is not enough to merely locate the species or variety desired. It is also necessary to obtain propagation material and perhaps propagation facilities. And one may be asked for materials or services in exchange. Perhaps the best way to get material is to find a person who grows the plant and knows it well. Museums, botanical gardens, agricultural experiment stations, and universities are also good places to look.

Successful introduction is also a matter of securing the right kind of propagating materials at a favorable time. The seeds of many tropical fruits need to be planted within a few days of being removed from the fruit, for they die when dried. Budwood or scions for grafting must be transferred quickly. Bare-rooted trees are often difficult or impossible to transfer. Therefore, careful planning and attention to transportation details are necessary.

The laws of various countries may restrict both the removal and the introduction of plant materials. While these regulations might seem to be unnecessary obstacles to the novice, they are generally based on a realistic assessment of the hazards of uncontrolled plant introduction. Permits are usually necessary for introduction, and inspection of the plant materials before and after introduction is often required. These requirements are time consuming. Transfer of plant materials within a country, however, is relatively unrestricted, so it is best to look for domestic materials before contemplating foreign introductions.

The transfer of germplasm into a region is only the first step. Some material may have to be kept in quarantine for a time. Then, it must be cared for and multiplied. If a number of varieties or kinds have been chosen for introduction, evaluation to select the best plants is desirable, and this process is usually time consuming when the plants are fruit trees. Widespread distribution and testing over a number of years is also desirable—another lengthy process.

Finally, after good new fruit varieties are available comes the problem of distributing them to the public. Not only must the mechanics of distribution be worked out, but also the producing farmer and consuming public must be educated. If this last step is not taken, trees may be willfully destroyed (if they have been distributed free of charge) or the fruit may be ignored in the marketplace.

When is the job of introducing a new fruit done? We consider the job done when 50 percent of the adult population in a country knows the fruit. By our criterion, fairly well known fruits have not been fully introduced.

Major Sources of Information

A complete list of our published sources is at the end of this book. Some of them deserve special mention.

A most useful compendium was "Tanaka's Cyclopedia of Edible Plants of the World (1976)." This broadly based compendium is undoubtedly the best source of names of any kind of edible plant. Because of its breadth, it often lists little more than the scientific name, the fact of edibility, and a reference. Synonyms are often marked, but others are sometimes overlooked. Furthermore, the extensive listing cannot suggest the close relationships that exist among some entities listed as separate species. Tanaka's list contains little information concerning the frequency of use, economic importance, quality, and potential of a given fruit.

Tanaka's "Cyclopedia" relies heavily on certain regional publications to which we have referred frequently:

For Southeast Asia, Burkill's "Dictionary" (1935) is the best available source of information, although it is now somewhat out of date. "Useful Plants of the Philippines," by W. H. Brown (1951-56), was also very useful.

For India, Watt's "Dictionary of the Economic Products of India" (1893) was useful, but it may have led us into many errors because the relative importance of minor fruits was often not given. Still, we had no better source.

For the worthwhile fruits of the American tropics, we relied heavily on Uphof's "Dictionary of Economic Plants" (1968). Short to long paragraphs are supplied for each fruit, but minor species are often omitted.

For Brazil, the works by Fonseca (1954), Le Cointe (1934), and Goméz (1977) are excellent. In addition, the small book by Cavalcante (1976) is the best we know as a source of information on fruits of the Amazon basin.

For Africa, Dalziel's book (1948) is an excellent source of information. Jardin's book (1967) is more comprehensive but less informative.

The following list of institutions in the tropics might be useful in obtaining new information and specific fruits or seeds:

Brazil

Centro de Pesquisa Agropecuaria do Trópico Úmido
Caixa Postal 48
Belém, Pará
Brazil

Departamento de Fitotecnia
Universidade Federal de Viçosa
36570 Viçosa, Minas Gerais
Brazil

Jardím Botanico do Rio de Janeiro
Rio de Janeiro, Gaunabara
Brazil

Jardím Botanico do São Paulo
Caixa Postal 4005
São Paulo, São Paulo
Brazil

Chile

Facultad de Agronomía
Universidad de Chile
Santiago
Chile

Colombia

Instituto Colombiano Agropecuario
Palmira
Colombia

Costa Rica

Centro Agronómico Tropical de Investigación
y Enseñanza
Turrialba
Costa Rica

Instituto Internacional para Cooperacion en
la Agricultural
Apartado 55, Coronado
San José
Costa Rica

England

Tropical Products Institute
56-62 Gray's Inn Road
London WCIX 8LU
England

Guatemala

Jardín Bótanico
Avenida de la Reforma 0-42
Zona 10
Guatemala
Guatemala

Honduras

Tela Railroad Co.
Division of Tropical Research
La Lima
Honduras

Escuela Agrícola Panamericana
Apartado 93
Tegucigalpa
Honduras

Lancetilla Experiment Station and
Wilson Popenoe Botanical Garden
Apartado 46
Tela, Atlántida
Honduras

Hong Kong

Hong Kong Herbarium
Agriculture and Fisheries Department
Canton Road
Kowloon
Hong Kong

India

Division of Horticulture
College of Agriculture
Dharwar 580005
India

Calcutta University
35 Ballygunge, Circular Road
Calcutta 19
India

Horticultural Research Station
Saharanpur, Uttar Pradesh
India

Botanical Gardens
Lucknow, Uttar Pradesh
India

Indonesia

Lembaga Penelitian Horticulture
Pasarminggu
Jakarta Selatan
Indonesia

National Biological Institute
Bogor
Indonesia

Israel

Division of Subtropical Horticulture
Volcani Institute for Agricultural Research
Beit-Dagan, Box 6
Israel

Jamaica

Castleton Gardens
St. Mary
Jamaica

Royal Botanic Gardens
Kingston
Jamaica

Malaysia

MARDI
Serdang, Sungei Besi
Selangor
Malaysia

Mexico

Comisión Nacional de Fruticultura
Juan Soto #1
Veracruz, Xalapa
México

INIA, Departamento de Frutales Tropicales
Apartado 6-882 y 6-883
México 6, D.F.
México

New Zealand

Department of Scientific and Industrial Research
Auckland
New Zealand

Peru

Universidad Nacional de la Selva
Apartado 165
Tingo Maria
Peru

Departamento de Horticultura
Universidad Nacional Agraria
Apartado 456, La Molina
Lima
Peru

Philippines

College of Agriculture
University of the Philippines
Los Banos, Laguna
Philippines

Singapore

Botanic Gardens
Singapore 10
Singapore

South Africa

University of Natal
Pietermaritzburg
Natal
South Africa

Taiwan

Chia-Yi Experiment Station
Chia-Yi
Taiwan

Thailand

Department of Horticulture
Kasetsart University
Bangkok 9
Thailand

Trinidad

University of the West Indies
St. Augustine
Trinidad

Uganda

Entebbe Botanic Gardens
P.O. Box 40
Entebbe
Uganda

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California Rare Fruit Growers
Star Route, Box P
Bonsall, Calif. 92003
U.S.A.

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University of California
Riverside, Calif. 92502
U.S.A.

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Honolulu, Hawaii 96822
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Department of Horticulture
University of Puerto Rico
Mayagüez, P.R. 00708
U.S.A.

Fairchild Tropical Gardens
10901 Old Cutler Rd.
Miami, Fla. 33156
U.S.A

Foster Gardens
Honolulu, Hawaii 96815
U.S.A.

Tropical Agriculture Research Station
Agricultural Research Service
U.S. Department of Agriculture
Box 70
Mayagüez, P.R. 00709
U.S.A.

Rare Fruit Council International, Inc.
13609 Old Cutler Road
Miami, Fla. 33158
U.S.A.

Texas A&M University
Cooperative Research Unit
Weslaco, Tex. 78596
U.S.A.

University of Florida, TREC
18905 S.W. 280th St.
Homestead, Fla. 33031
U.S.A.

Subtropical Horticulture Research Unit
Agricultural Research Service
U.S. Department of Agriculture
13601 Old Cutler Rd.
Miami, Fla. 33158
U.S.A.

Venezuela

Fondo de Desarrollo Frutícola
Edificio Nuevo Centro, Piso 8
Avenida Libertador, Chacao
Caracas
Venezuela

Actinidiaceae

***Actinidia chinensis* Planch.**

Common names: Chinese gooseberry, kiwi (English); yang-t'ao (Chinese); oni-matatabi (Japanese).

Origin: China.

Distribution: Subtropical areas; warm Temperate Zone.

Cultural requirements: Requires prolonged cool weather during dormancy for successful development. Long days promote flowering. Tolerant of frost when dormant.

Description: Deciduous vine, grown on trellises. Propagation by seed, cuttings, grafting. Fruit production in 2-3 years from seed, 1 year from vegetative propagation. Flowers October-November in Southern Hemisphere, May-June in Northern. Dioecious. Fruit matures in 180-200 days. Fruit ellipsoid, 10-15 cm long, 50-100 g, solitary or in clusters of 2-3; external color brown, internal green.

Utilization: Internationally known, of growing economic importance. Pulp of fruit eaten fresh, cooked in preserves, pies. Flavor sweet, pleasant; wide appeal. Good source of vitamins A and C. Commercial production in China, New Zealand, South Africa, U.S.A. (California). Good potential for expansion in cool areas. Varieties: 'Abbott', 'Allison', 'Bruno', 'Greensill', 'Hayward', 'Matua', 'Monty', 'Tomuri'.

References: Bailey 1961, Habart 1974, Nihoul 1976.

Anacardiaceae

***Anacardium occidentale* L.**

Common names: cashew (English); marañon, merey, cajuil (Spanish); cajú (Portuguese); acajou (French).

Origin: South America.

Distribution: Pantropic.

Cultural requirements: Grows best in hot tropical climate below 1,000 m elevation. Soil pH 4.5-6.5. Tolerant of poor soils and seasonally dry conditions.

Description: Tree to 12 m. Propagation by seed, grafting, layering, cuttings. Fruit production in 4-5 years from seed, 2-3 years from vegetative propagation. Flowers February-March. Fruit matures in 60-90 days. Consists of one seed (cashew nut, 2.5-3 cm long) hanging below the enlarged peduncle (cashew apple). Solitary or in small clusters. Apple has red or yellow external color, pale-yellow internal color.

Utilization: Nut highly commercialized and of high quality. Nut roasted to remove noxious oil; excellent flavor, universal appeal. Apple eaten fresh, as juice, preserve; flavor sweet, somewhat astringent, with moderate appeal. Nut rich in protein and oil, apple in vitamin C. Nut important in international commerce, apple in local areas. Good potential for expansion.

References: Araque 1968, Morton 1967.

***Anacardium giganteum* Hanc. ex Engler**

Common names: anacardier géant, cajou (French); cajueiroacu-da-mata (Portuguese).

Origin: Brazil, Guiana.

Distribution: Brazil, Guiana.

Cultural requirements: Hot, humid tropical lowlands.

Description: Tree to 40 m. Propagation by seed. Flowers in December (Brazil). Fruit 2.5 cm long, edible peduncle 2 cm long, in small clusters; peduncle external color red, internal color pink.

Utilization: Nut edible but small. Peduncle eaten fresh, as juice; flavor sweet or acid, astringent, refreshing; moderate appeal. Nut rich in protein and oil, peduncle in vitamin C. Potential unexplored, but probably fair.

References: Cavalcante 1976, Fouqué 1974.

***Bouea gandaria* Blume** (= *B. macrophylla* Griff.)

Common names: maprang (English); kundangan, setar (Malaya); maprang (Thailand); gandaria (Java).

Origin: Southeast Asia.

Distribution: Southeast Asia.

Cultural requirements: Hot tropical lowlands with monsoon climate. Not well adapted to calcareous soils.

Description: Tree to 20 m. Propagation by seed, grafting. Fruit production from grafts in 2-3 years. Flowers January-March. Fruit matures in 180 or more days. Fruit 4-7 cm long, in small clusters; external color yellow, internal yellow to orange.

Utilization: Pulp eaten fresh or cooked in jams, chutney. Flavor of good selections sweet, pleasant; moderate appeal. Good source of vitamins A and C. Fair potential in areas where known, but not likely to be widely commercialized.

Reference: Molesworth Allen 1967.

***Bouea oppositifolia* (Roxb.) Adelb.** (= *B. microphylla* Griff.)
Common names: plum mango (English); remenia (Malaya).
Origin: Southeast Asia.
Distribution: Southeast Asia.
Cultural requirements: Hot tropical lowlands with monsoon climate.
Description: Tree. Propagation by seed. Fruit 2.5 cm long; external color yellow, internal yellow to orange.
Utilization: Pulp eaten fresh (green or ripe), cooked in jam, chutney. Flavor sour, pleasant; limited appeal. Good source of vitamins A and C. Little potential.
References: Burkill 1935, Molesworth Allen 1967.

***Buchanania lanzan* Spreng.**
Common names: almondette (English); kalompang (Malaya); piyal (India).
Origin: India, Burma.
Distribution: India, Burma, Malaya.
Cultural requirements: Hot tropical-monsoon climate.
Description: Medium-size tree. Propagation by seed. Fruit 1.5 cm long, black exterior.
Utilization: Pulp eaten fresh or dried; flavor sweet, pleasant; medium appeal. Seed roasted; used in confections and as source of oil; flavor similar to almond; source of protein and oil. Fair potential as almond substitute.
References: Burkill 1935, Dastur 1951.

***Dracontomelum mangiferum* Blume**
Common names: sekuang (Malaya); manguier mombin (French).
Origin: Southeast Asia, India.
Distribution: Southeast Asia, India.
Cultural requirements: Hot tropical lowlands.
Description: Tree to 20 m. Propagation by seed. Fruit small, with scant pulp.
Utilization: Fruit preserved as relish. Flavor sour; limited appeal. Locally used; of little economic value and potential.
Reference: Burkill 1935.

***Harpephyllum caffrum* Bernh. ex Krause**
Common names: Kaffir plum, cape ash (English).
Origin: South Africa.
Distribution: Africa, India, U.S.A.
Cultural requirements: Tropical and subtropical climates. Tolerant of dry conditions, poor soil.
Description: Tree. Propagation by seed. Fruit small.
Utilization: Pulp eaten fresh, made into jelly. Esteemed locally or of local economic value. Little potential.
Reference: Irvine 1961.

***Lannea acida* A. Rich.**
Common names: bembé (Mali); sabaga (Volta).
Origin: West Africa.
Distribution: West Africa.
Cultural requirements: Hot tropical lowlands. Tolerant of poor, rocky soils and dry savanna conditions.
Description: Tree to 10 m. Propagation by seed. Flowers December, fruit matures in 30 or more days. Fruit 1.5 cm long, in large clusters, red to purple exterior.
Utilization: Pulp eaten fresh, dried. Flavor sour, somewhat resinous. Widely used in local areas but of limited appeal. Some possibility of expansion.
References: Dalziel 1948, Irvine 1961.

***Mangifera caesia* Jack.**
Common names: binjai (English); binjai, kemang (Malaya); lam-yai (Thailand); bonglo (Java).
Origin: Southeast Asia.
Distribution: Southeast Asia.
Cultural requirements: Hot tropical lowlands with monsoon climate.
Description: Tree to 35 m. Propagation by seed. Fruit 10–15 cm long; external color brown to yellowish brown, internal whitish.
Utilization: Pulp of green or ripe fruit eaten fresh, cooked, preserved. Flavor sweet to sour, aromatic. Widely used but of limited appeal. Source of vitamin A. Little potential for expansion.
References: Burkill 1935, Molesworth Allen 1967.

***Mangifera foetida* Lour.**
Common names: horse-mango (English); bachang, machang (Malaya); ma-mut (Thailand); xoai hoi (Vietnam).
Origin: Southeast Asia.
Distribution: Southeast Asia.
Cultural requirements: Hot tropical lowlands with monsoon climate.
Description: Tree to 25 m. Propagated by seed. Fruit 10–15 cm long; external color yellowish green, internal yellow to orange.
Utilization: Pulp eaten fresh, more commonly in curries, chutneys, preserves. Flavor sweet; strong unpleasant odor. Source of vitamins A and C. Little potential outside of present area of culture.
References: Burkill 1935, Molesworth Allen 1967.

***Mangifera indica* L.**
Common names: mango (English, Spanish, various other languages); mangga (Malaya); ma-muang (Thailand).
Origin: Southeast Asia.
Distribution: Pantropic; hot subtropical areas.
Cultural requirements: Hot tropical lowlands, seasonally dry. Tolerant of a variety of soil conditions.
Description: Tree to 25 m. Propagation by seed, grafting. Fruit production in 6-10 years from seed, 3-5 years from grafts. Can flower at any time of year, depending on variety, latitude, and climate. Fruit matures in 120-180 days. Most varieties self-fertile but benefit from cross-pollination. Fruit 8-25 cm long, 200-1,800 g, solitary or in small clusters; external color green, yellow, orange, or red; internal color yellow to orange.
Utilization: Pulp of green or ripe fruit eaten fresh, cooked, dried, canned, preserved, frozen. Flavor sweet, aromatic; universal appeal. Good source of vitamins A and C. One of the most important fruits of the world, with excellent potential for expanded cultivation. Hundreds of varieties exist. Variety collections and research programs in Central and South America, India, Indonesia, Israel, Malaya, the Philippines, South Africa, Taiwan, Thailand, U.S.A. (Florida, Hawaii, Puerto Rico).
References: Molesworth Allen 1967, Popenoe 1939, Ruehle and Ledin 1956, Singh 1960.

***Mangifera odorata* Griff.**
Common names: kuini (English, Malaya); ma-mut (Thailand).
Origin: Southeast Asia.
Distribution: Southeast Asia.
Cultural requirements: Hot tropical lowlands with monsoon climate. Tolerant of a variety of soil conditions.
Description: Tree to 25 m. Propagation by seed (can be grafted easily, but not a common practice). Fruit production in 6-9 years from seed. Flowering season variable, depending on latitude and climate. Fruit matures in 150 days. Fruit 10-15 cm long, 300-450 g, usually solitary; external color yellowish green, internal orange.
Utilization: Pulp eaten fresh, cooked in preserves, chutneys. Flavor sweet, highly aromatic, unpleasant to some. Source of vitamins A and C. Important in native area but little potential for expanded use.
References: Burkill 1935, Molesworth Allen 1967.

***Pleiogynium solandri* Engler**
Common names: burdekin plum, hog plum (English).
Origin: Australia.
Distribution: Introduced elsewhere into Tropics but rare.
Cultural requirements: Hot tropical lowlands with medium rainfall.
Description: Tree to 20 m or more. Propagation by seed. Fruit oblate, 4 cm in diameter, exterior purple.
Utilization: Pulp eaten fresh. Flavor subacid; pleasant. Seed also edible. Chiefly wild; little potential for cultivation.
Reference: Neal 1965.

***Pseudospondias microcarpa* (A. Rich.) Engler**
Common names: ochol, bololo, mubulu (tropical Africa).
Origin: Tropical Africa.
Distribution: Tropical Africa.
Cultural requirements: Hot tropical lowlands; often found in swampy areas.
Description: Tree to 35 m. Propagation by seed. Flowers January-February, June-July. Fruit matures in 90-120 days. Fruit 2.5 cm long, exterior red or bluish black. Pulp scant.
Utilization: Pulp eaten fresh. Flavor sweet, resinous; limited appeal. Little potential for further cultivation.
References: Dalziel 1948, Irvine 1961.

***Sclerocarya birrea* Hochst.**
Common name: nobse (Mozambique).
Origin: Tropical Africa.
Distribution: Tropical Africa.
Cultural requirements: Hot, dry tropical savanna and forest areas.
Description: Tree to 14 m. Propagation by seed, cuttings. Flowers in December-January. Fruit matures in 180 days. Fruit 3.5 cm long, exterior yellow.
Utilization: Pulp eaten fresh, cooked, in beverages. Seed edible. Flavor of pulp subacid, pleasant. Seed source of oil. Possibly useful if more widely extended.
References: Dalziel 1948, Irvine 1961.

***Sclerocarya caffra* Sond.**
Common names: kaffir plum, cat thorn, marvala plum or nut (English).
Origin: Eastern and southern Africa.
Distribution: Africa, Madagascar, Australia.
Cultural requirements: Tropical and subtropical dry savanna.
Description: Tree. Propagation by seed, cutting. Fruit exterior yellow.
Utilization: Pulp squeezed for juice, sometimes fermented. Seed edible. Little known outside Africa. Limited potential.
Reference: Jardin 1967.

***Semecarpus anacardium* L. f.**
Common names: marking nut, oriental cashew (English); bhilarva (India).
Origin: Northern India.
Distribution: Asia, east Africa.
Cultural requirements: Adaptable to variety of tropical and subtropical conditions.
Description: Small to medium tree. Propagation by seed. Fruit 2.5 cm long, exterior black. Enlarged pedicel yellow.
Utilization: Pulp of pedicel roasted. Young fruit pickled. Seed roasted. Limited potential as food crop.
References: Burkill 1935, Dastur 1951.

***Spondias cytherea* Sonn.** (= *Spondias dulcis* Parkins)
Common names: ambarella, Otaheite apple, golden apple (English); pomme cythère (French).
Origin: South Pacific.
Distribution: Pantropic.
Cultural requirements: Best adapted to hot tropical lowlands with monsoon climate. Tolerant of a variety of soils.
Description: Tree to 15 m. Propagation by seed, cuttings. Fruit production in 4-5 years from seed, 2-3 years from cuttings. Flowers March-May (Florida). Fruit matures in 200 or more days. Fruit ellipsoid, 5-8 cm long, in clusters of 8-12, exterior yellow.
Utilization: Pulp eaten fresh, cooked in jam, chutney. Green fruit pickled. Flavor sweet to subacid, spicy; wide appeal. Good potential for local cultivation in Tropics.
References: Molesworth Allen 1967, Ruehle et al. 1958

***Spondias mombin* L.** (= *Spondias lutea*)
Common names: hog plum, yellow mombin (English); ciruela, jobo (Spanish); mombin, mombin jaune (French); caja mirim (Portuguese).
Origin: Tropical America.
Distribution: Pantropic.
Cultural requirements: Hot tropical lowlands with high rainfall or with marked dry season. Tolerant of a variety of soils.
Description: Tree to 10 m or more. Propagation by seed, large cuttings. Fruit production in 4-6 years from seed, 2-3 years from cuttings. Flowers in March-April (Florida). Fruit matures in 180 days. Fruit ellipsoid, 2.5-4 cm long, solitary, yellow exterior.
Utilization: Pulp eaten fresh, used in jellies, sherbets. Flavor sweet, pleasant; general appeal. Good potential for cultivation in lowland Tropics.
References: Fouqué 1974, Ruehle et al. 1958.

***Spondias pinnata* Kurz**
Common names: hog plum (English); ambra (Laos); buah amara (Malaya).
Origin: Tropical Asia.
Distribution: Tropical Asia.
Cultural requirements: Hot tropical lowlands.
Description: Tree to 8 m. Propagation by seed, cuttings. Fruit ellipsoid, small.
Utilization: Pulp pickled or used as flavoring in cooked foods. Flavor sour, strong. Little potential for cultivation outside native area.
Reference: Burkill 1935.

***Spondias purpurea* L.**
Common names: red mombin, purple mombin (English); jocote, ciruela roja (Spanish); mombin rouge (French); caja, ciriguela (Portuguese).
Origin: Tropical America.
Distribution: Pantropic.
Cultural requirements: Hot tropical lowlands, wet to relatively dry. Tolerant of a variety of soils.
Description: Tree to 7 m. Propagation by seed, cuttings. Fruit production in 4-5 years from seed, 2-3 years from cuttings. Flowers in March-April (Florida). Fruit matures in 120 or more days. Fruit 2.5-5 cm long, solitary; external color red, internal yellow.
Utilization: Pulp eaten fresh, used for beverages, jellies. Flavor sweet, pleasant; general appeal. Good potential for cultivation in lowland Tropics.
References: Fouqué 1974, Ruehle et al. 1958.

***Spondias tuberosa* Arruda**
Common names: imbu (English, Spanish, French); imbu, umbu (Portuguese).
Origin: Brazil.
Distribution: South America.
Cultural requirements: Hot tropical climate. Very tolerant of dry conditions.
Description: Tree to 6 m. Propagation by seed, cuttings. Flowers April-May (Florida). Fruit 4 cm long, in clusters of 3-4; external color greenish yellow, internal whitish.
Utilization: Pulp eaten fresh, made into beverages, jelly, desserts. Flavor sweet, pleasant; general appeal. Good potential for dry tropical areas.
References: Fouqué 1974, Popenoe 1917.

Annonaceae

***Annona cherimola* Mill.**
Common names: cherimoya (English); anon, chirimoya (Spanish); cherimolier (French); chirimolia (Portuguese).
Origin: South America.
Distribution: Tropics, subtropics.
Cultural requirements: Tropical highlands or cool subtropical climate with well-distributed medium rainfall. Will not fruit well in hot, humid Tropics.
Description: Tree to 8 m. Propagation by seed, grafting. Fruit production in 5-6 years from seed, 3-4 years from grafts. Flowers April-May (Florida), sometimes two blooms per year. Hand-pollination needed in some areas for good production. Fruit matures in 150 days. Fruit 10-20 cm long, 200-2,000 g, solitary; external color green, internal white.
Utilization: Pulp eaten fresh, made into ice cream, sherbets. Flavor sweet, excellent; universal appeal. Good potential in suitable climate. Some variety selection and research in Spain, South America, U.S.A. (California).
References: Fouqué 1974, Popenoe 1939.

***Annona diversifolia* Saff.**
Common names: ilama (English); ilama, papauce (Spanish); ilama, cherimole des terres basses (French).
Origin: Central America, Mexico.
Distribution: Tropical America.
Cultural requirements: Hot tropical lowlands with low to medium rainfall. Very susceptible to frost injury. Poor fruit production is problem in many areas.
Description: Tree to 6 m. Propagation by seed, grafting. Fruit production in 7-8 years from seed, 3-4 years from grafts. Flowers in April-May (Florida). Fruit matures in 150 days. Fruit spherical to ovoid, 10-15 cm in diameter, 400-800 g, solitary; external color green or lavender, internal white or lavender.
Utilization: Pulp eaten fresh, in sherbets, other desserts. Flavor sweet, aromatic, pleasant; wide appeal. Fair potential for cultivation in tropical lowland areas.
References: Fouqué 1974, Ruehle et al. 1958.

***Annona montana* Macfad.**
Common names: mountain soursop (English); guanabana cimarrona (Spanish); corossolier bâtard (French); araticum ape, araticum cagao (Portuguese).
Origin: West Indies, South America.
Distribution: Tropical America.
Cultural requirements: Warm tropical climate with medium to high rainfall at low to medium elevations.
Description: Tree to 10 m. Propagation by seed. Fruit production in 5-6 years. Flowers May-June (Florida). Fruit matures in 120 days. Fruit 10-15 cm in diameter, solitary; external color green, internal white to yellowish.

Figure 11.—Mountain soursop, unusually flavored and good for drinks or for eating out of hand.

Utilization: Pulp eaten fresh, in desserts. Flavor subacid, resinous; limited appeal. Little potential for development.
References: Fouqué 1974, Popenoe 1939.

***Annona muricata* L.**
Common names: soursop (English); catoche, guanabana (Spanish); anone, corossolier (French); curassol, coraçao de rainha (Portuguese).
Distribution: Pantropic.
Cultural requirements: Hot tropical lowlands with high rainfall. Very susceptible to frost injury.
Description: Tree to 8 m. Propagation by seed, grafting. Fruit production in 4-5 years from seed, 2-3 years from grafts. Flowering season May-June, October-November (Florida). Poor fruit set is a frequent problem, possibly because of poor pollination. Fruit matures in 70-120 days. Fruit 15-35 cm long, 1,000-4,000 g, solitary; external color green, internal white.
Utilization: Pulp eaten fresh, made into juice, ice cream, other desserts. Flavor sweet to subacid, excellent; universal appeal. Potential for commercial production excellent.
References: Fouqué 1974, Popenoe 1939, Ruehle et al. 1958.

Figure 12.—Soursop, a sour fruit that almost everyone likes.

***Annona purpurea* Moc. et Sessé**
Common names: soncoya (English); soncoya, cabeza de negro (Spanish); atier, corossol, coeur de boeuf (French); cabeça de negro (Portuguese).
Origin: Mexico, Central America.
Distribution: Tropical America, Philippines.
Cultural requirements: Hot tropical lowlands with medium to high rainfall.
Description: Tree to 12 m. Propagation by seed. Fruit 15-20 cm in diameter, solitary; external color brown to gray, internal orange.
Utilization: Pulp eaten fresh. Flavor aromatic; limited appeal. Little potential.
References: Fouqué 1974, Popenoe 1939.

***Annona reticulata* L.**
Common names: custard apple, bullock's-heart (English); anon, anona corazón, chirimoya (Spanish); coeur de boeuf (French); condesa, coraçao de boi (Portuguese).
Origin: Tropical America.
Distribution: Pantropic.
Cultural requirements: Hot tropical lowlands or subtropical climate with medium to high rainfall. Tolerant of light frost.
Description: Tree to 7 m. Propagation by seed. Fruit production in 4-5 years. Flowers May-June (Florida). Fruit matures in 200 or more days. Fruit ovoid, 8-12 cm in diameter, 400-1,000 g, solitary; external color reddish to yellow, internal white.
Utilization: Pulp eaten fresh, in desserts. Flavor sweet, insipid; fair appeal. Good source of vitamin C. Fair potential as food crop and useful as rootstock for other Annona species.
References: Fouqué 1974, Popenoe 1939.

***Annona scleroderma* Saff.**
Common name: posh te (Spanish).
Origin: Mexico, Guatemala.
Distribution: Mexico, Guatemala.
Cultural requirements: Tropical climate at low and medium elevations.
Description: Small tree. Propagation by seed. Fruit 8 cm in diameter, solitary; external color green, internal white.
Utilization: Pulp eaten fresh, in desserts. Flavor sweet, aromatic; low appeal. Potential limited to native areas.
Reference: Popenoe 1939.

***Annona senegalensis* Pers.**
Common names: wild custard apple (English); abo (Nigeria).
Origin: West Africa.
Distribution: Tropical Africa.
Cultural requirements: Grows in poor soils in low moist areas in hot tropical climates.
Description: Tree to 6 m. Propagation by seed. Flowers February-April. Fruit matures in 120 days. Fruit 5 cm in diameter, solitary, yellow exterior.
Utilization: Pulp eaten fresh. Flavor sweet; limited appeal. Little potential as a food crop.
References: Dalziel 1948, Irvine 1961.

***Annona squamosa* L.**
Common names: sugar apple, sweetsop (English); anon, rinon, anona blanca (Spanish); attier, anone écaillouse (French); ata, fruta de condessa (Portuguese).
Origin: Tropical America.
Distribution: Pantropic.
Cultural requirements: Hot tropical lowlands or subtropical climate, with medium rainfall. Will survive light frost.
Description: Tree to 6 m. Propagation by seed, grafting. Fruit production in 3-5 years from seed, 2-3 years from grafts. Flowers in April-May (Florida). Fruit matures in 120-150 days. Fruit ovoid, 5-10 cm in diameter, solitary; external color green, internal white.
Utilization: Pulp eaten fresh, in ice cream, sherbets, other desserts. Flavor sweet, good; general appeal. Moderate levels of vitamin C. Good potential for home garden and limited commerical production.
References: Fouqué 1974, Popenoe 1939, Ruehle et al. 1958.

Annona squamosa* × *A. cherimola (hybrid).
Common name: atemoya (English).
Origin: U.S.A. (Florida).
Distribution: Tropics, subtropics.
Cultural requirements: Warm tropical or subtropical climate. Tolerant of a variety of climatic and soil conditions and of light frost.
Description: Tree to 6 m. Propagation by seed, grafting. Fruit production in 4-5 years from seed, 2-3 years from grafts. Flowers April-June (Florida), sometimes two blooms a year. Some varieties need hand-pollination for good production. Fruit matures in 150-180 days. Fruit 8-15 cm in diameter, 300-900 g or more, solitary; external color green, interior white.
Utilization: Pulp eaten fresh, in sherbets, other desserts. Flavor sweet, excellent; universal appeal. Great potential for commercial production in tropical and subtropical lowlands. Variety improvement, cultural research in Israel, South Africa, Australia, U.S.A. (Florida).
Reference: Campbell and Phillips 1980.

***Rollinia deliciosa* Saff.** (= *R. pulchrinervis* DC.)
Common names: biriba (English); biriba, fruta da condessa (Portuguese).
Origin: Brazil.
Distribution: Brazil; introduced elsewhere into Tropics but rare.
Cultural requirements: Hot, humid tropical lowlands. Very susceptible to frost injury.
Description: Tree to 10 m. Propagation by seed. Flowers April-May (Florida). Fruit matures in 90 or more days. Fruit 8-12 cm in diameter, solitary; external color yellow, internal white.
Utilization: Pulp eaten fresh, as juice, in desserts. Flavor sweet, pleasant; good acceptance. Fair potential as crop in humid Tropics.
References: Fouqué 1974, Popenoe 1939.

***Rollinia mucosa* Baill.**
Common names: wild sweetsop (English); anon cimarron (Spanish); cachiman crème, cachiman morveux (French); araticum pitaia, condessa (Portuguese).
Origin: Central and South America, West Indies.
Distribution: Tropical America.
Cultural requirements: Hot, humid tropical lowlands.
Description: Tree to 10 m. Propagation by seed. Flowers April-May (Florida). Fruit matures in 90 or

Figure 13.—*Rollinia mucosa*, a very good annonacious fruit.

more days. Fruit 8–12 cm in diameter, solitary; external color yellow, internal white.
Utilization: Pulp eaten fresh, in desserts. Flavor sweet, insipid. Little potential as food crop.
Reference: Fouqué 1974.

Apocynaceae

***Carissa carandas* L.**
Common names: karanda, Christ's-thorn (English).
Origin: India.
Distribution: Tropics, subtropics.
Cultural requirements: Subtropical climate with low to medium rainfall and medium-acid soil.
Description: Shrub to 3 m. Propagation by seed, cuttings, layering. Fruit production in 3–4 years from seed, 1–3 years from vegetative propagation. Flowers all year. Fruit spherical to ellipsoid, 1.5–2 cm in diameter, solitary; external color black, internal red.
Utilization: Pulp used in jelly, preserves, beverages. Flavor sour; fair appeal. Home garden crop; little potential for commercial production.
References: Burkill 1935, Ruehle et al. 1958.

***Carissa edulis* Vahl**
Common name: Egyptian carissa (English).
Origin: Africa.
Distribution: Africa.
Cultural requirements: Hot climate with low rainfall.
Description: Shrub. Propagation by seed, cuttings. Flowers March–August. Fruit matures in 60 days. Fruit 1.5 cm in diameter, solitary; external color black, internal reddish.
Utilization: Pulp eaten fresh, made into jam, vinegar. Flavor sweet, pleasant. Little potential for cultivation as food crop.
References: Dalziel 1948, Irvine 1961.

***Carissa grandiflora* A. DC.** (= *C. macrocarpa* (Eckl.) A. DC.)
Common name: Natal plum (English).
Origin: Eastern and southern Africa.
Distribution: Tropics, subtropics.
Cultural requirements: Grows well in variety of climatic and soil conditions and in wide range of altitudes and latitudes.
Description: Shrub to 4 m. Propagation by seed, cuttings, layering. Fruit production in 4–5 years from seed, 2–3 years from vegetative propagation. Flowers all year. Fruit matures in about 60 days. Fruit ellipsoid, 2.5–5 cm long, solitary; external color red, internal pink.
Utilization: Pulp eaten fresh, made into sherbets, jelly, jam. Flavor sweet to subacid, sometimes astringent; moderate appeal. Potential as home garden food plant. Important as ornamental.
References: Popenoe 1939, Ruehle et al. 1958.

***Hancornia speciosa* Gomez**
Common names: mangaba (English, Portuguese); caoutchouc de Pernambouc (French).
Origin: Brazil.
Distribution: South America.
Cultural requirements: Hot, dry tropical climate; sandy soils.
Description: Shrub or tree to 7 m. Propagation by seed. Fruit 3–6 cm in diameter; external color yellow or red, internal white.
Utilization: Pulp eaten fresh, made into sherbets, preserves, wine. Flavor subacid, pleasant; general appeal. Potential undeveloped, possibly high.
References: Cavalcante 1976, Fouqué 1974.

***Saba senegalensis* (A. DC.) Pichon**
Common names: saba (English); anoma (Ghana).
Origin: Africa.
Distribution: Africa.
Cultural requirements: Grows on fringe of forest zones, tropical climate.
Description: Woody vine. Propagation by seed. Fruit 10 cm long; external color orange, internal yellow.
Utilization: Pulp eaten fresh. Probably little potential.
Reference: Irvine 1961.

Araceae

***Monstera deliciosa* Liebm.**
Common names: ceriman, monstera (English); balazo, cerimán de México, pina anona (Spanish); ananas de Mexico, ceriman (French); banana de brejo, banana do mato, fruta de Mexico (Portuguese).
Origin: Mexico, Guatemala.
Distribution: Pantropic.
Cultural requirements: Hot, humid tropical lowlands with fertile soil.
Description: Large vine. Propagation by seed, cuttings. Fruit production in 6–8 years from seed, 3–4 years from cuttings. Flowers all year. Fruit matures in 90–120 days. Fruit cylindrical, 15–25 cm long, solitary; external color yellowish green, internal pale yellow.

Figure 14.—*Monstera deliciosa*, or ceriman, an unusual but delicious fruit.

Utilization: Pulp eaten fresh, made into jellies, jam. Flavor sweet, aromatic, unpleasant to some because of irritating crystals in pulp. Limited potential as food plant. Important as ornamental.
References: Fouqué 1974, Ruehle et al. 1958.

Balanitaceae

***Balanites aegyptiaca* (L.) Del.**
Common names: desert date, soapberry tree (English).
Origin: Africa.
Distribution: Africa; introduced widely elsewhere but rare.
Cultural requirements: Hot arid climate; not tolerant of humid climate.
Description: Tree to 13 m. Propagation by seed. Flowers January-February (Africa). Fruit matures in 60 days. Fruit 4 cm long, solitary, yellow exterior.
Utilization: Pulp eaten fresh, dried; fermented to make alcoholic beverage. Flavor sweet, somewhat bitter; moderate appeal. Good potential as food crop in arid areas.
Reference: Irvine 1961.

Bignoniaceae

***Parmentiera edulis* A. DC.**
Common names: parmentiera (English); cuachilote (Spanish).
Origin: Mexico, Central America.

Figure 15.—Cuachilote, a banana-shaped fruit with a sugarcane taste.

Distribution: Tropical America.
Cultural requirements: Lowland forest areas with medium to high rainfall.
Description: Tree to 10 m. Propagation by seed. Fruit production in 3-5 years. Flowers all year. Fruit elongate, 10-18 cm long, solitary on trunk and large limbs; external color yellow with red blush, internal white.
Utilization: Pulp eaten fresh, cooked, preserved. Flavor sweet, somewhat bitter; limited appeal. Little potential as food crop.
References: Fouque 1974, Kennard and Winters 1960.

Bombacaceae

***Adansonia digitata* L.**
Common names: baobab, monkey bread (English); calabassier du Senegal (French); hijid (Arabic).
Origin: Africa.
Distribution: Africa, Australia; widely introduced elsewhere in Tropics but not common.
Cultural requirements: Hot climate with low to medium rainfall.
Description: Tree to 20 m. Propagation by seed. Fruit production in 8-10 years. Flowers May-June (Africa). Fruit oblong, 20-30 cm long, solitary; external color brown, interior reddish yellow.
Utilization: Pulp used as flavoring or as food mixed with other ingredients. Seeds roasted or soaked and fermented. Flavor sour, pleasant. Important crop in native area; little potential elsewhere.
References: Dalziel 1948, Irvine 1961.

Figure 16.—Baobab, a fruit with dry but acidic pulp.

***Durio zibethinus* L.**
Common names: durian (English, Malay).
Origin: Southeast Asia.
Distribution: Tropical Asia; some introduction elsewhere in Tropics.
Cultural requirements: Hot, humid tropical lowlands with deep, fertile soil. Very susceptible to cold injury. Not tolerant of poor soils.
Description: Tree to 40 m. Propagation by seed, grafting. Fruit production in 7-8 years from seed, 3-4 years from grafts. Some flower all year. Fruit 15-30 cm long, solitary; external color greenish yellow, internal white or yellowish.
Utilization: Aril eaten fresh, preserved, dried. Seeds boiled, roasted. Flavor sweet, with strong aromatic odor; great appeal. Good source of calories, vitamins B and C. Excellent potential in humid Tropics. Variety selection and cultural research in Thailand.
References: Burkill 1935, Molesworth Allen 1967.

***Matisia cordata* H.B.K.** [= *Quararibea cordata* (Humb. et Bonpl.) Garc. et Hern.]
Common names: South American sapote (English); sapota, zapote chupachupa (Spanish); sapote du Pérou (French); sapota do Peru (Portuguese).
Origin: South America.
Distribution: South America.
Cultural requirements: Hot, humid tropical lowlands. Very susceptible to frost injury.
Description: Tree to 12 m. Propagation by seed. Flowers January-February (Florida). Fruit matures in 270-300 days. Fruit 12-14 cm in diameter; external color brown, internal orange.
Utilization: Pulp eaten fresh, in desserts. Flavor sweet, pleasant; moderate appeal. Potential as food crop limited except in native area.
References: Hodge 1960, Popenoe 1924, Whitman 1976.

Bromeliaceae

***Ananas comosus* Merr.**
Common names: pineapple (English); piña (Spanish); ananas (French); ananas, abacaxi (Portuguese).
Origin: South America.
Distribution: Pantropic.
Cultural requirements: Warm to hot tropical climate with medium rainfall. Light, well-drained, acid soil.
Description: Herb to 1 m. Vegetative propagation by crowns, slips, suckers. Fruit production in 15-24 months. Flowers can be induced at any time of year. Plants self-sterile, but pollination not necessary because fruit develops parthenocarpically. Fruit matures in about 180 days. Fruit 30-60 cm long, solitary; external color yellow to orange, internal white to yellow.
Utilization: Pulp eaten fresh, canned, frozen, dried; made into juice. Flavor sweet, aromatic; universal appeal. One of the most important fruit crops of the world, with commercial production in most countries of the Tropics.
Reference: Ochse et al. 1961.

Burseraceae

***Canarium album* Reanch.**
Common names: canarium, Chinese olive (English); kanran, ch'ing-huo (Chinese).
Origin: Asia.
Distribution: Asia.
Cultural requirements: Subtropical or cool tropical climate.
Description: Tree. Propagation by seed.
Utilization: Pulp eaten fresh. Whole fruit preserved. Seed edible but small and not generally used. Pulp source of oil.

***Canarium indicum* L.**
Common names: canary nut, Java almond (English).
Origin: Southeast Asia.
Distribution: Introduced widely in Tropics.
Cultural requirements: Tropical rain forest.
Description: Tree. Propagation by seed.
Utilization: Seed used in various food preparations and as source of oil. Flavor rich; wide appeal. Good potential for expansion.

***Canarium ovatum* Engler**
Common names: pili nut (English); anangi, pili (Philippines).
Origin: Philippines.
Distribution: Widespread in Tropics.
Cultural requirements: Hot, humid tropical lowlands.
Description: Tree to 20 m. Propagation by seed. Fruit 5–7 cm long, in large clusters; external color black, internal white.
Utilization: Pulp cooked, source of oil. Seed roasted. Flavor excellent; high appeal. High oil and protein content. Great potential in humid Tropics.
References: Brown 1920, Leon 1968, Wester 1925.

***Canarium schweinfurthii* Engler**
Common names: incense tree, African elemi (English).
Origin: Tropical Asia.
Distribution: Africa.
Cultural requirements: Hot tropical climate.
Description: Tree to 40 m. Propagation by seed. Flowers March–May (Africa). Fruit matures in 90 days. Fruit 3.5 cm long; external color bluish black, internal white to cream.
Utilization: Pulp eaten fresh as condiment. Seed roasted, source of oil (shea butter). Flavor good. Limited potential outside native area.
References: Dalziel 1948, Irvine 1961.

***Dacryodes edulis* H. J. Lam.** (= *Pachylobus edulis* G. Don)
Common names: bush butter (English); safoutier (French).
Origin: Tropical west Africa.
Distribution: Tropical Africa, Malaya.
Cultural requirements: Relatively dry tropical savanna.
Description: Tree. Propagation by seed, cuttings. Fruit production in 5–6 years from seed. Fruit exterior color blue black.
Utilization: Pulp eaten fresh, roasted, boiled as dessert, with curries. Flavor subacid, pleasant. Rich in oil and starch. Widely used in native area. Moderate potential for development.
Reference: Dalziel 1948.

Cactaceae

***Hylocereus undatus* Britt. et Rose**
Common names: night-blooming cereus, strawberry pear (English); pitaya, pitahaya (Spanish); cierge lézard, poire de chardon (French).
Origin: Mexico, Central America.
Distribution: Pantropic.
Cultural requirements: Warm tropical lowlands with low to high rainfall.
Description: Vine. Propagation by seed, more commonly by cuttings. Fruit 7–12 cm long; external color red, internal white.
Utilization: Pulp eaten fresh, used in desserts. Flavor sweet, pleasant. Locally important but little potential for commercial production.
References: Fouque 1974, Ruehle et al. 1958.

***Lemaireocereus thurberi* Britt. et Rose**
Common names: sweet pitaya (English); pitaya, pitahaya (Spanish).
Origin: Mexico, U.S.A.
Distribution: Mexico, U.S.A.
Cultural requirements: Dry, hot subtropical climate.
Description: "Tree" to 7 m. Propagation by seed, cuttings. Fruit 4–7 cm long; external color red, interior red or yellow.
Utilization: Pulp eaten fresh, in desserts. Flavor sweet, pleasant. Locally important but little potential for commercial development.
Reference: Fouqué 1974.

***Opuntia ficus-indica* Mill.**
Common names: prickly pear, Indian fig (English); cardón de México, chumbo, higo, tuna (Spanish); chardon d'Inde, figuier d'Inde (French).
Origin: Mexico.
Distribution: Tropics, subtropics.
Cultural requirements: Cool semiarid climate. Calcareous soil best.
Description: "Shrub" to 5 m. Propagation by seed, more commonly by cuttings. Fruit production in 5–6 years from seed, 2–3 years from cuttings. Fruit matures in 90 or more days. Fruit 4–9 cm long; external color purple or red, internal red.
Utilization: Pulp eaten fresh, dried, made into jelly, candy, preserves. Flavor sweet, pleasant. Locally important but little potential for expansion as commercial crop.
Reference: Fouqué 1974.

***Pereskia aculeata* Plum. ex Mill.**
Common names: Barbados gooseberry, lemon vine English); corona de novia, grosellero, guamacho (Spanish); cactier à fruits feuilles, groseillier de Barbade (French); mata velha (Portuguese).
Origin: Tropical America.
Distribution: Tropical America.
Cultural requirements: Hot tropical climate with medium to high rainfall.

Description: Vine. Propagation by seed, cuttings. Fruit 1.5–2 cm in diameter; external color yellow, internal white.
Utilization: Pulp eaten fresh, preserved. Flavor sweet to sour, pleasant. High in vitamin A, medium in calcium. Little potential for wider cultivation.
References: Fouqué 1974, Kennard and Winters 1960.

Capparidaceae

***Boscia senegalensis* Lam. ex Poir.**
Common names: aïsen (West Africa); kursan (Arabic).
Origin: Africa (Sahara, Sahel).
Distribution: Africa.
Cultural requirements: Hot, arid or semiarid climate.
Description: Shrub to 5 m. Propagation by seed. Fruit spherical, 1.5–2 cm in diameter.
Utilization: Fruit cooked and eaten after soaking. Locally important. Little potential for wider cultivation.
References: Dalziel 1948, Irvine 1961.

Caricaceae

***Carica candemarcensis* Hook. f.** *(= C. pubescens* Lenné et K. Koch)
Common names: mountain papaya (English); chamburo, papaya de tierra fria (Spanish).
Origin: South America.
Distribution: South America.
Cultural requirements: Tropical highlands and cool subtropical areas with well-distributed rainfall.
Description: Arborescent herb to 5 m or more. Propagation by seed. Fruit production in 2 years. Fruit 6–20 cm long; external color orange, internal yellow.
Utilization: Pulp made into preserves. Flavor sour, aromatic, pleasant. Locally important but little potential for large-scale cultivation.
References: Badillo 1971, Fouqué 1974.

***Carica papaya* L.**
Common names: papaya, pawpaw (English); papaya, lechosa, fruta bomba (Spanish); papayer (French); mamão (Portuguese).
Origin: Tropical America.
Distribution: Pantropic.
Cultural requirements: Warm tropical or subtropical climate, fertile soil, well-distributed rainfall. Not tolerant of frost or wind.
Description: Arborescent herb to 8 m. Propagation by seed. Fruit production in 8–10 months. Flowers all year. Dioecious or hermaphroditic. Fruit matures in 60 days. Fruit spherical to ellipsoid, 10–30 cm long, 400–2,500 g, solitary or in small clusters; external color yellow to orange; internal color yellow, orange, or red.
Utilization: Pulp eaten fresh, made into juice, preserves, desserts. Flavor sweet; general appeal. Excellent potential for commercial production in Tropics. Variety selection, propagation, cultural-method research in South Africa, South America, U.S.A. (Florida, Hawaii).
References: Ochse et al. 1961, Yee et al. 1970.

Caryocaraceae

***Caryocar nuciferum* L.** *(= C. villosum* Pers.)
Common names: souari nut (English); nuez souari (Spanish); noisette indienne (French).
Origin: South America.
Distribution: South America; introduced into tropical Asia.
Cultural requirements: Humid lowland tropical forest.
Description: Tree to 30 m. Propagation by seed. Fruit 10–15 cm in diameter; exterior gray brown.
Utilization: Seeds eaten fresh, roasted; source of oil. Flavor good. Locally important with fair possibility for further development.
Reference: Fouqué 1974.

Chrysobalanaceae

***Chrysobalanus icaco* L.**
Common names: coco plum (English); icaco, hicaco Spanish); icaque (French); abajeru (Portuguese).
Origin: Central and South America, West Indies.
Distribution: Pantropic.
Cultural requirements: Hot tropical lowlands, poor to fertile soils, coastal to inland sites. Usually found where soil moist or flooded.
Description: Shrub or tree to 8 m. Propagation by seed or cuttings. Flowers in two or more flushes a year. Fruit spherical to ellipsoid, 2–3 cm long; external color white, pink, or purple; internal color white.
Utilization: Pulp eaten fresh, canned. Seed cooked. Flavor sweet, somewhat insipid. Important in local areas; little potential for large-scale production.
Reference: Fouqué 1974.

***Licania platypus* Fritsh.**
Common names: sunsapote (English); zapote cabillo (Spanish), sansapote (Philippines).
Origin: Central and South America.
Distribution: Central and South America, Philippines.

Figure 17.—Papaya, a rapidly growing fruit appreciated everywhere in the Tropics.

Cultural requirements: Hot tropical lowlands, seasonally dry.
Description: Tree to 30 m. Propagation by seed. Fruit production in 10 years. Flowers November–December. Fruit matures in about 250 days. Fruit oblong, 15 cm long, 900 g; external color greenish brown, internal orange yellow.
Utilization: Pulp eaten fresh. Pulp dry, with sweet flavor. Locally important but little potential for extensive cultivation.
Reference: Wester 1925.

***Parinari curatellifolia* Planch. ex Benth.**
Common names: hissing tree (English); parinaire (French).
Origin: West Africa.
Distribution: Africa.
Cultural requirements: Tropical climate, light soils.
Description: Tree to 8 cm. Propagation by seed. Flowers December–February. Fruit matures in 180 days. Fruit diameter 2.5–4 cm; external color reddish brown, internal red.
Utilization: Pulp eaten fresh. Seed roasted. Flavor sweet, pleasant. Locally important. Little potential for wider cultivation.
References: Dalziel 1948, Irvine 1961.

Combretaceae

***Terminalia catappa* L.**
Common names: tropical almond, Singapore almond (English); almendro (Spanish).
Origin: Pacific islands, Southeast Asia.
Distribution: Pantropic.
Cultural requirements: Hot tropical lowlands. Grows well under great variety of conditions, including coastal strands.

Description: Tree to 20 m. Propagation by seed. Flowers at various times of year. Fruit 5-6 cm long; external color greenish brown, internal white.
Utilization: Seed eaten fresh, cooked. Flavor good. Limited potential because kernel difficult to extract. Used more as ornamental tree than as food crop.
Reference: Burkill 1935.

***Terminalia edulis* Blanco**
Common name: dalison (English).
Origin: Southeast Asia, Philippines.
Distribution: Southeast Asia, Philippines, Hawaii.
Cultural requirements: Tropical lowlands.
Description: Tree to 35 m. Propagation by seed. Fruit 5 cm long; external color red.
Utilization: Pulp eaten as preserves. Flavor sour. Little potential.
Reference: Brown 1920.

***Terminalia kaernbachii* Warb.**
Common name: okari nut (English).
Origin: Papua New Guinea.
Distribution: Southeast Asia, Hawaii.
Cultural requirements: Tropical lowlands.
Description: Large tree. Propagation by seed. Fruit 10 cm long; external color rose, internal white.
Utilization: Seed eaten fresh, roasted. Flavor good; high appeal. Good source of protein. Good potential for wider cultivation. Needs wider trial.

Cycadaceae

***Cycas circinalis* L.**
Common name: queen sago.
Origin: Asia, Africa.
Distribution: Pantropic.
Cultural requirements: Hot tropics and subtropics. Tolerant of light frost.
Description: Tree to 7 m. Propagation by seed. Fruit ovoid, 4-4.5 cm long, exterior color brown.
Utilization: Seed leached with water to remove toxins, dried meal used as starchy food. Locally important as food crop. More important in many areas as ornamental plant.
Reference: Burkill 1935.

Dilleniaceae

***Dillenia indica* L.**
Common names: elephant apple (English); chalba (India).
Origin: India.
Distribution: Widely introduced into Tropics.
Cultural requirements: Hot tropical lowlands with medium to high rainfall.
Description: Tree to 12 m. Propagation by seed. Fruit 12-15 cm in diameter, solitary; exterior color green.
Utilization: Fleshy sepals used as flavoring in curries, jams. Flavor has low appeal outside of native area. Little potential as food crop.
References: Burkill 1935, Kennard and Winters 1960.

Ebenaceae

***Diospyros discolor* Willd.**
Common names: velvet apple, butter fruit (English); mabolo (Philippines).
Origin: Philippines.
Distribution: Introduced widely into Tropics but not common.
Cultural requirements: Hot, humid tropical lowlands.
Description: Tree to 10 m. Propagation mostly by seed; can be grafted. Flowers March-May (Florida). Dioecious, occasionally monoecious. Seedless selections known. Fruit matures in 150-180 days. Fruit ovoid, 6-10 cm in diameter, solitary; external color purplish red to orange, internal white to yellowish.
Utilization: Pulp of fruit eaten fresh, preserved. Flavor sweet, aromatic; moderate appeal. Fair potential for wide cultivation.
References: Popenoe 1939, Ruehle et al. 1958.

***Diospyros ebenaster* Retz.** (= *D. digyna* Jacq.)
Common names: black sapote (English); zapote negro, zapote de mico (Spanish); barbacoa, bois d'ébène, sapote noir (French); ebano (Portuguese).
Origin: Mexico, Central America.
Distribution: Introduced elsewhere into Tropics but not common.
Cultural requirements: Hot tropical climate, low to middle elevations, relatively high rainfall. Well adapted to calcareous soils.
Description: Tree to 15 m. Propagation by seed, grafting. Fruit production in 5-6 years from seed, 2-3 years from grafts. Flowers March-May (Florida). Fruit mature in 200-300 days. Fruit ovate, 7-12 cm in diameter, solitary; external color green to brown, internal brown to black.

Utilization: Pulp eaten fresh, mixed with other fruits. Flavor sweet, insipid. Fair to good source of vitamin C. Moderate potential for development. Needs wider trial.
References: Fouqué 1974, Popenoe 1939, Ruehle et al. 1958.

***Diospyros kaki* L.**
Common names: Japanese persimmon (English); kaki (Japanese).
Origin: China, Japan.
Distribution: Worldwide in warm temperate and subtropical areas and in tropical highlands.
Cultural requirements: Requires seasonal cool period for successful flowering and fruiting, well-distributed rainfall.
Description: Tree to 12 m (usually smaller). Propagation by seed, grafting. Flowers March–April (Florida). Dioecious or polygamous. Fruit matures in about 200 days. Fruit ovoid to oblate, 2.5–8 cm in diameter, solitary; external color yellow or orange, internal orange.
Utilization: Pulp eaten fresh, dried, preserved. Flavor sweet, pleasant; wide appeal. Good source of vitamin A, fair source of vitamin C. Important fruit in Asia. Moderate potential for production elsewhere.
Reference: Popenoe 1939.

***Diospyros mespiliformis* Hochst. *ex* A. DC.**
Common names: West African ebony, swamp ebony (English); kaki du brousse (French).
Origin: Africa.
Distribution: Africa.
Cultural requirements: Hot tropical lowlands with low to medium rainfall.
Description: Tree to 20 m. Propagation by seed. Dioecious. Fruit 2.5 cm. in diameter.
Utilization: Pulp eaten fresh, dried, made into beverages by fermentation. Flavor sweet. Local importance as food crop but little potential for expansion.
References: Dalziel 1948, Irvine 1961.

Euphorbiaceae

***Antidesma bunius* (L.) Spreng.**
Common names: bignay, salamandar (English).
Origin: Southeast Asia.
Distribution: Introduced widely into Tropics but not common outside Asia.
Cultural requirements: Hot, humid tropical lowlands. Adapted to variety of soil conditions. Tolerates light frost.

Figure 18.—Bignay or salamander. The prolific fruits are useful in jellies.

Description: Tree to 10 m. Propagation by seed, cuttings, layering, grafting. Fruit production in 5–6 years from seed, 2–3 years from grafts. Flowers in April–May (Florida). Dioecious. Fruit matures in 150–200 days. Fruit spherical to ovoid, 1 cm in diameter, in clusters of 20–50; external color purple to black, internal purple.
Utilization: Pulp eaten fresh, made into jelly and wine. Flavor sweet, often bitter. Little potential for expansion as food crop.
References: Burkill 1935, Ruehle et al. 1958.

***Antidesma dallachyanum* Baill.**
Common name: Herbert River cherry (English).
Origin: Australia.
Distribution: Australia; introduced elsewhere but rare.
Cultural requirements: Tropical and warm subtropical climate.
Description: Tree to 7 m. Propagation by seed. Flowers in May (Florida). Fruit matures in 90–150 days. Fruit spherical, 1.5 cm in diameter, in clusters of 10–30; external color red, internal red.
Utilization: Pulp eaten fresh, made into jelly. Flavor sour. Little potential as food crop.
Reference: Ruehle et al. 1958.

***Baccaurea dulcis* Muell.-Arg.**
Common names: rambai, chupa, kapundung (Malaya).
Origin: Malay Peninsula, Indonesia.
Distribution: Southeast Asia.
Cultural requirements: Hot tropical lowlands.
Description: Tree, moderate size. Propagation by seed. Fruit in small clusters.
Utilization: Pulp eaten fresh, stewed. Cultivated in native area but little potential for expansion.
Reference: Burkill 1935.

***Baccaurea grifithii* Hook. f.**
Common names: larah, taban, rambai utan (Malaya).
Origin: Malay Peninsula.
Distribution: Malay Peninsula.
Cultural requirements: Hot, humid tropical lowlands.
Description: Medium tree. Propagation by seed. Dioecious. Fruit matures July and December. Fruit spherical, 2.5–6 cm in diameter, in clusters of 3–5; external color brownish, internal white.
Utilization: Pulp eaten fresh, stewed. Flavor sweet to subacid. Good potential as food crop if selection done for improved varieties.
Reference: Molesworth Allen 1967.

***Baccaurea motleyana* Muell.-Arg.**
Common names: rambai (English); rambai, rambeh (Malaya).
Origin: Southeast Asia.
Distribution: Southeast Asia.
Cultural requirements: Hot, humid tropical lowlands.
Description: Tree to 20 m. Propagation by seed, grafting. Dioecious. Fruit ovoid, 2.5–4.5 cm long, in small clusters; external color brownish yellow, internal whitish.
Utilization: Pulp eaten fresh, stewed, preserved. Flavor sweet. Good potential for expanded cultivation.
References: Burkill 1935, Molesworth Allen 1967.

***Elateriospermum tapos* Blume**
Common names: tapos, kedui (Indonesia).
Origin: Southeast Asia.
Distribution: Southeast Asia.
Cultural requirements: Hot, humid Tropics.
Description: Large tree. Propagation by seed. Seed 5 cm long.
Utilization: Seeds eaten after roasting or boiling to remove toxins. Sometimes pickled. Little potential as cultivated crop.
Reference: Burkill 1935.

***Phyllanthus acidus* L.**
Common names: Otaheite gooseberry (English); grosella (Spanish); chermai (Malaya).
Origin: India, Madagascar.
Distribution: Pantropic.
Cultural requirements: Hot, humid tropical lowlands. Tolerant of a variety of soils, seasonal dry period.
Description: Tree to 6 m. Propagation by seed, cuttings. Flowers February–April (Florida). Usually monoecious. Fruit matures in 90–100 days. Fruit oblate, conspicuously ribbed, 2–2.5 cm in diameter; exterior color yellow.
Utilization: Pulp eaten fresh, stewed, preserved. Flavor very sour, refreshing. Locally important but little potential for widespread cultivation.
References: Molesworth Allen 1967, Ruehle et al. 1958.

***Phyllanthus emblica* Skeels**
Common names: emblic (English); melaka (Malaya).
Origin: Tropical Asia.
Distribution: Tropical Asia; introduced elsewhere but rare.
Cultural requirements: Hot tropical lowlands. Tolerant of dry conditions.
Description: Tree to 20 m. Propagation by seed, cuttings, layering, grafting. Flowers June–July (Florida). Monoecious, occasionally dioecious. Fruit spherical, 2.5–5 cm in diameter, solitary; external color greenish yellow or red, internal yellowish.
Utilization: Pulp eaten fresh, stewed, preserved. Flavor very sour, sometimes bitter; little appeal. Very rich in vitamin C. Limited potential for development as food crop.
References: Molesworth Allen 1967, Morton 1955.

Flacourtiaceae

***Dovyalis abyssinica* Warb.**
Common names: African dove plum (English); mukambura (Kenya).
Origin: Ethiopia, Kenya.
Distribution: Some introduction elsewhere but relatively rare.
Cultural requirements: Adapted to hot, dry tropical climate but tolerant of higher rainfall. Grows poorly in calcareous soil.
Description: Shrub or tree to 10 m. Propagation by seed, cuttings. Dioecious. Fruit ovoid, 2.5 cm in diameter; external color light orange, internal yellow.
Utilization: Pulp eaten fresh, stewed, preserved. Flavor sour to subacid; limited appeal. Little potential for wider cultivation.
References: Eggeling 1940, Ruehle et al. 1958.

D. abyssinica* x *D. hebecarpa
Common name: hybrid dovyalis.
Origin: U.S.A. (Florida).
Distribution: Introduced into many tropical and subtropical areas.
Cultural requirements: Tropical or subtropical climate. Tolerant of a great range of soil, temperature, rainfall conditions.
Description: Shrub to 7 m. Propagation by seed, cuttings, layering. Fruit production in 4-5 years from seed, 2 years from vegetative propagation. Several cycles of flowering and fruiting per year. Hermaphroditic or monoecious. Fruit matures in 30-40 days. Fruit ovoid, 3-3.5 cm in diameter; exterior color orange.
Utilization: Pulp eaten fresh, stewed, in jams, jellies. Flavor subacid, pleasant. Good potential particularly for processing. Superior selections very productive, with good flavor.
References: Knight and Winters 1966, Ruehle et al. 1958, Sturrock 1959.

***Dovyalis caffra* (Hook. f. et Harv.) Warb.**
Common names: kei apple (English); umkokolo (South Africa).
Origin: Southwestern Africa.
Distribution: Widely introduced into tropical and subtropical areas but not common.
Cultural requirements: Adapted to semiarid tropical and subtropical climates. Tolerant of high rainfall, hot weather, temperatures to −8° C.
Description: Shrub or tree to 6 m. Propagation by seed, cuttings, layering, grafting. Fruit production in 5-6 years from seed, 2-3 years from vegetative propagation. Flowers February and June (Florida). Dioecious. Fruit matures in 90 days. Fruit ovoid, 3-4 cm in diameter; exterior color yellow, solitary.
Utilization: Pulp eaten fresh, cooked, preserved. Flavor sour to subacid, pleasant. Locally utilized but little potential for further development.
References: Burkill 1935, Ruehle et al. 1958.

***Dovyalis hebecarpa* Warb.**
Common names: Ceylon gooseberry, kitambilla, ketembilla (English).
Origin: Sri Lanka.
Distribution: Widely introduced into Tropics but not common outside native area.
Cultural requirements: Hot, humid tropical lowlands. Tolerant of variety of soils, light frost.
Description: Shrub to 7 m. Propagation by seed, cuttings. Dioecious. Fruit matures in May-June and October-November (Florida). Fruit ovoid, 2-2.5 cm in diameter, solitary, exterior color purple to black.
Utilization: Pulp eaten fresh, cooked, preserved. Flavor sour; little appeal. Good source of vitamin C. Little potential as food crop.
References: Ruehle et al. 1958, Sturrock 1959.

***Flacourtia indica* Merr.** (= *F. ramontchi* L'Her.)
Common names: governor's plum (English); ramontschi (India).
Origin: Tropical Asia, Madagascar.
Distribution: Pantropic.
Cultural requirements: Hot, humid tropical lowlands. Tolerant of a variety of soils.
Description: Shrub or tree to 6 m. Propagation by seed, layering, grafting. Flowers April-May (Florida). Dioecious. Fruit matures in 60-90 days. Fruit ovoid, 2-3 cm in diameter, solitary; external color purple, internal yellow.
Utilization: Pulp eaten fresh, in jellies, jams. Flavor sweet, pleasant. Plant vigorous, useful for local and home garden production but little potential for commercial development.
References: Burkill 1935, Popenoe 1939, Ruehle et al. 1958.

***Flacourtia inermis* Roxb.**
Common names: Martinique plum (English); lovi-lovi (language unknown).
Origin: Southeast Asia.
Distribution: Introduced elsewhere into Tropics but rare.
Cultural requirements: Hot, humid tropical lowlands. Very susceptible to frost injury.
Description: Tree to 5 m. Propagation by seed. Flowers May-June (Florida). Fruit matures in 60 days. Fruit spherical, 2 cm in diameter; external color red, internal yellow.
Utilization: Pulp eaten fresh, in jellies, jams. Flavor sour. Little potential for commercial development.
Reference: Burkill 1935.

***Flacourtia jangomas* Reausch.** (= *F. cataphracta* Roxb.)
Common names: runeala plum (English); prunier malagache (French).
Origin: Tropical Asia.
Distribution: Introduced elsewhere into Tropics but not common.

Cultural requirements: Hot, humid tropical lowlands.
Description: Shrub or tree to 5 m. Propagation by seed, layering, grafting. Flowers May-June (Florida). Dioecious. Fruit matures in 60-90 days. Fruit ovoid, 2-2.5 cm in diameter; external color purple, internal yellow.
Utilization: Pulp eaten fresh, in jellies, jams. Flavor sweet, pleasant. Useful for local food production, but little potential for commercial development.
Reference: Burkill 1935.

***Flacourtia rukam* Zoll. et Mor.**
Common names: rukam, Indian prune (English).
Origin: Philippines, Malaya Archipelago.
Distribution: Introduced elsewhere into Tropics but not common.
Cultural requirements: Hot, humid tropical lowlands.
Description: Tree to 7 m. Propagation by seed, grafting. Flowers May-June (Florida). Dioecious. Fruit matures in 60-90 days. Fruit ovoid, 2-2.5 cm in diameter; external color purple, internal yellow.
Utilization: Pulp eaten fresh, in jellies, jams. Flavor sweet, pleasant. Little potential for commercial development.
References: Burkill 1935, Sturrock 1959.

Gnetaceae

***Gnetum gnemon* L.**
Common names: Spanish joint fir (English); meninjau (Malaya).
Origin: Malaysia.
Distribution: Tropical Asia.
Cultural requirements: Hot, wet tropical climate.
Description: Tree to 20 m. Propagation by seed, cuttings. Fruit 3 cm long; exterior color yellow or red.
Utilization: Fruit eaten fresh, boiled, roasted. Leaves eaten fresh. Important in native area. Much potential as food crop.
References: Burkill 1935, Molesworth Allen 1967.

Guttiferae

***Garcinia cambogia* Desrouss.**
Common name: goraka (Sri Lanka).
Origin: Sri Lanka.
Distribution: Tropical Asia.
Cultural requirements: Hot, wet tropical climate.
Utilization: Pulp eaten fresh, dried; used in curries. Flavor very sour. Little potential for development.

***Garcinia dulcis* Kurz**
Common name: mundu (Malaya).
Origin: Philippines, Borneo, Java.
Distribution: Introduced elsewhere into Tropics but rare.
Cultural requirements: Hot, wet tropical lowlands.
Description: Tree to 13 m. Propagation by seed. Fruit conical, 5-7 cm in diameter, solitary; external color pale orange, internal orange yellow.
Utilization: Pulp eaten fresh, in jams, as flavoring in other foods. Flavor sour to subacid. Rich in citric acid. Potential as home garden fruit in Tropics.
References: Burkill 1935, Molesworth Allen 1967.

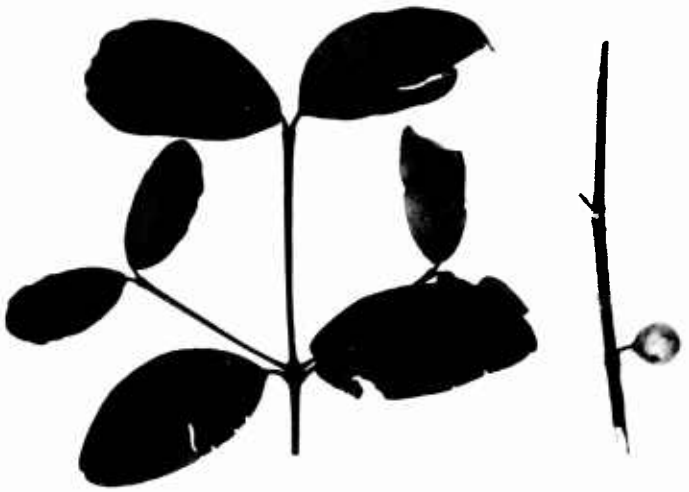

Figure 19.—*Garcinia dulcis*, small but delicious.

***Garcinia livingstonei* T. Anders.**
Common names: imbe (English); imbe (southeastern Africa).
Origin: Eastern tropical Asia.
Distribution: Introduced widely into Tropics but not common.
Cultural requirements: Originated in hot, dry tropical climate but grows well in more humid climate also.
Description: Tree to 6 m. Propagation by seed, grafting. Fruit production in 4-6 years from seed, 2-3 years from grafts. Flowers February-April, August-September (Florida). Dioecious. Fruit matures in 180-200 days. Fruit ellipsoid, 2.5-4 cm in diameter; external color orange, internal light orange.
Utilization: Pulp eaten fresh. Flavor sweet, pleasant. Pulp scant in most selections. Little potential for development.
References: Burkill 1935, Ruehle et al. 1958.

Figure 20.—Imbe, *Garcinia livingstonei*, a prolific fruit from a strange tree.

***Garcinia mangostana* L.**
Common names: mangosteen (English); manggis (Malaya); mangoustanier (French).
Origin: Southeast Asia.
Distribution: Pantropic but rare outside Asia.
Cultural requirements: Hot, wet tropical lowlands. Grows best in deep, fertile soils. Tolerant of heavy, poorly drained soils. Not tolerant of temperatures below 5° C.
Description: Tree to 12 m. Propagated by seed, grafting. Fruit production in 7-10 years from seed, 4-5 years from grafts. All known trees female; fruit develops parthenocarpically. Fruit matures in 150-180 days. Fruit ovoid, 6-8 cm in diameter; external color purple or reddish purple, internal white.
Utilization: Aril eaten fresh. Flavor sweet, excellent; universal appeal. Little nutritional value. Potential excellent as fresh fruit in hot, humid Tropics.
References: Almeyda and Martin 1976a, Burkill 1935, Molesworth Allen 1967, Popenoe 1939.

***Garcinia tinctoria* W. F. Wight** (= *G. xanthochymus* Hook. f.)
Common names: gamboge (English); asam kandis (Malaya).
Origin: India, Burma, Thailand.
Distribution: Introduced widely into Tropics but rare outside Asia.
Cultural requirements: Hot, humid tropical lowlands. Tolerant of shade, poor soils (including high pH), light frost.
Description: Tree to 10 m. Propagation by seed. Fruit production in 7-8 years. Flowers in April-May, sometimes other seasons (Florida). Fruit matures in 120-150 days. Fruit conical, 6-7 cm in diameter, yellow externally and internally.
Utilization: Pulp eaten fresh, in sherbets, jams; used as flavoring in other foods. Flavor very sour, aromatic. Rich in citric acid. Potential as food crop limited outside native areas.
References: Burkill 1935, Molesworth Allen 1967.

***Mammea africana* Sabine**
Common names: African apricot (English); abricotier d'Afrique (French).
Origin: West Africa.
Distribution: Tropical Africa.
Cultural requirements: Hot, tropical monsoon climate.
Description: Tree. Propagated by seed.
Utilization: Pulp eaten fresh. Important in native area but little potential elsewhere.

***Mammea americana* L.**
Common names: mamey apple (English); mamey, mamey de Santo Domingo (Spanish); abricotier des Antilles (French); abrico (Portuguese).
Origin: West Indies.
Distribution: Pantropic but common only in tropical America.
Cultural requirements: Hot tropical climate, low to high rainfall, variety of soil conditions. Not tolerant of frost.
Description: Tree to 20 m. Propagation by seed, grafting. Fruit production in 6-8 years from seed, 4-5 years from grafts. Dioecious. Fruit spherical, 8-15 cm in diameter, solitary; external color light brown, internal orange.
Utilization: Pulp eaten fresh, stewed, preserved. Flavor sweet, pleasant; high appeal. Fair potential for wider use, fresh and processed.
References: Fouqué 1974, Popenoe 1939, Ruehle et al. 1958.

***Platonia insignis* Mart.**
Common names: bacur (English); pacuri (Spanish); parcouri (French); bacupari, bacuri (Portuguese).
Origin: Brazil, Guyana.
Distribution: South America.
Cultural requirements: Hot, humid tropical lowlands. Tolerant of various soil conditions, including poor drainage.

Description: Tree to 25 m. Propagation by seed. Flowers June-July (Brazil). Fruit matures in 200-300 days. Fruit 10-12 cm in diameter; external color yellow to brown, internal white.
Utilization: Aril eaten fresh, in desserts. Flavor subacid, pleasant. Needs trial elsewhere in Tropics to determine potential.
References: Cavalcante 1972, Fouqué 1974.

***Rheedia madruno* Planch. et Triana**
Common names: madrono (English); madroño, cozoiba (Spanish); madruno (French).
Origin: South America.
Distribution: Introduced elsewhere but rare.
Cultural requirements: Hot, humid tropical lowlands.
Description: Tree to 8 m. Propagation by seed. Fruit 3-7 cm long; external color yellow, internal white.
Utilization: Aril eaten fresh, preserved. Flavor subacid, pleasant; high appeal. Good potential for wider trial in Tropics.
Reference: Fouqué 1974.

Juglandaceae

***Carya illinoensis* (Wang.) K. Koch**
Common names: pecan (English); nuez de pecan, nogal pecanero, pacana (Spanish); noix de pécan, pacanier (French).
Origin: U.S.A., Mexico.
Distribution: Tropical and subtropical highlands; warm Temperate Zone.
Cultural requirements: Best in temperate and cool subtropical climates. Deep, fertile soil best. Cool weather during dormancy required for successful flowering.
Description: Tree to 50 m. Propagation by seed, grafting. Fruit production in 10-12 years from seed, 5-8 years from grafts. Flowers in April-May (U.S.A.). Monoecious. Fruit matures in about 150 days. Fruit ellipsoid, 4-5 cm long, brown.
Utilization: Seed eaten fresh, roasted; used in many food preparations. Flavor excellent; universal appeal. Rich in oil. One of the most important nuts of the world. Good potential for expansion in production in all areas where adapted. Most important work in variety improvement and culture in U.S.A. (Texas and Florida).
References: Phillips et al. 1960, Sargent 1922, Sharpe and Gammon 1958.

***Juglans honorei* Dode**
Common names: Ecuador walnut (English); nogal (Spanish); noyer d'equateur (French); tocte (Quechua).
Origin: South America (Andes).
Distribution: South America.
Cultural requirements: Cool climate, low to medium rainfall, altitude of 1,800-3,000 m in Andes.
Description: Tree to 30 m. Propagation by seed. Monoecious. Fruit 2.5-4 cm long, brown.
Utilization: Seed eaten fresh, used in various food preparations. Flavor good; general appeal. Local importance as food crop. Important also for wood.
References: Fouqué 1974, Popenoe 1924.

Lauraceae

***Persea americana* Mill.**
Common names: avocado (English); aguacate, palta (Spanish); avocat (French); abacate (Portuguese).
Origin: Central and South America, Mexico.
Distribution: Tropics and subtropics of world.
Cultural requirements: Tropical or subtropical climate, depending on race. Medium to high rainfall. Tolerant of a variety of soils. Good drainage essential because of susceptibility to *Phytophthora* root rot.
Description: Tree to 16 m. Propagation by seed, grafting. Fruit production in 5-8 years from seed, 3-4 years from grafts. Flowers February-March (Florida). Synchronous dichogamy in flowering; most varieties benefit from cross-pollination. Fruit matures in 120-400 days, depending on race and variety. Fruit spherical, ovoid, ellipsoid, or pyriform, 8-20 cm long, 200-2,000 g; external color green, red, or purple; interior color yellow or whitish.
Utilization: Pulp eaten fresh, mixed with other ingredients in salads, desserts. Flavor nutty, buttery; general appeal. Good source of oil, minerals. Important commercial fruit with good potential for expansion. Large variety collections and work in all aspects of production in Central America, South America, Israel, South Africa, Australia, New Zealand, U.S.A. (California, Florida, Puerto Rico).
References: Popenoe 1939, Sauls et al. 1976.

***Persea schiedeana* Nees**
Common names: coyo, coyo avocado (English); coyo, coyocte, shucte, chucte (Spanish); avocatier du Guatemala (French).
Origin: Mexico, Central America.
Distribution: Tropical America.
Cultural requirements: Cool tropical to subtropical climate. Good soil drainage essential.
Description: Tree to 25 m. Propagation by seed, grafting. Flowers February-April (Central America). Fruit matures in 100-120 days. Fruit pyriform, 5-10 cm in diameter, 150-900 g, solitary; external color green, internal yellow.
Utilization: Pulp eaten fresh. Flavor rich, nutty. Good source of oil, minerals. Pulp often fibrous. Little potential outside native area because not as productive as avocado.
Reference: Popenoe 1939.

Lecythidaceae

***Bertholletia excelsa* Humb. et Bonpl.**
Common names: Brazil nut (English); nuez del Brazil (Spanish); amande d'Amérique, noix de Brésil (French); castanha do moranhao (Portuguese).
Origin: South America.
Distribution: South America; introduced elsewhere but rare.
Cultural requirements: Hot, humid tropical lowlands with deep, fertile soil.
Description: Tree to 45 m. Propagation by seed. Fruit production in 8-12 years. Fruit spherical to ovoid, 10-15 cm in diameter; external color brown, edible portion white.
Utilization: Seed eaten fresh, roasted. Flavor rich, excellent; general appeal. Important commercial crop, limited possibility for expansion.
References: Fouqué 1974, Leon 1968.

***Grias cauliflora* L.**
Common names: anchovy pear (English); paco, pera de anchoa (Spanish); poire d'anchois (French).
Origin: West Indies, Colombia.
Distribution: West Indies, South America.
Cultural requirements: Hot, humid tropical lowlands; swampy areas.
Description: Tree to 15 m. Propagation by seed. Fruit pyriform, 5-8 cm long; external color brown.
Utilization: Pulp eaten fresh. Little potential for development.
Reference: Fouqué 1974.

Figure 21.—Brazil nut, one of the best tropical nuts.

***Lecythis elliptica* Kunth**
Common names: monkey pot (English); olla de mono, sapucaia (Spanish); marmite de singe (French).
Origin: South America.
Distribution: Introduced elsewhere into Tropics but rare.
Cultural requirements: Hot, humid tropical lowlands; deep, fertile soils best.
Description: Small tree. Propagation by seed. Fruit 9 cm long, 7.5 cm in diameter; external color brown, edible portion white.
Utilization: Seed eaten fresh, roasted. Flavor excellent; high appeal. Rich in oil, protein, B vitamins. Good potential for development as commercial crop.
References: Fouqué 1974, Leon 1968.

***Lecythis ollaria* L.**
Common names: monkey pot (English); olla de mono (Spanish); noix de sapucaia (French); cambuça de macao, sapucaia (Portuguese).
Origin: Brazil.
Distribution: South America; introduced elsewhere but not common.

Cultural requirements: Hot, humid tropical lowlands; deep, fertile soils best.
Description: Tree to 35 m. Propagation by seed. Fruit 7–12 cm long, 8–15 cm in diameter; external color brown, edible portion white.
Utilization: Seed eaten fresh, roasted. Flavor rich, excellent; high appeal. Rich in oil and protein. Good potential for further development.
Reference: Fouqué 1974.

***Lecythis zabucajo* Aubl.** (= *L. usitata* Miers)
Common names: paradise nut (English); nuez de paraiso, nuez sapucaia, olla de mono (Spanish); noix de paradis, noix de sapucaia (French); sapucaia (Portuguese).
Origin: Brazil.
Distribution: South America; introduced elsewhere but not common.
Cultural requirements: Hot, humid tropical lowlands; deep, fertile soil best.
Description: Tree to 35 m. Propagation by seed. Fruit 15–20 cm long, 22–26 cm in diameter; external color brown, edible portion white.
Utilization: Seed eaten fresh, roasted. Flavor excellent; high appeal. Rich in oil, protein, B vitamins. Good potential for further development as food crop.
References: Fouqué 1974, Leon 1968.

Leguminosae

***Ceratonia siliqua* L.**
Common names: carob, St.-John's-bread (English); algarroba (Spanish).
Origin: Africa, Middle East.
Distribution: Dry subtropics.
Cultural requirements: Dry, seasonally hot subtropical climate with minimum of 300–380 mm of rainfall without irrigation. Grows but does not fruit well in high-rainfall areas.
Description: Tree to 10 m. Propagation by seed, grafting. Fruit production in 10–12 years from seed, 5–6 years from grafts. Dioecious, but hermaphroditic selections known. Fruit a narrow pod, 10–15 cm long, external color brown.
Utilization: Pulp eaten fresh, processed as chocolate substitute and thickener. Rich in carbohydrates, fair source of protein. Good potential in arid climates.
References: Coit 1949, Sturrock 1959.

***Cordyla pinnata* Milne-Redh.** (= *C. africana* Lour.)
Common names: wild mango (English); poivrier du Senegal (French).
Origin: West Africa.
Distribution: Tropical Africa.
Cultural requirements: Hot, dry tropical climate.
Description: Tree. Propagation by seed. Fruit external color yellow.
Utilization: Pulp eaten frest. Flavor sweet, astringent; limited appeal. Little potential for development.
Reference: Dalziel 1948.

***Coumarouna odorata* Aubl.** (= *Dipteryx odorata* Willd.)
Common names: tonka bean (English); choiba, sarrapia (Spanish); gaiac de Cayenne (French); cumaru verdadeiro (Portuguese).
Origin: South America.
Distribution: South America.
Cultural requirements: Hot, humid tropical lowlands.
Description: Tree to 30 m. Propagation by seed. Fruit production in 5 years. Fruit 5–6 cm long, 3 cm in diameter, external color brown.
Utilization: Pulp eaten fresh. Seed eaten after boiling to remove toxins. Little potential for development.
References: Fouqué 1974, Perez-Arbelaez 1956.

***Cynometra cauliflora* L.**
Common names: namnam (English); nam-nam (Malaya).
Origin: Southeast Asia.
Distribution: Southeast Asia; introduced elsewhere but rare.
Cultural requirements: Hot, humid tropical lowlands.
Description: Tree to 7 m. Propagation by seed. Fruit 5–10 cm long, 2.5 cm wide. External color brown, internal yellow.
Utilization: Pulp eaten fresh, cooked, pickled, in chutney, curries. Flavor sour, pleasant. Important in local areas. Little potential for commercial development.
References: Burkill 1935, Molesworth Allen 1967.

***Detarium microcarpum* Guill. et Perr.**
Common name: sweet dattock (English).
Origin: West Africa.
Distribution: Tropical Africa.
Cultural requirements: Hot, dry tropical climate.
Description: Tree to 10 m. Propagation by seed. Fruit 4 cm long, 2.5 wide; external color brown, internal greenish.
Utilization: Pulp eaten fresh, dried. Little potential for commercial development.
Reference: Dalziel 1948.

***Detarium senegalense* J. F. Gmelin**
Common name: tallow tree.
Origin: Africa.
Distribution: Africa.
Cultural requirements: Tropical forest areas with rainfall of 1,500–1,600 mm.
Description: Tree to 40 m. Propagation by seed. Fruit external color reddish, internal yellow.
Utilization: Pulp eaten fresh, dried. Little potential for commercial development.
References: Dalziel 1948, Irvine 1961.

***Dialium guineense* Willd.**
Common names: velvet tamarind, black tamarind (English); tamarinier blanc (French).
Origin: West Africa.
Distribution: Tropical Africa.
Cultural requirements: Hot tropical savanna with 1,000–1,600 mm of rainfall.
Description: Tree to 20 m. Propagation by seed. Flowers in September–November, January–April (West Africa). Fruit matures in 90–150 days. External color black, internal orange red.
Utilization: Pulp eaten fresh, macerated in water. Flavor sweet-sour, pleasant. Used in native area. Little potential for expansion.
References: Dalziel 1948, Irvine 1961.

***Dialium indum* L.**
Common name: tamarind plum (English).
Origin: Indonesia.
Distribution: Southeast Asia.
Cultural requirements: Hot, wet tropical climate.
Description: Tree to 40 m. Propagation by seed. Fruit 2.5 cm long, exterior color black.
Utilization: Pulp eaten fresh. Flavor sweet. Seldom cultivated. Little potential for development.
Reference: Burkill 1935.

***Hymenaea courbaril* L.**
Common names: West Indian locust (English); algarrobo, copal, courbaril (Spanish); caroubier de Guyane (French); jatai, jatoba (Portuguese).
Origin: Central and South America, West Indies.
Distribution: Central and South America, West Indies.
Cultural requirements: Hot tropical climate. Adapted to variety of conditions.
Description: Large tree. Propagation by seed. Fruit 6–15 cm long; external color brown, internal yellow.
Utilization: Pulp eaten fresh, powdered and made into gruel or cakes. Flavor sweet. Locally important but with limited potential for development.
Reference: Fouqué 1974.

***Inga edulis* Mart.**
Common names: guamo (English); guaba, guama, guamo (Spanish); pois sucre (French); inga cipo, rabo de mico (Portuguese).
Origin: South America.
Distribution: South America.
Cultural requirements: Hot, humid tropical climate.
Description: Tree to 15 m. Propagation by seed. Fruit production in 2 years. Flowers all year. Fruit up to 100 cm long; external color green, internal white.
Utilization: Aril eaten fresh. Flavor sweet. Not important as food crop. Little potential.
References: Cavalcante 1972, Fouqué 1974, Leon 1968.

***Inga feuillei* A. DC.**
Common names: pacay (English); pacae (Spanish).
Origin: Peru, Boliva.
Distribution: South America.
Cultural requirements: Hot, humid tropical climate.
Description: Tree. Propagation by seed. Fruit 30–60 cm long; external color green, internal white.
Utilization: Pulp (aril) eaten fresh. Flavor sweet. Used locally. Little potential.

***Inga laurina* (Sw.) Willd.**
Common names: guama (English); guabo, guamo (Spanish); pois doux (French).
Origin: Central and South America, West Indies.
Distribution: Tropical America, eastern tropical Asia.
Cultural requirements: Hot, wet tropical lowlands.
Description: Tree to 20 m. Propagation by seed. Fruit 6–12 cm long, 4–8 cm wide; external color green, internal white.
Utilization: Aril eaten fresh. Flavor sweet. Used locally. Little potential as food crop.
Reference: Fouqué 1974.

***Inga paterno* Harms.**
Common names: paterna (English); paterno, guama (Spanish).
Origin: Mexico, Central America.
Distribution: Mexico, Central America.
Cultural requirements: Tropical climate, wet to rather dry forest.

Description: Medium tree. Propagation by seed. Fruit 9–12 cm long, 4–5 cm wide; external color green, internal white.
Utilization: Aril eaten fresh. Seeds cooked. Flavor of pulp sweet. Used locally. Little potential as food crop.
Reference: Standley and Steyermark 1946.

***Inocarpus edulis* Forst.**
Common names: Otaheite chestnut (English); gayam (Java).
Origin: Malaysia and Pacific islands.
Distribution: Southeast Asia and Pacific islands.
Cultural requirements: Hot, humid tropical lowlands.
Description: Small tree. Propagation by seed.
Utilization: Seeds roasted, boiled; moderate appeal. Good source of protein. Potential for trial in other areas.
Reference: Burkill 1935.

***Parkia biglobosa* (Jacq.) Benth.**
Common name: African locust (English).
Origin: West Africa.
Distribution: Tropical Africa.
Cultural requirements: Hot tropical climate; savanna, forest.
Description: Tree to 12 m. Propagation by seed. Fruit 15–20 long; external color brown, internal yellow.
Utilization: Pulp made into a drink, mixed with other foods as flavoring. Seeds ground and fermented. Used in native area. Little potential for development.
References: Dalziel 1948, Irvine 1961.

***Parkia speciosa* Hort. ex Hassk.**
Common names: peté, sindutan (Java); patai (Sumatra); sataw (Thailand).
Origin: Malaysia, Indonesia.
Distribution: Southeast Asia.
Cultural requirements: Humid tropical climate.
Description: Tree to 25 m. Propagation by seed. Pods to 50 cm long, turning black when ripe.
Utilization: Pulp of pods used as food, flavoring; pods pickled; seeds, leaves eaten fresh. Flavor strong, somewhat resembling garlic; esteemed in native area. Little potential for wider cultivation.
Reference: Burkill 1935.

***Pithecellobium lobatum* Benth.**
Common names: jering (Java); jengkol, jaring (Sumatra); nieng, kanieng (Thailand).
Origin: Southeast Asia.
Distribution: Southeast Asia.
Cultural requirements: Hot tropical climate.
Description: Tree to 20 m.
Utilization: Young pods, immature and mature seeds eaten after boiling to remove toxins. Used mostly as flavoring. Flavor appreciated in native area. Little potential for development.
Reference: Burkill 1935.

***Tamarindus indica* L.**
Common names: tamarind (English); tamarindo (Spanish); tamarin (French); tamarindo (Portuguese).
Origin: Tropical Africa.
Distribution: Pantropic.
Cultural requirements: Hot tropical lowlands. Tolerant of a variety of soils if well drained and dry conditions. Does not fruit well where rainfall high all year. Large trees tolerant of light frost. Grows well in calcareous soils.
Description: Tree to 25 m. Propagation by seed, layering, grafting. Fruit production in 7–8 years from seed, 3–4 years from vegetative propagation. Flowers May–June (Florida). Fruit matures in 300–360 days. Fruit 8–15 cm long, 2.5–3 cm wide, in clusters, brown.
Utilization: Pulp eaten fresh, dried, candied, in beverages; flavoring in foods, sauces. Seeds cooked. Flavor of pulp sweet-sour; high appeal. Good source of calories, thiamine, minerals. Widely used but little potential for expansion.
References: Popenoe 1939, Ruehle et al. 1958.

Malpighiaceae

***Bunchosia armeniaca* DC.**
Common names: ciruela, ciruela verde (Spanish); bunchosie des Andes (French); ameixa do Pará (Portuguese).
Origin: South America.
Distribution: South America; some introduction elsewhere but rare.
Cultural requirements: Low to middle elevations, tropical climate.
Description: Shrub or tree to 10 m. Propagation by seed. Fruit production in 2 years. Several crops of fruit a year. Fruit ellipsoid, 3–4 cm long, in clusters of 8–10; external color orange, internal cream or red.

Utilization: Pulp eaten fresh, preserved. Flavor sweet but some somewhat astringent. Marketed locally but little potential for development.
References: Cavalcante 1974, Fouqué 1974, Popenoe 1924.

***Byrsonima crassifolia* (L.) H.B.K.**
Common names: nance, golden spoon (English); manero, manteco, nance (Spanish); maurissi, moureiller des Caraibes (French); murici, muruci (Portuguese).
Origin: Mexico, Central and South America, West Indies.
Distribution: Tropical America.
Cultural requirements: Hot tropical lowlands. Tolerant of considerable range of rainfall, variety of soil conditions.
Description: Shrub or tree to 10 m. Propagation by seed. Fruit 2-2.5 cm in diameter, ovoid, exterior color yellow.
Utilization: Pulp eaten fresh, in beverages; used to flavor liqueur. Flavor sweet, aromatic; general appeal. Potential for home gardens and local marketing.
References: Fouqué 1974, Leon 1968, Standley and Steyermark 1946.

***Malpighia glabra* L.** (= *M. punicifolia* L.)
Common names: West Indian cherry, Barbados cherry (English); acerola, cereza de Barbados (Spanish); acérolier, cerisier des Antilles (French).
Origin: West Indies, South America.
Distribution: Introduced throughout Tropics but rare in many areas.
Cultural requirements: Hot tropical lowlands with medium to high rainfall. Tolerant of a variety of soil conditions, seasonal dry period.
Description: Shrub to 6 m. Propagation by seed, cuttings, layering, grafting. Flowers April-October (Florida). Cross-pollination needed for good fruit production in most selections. Fruit matures in 30 days. Fruit ovoid, 1-3.5 cm in diameter, solitary; external color red, internal yellow.
Utilization: Pulp eaten fresh, in beverages; processed into puree and juice. Flavor sour to sweet; moderate appeal. Pulp very rich in vitamin C. Potential for home garden and commercial vitamin C production.
References: Fouqué 1974, Ledin 1958.

Figure 22.—Acerola, a compact package of vitamin C.

Melastomaceae

***Melastoma malabathricum* L.**
Common names: Singapore rhododendron (English); kluruk (Java).
Origin: Tropical Asia.
Distribution: Tropical Asia.
Cultural requirements: Hot, wet tropical lowlands.
Description: Small shrub. Fruit pulp red.
Utilization: Pulp eaten fresh. Flavor sweet, slightly astringent; moderate appeal. Little potential for wider cultivation.
Reference: Burkill 1935.

Meliaceae

***Lansium domesticum* Correa**
Common names: langsat, lanson (English); langsat (Southeast Asia); lanzon (Spanish); improved race with large fruit called duku (Malaya, English).
Origin: Southeast Asia.

Distribution: Introduced widely into Tropics but not common outside Asia.
Cultural requirements: Hot, wet tropical lowlands with mildly acid soil high in organic matter. Not tolerant of frost, drought.
Description: Tree to 15 m. Propagation by seed, layering, grafting. Fruit production in 15 years from seed, 4-5 years from vegetative propagation. Fruit spherical or ellipsoid, in clusters of about 20 (duku 8-10); external color yellow, internal whitish.
Utilization: Aril eaten fresh, preserved, in jellies. Flavor subacid to sweet; universal appeal. High potential for wider cultivation of superior selections in hot Tropics.
References: Burkill 1935, Molesworth Allen 1967.

***Sandoricum koetjape* Merr.** (= *Sandoricum indicum* Cav.)
Common names: santol (English); sentul, kechapi (Southeast Asia).
Origin: Southeast Asia.
Distribution: Widely introduced into Tropics but common only in Asia.
Cultural requirements: Hot, wet tropical lowlands with fertile medium-acid soil. Large trees will tolerate light frost.
Description: Large tree. Propagation by seed, layering, grafting. Flowers in April-May (Florida). Fruit matures in about 120 days. Fruit spherical, 4-8 cm in diameter; external color yellow orange, internal white.
Utilization: Pulp eaten fresh, preserved, in jellies. Flavor sour to sweet; good selections have universal appeal. Good potential for wider cultivation of superior selections.
References: Burkill 1935, Leon 1968.

Moraceae

***Artocarpus altilis* Fosb.** (= *A. communis* J. R. Forst.)
Common names: breadfruit (English); fruta de pan (Spanish); arbre de pain (French); fruta pao (Portuguese). Seedy form called breadnut.
Origin: Southeast Asia, Polynesia.
Distribution: Pantropic.
Cultural requirements: Hot, wet tropical lowlands. Tolerant of a variety of soils if well drained. Injured by temperatures below 5° C.
Description: Tree to 30 m. Propagation by cuttings, layering (seedy form by seed). Generally two crops of fruit mature during year, varying in time and duration. Monoecious. Fruit spherical, 20-30 cm in diameter; external color greenish yellow, interior whitish or pale yellow.

Figure 23.—Breadfruit, a starchy fruit usually eaten cooked.

Utilization: Entire fruit baked, boiled, roasted, fried; preserved by fermentation. Seeds of seedy selections boiled. Flavor starchy; general appeal. Important food in hot Tropics. Good potential for wider cultivation.
References: Burkill 1935, Molesworth Allen 1967, Ochse et al. 1961.

***Artocarpus integer* (Thunb.) Merr.** (= *A. champeden* Spreng.)
Common names: chempedak (English); champedak, chepedak (Java); chubadak, kakan (Sumatra).
Origin: Southeast Asia.
Distribution: Tropical Asia.
Cultural requirements: Hot, wet tropical climate.
Description: Tree to 20 m. Propagation by seed, grafting. Fruit 20-35 cm long, 10-15 cm in diameter, 10-20 kg (sometimes more); external color yellowish to orange, internal yellow.
Utilization: Pulp eaten fresh, preserved, cooked with various other foods. Seeds cooked. Flavor sweet, aromatic; general appeal. Important in native area. Medium potential as food crop.
References: Burkill 1935, Molesworth Allen 1967, Ochse et al. 1961.

***Artocarpus heterophyllus* Lam.** (= *A. integrifolius* non L. f.)
Common names: jackfruit (English); nongka (Java); lamasa, malasa (Sumatra); khanum (Thailand); jaca (Spanish); jaqueira, jaca (Portuguese).
Origin: Tropical Asia.
Distribution: Pantropic.
Cultural requirements: Hot, humid tropical climate. Grows well in variety of soils if well drained. Not tolerant of frost.
Description: Tree to 25 m. Propagation by seed, grafting. Generally flowers June-July and December-February in Florida. Fruit matures in 180-200 days. Fruit 30-90 cm long, 25-50 cm in diameter, to 60 kg but usually 20-25 kg; external color yellowish, internal yellow.
Utilization: Entire immature fruit cooked. Aril of mature fruit eaten fresh, preserved. Seeds roasted, boiled. Flavor sweet, strongly aromatic. Not widely esteemed outside Asia. Fair potential for wider cultivation in Tropics if good varieties introduced from Asia.
References: Burkill 1935, Molesworth Allen 1967, Ochse et al. 1961.

***Artocarpus odoratissima* Blanco**
Common name: Marang (English, Philippines).
Origin: Southeast Asia, Philippines.
Distribution: Southeast Asia, Philippines.
Cultural requirements: Hot, wet tropical lowlands.
Description: Tree. Propagation by seed, grafting. Fruit production in 6 years from seed.
Utilization: Aril of mature fruit eaten fresh, preserved. Flavor sweet, aromatic; general appeal. Source of iron, vitamin C. Good potential for introduction into other areas of Tropics.
Reference: Burkill 1935.

***Artocarpus rigidus* Blume**
Common name: monkey jack (English).
Origin: Tropical Asia.
Distribution: Tropical Asia.
Cultural requirements: Hot tropical climate.
Description: Large tree. Propagation by seed. Fruit pulp yellow.
Utilization: Aril of mature fruit eaten fresh. Seeds roasted. Flavor sweet. Needs further trial to determine potential.
Reference: Burkill 1935.

***Brosimum alicastrum* Sw.**
Common names: Maya breadnut (English); ramón, nuez de pan (Spanish); noyer à pain (French).
Origin: Mexico, Central America.
Distribution: Tropical America.
Cultural requirements: Hot, humid tropical climate with seasonal dry period. Tolerant of a variety of soils, seasonal flooding. Grows especially well in shallow calcareous soils.
Description: Tree to 30 m. Propagation by seed. Fruit production in 5-6 years. Two or three periods of bloom and fruiting per year in Florida. Fruit spherical to ellipsoid, 2-2.5 cm in diameter, exterior color orange. Pulp scant, seed large.
Utilization: Pulp eaten fresh; seed eaten fresh, cooked. Flavor of pulp sweet; seed has some bitterness unless cooked. Moderate appeal. Little potential for development.
References: Cook 1935, Fairchild 1945, Fouqué 1974.

***Ficus carica* L.**
Common names: fig (English); higo (Spanish); figue (French); figo (Portuguese).
Origin: Asia.
Distribution: Subtropics, cool Tropics.
Cultural requirements: Develops best in relatively dry climate where cool season alternates with hot season. Tolerant of a variety of soil conditions. Tolerant of temperatures below freezing when dormant. Fruiting poor in areas of high rainfall.
Description: Small tree. Propagation by seed, cuttings, grafting. Fruit production in 3-4 years from seed, 1-2 years from vegetative propagation. Most types produce 2-3 crops of fruit per year. Pollination required for Smyrna type; other types parthenocarpic. Fruit pyriform, 2.5-6 cm in diameter; external color green, yellow, red, or purple; internal color whitish, yellowish, or pink.
Utilization: Syconium eaten fresh, dried, preserved, stewed. Flavor sweet; universal appeal. Potential as home garden and commercial crop great in areas where adapted to climate. Many varieties selected in subtropical areas of world. Research on culture in U.S.A. (California, Florida, Louisiana).
References: Krezdorn and Adriance 1961, Storey and Condit 1969.

***Pourouma cecropiaefolia* Mart.**
Common names: Amazon tree grape (English); uvilla (Spanish); mapati, puruma, uva-da-mata (Portuguese).
Origin: South America.
Distribution: South America.

Cultural requirements: Hot, humid tropical lowlands. Not tolerant of frost.
Description: Tree to 12 m. Propagation by seed. Fruit spherical, 2.5 cm in diameter, in clusters, exterior color purple.
Utilization: Pulp eaten fresh, in beverages. Flavor sweet. Limited potential as food crop.
Reference: Cavalcante 1974.

***Treculia africana* Decne**
Common names: African breadfruit (English); arbre de pain (French).
Origin: Tropical west Africa.
Distribution: Tropical west Africa.
Cultural requirements: Hot tropical climate, forest areas.
Description: Tree to 26 m, propagation by seed. Tree monoecious. Fruit 45 cm in diameter, to 12 kg; external color yellowish brown, seeds brown.
Utilization: Seeds boiled, roasted, consumed whole; ground into meal; used in sauces, flavorings; source of oil. Flavor similar to peanuts. Rich in oil. Food source in local areas. Little potential for expansion.
References: Dalziel 1948, Irvine 1961.

Musaceae

***Musa acuminata* Colla and hybrids of *M. acuminata* and *M. balbisiana* Colla**
Common names: banana, plantain (English); banano, platano, guineo (Spanish); banane, bananier (French).
Origin: Southeast Asia.
Distribution: Pantropic; warm subtropics.
Cultural requirements: Hot, wet tropical climate. Fertile well-drained soil.
Description: Perennial herb to 8 m. Propagation of edible types by division. Fruit production about 12 months after planting. Flowers at any time of year depending on planting time, nutrition, and maturity. Fruit forms parthenocarpically. Fruit matures in 90-120 days. Fruit 6-35 cm long, 2.5-10 cm in diameter, 10 to 150 or more per cluster; external color greenish, yellow, orange, or red; internal color white, yellow, or orange.
Utilization: Pulp eaten fresh, cooked in many ways. Flavor sweet to starchy; great appeal. Good source of carbohydrates; some types have moderate amounts of vitamin A and C. Important food source throughout the world. Scores of varieties exist. Extensive research in culture in various places where commercial production exists.
References: Leon 1968, Ochse et al. 1961, Simmons 1959.

***Musa troglodytarum* L.**
Common name: fei banana (English).
Origin: South Pacific islands, Tahiti, New Caledonia.
Distribution: South Pacific islands.
Cultural requirements: Hot, wet tropical lowlands.
Description: Perennial herb. Propagation by division. Fruit 10-20 cm long, 5-30 per cluster; external color yellow, orange, or brown; internal color white or yellow.
Utilization: Pulp cooked. Flavor starchy; moderate appeal. Source of food in local areas. Little potential for expansion.
Reference: Simmons 1959.

Myristicaceae

***Myristica fragrans* (L.) Houtt.**
Common names: nutmeg, mace (English); nuez moscada (Spanish); muscade (French); noz moscada (Portuguese).
Origin: Moluccas.
Distribution: Pantropic; economically important only in limited areas.
Cultural requirements: Hot, wet tropical lowlands with well-distributed rainfall. Light well-drained soil with high organic content. Not tolerant of frost.
Description: Tree to 18 m. Propagation by seed, grafting. Fruit production in 8-10 years from seed, 4-5 years from grafts. Flowers throughout the year. Dioecious. Fruit spherical to ovoid, 3-9 cm in diameter, solitary; external color yellow, seed brown, aril red.
Utilization: Fruit pulp cooked. Seed (nutmeg) and aril (mace) dried as spices. Flavor of fruit pulp good when sweetened and stewed. Used as food crop only in limited areas. Nutmeg and mace are important spices, but conditions for successful production are exacting.
References: Ochse et al. 1961, Rosengarten 1969.

Myrtaceae

***Britoa acida* Berg**
Common names: para guava (English); goyavier de Para (French); araca do Pará (Portuguese).
Origin: Brazil.
Distribution: Brazil.
Cultural requirements: Hot, dry tropical climate; light soils.
Description: Shrub or tree to 8 m. Propagation by seed. Fruit spherical to ovoid, 5-7 cm long; external color yellow, internal whitish.

Utilization: Pulp made into jellies. Flavor sour, pleasant; general appeal. Some potential for processing.
References: Gomez 1977, Popenoe 1939.

***Eugenia aggregata* Kiaersk.**
Common names: cherry of the Rio Grande (English); cerise du Rio Grande (French).
Origin: Brazil.
Distribution: Tropical America but rare outside Brazil.
Cultural requirements: Grows well in tropical to subtropical conditions in a variety of soils. Not tolerant of drought; good supply of water needed especially during bloom and fruit development. Mature trees tolerate −6° C.
Description: Tree to 8 m. Propagation by seed (can be grafted). Fruit production in 4-5 years from seed. Flowers March-April (Florida). Flowers perfect but cross-pollination increases fruit set. Fruit matures in 60 days. Fruit oblong, 2-3 cm in diameter, solitary on new growth; external color red or purple, internal yellowish orange.
Utilization: Pulp eaten fresh, in jellies. Flavor sweet; moderate appeal. Good home garden fruit and ornamental tree. Little potential for commercial production.
References: Fouqué 1974, Ruehle et al. 1958.

***Eugenia dombeyi* Skeels** (= *E. brasiliensis* Lam.)
Common names: grumichama (English, Spanish); cerisier du brésil (French); grumixama (Portuguese).
Origin: Brazil.
Distribution: Widely introduced but not common outside tropical America.
Cultural requirements: Warm, wet tropical lowlands. Grows best in medium-acid soil. Easily injured by frost.
Description: Shrub or tree to 6 m. Propagation by seed (can be grafted). Flowers April-May (Florida). Fruit matures in 30-40 days. Fruit oblate, 2-3 cm in diameter, solitary on new growth; external color purple to black, internal orange.
Utilization: Pulp eaten fresh, in jellies. Flavor sweet; general appeal. Good home garden fruit and ornamental plant. Little potential for commercial production.
References: Fouqué 1974, Popenoe 1939, Ruehle et al. 1958.

***Eugenia luschnathiana* Klotzsch**
Common name: pitomba (English, French, Portuguese).
Origin: Brazil.
Distribution: Introduced elsewhere but rare outside Brazil.
Cultural requirements: Tropical to warm subtropical climate. Not tolerant of drought especially at time of bloom and fruit development.
Description: Tree to 8 m. Propagation by seed (can be grafted). Flowers April-May (Florida). Fruit matures in 60 days. Fruit ovoid, 2.5-3 cm in diameter; external color orange, internal yellow.
Utilization: Pulp eaten fresh, in jellies, preserves. Flavor sweet to subacid; good appeal. Good home garden fruit. Little potential for commercial production.
References: Fouqué 1974, Ruehle et al. 1958.

***Eugenia uniflora* L.**
Common names: Surinam cherry, pitanga (English); cereza de Surinam, pitanga (Spanish); cerise carree, cerisier de Suriname (French); pitanga, pitanga do norte (Portuguese).
Origin: South America.
Distribution: Pantropic.
Cultural requirements: Tropical and warm subtropical climates, medium to high rainfall, variety of soil conditions. Tolerant of light frost.
Description: Shrub or tree to 6 m. Propagation by seed (can be grafted). Fruit production in 3-4 years from seed. Main bloom March-May, occasionally at other times of year (Florida). Fruit matures in 35-50 days. Fruit oblate, conspicuously ribbed, 2-3.5 cm in diameter; external color red, purple, or black; internal color orange.
Utilization: Pulp eaten fresh, in jellies. Flavor sweet, sometimes resinous; limited appeal. No potential as commercial food crop. Important in some places as ornamental hedge plant.
References: Fouqué 1974, Popenoe 1939, Ruehle et al. 1958.

***Eugenia uvalha* Camb.**
Common names: ubaia, uvaia, uvalha (Portuguese).
Origin: Brazil.
Distribution: Introduced elsewhere but rare outside Brazil.
Cultural requirements: Tropical or warm subtropical climates with low to medium rainfall. Tolerant of light frost and drought.

Description: Shrub or tree to 8 m. Propagation by seed. Fruit production in 3-4 years. Flowers March-May (Florida). Fruit matures in 60 days. Fruit spherical, 3-5 cm in diameter, external color yellow.
Utilization: Pulp eaten fresh, as juice, in jellies; flavoring in alcoholic beverages. Flavor sweet, insipid. Odor sometimes unpleasant. Little possibility for cultivation outside local areas.
References: Fouqué 1974, Popenoe 1939.

***Feijoa sellowiana* Berg**
Common names: pineapple guava, feijoa (English); feijoa, guayaba chilena, guaybo (Spanish); feijoa (French); feijoa, guayabo del pais (Portuguese).
Origin: South America.
Distribution: Subtropics, cool Tropics.
Cultural requirements: Best development in cool subtropical and highland tropical climates. Tolerant of considerable range in rainfall, variety of soil conditions. Fruits poorly in hot tropical lowlands.
Description: Shrub or tree to 6 m. Propagation by seed, cuttings, layering, grafting. Fruit production in 3-5 years from seed, 2-3 years from vegetative propagation. Flowers April-May. Plants often self-sterile; fruiting improved by cross-pollination. Fruit matures in 150-180 days. Fruit ellipsoid, 2-5 m long, 2-4 cm in diameter; external color green, internal white.
Utilization: Pulp eaten fresh, in jellies, preserves. Flavor sweet, pleasant; moderate appeal. Mainly a home garden fruit. Little potential for development.
References: Fouqué 1974, Popenoe 1939, Ruehle et al. 1958.

***Myrciaria cauliflora* Berg**
Common names: jaboticaba (English, French, Spanish); jaboticaba sabara, jabuticaba (Portuguese).
Origin: Brazil.
Distribution: Introduced widely into tropical and subtropical areas but not common outside South America.
Cultural requirements: Cool tropical and warm subtropical climates with medium to high rainfall. Fertile, mildly acid, well-drained soils best. Tolerant of light frost.
Description: Shrub or tree to 12 m. Propagation by seed (can be grafted). Fruit production in 6-10 years or more from seed. Several cycles of flowers and fruit a year. Fruit matures in 30-40 days. Fruit spherical, 2-3 cm in diameter, borne on trunk and large limbs; external color black, internal white or pink.
Utilization: Pulp eaten fresh, in jellies; made into wines. Flavor sweet, excellent; wide appeal. Excellent home garden fruit with some potential for greater commercial production. Good ornamental plant. Several varieties known in Brazil.
References: Fouqué 1974, Popenoe 1939, Ruehle et al. 1958.

***Myrciaria floribunda* Berg**
Common names: guava berry (English); mirto, murta, mije, mijo (Spanish).
Origin: Mexico, West Indies, South America.
Distribution: Tropical America.
Cultural requirements: Warm tropical lowlands; relatively dry to moist conditions, variety of soils. Poor growth in high-pH soils.
Description: Shrub or tree to 12 m. Propagation by seed. Fruit produciton in 6-8 years. Flowers May-June (Florida). Fruit matures in 60 days. Fruit spherical to ovoid, 1-1.5 cm in diameter, solitary on new growth; external color red or yellow, internal yellow orange.
Utilization: Pulp eaten fresh, in jellies, preserves; flavoring in alcoholic beverages. Flavor sweet, aromatic, pleasant. Little possibility of commercial development.
Reference: Little et al. 1974.

***Pseudanamomis umbellulifera* (H.B.K.) Kausel**
Common names: monos plum (English); cereza de mono (Spanish).
Origin: Venezuela.
Distirbution: Venezuela, Florida.
Cultural requirements: Hot tropical lowlands with medium to high rainfall. Tolerant of a variety of soil conditions, light frost.
Description: Shrub to 5 m. Propagation by seed. Fruit production in 3-5 years. Often two crops of fruit per year (Florida). Fruit ellipsoid, 2.5-3 cm in diameter; external color orange, internal yellow orange.
Utilization: Pulp eaten fresh, in jellies. Flavor sweet, insipid. Little potential for cultivation.

***Psidium araca* Raddi** (= *P. guineense* Sw.)
Common names: Brazilian guava (English); araca de Brasil, guayaba acida (Spanish); goyavier acide, goyavier du Brésil (French); araçá, araçá do campo (Portuguese).
Origin: South America.

Distribution: Introduced elsewhere but rare outside South America.
Cultural requirements: Tropical to warm subtropical climates. Tolerant of a variety of soil conditions.
Description: Shrub or tree to 7 m. Propagation by seed or cuttings. Fruit ellipsoid, 2 – 3 cm in diameter, solitary on new growth; external color pale yellow, internal white.
Utilization: Pulp made into jellies. Flavor sour to subacid, pleasant; moderate appeal. Limited potential for processing.
References: Fouqué 1974, Popenoe 1939.

***Psidium cattleianum* Sabine**
Common names: Cattley guava, strawberry guava (English); cas dulce, guayaba de fresa (Spanish); goyavier de Cattley, goyavier fraise (French); Araca da praie, araca de coroa (Portuguese).
Origin: South America.
Distribution: Tropics, subtropics.
Cultural requirements: Cool to hot climate. Variety of soil conditions, swampy to well drained. Withstands temperature to – 6° C without injury.
Description: Shrub or tree to 7 m. Propagation by seed, cuttings, layering. Fruit production in 2 – 3 years from seed. Flowers several times a year (Florida). Fruit matures in 60 – 90 days. Fruit spherical, 2.5 – 4 cm in diameter, solitary on new growth; external color yellow or red, internal whitish.
Utilization: Pulp eaten fresh, as juice, jellies, preserves, sherbets. Flavor sweet or subacid, aromatic; wide appeal. Good home garden fruit and ornamental plant. Little potential for commercial production.
References: Fouqué 1974, Popenoe 1939, Ruehle et al. 1958.

***Psidium friedrichsthalianum* Niedz.**
Common names: Costa Rican guava (English); cas, guayaba ágria (Spanish); goyavier de Costa Rica (French).
Origin: Central America.
Distribution: Tropical America.
Cultural requirements: Hot tropical climate with medium to high rainfall; variety of soil conditions if well drained. Easily injured by frost.
Description: Tree to 10 m (usually smaller). Propagation by seed, cuttings. Fruit production in 4 – 5 years from seed. Main blooms March – April, September – October (Florida). Fruit matures in about 90 days. Fruit spherical to ovoid, 4 – 6 cm in diameter, solitary on new growth; external color yellow, internal pale yellow.
Utilization: Pulp made into beverages, jellies, preserves. Flavor very sour, aromatic; moderate appeal. Limited potential as home garden fruit.
References: Fouqué 1974, Popenoe 1939.

***Psidium guajava* L.**
Common names: guava, common guava (English); guayaba (Spanish); goyavier (French); goiaba (Portuguese).
Origin: Tropical America.
Distribution: Tropics, warm subtropics.
Cultural requirements: Warm climate with medium rainfall. Thrives in variety of light to medium soils, even with poor drainage. (So widely adapted it is considered a weed in some areas.) Mature plants can tolerate very light frost.
Description: Tree to 10 m. Propagation by seed, cuttings, layering, grafting. Fruit production in 4–5 years from seed, 2–3 years from vegetative propagation. Main blooms April–May, September–October (Florida). Fruit matures in 90–120 days. Fruit spherical, ellipsoid, or pyriform; 3–8 cm in diameter, solitary on new growth; external color white or yellow, sometimes with pink blush; internal color white, yellow, or red.
Utilization: Pulp eaten fresh, stewed, as juice, jellies, paste, preserves. Flavor sweet to sour, aromatic; high appeal. Rich in vitamin C. Good potential as home garden fruit or for commercial production for fresh market or processing. Variety improvement and cultural research in many countries, especially India and U.S.A. (Florida, Hawaii, Puerto Rico).
References: Popenoe 1939, Ruehle 1959.

***Psidium microphyllum* Britt.** (= *P. sartorianum* Niedenzu)
Common names: Puerto Rican guava (English); guayaba, pichiche (Spanish).
Origin: West Indies, Central America.
Distribution: West Indies, Central America.
Cultural requirements: Warm tropical climate.
Description: Tree to 15 m. Propagation by seed. Fruit spherical, 1–1.5 cm in diameter, solitary on new growth; external color pale yellow, internal whitish.
Utilization: Pulp eaten fresh, in jellies. Flavor sweetish; low appeal. Little potential for wider cultivation.
Reference: Fouqué 1974.

***Rhodomyrtus tomentosa* Wight**
Common names: downy myrtle, hill gooseberry (English); kemunting (Malaya, Java).
Origin: Tropical Asia.
Distribution: Introduced widely into subtropical areas but not common outside Asia (except in Florida where naturalized).
Cultural requirements: Cool tropical or warm subtropical climate; light acid soils (pH 4-6). Tolerant of wet soil conditions and temperatures to about −6° C. Will not grow in high-pH soils.
Description: Shrub to 3 m. Propagation by seed, division of crowns. Fruit production in 3-4 years from seed. Flowers April-May (Florida). Fruit matures in 60 days. Fruit ellipsoid, 1.5 cm in diameter, exterior color purple.
Utilization: Pulp eaten fresh, in pies, jellies, preserves. Flavor subacid; moderate appeal. Little potential for wider cultivation.
References: Burkill 1935, Ruehle et al. 1958.

***Stenocalyx dysentericus* Berg**
Common names: cageiteira (Portuguese).
Origin: Brazil.
Distribution: Brazil.
Cultural requirements: Dry tropical savanna.
Description: Tree to 6 m. Propagation by seed. Fruit 3-5 cm in diameter; external color yellow, internal white.
Utilization: Pulp eaten fresh, in jellies; made into wine. Flavor subacid. Chiefly harvested from the wild.
Reference: Fouqué 1974.

***Syzygium aqueum* Burm. f.** (= *Eugenia aquea*)
Common names: water rose apple, watery rose apple (English); jambu ayer (Malay).
Origin: Southeast Asia.
Distribution: Introduced widely into Tropics but not common outside Asia.
Cultural requirements: Hot, wet tropical lowlands with light, well-drained, mildly acid soils. Not tolerant of temperatures below freezing.
Description: Tree to 8 m. Propagation by seed, layering (many selections seedless). Fruit production in 7-8 years from seed, 3-4 years from layers. Flowers May-July (Florida), sometimes other seasons. Fruit matures in 30-40 days. Fruit pyriform, 3.5-4.5 cm in diameter, solitary; external color green, white, or pink; internal color white.
Utilization: Pulp eaten fresh, pickled. Flavor slightly sweet, insipid. Good eye appeal but limited taste appeal. Limited potential as commercial fruit in Southeast Asia, where many superior selections exist.
References: Burkill 1935, Molesworth Allen 1967.

***Syzygium cumini* Skeels**
Common names: Java plum, jambolan (English); jambolan (Malaya); jamun (India); duhat (Philippines).
Origin: Southeast Asia, Philippines.
Distribution: Pantropic.
Cultural requirements: Tropical lowland or hot subtropical climate. Tolerant of a variety of soils (even where poorly drained), seasonal dry period. Thrives under adverse conditions to the point of being a weed in some areas.
Description: Tree to 16 m. Propagation by seed (layering, grafting possible but seldom used). Fruit production in 5-6 years from seed. Flowers March-April (Florida), sometimes other seasons. Fruit matures in 90 days. Fruit ellipsoid, 1.5-2.5 cm in diameter, 5-20 per cluster; external color purple, internal white to lavender.
Utilization: Pulp eaten fresh, made into jellies, wine. Flavor sweet, usually astringent; low appeal. Marketed in Asia, but little potential for expansion.
References: Burkill 1935; Molesworth Allen 1967; Popenoe 1939.

Figure 24.—Java plum, an astringent fruit.

***Syzygium guineense* A. DC.**
Common names: Water berry (English); musombo (Africa).
Origin: Tropical Africa.
Distribution: Tropical Africa.
Cultural requirements: Tropical climate, varied conditions including seashore, streambanks, savanna, forest.
Description: Shrub or tree to 12 m. Fruit 1-1.5 cm long.
Utilization: Pulp eaten fresh, made into a beverage. Limited appeal. Little potential for wider cultivation.
References: Dalziel 1948, Irvine 1961.

***Syzygium malaccensis* Merr. et Perry**
Common names: Malay apple, Malay rose apple, mountain apple (English); jambu merah (Malaya).
Origin: Southeast Asia.
Distribution: Pantropic.
Cultural requirements: Hot, wet tropical climate; variety of soil types. Not tolerant of high-pH soils, frost.
Description: Tree to 15 m. Propagation by seed, layering, grafting. Fruit production in 5-6 years from seed, 3-4 years from vegetative propagation. Flowers May-June (Florida), often other seasons as well. Fruit matures in 30-40 days. Some selections seedless. Fruit pyriform, 5-8 cm long; external color yellow, pink, red, or purple; internal color white.
Utilization: Pulp eaten fresh, stewed, preserved. Flavor sweet, insipid; moderate appeal. Good ornamental tree. Commercial production in Asia but little potential for expansion.
Reference: Molesworth Allen 1967.

***Syzygium samarangense* Merr. et Perry** (= *S. javanicum* Miq.)
Common names: Java apple, wax jambu (English); jambu ayer rhio (Malaya); jamelac (French).
Origin: Southeast Asia.
Distribution: Introduced widely into Tropics but rare outside Asia.
Cultural requirements: Hot, wet tropical lowlands; variety of soil conditions.
Description: Tree to 12 m. Propagation by seed, layering (some forms seedless). Fruit production in 5-6 years from seed. Flowers April-June (Florida), sometimes other seasons. Fruit matures in 30-40 days. Fruit pyriform, 3-5 cm long; external color green, yellow, white, or pink; internal color white.
Utilization: Pulp eaten fresh, preserved. Flavor sweet, insipid; moderate appeal. Marketed in Asia but little potential for expansion.
References: Burkill 1935, Molesworth Allen 1967.

Naucleaceae

***Nauclea latifolia* Smith** (= *N. esculenta,* Merr., *Sarcocephalus esculentus* Afzel. ex Sabine)
Common names: African peach, country fig (English); pêcher des nègres (French); doundaké (West Africa).
Origin: Africa.
Distribution: Introduced elsewhere into Tropics but rare outside Africa.
Cultural requirements: Hot tropical climate. Adapted to conditions from savanna to moist forest.
Description: Shrub or tree to 30 m, depending on moisture conditions. Propagation by seed. Fruit production in 5-6 years. Flowers July-August (Florida). Fruit matures in 100-120 days. Fruit spherical to ellipsoid, 4-6 cm in diameter, solitary, red inside and out.
Utilization: Pulp eaten fresh, dried. Flavor sweet, slightly bitter; limited appeal. Little potential for extensive cultivation.
References: Dalziel 1948, Irvine 1961.

Olacaceae

***Coula edulis* Baill.**
Common names: African walnut (English); noyer du pays (French); bodwe (Ghana); emumu (Nigeria); kumen, kumini (Cameroon).
Origin: Tropical west Africa.
Distribution: Tropical west Africa.
Cultural requirements: Hot, humid tropical lowlands.
Description: Tree to 20 m. Propagation by seed. Flowers April-May, October-January. Fruit spherical to ellipsoid, 3 cm long; external color brown, edible portion brownish.
Utilization: Seed eaten fresh, boiled, roasted. Flavor good; general appeal. Very rich in oil. Locally important but little potential for wider cultivation.
References: Dalziel 1948, Irvine 1961.

***Ximenia americana* L.**
Common names: tallowwood plum, hog plum (English); chocomico, manzanillo (Spanish); citron de la mer, prunier de mer (French); ameixa (Portuguese).
Origin: Pantropic; warm subtropics.

Distribution: Pantropic; warm subtropics.
Cultural requirements: Hot tropical lowland or subtropical climate. Tolerant of great range in rainfall, soil conditions. Tolerant of light frost.
Description: Scandent shrub or tree to 10 m. Propagation by seed. Fruit production in 3-4 years. Flowers several times a year. Fruit matures in 50-60 days. Fruit ellipsoid, 2.5 cm long, exterior color yellow.
Utilization: Pulp eaten fresh, preserved; seed eaten fresh, roasted. Flavor of pulp subacid, insipid; limited appeal. Little potential for wider cultivation.
Reference: Fouqué 1974.

Oleaceae

***Noronhia emarginata* Thou.**
Common names: Madagascar olive (English); noronha (Madagascar).
Origin: Madagascar, Sri Lanka.
Distribution: Introduced around Tropics but not widely known.
Cultural requirements: Tropical climate, often near seashore. Tolerant of poor soils, saline conditions, wind.
Description: Small tree. Propagation by seed. Fruit ellipsoid, 2-3 cm long, external color greenish.
Utilization: Pulp preserved. Flavor sweet; moderate appeal. Little potential for cultivation as good food. Used as ornamental tree in coastal areas.

Oxalidaceae

***Averrhoa bilimbi* L.**
Common names: bilimbi (English); bilimbi, grosella (Spanish); belimbing asam (Malaya).
Origin: Southeast Asia.
Distribution: Introduced throughout Tropics but not common outside Asia.
Cultural requirements: Hot, wet tropical lowlands. Tolerant of a variety of soil conditions, seasonal dry period. Very susceptible to frost injury.
Description: Tree to 10 m. Propagation by seed (can be grafted). Fruit production in 5-6 years from seed. Several cycles of bloom and fruit during year. Fruit matures in 90 days. Fruit cylindrical, 5-8 cm long, shallowly ribbed, in small clusters on trunk and limbs of tree, greenish yellow inside and out.

Figure 25.—Bilimbi, a sour fruit for cooking or for chutneys.

Utilization: Pulp used in curries, jellies, chutney, preserves, pickles. Flavor very sour; fair appeal. Good source of vitamin C. Important in home gardens and local marketing. Little potential for further commercial development.
References: Leon 1968, Molesworth Allen 1967, Popenoe 1939.

***Averrhoa carambola* L.**
Common names: carambola, starfruit (English); carambola (Spanish, Portuguese); belimbing manis (Malaya).
Origin: Southeast Asia.
Distribution: Introduced throughout Tropics but not common outside Asia.

Cultural requirements: Hot, wet tropical lowlands. Tolerant of a variety of soils if well drained and mildly acid. Tolerant of seasonal dry period and light frost. Grows well in warm subtropical areas.
Description: Tree to 10 m. Propagation by seed, layering, grafting. Fruit production in 6-8 years from seed, 2-3 years from grafts. Several cycles of bloom and fruit during year. Fruit matures in about 90 days. Fruit ellipsoid, conspicuously ribbed, 6-15 cm long, solitary or in small clusters on limbs and sometimes trunk of tree, yellow to orange inside and out.
Utilization: Pulp eaten fresh, in preserves, jellies, sauces. Flavor sweet to very sour; improved varieties excellent, with wide appeal. Good source of vitamin C. Marketed widely in Asia. Commerical production in Florida; fair potential for further commercial development. Many varieties selected in Southeast Asia, U.S.A. (Florida).
References: Campbell and Malo 1972, Leon 1968, Molesworth Allen 1967, Popenoe 1939.

Palmae

***Areca catechu* L.**
Common names: betel nut (English); aveline des Indes, noix d'arec (French).
Origin: Southeast Asia, Pacific islands.
Distribution: Introduced widely into Tropics but not economically important outside Asia and Pacific islands.
Cultural requirements: Hot, humid tropical lowlands; monsoon climate.
Description: Palm, single trunk, to 30 m. Propagation by seed. Fruit production in 6-10 years or more. Flowers throughout year. Fruit matures in 270-300 days. Fruit ovoid, 4-5 cm long, in clusters of 200-300, exterior color orange or red.
Utilization: Seed chewed as stimulant. Low appeal outside Asia. Little potential for further development.
Reference: Blatter 1926.

***Astrocaryum tucuma* Mart.**
Common names: tucuma (English); cumare, tucuma (Spanish); aovara (French); tucum, tucumá açu (Portuguese).
Origin: Brazil.
Distribution: Brazil.
Cultural requirements: Hot tropical lowlands; sandy soils in coastal areas.
Description: Palm, single trunk, to 14 m. Propagation by seed. Fruit 5-6 cm in diameter, 70 g; external color greenish yellow to orange, internal yellow.
Utilization: Pulp eaten fresh, in confections. Seed and pulp a source of edible fats. Flavor of moderate appeal. Fruit good source of vitamins A, B_1, and C. Locally important but limited potential for wider cultivation.
Reference: Fouqué 1974.

***Attalea cohune* Mart.** (= *Orbignya cohune* (Mart.) Dahlgr. ex Stand.)
Common names: cohune palm (English); corozo (Spanish).
Origin: Central America.
Distribution: Tropical America.
Cultural requirements: Hot, wet tropical lowlands.
Description: Palm, single trunk, to 6 m. Propagation by seed. Flowers all year. Fruit ellipsoid, 6 cm long, in large clusters, exterior color brown.
Utilization: Pulp candied. Seed a source of edible oil. Locally important oil source. Little potential for expansion.

***Bactris minor* Jacq.**
Common name: tobago cane (English).
Origin: Northern South America.
Distribution: Tropical America.
Cultural requirements: Hot tropical climate; coastal regions.
Description: Palm, multiple trunks, to 12 m. Propagation by seed. Fruit spherical to ovoid, 1.5 cm long, in clusters, exterior color purple to black.
Utilization: Pulp eaten fresh. Flavor subacid; moderate appeal. Little potential for cultivation as food crop.
Reference: Fouqué 1974.

***Borassus flabellifer* L.**
Common names: Palmyra palm, African fan (English).
Origin: Southeast Asia, India.
Distribution: Asia; introduced into plant collections elsewhere.
Cultural requirements: Hot tropical climate; sandy soils in coastal areas.
Description: Palm, single trunk, to 30 m. Propagation by seed. Flowers March-April (India). Fruit matures in 120 days. Fruit 15-20 cm in diameter, in large clusters, external color brown.
Utilization: Mesocarp of fruit eaten fresh, dried. Endosperm of immature seeds eaten fresh. Sap from cut inflorescences made into sugar, wine, vinegar. Important food crop in India. Limited potential for cultivation outside Asia.
Reference: Blater 1926.

***Borassus flabellifer* L. var. *aethiopica* Warb.** (= *B. aethiopium* Mart.)
Common names: deleb palm, African fan palm (English); ronier (French).
Origin: Africa.
Distribution: Africa; introduced into plant collections elsewhere.
Cultural requirements: Hot tropical climate with low to medium rainfall.
Description: Palm, single trunk, to 25 m. Propagation by seed. Fruit 15 cm in diameter, in large clusters, exterior color brown.
Utilization: Pulp of fruit eaten fresh, dried. Endosperm of immature seed eaten fresh. Sap from cut inflorescences made into sugar, wine. Locally important crop in Africa. Little potential for expansion.
References: Dalziel 1948, Irvine 1961.

***Butia capitata* Becc.**
Common names: jelly palm, pindo, butia (English).
Origin: Brazil.
Distribution: Widely introduced into tropical and subtropical areas.
Cultural requirements: Subtropical or cool tropical climate. Adapted to wide range of soil conditions. Very resistant to freeze injury.
Description: Palm, single trunk, to 8 m. Fruit globose, 2.5 cm in diameter, in large clusters, exterior color yellow to orange yellow.
Utilization: Pulp eaten fresh, in jellies. Seed is minor source of oil. Flavor of pulp subacid, pleasant. Little potential as food crop. Used as ornamental plant.
Reference: Fouqué 1974.

***Cocos nucifera* L.**
Common names: coconut (English); coco, cocotero (Spanish); cocotier (French); coqueiro da Bahia (Portuguese).
Origin: Pantropic.
Distribution: Pantropic.
Cultural requirements: Hot, wet tropical lowlands. Tolerant of a variety of soil conditions.
Description: Palm, single trunk to 30 m. Propagation by seed. Fruit production in 6-9 years. Flowers all year. Fruit matures in 16-18 months. Fruit ovoid, 10-40 cm in diameter, in clusters of 10-20; external color brown, edible portion white.
Utilization: Endosperm of seed eaten fresh, dried; prepared in many ways with other foods; used as source of edible oil. Flavor good; high appeal. Rich in oil, protein. An important food crop. Cultivation not likely to expand much.
References: Leon 1968, Ochse et al. 1961.

***Elaeis guineensis* Jacq.**
Common names: African oil palm, oil palm (English); Palma de aceite, palma africana (Spanish); palmier à huile (French); dendezeiro (Portuguese).
Origin: South America, Africa.
Distribution: Hot Tropics.
Cultural requirements: Hot, wet tropical lowlands with deep, fertile, well-drained soil.
Description: Palm, single trunk, to 20 m. Propagation by seed. Fruit production in 3-5 years. Flowers all year. Fruit irregularly shaped, 3-5 cm long, in large tight clusters of about 100; external color orange, red, or black; internal color yellow or orange.
Utilization: Pulp and endosperm of seed processed for edible oil. Not consumed as fresh fruit. High oil and vitamin A content. Very important oil source, increasing in importance in Tropics. Important plantings in Southeast Asia, Central and South America.
References: Leon 1968, Ochse et al. 1961.

***Euterpe edulis* Mart.** (= *E. oleracea* Mart.)
Common names: para palm (English); manaca, palmiche de Rio Negro (Spanish); pinot (French); açaí do Pará (Portuguese).
Origin: South America.
Distribution: South America.
Cultural requirements: Hot, wet tropical lowlands; sandy soils; marshy areas.
Description: Palm, single trunk, to 20 m. Propagation by seed. Flowers all year. Fruit about 1.5 cm in diameter, external color black to purple.
Utilization: Pulp eaten fresh, fermented into beverages. Important source of hearts of palm. Locally important. Little potential for wider cultivation.
References: Cavalcante 1974, Fouqué 1974.

***Guilielma gasipaes* (H.B.K.) L. H. Bailey** (= *Bactris gasipaes* H.B.K.)
Common names: peach palm (English); pejibaye (Spanish); palmier-pêche (French); casipaes (Portuguese).
Origin: Central America.
Distribution: Central and South America.
Cultural requirements: Hot, wet tropical lowlands; will not yield well under dry conditions.
Description: Palm, single or multiple trunks, to 20 m. Propagation by seed (suckers to small extent). Fruit production in 3-4 years from seed. Flowers all year. Fruit variously shaped, 2.5-5 cm long, in clusters of up to 300; external color green, yellow, orange, or red; internal color yellow to orange.

Utilization: Pulp cooked, preserved. Seed eaten fresh, cooked. Flavor nutty, oily; high appeal. Rich in oil, vitamin A. Good source of hearts of palm. Good potential for commercial cultivation. Variety collection at Turrialba, Costa Rica.
References: Camacho 1969, Fouqué 1974, Hunter 1969, Johanessen 1967.

***Hyphaene thebaica* Mart.**
Common names: doum palm, gingerbread palm (English).
Origin: North Africa.
Distribution: Africa, Middle East, elsewhere in plant collections.
Cultural requirements: Dry tropical or subtropical climate.
Description: Palm, branched trunk, to 10 m. Propagation by seed. Fruit ovoid, 8 cm long, exterior color brown.
Utilization: Pulp eaten fresh, mixed with other foods. Endosperm of immature seeds eaten fresh. High protein and oil content. Locally important but little potential for expansion.
References: Dalziel 1948, Irvine 1961.

***Jubaea chilensis* Baill.** (= *J. spectabilis* H.B.K.)
Common names: Chilean wine palm (English); coco de Chile, coquito (Spanish); cocotier du Chile (French).
Origin: Chile.
Distribution: Introduced into warm Temperate Zone areas and subtropical areas of world but not common.
Cultural requirements: Warm temperate, cool subtropical, or high-altitude tropical climate. Very cold tolerant.
Description: Palm, single trunk, to 20 m. Fruit 4-5 cm long, 3 cm in diameter, exterior color yellow.
Utilization: Sirup and wine made from sap of trunk; flavor excellent. Little potential for cultivation as food crop, but used as ornamental. Wild population in danger of extinction because tree must be destroyed to obtain sap.
Reference: Fouqué 1974.

***Lodoicea maldivica* Pers.**
Common names: double coconut, Seychelles nut (English).
Origin: Seychelles.
Distribution: Introduced into various palm collections in Tropics.
Cultural requirements: Hot, wet tropical lowlands; various soil conditions.
Description: Palm, single trunk, to 30 m. Propagation by seed. Fruit production in 20 years or more. Dioecious. Fruit bilobed, 40 cm or more in diameter, 20 kg or more; external color brown, edible portion white.
Utilization: Endosperm of seed eaten fresh. Limited appeal. Little potential for wider cultivation.

***Mauritia flexuosa* L.**
Common names: wine palm, mirity palm (English); aguaje, achual (Spanish); palmier bâche (French); miritĺ (Portuguese).
Origin: Northeastern South America.
Distribution: South America.
Cultural requirements: Hot, wet tropical lowlands; poorly drained or periodically flooded soils.
Description: Palm, single trunk, to 25 m. Propagation by seed. Fruit 4-6 cm long; external color yellow to reddish brown, internal yellow to orange.
Utilization: Pulp of immature fruit eaten fresh. Endosperm of seed eaten fresh. Starch extracted from trunk. Significant source of food in native area. Little potential for wider cultivation.
References: Cavalcante 1974, Fouqué 1974.

***Mauritia vinifera* Mart.**
Common names: moriche palm (English); aguaje, morichi (Spanish); palmier bâche (French); Buritĺ (Portuguese).
Origin: South America.
Distribution: South America.
Cultural requirements: Hot, wet tropical climate; acid soils.
Description: Palm, single trunk, to 30 m. Propagation by seed. Fruit 4-6 cm long.
Utilization: Fruit pulp fermented into wine. Little potential for wider cultivation.

***Nipa fruticans* Thunb.**
Common names: nipa palm (English), gúlga (India).
Origin: Tropical Asia.
Distribution: Tropical Asia; introduced into plant collections elsewhere.
Cultural requirements: Hot, wet tropical lowlands; grows in tidal areas where soil inundated with saltwater.
Description: Palm, prostrate trunk buried in soil. Propagation by seed.

Utilization: Sap from cut inflorescence fermented into wine. Endosperm of seed candied. Important only in native area. Little potential for wider cultivation.
Reference: Burkill 1935.

***Orbignya martiana* Barb.**
Common names: babassu (English); babacu (Portuguese).
Origin: South America.
Distribution: South America.
Cultural requirements: Hot tropical monsoon climate.
Description: Palm, single trunk, to 20 m. Fruit 6-12 cm long.
Utilization: Seed eaten fresh, extracted for edible oil. Little potential for wider cultivation.
Reference: Fouqué 1974.

***Phoenix dactylifera* L.**
Common names: date, date palm (English); datil (Spanish); datile, tamareira (Portuguese).
Origin: Africa.
Distribution: Dry subtropical and tropical areas of world.
Cultural requirements: Hot, dry atmospheric conditions needed for proper fruit maturation, but irrigation needed for growth of plant. Tolerant of salinity in irrigation water, various types of soil, temperatures to about -5° C.
Description: Palm, multiple trunks, to 30 m (usually only one trunk allowed to grow large in cultivation). Propagation by seed or by suckers from base of trunk. Fruit production in 5-8 years from suckers. Dioecious. Fruit 5 cm long, 2.5 cm in diameter, in clusters of 1,000-1,500; yellow, greenish, orange, red, or brown.
Utilization: Pulp dried, mixed with other foods. Flavor sweet, nutty; universal appeal. Rich in carbohydrates. Important article of commerce. Cultivation could be expanded. Many varieties in Middle East, California.
References: Ochse et al. 1961, Popenoe 1913, Popenoe 1939.

***Phoenix reclinata* Jacq.**
Common names: Senegal date palm, dwarf date palm (English); dattier à feuille panchées (French).
Origin: Tropical Africa.
Distribution: Pantropic.
Cultural requirements: Hot tropical climate with medium rainfall.
Description: Palm, multiple trunks, to 12 m. Propagation by seed. Fruit 2.5 cm long, 1 cm in diameter, in large clusters, brown when dry.
Utilization: Pulp eaten fresh. Trunk tapped for sap to make wine. Little potential as food crop. Widely used as ornamental plant.
References: Dalziel 1949, Irvine 1961.

***Salacca edulis* Reinw.**
Common names: Salak palm, salak (English).
Origin: Southeast Asia.
Distribution: Introduced elsewhere into Tropics but rare.
Cultural requirements: Hot, wet tropical lowlands.
Description: Palm, multiple trunks, to 4 m. Propagation by seed, suckers. Dioecious. Fruit 5-7 cm long; external color brown, interior yellowish white.
Utilization: Pulp eaten fresh. Flavor sweet; high appeal. high potential for introduction into other areas of hot Tropics.
Reference: Leon 1968.

Pandanceae

***Pandanus leram* Jones**
Common name: Nicobar breadfruit (English).
Origin: Andaman and Nicobar Islands.
Distribution: Andaman and Nicobar Islands.
Cultural requirements: Tropical lowlands.
Description: Tree growing in coastal areas.
Utilization: Pulp boiled, pressed into cakes. Source of carbohydrate. Moderate appeal. Little potential for wider cultivation.

***Pandanus tectorius* Sol. ex Balf. f.**
Common names: screwpine, Nicobar breadfruit.
Origin: Southeast Asia, South Pacific islands.
Distribution: Pantropic.
Cultural requirements: Sandy soils at seashore, tropical climate.
Description: Tree to 7 m. Propagation by seed, cuttings. Fruit ovoid, 18 cm in diameter; exterior color red or yellow, yellowish inside.
Utilization: Soft portion of pulp cooked. Seeds eaten fresh, cooked. Terminal buds eaten fresh. Important locally in Asia and Pacific; little potential elsewhere.
Reference: Brown 1931.

Passifloraceae

***Passiflora antioquiensis* Karst**

Common names: banana passion fruit (English); curuba antioquena (Spanish).
Origin: South America (Andes).
Distribution: South America.
Cultural requirements: Cool high-altitude areas in Tropics.
Description: Vine. Propagation by seed. Fruit ellipsoid, 4-5 cm long, solitary; external color yellow or red, internal orange.
Utilization: Arils eaten fresh, in beverages, desserts. Flavor sweet; moderate appeal. Little potential for expanded cultivation.
References: Martin and Nakasone 1970, Popenoe 1924.

***Passiflora edulis* Sims**

Common names: purple passion fruit, purple granadilla (English); maracuyá, granadilla, parcha (Spanish); grenadille violette (French); maracujá, maracujá comun (Portuguese).
Origin: Brazil.
Distribution: Pantropic; warm subtropics.
Cultural requirements: Cool tropical or subtropical climate with well-distributed medium rainfall and light well-drained soils. Not tolerant of frost or wind. Will not set fruit if mean temperature too high.
Description: Vine. Propagation by seed, cuttings, grafting. Fruit production in 1-2 years from seed, less than 1 year from vegetative propagation. Flowers around March and September in Hawaii. Most vines self-incompatible, require cross-pollination. Fruit spherical, 5-9 cm long, solitary; external color purple, internal yellow to orange.
Utilization: Arils can be eaten fresh or in jellies, but used mostly as flavoring in beverages, desserts. Flavor sweet to subacid; high appeal. Good source of vitamins A and C. Potential good for increased cultivation if disease-resistant varieties developed. Cultivated in New Zealand, Hawaii, American Tropics.
References: Akamine et al. 1956, Fouqué 1974; Martin and Nakasone 1970, Popenoe 1939.

***Passiflora edulis* Sims f. *flavicarpa* Deg.**

Common names: yellow passion fruit, yellow granadilla (English); granadilla, maracuyá, parcha (Spanish); grenadille (French); maracujá (Portuguese).
Origin: Australia (not certain).
Distribution: Pantropic; warm subtropics.
Cultural requirements: Cool tropical or warm subtropical climate with well-distributed medium rainfall. Adapted to a variety of soils if well drained. Tolerates heavy soils better than the purple granadilla does. Does not set fruit well if mean temperature too high.
Description: Vine. Propagation by seed, cuttings, grafting. Fruit production in 1-2 years from seed, less than 1 year from vegetative propagation. Flowers around March and September in Hawaii. Most vines self-incompatible; cross-pollination necessary. Fruit spherical to ovoid, 6-10 cm in diameter; external color yellow, internal yellow to orange.
Utilization: Arils used in jellies, as flavoring in beverages, desserts. Flavor subacid to sour; high appeal. High vitamin A and C content. Good potential for expansion of commercial production; more widely adapted than purple granadilla. Cultivated in New Zealand, Hawaii, American Tropics.
References: Akamine et al. 1956, Fouqué 1974, Martin and Nakasone 1970, Popenoe 1939.

***Passiflora laurifolia* L.**

Common names: water lemon, yellow granadilla (English); parcha, parcha de culebra (Spanish); maritambou, pomme d'or, pomme-liane (French); maracujá, maracujá comun (Portuguese).
Origin: West Indies, South America.
Distribution: Widely introduced into Tropics.
Cultural requirements: Hot, wet tropical lowlands. Sometimes used as rootstock for *P. edulis* because it is less susceptible to soilborne diseases.
Description: Vine. Propagation by seed, cuttings. Fruit ovoid, 5-8 cm long; external color yellow to orange, internal yellow.
Utilization: Arils eaten fresh, in beverages, desserts. Flavor subacid; limited appeal. Little potential for wider cultivation.
References: Fouqué 1974, Martin and Nakasone 1970.

***Passiflora ligularis* Juss.**

Common names: sweet granadilla (English); granadilla, parchita amarilla (Spanish); grenadille douce (French).
Origin: Central and South America.
Distribution: Introduced widely into Tropics but not common outside Central and South America.

Cultural requirements: Cool tropical climate with well-distributed medium to high rainfall. Does not grow or fruit well in hot tropical lowlands.
Description: Vine. Propagation by seed, cuttings. Fruit ellipsoid, 5-8 cm long, 4-5 cm in diameter, solitary; external color greenish, yellow, or orange; internal color white.
Utilization: Arils eaten fresh, in beverages, desserts. Flavor sweet; limited appeal. Little potential for expanded cultivation.
References: Fouqué 1974, Martin and Nakasone 1970, Popenoe 1939.

***Passiflora maliformis* L.**
Common names: sweet calabash (English); curuba, granadilla de hueso, parcha cimarrona (Spanish); liane à agoutis, pomme calebasse (French).
Origin: West Indies, South America.
Distribution: Limited introduction elsewhere in Tropics but common only in area of origin.
Cultural requirements: Warm, wet tropical climate.
Description: Vine. Propagation by seed, cuttings. Fruit production in 1-2 years from seed, less than 1 year from cuttings. Fruit 3.5-5 cm in diameter; external color greenish, yellow orange; internal color yellowish orange.
Utilization: Arils eaten fresh, in beverages, desserts. Flavor sweet; moderate appeal. Limited potential for wider cultivation.
References: Fouqué 1974, Martin and Nakasone 1970.

***Passiflora quadrangularis* L.**
Common names: giant granadilla (English); granadilla, badea (Spanish); barbadine (French); maracujá açu, maracujá grande, maracujá mamao (Portuguese).
Origin: Tropical America.
Distribution: Pantropic.
Cultural requirements: Hot, wet tropical lowlands.
Description: Vine. Propagation by seed, cuttings. Fruit production in 1-2 years from seed, less than 1 year from cuttings. Fruit irregularly shaped, 10-30 cm long, 10-15 cm in diameter; external color yellowish green, mesocarp white, arils yellow.
Utilization: Entire immature fruit eaten as a cooked vegetable. Pulp eaten fresh, in desserts. Arils eaten fresh, in beverages, desserts. Flavor subacid, somewhat insipid. Widely cultivated. Moderate potential for expansion.
References: Araque 1963, Fouqué 1974, Martin and Nakasone 1970.

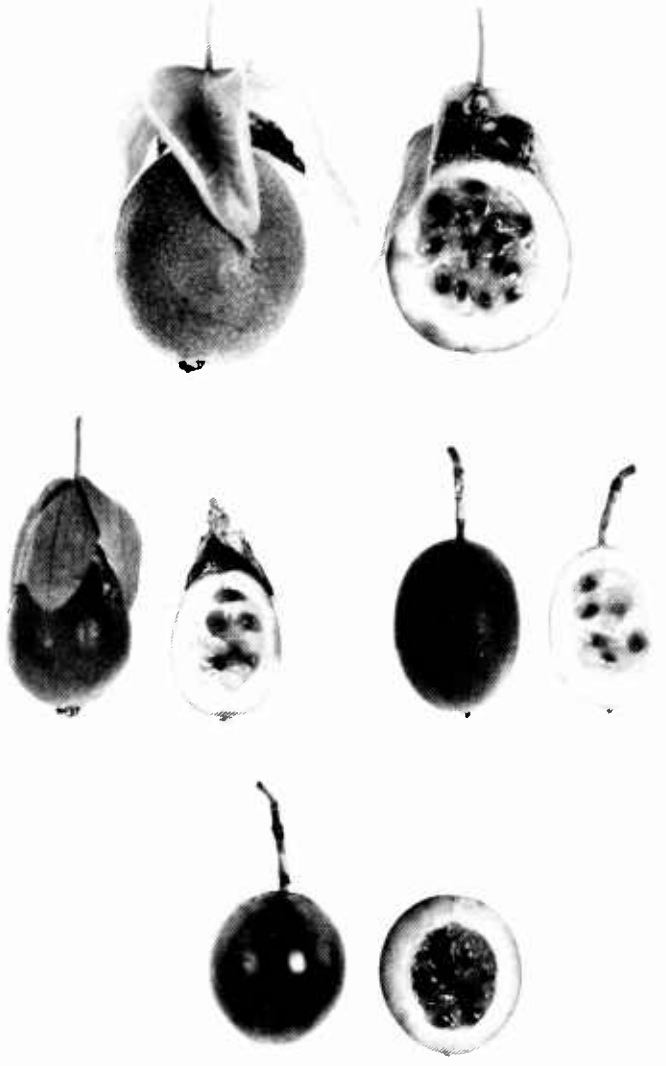

Figure 26.—*Passiflora maliformis*, one of many edible species.

***Passiflora serrato-digitata* L.**
Common names: tagua (English); tagua-tagua (Spanish); pomme à agoutis, pomme-liane manicou (French); maracujá do mato, maracujá pedra (Portuguese).
Origin: West Indies, South America.
Distribution: Tropical America; introduced elsewhere but not well known.
Cultural requirements: Warm tropical lowlands.
Description: Vine. Propagation by seed, cuttings. Fruit 4-5 cm in diameter; external color yellow, internal white.
Utilization: Arils eaten fresh, in beverages, desserts. Flavor sweet; low appeal. Little potential for further cultivation.
References: Fouqué 1974, Martin and Nakasone 1970.

Polygonaceae

***Coccoloba uvifera* (L.) L.**
Common names: seagrape (English); uva de la playa, uva de mar, uvero macho (Spanish); raisinier, raisinier bord de mer (French); uva de praia (Portuguese).
Origin: Tropical America.
Distribution: Pantropic.
Cultural requirements: Warm tropical lowlands, coastal areas. Tolerant of considerable range in rainfall, variety of soil conditions, salinity in soil. Easily injured by frost.
Description: Shrub or tree to 10 m, depending on environment. Propagation by seed (can be propagated by cuttings, layering). Usually dioecious. Fruit spherical to ovoid, 1-2 cm in diameter, in clusters, exterior color red to purple.
Utilization: Pulp eaten fresh, in jellies. Flavor sweet to subacid; limited appeal. Little potential as food crop. Important ornamental plant.
References: Fouqué 1974.

Proteaceae

***Macadamia integrifolia* Maiden et Betche**
Common names: macadamia nut, Queensland nut, smooth-shell macadamia (English); macadamia (Spanish, French).
Origin: Australia.
Distribution: Tropics and subtropics with suitable climate.
Cultural requirements: Cool tropical or subtropical climate with well-distributed medium to high rainfall. Not tolerant of frost or excessive heat. Areas of adaptation limited because of exacting climatic requirements.
Description: Tree to 16 m. Propagation by seed, cuttings, grafting. Flowers February-April (Florida). Fruit matures September-November (Florida). Some fruit produced nearly all year in California. Fruit spherical, 1.5-3 cm in diameter, in small clusters; husk green, nut brown, kernel white or yellowish.
Utilization: Kernel of seed eaten fresh, roasted. Flavor excellent; high appeal. Good source of protein; rich in oil. Potential great for expansion in areas with suitable climate. Commercial production in Australia, Rhodesia, South Africa, U.S.A. (California, Hawaii).
References: Hamilton and Fukunaga 1959, Leon 1968, Storey 1959, 1965.

***Macadamia tetraphylla* L. A. S. Johnson**
Common names: macadamia nut, rough-shell macadamia, spiny leaf macadamia, rough-shell queensland nut (English).
Origin: Australia.
Distribution: Tropics and subtropics with suitable climate.
Cultural requirements: Cool tropical or subtropical climate with well-distributed rainfall. Fertile, deep, medium-acid soil. Not tolerant of frost or very hot weather.
Description: Tree to 16 m. Propagation by seed, cuttings, grafting. Flowers February-April (Florida). Fruit matures September-November (Florida), September-January (California). Fruit spherical to ovoid, 1.5-3.5 cm in diameter, in small clusters; husk green, nut brown, kernel whitish.
Utilization: Kernel of seed eaten fresh, roasted. Flavor excellent; high appeal. Rich in protein, oil. Good potential for expanded cultivation. Commercial production in same areas as *M. integrifolia*.
References: Hamilton and Fukunaga 1959, Storey 1959, 1965.

Figure 27.—Macadamia nut, Australia's contribution to the Tropics.

Punicaceae

***Punica granatum* L.**
Common names: pomegranate (English); granada (Spanish); grenade (French); shih-liu (China).
Origin: Middle East.
Distribution: Subtropical and cool tropical areas.
Cultural requirements: Subtropical climate. Well adapted to hot conditions, but can tolerate temperatures to −8° C. Tolerant of dry conditions, heavy soils, poor drainage. Poor growth in calcareous soils.
Description: Shrub or small tree to 6 m. Propagation by seed, cuttings, layering. Fruit production in 3-4 years from seed. Fruit globose to ovoid, 5-10 cm in diameter; external color yellow or red, internal white, yellow, or red.
Utilization: Pulp eaten fresh, in beverages. Flavor sweet or subacid; moderate appeal. Little potential for expanded cultivation.
References: Leon 1968, Popenoe 1939.

Rhamnaceae

***Ziziphus jujuba* Mill.**
Common names: Chinese jujube, tsao (China).
Origin: Asia.
Distribution: Subtropics, warm Temperate Zone.
Cultural requirements: Hot, relatively dry climate during growing season, cool to cold during dormancy. Tolerant of temperatures to −10° C during dormancy.
Description: Deciduous tree to 10 m. Propagation by seed, cuttings, grafting. Fruit ellipsoid, 2-3 cm long; external color dark red to brown, internal whitish.
Utilization: Pulp eaten fresh, dried, stewed, candied, preserved. Flavor sweet; moderate appeal. Important in native area; little potential for commercial production elsewhere. Many varieties in China.
References: Popenoe 1939.

***Ziziphus mauritiana* Lam.**
Common names: Indian jujube (English); beri (India).
Origin: India.
Distribution: Tropics, warm subtropics.
Cultural requirements: Warm to hot tropical climate with low to relatively high rainfall. Tolerant of poor soils, flooding; not tolerant of frost.
Description: Tree to 12 m. Propagation by seed, cuttings, grafting. Flowers July-September (Florida). Fruit matures in 180 days. Fruit ellipsoid, 2.5-4 cm long, solitary; external color brown, internal whitish.
Utilization: Pulp eaten fresh, dried, stewed, candied, preserved. Flavor sweet; moderate appeal. Important in native area; little potential for commercial production elsewhere.
References: Popenoe 1939, Ruehle et al. 1958.

***Ziziphus spina-christi* Willd.**
Common names: Christ's-thorn (English).
Origin: Africa.
Distribution: Africa, Middle East.
Cultural requirements: Hot tropical or subtropical climate with low to medium rainfall.
Description: Shrub or tree to 10 m. Propagation by seed. Fruit 2 cm long.
Utilization: Pulp eaten fresh, dried, cooked, preserved. Limited potential for wider cultivation.
References: Dalziel 1948, Irvine 1961.

Rosaceae

***Crataegus pubescens* (H.B.K.) Steud.**
Common names: Mexican hawthorn, manzanilla (English); manzanilla (Spanish).
Origin: Mexico.
Distribution: Mexico; some introduction into other tropical and subtropical areas.
Cultural requirements: Cool tropical or subtropical climate.
Description: Tree to 13 m. Propagation by seed (can be grafted). Fruit ovoid, 1-2 cm long, external color.
Utilization: Pulp eaten fresh, in jellies, preserves. Flavor sweet; moderate appeal. Good source of vitamins A and C, pectin. Limited potential for commercial production.
References: Coetzee et al. 1950, Standley 1922.

***Cydonia oblonga* Mill.**
Common names: quince (English); membrillo, marumero (Spanish).
Origin: Middle East.
Distribution: Worldwide in Temperate Zone, subtropics, highland Tropics.
Cultural requirements: Temperate, cool tropical, or subtropical climate with well-distributed rainfall, heavy soils. Grows poorly in hot tropical climate.
Description: Shrub or tree to 7 m. Propagation by seed, cuttings, grafting. Fruit irregularly shaped, 7-10 cm long; external color green or yellow, internal pale yellow or white.
Utilization: Pulp used in jellies, preserves. Flavor sour to subacid, often used as rootstock for apples in Tropics.
Reference: Bailey 1949.

***Eriobotrya japonica* (Thunb.) Lindl.**
Common names: Loquat, Japanese plum (English); níspero del Japón (Spanish); néflier du Japón, bibace (French).
Origin: China.
Distribution: Subtropics, highland Tropics.
Cultural requirements: Grows and fruits well in subtropical or tropical highland climates with well-distributed medium rainfall. Tolerant of variety of soil conditions. Does not fruit well in hot tropical climate or in areas where subjected to frost during bloom or fruit development.
Description: Tree to 10 m. Propagation by seed, grafting. Fruit production in 5-6 years from seed, 2-3 years from grafts. Flowers in October-December, sometimes August-September (Florida). Fruit matures in about 120 days. Fruit ellipsoid to pyriform, 3-7 cm long, 10-40 g, in clusters of 8-20; external color yellow or orange, internal white, yellow, or orange.
Utilization: Pulp eaten fresh, stewed, preserved, in jellies. Flavor sour, subacid, or sweet; universal appeal. Excellent crop for home gardens and local marketing. Little potential as major commerical crop. Many varieties selected in China, Japan, India, U.S.A. (California, Florida).
References: Condit 1915, Popenoe 1939.

***Fragaria vesca* L.**
Common name: Woodland strawberry (English).
Origin: Eurasia, North America.
Distribution: Temperate Zone, subtropics, highland Tropics.
Cultural requirements: Cool climate with well-distributed medium rainfall.
Description: Perennial herb to 18 cm. Propagation by seed, division. Fruit conical, 1-2 cm in diameter, red or white.
Utilization: Fruit eaten fresh, in preserves. Flavor sweet; general appeal. Useful in development of cultivated strawberry varieties having good commercial potential.

***Prunus salicifolia* H.B.K.** (= *P. capollin* Zucc.)
Common names: capulin cherry (English); capulín, cerezo (Spanish); capulin, cerisier capulin (French).
Origin: Central and South America.
Distribution: Widely introduced into cool climates but common only in native area.
Cultural requirements: Cool subtropical or tropical highland climate with well-distributed medium rainfall.
Description: Tree to 12 m. Propagation by seed, grafting. Fruit production in 6-8 years from seed, 3-4 years from grafts. Flowers September-October (Ecuador). Fruit globose, 1-2 cm in diameter, in clusters of 7-10; external color black or purple, internal greenish yellow.
Utilization: Pulp eaten fresh, canned, in liqueurs. Flavor sweet, often astringent; moderate appeal. Little potential for existing selections, but could be improved greatly through breeding and selection.
References: Fouqué 1974, Popenoe 1939.

***Rubus adenotrichus* Schlecht.**
Common names: blackberry (English); frambuesa, mora, mora común (Spanish).
Origin: Mexico, Central and South America.
Distribution: Mexico, Central and South America.
Cultural requirements: Subtropical or tropical highland climate.
Description: Shrub to 5 m. Propagation by seed, division. Fruit ellipsoid, 2 cm long, purple.
Utilization: Fruit eaten fresh, in juice, jellies, desserts. Flavor sweet; general appeal. Important in local areas but little potential for commercial production.
Reference: Popenoe 1924.

***Rubus glaucus* Benth.**
Common names: Andean blackberry (English); mora de Castilla (Spanish); mûre des Andes (French).
Origin: South America (Andes).
Distribution: Widely introduced into tropical highland and subtropics but not common outside South and Central America.
Cultural requirements: Subtropical or tropical highland climate with well-distributed medium rainfall.
Description: Scandent shrub to 3 m. Propagation by seed, cuttings. Fruit production in 2 years from seed, 1 year from cuttings. Fruit ellipsoid, 2.5-3 cm long, red to purple.
Utilization: Fruit eaten fresh, in juice, sirup, preserves, desserts. Flavor sweet to subacid, aromatic; high appeal. Good potential for commercial production in suitable climate.
References: Fouqué 1974, Popenoe 1924.

***Rubus lasiocarpus* Smith** (= *R. albescens* Roxb.)
Common names: Mysore raspberry, Ceylon raspberry, hill raspberry (English).
Origin: Mountains of tropical Asia.
Distribution: Widely introduced but not common outside native area.

Cultural requirements: Cool tropical or subtropical climate with well-distributed medium to high rainfall. Not tolerant of drought or frost; tolerant of a variety of soil conditions.
Description: Shrub to 3 m. Propagation by seed, tip layering, cuttings. Fruit production in 1-2 years from seed, 1 year from vegetative propagation. Flowers December-April (Florida). Fruit matures in 90 days. Fruit 1.5-2 cm in diameter, in clusters of 10-15, purple.
Utilization: Pulp eaten fresh, in juice, jelly, jam, desserts. Flavor sweet; moderate appeal. Good crop for home garden. Limited possibility for commercial planting.
Reference: Ledin 1953.

***Rubus macrocarpus* Benth.**
Common names: mora, frambuesa (Spanish).
Origin: South America (Andes).
Distribution: South America.
Cultural requirements: Tropical highland climate.
Description: Shrub. Propagation by seed, cuttings. Fruit ellipsoid, up to 5 cm long, red.
Utilization: Fruit eaten fresh, in juice, preserves, desserts. Flavor subacid; moderate appeal. Little potential for commercial cultivation.

***Rubus rosaefolius* Smith.**
Common names: thimbleberry (English); zarza, frambuesa (Spanish).
Origin: India.
Distribution: Introduced into many areas of Tropics.
Cultural requirements: Warm to cool tropical climate at low and middle elevations.
Description: Trailing shrub. propagation by seed, cuttings. Fruit 2-2.5 cm long, red.
Utilization: Pulp eaten fresh, as juice, jelly, desserts. Flavor sweet; limited appeal. Little potential for commercial production.
References: Leon 1968, Neal 1965.

Rubiaceae

***Alibertia edulis* A. Rich.**
Common names: purui, apurui, mermelada (Portuguese).
Origin: South America.
Distribution: South America.
Cultural requirements: Hot tropical lowlands.
Description: Shrub or small tree. Propagation by seed. Dioecious. Fruit ovoid, 1.5-3 cm in diameter, exterior color yellowish brown.
Utilization: Pulp eaten fresh, in beverages. Moderate appeal. Little potential for cultivation.
Reference: Hoehne 1946.

***Borojoa patinoi* Cuatr.**
Common name: borojo (Spanish).
Origin: Colombia.
Distribution: Colombia.
Cultural requirements: Warm tropical lowlands. with medium rainfall, heavy soils.
Description: Small tree. Propagation by seed. Fruit globose, 6-8 cm in diameter; external color green, internal brown to black.
Utilization: Pulp eaten fresh, in desserts. Flavor sweet, some bitterness; moderate appeal. Little potential as commercial crop.
Reference: Pérez-Arbelaez 1956.

***Genipa americana* L.**
Common names: genipap, marmalade box (English); bilito, genipa, huitu, jagua, maluco (Spanish); genipapo (Portuguese).
Origin: West Indies, South America.
Distribution: Some introduction into other areas of Tropics.
Cultural requirements: Hot tropical lowlands with medium to high rainfall. Tolerant of seasonal dry period. Injured at temperatures a few degrees above freezing.
Description: Tree to 20 m. Propagation by seed, grafting. Fruit globose, 5-8 cm in diameter, external color to gray.
Utilization: Pulp eaten fresh, in beverages; fermented to make alcoholic beverages. Flavor sweet, aromatic; moderate appeal. Little potential for expanded production.
References: Fouqué 1974, Hoehne 1946, Popenoe 1939.

***Randia formosa* K. Schum.**
Common name: Blackberry jam fruit (English).
Origin: Brazil.
Distribution: Introduced into various places in Tropics but rare.
Cultural requirements: Hot, wet tropical lowlands with acid soils.
Description: Shrub. Propagation by seed. Fruit external color yellow, internal black.
Utilization: Pulp eaten fresh, in beverages. Flavor sweet; low appeal. No potential for commercial production.
Reference: Neal 1965.

***Vangueria madagascariensis* J. F. Gmel.**
Common names: Spanish tamarind (English); voavanga (Africa).
Origin: Africa, Madagascar.
Distribution: Introduced into many areas in Tropics but not common.
Cultural requirements: Hot, wet tropical lowlands. Not tolerant of frost.
Description: Shrub to 5 m. Propagation by seed. Fruit 2-3.5 cm in diameter, greenish yellow inside and out.
Utilization: Pulp eaten fresh, in beverages, other foods. Flavor subacid, aromatic. Little potential for wider cultivation.
References: Burkill 1935, Wester 1925.

Rutaceae

***Casimiroa edulis* Llav. et Lex.** (= *C. tetrameria* Millsp., a form of this species)
Common names: white sapote (English); matasano, sapote blanco, zapote (Spanish); matasano, pomme mexicaine, sapote blanche (French).
Origin: Mexico, Central America.
Distribution: Cool tropic areas and subtropics of the world but not common outside tropical America.
Cultural requirements: Subtropical or tropical highland climate with medium rainfall. Tolerant of variety of soil conditions, seasonal dry period, frost.
Description: Tree to 15 m. Propagation by seed, cuttings, layering, grafting. Fruit production in 7-8 years from seed, 3-4 years from vegetative propagation. Flowers January-February (Florida). Fruit matures in 120 days. Fruit spherical to oblate, 6-121 cm in diameter, in clusters of 2-3; external color greenish yellow or yellow, internal white to yellow.
Utilization: Pulp eaten fresh, in preserves. Flavor sweet, often bitter; moderate appeal. Good potential for home garden and local marketing; little potenital for commercial cultivation. Various named varieties in United States (California and Florida).
References: Fairchild 1939, Fouqué 1974, Popenoe 1939.

Sapindaceae

***Blighia sapida* Koenig**
Common names: akee (English); aki, seso vegetal (Spanish).
Origin: Tropical west Africa.
Distribution: Widely introduced into Tropics.
Cultural requirements: Hot tropical lowlands. Grows well where rainfall is well distributed or where seasonal dry period occurs. Well adapted to a variety of soils, including infertile rocky soils. Tolerant of light frost.
Description: Tree to 15 m. Propagation by seed. Fruit production in 3-4 years. Flowers April-May, often at other times (Florida). Fruit matures in about 90 days. Fruit pyriform, 7-8 cm long, 4-5 cm in diameter, in clusters of 3-10; external color red and yellow, internal cream; black seeds.
Utilization: Aril eaten fresh, cooked. Immature fruit very toxic. Flavor rich, nutty; general appeal. Seeds not eaten. Little potential for expansion of commercial production, partly because of toxicity. Cultivated in Africa, India, tropical America.
References: Dalziel 1948, Irvine 1961, Leon 1968, Popenoe 1939.

***Erioglossum rubiginosum* Blume**
Common names: katilaju (Java); pancovier (French), mertajam (Malaya).
Origin: Southeast Asia to Australia.
Distribution: Introduced elsewhere into Tropics but rare outside native area.
Cultural requirements: Hot, wet tropical lowlands.
Description: Large tree. Propagation by seed. Flowers March-May (Florida). Fruit matures in about 100 days. Fruit ovoid, 1.5 cm long, in large clusters; external color red to purple, internal whitish.
Utilization: Aril eaten fresh. Flavor subacid, astringent; low appeal. Little potential for wider cultivation.
References: Burkill 1935.

***Euphoria longana* Steud.** (= *Nephelium longana* (Lam.) Carm.)
Common names: longan (English); oeil de dragon (French); lungan (Malaya); lam yai (Thailand).
Origin: Southern China to Thailand.
Distribution: Introduced into cool tropical and subtropical areas of the world.
Cultural requirements: Cool tropical lowland or warm subtropical climate with well-distributed medium-to-high rainfall. Does not fruit well in hot lowland Tropics.
Description: Tree to 15 m. Propagation by seed, layering, grafting. Fruit production in 7-10 years from seed, 3-5 years from vegetative propagation. Flowers March-April (Florida). Polygamous, usually self-fertile. Fruit matures in 120-150 days. Fruit globose to ovoid, 2-4 cm in diameter, 15-30 g, in clusters of 5-50 or more; external color yellow to brown; internal color whitish, translucent. Erratic in bearing.

Utilization: Aril eaten fresh, dried, canned, in jellies. Flavor very sweet, sometimes aromatic; general appeal. Good home garden fruit. Important in markets of Southeast Asia, where many varieties exist. Potential for commercial production would be greater if regularly bearing varieties were available.
References: Groff 1921, Ruehle et al. 1958, Popenoe 1939.

***Litchi chinensis* Sonn.**
Common names: litchi, lychee (English); lichi (Spanish); litchi (French); li chih (China).
Origin: China.
Distribution: Cool tropical and warm subtropical areas of the world.
Cultural requirements: Cool tropical or warm subtropical climate with well-distributed medium rainfall, medium acid soil with high organic content. Not tolerant of drought. Does not fruit in hot lowland Tropics. Mature trees tolerant of light frost. Requirements exacting; not well adapted in many areas.
Description: Tree to 12 m. Propagation by seed, layering, grafting. Fruit produciton in 8-12 years or more from seed, 3-4 years from vegetative propagation. Flowers March-April (Florida). Polygamous, usually self-fertile. Fruit matures in 60-90 days. Fruit spherical, conical, or ovoid, 2.5-4 cm in diameter, 15-30 g, in clusters of 5-30 or more; external color yellow, pink, or red; internal color whitish, translucent. Erratic in bearing.
Utilization: Aril eaten fresh, dried, canned, preserved, in desserts. Flavor sweet, aromatic; universal appeal. Commercial production in China, Taiwan, South Africa, Australia, India, U.S.A. (Florida, Hawaii). Potential good for expanded commercial production if regularly bearing varieties can be found. Many varieties selected in Asia. Research on culture and variety improvement in Florida.
References: Campbell and Malo 1968, Cobin 1954, Groff 1921, Leon 1968.

***Melicoccus bijugatus* Jacq.** (= *Melicocca bijuga* L.)
Common names: Spanish lime, quenep, kenep (English); quenepa, mamón, mamoncillo, limoncillo (Spanish); kenépier, quenettier (French).
Origin: West Indies, Central and South America.
Distribution: Introduced widely into Tropics but common only in Caribbean region.
Cultural requirements: Hot tropical lowlands with poor to good soils, low to high rainfall. Very resistant to drought; not tolerant of frost.

Figure 28.—Quenepa, a common and popular fruit in dry regions of the American Tropics.

Description: Tree to 20 m. Propagation by seed, layering, grafting. Fruit production in 7-10 years from seed, 4-5 years from vegetative propagation. Flowers in April (Florida). Dioecious; occasional hermaphroditic plants reported. Fruit matures in 90-150 days, depending on selection. Fruit globose, 2-3.5 cm in diameter, 10-25 g; external color green, internal yellow to orange. Some varieties selected in Florida and Puerto Rico.
Utilization: Aril eaten fresh, in jellies, beverages. Seed roasted. Flavor of aril sweet to subacid (poor selections astringent); general appeal. Good for home garden and local marketing. Little potential for commercial produciton.
References: Campbell 1976, Jackson 1967, Popenoe 1939.

***Nephelium eriopetalum* Miq.**
Common names: lotong, rambutan hutan (Malaya).
Origin: Southeast Asia.
Distribution: Southeast Asia.
Cultural requirements: Hot, wet tropical lowlands.
Description: Large tree. Propagation by seed. Fruit 3-5 cm in diameter; pulp whitish.
Utilization: Aril eaten fresh. Flavor sour. Little potential for wider cultivation.
References: Burkill 1935, Molesworth Allen 1967.

***Nephelium glabrum* Noronha**
Common names: redan, rambutan pachat (Malaya).
Origin: Southeast Asia.
Distribution: Southeast Asia.
Cultural requirements: Hot tropical lowlands.
Description: Medium tree. Propagation by seed. Fruit 1.5 cm long, exterior color purple.
Utilization: Aril eaten fresh. Flavor sweet, astringent; low appeal. Little potential for wider cultivation.
References: Burkill 1935, Molesworth Allen 1967.

***Nephelium lappaceum* L.**
Common names: rambutan (Malaya, English, Spanish); ngo-phan (Thai).
Origin: Southeast Asia.
Distribution: Introduced widely into Tropics but rare outside Asia.
Cultural requirements: Hot, wet tropical lowlands. Not tolerant of frost, high-pH soils.
Description: Tree to 13 m. Propagation by seed, layering, grafting. Male and hermaphroditic trees exist; fruiting increased by planting these together. Fruit ovoid, 5-6 cm long, in clusters of 10-12; external color greenish, yellow, or red; internal color whitish, translucent. Varieties selected in Southeast Asia.
Utilization: Aril eaten fresh, stewed, canned, in jams, jellies. Flavor sweet; great appeal. Good potential for expansion of commercial production in hot Tropics because of regular bearing.
References: Burkill 1935, Leon 1968, Popenoe 1939, Valmayor et al. 1971.

***Nephelium malaiense* Griff.**
Common names: cat's-eye (English); mata kuching (Malaya).
Origin: Southeast Asia.
Distribution: Southeast Asia; some introduction elsewhere but rare.
Cultural requirements: Hot, wet tropical lowlands.
Description: Tree to 20 m. Propagation by seed. Fruit production in 4-5 years. Flowers in March-May (Florida). Fruit matures in about 120 days. Fruit ovoid, 1.5-2 cm in diameter, in large clusters; external color brown; internal color whitish, translucent.
Utilization: Aril eaten fresh. Flavor sweet, aromatic; moderate appeal. Little potential for cultivation outside Asia.
References: Burkill 1935, Molesworth Allen 1967.

***Nephelium mutabile* Blume**
Common names: pulasan (Malaya); ngo-khonsan (Thai).
Origin: Southeast Asia.
Distribution: Southeast Asia; some introduction elsewhere but rare.
Cultural requirements: Hot, wet tropical lowlands.
Description: Tree to 9 m. Propagation by seed, layering, grafting. Polygamous; some varieties bear parthenocarpic fruit. Fruit globose, 3-6 cm long; external color yellow or red, internal white.
Utilization: Aril eaten fresh, cooked, in jams, desserts. Flavor subacid to sweet; general appeal. Regular bearing. Good potential for wider cultivation in hot Tropics.
Reference: Molesworth Allen 1967.

***Pometia pinnata* Forst.**
Common names: Fijian longan (English); kasai, asam kuang (Malaya).
Origin: Malaysia. Polynesia.
Distribution: Introduced into other areas of the Tropics, mostly in Asia and South Pacific islands.
Cultural requirements: Hot, wet tropical climate at low and medium altitudes.
Description: Tree to 40 m. Propagation by seed. Fruit globose, 5 cm long; external color brown, internal whitish.
Utilization: Aril eaten fresh. Seed roasted. Flavor of aril sweet; low appeal. Little potential as food crop.
References: Neal 1965, Wester 1925.

***Talisia esculenta* Radlk.** (= *Sapindus esculentus* St. Hil.)
Common names: pitomba, pitombeira (Portuguese); pitoulier comestible (French).
Origin: South America.
Distribution: South America.
Cultural requirements: Hot, wet tropical lowlands.
Description: Tree to 15 m. Propagation by seed. Flowers September-November (Brazil). Fruit matures in 120 days. Fruit 3 cm long, 2.5 cm in diameter; external color yellow; internal color white, translucent.
Utilization: Aril eaten fresh. Flavor subacid; moderate appeal. Little potential for wider cultivation.
References: Cavalcante 1974, Fouqué 1974.

***Talisia olivaeformis* Radlk.**
Common names: yellow genip (English); cotoperiz, cotopriz, mamón de mico, tapal jocote (Spanish); pitoulier a fruits oliviformes (French).
Origin: West Indies, Central and South America.
Distribution: Introduced elsewhere to small extent but rare outside tropical America.
Cultural requirements: Hot tropical lowlands with poor to good soils, low to high rainfall. Not tolerant of frost.
Description: Tree to 18 m. Propagation by seed. Fruit production in 7-10 years from seed. Flowers in April (Florida). Dioecious or hermaphroditic. Fruit matures in 120 days. Fruit globose to ovoid, 2.5-3.5 cm long, in clusters of 6-10; external color yellowish green; internal color yellow, orange, or pink.
Utilization: Aril eaten fresh, in jellies. Flavor sweet or subacid; moderate appeal. Marketed in local areas. Little potential for wider cultivation.
References: Fouqué 1974.

Sapotaceae

***Bequaertiodendron magalismontanum* (Sond.) Heine et J. H. Hemsley**
Common name: wild plum (English).
Origin: Africa.
Distribution: Africa.
Cultural requirements: Lowland tropical or subtropical climate. Adapted to wide range of environmental conditions.
Description: Tree to 30 m. Propagation by seed.
Utilization: Pulp of fruit widely used. Moderate appeal. Little potential for cultivation outside Africa.
Reference: Irvine 1961.

***Butyrospermum paradoxum* (Gaertn. f.) Hepper** (= *B. parkii* (Don.) Kotschy.)
Common name: Shea butter tree (English).
Origin: Tropical West Africa.
Distribution: Africa.
Cultural requirements: Hot tropical lowlands with low rainfall and definite dry season. Grows well in poor lateritic soils.
Description: Tree to 13 m. Propagation by seed. Fruit production in 12-15 years. Flowers December-February (Ghana). Fruit matures in 90 days. Fruit ovoid, 5 cm long, solitary. Edible fat extracted from seed used in cooking, soapmaking. Important source of edible fat. Good potential in Africa in areas where oil palm does not grow.
References: Dalziel 1948, Irvine 1961.

***Calocarpum sapota* Merr.** (= *C. mammosum* Pierre)
Common names: mamey sapote (English); mamey, mamey colorado, zapote (Spanish); lucume, mamey, sapote mamey (French); sapota (Portuguese).
Origin: Mexico, Central America.
Distribution: Introduced into many areas in Tropics but rare outside tropical America.
Cultural requirements: Hot tropical lowlands with medium rainfall and seasonal dry period. Adapted to a variety of soil conditions. Not tolerant of frost, prolonged drought.
Description: Tree to 20 m. Propagation by seed, grafting. Fruit production in 8-12 years or more from seed, 4-5 years from grafts. Most flower in Florida April-July but some bloom all year. Hermaphroditic but yields generally improved by cross-pollination. Fruit matures in 12-15 months. Fruit ovoid to ellipsoid, 10-18 cm long, 300-1,300 g or more, solitary; external color brown, internal orange to red. Seeds 1-3.
Utilization: Pulp eaten fresh, in preserves, marmalades, various desserts. Seed used to prepare material similar to chocolate. Flavor very sweet; general appeal. Good potential for commercial development in hot Tropics. Some varieties selected in Centrla America, West Indies, Florida.
References: Almeyda and Martin 1976b, Campbell 1967, Fouqué 1974, Malo 1970, Popenoe 1939.

***Calocarpum viride* Pitt.**
Common names: green sapote (English); injerto (Spanish).
Origin: Central America.
Distribution: Tropical America.
Cultural requirements: Cool tropical climate with well-distributed medium rainfall. Not tolerant of frost or very hot conditions.
Description: Tree to 20 m. Propagation by seed, grafting. Fruit matures in about 12 months. Fruit ovoid to ellipsoid, 5-12 cm long, solitary; external color green, internal orange to red.
Utilization: Pulp eaten fresh, preserved, in desserts. Flavor sweet; general appeal. Moderate potential. Less widely adapted than the mamey sapote.
Reference: Popenoe 1939.

***Chrysophyllum cainito* L.**
Common names: star apple (English); caimito, cauje (Spanish); caimito, caimitier, pomme étoile (French); cainito (Portuguese).
Origin: Central America, West Indies.
Distribution: Widely introduced into lowland Tropics.

Cultural requirements: Hot tropical lowlands with medium to high rainfall. Grows well in a variety of soil types. Not tolerant of frost or cool climate.
Description: Tree to 20 m. Propagation by seed, grafting. Fruit production in 8-12 years from seed, 4-5 years from grafts. Flowers August-October (Florida). Hermaphroditic, usually self-fertile. Fruit matures in about 180 days. Fruit globose, 5-8 cm in diameter, solitary; external color purple or light green, internal purple or white.
Utilization: Pulp eaten fresh, in preserves, beverages. Flavor sweet; general appeal. Good for home garden and local marketing. Moderate potential for commercial planting.
References: Campbell 1974, Fouqué 1974, Leon 1968, Popenoe 1939.

***Madhuca longifolia* Macbr.** (= *Bassia longifolia* L.)
Common names: Indian butter tree, wild sapote tree (English); mahua, moha, mowa (India).
Origin: India, Sri Lanka.
Distribution: Introduced elsewhere into Tropics but rare.
Cultural requirements: Hot tropical climate with low to medium rainfall.
Description: Large tree. Propagation by seed. Fruit 5 cm long, external color yellow.
Utilization: Pulp eaten fresh. Seeds most important as source of oil for cooking, soapmaking. Sap from flowers source of sugar, also used to make wine. Potential needs to be evaluated through wider introduction.
Reference: Dastur 1951.

***Manilkara kauki* Dubard** (= *Mimusops kauki* L.)
Common names: sau, sawa (Malaya); pekola (Indonesia); bilat-bilat (Philippines).
Origin: Southeast Asia.
Distribution: Introduced into many places in Tropics.
Cultural requirements: Tropical or warm subtropical climate. Tolerant of a variety of soil types, light frost.
Description: Tree to 15 m. Propagation by seed. Fruit ovoid, 3.5 cm long, exterior color orange.
Utilization: Pulp eaten fresh. Flavor sweet, insipid. Little potential as food crop.
References: Molesworth Allen 1967, Wester 1925.

***Manilkara zapota* Van Royen** [= *Achras sapota* (Mill.) Fosb.]
Common names: sapodilla, naseberry (English); chicozapote, níspero (Spanish); sapotille (French); sapoti, sapota, sapotilha (Portuguese).
Origin: Central America.
Distribution: Introduced widely into lowland Tropics.
Cultural requirements: Hot tropical lowlands with low to relatively high rainfall. Adapted to a variety of soil types, especially calcareous soils; poor growth in heavy clays. Not tolerant of frost.
Description: Tree to 20 m. Propagation by seed, grafting (layering reported successful in some areas). Fruit production in 6-10 years from seed, 3-5 years from grafts. Main bloom in September-October, some all year (Florida). Fruit matures in 180-240 days. Fruit spherical, ellipsoid, or conical, 5-15 cm in diameter, 100-500 g; external color brown; internal color white, orange, tan, or brown. Varieties selected in Florida.
Utilization: Pulp eaten fresh, in desserts. Flavor sweet; wide appeal. Good potential for home garden and commercial production. Widely grown in tropical America, India, Philippines.
References: Campbell et al. 1967, Popenoe 1939.

***Mimusops djave* Engler**
Common names: djave nut, false shea butter nut (English); nyam (West Africa).
Origin: Africa.
Distribution: Africa.
Cultural requirements: Hot, wet tropical lowlands.
Description: Large tree. Propagation by seed.
Utilization: Pulp eaten fresh, with other foods. Seed a source of fat used in cooking. Flavor subacid; low appeal. Little potential outside native area.
Reference: Dalziel 1948.

***Mimusops elengi* L.**
Common names: bulletwood, Indian medlar (English); pokok tanjong (Malaya); borsali, bukul, elengi (India).

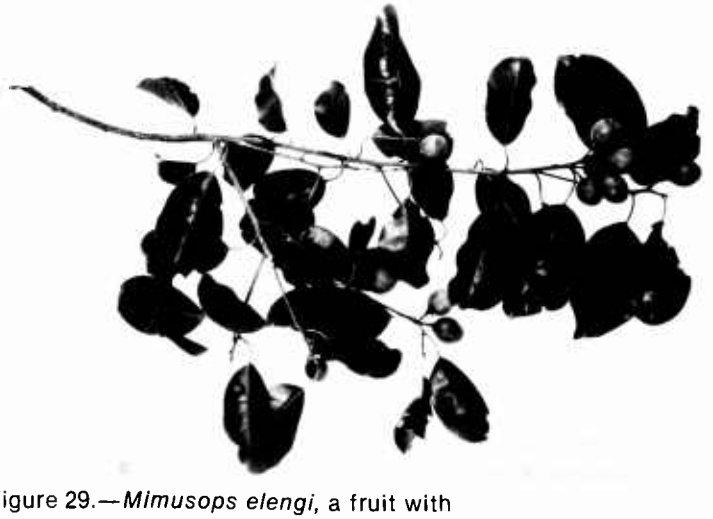

Figure 29.—*Mimusops elengi,* a fruit with latex that bothers most persons.

Origin: India, Southeast Asia.
Distribution: Introduced widely into Tropics.
Cultural requirements: Hot tropical lowlands. Adapted to a variety of soil types.
Description: Tree to 16 m. Propagation by seed. Fruit ovoid, 2-3 cm long; external color yellow or orange, internal yellow.
Utilization: Pulp eaten fresh. Flavor sweet, insipid; low appeal. Little potential as food crop.
References: Molesworth Allen 1967, Neal 1965.

***Pouteria caimito* Radlk.**
Common names: abiu (English, French); caimo, cauje (Spanish); abiu, abeiro (Portuguese).
Origin: South America.
Distribution: Introduced elsewhere but rare outside tropical America.
Cultural requirements: Hot, wet tropical lowlands with acid soils. Not tolerant of frost.
Description: Tree to 12 m. Propagation by seed, grafting. Fruit production in 7-10 years from seed, 3-4 years from grafts. Flowers June-August (Florida). Flowers hermaphroditic. Some trees self-fruitful, others evidently require cross-pollination. Fruit matures in 180 days. Fruit ellipsoid to spherical, 5-10 cm long, solitary; external color yellow, internal whitish.
Utilization: Pulp eaten fresh, in desserts. Flavor sweet; wide appeal. Good potential for commercial production in hot Tropics.
References: Cavalcante 1974, Fouqué 1974, Popenoe 1939.

***Pouteria campechiana* Baehni** (= *Lucuma nervosa* DC., *L. salicifolia* H.B.K.)
Common names: canistel, eggfruit, yellow sapote (English); canistel, fruta huevo, sapote amarillo (Spanish); canistel, janne d'oeuf (French).
Origin: Central America, West Indies.
Distribution: Widely introduced into Tropics.
Cultural requirements: Hot tropical lowlands with medium to high rainfall. Well adapted to seasonal dry period, variety of soil types. Tolerant of light frost.
Description: Tree to 12 m. Propagation by seed, grafting. Fruit production in 5-7 years from seed, 3-4 years from grafts. Flowers June-August (Florida). Fruit matures in about 180 days. Fruit ovoid to conical, 4-12 cm in diameter, solitary on young shoots, yellow to orange inside and out.
Utilization: Pulp eaten fresh; used in beverages, desserts. Flavor very sweet; moderate appeal. High in niacin, vitamins A and C, proteins, carbohydrates. Good potential for development because of productivity, adaptability, and nutrient content.
References: Fairchild 1943, Popenoe 1939.

***Pouteria obovata* Baehni** (= *Lucuma obovata* H.B.K.)
Common names: lucmo, lucumo, lucma, lucuma (Spanish); lucmo (French).
Origin: South America (Andes).
Distribution: Tropical America.
Cultural requirements: Cool tropical climate with medium rainfall. Not well adapted to hot tropical lowlands.
Description: Tree to 12 m. Propagation by seed, grafting. Flowers June-August (Florida). Fruit matures in about 180 days. Fruit ovate, 4-8 cm long, solitary, yellow inside and out.
Utilization: Pulp eaten fresh, dried, powdered; used to flavor desserts, beverages. Flavor sweet; moderate appeal. Fair potential for commercial production but less widely adapted than the canistel.
References: Fouqué 1974, Popenoe 1939.

***Synsepalum dulcificum* Daniell**
Common names: miracle fruit, miraculous berry (English).
Origin: Tropical west Africa.
Distribution: Widely introduced into Tropics but not common outside native area.
Cultural requirements: Hot, wet tropical lowlands with acid soils having organic content. Grows well in light shade. Not tolerant of frost.
Description: Shrub or tree to 6 m. Propagation by seed, cuttings. Fruit production in 4-5 years from seed. Flowers several times a year (Florida). Fruit ellipsoid, 2-3 cm long; external color red, internal white.
Utilization: Pulp eaten with other foods to counter sour or bitter flavors; used to flavor palm wine. Flavor of pulp sweet, insipid. Not important as a food crop. Attempts to exploit the striking effect on perception of sour flavors in development of artificial sweeteners have not been successful but are continuing.
References: Dalziel 1948, Irvine 1961, Montagut 1972.

Simaroubaceae

***Irvingia gabonensis* Baill.**
Common names: wild mango, duiker nut, dika, dika nut (English).
Origin: West Africa.
Distribution: West Africa.
Cultural requirements: Tropical monsoon climate.
Description: Tree to 40 m. Propagation by seed. Flowers December-January (Africa). Fruit 5 cm in diameter, exterior color yellow.

Utilization: Pulp eaten fresh. Seed eaten fresh or processed for fat. Pulp bitter and acid. Locally important but little possibility for cultivation outside native area.
References: Dalziel 1948, Irvine 1961.

Solanaceae

***Cyphomandra betacea* Sendt.**
Common names: tree tomato (English); arbol de tomates, palo de tomate (Spanish); tomate d'arbre (French); tomate frances (Portuguese).
Origin: South America.
Distribution: Tropical highlands and warm subtropics.
Cultural requirements: Grows best in frost-free climate with warm days, cool nights, well-distributed rainfall. Prefers light, mildly acid soil. Not tolerant of wind, root-knot nematodes.
Description: Herbaceous shrub to 4 m. Propagation by seed, cuttings. Fruit production in 1-2 years from seed. Some trees flower all year. Fruit set only if night temperatures cool. Fruit matures in 60-90 days. Fruit conical to ellipsoid, 4-6 cm long, 3-5 cm wide; external color yellow, red, or purple; internal color yellow or orange.
Utilization: Pulp eaten fresh but used mostly in jams, sauces. Flavor subacid to sour, some rather strong; moderate appeal. Fair potential for processing in highland Tropics, subtropics.
References: Fletcher 1965, Fouqué 1974.

Figure 30.—Tree tomato, *Cyphomandra*, on lanky branches.

***Solanum muricatum* Ait.**
Common names: melon shrub, pepino (English); pepino, pepino dulce (Spanish); melon-poire, poire-melon (French).
Origin: Southwestern South America.
Distribution: Tropical America; limited introduction elsewhere.
Cultural requirements: Subtropical to tropical highland climate with cool to hot days, cool nights, and well-distributed rainfall. Prefers light, fertile, well-drained soils. Grows poorly in hot tropical lowlands. Not tolerant of freezing temperatures.
Description: Herbaceous shrub to 1 m. Propagation by seed. Fruit ovoid to ellipsoid, 5-20 cm long; external color green, white, or yellow, often with purple stripes; internal color white or yellow. Good selections in Ecuador, Peru, and Chile.
Utilization: Pulp eaten fresh, canned, preserved. Flavor sweet to subacid, much variation in quality; moderate appeal. Good potential for commercial production.
References: Fouqué 1974, Popenoe 1924.

***Solanum quitoense* Lam.**
Common names: naranjilla (English); lulo, naranjilla, naranjilla de Quito (Spanish); morelle de Quito; naranjilla (French).
Origin: South America (Andes).
Distribution: Some introduction into other areas but not common outside South America.
Cultural requirements: Cool, moist tropical highlands with light, fertile, well-drained soil. Not tolerant of frost, wind, root-knot nematodes. Does not grow or set fruit well in hot tropical lowlands.
Description: Herbaceous shrub to 2 m. Propagation by seed (grafting on nematode-resistant rootstocks has been done experimentally). Fruit production in 10-13 months from seed. Flowers all year. Plants hermaphroditic, self-fertile. Fruit matures in 50-60 days. Fruit globose to ovoid, 3-5 cm long, 4-6 cm in diameter, in clusters of 3-4; external color yellow or orange, internal green.
Utilization: Juice consumed fresh, mixed with other juices, used as flavoring in desserts. Flavor subacid; universal appeal. Good potential for limited commercial production in areas with suitable climate.
References: Gattoni 1957, Ledin 1952, Schultes and Cuatrecasas 1953.

***Solanum topiro* Humb. et Bonpl.** (mistakenly called *S. hyporhodium*)
Common names: cocona (English); cocona, lulo, topiro (Spanish).

Origin: South America (upper Amazon).
Distribution: South America; some introduction elsewhere but rare.
Cultural requirements: Hot, wet tropical lowlands with light well-drained soils. Not tolerant of root-knot nematodes.
Description: Herbaceous shrub to 2 m. Propagation by seed. Fruit ovoid, 7–10 cm in diameter; external color white or yellow, sometimes with purple markings; internal color whitish.
Utilization: Pulp made into preserves; eaten fresh only to small extent. Flavor sweet, insipid; limited appeal. Little potential because of limited adaptability.
Reference: Fouqué 1974.

Sterculiaceae

***Cola acuminata* Schott et Endl.** (a very similar species is *C. nitida* A. Chev.)
Common names: cola nut, kola nut (English); obi abata (west Africa).
Origin: Tropical Africa.
Distribution: Widely introduced into Tropics.
Cultural requirements: Hot, wet tropical lowlands with fertile, well-drained, medium-acid soil high in organic content. Not tolerant of high-pH soils or frost.
Description: Tree to 20 m (usually smaller). Propagation by seed, layering, cuttings. Fruit 20 cm long, 6–7 cm in diameter, solitary; external color brown, internal whitish; seeds white, red, or pink.
Utilization: Seeds used fresh as masticatory and as source of extracts for beverages and drugs. No potential as food crop. Moderate potential in production of beverages and stimulants.
References: Burkill 1935, Dalziel 1948, Irvine 1961.

***Sterculia foetida* L.**
Common names: Java olive (English); kelumpang (Malaya); sam (Thai).
Origin: Tropical Asia.
Distribution: Pantropic.
Cultural requirements: Hot tropical lowlands with medium to high rainfall. Adapted to variety of soil types, seasonal dry period.
Description: Tree to 16 m. Propagation by seed. Polygamous; some trees evidently need cross-pollination for fruit set. Fruit lobed, 7 cm long, 12 cm in diameter; external color brown to red; seeds bluish or gray.
Utilization: Seeds eaten fresh, roasted; source of cooking oil; adulterant for chocolate. Flavor nutty; moderate appeal. Purgative if eaten in quantity. Little potential for cultivation as food crop.
References: Burkill 1935, Dalziel 1948, Neal 1965.

***Sterculia monosperma* Ventenat** (= *S. nobilis* Smith)
Common names: China chestnut, noble battle tree (English); pheng phok (Thai).
Origin: China, Thailand.
Distribution: China, Thailand, Sumatra, Taiwan.
Cultural requirements: Hot, wet tropical lowlands. Tolerates a variety of soil conditions.
Description: Tree to 13 m. Propagation by seed. Fruit 9 cm long, 5 cm in diameter, in clusters of 12 or more; external color red; seeds black.
Utilization: Seeds eaten after cooking. Little potential for wider cultivation.
Reference: Molesworth Allen 1967.

***Theobroma bicolor* Humb. et Bonpl.**
Common names: mocambo, pataste (Spanish); cacao do Perú (Portuguese).
Origin: Mexico, Central and South America.
Distribution: Introduced elsewhere into Tropics but not common outside tropical America.
Cultural requirements: Hot, wet tropical lowlands.
Description: Tree to 12 m. Propagation by seed. Fruit ellipsoid, 15–20 cm long, 10–11 cm in diameter.
Utilization: Pulp eaten fresh. Seeds roasted, cooked with other foods. Flavor of pulp subacid, pleasant; odor somewhat disagreeable. Little potential for commercial production.
References: Fouqué 1974, Leon 1968.

***Theobroma cacao* L.**
Common names: cocoa, cacao (English); cacao (Spanish); cacao, cacaotier (French); cacau (Portuguese).
Origin: South America.
Distribution: Pantropic.
Cultural requirements: Hot, wet tropical lowlands with fertile well-drained soils. Often grown in light shade. Not tolerant of frost.
Description: Tree to 8 m. Propagation by seed, layering, cuttings, grafting. Flowers June–July, September–October (Northern Hemisphere). Self-sterility common; cross-pollination desirable. Fruit matures in 120–150 days. Fruit ellipsoid, 15–30 cm long; external color yellow, orange, red, purple, or brown; pulp white, pink, or brown.

Utilization: Pulp eaten fresh; flavor subacid, pleasant. Seeds processed into chocolate. Not important for pulp; very important as source of chocolate. Good potential for greater production. Commercial production in many areas of hot Tropics.
References: Chatt 1953, Ochse et al. 1961, Urquhart 1962.

***Theobroma grandiflorum* K. Schum.**
Common names: cupuassu (English); cupuaçu (Portuguese).
Origin: Brazil.
Distribution: Some introduction elsewhere into Tropics but common only in Amazon.
Cultural requirements: Hot, wet tropical lowlands.
Description: Tree to 20 m. Propagation by seed. Fruit 12–25 cm long, 10–12 cm in diameter; external color brown, internal yellowish or whitish.
Utilization: Pulp eaten fresh, in beverages. Flavor subacid, aromatic; high appeal. Important in native area. Evaluation of potential elsewhere needed.
References: Cavalcante 1974, Fouqué 1974.

Strychnaceae

***Strychnos spinosa* Lam.**
Common names: Kaffir orange, monkey ball (English).
Origin: Africa.
Distribution: Introduced into many areas but not common outside Africa.
Cultural requirements: Hot, dry tropical or subtropical savanna. Tolerant of light frost.
Description: Shrub or tree to 10 m. Propagation by seed. Fruit globose, 10–12 cm in diameter; external color yellowish orange, internal yellowish brown.
Utilization: Pulp eaten fresh, fermented to make alcoholic beverage. Flavor subacid; moderate appeal. Little potential for cultivation as food crop.

Verbenaceae

***Vitex doniana* Sweet** (= *V. cuneata* K. Schum. et Thonn., *V. cienkowskii* Kotschy et Perr.)
Common names: black plum, African plum (English); prune noire (French); koro (Africa).
Origin: Africa.
Distribution: Africa.
Cultural requirements: Hot tropical climate; savanna and deciduous forest with low to medium rainfall.
Description: Tree to 20 m. Propagation by seed. Fruit 2 cm long, external color black.
Utilization: Pulp eaten fresh, candied, mixed with other fruits and used in various ways. Flavor sweet (resembles prune). Widely used in native area; little potential for cultivation elsewhere.
References: Dalziel 1948, Eggeling 1940, Irvine 1961.

Vitaceae

***Vitis vinifera* L.**
Common names: grape (English); uva (Spanish); raisin (French).
Origin: Eurasia.
Distribution: Tropics, subtropics, Temperate Zone.
Cultural requirements: Best development in subtropical and temperate regions with fertile well-drained soils and good supply of soil moisture during growing season. In these regions, dormancy is induced by cool weather. In some hot tropical areas fruit production is achieved by pruning or withholding water to induce dormancy. In general, grapes are not well adapted to the hot, wet, lowland Tropics.
Description: Woody deciduous vine. Propagation by cuttings, grafting. Fruit production in 3–4 years. Flowering occurs after dormant period. Fruit matures in 90 or more days. Fruit globose to ellipsoid, in large clusters; external color green, yellow, red, or purple; internal color white, pink, or red.
Utilization: Fruit eaten fresh, dried; made into jellies, jams, wine, juice. Flavor sweet; universal appeal. Widely grown on a commercial scale, with many varieties adapted to subtropical and temperate regions. Varieties adapted to the Tropics are needed to stimulate more commercial production, for which there is good potential.
References: Araque 1969, Olmo 1970, Tafurt et al. 1969.

3. Citrus Fruits and Their Relatives

The fruits commonly called citrus belong to three genera, *Citrus, Fortunella,* and *Poncirus,* in the family Rutaceae. There are numerous cultivated varieties, many named hybrids, and many fruits of uncertain origin and relationship. Citrus is produced from the warm Temperate Zone to the hottest parts of the Tropics (fig. 7), and the fruits and their products are shipped eveywhere. The best source of information concerning citrus fruit varieties and their status is Hodgson (1967).

Principal Citrus Fruits

The major citrus fruit species and varieties are given in table 1, some minor species are included because they represent a distinct fruit type.

Table 1.—Principal cultivated varieties of *Citrus, Fortunella,* and *Poncirus*

Species, group, and variety	Note	Value[1]
Citrus sinensis (L.) Osbeck, sweet orange:		
Common group:		
Barão	Brazilian	3
Belladonna	Italian	3
Berna (Bedmar, Bernia, Verda, Verna, Vernia)	Spanish	2
Biondo Comune (Nostrale Liscio)	Italian	3
Biondo Piccio	Italian	3
Cadenera (Cadena Fina, Orero, Precoce de Canarias, Prococe de Valence, Sin Jueso, Valencia sans Pepins)	Spanish	1
Calabrese (Ovale)	Italian	1
Castellana	Spanish	3
Clanor (Lanwilliam)	South African	3
Hamlin (Norris)	Floridian	1
Homosassa	Floridian	3
Jaffa (Florida Jaffa)	Floridian	2
Joppa	Widespread	3
Khettmali (Hitmali, Khatmali)	Lebanese	3
Macetera	Spanish	3
Malta (Malta Common)	Indian	3
Maltaise Blonde (Maltaise, Petite Jaffa, Portugaise Blonde)	North African	2
Maltaise Ovale (California or Gareys Mediterranean Sweet, Maltese Oval)	Mediterranean	2
Marrs (Marrs Early)	Texan	3
Mosambi (Mosambique)	Indian	3
Natal	Brazilian	3
Parson (Parson Brown)	Floridian	2
Pera	Floridian (Brazilian)	1
Pineapple	Floridian	2
Pope (Glen Summer, Pope Summer)	Floridian	4
Premier	Rhodesian	2
Queen	Floridian	3
Salustiana	Spanish	2
Sathgudi	Indonesian	4
Seleta (Selecta, Siletta)	Portuguese (Australian)	2
Shamouti (Chamouti, Jaffaoui, Laffaoui, Palestine Jaffa)	Israeli	3

Table 1.—Principal cultivated varieties of *Citrus, Fortunella,* and *Poncirus*—Continued

Species, group, and variety	Note	Value[1]
Citrus sinensis (L.) Osbeck, sweet orange:		
Common group—Con.		
Shamouti Masri (Egyptian Shamouti, Khalily White)	Egyptian	3
Valencia (Hart Late, Hart's Tardiff, Valencia Late)	Portuguese	1
Vicieda (Viciedo)	Spanish	3
Citrus sinensis (L.) Osbeck, sweet orange:		
Sugar group:		
Lima	Brazilian	3
Succari (Sukkari)	Egyptian	3
Sucreña (Cavamiel, Grando de Oro, Imperial, Real)	Spanish	3
Vainiglia (Dolce, Maltese, Vaniglia	Italian	4
Pigmented group:		
Bloodred (Blood Red Malta)	Mediterranean, Indian, Pakistani	3
Doblefina (Blood Oval, Morlotte, Oval Sangre, Rojo Oval, Sanguina Oval, Sanguine Ovale)	Spanish	2
Doublefine Ameliroee (Gross Sanguine, Pedro Veyrot, Washington Sanguine, Washington Sangre)	Spanish (North African)	2
Entrefina (Inglesa)	Spanish	4
Maltaise Sanguine (Portugaise)	Maltese	3
Moro (Belladonna Sanguigno)	Sicilian	3
Murtera	Spanish	4
Ruby (Ruby Blood)	Mediterranean (U.S.A.)	3
Sanguigno Semplice	Sicilian	4
Sanguinello Comune	Italian	3
Sanguinello Moscato	Sicilian	3
Spanish Sanguinelli (Sanguinella, Sanguinelli)	Spanish	3
Tarocco (Tarocco dal Muso, Tarocco di Francoponte)	Italian	2
Tarocco Liscio (Calabrese Sanguigno, Tarocco Ovalo)	Sicilian	3
Tomango	South African	3
Navel group:		
Australian	Brazilian	4
Baianinha Piracicaba	Brazilian	2
Frost Washington	Californian	1
Gillette	Californian	2
Leng	Australian	2
Navelina (Dalmau)	Californian (Spanish)	3
Oberholzer (Oberholzer Palmer)	South African	2
Robertson	Californian	3
Thompson (Thomson Improved)	Californian	3
Washington (Bahia, Baia, Baina, Riverside)	Brazilian (U.S.A.)	1

Table 1.—Principal cultivated varieties of *Citrus, Fortunella,* and *Poncirus*—Continued

Species, group, and variety	Note	Value[1]
Citrus aurantium (L.) sour or bitter orange:		
Common group:		
Seedlings	Widespread	2
Sevillano (Agrio de España, Real)	Spanish	1
Bittersweet group:		
Bittersweet	Floridian	3
Paraguay (Apepu)	Paraguayan	3
Variant group:		
Abies Narrow Leaf	Algerian	3
Bouquet (Bouquet de Fleurs)	French	3
Bouquetier a Grandes Fleurs (Bouquetier a Peau Epaisse)	French	3
Bouquetier de Nivea (Fleurs Doubles)	French	3
Kabasu	Japanese	3
Kikudaidai	Japanese	3
Variegated (Panache)	Californian	3
Willowleaf	Unknown	4
Zadaidai	Japanese	2
Myrtle-leaf group:		
Boxwood Leaf Chinotto (Chinois a Fou Bois)	Mediterranean	3
Crispifolia Chinotto (Crinkle Leaf Chinotto)	Mediterranean	3
Dwarf Chinotto	Mediterranean	3
Large Chinotto	Mediterranean	3
Citrus bergamia Risso, bergamot:		
Castagnaro	Mediterranean	3
Femminello	Mediterranean	3
Melarosa	Mediterranean	4
Piccola (Petite)	Mediterranean	4
Torulosa (Striata)	Mediterranean	4
Citrus unshiu Marc., marcovitch, satsuma mandarin:		
Early (Wase) group:		
Aoe	Japanese	2
Iseki	Japanese	4
Matsuyama	Japanese	3
Miho	Japanese	3
Miyagawa	Japanese	1
Okitsu	Japanese	2
Late (Unshu) group:		
Hayashi	Japanese	2
Ishikawa	Japanese	2
Nankan No. 4	Japanese	2
Owari	Japanese	3
Silverhill	Floridian	4
Sugiyami	Japanese	1
Citrus nobilis Loureiro, king mandarin:		
King	Malayan	3

Table 1.—Principal cultivated varieties of *Citrus, Fortunella,* and *Poncirus*—Continued

Species, group, and variety	Note	Value[1]
Citrus deliciosa Tenore, Mediterranean mandarin:		
Mediterranean Common (Willowleaf)	Mediterranean	1
Citrus reticulata Blanco, common mandarin:		
Beauty (Glen)	Australian	2
Campeona	Uruguayan	2
Clementina (Algerian)	North African	1
Cravo (Laranja Cravo)	Portuguese	3
Dancy	Indian	1
Ellendale (Ellendale Beauty)	Australian	2
Emperor (Emperor of Canton)	Australian	3
Encore	Californian	3
Fairchild	Californian	2
Fewtrell (Fewtrell's Early)	Australian	3
Fortune	Californian	3
Fremont	Floridian	3
Imperial	Australian	1
Kara	Californian	3
Kinnow	Californian	2
Lee	Floridian	3
Murcot (Murcott Honey, Smith)	Floridian	2
Nova	Floridian	2
Ortanique	Jamaican	2
Osceola	Floridian	3
Page	Floridian	3
Ponkan (Nagpur, Warnuco)	Floridian	2
Robison	Floridian	2
Tankan	Chinese	3
Wilking	Californian	3

Figure 31.—Willow mandarin, an old variety of *Citrus reticulata*.

Table 1.—Principal cultivated varieties of *Citrus, Fortunella,* and *Poncirus*—Continued

Species, group, and variety	Note	Value[1]
Mandarinlike fruits (often hybrids):		
Tangor group:		
Dweet	Californian	3
Mency	Californian	3
Temple	Jamaican	2
Umatilla	Floridian	3
Tangelo group:		
Allspice	Californian	3
Minneola	Floridian	2
Orlando	Floridian	3
Seminole	Floridian	4
Thornton	Floridian	4
Ugli	Jamaican	2
Citrus grandis (L.) Osbeck, pummelo:		
Common group:		
Bampeiyu	Malaysian	1
Hirado	Japanese	1
Kao Pan (Kao Panne)	Thailandese	1
Kao Phunag	Thailandese	1
Mato	Chinese	2
Tahitian (Moanalua)	Borneo	3
Pigmented group:		
Chandler	Californian	2
Ogami	Japanese	2
Pandan Benor	Indonesian	1
Pandan Wangi	Indonesian	1
Siamese Pink (Siam)	Thailandese	2
Thong Dee	Thailandese	2
Sweet or nonacid group:		
Siamese Sweet	Thailandese	3
Ama (Mikado)	Japanese	3
Citrus paradisi Macfad., grapefruit:		
Common group:		
Duncan	Floridian	2
Marsh	Floridian	1
Triumph	Floridian	3
Walters	Floridian	4
Pigmented group:		
Foster (Foster Pink)	Floridian	3
Redbush (Red Marsh, Red, Red Seedless, Ruby)	Texan	1
Thompson (Pink Marsh)	Floridian	3
Fruits like grapefruit		
Tangelo group:		
K-Early	Floridian	3

Table 1.—Principal cultivated varieties of *Citrus, Fortunella,* and *Poncirus*—Continued

Species, group, and variety	Note	Value[1]
Fruits like grapefruit—Con.		
Orangelo group:		
Chironja	Puerto Rican	3
Natsudaidai	Japanese	1
Poorman (Poorman Orange)	Oriental	2
Wheeny Grapefruit	Australian	3
Citrus medica L., citron:		
Acid group:		
Diamante (Cedro Liscio)	Italian	2
Etrog (Atrog, Ethrog)	Israeli	2
Sweet group:		
Corsian	Corsican	2

Figure 32.—Chironja, probably a hybrid of orange and grapefruit, under development in Puerto Rico.

Table 1.—Principal cultivated varieties of *Citrus, Fortunella,* and *Poncirus*—Continued

Species, group, and variety	Note	Value[1]
Citrus limon (L.) Burm, f., lemon:		
Acid group:		
Berna (Bernia, Verna, Vernia)	Spanish	1
Eureka	Californian	1
Femminello Ovale (Comune, Ruvittaru)	Italian	2
Femminello Sfusato (Favazzina, Siracusa)	Italian	3
Interdonata (Speciale)	Italian	3
Lisbon	Portuguese	1
Mesero	Spanish	3
Monachello	Italian	2
Villafrancha	Sicilian	2
Sweet group:		
Dorshapo	Brazilian	4
Fruits similar to lemon		
Meyer	Chinese	2
Rough	Indian	2

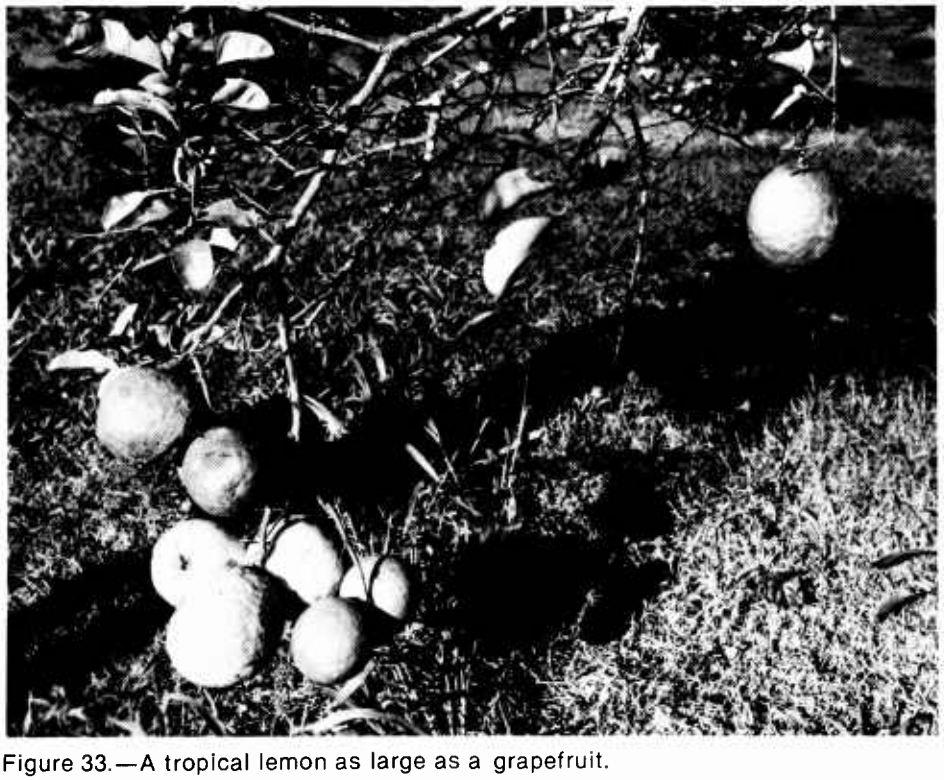

Figure 33.—A tropical lemon as large as a grapefruit.

Table 1.—Principal cultivated varieties of *Citrus*, *Fortunella*, and *Poncirus*—Continued

Species, group, and variety	Note	Value[1]
Citrus aurantifolia (L.) Swingle, lime:		
Small fruited acid group:		
West Indian (Key, Mexican)	Widely extended	1
Large fruited acid group:		
Tahiti (Persian)	Mediterranean	2
Bearss (Bearss Seedless)	Floridian	2
Citrus limettioides Tan.		
Indian Sweet, Palestine	Indian	3
Fortunella margarita (Lour.) Swingle, kumquat:		
Nagami, Oval	Japanese	2
Fortunella crassifolia Swingle		
Meiwa, Large Round	Japanese	3
Fortunella japonica (Thunb.) Swingle		
Marumi, Round	Japanese	3
Fortunella hindsii (Champ.) Swingle		
Hongkong	Japanese, Chinese	3
Fortunella obovata Tan.		
Changshow	Japanese, Chinese	4
Fortunella polyandra (Ridl.) Tan.		
Malayan	Malaysian	4
Poncirus trifoliata (L.) Raf., trifoliate orange:		
Root-stock group:		
Rubidoux	Calfornian	1

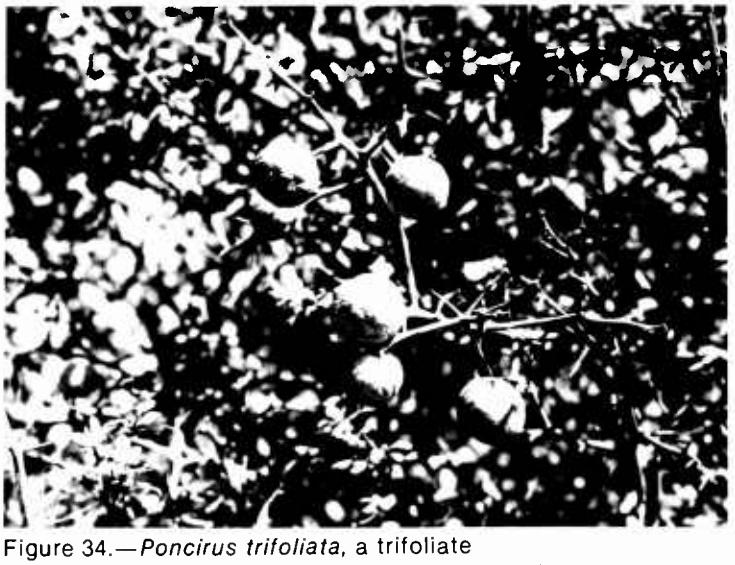

Figure 34.—*Poncirus trifoliata*, a trifoliate orange with small fruits and large thorns.

Table 1.—Principal cultivated varieties of *Citrus, Fortunella,* and *Poncirus*—Continued

Species, group, and variety	Note	Value[1]
Poncirus trifoliata (L.) Raf., trifoliate orange—Con.		
Ornamental group:		
Flying Dragon	Japanese	3
Hybrid group:		
Carrizo	Floridian	1

[1]Value: 1, Widespread, highly commercialized, very important. 2, Widespread, somewhat commercialized, very promising. 3, Localized use or little known, but appreciated. 4, Minor importance.

Other Fruits of the Orange Subfamily

Other fruits in subfamily Aurantioideae are given in table 2. These fruits, having citruslike characteristics, are many in number, widely scattered, and often unknown except in localized areas. The work of Swingle and Reece (1967) has been very useful in making up this table.

Table 2.—Fruits of the orange subfamily Aurantioideae, excluding *Citrus, Fortunella,* and *Poncirus*

Species	Common name	Origin	Use	Value[1]
Aegle marmelos (L.) Corr.	Indian bael	India	Pulp, eaten fresh, used in drinks	1
Afraegle paniculata (Schum. et Thonn.)	Powder-flask fruit	West Africa	Oil extracted from seeds	
Atalantia monophylla Kurz.	Indian atlantia	India	Immature fruits pickled	3
Citropsis articulata (Willd.) Swingle et M. Kell.	West African cherry orange	West Africa	Fruit eaten fresh	4
Citropsis schweinfurthii Swingle	Uganda cherry orange	East Africa	Fruit eaten fresh	4
Citropsis tanakae Swingle et M. Kell	Sierra Leone cherry orange	East Africa	Fruit eaten fresh	4
Clausena anisata (Willd.) Hook f.	Mokolokale	Southern Africa	Fruit eaten fresh	4
Clausena anisum-olens (Blanco) Merr.	Kayumanis	Philippines	Fruit eaten fresh, fermented into liquor	3
Clausena dentata var. *dulcis* (Bedd.) Swingle	Indian wampee, wampi	India	Fruit eaten fresh	2

Table 2.—Fruits of the orange subfamily Aurantioideae, excluding *Citrus, Fortunella,* and *Poncirus*—Continued

Species	Common name	Origin	Use	Value[1]
Clausena dentata var. *henryi* Swingle	Ichang	China	Fruit eaten fresh	4
Clausena excavata Burm. f.	Pink limeberry	China	Fruit eaten fresh, leaves stewed in curry	4
Clausena heptaphylla (Roxb.) Wight. et Arn.	Karumphul	Southeast Asia	Leaves used to flavor chewing tobacco	4
Clausena indica (Dalz.) Oliv.		India	Fruit eaten fresh	4
Clausena lansium (Lour.) Skeels	Wampee	China	Fruit eaten fresh	2
Clausena lunulata Hayata	Hime-wampi	Taiwan	Fruit eaten fresh	2
Clausena mollis Merr.	Wampee	Philippines	Fruit eaten fresh	4
Clymenia polyandra (Tan.) Swingle	Clymenia	New Ireland	Fruit eaten fresh	3
Eremocitrus glauca (Lindl.) Swingle	Australian desert lime	Australia	Fruit used in juice and jam	3
Feronia limonia Swingle	Wood apple	Tropical Asia	Fruit eaten fresh, used in drinks, desserts	3
Feroniella lucida (Scheff.) Swingle	Java feroniella	Indonesia	Fruit eaten fresh	4
Feroniella oblata Swingle	Indochina feroniella	Indochina	Cooked fruit used as condiment	4
Glycosmis citrofolia (Willd.) Lindl.	Chinese glycosmis	China	Fruit eaten fresh	4
Glycosmis pentaphylla Correa	Glycosmis	Tropical Asia	Fruit eaten fresh	4
Hesperethusa crenulata (Roxb.) Roem.	Hesperethusa	India, Indochina	Cooked fruit used as condiment	3
Luvunga scandens (Roxb.) Buch.-Ham.	Trifoliate liana-lime	India, Southeast Asia	Fruit used for perfumed medicine oil	4
Microcitrus australasica (F. Muell.) Swingle	Australian finger lime	Australia	Fruit eaten fresh	4
Microcitrus australis (Planch.) Swingle		Australia	Fruit eaten fresh	4
Microcitrus garrowayi (F. M. Bail.) Swingle	Garroway's Australian lime	Australia	Fruit eaten fresh	4
Microcitrus warburgiana (F. M. Bail.) Tanaka	New Guinea wild lime	Papua New Guinea	Fruit eaten fresh	4

Table 2.—Fruits of the orange subfamily Aurantioideae, excluding *Citrus, Fortunella,* and *Poncirus*—Continued

Species	Common name	Origin	Use	Value[1]
Murraya koenigii (L.) Spreng.	Curry leaf	Tropical Asia	Leaf used to flavor curries	3
Murraya paniculata (L.) W. Jack	Jasmine orange	China	Ripe fruit, leaves used as condiment	4
Severinia buxifolia Tenore	Chinese box orange	China, India	Leaves used in Chinese yeast cake	3
Severinia disticha (Blanco) Swingle	Philippine box orange	Vietnam, Philippines	Fruit eaten fresh	4
Triphasia trifolia (Burma. f.) P. Wilson	Triphasia, limeberry	Southeast Asia	Fruit candied; ornamental	4

[1]Value: 1 Widespread, highly commercialized, very important. 2, Widespread, somewhat commercialized, very promising. 3, Localized use or little known, but appreciated. 4, Minor importance.

Figure 35.—*Triphasia trifolia*, foliage, flowers, and fruits.

Other Minor Fruits of the Family Rutaceae

Rutaceae contains many other genera with edible species. Usually these fruits, given in table 3, do not resemble citrus. The best source of information about them is Tanaka (1976).

Table 3.—Minor species of the family Rutaceae, excluding the subfamily Aurantioideae

Species	Common name	Where found	Use
Acronychia pedunculata Miq.	Baiba, bai bai	India, Southeast Asia	Pulp eaten fresh, leaves raw.
Adenandra formosana Hayata	Ang-tan	Okinawa, Taiwan	Pulp eaten fresh.
Adenandra fragrans Roem. et Schult.		South Africa	Pulp, leaves brewed as tea.
Adenandra ryukyuensis Masamune		Okinawa	Pulp eaten fresh.
Calodendron capensis Thunb.	Cape chestnut	South Africa	Nuts eaten.
Casimiroa edulis Llave et Lex.	White sapote, Mexican apple	Mexico, Central America	Pulp eaten fresh.
Correa alba Andr.	Cape Barren tea	Australia	Tea brewed from leaves.
Evodia daniellii Hemsl.	Sui-nam	Korea, northern China	Oil extracted from pulp and seeds.
Evodia fraxinifolia Hook. f.	Kanukpa	Bengal, Nepal	Oil extracted from pulp and seeds.
Evodia lunu-ankenda Merr.	Stenggek burong	Thailand, Malaysia, India	Leaves used as tea.
Evodia ptelaefolia Merr.	Awadan	Taiwan, southern China, Vietnam	Tea brewed from leaves.
Fagara chalybea Engler	Iguga	Tropical Africa	Leaves used as condiments.
Fagara inaequalis Engler	Bolongolo	Tropical Africa	Oil extracted from seeds.
Fagara lemaire De Wild.	Bolongolo	Niger, Zaire	Oil extracted from seeds.
Fagara okinawensis Nakai	Shima-mu-zanshô	Okinawa	Shoots used as condiment.
Fagara zanthoxyloides Lam.		Western tropical Africa	Dried leaves used as condiment.
Feretia apodanthera Del.		Northern Cameroon	Seeds brewed as coffee.
Melicope ternata Forst.	Ternate-leaved melicope	New Zealand	Gums chewed.
Melicope triphylla Merr.	Wadan	Okinawa	Leaves cooked.
Orixa japonica Thunb.	Ko-kusagi	China, Japan	Leaves cooked.
Orixa swynnertonii Verd.		Zimbabwe	Pulp eaten fresh.
Ptelea tomentosa Rafin.		Southwestern U.S.A.	Pulp eaten fresh.
Ptelea trifoliata L.	Wafer ash, common hop tree.	North America	Fruit used to flavor beer.
Ruta graveolens L.	Rue	Throughout Temperate Zone and Tropics	Leaves used as condiment.

Table 3.—Minor species of the family Rutaceae, excluding the subfamily Aurantioideae—Continued

Species	Common name	Where found	Use
Ruta tuberculata Forsk.		Iran, Arabia, north Africa	Oil extracted from leaves.
Skimmia laureola Sieb. et Zucc.		India	Oil extracted from leaves.
Teclea afzelii Engler		West Africa	Fruit eaten fresh.
Teclea englerima	Kimena	Zaire	Fruit eaten fresh.
Teclea natalensis	Bastard ironwood	South Africa	Fruit eaten fresh.
Toddalia aculeata Pers.	Wild orange	India, Sri Lanka, Madagascar	Leaves and pulp chewed.
Toddalia asiatica Lam.	Daung	Okinawa, Philippines	Fruit eaten fresh, leaves used as condiment.

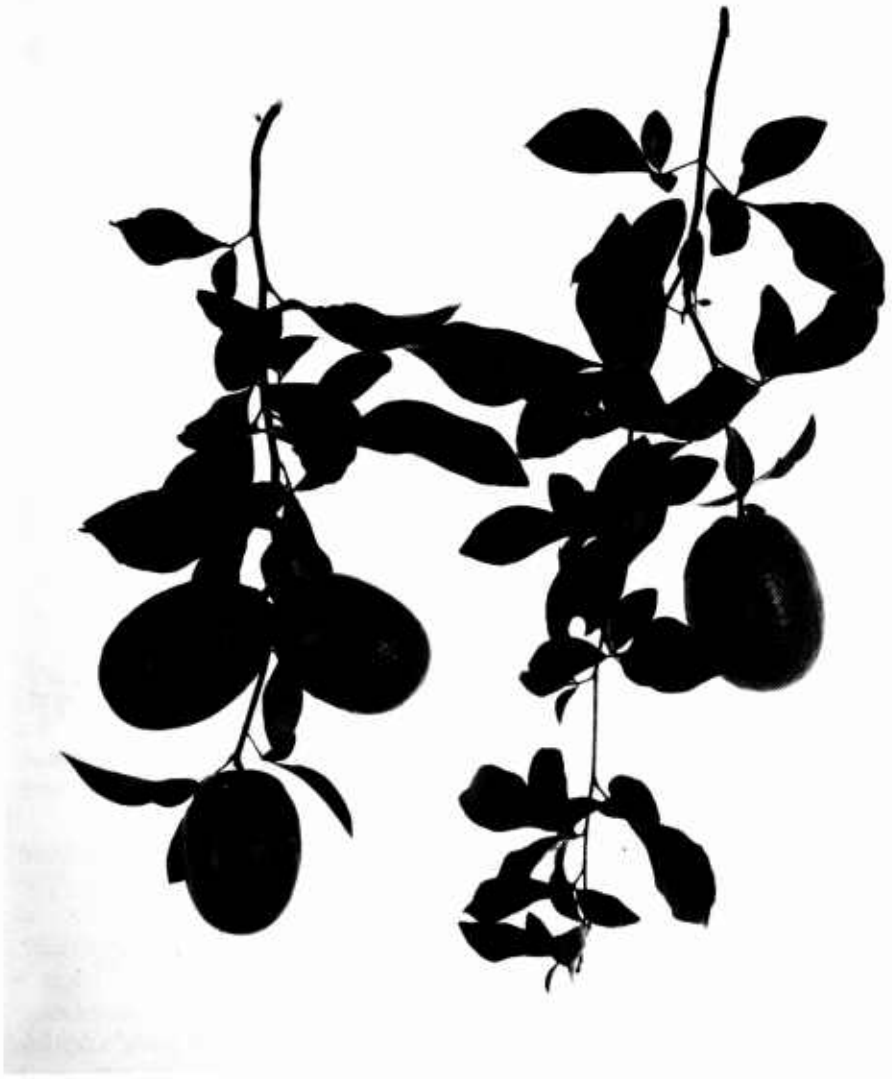

Figure 36.—*Chaetospermum glutinosum*, a handsome fruit not used as a food.

Table 3.—Minor species of the family Rutaceae, excluding the subfamily Aurantioideae—Continued

Species	Common name	Where found	Use
Zanthoxylum acanthopodium DC.	.....	Laos	Leaves used as condiment.
Zanthoxylum ailanthoides Sieb. et Zucc.	Karasu-zanshô	Japan, China, Korea, Taiwan	Leaves are eaten
Zanthoxylum alatum Roxb. ...	Timbur.....	China, Taiwan, ... Malaysia	Fruit, leaves used as condiment.
Zanthoxylum avicennae DC. ..	Cay sen lai ...	Southern China, ... Taiwan	Leaves used as condiment.
Zanthoxylum beecheyanum K. Koch.	Hire-zanshô ..	Okinawa	Fruit and bark used as condiment.
Zanthoxylum budrunga Wall...	Clavarier	Asian Tropics	Various parts used as condiment.
Zanthoxylum coreanum Nakai	O-shanshô ...	Korea	Leaves eaten fresh.
Zanthoxylum heterophyllum .. Smith	.....	Madagascar, Réunion	Fruit, bark used as condiment.
Zanthoxylum nitidum DC.....	Sung	China, Vietnam	Leaves, seeds used as condiment, made into beverage.
Zanthoxylum oxyphyllum Edgw.	Mezenga	India	Shoots eaten fresh.
Zanthoxylum piperatum DC. ..	Sanshô	Japan, China	Leaves, fruit, bark used as condiment.
Zanthoxylum planispinum Sieb. et Zucc.	Fuyu-sanshô .	Japan, China, Korea,	Peel used as condiment.
Zanthoxylum rhetsa DC.....	Baharmani ...	India, Iran, Indonesia	Seeds, rind, bark used as condiment.
Zanthoxylum schinifolium Sieb.	Inu-zanshô ...	Japan, China, Korea	Leaves, fruit eaten fresh.
Zanthoxylum senegalense DC.	Senegal prickly ash	Senegal	Fruit eaten fresh, fermented.
Zanthoxylum simulans Hance	Pepper bush ..	China	Fruit used as condiment.
Zanthoxylum triphyllum Wight	.....	India	Fruit used as condiment.
Zanthoxylum usitatum Lanessak	Xuong	Vietnam	Fruit used as condiment.

4. Minor Fruits of the Americas

Scientific name	Common name	Where found	Part used
Actinidaceae			
Saurauia pulchra Sprague	Moquillo	Colombia	Pulp
Alangiaceae			
Metteniusa edulis Karst	Kanji	Colombia	Seed
Anacardiaceae			
Anacardium excelsum Skeels	Caracolí	Colombia	Peduncle
Anacardium humile St. Hil.	Monkey nut	Brazil	Nut
Anacardium macrocarpa Engler	Caju-assu	Brazil	Fruit stalk
Anacardium microcarpum Ducke	Caju-do-campo	Brazil	Fruit stalk
Anacardium nanum St. Hil.	.....	Brazil	Nut
Anacardium negrense Pires et Froes.	Cajutim	Brazil	Nut
Anacardium pumilum St. Hil.	Cajueiro rasteiro	Brazil	Nut
Anacardium rhinocarpus DC.	Wild cashew, caracolí	Brazil	Nut
Anacardium spruceanum Benth.	Cajuaçu	Brazil	Nut
Campnosperma panamensis Standl.	Sajo	Colombia	Pulp
Poupartia amazonica Ducke	Cerdo branco	Brazil	Pulp
Schinus latifolius Engler	Chilean pepper tree	Chile	Pulp (wine)
Schinus molle L.	California pepper tree	Brazil	Pulp (wine)
Spondias macrocarpa Engler	Taperyba assu	Brazil	Pulp
Spondias myrobalanus Vell.	.....	Brazil	Pulp
Spondias venulosa Mart.	.....	Brazil	Pulp

Scientific name	Common name	Where found	Part used
Annonaceae			
Annona acutiflora Mart.	Pau de Guine	Brazil	Pulp
Annona cinerea Donal	Rinón	Venezuela	Pulp
Annona coriacea Mart.	Araticum-de-tabuleiro	Brazil	Pulp
Annona cornifolia St. Hil.	Aranticó mirim	Brazil	Pulp
Annona crassiflora Mart.	Marolo	Brazil	Pulp
Annona densiconia Mart.	Araticum-do-mato	Brazil	Pulp
Annona exalbida Vell.	Araticum alvadio	Brazil	Pulp
Annona furfuracea St. Hil.	Araticum grande	Brazil	Pulp
Annona glabra L.	Pond apple	Florida, South America, West Indies	Pulp
Annona globiflora Schlecht.	Anonita de papagayos	Mexico	Pulp
Annona involucrata Baill.	.....	Central America, Trinidad	Pulp
Annona jahnii Saff.	Manirito	Venezuela Colombia	Pulp
Annona longiflora S. Wats.	Wild cherimoya	Mexico	Pulp
Annona lutescens Saff.	.....	Central America	Pulp
Annona marcgravii Mart.	Pohne	Central America	Pulp
Annona montana Macfad.	Mountain soursop	Brazil West Indies	Pulp
Annona nutans R. E. Fries	Araticum	Paraguay	Pulp
Annona paludosa Abul.	.....	Guiana	Pulp
Annona palustris L.	Araticum-paná	Brazil	Pulp
Annona pisonis M.	Araticum apê	Brazil	Pulp
Annona punctata Abul.	.....	Guiana	Pulp
Annona rodriguessi Barb.	.....	South America	Pulp
Annona sancta-crucis S. Moore	.....	South America	Pulp

Scientific name	Common name	Where found	Part used
Annona scleroderma Saff.	Poshte	Central America, Mexico	Pulp
Anona testudinea Saff.	Annona del monte	Central America	Pulp
Coussapoa ruizii Klotzsch.	Cibuero	South America	Pulp
Duguetia bracteosa Mart.	Pinhao	Brazil	Pulp
Duguetia lanceolata St. Hil.	Beribazeiro	Brazil	Pulp
Duguetia longifolia Baill.	.....	Guiana, Trinidad, Peru	Pulp
Duguetia marcgraviana Mart.	.....	Brazil	Pulp
Duguetia spiaxana Mart.	Biribarana	Brazil	Pulp
Porcelia nitidifolia Ruiz et Pav.	.....	Peru	Pulp
Porcelia saffordiana Rusby	.....	Bolivia	Pulp
Rollinia discreta L.	.....	Guiana	Pulp
Rollinia edulis Tr. et Pl.	Anón	Colombia	Pulp
Rollinia emarginata Schlecht.	Mirim	Brazil	Pulp, seeds
Rollinia jimenzii Saff.	Anonilla	Costa Rica	Pulp
Rollinia laurifolia Schlecht.	Anonilla	Costa Rica	Pulp
Rollinia longifolia St. Hil.	.....	Brazil	Pulp
Rollinia multiflora	Anoncillo	Surinam	Pulp
Rollinia mucosa Baill.	Wild cachiman	Tropical South America, West Indies	Pulp
Rollinia orthopetala A. DC.	Biribá	South America	Pulp
Rollinia pulcherinervia A. DC.	Guiana	Pulp	
Rollinia sylvatica St. Hil.	Articum do mato	Brazil	Pulp
Rolliniopsis discreta Saff.	Fructa de macaco	Brazil	Pulp
Unona discreta L.	.....	Guiana	Pulp

Scientific name	Common name	Where found	Part used
Apocynaceae			
Ahouai nitida M. Pichon	Tomate del diablo	Colombia	Pulp
Ambelania acida Aubl.	Pepito do mato	Brazil	Pulp
Ambelania tenuifolia Muell.-Arg.	Pepito do mato	Brazil	Pulp
Bonafousia longituba Mgf.	Paiuetu	Brazil	Pulp
Bonafousia tetrastachya Mgf.	Azúcar	Colombia	Pulp
Couma guianensis Abul.	Sorva	Guiana, Brazil	Pulp
Couma macrocarpa Barb.	Sorva grande	Brazil	Pulp
Couma rigida Muell.-Arg.	Itapeuá	Brazil	Pulp
Couma utilis Muell.	Couma, huansoco	Brazil	Pulp
Lacmelia edulis Karst	Lechemiel	Venezuela	Pulp
Lacmelia floribunda Benth. et Hook. f.	Tachuelo	Colombia'	Pulp
Lacmelia speciosa	Perillo	Colombia	Pulp
Macoubea guianensis	Pequia nut	Brazil, Guiana	Nut
Parahancornia ampa Ducke	Amapá	Brazil	Pulp
Vallesia glabra Cav.	.....	Central America, Florida, West Indies	Pulp
Zschokkea arborescens Muell.-Arg.	Molongo	Brazil	Pulp
Araceae			
Montrichardia arborescens Schott	Arracacho	Colombia	Seeds
Philodendron bipinnatifidum Schott	Banana de macaco	Brazil	Pulp

Scientific name	Common name	Where found	Part used
Araucariaceae			
Araucaria brasiliensis Lam.	Pinheiro brasileiro	Brazil	Seeds
Asclepiadaceae			
Vincetoxicum salvinii Standl.	Cuchamper	Central America	Pulp
Berberidaceae			
Mahonia pinnata Fedde	Lẽna amarilla	Mexico, U.S.A.	Pulp
Mahonia trifoliata Fedde	Agrito	Mexico, U.S.A.	Pulp
Betulaceae			
Carpinus caroliniana Walt.	American hornbeam	Central America, Mexico, U.S.A.	Nut
Bignoniaceae			
Crescentia cujete L.	Calabazo	Tropical Americas	Pulp, seeds
Parmentiera stenocarpa Dug.	Palo vela	Colombia	Pulp, seeds
Tanaecium liliacinum Seem.	Emossé berog	Panama Guiana,	Pulp
Bombacaceae			
Bombax aquaticum Schum.	Cacao selvagen	Brazil	Seed
Bombax gracilipes Schum.	.....	Brazil	Seed
Bombax manguba Mart.	Manguba	Brazil	Seed
Bombax spruceanum Ducke	Mamorana grande	Brazil	Seed
Cavanillesia platanifolia H.B.K.	Macondo	Colombia	Seed
Eriodendron aesculifolium DC.	.....	Mexico	Pulp, seed

Scientific name	Common name	Where found	Part used
Pachira grandiflora Tussac.	.....	West Indies	Seed
Pachira macrocarpa Schlecht.	Cayenne nut, sapotón	Central America, Mexico	Seed (as cocoa)
Patinoa almirajo Cuatr.	Almirajó	Colombia	Seed
Boraginaceae			
Cordia dentata Poir.	Uvito	Colombia	Pulp
Cordia dodecandra DC.	Siricote	Mexico	Pulp
Tournefortia hirsutissima L.	Nigua	Colombia	Pulp
Bromeliaceae			
Aechmea hoppii L. B. Smith	.....	Tropical Americas	Pulp
Aechmea magdalenae Andre ex Baker	Pita	Tropical Americas	Pulp
Ananas ananasoides L.B.S.	.....	Brazil	Pulp
Ananas bracteatus Schult.	Carauatá	Brazil	Pulp
Bromelia chrysantha Jacq.	Piñuela	South America	Pulp
Bromelia karatas L.	Piñuela	Tropical Americas	Pulp, vegetative
Bromelia pinguin L.	Pinguin	West Indies	Pulp
Bromelia trianae Mez.	Piñuela	Colombia	Pulp
Greigia sphacelata Regel.	Chupón	Chile	Pulp
Burseraceae			
Bursera icicariba Baill.	.....	Brazil	Pulp
Bursera leptophleos Mart.	Emburana	Brazil	Pulp
Protium brasiliense Engler	Almecera	Brazil	Seeds (oil)
Protium heltaphyllum March.	Breu branco	Brazil, Guiana	Pulp

Scientific name	Common name	Where found	Part used
Cactaceae			
Acanthocereus pentagonos L.	Pitahaya morada	Mexico, South America	Pulp
Acanthocereus pitajaya Dug.	Pitahaya	West Indies	Pulp
Borzicactus acanthurus Britt. et Rose	.....	Peru	Pulp

Figure 37.—*Bromelia pinguin*, a wild but tasty fruit of the Caribbean.

Scientific name	Common name	Where found	Part used
Borzicactus eriotrichus Britt. et Rose	.....	Peru	Pulp
Borzicactus sepium Britt. et Rose	.....	Ecuador	Pulp
Carnegia gigantea Britt. et Rose	Sahuaro	Mexico, U.S.A.	Pulp
Cephalocereus russelianus Rose	Cardón peludo	Colombia, Venezuela	Pulp
Cereus variabilis Pfeiff.	Jumbeba	Brazil	Pulp
Cereus hexagonus Mill.	Cacto columnar	South America, West Indies	Pulp
Cereus jamacaru P. DC.	Mandacaru	Brazil	Pulp
Cereus margaritensis Johnst.	Cardón higo	Colombia	Pulp
Echinocactus horizonthalonius Lem.	.....	Mexico	Pulp
Echinocereus conglomeratus Forst.	Pitahaya de agosto	Mexico	Pulp
Echinocereus enneacanthus Engelm.	Strawberry cactus	Mexico, U.S.A.	Pulp
Echinocereus engelmannii Rumpl.	.....	Mexico, U.S.A.	Pulp
Echinocereus trichochidiatus Engelm.	.....	Mexico, U.S.A.	Pulp
Epiphyllus phyllanthus Haw.	Calaguala	Central America	Pulp
Escontria chiotilla Rose	Chiotilla	Mexico	Pulp
Espostoa lanata Britt. et Rose	Cotton ball, Soroco	Ecuador, Peru	Pulp
Eulychnia acida Phil.	Copao	Chile	Pulp
Eulychnia spinibarbis Britt. et Rose	Guillave	Chile	Pulp

Scientific name	Common name	Where found	Part used
Haageocereus decumbens Backeb.	.....	Peru	Pulp
Haageocereus pseudo-melanostele Backeb.	.....	Peru	Pulp
Hamatocactus uncinatus Orcutt.	.....	Mexico	Pulp
Harrisia bonplandii Parn.	.....	Brazil	Pulp
Harrisia eriophora Britt. et Rose	.....	Cuba	Pulp
Harrisia guelichii Britt. et Rose	.....	Argentina	Pulp
Harrisia portorricence Britt. et Rose	.....	Puerto Rico	Pulp
Hylocereus costaricensis Britt. et Rose	Pitahaya	Costa Rica	Pulp
Hylocereus guatemalensis Britt. et Rose	Pitahaya	Costa Rica, Guatemala	Pulp
Hylocereus ocamponis Britt. et Rose	Pitahaya	Mexico	Pulp
Hylocereus polyrhizus Britt. et Rose	Pitahaya	Colombia, Panama	Pulp
Hylocereus trigonus Saff.	Pitahaya	West Indies	Pulp
Hylocereus undatus Britt. et Rose	Pitahaya	Central America, Mexico	Pulp
Lemaireocereus chichipe Britt. et Rose	Chichipe	Mexico	Pulp
Lemaireocereus deficiens Britt. et Rose	.....	Venezuela	Pulp
Lemaireocereus griseus Britt. et Rose	Cardón	Curacao, Venezuela	Pulp
Lemaireocereus lateus Britt. et Rose	.....	Ecuador	Pulp
Lemaireocereus queretaroensis Saff.	Pitahaya	Mexico	Pulp

Scientific name	Common name	Where found	Part used
Lemaireocereus stellatus Britt. et Rose	.....	Mexico	Pulp
Lemaireocereus thurberi Britt. et Rose	Pitahaya dulce	Mexico, U.S.A.	Pulp
Lemaireocereus weberi Britt. et Rose	.....	Mexico	Pulp, seeds
Lophocereus schottii Britt. et Rose	Cina	Mexico	Pulp
Machaerocereus gummosus Britt. et Rose	Pitahaya agria	Mexico	Pulp, seed
Mammillaria spp.	.....	Central America, South America, West Indies	Pulp
Myrtillocactus geometrizans Console	Garambullo	Guatemala, Mexico	Pulp
Nopalea cochinellifera Salm-Dyck.	Cochineal plant, nopal	Mexico	Pulp
Nopalea dejecta Salm-Dyck.	Nopal chamacuero	Mexico	Pulp
Nopaloxochia ackermanii Britt. et Rose	Beni-kujaku	Mexico	Pulp
Opuntia azurea Rose	Nopalillo	Mexico	Pulp
Opuntia bonplandii Pfeiff.	.....	Ecuador	Pulp
Opuntia chlorotica Engelm. et Bigel.	.....	Mexico, U.S.A.	Pulp
Opuntia dillenii Haw.	Prickly pear	Tropical Americas	Pulp
Opuntia dobbieana Britt. et Rose	.....	Ecuador	Pulp
Opuntia fulgida Engelm.	Velas de coyote	Mexico, U.S.A.	Pulp
Opuntia imbricata DC.	Xoconostle	Mexico, U.S.A.	Pulp
Opuntia leucotricha DC.	Nopal duraznillo	Mexico	Pulp
Opuntia megacantha Salm-Dyck.	Nopal, tuna	Mexico	Pulp

Scientific name	Common name	Where found	Part used
Opuntia phaecantha Engelm.	.....	Mexico, U.S.A.	Pulp
Opuntia soederstromiana Britt. et Rose	.....	Ecuador	Pulp
Opuntia versicolor Engelm.	.....	Mexico, U.S.A.	Pulp
Pachycereus columna-trajani Britt. et Rose	Higos de tetezo	Mexico	Pulp
Pachycereus pectan-aboriginum Britt. et Rose	Cardón	Mexico	Pulp
Pachycereus pringlei Britt. et Rose	Cardón	U.S.A.	Pulp, seeds
Pereskia bahiensis Guerke	.....	Brazil,	Pulp
Pereskia bleo DC.	Bleo de chupa	Colombia, Panama	Pulp
Pereskia colombiana	Guamacho	Colombia	Pulp
Pereskia grandifolia Haw.	.....	Brazil	Pulp
Pereskia guamacho Weber	.....	Colombia, Venezuela	Pulp
Pereskiopsis aquosa Britt. et Rose	Tuna de agua	Mexico	Pulp
Pereskiopsis porteri Brandeg.	Alcajer	Mexico	Pulp
Phyllocactus biformis Labour.	.....	Honduras	Pulp
Pilocereus royenii Rumpl.	Sebucán	Puerto Rico	Pulp
Selenicereus grandiflorus Britt. et Rose	.....	West Indies	Pulp
Tephrocactus ferocior Backbg.	.....	Bolivia, Peru	Pulp
Trichocereus chiloensis Britt. et Rose	Cardón de candelabro	Chile	Pulp

Scientific name	Common name	Where found	Part used
Trichocereus coquimbanus Britt. et Rose	Copao	Chile	Pulp
Trichocereus schickendantzii Britt. et Rose	.....	Argentina	Pulp
Capparidaceae			
Crataera tapia L.	Tapia	Tropical Americas	Pulp
Morisonia americana L.	Zorrocloco, higicho	Venezuela	Pulp
Caprifoliaceae			
Sambucus australis Cham. et Schlet.	.....	Brazil, Chile	Pulp
Caricaceae			
Carica candicans Gray	Mito	Peru	Pulp
Carica cauliflora Jacq.	Papaita	Venezuela	Pulp
Carica cestriflora Solms	Papaya de tierra fria	Colombia	Pulp
Carica chilensis Solms	Palo gordo	Chile	Pulp
Carica chrysopetala Heilb.	Chamburo, higacho	Ecuador	Pulp
Carica chrysophylla Heilb.	Chihualcan, higacho	Southeastern Colombia, Ecuador	Pulp
Carica digitata Poepp.	Mamão	Brazil	Pulp
Carica frutifragrans H. García B. et J. Hernández C.	Chamburo	Colombia	Pulp
Carica goudotiana Tr. et Pl.	Tapaculo, papayuela	Colombia	Pulp
Carica petala Hook. et Arn.	Papaya de mica	Central America	Pulp
Carica pentagona Heilb.	Babaco	Ecuador	Pulp

Scientific name	Common name	Where found	Part used
Carica quercifolia Benth. et Hook.	Mountain papaya	Tropical Americas	Pulp
Jaracatia dodecaphylla A. DC.	Jaracatia	Brazil	Pulp
Jaracatia mexicana A. DC.	Papaya orejona	Central America, Mexico	Pulp
Jaracatia spinosa A. DC.	Mamão bravo	Brazil	Pulp
Jarilla caudata Standl.	Jarilla	Mexico	Pulp
Caryocaraceae			
Caryocar amygdaliferum Cav.	Almendrón	Colombia, Ecuador, Peru	Nut (oil)
Caryocar brasiliense Camb.	.....	Brazil	Pulp
Caryocar butyrosum Willd.	.....	Tropical Americas	Nut
Caryocar glabrum Pers.	Piquiá-arana	Brazil, Guiana	Nut
Caryocar tomentosum Willd.	Piquiá nut	French Guiana	Nut
Caryocar villosum Pers.	Piquiá nut	Brazil, Guiana	Nut
Celastraceae			
Elaeodendron attenuatum Rich.	.....	Guadeloupe	Pulp
Goupia polyandra	.....	South America Brazil	Pulp
Peritassa laevigata A. C. Smith	Gogo	Venguela	Aril
Chrysobalanaceae			
Couepia bracteosa Benth.	Pajurá	Brazil, Guiana	Pulp
Couepia chrysocalyx Benth.	Parinari	Brazil	Pulp
Couepia guianensis Aubl.	Merecure	Colombia	Pulp
Couepia longipendula Pilg.	Castanha-de-galinha	Brazil	Nut

Scientific name	Common name	Where found	Part used
Couepia polyandra Rose	.....	Mexico	Pulp
Couepia subcordata Benth.	Marirana	Brazil	Pulp
Hirtelia americana L.	Pasito	Colombia	Pulp, seeds
Hirtelia triandra Swartz	Pasito	Colombia	Pulp, seeds
Licania apetala Fritsch.	Ajurú	Brazil, Guiana	Pulp
Licania heteromorpha Benth.	Ajurú	Brazil	Pulp
Licania incana Aubl.	Ajurú	Brazil, Guiana	Pulp
Licania macrophylla Benth.	Anauerá	Brazil	Pulp
Licania montana Aubl.	Pajurá-da-mata	Brazil	Pulp
Licania parinarioides Hub.	Copuda	Brazil	Seed
Licania parviflora Benth.	Ajurú	Brazil	Pulp
Licania pendula Benth.	Ajurú	Brazil	Pulp
Licania pyrifolia Griseb.	Merecure	Colombia	Pulp
Licania tomentosa Fr.	Braganca	Brazil, Guiana	Pulp
Parinarium campestre Aubl.	.....	Brazil, Guiana	Pulp
Parinarium montanum Aubl.	Pajurá da mata	Brazil, Guiana	Pulp
Parinarium pachyphyllum Rusby	Perehuétano	Colombia	Pulp
Compositae			
Wulfia stenogossa Hub.	Jambu	Brazil	Pulp
Convolvulaceae			
Maripa panamensis Hemsl.	Miel quemada	Colombia	Pulp
Coriariaceae			
Coriaria ruscifolia L.	Dew	Chile, Peru	Pulp (wine)

Scientific name	Common name	Where found	Part used
Ebenaceae			
Diospyros conzatti Standl.	Uzxaca	Mexico	Pulp
Diospyros inconstans Jacq.	Negra lora	Antilles, South America	Pulp
Diospyros texana Scheele	.....	Mexico	Pulp
Maba inconstans Griesb.	.....	West Indies	Pulp
Ehretiaceae			
Auxemma oncocalyx Fr. All.	Pau branco	Brazil	Pulp
Cordia alliodora Cham.	Capá	Central America, Mexico	Pulp
Cordia calocephala Cham.	Claraiba	Brazil	Pulp
Cordia collococca L.	Clammy cherry	West Indies	Pulp
Cordia dentata Poir.	Chachalaca	Central America	Pulp
Cordia dodecandra DC.	Chacopte	Guatemala, Mexico	Pulp
Cordia grandiflora DC.	Jaguara muru	Brazil	Pulp
Cordia sebestena L.	Geiger tree	Mexico, West Indies	Pulp
Cordia sellowiana Cham.	Mata fome	Brazil	Pulp
Cordia superba Cham.	Babosa branca	Brazil	Pulp
Ehretia bourreria L.	Currant tree	Jamaica	Pulp
Ehretia elliptica DC.	.....	Mexico, U.S.A.	Pulp
Ehretia tinifolia L.	Bastard cherry	West Indies	Pulp
Elaeocarpaceae			
Aristotelia chilensis Stuntz	Maqui	Chile	Pulp
Muntingia calabura L.	Capulín	Tropical Americas	Pulp
Ericaceae			
Cavendishia cordifolia Hoer.	Uvo	Tropical Americas	Pulp

Scientific name	Common name	Where found	Part used
Clethra tinifolia Sw.	Soap wood	Tropical Americas	Pulp
Disterigma margaricoccum Blake	.....	Ecuador	Pulp
Disterigma popenoei Blake	Tirá	Ecuador	Pulp
Englerodendron alata Hörold.	Para silvestre	Ecuador	Pulp
Gaylussacia buxifolia H.B.K.	.....	Colombia	Pulp, seeds
Macleania ecuadorensis Hoerold	.....	Ecuador	Pulp
Macleania lurina Blake	Chaqui-lulu	Ecuador	Pulp
Macleania popenoei Blake	Joyapa	Ecuador	Pulp
Macleania rupestris A. C. Smith	Uva camarona	Tropical Americas	Pulp
Plutarchia guascensis A. C. Smith	.....	Colombia	
Thibaudia alata Dun.	.....		Pulp
Thibaudia floribunda H.B.K.	Coral	Colombia, Ecuador	Pulp
Thibaudia grantii A. C. Smith	Chorota	Colombia	Pulp
Thibaudia imrayi Hook.	.....	Dominica	Pulp
Thibaudia melliflora Ruiz et Pav.	.....	Mexico, Peru, West Indies	Pulp
Vaccinium floribundum H.B.K.	Colombian blueberry	Andes	Pulp
Vaccinium leucanthum Schlecht.	Mexican blueberry	Mexico	Pulp
Vaccinium meridionale Sw.	Jamaican blueberry	Jamaica	Pulp
Vaccinium mortinia Benth.	Mortiña	Colombia, Ecuador	Pulp

Scientific name	Common name	Where found	Part used
Euphorbiaceae			
Apuleia ferrea Mart.	Pau ferro	Brazil	Pulp
Caryodendron orinocense Karst	Cacay	Colombia	Seeds
Hieronyma colombiana Cuatr.	Motilón	Colombia	Pulp
Omphalea diandra L.	Comadre de vaquero	Tropical South America, West Indies	Seed
Omphalea megacarpa L.	Hunter's nut	West Indies	Seed
Omphalea triandra L.	Jamaica cobseed	Tropical Americas	Seed
Flacourtiaceae			
Casearia parviflora Willd.	.....	Martinique	Aril
Casearia pringlei Brig.	.....	Mexico	Aril
Mayna grandifolia Warb.	Achiote de venado	Colombia	Aril
Gesneriaceae			
Besleria violacea Aubl.	.....	Brazil, Guiana	Pulp
Gnetaceae			
Gnetum nodiflorum Brongn.	Hava	Brazil, Guiana	Seed
Gnetum urens Blume	Blume Huá-assú	Brazil	Seed
Guttiferae			
Garcinia cochinchinensis Choisy	Mangostão-amarelo	Brazil	Pulp
Rheedia acuminate Planch. et Triana	.....	Peru	Pulp
Rheedia benthamiana Planch. et Triana	Bacuripari selvagem	Brazil	Pulp

Scientific name	Common name	Where found	Part used
Rheedia brasilienses Planch. et Triana	Bacupari	Brazil	Pulp
Rheedia edulis Planch. et Triana	Berba	Central America, South America	Pulp
Rheedia lateriflora I.	Wild mammey	Venezuela	Pulp
Rheedia macrophylla Planch et. Triana	Bacupari	Brazil	Pulp
Hippocrateaceae			
Salacia campestris Salp.	Laranginha do campo	Brazil	Pulp
Salacia dulcis Benth.	Waiateima	Brazil	Pulp
Salacia polyanthomaniaca Barb.	Bochecha de velho	Brazil	Pulp
Salacia scabra DC.	.....	Guiana	Pulp
Salacia silvestris Walp.	Bacuparis-do-mato	Brazil	Pulp
Houmiriaceae			
Endopleura uchi Cuatr.	Uchi, uxi	Brazil	Pulp
Hippocratea volubilis L.	Fava-de-arara	Brazil	Seeds
Hourimiri balsamifera Pers.	.....	Guiana	Pulp
Hourimiri floribunda Mart.	Umiri	Brazil	Pulp
Saccoglottis cuspidata Urb.	Uchi	Brazil	Pulp
Saccoglottis guianensis Benth.	Vaxiva	Brazil, Guiana	Pulp
Saccoglottis uchi Hub.	Uchi	Brazil	Pulp
Saccoglottis verrucosa Ducke	Uchi-coroa	Brazil	Pulp
Icacinaceae			
Poraqueiba paraensis Ducke	Mari	Brazil	Aril
Poraqueiba sericea Tul.	Mari	Brazil	Aril

Scientific name	Common name	Where found	Part used
Juglandaceae			
Carya illinoensis (Wangenh.) K. Koch	Pecan	Mexico, U.S.A.	Nut
Carya mexicana Sarg.	.....	Mexico	Nut
Carya myristiciformis (Michx. f.) Nutt.	Nutmeg hickory	Mexico, U.S.A.	Nut
Juglans boliviana (C. DC.) Dode	Bolivian black walnut	Bolivia	Nut
Juglans honorei Dode	Nogal, tocte	Ecuador	Nut
Juglans jamaicensis DC.	West indian walnut	West Indies	Nut
Juglans olanchana Stand. et Will.	Central American walnut	Central America	Nut
Lardizabalaceae			
Lardizabala biternata Ruiz et Pav.	Aquibuquil	Chile, Peru	Pulp
Lardizabala triternata Ruiz et Pav.	.....	Chile	Pulp
Lauraceae			
Bielschmiedia anay Kostern.	Escalan	Mexico	Pulp
Cryptocarpa alba Looser	Peumo	Chile	Pulp
Persea leiogyna Balke	Florida avocado	Florida	Pulp
Persea schiedeana Nees	Cayo	Costa Rica, Mexico	Pulp
Lecythidaceae			
Couroupita guianensis Abul.	Cannonball tree	Brazil	Pulp, seed
Couroupita subsessilis Pilg.	.....	Brazil	Pulp
Couroupita surinamensis Mart.	.....	Brazil, Guiana	Pulp
Grias haughtii Knuth	.....	Colombia	Pulp

Scientific name	Common name	Where found	Part used
Gustavia meubertii	Saccha mango	Brazil, Peru	Nut
Gustavia nana Pitt.	Pacó	Colombia, Panama	Nut
Gustavia speciosa DC.	Chupa	Colombia	Nut
Gustavia superba Berg.	Pacó	Tropical South America	Nut
Lecythis amapaensis Ledoux	Sapucaia do amapa	Brazil	Nut
Lecythis amazonii Mart.	Sapucaia	Brazil	Seed (oil)
Lecythis angustifolia Endl.	Sapucaia, mirim	Brazil	Seed (oil)
Lecythis constaricensis Pitt.	Cocoboloa	Central America	Nut
Lecythis grandiflora Aubl.	.....	Guiana	Nut
Lecythis lanceolata Poir.	Sapucaia branca	Guiana, Brazil	Seed (oil)
Lecythis minor Jacq.	Olla de mono	Colombia	Seed
Lecythis ovata Cambess	Sapucaia	Brazil	Seed (oil)
Lecythis paraensis Hub.	Castanha sapucaia	Brazil	Nut
Lecythis usitata Miers.	Castanha sapucaia	Brazil	Nut
Leguminosae			
Cassia leiandra Benth.	Marimari	Brazil	Seed
Coumarouna oleifera Taub.	Almendro	South America	Seed
Erythrian edulis Tr. ex Micheli	Chachafruto, boleú	Brazil Central America	Pulp, seeds
Geoffraea superba Humb. et Bonpl.	Almendoa	Brazil	Seed
Inga alba Willd.	Ingá chichica	Brazil	Pulp
Inga cinnamomea Spruce	Ingá-açu	Brazil	Pulp
Inga fagifolia Willd.	Ingá curumim	Brazil	Pulp
Inga falcistipula Ducke	Ingá chichica	Brazil	Pulp

Scientific name	Common name	Where found	Part used
Inga heterophylla Willd.	Ingá chichica	Brazil	Pulp
Inga ingoides	Guamo cafetero	Colombia	Pulp
Inga insignis Kunth	Guamá	Ecuador	Pulp
Inga laurina Willd.	Guamá	Tropical Americas	Pulp
Inga leptoloba Schlect.	Pepito	Mexico	Pulp
Inga macrophylla N.B.K.	Ingá-peua	Brazil	Pulp
Inga multijuga Benth.	Guavitos	Colombia	Pulp
Inga spuria Willd.	Churimo	Colombia	Pulp
Inga thibaudiana DC.	Ingá chichica	Brazil	Pulp
Inga velutina Willd.	Ingá-de-fogo	Brazil	Pulp
Pachylecythis egleri Ledoux	Sapucaia grande	Brazil	Nut
Pithecellobium dulce Benth.	Manila tamarind	Tropical Americas	Aril
Pithecellobium hymenaeaefolium Benth.	Barba de angel	Colombia	Aril
Pithecellobium lanceolatum Benth.	Buche	Colombia	Aril
Prosopis alba Hieron.	Algarrobo blanco	Argentina	Whole fruit
Prosopis agarobilla Griesb.	Algarobia	Argentina, Brazil	Whole fruit
Prosopis chilensis Stuntz	Mesquite, honeypod	Tropical Americas	Whole fruit or pulp
Prosopis dulcis Kunth	Mesquite	Puerto Rico	Whole fruit or pulp
Prosopis glandulosa Torr.	Mesquite, honeypod	North America, South America	Whole fruit or pulp
Prosopis juliflora DC.	Algarobeira	Tropical Americas	Pulp
Prosopis laevigata M. C. Johnst.	Mesquite	Mexico	Pulp
Prosopis nigra Hieron.	.....	Brazil	Whole fruit or pulp
Samanea saman Merr.	Rain tree	Tropical Americas	Pulp

Scientific name	Common name	Where found	Part used
Uribea tamarindoides Dug. et Rom.	Tamarindo de monte	Colombia	Pulp
Zollernia ilicifolia Vog.	.....	Brazil	Pulp
Malpighiaceae			
Banisteria crotonifolia A. Juss.	.....	Brazil	Pulp
Bunchosia armeniaca Rich.	Ciruela verde	Peru	Pulp
Bunchosia costaricensis Rose ex Pitt.	Cereza	Costa Rica	Pulp
Byrsonima amazonica Griesb.	Murici vermelho	Brazil	Pulp
Byrsonima apicata Rich.	Maricao	Brazil	Pulp
Byrsonima coriacea DC.	Maricao	Puerto Rico	Pulp
Byrsonima crispa A. Juss.	Murici-da-mata	Brazil	Pulp
Byrsonima crysophylla H.B.K.	Murici pinima	Brazil, Venezuela	Pulp
Byrsonima intermedia A. Juss.	Gangica	Brazil	Pulp
Byrsonima lancifolia Juss.	Murici-da-copoeira	Brazil	Pulp
Byrsonima locidula Hub.	Murici vermelho	Brazil	Pulp
Byrsonima sericea DC.	Murici	Brazil	Pulp
Byrsonima verbascifolia Rich.	Murici-rasteiro	Brazil	Pulp
Malpighia angustifolia L.	.....	West Indies	Pulp
Malpighia aquifolia L.	.....	West Indies	Pulp
Malpighia beteruaba Spreng.	.....	Guadeloupe	Pulp
Malpighia cnide Spreng.	.....	Dominician Republic	Pulp
Malpighia coccitera L.	.....	West Indies	Pulp

Scientific name	Common name	Where found	Part used
Malpighia emarginata Moc. et Sessé	.....	Mexico	Pulp
Malpighia fucata Ker Gawl.	.....	Jamaica	Pulp
Malpighia grandiflora Jacq.	.....	Martinique	Pulp
Malpighia incana Mill.	.....	Honduras	Pulp
Malpighia macrophylla Willd.	.....	Brazil	Pulp
Malpighia nitida Crantz	.....	Venezuela	Pulp
Malpighia obovata H.B.K.	.....	South America	Pulp
Malpighia setosa Spreng.	.....	West Indies	Pulp
Malpighia urens L.	.....	West Indies	Pulp
Malvaceae			
Malvaviscus arboreus Cav.	Quesito	Colombia	Pulp
Melastomataceae			
Bellucia aubletii Naud.	Missel	Guiana	Pulp
Bellucia axinanthera Triana	Manzana de corona	Venezuela	Pulp
Bellucia brasiliensis Naud.	.....	Brazil	Pulp
Bellucia costaricensis Cogn. Ex.	Papaturro agrio	Costa Rica	Pulp
Bellucia grossularioides	Manzana de corona	Venezuela	Pulp
Bellucia imperialis Sald. et Cogn.	Araçá de anta	Brazil	Pulp
Blakea laurifolia Naud.	.....	Guadeloupe	Pulp
Clidemia hirta D. Don	Camasey peludo	Colombia	Pulp
Conostegia xalapensis D. Don	Capiroto	Mexico	Pulp
Henriettea flavescens Triana	.....	Guiana	Pulp

Scientific name	Common name	Where found	Part used
Henriettea succosa, DC.	.....	Guiana	Pulp
Huilaea macrocarpa (L.) Uribe	Tuno	Colombia	Pulp
Loreya arborescens DC.	.....	Guiana	Pulp
Maieta guianensis Aubl.	.....	Guiana	Pulp
Maieta heterophylla DC.	.....	Peru	Pulp
Maieta poeppigii Mart.	.....	Peru	Pulp
Maieta rubra Baill.	.....	Martinique	Pulp
Miconia albicans Triana	.....	Central America, Mexico	Pulp
Miconia desmantha	.....	Colombia, Venezuela	Pulp
Miconia holosericia Bello	.....	Colombia, Venezuela	Pulp
Miconia ligustrina Triana	Esmeraldo	Colombia	Pulp
Miconia prasina DC.	Camasey	Puerto Rico	Pulp
Mouriria apiranga Spruce ex Triana	Apirange	Brazil	Pulp
Mouriria domingensis Spach	Murta	Puerto Rico	Pulp
Mouriria grandiflora DC.	Camutin	Brazil	Pulp
Mouriria pseudo-geminata Pitt.	Pauji	Venezuela	Pulp
Mouriria pusa Gardn.	Silverwood	Brazil	Pulp
Myriaspora decipiens Naud.	Tuno	Colombia	Pulp
Tocota guianensis Aubl.	.....	Guiana	Pulp
Meliaceae			
Cabralea cangerana Sald.	Cangerana	Brazil	Pulp
Gurarea trichiliodes L.	Muskwood	Tropical Americas	Pulp

Scientific name	Common name	Where found	Part used
Menispermaceae			
Chonododendron platyphyssum Miers	Jabuticabeira-de-cipó	Brazil	Pulp
Chonododendron tomentosum Ruiz et Pav.	.....	Brazil, Peru	Pulp
Monimiaceae			
Peumus boldus Mol.	Boldo	Chile, Peru	Fruit
Moraceae			
Bagassa guianensis Aubl.	Tatajuba	Brazil	Pulp
Brosimum potabile Ducke	Amapá doce	Brazil	Pulp
Brosimum acutifolium Hub.	Muira piranga	Brazil	Seeds
Brosimum caudichaudii Trec.	Maminha-de-cadela	Brazil	Sap
Brosimum costaricanum Liebm.	.....	Costa Rica	Seeds
Brosimum discolor Schott.	Muira pinima	Brazil	Seeds
Brosimum galactodendron D. Don	Palo de vaca	Central America	Sap
Broussonetia xanthoxylum Mart.	Tayuva	Brazil	Pulp
Castilloa ulei Warb.	Caucho	Brazil	Pulp
Chlorophora tinctoria Gaud	Dinde	Colombia	Pulp
Ficus anthelminthica Mart.	Caxinguba	Brazil	Pulp
Ficus dulciaria Dug.	Higuerón guayabo	Colombia	Pulp
Ficus gigantosyce Dug.	Higuerón	Colombia	Pulp
Ficus glabrata H.B.K.	Higo	Honduras	Pulp
Ficus involuta Miq.	Matapalo	Mexico	Pulp
Ficus padifolia H.B.K.	Camichón	Mexico	Pulp
Ficus pallida Vahl	Higuito	Colombia	Pulp
Ficus sapida Miq.	Higuito	Colombia	Pulp
Ficus velutina H.B.K.	Oticón	Colombia	Pulp

Scientific name	Common name	Where found	Part used
Maclura mora Grieseb.	.....	Argentina	Pulp
Maclura xanthoxilon Endl.	Tatajiba	Brazil	Pulp
Morus celtidifolia H.B.K.	.....	Central America, Mexico	Pulp
Morus multicaulis Perr.	.....	Brazil	Pulp
Paratocarpus woodii Merr.	.....	Mexico	Pulp
Poulsenia armata Standl.	Cocuá	Colombia	Pulp
Pourouma acuminata Mart.	Imbauba puruma	Brazil	Pulp
Pourouma cecropiaefolia Mart.	Mapati	Brazil	Pulp
Pseudolmedia rigida Cuatr.	Guaimarillo	Northern South America	Pulp
Sahagunia racemifera Hub.	Janitá	Brazil	Pulp
Sahagunia strepticans Liebm.	.....	Brazil	Pulp
Myristocaceae			
Compsoneura atopa A. C. Smith	Josebé	Colombia	Seed
Dialyanathera acuminata Standl.	Cuángare	Colombia	Aril
Myrsinaceae			
Ardisia coricea Sw.	Beefwood	Jamaica	Pulp
Ardisia escalloniodes Schlect. et Cham.	Marlberry	Central America, West Indies	Pulp
Ardisia esculenta Pav.	.....	South America	Pulp
Ardisia manglillo Duchas.	Manglillo	Pacific Coast	Pulp
Ardisia guadelupensis Duchas.	.....	Guadeloupe	Pulp

Scientific name	Common name	Where found	Part used
Ardisia longistaminea A. C. Smith	Capulí	Colombia	Pulp
Ardisia revoluta H.B.K.	Guastomate	Colombia	Pulp
Ardisia sapida Cuatr.	Hayuelo	Colombia	Pulp
Ardisia semi-crenata Mart.	Icacoré-caatinga	Brazil	Pulp
Icacorea guianensis Aubl.	Icacoré-caatinga	Brazil, Florida, West Indies	Pulp
Rapanea ovalifolia Mez.	Jómirim	Brazil	Pulp
Myrtaceae			
Abbevillea fenzniana Berg.	Guabiroba	Brazil	Pulp
Britoa sellowiana Berg.	Sete casacas	Brazil	Pulp
Calyptranthes grandifolia Grieseb.	Brasaviva	Brazil	Pulp
Calyptranthes obscura DC.	.....	Brazil	Pulp
Calyptranthes pallens Grieseb.	Tapón blanco	Florida, West Indies	Pulp
Campomanesia aromatica Grieseb.	Guavaberry	West Indies	Pulp
Campomanesia caerulea Berg.	Guabiroba	Brazil	Pulp
Campomanesia cornifolia H.B.K.	Palilho	Brazil	Pulp
Campomanesia guaviroba Benth. et Hook. f.	Guabiroba	Brazil	Pulp
Campomanesia lineatifolia Ruiz et Pav.	Michinche	Peru	Pulp
Eugenia acapulcensis Steud.	Capulín	Mexico	Pulp
Eugenia aeruginea DC.	Guasábara	Puerto Rico	Pulp
Eugenia arrabidae Berg.	Uvaia	Brazil	Pulp
Eugenia biflora Krug et Urb.	Pitangueira	Puerto Rico	Pulp

Scientific name	Common name	Where found	Part used
Eugenia cabelludo Kiaersk	Cabelluda	Brazil	Pulp
Eugenia capuli Berg.	Capulín	Central America, Mexico	Pulp
Eugenia catinga Baill.	.....	Guiana	Pulp
Eugenia cauliflora Berg.	.....	Brazil	Pulp
Eugenia conzattii Standl.	.....	Mexico	Pulp
Eugenia crenata Vell.	Cambuhy	Brazil	Pulp
Eugenia dichotoma DC.	.....	West Indies	Pulp
Eugenia distycha DC.	Wild coffee	West Indies	Pulp
Eugenia dulcis Berg.	.....	Brazil	Pulp
Eugenia eggersii Kiaersk	Guasábara	Puerto Rico	Pulp
Eugenia fragrans Willd.	Zebra wool, guayabillo	Mexico, West Indies	Pulp
Eugenia guabiju Berg.	Guabijú	Brazil	Pulp
Eugenia haematocarpa Alasin	Uvillo	Puerto Rico	Pulp
Eugenia inocarpa DC.	.....	Brazil	Pulp
Eugenia itacolumensis Berg.	.....	Brazil	Pulp
Eugenia ligustrina Willd.	Palo de muleta	Puerto Rico	Pulp
Eugenia longipes Berg.	.....	Florida	Pulp
Eugenia myrobalana DC.	Guabirobeira	Brazil	Pulp
Eugenia nhanica Cambess	.....	Brazil	Pulp
Eugenia oblongifolia Sagot	Vara real	Colombia	Pulp
Eugenia origanoides Berg.	Capulín	Mexico	Pulp
Eugenia pisiformis Cambess	.....	Brazil	Pulp
Eugenia procera Poir.	Ironwood	Tropical Americas	Pulp
Eugenia pseudopsidium Jacq.	.....	Martinique	Pulp
Eugenia pumila Gardn.	.....	Brazil, Guiana	Pulp
Eugenia selloi Berg.	Pitanga tuba	Brazil	Pulp
Eugenia stipitatata McVaugh	Araçá-boi	Brazil	Pulp
Eugenia supra-axillaris Spreng.	Tala	Brazil	Pulp

Scientific name	Common name	Where found	Part used
Eugenia tomentosa Cambess.	Cabelluda	Brazil	Pulp
Eugenia umbellulifera Krug et Urb.	Ciruelas	South America, West Indies	Pulp
Marliera edulis Ndz.	Cambucazeiro	Brazil	Pulp
Marliera glomerata Berg.	Cambucá	Brazil, Guiana	Pulp
Myrcia sphaeocarpa DC.	Cambuizeiro	Brazil	Pulp
Mrycia splendens DC.	Hoja menuda	Puerto Rico	Pulp
Myrciaria dubia McVaugh	Guayabo	Colombia, Venezuela	Pulp
Myrciaria floribunda Berg.	.....	West Indies	Pulp
Myrciaria linearifolia Berg.	Cambuizeiro	Brazil	Pulp
Myrciaria plicato-costata Berg.	Cambucá	Brazil	Pulp
Myrciaria tenella Berg.	Cambuizeiro preto	Brazil	Pulp
Myrciaria trunciflora Berg.	.....	Brazil	Pulp
Myrtus alba Piso	Cambuí amarelo	Brazil	Pulp
Myrtus arayan H.B.K.	.....	Peru	Pulp
Myrtus cisplatensis Muell.	.....	Brazil	Pulp
Myrtus edulis Muell.	Arrayán	Uruguay	Pulp
Myrtus foliosa H.B.K.	Arrayán	Tropical Americas	Pulp
Myrtus incana Berg.	.....	Brazil	Pulp
Myrtus mucronata Cambess.	.....	Brazil	Pulp
Myrtus rubra Piso	Cambuizeiro verdadero	Brazil	Pulp
Paivaea langsdorffii Berg.	Cambucizeiro	Brazil	Pulp
Psidium acutangulum Mart.	Araçá pomba	Brazil	Pulp
Psidium albidum Cambes	Aracazeiro branco	Brazil	Pulp
Psidium aromaticum Aubl.	.....	Brazil	Pulp
Psidium cinereum Mart.	.....	Brazil	Pulp

Scientific name	Common name	Where found	Part used
Psidium fluviatile Rich.	.....	Guiana	Pulp
Psidium grandifolium Mart.	.....	Brazil	Pulp
Psidium humile Vell.	.....	Brazil	Pulp
Psidium incarnescens Sw.	.....	Brazil	Pulp
Psidium littorale Raddi	Araçá do praia	Brazil	Pulp
Psidium molle Bertol.	Guisaro	Central America, Mexico	Pulp
Psidium multiflorum Cambess	Guabiroba das gerais	Brazil	Pulp
Psidium oerstedeanum Berg.	Arrayán	Central America	Pulp
Psidium sartorianum Niedz.	Pichiché	Mexico	Pulp
Psidium sylvestre	Araçá piranga	Brazil	Pulp
Stenocalyx suleatus Berg.	Pitanga	Brazil	Pulp
Olacaceae			
Ximenia coriacea Engler	Ameixeira brava	Brazil	Pulp
Onagraceae			
Fuchsia corymbifolia Ruiz et Pav.	Fuchsia	Peru	Pulp
Fuchsia denticulata Ruiz et Pav.	.....	Peru	Pulp
Fuchsia fulgens Moc. et Sessé	.....	Guatemala, Mexico	Pulp
Fuchsia magellanica Lam.	.....	Tropical Americas	Pulp
Fuchsia racemosa Lam.	.....	Tropical Americas	Pulp
Fuchsia splendens Zucc.	.....	Mexico	Pulp
Opiliaceae			
Aveledoa nuciferum Pitt.	.....	Venezuela	Nut

Scientific name	Common name	Where found	Part used
Palmae			
Acanthorrhiza aculeata H. Wendl.	.....	Mexico, Trinidad	Juice (wine)
Acrocomia lasiospatha Mart.	Mucujá	Brazil, West Indies	Pulp
Acrocomia media Cook.	Corozo	Puerto Rico	Seed
Acrocomia mexicana Karw. ex Mart.	Palmito de coyol	Central America, Mexico	Pulp, seed (oil)
Acrocomia sclerocarpa Mart.	Grugru, mucajá	South America, West Indies	Pulp, seed (oil)
Acrocomia totai Mart.	Totai	Argentina, Bolivia, Paraguay	Seed (oil)
Acrocomia vinifera Oerst.	Coyol	Central America	Pulp
Aiphanes acanthophylla Burret	Coyor	Puerto Rico	Pulp, seed
Aiphanes caryotifolia Wendl.	Chascara	Colombia	Pulp, seed
Aiphanes minima Burret	Coyor	Central America, South America	Pulp, seed
Astrocaryum acuale Mart.	Palmeira lú	Brazil, Guiana	Pulp
Astrocaryum ayiri Mart.	In	Brazil	Seed (oil)
Astrocaryum jauary Mart.	Jauary	Brazil	Seed (oil)
Astrocaryum macrocarpum Hub.	Palmeira-tucumá-assi	Brazil	Pulp
Astrocaryum mubaca Mart.	Mumbaca	Brazil	Seeds
Astrocaryum murumuru Mart.	Murú murú	Brazil	Pulp, seed (oil)
Astrocaryum princepa Barb.	Tucumá-assu	Brazil	Pulp

Scientific name	Common name	Where found	Part used
Astrocaryum standleyanum Bailey	.....	Honduras	Pulp
Astrocaryum tucuma Mart.	Tucumá	Brazil	Pulp, seed (oil)
Astrocaryum vulgare Mart.	Cumari	Brazil	Pulp, seed (oil)
Attalea cohune Mart.	Cohune palm	Central America	Pulp, seed (oil)
Attalea compacta Mart.	Pindoba	Brazil	Seed (oil)
Attalea excelsa Mart.	Urucury	Brazil	Seed (oil)
Attalea funifera Mart.	Coquilla	Brazil	Seed (oil)
Attalea humilis Mart.	Indaya	Brazil	Seed (oil)
Attalea princeps Mart.	Naya	Brazil	Seed (oil)
Attalea speciosa Mart.	Babassú	Brazil	Seed (oil)
Attalea spectabilis Mart.	Guruá	Brazil	Seed (oil)
Attalea uberrima Dug	Taparo	Colombia	Nut
Bactris arundinacea Trail	Palmeria lú-i	Brazil	Pulp
Bactris major Jacq.	Peach palm	Brazil	Pulp, seed (oil)
Bactris maraja Mart.	Marajah palm	Brazil	Pulp
Bactris minor Jacq.	Coyolito	Brazil, Colombia	Pulp

Figure 38.—*Astrocaryum standleyanum*, one of many marginally edible palm fruits.

Scientific name	Common name	Where found	Part used
Bactris piranga Trail	Palmeira maraja-piranga	Brazil	Pulp
Bactris setosa Mart.	Tucum	Brazil	Pulp, seed (oil)
Bactris subglobosa H. Wendl.	.....	El Salvador	Pulp
Brahea dulcis Mart.	Palma dulce	Mexico	Pulp
Brahea salvadorensis H. Wendl.	.....	Central America	Pulp (oil)
Butia eriospatha Becc.	.....	Brazil	Pulp
Butia yatay Becc.	Coqueiro-yatay	Brazil, Uruguay	Seeds
Chamaedorea elegans Mart.	.....	Central America, Mexico	Fruits
Cocos schizophylla Barb.	Aricuri	Brazil	Pulp
Cocos vagans Bondar	Ariri	Brazil	Seed (oil)
Copernicia cerifera Mart.	Carnaubeira	Brazil	Seed
Desmoncus macroacanthos Mart.	Jacitara	Brazil	Pulp
Desmoncus prunifera Poepp.	Jacitara tipiti	Peru	Pulp
Dictyocaryum schultzei Burret	Palma real	Colombia	Endocarp
Diplothenium campestre Mart.	.....	Brazil	Pulp
Diplothenium maritimum Mart.	.....	Brazil	Pulp
Elaeis melanococca Gaertn.	Caiaué	Brazil	Seed (oil)
Erythea armata S. Wats.	Mexican blue palm	Mexico	Pulp
Erythea edulis S. Wats.	Guadeloupe palm	Mexico	Pulp
Euterpe badiocarpa Barb.	Açai-pardo	Brazil	Pulp
Euterpe controversa Barb.	Açaí-caatinga	Brazil	Pulp (wine)

Scientific name	Common name	Where found	Part used
Guilielma insignis Mart.	Chonta	Northern South America	Pulp
Jessenia bataua Burrett	Seje, patauá	Brazil	Pulp (oil)
Jessenia polycarpa Karst	.....	Brazil	Pulp
Leopoldinia piassaba Wallace	Pissava	Brazil	Pulp (oil)
Leopoldinia pulchera Mart.	Iara	Brazil	Pulp (starch)
Manicaria saccifera Gaertn.	Temiche	Central America, South America	Seed (oil)
Mauritia aculeata H.B.K.	Caraná-i	Brazil	Pulp
Mauritia armata Mart.	Buritirana	Brazil	Pulp
Mauritia huberi Burrett	Caraná-grande	Brazil	Pulp
Mauritia martiana Spr.	Caraná	Tropical South America	Pulp
Maximiliana inajay Spr.	Inajaí	Brazil	Pulp
Maximiliana maripa Drule.	Maripá	Brazil, Guiana	Seeds (oil)
Maximiliana regia Mart.	Inajá	Brazil	Seeds (oil)
Oenocarpus bacaba Mart.	Bacaba	Brazil, Guiana,	Pulp (oil)
Oenocarpus batauá Mart.	Batauá	Brazil	Pulp
Oenocarpus distichus Mart.	Bacaba	Brazil, Uruguay	Pulp (beverage)
Oenocarpus minor Mart.	Becabinha	Brazil	Pulp (beverage)
Oenocarpus multicaulis Spr.	Bacaba	Brazil, Peru	Pulp (beverage)
Orbignya guacuyule Hernandez X.	Coquito de aceite	Mexico	Pulp (oil)

Scientific name	Common name	Where found	Part used
Orbignya speciosa Barb.	Babaçu	Brazil	Pulp
Orbignya spectabilis Burret	Carua	Northern South America	
Phytelephas macrocarpa Ruiz et Pav.	Ivory nut	Tropical South America	Young fruit
Pyrenoglyphis maraja Burret	Marajá	Brazil	Pulp
Raphia taedigera Mart.	Jupaty	Brazil	Pulp
Rhyticocos amara Becc.	Coco nain	Lesser Antilles	Pulp (beverage)
Roystonea borinquena Cook	Royal palm	Puerto Rico	Pulp
Sabal palmetto Lodd. ex Schult. f.	Cabbage palmetto	U.S.A., West Indies	Pulp
Scheelea liebmannii Becca.	Coyol real	Mexico	Pulp (oil)
Trithrinax brasiliensis Mart.	.....	Brazil, Paraguay, Uruguay	Pulp
Washingtonia sonorae S. Wats.	Palma branca	Mexico	Pulp
Passifloraceae			
Passiflora alata Ait.	Maracujá grande	Brazil	Pulp
Passiflora amethystina Karst	Maracujá de serra	Brazil	Pulp
Passiflora cearensis Barb.	Peora	Brazil	Pulp
Passiflora cincinnata Mart.	Maracujá-mochila	Brazil	Pulp
Passiflora coccinea Aubl.	Guacú	Brazil	Pulp
Passiflora foetida L.	Parchita de montana	Tropical Americas	Pulp

Scientific name	Common name	Where found	Part used
Passiflora incarnata L.	Maypop, Maracujazeiro vermelho	Brazil	Pulp
Passiflora laurifolia L.	Yellow granadilla, maracujá	Brazil	Pulp
Passiflora manicata Juss.	Parcho	Andes	Pulp
Passiflora membranaceae Benth.	Granadilla bellisima	Andes	Pulp
Passiflora mucronata L.	Maracujá	Brazil, Venezuela	Pulp
Passiflora nitida H.B.K.	Maracujá-de-rato	Brazil, Venezuela	Pulp
Passiflora organensis Gardn.	Nensi	Brazil	Pulp
Passiflora pinnatistipula Cav.	Galupa	Chile, Colombia	Pulp
Passiflora platyloba Killip	Monesa granadilla	Central America	Pulp
Passiflora popenovii Killip	Grandilla de quijos, chisiqui	Ecuador	Pulp
Passiflora psilantha Killip	Gullan	Ecuador	Pulp
Passiflora riparia Mart.	Maracujá	Brazil	Pulp
Passiflora rubra L.	Maracujazeiro suspiro	Brazil	Pulp
Passiflora serrata L.	Maracujazeiro-do-mato	Brazil	Pulp
Passiflora schlimiana Tr. et Pl.	Curuba	Colombia, Venezuela	Pulp
Passiflora tripartita Poir.	Tasco	Ecuador	Pulp
Passiflora villosa Mart.	Nuxilla	Brazil	Pulp
Passiflora vitifolia H.B.K.	Chulupo	Colombia	Pulp

Scientific name	Common name	Where found	Part used
Pinaceae			
Pinus cembroides Zunn.	Pinón	Mexico, U.S.A.	Seeds
Pinus nelsonii Shaw	.....	Mexico	Seeds
Polygalaceae			
Moutabea aculeata Poepp. et Endl.	Caimito do monte	Tropical Americas	Pulp
Moutabea angustifolia Hub.	Gogo de guariba	Brazil	Pulp
Moutabea chodatiana Hub.	Gogo de guariba	Brazil	Pulp
Polygonaceae			
Coccoloba caracasana Meissn.	.....	Central America	Pulp
Coccoloba diversifolia Jacq.	Pigeon plum	Florida, West Indies	Pulp
Coccoloba obovata H.B.K.	Uvillo	Pantropics	Pulp
Coccoloba pichuna Hub.	Pixuna	Brazil	Pulp
Coccoloba venosa L.	Calambrena	Puerto Rico	Pulp
Quiinaceae			
Lacunaria grandiflora Ducke	Moela de mutum	Brazil	Pulp
Lacunaria jenmani Ducke	Moela de mutum	Brazil, Guiana	Pulp
Rhamnaceae			
Condalia mexicana Schlect.	.....	Mexico	Pulp
Reynosia septentrionalis Urb.	Guamaberry, darling plum	Florida, West Indies	Pulp
Reynosia uncinata Urb.	Cascarola	Puerto Rico	Pulp
Ziziphus angolito Stand.	Angolito	Colombia	Pulp
Ziziphus endlichii Loes	.....	Mexico	Pulp

Scientific name	Common name	Where found	Part used
Ziziphus joazeiro Mart.	Joazeiro	Brazil	Pulp
Ziziphus mistol Griesb.	Argentine jujube	Argentina	Pulp
Rosaceae			
Crataegus pubescens Steud.	Manzanilla	Guatemala, Mexico	Pulp
Crataegus stipulosa Steud.	Manzanilla	Guatemala to Ecuador	Pulp
Heteromeles arbutifolia Roem.	Christmas berry	Mexico, U.S.A.	Pulp
Heteromeles ferruginea Benth.	Cerote	Colombia	Pulp
Licania incana Aubl.	Licania	Brazil	Pulp
Prunus occidentalis Sw.	West Indian cherry laurel	West Indies	Pulp, seeds
Prunus serotina Ehrh.	Ceresa	Tropical Americas	Pulp
Rubus adenotrichos Schlecht.	Mora	Ecuador, Mexico	Pulp
Rubus bogotensis H.B.K.	Mora	Colombia	Pulp
Rubus brasiliensis Mart.	.....	Brazil	Pulp
Rubus constaricanus Liebm.	.....	Costa Rica	Pulp
Rubus geoides J. Sm. ex Hook.	Minemine	Chile	Pulp
Rubus hondurensis Baill.	Zarzamora	Honduras	Pulp
Rubus nubigenus H.B.K.	Mora	Colombia	Pulp
Rubus porphyromallus Focke	Mora	Colombia	Pulp
Rubus roseus Poir.	Mora de rocota	Ecuador, Peru	Pulp
Rubus urticaefolius Poir.	Mora	Ecuador, Peru, Brazil	Pulp

Scientific name	Common name	Where found	Part used
Rubiaceae			
Alibertia hexagina Karst	Pera	Colombia	Pulp
Alibertia melloana Hook. f.	Madroño	Southern Brazil	Pulp
Alibertia sessilis Schum.	Marmelinho do campo	Brazil	Pulp
Amajova edulis Baill.	Boiabeira preta	Brazil	Pulp
Amajova guianensis Aubl.	Amaina	Brazil, Guiana	Pulp
Duranta macrophylla Hub.	Puruhi grande	Brazil	Pulp
Duranta plumieri Jacq.	.....	Brazil, West Indies	Pulp
Duroia saccifera Hook. f.	Cabeca-de-uruba	Brazil	Pulp
Gardenia brasiliensis Spreng.	.....	Brazil	Pulp
Gardenia suaveolens Vell.	Bacupari-açu	Brazil	Pulp
Guettarda speciosa L.	Angelica	Brazil	Pulp
Guettarda uruguensis Cham. et Schlecht.	Velvet seed	Brazil, Uruguay	Pulp
Hamelia patens Jacq.	Scarlet bush, bálsamo	Puerto Rico, Martinique	Pulp
Pentagonia brachyotis Standl.	Murciélago	Colombia	Pulp
Pentagonia macrophylla Benth.	Murciélago	Central America, Colombia	Pulp
Posoqueria acutifolia Mart.	Bacupari-mirim	Brazil	Pulp
Posoqueria latifolia Roem. et. Schult.	Jazmín de monte	Brazil	Aril
Randia aculeata L.	Cruceto, cambrón	Antilles, Central America, South America	Pulp

Scientific name	Common name	Where found	Part used
Thieleodoxa sorbilis Ducke	Puruhi grande	Brazil	Pulp
Thieleodoxa stipularis Ducke	.....	Brazil	Pulp
Thieleodoxa verticillata Ducke	.....	Brazil	Pulp
Tocoyena formosa K. Schum.	Genipapo do campo	Brazil	Pulp
Santalaceae			
Acanthosyris falcata Griseb.	.....	Bolivia, Paraguay	Pulp
Acanthosyris spinescens Griseb.	Sombra de touro	Brazil	Pulp
Sapindaceae			
Meliococca lepidopetala Radlk.	.....	Central America, West Indies	Pulp
Paullinia cupaná H.B.K.	Guaraná	Brazil	Pulp
Paullinia macrophylla H.B.K.	Bejuco prieto	Colombia	Aril
Paullinia subrotundata Pers.	.....	Peru	Seeds, aril
Schmidelia edulis St. Hil.	Fructa de parao	Brazil	Pulp
Talisia esculenta Radlk.	Pitomba	Brazil	Pulp
Talisia hexamphylla Vahl.	Mamón cutuplis	Venezuela	Pulp
Sapotaceae			
Bumelia altamiranoi Rose et Standl.	.....	Mexico	Pulp
Bumelia laetevirens Hemsl.	Tempixtle	Mexico	Latex
Bumelia sartorum Mart.	Quixaberia	Brazil	Pulp
Chrysophyllum argenteum Jacq.	.....	West Indies	Pulp

Scientific name	Common name	Where found	Part used
Chrysophyllum auratum Miq.	Nispero-caimito	Colombia	Pulp
Chrysophyllum bicolor Poir.	Caimillo	Puerto Rico	Pulp
Chrysophyllum excelsum Hub.	Sorva do Peru	Brazil	Pulp
Chrysophyllum macoucow Aubl.	.....	Guiana	Pulp
Chrysophyllum mexicanum Brand. ex Standl.	Caimito, cimarrón	Colombia, Peru	Pulp
Chrysophyllum microcarpum Swantz	.....	West Indies	
Chrysophyllum monopyrenum Swartz	Satin leaf	Tropical Americas	Pulp
Chrysophyllum oliviforme L.	Satin leaf	Florida, West Indies	Pulp
Glycoxylon huberi Ducke	Páo doce	Brazil	Pulp
Glycoxylon inophyllum Ducke	Páo doce	Brazil	Pulp
Glycoxylon pedicellatum Ducke	Ajará-y	Brazil	Pulp
Labourdonnaisia albescens Benth.	Almique	Cuba	Pulp
Lucuma arguacoensium Karst	Nawe, manzano	Colombia	Pulp
Lucuma dissepela Ducke	Abiurana grande	Brazil	Pulp
Lucuma lasiocarpa Mart.	Abíurana	Brazil	Pulp
Lucuma laurifolia DC.	Guapeba	Brazil	Pulp
Lucuma multiflora A. DC.	Jácana	Puerto Rico	Pulp
Lucuma palmeri Fern.	Mexican sapodilla, huicon	Mexico	Pulp
Lucuma paraensis Standl.	Abíu	Brazil	Pulp
Lucuma parviflora Benth.	Muira-pixi	Brazil	Pulp
Lucuma procera Mart.	Macarandiba	Brazil	Pulp
Lucuma rivicola Gaertn.	Cutitiribá, egg fruit	Brazil	Pulp

Scientific name	Common name	Where found	Part used
Lucuma serpentaria H.B.K.	.....	Cuba	Pulp
Lucuma speciosa Ducke	Pajurá	Brazil	Pulp
Lucuma torta DC.	.....	Brazil	Pulp
Lucuma valparadisea A. DC.	Palo colorado	Chile	Pulp
Manilkara balta Dub.	.....	Brazil, Guiana	Pulp
Manilkara bidentata Dub.	Ausubo	Puerto Rico	Pulp
Manilkara coriacea Miq.	Abricoteiro-do-mato	Brazil	Pulp
Manilkara huberi Stand.	Maçaranduba	Brazil	Pulp
Manilkara sieberi Dub.	.....	West Indies, Florida	Pulp
Mimusops elata Fr Alemao	Maçaranduba vermelha	Brazil	Pulp
Mimusops excelsa Ducke	Maçaranduba	Brazil	Latex
Mimusops huberi Ducke	True maçaranduba	Brazil	Pulp
Mimusops triflora F. Allem.	Maçaranduba	Brazil	Pulp
Ocythece fabrilis Pierre	.....	West Indies	Pulp (drink)
Pouteria carabobensis Pitt.	Chupón torito	Venezuela	Pulp
Pouteria macrocarpa Baehni	Cutite-grande	Brazil	Pulp
Pouteria macrophylla Eyma	Cutite	Brazil	Pulp
Pouteria pariry Baehi	Pariri	Brazil	Pulp
Pouteria speciosa Baehni	Pajurá-de-obidos	Brazil	Pulp
Pouteria suavis Hemsl.	.....	Uruguay	Pulp
Pouteria tovarencis Engler	Níspero de monte	Venezuela	Pulp
Pouteria ucuqui Pires et Schultes	Ucuqui	Colombia	Pulp
Sideroxylon amigdalicarpum Pitt.	Chupón colorado	Venezuela	Pulp

Scientific name	Common name	Where found	Part used
Sideroxylon capiri Pitt.	Zapote de ave	Mexico	Pulp
Sideroxylon foetidissimum Jacq.	Mastic	West Indies	Pulp
Sideroxylon rugosum Roem. et Schult.	Mecieira de boi	Brazil	Pulp
Vitellaria multiflora A. DC.	Zapatillo	Colombia	Pulp
Saxifragaceae			
Gumillea auriculata Ruiz et Pav.	.....	Peru	Seeds (coffee substitute)
Simarubaceae			
Simaruba glauca Sw.	Paradise tree	Florida, South America, Mexico, West Indies	Pulp
Solanaceae			
Acnistus arborescens Schlect.	Palo de gallina	Colombia	Pulp
Cyphomandra crassifolia Macbr.	Tomate silveste	South America	Pulp
Cyphomandra hartwegi Sendt.	Cyndra	Argentina, Chile	Pulp
Cyphomandra heterophylla Taub.	Pepinillo	Colombia	Pulp
Cyphomandra naranjilla Pitt.	Naranjilla	Colombia	Pulp
Physalis angulata L.	Camapu	Brazil	Pulp
Physalis peruviana L.	Uchuva	South America	Pulp
Physalis pubescens L.	Camapu	Brazil	Pulp
Solandra grandiflora Sweet	Trumpet flower, gusaticha	Jamaica, Venezuela	Pulp
Solanum agrarium Sendt.	.....	Brazil	Pulp
Solanum asarifolium Kth. et Bcke.	.....	Bolivia	Pulp
Solanum caripense Humb. et Bonpl.	Frijolitos	South America	Pulp

Scientific name	Common name	Where found	Part used
Solanum georgicum R. E. Schultes	Tonto-rande	Colombia	Pulp
Solanum grandiflorum Ruiz et Pav.	Fructa de lobo	Brazil, Peru	Pulp
Solanum hirtum Vahl	.....	Colombia, Trinidad	Pulp
Solanum hirsutissimum Standl.	Naranjillo	Costa Rica to Ecuador	Pulp
Solanum liximitante R. E. Schultes	Coconilla	Ecuador, Peru	Pulp
Solanum nigrum L.	Black nightshade	Tropical Americas	Pulp
Solanum piloferum Benth.	.....	Mexico	Pulp
Solanum platyphyllum Humb. et Bonpl.	Lulo	Amazon and Orinoco River area	Pulp
Solanum pseudolulo Heiser	.....	Colombia	Pulp
Solanum scabrum Vahl	Arana gato	Antilles, Central America, South America	Pulp
Solanum sessiliflorum Dun.	Cubio, cubii	Brazil (Amazon and Pará River areas)	Pulp
Solanum sisymbrifolium Lam.	Guinda	South America	Pulp
Solanum stramoniifolium Jacq.	Jua	Andes	Pulp
Solanum tequilense A. Gray	.....	Central America, Mexico	Pulp
Solanum vestissimum Dunal	.....	Colombia, Venezula	Pulp
Solanum torvum Swartz	Wild eggplant	Tropical Americas	Green pulp
Sterculiaceae			
Guazuma tomentosa H.B.K.	Bastard cedar	Tropical Americas	Pulp
Guazuma ulmifolia Lam.	West Indian guácima	South America, West Indies	Pulp
Sterculia apetala Karst	Capera	Panama	Seed
Sterculia chicha St. Hil.	Castanha do pará	Brazil	Seed

Scientific name	Common name	Where found	Part used
Theobroma albiflora Goud.	Cacao montaras	Colombia	Seed
Theobroma bicolor H.B.K.	Cacao, perúcocoa	Amazonia, Central America, Peru	Seed
Theobroma grandiflorum K. Schum.	Cupuassú	Amazonia	Seed, Pulp
Theobroma mariae Schum.	Cacaoti	Brazil	Seed
Theobroma martiana Dietr.	.....	Brazil	Seeds
Theobroma microçarpa Mart.	Cacao-rana	Brazil	Seeds
Theobroma obovatum Bern.	Cabeça de drunú	Brazil	Pulp
Theobroma pentagona Bern.	Cacao lagarto	Central America	Seeds
Theobroma purpureum Pitt.	Cacao de mico	Central America	Seeds
Theobroma speciosa Willd.	Cacao do mono	Brazil	Seeds
Theobroma spruceanum Bern.	Cacao azul	Brazil	Pulp, seed
Theobroma stipulatum Cuatr.	Chocolate	Colombia	Pulp
Theobroma subincanum Mart.	Cupuahy, cacao-rana	Amazonia	Seeds
Symplocaceae			
Symplocos serrulata Humb. et Bonpl.	Azajar	Colombia	Pulp
Taxaceae			
Podocarpus andina Poepp.	Lieuque	Chile	Pulp
Podocarpus macrostachyus Parl.	Pinete	Colombia, Ecuador	Pulp
Theophrastaceae			
Jaquinia caracasana H.B.K.	.....	Venezuela	Pulp
Tiliaceae			
Sloanea dentata L.	Urucurana	Brazil, Guiana	Pulp

Scientific name	Common name	Where found	Part used
Ulmaceae			
Celtis glycicarpa Mart.	Grão de gallo	Brazil	Pulp
Celtis iguanaea Sarg.	Uña de gato	Colombia	Pulp
Celtis tala Gill.	.....	Mexico	Pulp
Phyllostylon rhamnoides Taub.	Sabanaemico	Colombia	Nut
Vacciniaceae			
Vaccinium meridionale Sw.	Agraz	Colombia	Pulp
Verbenaceae			
Callicarpa americana L.	French mulberry	U.S.A., West Indies	Pulp
Citharexylum fruticosum L.	Florida, fiddle-wood, pendula	Florida, West Indies	Pulp
Lantana camara L.	Mountain sage	Tropical Americas	Pulp
Lantana trifolia L.	Wild sage	Tropical Americas	Pulp
Vitex capitata Vahl	Aceituno	Colombia, Venezuela	Pulp
Vitex cymosa Hub.	Aceituno	Brazil	Pulp
Vitex duckei Hub.	.....	Brazil	Pulp
Vitex flavens H.B.K.	Turumã turia	Brazil, Peru	Pulp
Vitex gigantea H.B.K.	Pechichi	Ecuador	Pulp
Vitex mollis H.B.K.	Uvalama	Mexico	Pulp
Vitex odorata Humb.	Turumã cheiroso	Brazil	Pulp
Vitex orinocensis H.B.K.	Guarataro	Brazil, Venezuela	Pulp
Vitex triflora Hub.	.....	Brazil, Guiana	Pulp
Violaceae			
Gloeospermum sphaexocarpum Tr. et Pl.	Pepito	Peru	Pulp
Leonia triandra Cuatr.	Yema de huevo	Brazil, Peru	Pulp

Scientific name	Common name	Where found	Part used
Vitidaceae			
Vitis caribaea DC.	Uva silvestre	Central America, Mexico, West Indies	Pulp
Vitis sicyoides Miq.	.....	Tropical Americas	Pulp
Vochysiaceae			
Erisma calcaratum Warna	Jabuti	Brazil	Pulp
Erisma japura Spruce	Japura	Brazil	Pulp

5. Minor Fruits of Africa

Scientific name	Common name	Where found	Part used
Acanthaceae			
Barleria bornuensis S. Moore	Jatibolohi	Northern Cameroon	Pulp
Agavaceae			
Dracaena afro-montana	Ikenke	Zaire	Berries
Dracaena butayei	Diaria mbula	Zaire	Berries
Dracaena capitulifera	Bodelo	Zaire	Berries
Dracaena dundusanensis	Lubete	Zaire	Berries
Dracaena fragans	Ipepe	Zaire	Berries
Dracaena hookeriana	Bastard apple	Zaire, southern Africa	Berries
Dracaena laurentii	Kwikwi	Zaire	Berries
Dracaena poggei	Lilandala	Zaire	Berries
Dracaena reflexa var. *nitens*	Ebiamba	Zaire	Berries
Dracaena rubro-aurantiaca	Lile	Zaire	Berries
Dracaena thalioides	Gungowa	Zaire	Berries
Dracaena vanderysti	Ilonda	Zaire	Berries
Anacardiacaea			
Antrocaryon klaineanum Pierre	.....	West Africa	Pulp
Antrocaryon micraster A. Chev. et Guillaum.	.....	Tropical Africa	Pulp, seed
Antrocaryon nannanii De. Wild.	.....	Zaire	Seed
Glycycarpus racemosus Dalz.	Amberee	Tropical Africa	Pulp
Haematostaphis barteri Hook. f.	Blood plum	West Africa	Pulp
Lannea alata Engler	Wa'anreh	East Africa	Pulp
Lannea discolor Engler	Live-long	East and southern Africa	Pulp
Lannea edulis Engler	Wild grape	Southern Africa	Pulp
Lannea fulva Engler	.....	Malawi	Pulp
Lannea kirkii Burtt-Davy	Tree grape	Southern and east Africa	Pulp

Scientific name	Common name	Where found	Part used
Lannea stuhlmannii Engler	Mango, mvure	Malawi	Pulp
Lannea velutina A. Rich.	Sambitouliga	Upper Volta, Zaire	Pulp
Lannea welwitschii Engler	Kumbi	Zaire	Pulp
Ozoroa reticulata R. et A. Fernandez	.....	East Africa	Pulp
Picralima elliotii Stapf	.....	West Africa	Pulp
Rhus albida Schousb.	Hawthorn	Southern and west Africa	Berries
Rhus natalensis Bernh. ex Krauss	Garri	East Africa	Berries
Rhus tenuinervis Engler	.....	Southern Africa	Berries
Rhus tripartita (Ucria) Grande	Dmah	West Africa	Berries
Rhus vulgaris Meikle	Muthigio	East Africa	Berries
Sclerocarya schweinfurthiana Schinz	Mungongo	Angola	Pulp
Sorindeia grandifolia Engler.	.....	Sierra Leone	Pulp
Sorindeia juglandifolia Planch. ex Oliv.	Damson	West Africa	Pulp
Sorindeia madagascariensis DC.	Crape mango	Madagascar	Pulp
Sorindeia warneckei Engler	.....	Tropical Africa	Pulp
Trichoscypha acuminata Engler	Dole	Zaire, Angola	Pulp
Trichoscypha arborea A. Chev.	.....	West Africa	Pulp
Trichoscypha ferruginea Engler	.....	West Africa	Pulp
Trichoscypha longifolia Engler	.....	West Africa	Pulp
Trichoscypha reygaertii De. Wild.	.....	Zaire	Pulp

Scientific name	Common name	Where found	Part used
Anisophylleaceae			
Anisophyllea fruticulosa Engler et Gilg.	Mufungo	Zambia	Pulp
Anisophyllea laurina R. BR. ex Sabine	Monkey apple	Tropical Africa	Pulp
Anisophyllea poggei Engler	Prune du Kasai	Zaire	Pulp
Annonaceae			
Annona arenaria Thonn.	Bagra, lolo	Zaire	Pulp
Annona cuneata R. E. Fries var.*glabrescens* Robyns et Gherq.	Elolo	Zaire	Pulp
Annona glabra L.	Pond apple, monkey apple	West Africa	Pulp
Annona stenophylla Engler et Diels ssp. *nana* Robson	.....	Zaire	Pulp
Anonidium mannii Engler et Diels	Mongongwe	Equatorial Africa	Pulp
Artabotrys boonei	Aganboli	Zaire	Pulp
Artabotrys likimensis	Kakambo	Zaire	Pulp
Artabotrys malchairi	Entsala	Zaire	Pulp
Artabotrys species	Mukukuma	Madagascar, east Africa	Pulp
Artabotrys thomsonii	Longuro	Zaire	Pulp
Cleistopholis bequaerti	Musoka	Zaire	Pulp
Cleistopholis glauca	Ominga	Zaire	Pulp
Cleistopholis grandiflora	Montole	Zaire	Pulp
Cleistopholis patens Engler	Bontolei	Zaire	Pulp
Cleistopholis pynaertii	Bontole	Zaire	Pulp
Cleistopholis verschuereni	*Bontole*	*Zaire*	*Pulp*
Enneastemon foliosus Robyns et Gherq.	.....	Equatorial Africa	Pulp

Scientific name	Common name	Where found	Part used
Enneastemon schweinfurthii Robyns et Gherq.	.....	Central Africa	Pulp
Enneastemon sereti	Nangdjangu	Zaire	Pulp
Enneastemon vogelii Keay	.....	West Africa	Pulp
Hexalobus crispiflorus A. Rich.	Keyiowo, mosome, ilumbe	Central Africa, Zaire	Pulp
Hexalobus monopetalus Engler et Diels	Mukundu	Equatorial and Southern Africa	Pulp, nut
Popowia caffra	Dwaba berry	Southern Africa	Pulp
Popowia congensis Engler	.....	Southern Nigeria	Pulp
Popowia obovata Engler et Diels	.....	East Africa	Pulp
Popowia pynaerti	Pome	Zaire	Pulp
Uvaria afzelii SC. Elliot	.....	West Africa	Pulp
Uvaria cabrae De Wild.	Mundembo	Zaire	Pulp (aril)
Uvaria chamae Beauv.	Bush banana	Sierra Leone	Pulp
Uvaria doeringii Diels	.....	West Africa	Pulp
Uvaria leptocladon Oliv.	.....	Kenya	Pulp
Uvaria ovata A. DC.	.....	West Africa	Pulp
Uvaria scabidra	Kuatiliu	Zaire	Pulp
Apocynaceae			
Acokanthera longiflora Stapf	.....	Kenya	Pulp
Ancylobothrys amoena Hua	Bulempe	Tanzania, Sudan	Pulp
Ancylobothrys pyriformis Pierre	.....	Zaire	Pulp
Ancylobothrys scandens Pichon	.....	West Africa	Pulp (beverage)
Anthoclitandra robustior Pichon	.....	Zaire	Pulp
Azanza garckeana Exell et Hillcoat	Quarters, snot-apple	Kenya, Tanzania, Zimbabwe	Pulp

Scientific name	Common name	Where found	Part used
Carissa bispinosa Desf. ex Brenan	Num-num	Southern Africa, Kenya	Pulp
Carissa ferox DC.	.....	Southern Africa	Pulp
Carissa haematocarpa	Amatungulu	Southern Africa, Kenya	Pulp
Carpodinus gracilis Stapf	.....	Southern Africa	Pulp
Carpodinus verticillata De Wild. et E. Laurent	.....	Tropical Africa	Pulp
Clitandra arnoldiana De Wild.	.....	Zaire	Pulp
Clitandra cirrhosa Radlk.	Oban rubber	West Africa	Pulp
Conopharyngia elegans Stapf	Kakope, toad tree	Zambia	Pulp
Dictyophleba leonensis Pichon	.....	West Africa	Pulp
Hunteria elliotii Pichon	.....	Sierra Leone	Pulp
Jasminochyla ugandensis Pichon	Nandi rubber vine	East Africa	Pulp
Landolphia calabarica E. A. Bruce	.....	Sierre Leone	Pulp
Landolphia capensis Oliv.	Wild apricot	Southern Africa	Pulp
Landolphia droogmansiana De Wild.	.....	Zaire	Pulp
Landolphia dubreucquiana De Wild.	.....	Zaire	Pulp
Landolphia dulcis Pichon	.....	Tropical Africa	Pulp
Landolphia gentilii De Wild.	Lisuki	Tropical Africa	Pulp
Landolphia heudelotii DC.	Guinea gumvine	Senegal, tropical Africa	Pulp (beverage)
Landolphia hirsuta Pichon	.....	Tropical Africa	Pulp
Landolphia humilis K. Schum.	.....	Zaire	Pulp

Scientific name	Common name	Where found	Part used
Landolphia kirkii Dyer	Coast rubber vine	Malawi, southern Africa	Pulp
Landolphia lanceolata Pichon	.....	Tropical Africa	Pulp
Landolphia landolphioides A. Chev.	.....	Tropical Africa	Pulp
Landolphia macrantha Pichon	.....	Tropical Africa	Pulp
Landolphia owariensis Beauv.	White rubber vine, white ball rubber	Tropical Africa	Pulp (beverage)
Landolphia parvifolia K. Schum.	.....	Malawi	Pulp
Landolphia petersiana This.-Dyer	.....	East Africa	Pulp
Landolphia thollonii Dewevre	Londi-londi	Zaire	Pulp
Roupellia grata Wall. et Hook. f.	Cream fruit	Tropical Africa	Pulp
Saba florida Bullock	Chiwo	Zaire, Sudan, west Africa	Pulp
Saba senegalensis Pichon	Saba	Tropical Africa	
Thespesia danis Oliv.	Danisa	Kenya	Pulp
Araliaceae			
Cussonia angolensis	Lombilla	Zaire	Pulp
Cussonia arborea	Dikasa ya tambu	Zaire	Pulp
Cussonia brieyi	Loka-loka	Zaire	Pulp
Cussonia corbisieri	Dikasa-diatembo	Zaire	Pulp
Cussonia delovoyi	Kitompo	Zaire	Pulp
Cussonia holstii	Muamve	Zaire	Pulp
Cussonia kirkii Seem	Cabbage tree	Malawi	Pulp
Cussonia natalensis	Cabbage tree	Southern Africa	Pulp
Cussonia paniculata	Umbrella tree	Southern Africa	Pulp
Cussonia spicata Thunb.	Cabbage tree, kipersol	Malawi, southern Africa	Pulp
Cussonia thyrsiflora	Kipersol	Southern Africa	Pulp
Cussonia umbellifera	Cabbage tree	Zaire	Pulp
Pentadiplandra brazzeana Baill.	.....	Zaire	Pulp

Scientific name	Common name	Where found	Part used
Asclepiadaceae			
Leptadenia pyrotechnica DC.	Asabai	Niger	Pulp
Sarcostemma viminale R. Br.	Creeper	East and southern Africa	Pulp
Balanitaceae			
Balanites aegyptiaca Del.	Desert date	Senegal, Sudan, Uganda	Pulp (dried)
Balanites glabra Mildr. et Schlecht.	Olngaswa	Kenya	Pulp
Balanites maughamii Sprague	Torch fruit tree	Southern Africa	Nut
Balanites quarrei	Wabagana	Zaire	Nut
Balanites wilsoniana Dawe et Sprague	.....	Uganda, Zaire	Nut
Berberidaceae			
Berberis holstii Engler	.....	East Africa	Berries
Bignoniaceae			
Colea mauritiana Boj.	Sofint sohy	Madagascar	Pulp
Colea telfairea Boj.	Voansakalava	Madagascar	Pulp
Phyllarthorn bojerianum DC.	Zahana	Madagascar	Pulp
Phylloctenium decaryanum H. Perr.	Balmy fruit	Madagascar	Pulp
Bombacaceae			
Adansonia madagascariensis Baill.	Madagascar baobab, Zaha	Madagascar	Pulp
Pochota glabra Bullock	Pachira nut	West Africa, Zaire	Nut

Scientific name	Common name	Where found	Part used
Brexiaceae			
Brexia madagascariensis Thouars ex Ker Gawl.	.....	Tanzania	Pulp
Burseraceae			
Commiphora africana Engler	Mbambara	East and southern Africa	Pulp
Commiphora caraifolia	Cork tree	Southern Africa	Pulp
Commiphora harveyi	Cork tree	Southern Africa	Pulp
Commiphora pedunculata Engler	Hill mango	West Africa	Pulp
Dacryodes buettneri Lam.	.....	Gabon	Pulp
Dacryodes edulis H. J. Lam.	Eben tree	West Africa	Pulp
Dacryodes klaineana H. J. Lam.	Damson	Sierre Leone	Pulp
Protium macgregorii Leehn.	Kaibas	East Africa	Pulp
Santiria trimera Aubrév.	Balsamier	West Africa	Pulp
Cactaceae			
Opuntia dillenii Haw.	Prickly pear	Madagascar	Pulp
Opuntia megacantha Salm-Dyck	Mispel	Southern Africa	Pulp
Opuntia stricta Haw.	Figuier de barbarie, prickly pear	Madagascar	Pulp
Opuntia tuna Mill.	Tuna, prickly pear	Senegal	Pulp
Opuntia vulgaris Mill.	Cochineal fig	Southern Africa	Pulp
Canellaceae			
Warburgia ugandensis Sprague	.....	East Africa	Pulp
Capparidacea			
Boscia albitrunca Gilg. et Bened	Emigrants' tree	Southern Africa	Berries
Boscia angustifolia A. Rich.	.....	West Africa	Berries
Boscia senegalensis Lam. ex Poir.	Kursan	Tropical Africa	Berries

Scientific name	Common name	Where found	Part used
Capparis citrifolia	Capers	Southern Africa	Pulp
Capparis corymbosa Lam.	Mordo	Tropical Africa	Pulp
Capparis fascicularis DC.	.....	Northern Cameroon	Pulp
Capparis hypericoides	.....	Southern Africa	Pulp
Capparis zeheri	Wait-a-bit	Southern Africa	Pulp
Courbonia edulis Gilg et Bened.	.....	Tanzania, east Africa	Pulp
Courbonia glauca Gilg et Bened.	.....	East Africa	Pulp
Courbonia virgata A. Brongn.	Kurdan	Sudan	Pulp
Crateva adansonii DC.	.....	Congo, Sudan	Pulp
Euadenia eminens Hook. f.	.....	Sierra Leone	Pulp
Maerua angolensis DC.	Knob bean, jabsabsa	Southern Africa, Zaire	Pulp
Maerua angustifolia	Snake egg bush	Southern Africa, Zaïre	Pulp
Maerua aprevalina	Esembe	Zaire	Pulp
Maerua cabra	White bushwood	Southern Africa	Pulp
Maeru crassifolia Forsk.	Eb nembe	Mauritania	Pulp
Maerua denhardtiorum Gilg	Kukupe	Kenya	Pulp
Maerua juncea	Kasakala	Zaire	Pulp
Maerua oblongifolia A. Rich.	.....	Sudan	Pulp
Celastraceae			
Cassine burkeana	.....	Southern Africa	Pulp
Cassine capensis	.....	Southern Africa	Pulp
Cassine croceae	.....	Southern Africa	Pulp
Cassine eucleaeformis	.....	Southern Africa	Pulp
Cassine kraussiana	Red pear	Southern Africa	Pulp
Cassine maurocenia L.	Hottentot cherry	Southern Africa	Pulp
Cassine papillosa	.....	Southern Africa	Pulp
Cassine schlechteri Davison	.....	Mozambique	Pulp

Scientific name	Common name	Where found	Part used
Cassine sphaerophylla	Cape cherry	Southern Africa	Pulp
Cassine tetragona	Dry liver	Southern Africa	Pulp
Maytenus acuminata	Silky bark	Southern Africa	Pulp
Maytenus cymosa	Wait-a-bit	Southern Africa	Pulp
Maytenus peduncularis	Blackwood	Southern Africa	Pulp
Maytenus polyacantha	.....	Southern Africa	Pulp
Maytenus senegalensis Exell	Volfa	Botawana, southern Africa	Pulp
Maytenus tenuispina	.....	Southern Africa	Pulp
Maytenus undata	Koko tree	Southern Africa	Pulp
Mystroxylon aethiopicum Loes.	Spoon wood	Uganda, southern Africa	Pulp
Mystroxylon kuba Eckl. et Zeyh.	Kubu	Southern Africa	Pulp
Pachystigma bowkeri Robyns	.....	Southern Africa	Pulp
Salacia caillei A. Chev.	.....	Tropical Africa	Pulp
Salacia demeusei	Seka	Zaire	Pulp
Salacia dentata Baker	Tsimatra	Madagascar	Pulp
Salacia erecta Walp.	.....	Tropical Africa	Pulp
Salacia lomensis Loes.	.....	West Africa	Pulp
Salacia nitida N. E. Br.	.....	West Africa	Pulp
Salacia pyriformis Steud.	Tontel	Sierra Leone	Pulp
Salacia rehmannii Schinz et DC.	Wild orange, malombo	Southern Africa, Sierra Leone, Zaire	Pulp
Salacia senegalensis DC.	.....	West Africa	Pulp
Salacia stuhlmanniana Loes.	.....	Tanzania	Pulp
Salacia togoica Loes.	.....	Togo, west Africa	Pulp
Chrysobalanaceae			
Chrysobalanus ellipticus Soland. ex Sabine	Odora pear	West Africa	Pulp

Scientific name	Common name	Where found	Part used
Chrysobalanus orbicularis Schum. et Thonn.	Mafuli	Zaire	Pulp, seed
Grangeria madagascariensis O. Hoffmg.	Morasira	Madagascar	Pulp
Hirtella zanzibarica Oliv.	.....	East Africa	Pulp
Magnistipula bangweolensis Grah.	.....	Tanzania	Pulp
Parinari benna SC. Elliot	.....	Tropical Africa	Pulp
Parinari bequartii	Mukuwe	Zaire	Pulp
Parinari congensis F. Didr.	Mampombo	Zaire	Pulp
Parinari curatellifolia Planch.	Cork or hissing tree, mobola plum, imbombo	Equatorial and southern Africa	Nut
Parinari emirnensis Baker	Vandevenona	Madagascar	Pulp
Parinari excelsa Sabine	Rough-skinned plum, grey or Guinea plum, busumbi	Tropical Africa	Pulp, nut
Parinari glabra Oliv.	.....	Zaire	Nut
Parinari latifolia Exell	Sand apple	Southern Africa	Pulp
Parinari macrophylla Sabine	Cayor apple, gingerbread plum	Senegal	Nut, pulp
Parinari mobola Oliv.	Mabo, sand apple	Zaire, southern Africa	Nut
Parinari pumila Mildbr.	Pommier du cayor, parinarium	Zaire	Nut
Combretaceae			
Laguncularia racemosa Gaertn. f.	Tarrafe	Bissago	Nut
Strephonema pseudocola A. Chev.	Awuruku	West Africa	Nut
Terminalia parvula Pampan	Megag	Somalia	Nut

Scientific name	Common name	Where found	Part used
Connaraceae			
Cnestis ferruginea DC.	Nkualisende	Zaire	Pulp
Cnestis iomalla	Bankala	Zaire	Pulp
Cnestis natalensis	Wild peach	Southern Africa	Pulp
Cnestis sapinii De Wild.	.....	Zaire	Pulp
Cnestis setosa	Bankaka	Zaire	Pulp
Cnestis urens	Biesende	Zaire	Pulp
Rourea platysepala Baker	Voampika	Madagascar	Pulp
Santaloides gudjuanum Schellenb.	.....	West Africa	Pulp
Cycadaceae			
Cycas thouarsii Gaudich.	Fatra	Madagascar	Nut
Encephalartos altensteinii Lehm.	Bread tree	Equatorial and southern Africa	Pulp
Encephalartos caffer Miq.	Bushman bread	Southern Africa	Pulp
Encephalartos cycadifolius	Kaffir bread tree	Southern Africa	Pulp
Encephalartos eugene-maraisii	Wild date	Southern Africa	Pulp
Encephalartos ferox	Bread palm	Southern Africa	Pulp
Encephalartos horridus	Kaffier bread	Southern Africa	Pulp
Encephalartos latifrons	.....	Southern Africa	Pulp
Encephalartos lehmannii	.....	Southern Africa	Pulp
Encephalartos longifolus	Bread palm, cycad	Southern Africa	Pulp
Encephalartos paucidentatus	.....	Southern Africa	Pulp
Encephalartos transvenosus	Modjadji's palm	Southern Africa	Pulp
Encephalartos vilosus	.....	Southern Africa	Pulp
Dichapetalaceae			
Dichapetalum cymosum	Poison leaf	Southern Africa	Pulp

Scientific name	Common name	Where found	Part used
Dichapetalum edule Engler	.....	Tropical Africa	Pulp
Dichapetalum flexuosum Engler	.....	West Africa	Pulp
Dichapetalum toxicarium Baill.	.....	West Africa	Pulp
Dichapetalum venenatum Engler et Gilg	Makaou, machaow	West Africa	Pulp
Ebenaceae			
Diospyros atropurpurea Guerke	.....	West Africa	Pulp
Diospyros austro-africana var. *microphyla*	.....	Southern Africa	Pulp
Diospyros austro-africana var. *rubriflora*	Fire bush	Southern Africa	Pulp
Diospyros barteri Hiern.	.....	Tropical Africa	Pulp
Diospyros bequaerti	Imbimbo	Zaire	Pulp
Diospyros bipidensis Guerke	Pandi	Zaire	Pulp
Diospyros boala	Boala	Zaire	Pulp
Diospyros canaliculata De Wild.	Flint bark	Tropical Africa	Pulp
Diospyros crassiflora Hiern.	Ekili	Zaire	Pulp
Diospyros dendo Welw.	.....	Tropical Africa	Pulp
Diospyros dichrophylla	Monkey apple	Southern Africa	Pulp
Diospyros elliotti F. White	.....	Sierra Leone	Pulp
Diospyros heudelotti Hiern.	.....	Tropical Africa	Pulp
Diospyros kamerunensis Guerke	.....	Tropical Africa	Pulp
Diospyros kimba-kimba	Kimba-kimba	Zaire	Pulp
Diospyros lycioides sp. *guerkei*	.....	Southern Africa	Pulp
Diospyros lycioides sp. *lysioides*	Jackalberry	Southern Africa	Pulp
Diospyros lycioides sp. *sericeae*	.....	Southern Africa	Pulp
Diospyros mespiliformis Hochst. ex A. DC.	Monkey guava	Tropical Africa	Pulp

Scientific name	Common name	Where found	Part used
Diospyros natalensis Brenan	Smalbead	Southern Africa	Pulp
Diospyros pallens	.....	Southern Africa	Pulp
Diospyros ramulosa	.....	Southern Africa	Pulp
Diospyros scabrida	.....	Southern Africa	Pulp
Diospyros simii	Star apple	Southern Africa	Pulp
Diospyros staudtii	Bolinda	Zaire	Pulp
Diospyros thomasii Hutch. et J. M. Dalz.	.....	West Africa	Pulp
Diospyros tricolor Hiern.	.....	West Africa	Pulp
Diospyros whyteana	African bladder nut, wild coffee	Southern Africa	Pulp
Diospyros viridicans Hiern.	Gabon ebony	West Africa	Pulp
Euclea crispa	.....	Southern Africa	Pulp
Euclea crispa var. *ovata*	.....	Southern Africa	Pulp
Euclea divinorum Hiern.	Musaki	Uganda	Pulp
Euclea katangensis	Sakonida	Southern Africa	Pulp
Euclea lancea	.....	Southern Africa	Pulp
Euclea linearis	.....	Southern Africa	Pulp
Euclea milbraedii	Botuna, kinga, kenga	Zaire	Pulp
Euclea natalensis A. DC.	.....	Southern Africa	Pulp
Euclea ovata Burch.	.....	Southern Africa	Pulp
Euclea polyandra	Guarri	Southern Africa	
Euclea pseudebenus E. Mey.	Black ebony	Angola, southern Africa	Pulp
Euclea racemosa	Guarri	Southern Africa	Pulp
Euclea schimperi Dandy	Ogum	East and southern Africa, Sudan	Pulp
Euclea tomentosa	.....	Southern Africa	Pulp
Euclea undulata Thunb.	.....	Southern Africa	Pulp
Euclea undulata var. *myrtina*	.....	Southern Africa	Pulp
Ehretiaceae			
Cordia africana Lam.	Mukumari	Tropical Africa	Pulp
Cordia balanocarpa Brenan	.....	Tanzania	Pulp
Cordia caffra	.....	Southern Africa	Pulp
Cordia charaf B. Ehren ex Aschers.	Marer, maded	East Africa	Pulp

Scientific name	Common name	Where found	Part used
Cordia myxa L.	Sapistan, sebestan, Assyrian plum	West Africa	Pulp
Cordia ovalis R. Br.	Sandpaper tree	Angola	Pulp
Cordia somaliensis Baker	Pumbazi	Kenya	Pulp
Ehretia amoena	.....	Southern Africa	Pulp
Ehretia petiolaris Lam.	Betel tree	Mauritius	Pulp
Ehretia rigida	Cape lilac	Southern Africa, Kenya	Pulp
Elaeagnaceae			
Elaeagnus angustifolia L.	Chalef	Algeria	Pulp
Elaeagnus multiflora Thunb.	.....	North Africa	Pulp
Ericaceae			
Arbutus canariensis Duham.	Canary madrone	Canary Islands	Pulp
Arbutus unedo L.	Strawberry tree	North Africa	Pulp
Vaccinium andringitrense Perr.	.....	Madagascar	Pulp
Vaccinium emirnense Hood.	.....	Madagascar	Pulp
Vaccinium littorale H. Perr.	.....	Madagascar	Pulp
Vaccinium stanleyi Schweinf.	Myrtillier du Congo	Zaire	Pulp
Euphorbiaceae			
Antidesma laciniatum	Esutu	Zaire	
Antidesma madagascariense Lam.	Taindalitra, verana	Madagascar	Pulp
Antidesma membranaceum Muell.-Arg.	.....	Uganda, Zaire	Pulp
Antidesma venosum E. Mey. ex Tul.	Itombo	Tropical and southern Africa	Pulp
Bridelia atroviridis	Mondjako	Zaire	Pulp
Bridelia brideliifolia	Mutako	Zaire	Pulp
Bridelia ferruginea Benth.	Utulu	Northern Cameroon, Malawi, Zaire	Pulp

Scientific name	Common name	Where found	Part used
Bridelia micrantha Baill.	.....	Tropical and southern Africa	Pulp
Bridelia schleronerua Muell.Arg.	Kimwindu	Tropical Africa, Zaire	Pulp
Crotonogyne poggei Pax	Mondondo	Zaire	Pulp
Drypetes arguta Hutch.	Bastard white ironwood	Southern Africa	Pulp
Drypetes finvorensis Hutch. et J. M. Dalz.	.....	West Africa	Pulp
Drypetes floribunda Hutch.	.....	West Africa	Pulp
Drypetes gerrardii	White ironwood	Southern Africa	Pulp
Drypetes gilgiana Pax et Hoffm.	.....	West Africa	Pulp
Drypetes ivorensis Hutch. et Dalz.	.....	West Africa	Pulp
Drypetes natalensis	Stink bush	Southern Africa	Pulp
Hymenocardia acida Tul.	.....	Tropical Africa	Pulp
Lingelsheimia gilgiana Hutch.	.....	West Africa	Pulp
Macaranga angolensis	Ebili	Zaire	Pulp
Macaranga barteri	Esenge	Zaire	Pulp
Macaranga dibeleensis	Botimeli	Zaire	Pulp
Macaranga gilleti	Bolongo	Zaire	Pulp
Macaranga heterophylla Muell.-Arg.	.....	West Africa	Pulp
Macaranga laurentii	Esenge	Zaire	Pulp
Macaranga monandra	Mondombe	Zaire	Pulp
Macaranga neomildbraediana	Mushasha	Zaire	Pulp
Macaranga saccifera	Kilokote	Zaire	Pulp
Macaranga spinosa	Boengi	Zaire	Pulp
Macaranga rosea	Itele	Zaire	Pulp
Macaranga lecomtei	Itele	Zaire	Pulp
Macaranga vermoeseni	Sasa	Zaire	Pulp

Scientific name	Common name	Where found	Part used
Maesobotrya barteri Hutch.	Olowun	West Africa	Pulp
Maesobotrya bertramiania	Ekakoloko	Zaire	Pulp
Maesobotrya floribunda Benth. var. hirtella Pax	Bolongo	Zaire	Pulp
Maesobotrya sparsiflora Hutch.	.....	West Africa	Pulp
Maesobotrya staudtii Hutch.	.....	Zaire	Pulp
Manniophyton fulvum Muell.-Arg.	.....	Nigeria	Nut
Microdesmis zenkeri Pax	.....	West Africa	Pulp
Microdesmis puberula Hook. f. ex Planch.	.....	West Africa	Pulp
Phyllanthus capillaris	Eselebele	Zaire	Pulp
Phyllanthus delpyanus	Kolokole	Zaire	Pulp
Phyllanthus discoideus Muell.-Arg.	Mukarara, red pear	Southern, west and east Africa; Zaire	Pulp
Phyllanthus incurvus	Dye bush, kridia	Southern Africa, Zaire	Pulp
Phyllanthus medraspatensis	.....	Southern Africa	Pulp
Phyllanthus muellerianus Exell	Bolombwe	Zaire	Pulp
Phyllanthus niruri	Sonso	Zaire	Pulp
Phyllanthus polyanthus	Mokolokala	Zaire	Pulp
Phyllanthus reticulatus Poir.	Mkasiri	East Africa	Pulp
Pseudolachnostylis glauca Hutch.	.....	Southern Africa	Pulp
Pseudolachonstylis maprouneifolia Pax	.....	Malawi	Pulp
Ricinodendron rautinenii Schinz	Mokuru	Angola	Pulp

Scientific name	Common name	Where found	Part used
Securinega virosa Baill.	Mkwamba	Sudan, Kenya	Pulp
Tetracarpidium conophorum Hutch. et Dalz.	Awusa nut	West Africa	Pulp, seeds
Fagaceae			
Quercus ilex L.	Evergreen oak	North Africa	Seed
Quercus suber L.	Cork oak	North Africa	Seed
Flacourtiaceae			
Caloncoba crepiniana	Kuma	Zaire	Pulp
Caloncoba gilgiana Gilg	Gorli	West Africa	Pulp
Caloncoba glauca Gilg	Gorli, bakala	West Africa, Zaire	Pulp
Caloncoba mannii	Obobondo	Zaire	Pulp
Caloncoba welwitschii	Bosanku	Zaire	Pulp
Dovyalis celastroides Sond.	Cranberry	Southern Africa	Pulp
Dovyalis giorgii	Bokoma	Zaire	Pulp
Dovyalis macrocalyx Warb.	.....	East Africa	Pulp
Dovyalis rhamnoides E. Mey.	Cape cranberry, wineberry	Southern Africa	Pulp
Dovyalis tristis Sim.	.....	Southern Africa	Pulp
Dovyalis zeyheri Warb.	.....	Southern Africa	Pulp
Flacourtia flavescens Willd.	Niger plum, berry tree	Upper Volta	Fruit
Flacourtia hirtiuscula Oliv.	.....	Southern and southeast Africa	Pulp
Flacourtia vogelii Hook. f.	Blackberry	Sierra Leone	Pulp
Oncoba spinosa Fursk.	Oncob, snuffbox	Tropical Africa	Pulp
Prockia rotundifolia Eckl. et Zeyh.	.....	Southern Africa	Pulp
Rawsonia lucida Harv. et Sond.	.....	East Africa	Pulp

Scientific name	Common name	Where found	Part used
Scolopia mundii	Red pear	Southern Africa	Pulp
Scolopia thorneroftii	.....	Southern Africa	Pulp
Scolopia zeyheri Szyszyl.	Red pear, thorn pear	East Africa	Pulp
Smeathmannia laevigata Soland.	.....	West Africa	Pulp
Soyauxia gabonensis Oliv.	.....	Nigeria	Pulp
Goodeniaceae			
Scaevola plumieri Vahl	Ngoli foyi	Senegal	Pulp
Guttiferae			
Garcinia afzelii Engler	.....	West Africa	Pulp
Garcinia cernua Baker	.....	Madagascar	Pulp
Garcinia conrauana Engler	Ntu, false cola	West Africa	Pulp, seed
Garcinia epunctata Stapf	Botata	Zaire	Pulp
Garcinia giadidi De Wild.	Ngadidi	Nigeria, Zaire	Pulp
Garcinia huillensis Welw. ex Oliv.	Gadi	Zaire, east Africa	Pulp
Garcinia kola Heckel	Bitter kola	Nigeria, Zaire	Pulp, seed
Garcinia mannii Oliv.	Balala	Zaire, west Africa	Pulp
Garcinia mlanjiensis Dunkley	.....	Southern Africa, Malawi	Pulp
Garcinia natalensis Schlechter	Ebony, wild plum	West Africa	Pulp
Garcinia ovalifolia Oliv.	Italonga	Zaire	Pulp
Garcinia polyantha Oliv.	Akwala	Zaire	Pulp
Garcinia smeathmannii Oliv.	False chewstick	West Africa	Pulp
Garcinia verrucosa Jum. et Perr.	.....	Madagascar	Pulp

Scientific name	Common name	Where found	Part used
Garcinia wentzeliana Engler	Magola	Tropical Africa	Pulp
Harungana madagascariensis	Montoni	West Africa, Sudan, Uganda, Zaire	Pulp
Hypericum aethiopicum	Sukibile, St.-Johnswort	Southern Africa	Pulp
Hypericum lanceolatum	Mohanga	Zaire	Pulp
Hypericum peplidifolium A. Rich.	.....	East Africa	Pulp
Hypericum roperianum	Kabalebale	Zaire	Pulp
Mammea gilletii De Wild.	.....	Dahomey	Pulp
Pentadesma butylaceae Sabine	Owala oil tree	Tropical Africa	Seed
Rheedia pervillei Planch. et Triana	.....	Madagascar	Pulp
Symphonia fasciculata Baill.	Kiza	Madagascar	Pulp
Symphonia louvelii Jum.	.....	Madagascar	Pulp
Symphonia macrocarpa Jum.	.....	Madagascar	Pulp
Tsimatimia pervillei Jum. et Perr.	.....	Madagascar	Pulp
Houmiriaceae			
Aubrya gabonensis Baill.	.....	Gabon	Pulp
Sacoglottis gabonensis Urb.	Ozouga	Liberia, Ghana	Pulp
Icacinaceae			
Alsodeiopsis staudtii Engler	.....	Tropical Africa	Pulp
Icacina claesensi	Kukbukumbu	Zaire	

Scientific name	Common name	Where found	Part used
Icacina guessfeldtii Aschers. ex Engler	.....	Zaire	Pulp
Icacina mannii	Mumu	Zaire	Pulp
Icacina senegalensis A. Juss.	False yam	Tropical Africa	Nut, pulp
Rhapiostylis beniniensis Planch.	.....	West Africa	Seeds
Ixonanthaceae			
Desbordesia glaucescens Pierre	.....	West Africa	Pulp, seed
Irvingia gabonensis Baill.	Dika nut	Tropical Africa	Nut
Irvingia grandifolia Engler	Kumakuma	Tropical Africa	Nut
Irvingia oblonga A. Chev.	.....	Gabon	Nut, pulp
Irvingia smithii Hook. f.	.....	Zaire, central Africa	Nut, pulp
Klainedoxa elliptica	Bonkesa	Zaire	Nut
Klainedoxa gabonensis Pierre ex Engler	Sopei	Sierre Leone, Zaire	Nut, pulp
Klainedoxa longifolia	Lolo	Zaire	Pulp
Klainedoxa oblongifolia	Musombo	Zaire	Pulp
Klainedoxa ovalifolia	Wangata	Zaire	Pulp
Lauraceae			
Bequaertiodendron magalismontaun Heine et J. H. Hemsley	Stemfruit	Southern and tropical Africa	Pulp
Bequaertiodendron natalense Heine et J. H. Hemsley	Natal plum, mwamba	Southern Africa, Kenya	Pulp
Bequaertiodendron oblanceolatum Heine et J. H. Hemsley	.....	Tropical Africa	Pulp

Scientific name	Common name	Where found	Part used
Leeaceae			
Leea guineensis G. Don	Voanka zoambana,	West Africa, Madagascar, Zaire	Pulp
Leguminosae			
Acacia albida Del.	.....	Zaire	Seeds
Acacia macrostachya Reich. ex Benth.	.....	Upper Volta	Seeds
Acacia nilotica Willd. ex Del.	.....	Cameroon	Seeds
Acacia tortilis Hayne	Djodjailmo	Central Africa, Zaire, Angola	Seeds
Afzelia africana Smith	Lovolovo	Tropical Africa	Seeds
Afzelia belle Harms	Bolinga	Zaire	Seeds
Afzelia bijuga Gray	.....	Madagascar	Seeds
Afzelia brieyi	Nkokongo	Zaire	Seeds
Afzelia pachyloba Harms	.....	Nigeria	Seeds
Afzelia quanzensis Welw.	Mahogany bean	Southern Africa	Pulp
Andira inermis DC.	.....	Northern Cameroon	Pulp
Bauhinia bequarti	Kitunju	Zaire	Pods
Bauhinia esculenta Burch.	Gemsbuck bean	Southern Africa	Pods
Bauhinia fassagleensis Kotschy	Kadaranda	Zaire	Pods
Bauhinia galpinii	Pride of the cape	Southern Africa	Pods
Bauhinia kirkii	Marama bean	Southern Africa	Pods
Bauhinia macrantha Oliv.	Camel's foot	Angola, southern Africa	Seeds
Bauhinia petersiana Bolle	Mutata	Zaire	Pods
Bauhinia rufescens Lam.	.....	Nigeria, Senegal	Pods, seeds
Bauhinia tomentosa L.	Dembademba	Southern Africa	Pods
Beilschmiedia manii Benth. et Hook.	Spicy cedar, Laurier	Tropical Africa	Pulp
Brachystegia appendiculata Benth.	.....	Tropical Africa	Pulp

Scientific name	Common name	Where found	Part used
Bussea massaiensis Harms	.....	Tanzania	Seeds
Bussea occidentalis Hutch.	Samanta	West Africa	Pulp, seeds
Cassia alata L.	.....	Tropical Africa	Seeds
Cassia delagoensis Harv.	.....	Sierra Leone	Seeds
Cassia sennal L.	Coffee senna	Tropical Africa	Seeds
Cassia singueana Del.	.....	Sierre Leone	Seeds
Cathormion altissimum Hutch. et Dandy	Zegelia	West Africa	Pulp
Cordyla richardii Planch. ex Milne-Redhead	Kalindi	Uganda	Pulp
Dichrostachys cinerea Wight et Arn.	Bastard acacia, chinese lantern tree, kisanga	Ghana, Nigeria	Pulp, seed
Drepanocarpus lunatus G. F. W. Mey.	.....	Sierrre Leone, Madagascar	Pulp
Guibourtia coleosperma J. Leon.	Mushi, bastard teak	Tropical Africa	Seeds
Lemuropisum edule H. Perr.	.....	Madagascar	Pulp
Parkia bicolor A. Chev.	African locust, arbre a farine, nere, nete, libamba	Tropical Africa, Zaire	Seeds
Parkia clappertoniana Keay	African locust, arbre a farine, nere, nete	Tropical Africa	Seeds
Parkia filicoidea Welw.	African locust, arbre a farine, nere, nete, bolembelembe	Tropical Africa, Zaire	Seeds
Parkia oliveri Macbride	African locust, arbre a farine, nere, nete	Tropical Africa	Pulp, seed
Pentaclethra macrophylla Benth.	Olive bean tree	Tropical Africa	Seeds

Scientific name	Common name	Where found	Part used
Piliostigma reticulatum Hochst.	Bauhinia, kifumbi	Tropical Africa	Pods, seeds
Piliostigma thonningii Milneredh.	Picture frame tree	Tropical and southern Africa, Sudan	Pods, seeds
Pithecellobium dulce Benth.	.....	Madagascar	Pulp (aril)
Prosopsis africana Taub.	Mesquite	Tropical Africa	Seeds
Pseudocadia zambesiaca Harms	Nyala tree	Southern Africa	Pulp
Pterocarpus santalinoides L'Herit.	Padouk	Tropical Africa	Seeds
Sesbania pachycarpa DC.	.....	Senegal	Seeds
Sesbania sesban Merr.	.....	Tropical Africa	Seeds, pods
Tetrapleura tetraptera Taub.	Bulesa	West and east Africa, Zaire	Wings and ridges of fruit
Linaceae			
Hugonia obtusifolia C. M. Wright	Bondesobe	Zaire, west Africa	Pods
Loganiaceae			
Stachynos triclisioides Baker	.....	West Africa	Pulp
Loranthaceae			
Loranthus discolor Engler	Lige, mpoa	Zaire	Pulp
Malvaceae			
Abutilon mauritianum Sw.	Country mallow	West Africa	Pod
Melastomataceae			
Dinophora spenneroides Benth.	Fundoka	Equatorial Africa, Zaire	Pulp
Dissotis canescens	Ordeal bean	Southern Africa	Pulp
Dissotis erecta Dandy	.....	Zaire	Pulp
Dissotis hensii Cogn.	.....	Zaire	Pulp
Dissotis princeps	.....	Southern Africa	Pulp

Scientific name	Common name	Where found	Part used
Tristemma hirtum Beauv.	.....	Congo	Pulp
Tristemma incompletum R. Br.	.....	Equatorial Africa	Pulp
Tristemma virusanum Commers. ex Juss.	.....	Madagascar	Berries
Meliaceae			
Ekebergia arborea Bak. f.	.....	Malawi	Pulp
Ekebergia capensis	Dog ash	Southern Africa	Pulp
Ekebergia meyeri	Dog plum	Southern Africa	Pulp
Ekebergia pterophylla	.....	Southern Africa	Pulp
Ekebergia ruppeliana	Musimba	Zaire	Pulp
Trichilia buchanani	Mbayu	Zaire	Pulp
Trichilia emetica Vahl	Red ash, thunder tree	Nigeria, southern Africa	Pulp
Trichilia heudelotii	Soko	Zaire	Pulp
Trichilia kisoko	Kisoko	Zaire	Pulp
Trichilia lancei	Soko	Zaire	Pulp
Trichilia montchali	Esao	Zaire	Pulp
Trichilia prieureana	Mbula, mambobo	Zaire	Pulp
Trichilia rubescens	Libembe	Zaire	Pulp
Trichilia urbrosa	Soko	Zaire	Pulp
Turraea cabrae	Monganagana	Zaire	Pulp
Turraea floribunda	Honeysuckle	Southern Africa	Pulp
Turraea nilotica Kotschy et Peyr.	.....	Malawi	Pulp
Turraea vogelii	Niambe, boboie	Zaire	Pulp
Menispermaceae			
Burasaia madagascariensis Thouars.	.....	Madagascar	Berries
Chasmanthera welwitschii Troup.	.....	Central Africa	Berries
Cocculus cebatha DC.	.....	North Africa	Berries, pulp
Dioscoreophyllum cumminsii Diels	.....	Zaire	Berries
Sphenocentrum jollyanum Pierre	.....	West Africa	Berries
Tiliacora dielsiana Hutch. et Dalz.	.....	West Africa	Berries
Tiliacora gilletii	Efiliti	Zaire	Berries

Scientific name	Common name	Where found	Part used
Monimiaceae			
Xymalos monospora Baill. ex Warb.	Wild lemon, lemonwood	Malawi, southern Africa	Pulp
Moraceae			
Bosquiea angolensis Ficalho	Bofunge	Zaire	Pulp
Cardiogyne africana Bureau	Mbambo	Kenya	Pulp
Chlorophora excelsa Benth. et Hook. f.	Moreira	Zaire	Pulp
Chlorophora regia A. Chev.	.....	West Africa	Pulp
Ficus abutilifolia Miq.	.....	West Africa	Pulp
Ficus amadiensis	.....	North Nigeria	Pulp
Ficus artocarpoides Warb.	Eze, Likumo	Zaire, west Africa	Pulp
Ficus asperifolia Miq.	.....	North Cameroon, Madagascar	Pulp
Ficus baronii Bak.	Adabo	Madagascar	Pulp
Ficus barteri Sprague	.....	West Africa	Pulp
Ficus brachypoda	Koti	Zaire	Pulp
Ficus bubu	Mbubu	Zaire	Pulp
Ficus burkei	Wild fig	Southern Africa	Pulp
Ficus burrt-davyi	Wild fig	Southern Africa	Pulp
Ficus capensis Thunb.	Kaya	Zaire, southern Africa	Pulp
Ficus capensis var. *ostiolata*	Apapa	Zaire	Pulp
Ficus capreifolia Del.	Willow wild fig, samura	Zaire, southern, east, and west Africa	Pulp
Ficus cordata Thunb.	Wild fig	Southern Africa	Pulp
Ficus congensis Engler	.....	Equatorial Africa, Zaire	Pulp
Ficus crassipedicellata	Bongonguru	Zaire	Pulp
Ficus cyathistipula	Kimbale	Zaire	Pulp
Ficus dryepondtiana	Lotola	Zaire	Pulp
Ficus elegans Miq.	.....	West Africa	Pulp
Ficus eriobotryoides Kunth et Bouche	.....	West Africa	Pulp
Ficus eucalyptoides Batt. et Trab.	.....	Libya	Pulp
Ficus exasperata Vahl	Likoyo	Southern Africa, Zaire	Pulp

Scientific name	Common name	Where found	Part used
Ficus glumosa Del.	.....	Tropical Africa	Pulp
Ficus gnaphalocarpa Steud. ex A. Rich.	.....	Tropical Africa	Pulp
Ficus homblei De Wild.	.....	Zaire	Pulp
Ficus ilicina	Wild fig	Southern Africa	Pulp
Ficus ingens Miq.	Glabrous fig	Southern Africa, Malawi	Pulp
Ficus iteophylla Miq.	.....	West Africa	Pulp
Ficus kisantuensis	Nsanda	Zaire	Pulp
Ficus leprieuri	Mulumba	Zaire	Pulp
Ficus lingua	Moabu	Zaire	Pulp
Ficus luteola	Ambuta	Zaire	Pulp
Ficus mallotocarpa	Kikuya	Zaire, southern Africa	Pulp
Ficus megapoda Baker	.....	Madagascar	Pulp
Ficus mucosa Welw. ex Filcalho	Kibembe	West Africa	Pulp
Ficus natalensis Hochst.	Wild fig	Southern Africa	Pulp
Ficus nekbudu Warb.	Nekbudu	Zaire	Pulp
Ficus ovata Vahl var. *octomelifolia*	Leba	Zaire	Pulp
Ficus petersii	Wild fig	Southern Africa	Pulp
Ficus petitiana A. Rich.	.....	Ethiopia	Pulp
Ficus platyphylla Del.	.....	Tropical Africa	Pulp
Ficus polita Vahl	.....	Tropical Africa	Pulp
Ficus populifolia Vahl	.....	Sudan, central Africa	Pulp
Ficus pretoriae Burtt Davy	Wonderboom	Southern Africa	Pulp
Ficus preussii Warb.	Dikanda	Zaire	Pulp
Ficus pseudo-carica Miq.	.....	Ethiopia	Pulp
Ficus recurvata	Andom	Zaire	Pulp
Ficus rupium	Wild fig	Southern Africa	Pulp
Ficus sakalavarum Baker	Adabo	Madagascar	Pulp
Ficus salicifolia	Milumba	Zaire	Pulp
Ficus smutssii	Wild fig	Southern Africa	Pulp
Ficus soldenella	Wild fig	Southern Africa	Pulp
Ficus sonderi	Kitabataba	Zaire, southern Africa	Pulp
Ficus storthophylla	Adzogni	Zaire	Pulp
Ficus stuhlmannii Warb.	Makuyu, Stuhlmann's wild fig	Zaire, southern Africa	Pulp

Scientific name	Common name	Where found	Part used
Ficus sycomorus L.	Sycamore	North, east, and southern Africa	Pulp
Ficus teloukat Batt. et Trab.	Teloukat	Sahara, Libya	Pulp
Ficus thonningii	Bodo, nogi	Zaire	Pulp
Ficus tiliifolia Baker	.....	Madagascar	Pulp
Ficus tuberculata	Milumba	Zaire	Pulp
Ficus umbellata Vahl	Muteri	Zaire, Malawi	Pulp
Ficus urceolaris Welw. ex Hiern.	.....	Zaire, east Africa	Pulp
Ficus vallis-choudae Del.	Vuruma	Tropical Africa, Zaire	Pulp
Ficus verruculosa Warb.	Bwilembo	Angola, Zaire	Pulp
Ficus vestito-bracteata	Akai	Zaire	Pulp
Ficus vogeliana Miq.	.....	West Africa	Pulp
Ficus vogelii Miq.	Mtemboe	Tanzania	Pulp
Ficus wildemansiana	Sonkunu	Zaire	Pulp
Morus mesozygia Stapf	Murier du Senegal	West Africa	Pulp
Myriaceae			
Myrica cordifolia	.....	Southern Africa	Berries
Myrica faya Ait.	Firetree	Canary Islands	Berries
Myristicaceae			
Scyphocephalum ochocoa Warb.	Ochoco	West Africa	Pulp
Myrtaceae			
Eugenia arthroopoda Drake	.....	Madagascar	Pulp
Eugenia capensis Harv.	.....	Southern Africa	Pulp
Eugenia gerrardii Sim.	.....	Southern Africa	Pulp
Eugenia goviala H. Perr.	.....	Madagascar	Pulp
Eugenia owariensis P. Brauv.	Mukulumbi	Zaire	Pulp
Eugenia sakalavarum H. Perr.	.....	Madagascar	Pulp
Eugenia tisserantii Aubrev. et Pellegr.	Aliago-ngu	Central Africa	Pulp

Scientific name	Common name	Where found	Part used
Eugenia tropophyla H. Perr.	.....	Madagascar	Pulp
Eugenia zeyheri Harv.	Blacktea bush, wild jambos, wild myrtle	Madagascar	Pulp
Syzygium cordatum Hochst. ex Sond.	Waterberry	East and southern	Pulp
Syzygium gilletti	Mpese	Zaire	Pulp
Syzygium guineense DC.	Alika	Zaire	Pulp
Syzygium macrocarpum	Kpwokpwo	Zaire	Pulp
Syzygium owariense Benth.	Luamba	Malawi, Zaire	Pulp
Syzygium parvifolium	Mokote	Zaire	Pulp
Napoleonaceae			
Napoleonaea heudelotii A Juss.	.....	West Africa	Pulp
Napoleonaea imperialis Hutch. et Dalz.	.....	West Africa	Pulp, nut
Napoleonaea leonensis Hutch. et Dalz.	.....	West Africa	Pulp
Napoleonaea parviflora Bak. f.	.....	West Africa	Pulp
Napoleonaea vogelii Hook. et Planch.	.....	West Africa	Pulp
Naucleaceae			
Cephalanthus natalensis Oliv.	Quinineberry	Southern Africa	Pulp
Nauclea diderrichii Merr.	.....	Tropical Africa	Pulp
Nyctaginaceae			
Boerhavia diffusa L.	Hogweed, tanguinarh	West Africa	Pulp
Ochnaceae			
Ochna afzelii R. Br. ex Oliv.	.....	West Africa	Berries
Ochna arborea	Redwood	Southern Africa	Berries
Ochna debeerstii	Kinkunga	Zaire	Berries
Ochna holstii	Real red pear	Southern Africa	Berries

Scientific name	Common name	Where found	Part used
Ochna katangensis De Wild.	Mulolo	Zaire	Berries
Ochna natalitia	Redwood	Southern Africa	Berries
Ochna o'connori	African boxwood	Southern Africa	Berries
Ochna pretoriensis	Mountain plum	Southern Africa	Berries
Ochna pulchra	Wild pear, wild plum	Southern Africa	Berries
Ochna schweinfurthiana F. Hoffm.	Kitete	Zaire	Berries
Ochna suberosa	Kasukasuka	Zaire	Berries
Ouratea arnoldiana	Mosange	Zaire	Carpels
Ouratea brunneo-purpurea	Bosaka	Zaire	Carpels
Ouratea callophylla	Mpandjandji	Zaire	Carpels
Ouratea coriacea	Bonpandja	Zaire	Carpels
Ouratea densiflora	Bongolu	Zaire	Carpels
Ouratea dewevrei	Bolo	Zaire	Carpels
Ouratea elongata	Bukali	Zaire	Carpels
Ouratea engama	Engama	Zaire	Carpels
Ouratea flava Hutch. et Dalz.	.....	West Africa	Carpels
Ouratea goosensi	Kosaka	Zaire	Carpels
Ouratea laxiflora	Mbete	Zaire	Carpels
Ouratea likimiensis	Bokwabangi	Zaire	Carpels
Ouratea macrobotrys	Bofafuta	Zaire	Carpels
Ouratea pellucida	Sati	Zaire	Carpels
Ouratea refracta	Fendjinjoko	Zaire	Carpels
Ouratea subumbellata	Mbogo	Zaire	Carpels
Ouratea thonneri	Akwala	Zaire	Carpels
Ouratea welwitschii	Mokamba	Zaire	Carpels
Olacaceae			
Coula edulis Baill. var. *cabrae* J. Leon.	African walnut, kumunu, mombombo	West Africa, Zaire, Gabon	Nut, pulp
Heisteria parvifolia Sm.	Longuanta	Zaire, Liberia	Nut, pulp
Heisteria parvifolia var. *angustifolia*	Lokuanta	Zaire	Nut, pulp
Heisteria parvifolia var. *grandifolia*	Bokala	Zaire	Nut, pulp
Heisteria trillesiana Pierre	.....	Gabon	Nut, pulp
Olax pynaertii De Wild.	.....	Zaire	Nut

Scientific name	Common name	Where found	Part used
Olax subscorpioidea Oliv.	Miti	Ghana	Pulp
Ongokea gore Pierre	Boleka	Tropical Africa	Nut
Strombosia grandifolia Hook. f. ex Benth.	M'senha	Tropical Africa	Nut
Ximenia caffra Sond.	Sour plum	East and southern Africa, Malawi	Pulp (juice)
Ximenia caffra var. *natalensis*	Natal plum, wild plum	Southern Africa	Pulp (juice)
Oleaceae			
Jasminum bieleri	Tete	Zaire	Pulp
Jasminum Vahl	Kisjinko	Uganda, Zaire	Pulp
Olea africana Mill.	Wild or brown olive, muke	East and southern Africa, Zaire	Pulp
Olea capensis L.	.....	Southern Africa	Pulp
Olea exasperata	Snakewood	Southern Africa	Pulp
Olea hochstetteri	Ndobo	Zaire	Pulp
Olea laurifolia Lam.	.....	Southern Africa	Pulp
Olea macrocarpa Wright	.....	Southern Africa	Pulp
Olea woodiana Knobl.	.....	Southern Africa	Pulp
Opiliaceae			
Opilia celtidifolia Endl. ex Walp.	.....	Kenya	Pulp
Palmae			
Hyphaene coriacea Gaertn.	Gingerbread palm	East Africa	Pulp
Hyphaene crinata Gaertn.	Fan palm, ilala palm	Southern Africa	Pulp
Hyphaene dankaliensis Becc.	.....	Eastern Ethiopia	Pulp
Hyphaene guineense	Mako	Zaire	Pulp
Hyphaene schatan Boj.	Satra	Madagascar	Nut
Hyphaene thebaica Mart.	Dum palm	Tropical Africa	Unripe kernel
Hyphaene ventricosa Kirk.	Fan palm	Southern Africa	Pulp
Medemia argun H. Wendl.	.....	North Africa	Pulp

Scientific name	Common name	Where found	Part used
Phoenix canariensis Hort.	.....	Canary Islands	Pulp
Podococcus barteri Mann. et Wendl.	.....	West Africa	Nut
Raphia farinifera Hylander	Rafia	Madagascar	Nut, pulp
Raphia hookeri Mann. et Wendl.	Raffia	Ivory Coast	Nut
Raphia vinifera Beauv.	.....	Tropical Africa	Pulp
Vonitra utilis Jum.	Vonitra	Madagascar	Pulp
Pandanaceae			
Microdesmis puberula Hook. f. ex Planch.	Iseke	Tropical Africa	Pulp
Pandanus candelabrum	Makeke	Zaire	Pulp
Pandanus edulis Thouars	.....	Madagascar	Pulp
Pandanus utilis Bory	.....	Madagascar	Pulp, seed
Passifloraceae			
Adenia hastata Schinz Davy	.....	Southern Africa	Pulp
Passiflora caerulea L.	Passionflower	Southern Africa	Pulp
Passiflora foetida L.	Stinky passion fruit	Tropical Africa	Pulp
Passiflora incarnata L.	Apricot vine	Madagascar	Pulp
Passiflora laurifolia L.	Lemon apple	Tropical Africa	Pulp
Passiflora stipulata Aubl.	Grenadille	Madagascar	Pulp
Pentadiplandraceae			
Pentadiplandra brazzeana Baill.	.....	Zaire	Pulp
Pistaciaceae			
Pistacia atlantica Desf. Betoum.	.....	Northern Africa	Nut
Pistacia vera L.	Pistachio nut	Tunisia, Near East	Nut
Polygalaceae			
Atroxima afzeliana Stapf	.....	West Africa	Pulp

Scientific name	Common name	Where found	Part used
Carpolobia alba G. Don	Bondjeke, biembe	West Africa, Zaire	Pulp
Carpolobia goetzei Guerke	Mtindapo	Kenya, Tanzania	Pulp
Carpolobia lutea G. Don	.....	West Africa	Pulp
Proteaceae			
Brabejum stellatifolium L.	Wild almond	Southern Africa	Seed (beverage)
Rhamnaceae			
Berchemia discolor Hemsley	Bird plum	Equatorial and southern Africa	Pulp
Berchemia zeyheri	Pink ivory, red ivory	Southern Africa, Swaziland	Pulp
Maesopsis eminii Engler	.....	West and southern Africa	Pulp
Rhamnus zeyeri Sond.	Red ebony	Southern Africa	Pulp
Scutia myrtina Kurz	Cat thorn	Uganda, southern Africa	Pulp
Ziziphus abyssinica Hochst. ex A. Rich.	Catch thorn	Southern Africa	Pulp
Ziziphus helvola	Small wait-a-bit	Southern Africa	Pulp
Ziziphus jujuba Mill.	Kankole	Zaire	Pulp
Ziziphus lotus Lam.	Lotus fruit	Tunisia, western Sahara	Pulp
Ziziphus mucronata Willd.	Buffalo thorn	East and southern Africa	Pulp
Ziziphus pubescens Oliv.	Mkone	East Africa	Pulp
Ziziphus zeyheriana Sond.	Sekhalo, wait-a-bit	Southern Africa	Pulp
Rhizophoraceae			
Cassipourea congoensis R. Br. ex DC.	.....	Zaire	Pulp (aril)
Poga oleosa Pierre	Inoi nut	Cameroon	Nut
Rhizophora mangle L.	Meuma	Zaire	Embryo
Rhizophora mucronata Lam.	Red mangrove	Southern Africa	Embryo
Rhizophora racemosa G. F. W. Mey.	Tarrafe, mema	Bissago, Zaire	Embryo

Scientific name	Common name	Where found	Part used
Rosaceae			
Crataegus azarolus L.	Azarole	North Africa	Pulp
Crataegus pubescens Steud.	Mexican hawthorn	Southern Africa	Pulp
Mespilus germanica L.	Medlar	North Africa	Overripe pulp
Pancovia laurentii Gilg ex De Wild.	Bodumbe	Zaire	Pulp
Pyrenacantha scandens	.....	Zaire	Pulp
Rubus apetalus Poir.	Voaromainty	Madagascar, west and east Africa	Berries
Rubus cuneifolius Pursh	Gozzard's curse	Southern Africa	Berries
Rubus fellatae A Chev.	.....	West Africa	Berries
Rubus fruticosus L.	Blackberry, bramble	Southern Africa	Berries
Rubus idaeus L.	Wild raspberry	Madagascar	Berries
Rubus ludwigii	Wild raspberry	Southern Africa	Berries
Rubus myrianthus Baker	Voarmainty	Madagascar	Berries
Rubus pauciflorus Baker	.....	Madagascar	Berries
Rubus pinnatus Willd.	South African blackberry	Zaire, Cameroon	Berries
Rubus rigidus Sm.	.....	Zaire	Berries
Rubus rosiefolius Sm.	Himalayan raspberry	Madagascar	Berries
Rubus runssorenis Engler	.....	Zaire	Berries
Rubus steudneri Schweinf.	.....	East Africa	Berries
Rubus transvalliensis	Brame	Southern Africa	Berries
Rubus volkensii Engler	.....	East Africa	Berries
Sorbus domestica L.	Service tree	North Africa	Berries
Rubiaceae			
Canthium ciliatum	.....	Southern Africa	Pulp
Canthium crassum Hiern.	.....	Kenya, Malawi	Pulp
Canthium longiflorum Hiern.	.....	Tropical Africa	Pulp
Canthium gilfillanii	.....	Southern Africa	Pulp

Scientific name	Common name	Where found	Part used
Canthium glabriflorum	Mukula	Zaire	Pulp
Canthium gueinzii Sond.	Monkey rope	Southern Africa	Pulp
Canthium huillense	.....	Southern Africa	Pulp
Canthium inerme O. Ktze.	Cape date, turkeyberry	Southern Africa	Pulp
Canthium lactescens Hiern.	.....	East Africa	Pulp
Canthium mundtianum	Rock alder	Southern Africa	Pulp
Canthium obovatum	Quar	Southern Africa	Pulp
Canthium oddoni	Bokiri	Zaire	Pulp
Canthium pauciflorum	.....	Southern Africa	Pulp
Canthium spinosum	.....	Southern Africa	Pulp
Canthium venosum	Mabunga	Zaire	Pulp
Euclinia longiflora Salisb.	.....	West Africa	Pulp
Fadogia cienkowskii Schweinf.	.....	Tropical Africa	Pulp
Fadogia fragrans	Wild date	Southern Africa	Pulp
Fadogia odorata Krause	.....	Malawi	Pulp
Fadogia salictaria	Katuba	Zaire	Pulp
Fadogia schumanniana	Kibusji	Zaire	Pulp
Fadogia tomentosa	Lumpembe	Zaire	Pulp
Gardenia aqualla Stapf et Hutch.	.....	Tropical Africa	Pulp
Gardenia boonei	Yapingu	Zaire	Pulp
Gardenia cornuta	Wild apple	Southern Africa	Pulp
Gardenia erubescens Stapf et Hutch.	Madju	Tropical Africa	Pulp
Gardenia imperialis	Mutoto	Zaire	Pulp
Gardenia jasminoides	Cape jessamine	Southern Africa	Pulp
Gardenia jovis-tonantis Hiern.	Ngbege	Sudan, Zaire	Pulp
Gardenia lutea Fres.	.....	Ethiopia	Pulp
Gardenia neuberia Eckl. et Zeyh.	Kaffir cherry	Southern Africa	Pulp
Gardenia nitida Hook.	.....	Ghana	Pulp
Gardenia ternifolia Schum. et Thonn.	.....	Sudan	Pulp
Genipa rutenbergiana Baill.	Karipedahy	Madagascar	Pulp

Scientific name	Common name	Where found	Part used
Heinsia crinita G. Tayl.	Bush apple	Tropical Africa	Pulp
Heinsia pulchella var. *phyllocalyx*	Bwongo	Zaire	Pulp
Ixora astericus	Matshi	Zaire	Berries
Ixora brachypoda DC.	Batiango, litumba	Gambia, west Africa, Zaire	Berries
Ixora longipedunculata De Wild.	Bolombo	Zaire	Berries
Ixora odorata	Singa	Zaire	Berries
Ixora soyauxii	Monyenye	Zaire	Berries
Morelia senegalensis A. Rich.	.....	Nigeria	Pulp
Mussaenda arcuata Lam.	Groseillier de l'afrique Centrale, Mapinga	Tropical Africa, Zaire	Berries
Mussaenda elegans Schum. et Thonn.	Alambili	West Africa, Zaire	Berries
Mussaenda erythrophylla	Lofandja	Zaire	Berries
Mussaenda stenocarpa	Mpalambambu	Zaire	Berries
Mussaenda tenuiflora	Bompampango	Zaire	Berries
Oxyanthus gerrardii	Whipstick tree	Southern Africa	Pulp
Oxyanthus tubiflorus DC.	.....	Sierre Leone	Pulp
Pauridiantha canthiifolia	Molikuana	Zaire	Pulp
Pauridiantha dewevrei Bremek.	Mpapungo	Zaire	Pulp
Pouchetia gilletii De Wild.	Bokana	Zaire	Pulp
Pygmaeothamnus zeyheri Robyns	.....	Southern Africa	Pulp
Rothmannia capensis	Candlewood	Southern Africa	Pulp
Rothmannia hispida	Botumba	Zaire	Pulp
Rothmannia lateriflora	Bita	Zaire	Pulp
Rothmannia longiflora Salisb.	.....	Tropical Africa	Pulp
Rothmannia manganjae Garcia	.....	Malawi	Pulp

Scientific name	Common name	Where found	Part used
Rutidea glabra Hiern.	Nserewedua	Ghana	Berries
Rytigynia tomentosa Robyns	.....	Tropical Africa	Pulp
Sabicea africana Hepper	.....	Central Africa	Berries
Sabicea calycina	Ibango	Zaire	Berries
Sabicea elliptica Hepper	.....	Central Africa	Berries
Sabicea goosensis	Ntsinga-ntumu	Zaire	Berries
Sabicea laurentii	Boanga	Zaire	Berries
Sabicea venosa	Sama	Zaire	Berries
Sabicea vogelii Benth.	.....	Sierre Leone	Berries
Sherbournia bignoniiflora Hua.	.....	West Africa	Pulp
Sherbournia calycina Hua	.....	West Africa, Zaire	Pulp
Tapiphyllum parvifolium Robyns	Berg mispel	Southern Africa	Pulp
Temnocalyx fuchsioides Robyns	Makumbakumba	Zaire	Pulp
Temnocalyx obovatus Robyns	Buliansimba	Malawi, Zaire	Pulp
Temnocalyx verdickii	Pombao-mwefu	Zaire	Pulp
Vangueria acutiloba Robyns	.....	East Africa	Pulp
Vangueria apiculata K. Schum.	.....	East Africa	Pulp
Vangueria esculenta S. Moore	Munjiro	Mozambique	Pulp
Vangueria infausta Burch.	Wild medlar, mabolela	Equatorial and southern Africa	Pulp
Vangueria madagascariensis J.F. Gmel.	Spanish tamarind	Madagascar	Overripe pulp
Vangueria reygaerti	Bolenge	Zaire	
Vangueria tomentosa Hochst.	Wild medlar	Equatorial and southern Africa	Pulp
Vangueria venosa Hochst.	Wild medlar	Africa	Pulp
Vangueriopsis lanciflora Robyns	Wild medlar	Southern Africa	Pulp
Warburgia ugandensis Sprague	.....	East Africa	Pulp

Scientific name	Common name	Where found	Part used
Rutaceae			
Calodendron capensis Thunb.	Cape chestnut	Southern Africa	Nut
Clausena anisata Hook. f. ex Benth.	Mokolokale	Zaire, southern Africa	Pulp
Feretia apodanthera Del.	.....	Northern Cameroon, Chad	Pulp
Oricia swynnertonii Verd.	.....	Zimbabwe	Berries
Teclea afzelii Engler	.....	West Africa	Pulp
Teclea englerima	Kimena	Zaire	Pulp
Teclea natalensis	Bastard ironwood	Southern Africa	Pulp
Salvadoraceae			
Dobera roxburghii Planch.	.....	Tropical Africa	Pulp
Salvadora angustifolia	Lion bush	Southern Africa	Pulp
Salvadora persica L.	Toothbrush tree	Scattered throughout Africa	Pulp
Sapindaceae			
Aphania senegalensis Radlk.	Soapberry	Senegal, east Africa	Pulp
Blighia milbraedii	Kokole	Zaire	Pulp (aril)
Blighia wildemaniana Gilg. ex De Wild.	Bosi	Zaire	Pulp (aril)
Cardiospermum alatum	.....	Southern Africa	Pulp (aril)
Cardiospermum halicacabum L.	Pumpum	Northern Cameroon	Pulp
Chytranthus gerardii De Wild.	.....	Zaire	Pulp
Chytranthus macrobotrys Exell. et Mendonca	Bodumbe	West Africa	Pulp
Chytranthus mannii Hook. f.	.....	Tropical Africa	Pulp

Scientific name	Common name	Where found	Part used
Chytranthus mortehanii De Voldere	Odomba	Tropical Africa	Pulp
Deinbollia borbonica Scheff.	Mkilimu	Kenya	Pulp
Deinbollia giorgii	Mombia	Zaire	Pulp
Deinbollia grandifolia Hook. f.	.....	Tropical Africa	Pulp, seed
Deinbollia laurentii	Lifake	Zaire	Pulp
Deinbollia pinnata Schum. et Thonn.	.....	Tropical Africa	Pulp
Deinbollia pynaertii	Eshu	Zaire	Pulp
Deinbollia variabilis	Limbangi	Zaire	Pulp
Eriocoelum microspermum	Boembe	Zaire	Pulp
Eriocoelum racemosum Baker	.....	Ivory Coast	Pulp
Lecaniodiscus cupanioides Planch. ex Benth.	.....	West Africa	Pulp
Papea capensis Eckl. et Zeyh.	Wild plum	Southern Africa	Pulp
Paullinia pinnata L.	Lusambo	West Africa	Pulp
Sapindus senegalensis Poir.	Senegal cherry	West Africa	Pulp
Zanha golungensis Hiern.	.....	Togo, Malawi	Pulp
Sapotaceae			
Afrosersalisia afzelii A. Chev.	.....	West Africa	Pulp
Afrosersalisia cerasifera Aubrév.	.....	Equatoual Africa	Pulp
Afrosersalisia malchairi	Ebe	Zaire	Pulp
Aningueria robusta Aubrév. et Pellegr.	.....	Tropical Africa	Pulp
Baillonella toxisperma Pierre	Djave	Tropical Africa	Nut
Bequaertiodendron magalismontanum Heine et J. H. Hemsley	Musambya	Tropical Africa	Pulp
Bequaertiodendron natalina Heine et J. H. Hemsley	Mwamba	Kenya	Pulp
Bequaertiodendron oblanceolatum Heine et J. H. Hemsley	.....	Tropical Africa	Pulp

Scientific name	Common name	Where found	Part used
Chrysophyllum albidum G. Don	White star apple	Tropical Africa	Pulp
Chrysophyllum brieyi	Kalolongi	Zaire	Pulp
Chrysophyllum claessensi	Agbulu	Zaire	Pulp
Chrysophyllum delevoyi De Wild.	Mwalu, African star apple	Zaire, west Africa	Pulp
Chrysophyllum lacourtianum De Wild	Bonono	West Africa, Zaire	Pulp
Chrysophyllum longifolium	Inginge	Zaire	Pulp
Chrysophyllum longipes	Amekwiru	Zaire	Pulp
Chrysophyllum lungi	Lungi	Zaire	Pulp
Chrysophyllum magalis-montana Sond.	Stam vrugte	Southern Africa	Pulp
Chrysophyllum mortehani	Bosabe	Zaire	Pulp
Chrysophyllum obovatum Sabine	.....	Tropical Africa	Pulp
Chrysophyllum perpulchrum Mildbr. ex Hutch. et Dalz.	Monkey star apple	Tropical Africa	Pulp
Chrysophyllum pruniforme Pierre ex Engler	Prunier du Gabon	West Africa	Pulp
Chrysophyllum vermoeseni	Dilonge	Zaire	Pulp
Malacantha alnifolia Pierre	Bulanga	Tropical Africa, Zaire	Pulp
Manilkara butugi Chiov.	Ludulio	Kenya	Pulp
Manilkara cuneifolia Dubard	N-kunya	Uganda	Pulp
Manilkara mochisia Dubard	Mnago	East Africa	Pulp
Manilkara obovata J. H. Hemsley	African pearwood	West Africa	Pulp
Mimusops affinis	Mungagu	Zaire	Pulp
Mimusops angolensis	Kungulu	Zaire	Pulp
Mimusops bagshawei S. Moore	.....	East and southern Africa	Pulp
Mimusops boonei var. *acuminata*	Bulongo	Zaire	Pulp
Mimusops djave Engler	Muabi	Tropical Africa, Zaire	Pulp, seed (oil)

Scientific name	Common name	Where found	Part used
Mimusops giorgii	Mutondo	Zaire	Pulp
Mimusops heckelii Hutch. et J. M. Dalz.	Baco nut	Tropical Africa	Seed (oil)
Mimusops kummel Bruce	.....	East and southern Africa	Pulp
Mimusops obovata	Red milkwood	Southern Africa	Pulp
Mimusops schimpferi Hochst.	.....	Egypt, Ethiopia	Pulp
Mimusops zeyheri Sond.	Transvaal milk-wood	Zambia southern Africa	Pulp
Neolemonniera adolfi-friderici	Muhagi	Zaire	Pulp
Neolemonniera clitandrifolia Heine	.....	Tropical Africa	Pulp, seed
Neolemonniera inerme	White milkwood	Southern Africa	Pulp
Omphalocarpum agglomeratum	Sangasanga	Zaire	Pulp
Omphalocarpum bomanehense	Bofamba	Zaire	Pulp
Omphalocarpum boyankombo	Boyankombo	Zaire	Pulp
Omphalocarpum brieyi	Nsala	Zaire	Pulp
Omphalocarpum busange	Busange	Zaire	Pulp
Omphalocarpum ghesquierei	Bomate, sanga sanga	Zaire	Pulp
Omphalocarpum laurentii	Mubata	Zaire	Pulp
Omphalocarpum lujai	Bodimba	Zaire	Pulp
Omphalocarpum mortehani	Bolubu	Zaire	Pulp
Omphalocarpum procerum Beauv.	.....	Ghana, west Africa	Pulp (soup)
Omphalocarpum sankuruensis	Illula	Zaire	Pulp
Omphalocarpum vermoeseni	Salala	Zaire	Pulp
Pachystela brevipes Baill. ex Engler	Mopika	Tropical Africa	Pulp
Pachystela longistyla	Bokoloku	Zaire	Pulp
Pachystela msolo Engler	Monbongome	Uganda, Kenya, Zaire	Pulp
Sideroxylon inerme L.	Milkwood	Southern Africa	Pulp

Scientific name	Common name	Where found	Part used
Synsepalum attenuatum Hutch. et J. M. Dalz.	Miracle fruit	Nigeria	Pulp
Synsepalum dulcificum Daniel	Miracle fruit	Dahomey, Ghana, Zaire	Pulp
Synsepalum glychdorum Wernham	Miracle fruit	Tropical Africa	Pulp
Synsepalum stipulatum Engler	Miracle fruit	Tropical Africa	Pulp
Synsepalum subcordatum De Wild	.....	Tropical Africa	Pulp
Sarcolaenaceae			
Rhodolaena bakeriana Baill.	Fotona	Madagascar	Pulp
Scytopetalaceae			
Scytopetalum tieghemii Hutch. et Dalz.	.....	Sierra Leone	Pulp
Simarubaceae			
Odyendea gabonensis Engler	.....	Gabon	Nut
Smilacaceae			
Smilax kraussiana Meisn.	Wait-a-bit	Zaire	Berries
Sterculiaceae			
Cola acuminata Schott et Endl.	Abata kola	West Africa	Seeds
Cola caricifolia K. Schum.	Monkey cola	West Africa	Seeds, pulp
Cola chlamydantha K. Schum.	Ekom	Cameroon	Pulp
Cola cordifolia R. Br.	Boro	Zaire, tropical Africa	Pulp, seeds
Cola derumieri	Viniu	Zaire	Pulp
Cola diversifolia De Wild. et Th. Dur.	Ikaie, kurrajong	Zaire, tropical Africa	Seeds
Cola gilletii De Wild.	Skaie	Tropical Africa, Zaire	Pulp
Cola griseiflora	Mokekeri	Zaire	Pulp

Scientific name	Common name	Where found	Part used
Cola heterophylla Schott. et Endl.	Ikaie	Tropical Africa, Zaire	Seeds
Cola lateritia K. Schum.	Likoko	Sierra Leone to Zaire	Pulp
Cola laurentii	Vuvunga	Zaire	Pulp
Cola lepidola	.....	.....	Pulp
Cola nalaensis	Boboi	Zaire	Pulp
Cola nitida Schott et Endl.	Kola	Tropical Africa	Seeds
Cola pachycarpa	.....	.....	.....
Cola rhodophylla	Mbwakila	Zaire	Pulp
Cola subverticillata	Ekongo	Zaire	Pulp
Cola togoensis Engler et Krause	Monkey cola	West Africa	Seeds
Cola variantifolia	Lokeke	Zaire	Pulp
Cola verticillata Stapf ex A. chev.	Slipperly cola	West Africa	Seeds
Hildegardia barteri Kosterm.	.....	West Africa	Seeds
Scaphopetalum amoenum A. Chev.	.....	Liberia, Ivory Coast	Seed
Sterculia foetida L.	Javo olive	Senegal	Seed
Sterculia oblonga Mart.	.....	Cameroon	Seed
Sterculia setigera Del.	.....	West Africa, Uganda	Seed
Strychnaceae			
Strychnos boonei	Malekwe	Zaire	Pulp
Strychnos cocculoides Baker	Polopopo, kaffir orange	Zaire, southern Africa	Pulp
Strychnos congolana	Goyo	Zaire	Pulp
Strychnos dale	Dale	Zaire	Pulp
Strychnos decussata Gilg.	Mdolongwe, cape teak	Kenya, southern Africa	Pulp
Strychnos dewevrei Gilg.	Mbundu	Zaire	Pulp
Strychnos dundusanensis	Benge	Zaire	Pulp
Strychnos gerrardii N. E. Br.	Monkey apple	Mozambique, Swaziland	Pulp
Strychnos henningsii Gilg.	Cape hard pear	Southern Africa	Pulp

Scientific name	Common name	Where found	Part used
Strychnos innocua Del.	Monkey apple	Uganda, tropical Africa	Pulp
Strychnos likimiensis	Bosisilit	Zaire	Pulp
Strychnos malchairi	Mobau	Zaire	Pulp
Strychnos miniungansamba	Kakunta-puku	Zaire	Pulp
Strychnos mortehani	Mongonda	Zaire	Pulp
Strychnos pungens Solered.	Drikondu, kaffir orange	Zaire, southern Africa	Pulp
Strychnos reygaerti	Malegwe	Zaire	Pulp
Strychnos schumanniana Gilg.	.....	Southern Africa	Pulp
Strychnos spinosa Lam.	Natal orange	Southern Africa, Madagascar	Pulp

Figure 39.—*Strychnos spinosa*, a fruit with edible pulp and poisonous seeds.

Scientific name	Common name	Where found	Part used
Strychnos subaquatica	Benge	Zaire	Pulp
Strychnos suberosa De Wild.	Polopopo	Zaire	Pulp
Strychnos unguacha A. Rich.	Sanza	Zaire	Pulp
Strychnos vacacoua Baill.	Bakanko	Madagascar	Pulp
Strychnos volkensii Gilg. ex Engl.	Moage	East Africa	Pulp
Thymelacaceae			
Dicranolepsis baertsiana	Intoe	Zaire	Pulp
Dicranolepsis oligantha	Limbala	Zaire	Pulp
Dicranolepsis persei Cummins	.....	Ghana	Pulp
Dicranolepsis pulcherrima	Embala	Zaire	Pulp
Peddiea africana	.....	Southern Africa	Pulp
Peddiea fischeri Engl.	Kurandoli	Guinea	Pulp
Tiliaceae			
Desplatsia chrysochlamys Milbr. et Burret	.....	Central Africa	Berries
Desplatsia dewevrei Burret	Nokamba	Central Africa, Zaire	Berries
Desplatsia subericarpa	.....	Southern Africa	Berries
Grewia barteri Burret	Gurku	Northern Nigeria	Berries
Grewia bicolor Juss.	Imijij dargaza	Mauritania, Nigeria, southern Africa	Berries
Grewia caffra	.....	Zaire	Berries
Grewia carpinifolia Juss.	Ntamba	West Africa, Zaire	Berries
Grewia cissoides Hutch. et. Dalz.	.....	Northern Cameroon	Berries
Grewia claessensi	Akamba	Zaire	Berries
Grewia conocarpa K. Schum.	.....	Tanzania	Berries
Grewia coriacea	.....	Zaire	Berries
Grewia ectasicarpa S. Moore	Msokote	Kenya	Berries

Scientific name	Common name	Where found	Part used
Grewia flava DC.	Brandy bush, wild currant	Southern Africa	Berries
Grewia flavescens Juss.	Abba	Tropical and southern Africa	Berries
Grewia homblei	Malembwe	Zaire	Berries
Grewia inacquilatera	.....	Southern Africa	Berries
Grewia kapiriensis	Butola	Zaire	Berries
Grewia lasiocarpa	Elephant's ear	Southern Africa	Berries
Grewia malacarpa	Abasa	Zaire	Berries
Grewia megalocarpa Juss.	.....	Tropical Africa	Berries
Grewia mollis Juss.	Kpoyo, gombo	Tropical Africa, Zaire	Berries
Grewia monticola	.....	Zaire	Beries
Grewia occidentalis	Four-corners-berry	Southern Africa	Berries
Grewia pachycalyx K. Schum.	.....	Tanzania	Berries
Grewia pinnatifida	Mabasa, epumbu	Zaire	Berries
Grewia pubescens Beauv.	.....	West Africa	Berries
Grewia robusta	.....	Southern Africa	Berries
Grewia sereti	Masani	Zaire	Berries
Grewia similis K. Schum.	.....	East Africa	Berries
Grewia subargentea	Bakba, balawa	Zaire	Berries
Grewia tenax Fiori	Gleia	Western Sahara, Nigeria, Sudan	Berries
Grewia trichocarpa Hochst. ex A. Rich.	.....	East Africa	Berries
Grewia venusta	Mulembe	Zaire	Berries
Grewia villosa Willd.	Goursoumi	Tropical Africa	Berries
Grewia woodiana K. Schum.	.....	Malawi	Berries
Leptonychia batangensis Burrett	Bofumbo	Zaire	Berries
Leptonychia multiflora	Indembu	Zaire	Berries
Uapacaceae			
Uapaca albida	Masuku	Zaire	Pulp
Uapaca angustipyrena	Djangasenge	Zaire	Pulp
Uapaca bossenge	Bosenge	Zaire	Pulp
Uapaca brieyi	Samfi	Zaire	Pulp
Uapaca casteelsi	Bosenge na mokili	Zaire	Pulp
Uapaca clusioides Baker	Tapia	Madagascar	Pulp
Uapaca corbisieri	Djangasenge	Zaire	Pulp
Uapaca dubia De Wild.	Malobe	Zaire	Pulp

Scientific name	Common name	Where found	Part used
Uapaca ealeansis	Bosenge na mokili	Zaire	Pulp
Uapaca esculenta A. Chev. ex Aubrév. et Leandri	.....	West Africa	Pulp
Uapaca ferrari	Makala	Zaire	Pulp
Uapaca goosensi	Djangasenge	Zaire	Pulp
Uapaca guineensis Muell.-Arg.	Sugarplum, bosenge na mai	Equatorial Africa	Pulp
Uapaca heudelotii Baill.	Mbula	Equatorial Africa	Pulp
Uapaca homblei	Masuku	Zaire	Pulp
Uapaca kibuati	Kibuati	Zaire	Pulp
Uapaca kirkiana Muell.-Arg.	Wild loquat, mzhanzhe, masuku	Zambia, Malawi, Zaire, southern Africa	Pulp
Uapaca laurenti	Bosenge	Zaire	Pulp
Uapaca lebruni	Bosenge	Zaire	Pulp
Uapaca macrostipulata	Bosenge na mokili	Zaire	Pulp
Uapaca masuku	Masuku	Zaire	Pulp
Uapaca multinervata	Bosenge na mai	Zaire	Pulp
Uapaca munamensis	Tokongo	Zaire	Pulp
Uapaca meo-masuku	Masuku	Zaire	Pulp
Uapaca nitida Muell.-Arg.	Musenge	Zaire	Pulp
Uapaca pilosa Hutch.	Mukonkola	Tropical Africa	Pulp
Uapaca pynaerti	D'angasenge	Zaire	Pulp
Uapaca robynsi	Misuku	Zaire	Pulp
Uapaca samfi	Samfi	Zaire	Pulp
Uapaca sansibarica Pax	.....	Tropical Africa	Pulp
Uapaca staudii Pax	.....	West Africa	Pulp
Uapaca togoensis Pax	.....	Tropical Africa	Pulp
Uapaca vanhouttei	Nkalankala kimasa	Zaire	Pulp
Ulmaceae			
Celtis africana	Cannibal stinkwood	Southern Africa	Pulp
Celtis brieyi De Wild.	Diania	Zaire	Pulp
Celtis durandii	Lingenge	Zaire	Pulp
Celtis integrifolia Lam.	Nettle tree	Tropical Africa	Pulp
Trema orientalis Blume	Esese, pigeonwood	Zaire, southern Africa	Pulp

Scientific name	Common name	Where found	Part used
Urticaceae			
Musanga cecropiodes R. Br.	Corkwood, umbrella tree, mambamba	Zaire	Berries
Musanga smithii R. Br.	.....	Tropical Africa	Pulp (beverage)
Myrianthus arboreus Beauv.	Mobambu	West Africa, Zaire	Nut
Myrianthus holstii Engler	Yellow giant mulberry, mwamba	Zaire, east Africa	Nut
Myrianthus libericus Rendle	.....	Liberia	Nut
Myrianthus preussi	Ekoka	Zaire	Nut
Myrianthus serratus Benth.	Anyankoma	West Africa	Nut
Verbenaceae			
Lantana camara L.	Lantana	Tropical Africa	Berries
Lantana repens	Wild rosmary	Zaire	Berries
Lantana rhodesiensis Moldenke	.....	East Africa	Berries
Lantana rugosa	Birds brandy	Zaire	Berries
Lantana trifolia L.	Lantana	Tropical Africa	Berries
Premma holstii Guerke	Mvumbangombe	Tropical Africa	Berries
Vitex bequaerti	Musuku	Zaire	Berries
Vitex congolensis	Bolombe	Zaire	Berries
Vitex crenata A. Chev.	Alia	Equatorial Africa	Berries
Vitex ferruginea Schum. et Thonn.	.....	West Africa	Berries
Vitex fischeri Guerke	.....	Tanzania	Berries
Vitex grandifolia Guerke	.....	West Africa	Berries
Vitex huillensis	Molankunda	Zaire	Berries
Vitex kapirensis De Wild.	Mufutu	Zaire	Berries
Vitex keniensis Turrill	.....	Tanzania	Berries
Vitex longipetiolata Guerke	.....	Equatorial Africa	Berries
Vitex madiensis Oliv.	Mufutu, nembule	Zaire	Berries
Vitex micrantha Guerke	.....	Liberia	Berries
Vitex mombassae Vatke	Samba	Tanzania, Malawi, Zaire	Berries

Scientific name	Common name	Where found	Part used
Vitex payos Merrill	.....	Zimbabwe	Berries
Vitex phaeotricha Mildbr. ex Pieper	.....	Equatorial Africa	Berries
Vitex polyantha	Mufutu-kinka	Zaire	Berries
Vitex poora Corbishley	Stinkbessie, stickberry	Southern Africa	Berries
Vitex rivularis Guerke	.....	West Africa	Berries
Vitex simplicifolia Oliv.	.....	West and equatorial Africa	Berries
Vitex strickeri Vatke et Hildebr.	.....	Tanzania	Berries
Vitex thomasi	Mufutu	Zaire	Berries
Vitex thonneri	Esesele	Zaire	Berries
Vitex vermoeseni	Palabikunda	Zaire	Berries
Vitex wellensi	Mbamba	Zaire	Berries
Vitex welwitschii Guerke	Momposo	Zaire	Berries
Vitex zeyheri	Pipestem tree	Southern Africa	Berries
Vitidaceae			
Ampelocissus abyssinica Planch.	.....	Tanzania	Berries
Ampelocissus bombycina Planch.	.....	West Africa	Berries
Ampelocissus calophylla	Bonze	Zaire	Berries
Ampelocissus cavicaulis Planch.	Mingonsa	Zaire	Berries
Ampelocissus chantinii	Kisangama	Zaire	Berries
Ampelocissus edulis Gilg. et Brandt.	Kansugana	Zaire	Berries
Ampelocissus elephantina Planch.	Vigne de Madagascar	Madagascar	Berries
Ampelocissus gracilipes Stapf	.....	West Africa	Unripe berries
Ampelocissus grantii Planch.	Wild grape	West Africa, Zimbabwe	Berries
Ampelocissus lecardii Planch.	.....	West Africa	Berries
Ampelocissus leonensis Planch.	.....	West Africa	Berries
Ampelocissus malchairi	Libakoko	Zaire	Berries
Ampelocissus multistriata Planch.	.....	Tropical Africa	Berries

Scientific name	Common name	Where found	Part used
Ampelocissus schimperiana Hochst.	.....	Sudan	Berries
Ampelocissus venenosa	Milundu	Zaire	Berries
Ampelocissus verdickii	Munganza	Zaire	Berries
Cissus adenocaulis Steud. ex A. Rich.	Madapa	Zaire	Berries
Cissus afzelii	Monzonzo	Zaire	Berries
Cissus aralioides Planch.	Elongo	Zaire, west Africa	Berries
Cissus arguta Hook. f.	.....	West Africa	Berries
Cissus barbeyana	Ngula	Zaire	Berries
Cissus barteri	Boloko	Zaire	Berries
Cissus bullata Gilg. et Brandt.	.....	Tropical Africa	Berries
Cissus caesia Afzel.	.....	West Africa	Berries
Cissus chevalieri Gilg. et Brandt.	.....	West Africa	Berries
Cissus cornifolia Planch.	Moganza	Zaire	Berries
Cissus dasypleuris	Jackal grapes	Southern Africa	Berries
Cissus debilis	Gabo	Zaire	Berries
Cissus deweverei	Kuobegela	Zaire	Berries
Cissus diversilobatus C. A. Smith	.....	Southern Africa	Berries
Cissus doeringii Gilg. et Brandt.	.....	Tropical Africa	Berries
Cissus flavicans Planch.	.....	Tropical Africa	Berries
Cissus gilletti	Ngalanda	Zaire	Berries
Cissus guerkeana	Bilabila	Zaire	Berries
Cissus homblei	Bubonbolin	Zaire	Berries
Cissus integrifolia	Lendja	Zaire	Berries
Cissus jatrophoides Planch.	.....	Tropical Africa	Berries
Cissus lonicerifolius	Pepper bush	Southern Africa	Berries
Cissus mugansa	Mugansa	Zaire	Berries
Cissus natalitus	Tickberry bush	Southern Africa	Berries
Cissus obovata-oblonga	Sammaba	Zaire	Berries
Cissus orondo Gilg. et Bemed.	.....	Tropical Africa	Berries
Cissus plamatifolia Planch.	.....	West Africa	Berries
Cissus petiolata	Bokengo	Zaire	Berries
Cissus peynaerti	Gwakulu	Zaire	Berries
Cissus polyantha	Idjongo	Zaire	Berries
Cissus populnea Guill. et Perr.	.....	Tropical Africa	Berries

Scientific name	Common name	Where found	Part used
Cissus producta	Abalabala	Zaire	Berries
Cissus quadrangularis L.	Climbing cactus	Tropical and southern Africa	Berries
Cissus rubiginosa Planch.	Mokila na kabonde	West Africa, Zaire	Berries
Cissus smithiana	Mosembe	Zaire	Berries
Cissus succulentus	Snake grapes	Southern Africa	Berries
Cissus unguiformifolius C. A. Smith	.....	Southern Africa	Berries
Cissus woodii Gilg. et Brandt.	.....	Southern Africa	Berries
Rhoicissus capensis Planch.	Wild grape	Southern Africa	Berries
Rhoicissus cuneifolia Planch.	.....	Southern Africa	Berries
Rhoicissus digitata	Wild potato	Southern Africa	Berries
Rhoicissus erythrodes Planch.	.....	Southern Africa	Berries
Rhoicissus revoilii Planch.	.....	Tropical Africa	Berries
Rhoicissus rhomboidea Planch.	Kaffir ropewood	Southern Africa	Berries
Rhoicissus tomentosa	Monkey rope, wild grape	Southern Africa	Berries
Rhoicissus tridentata Wild. et Dummond	Wild grape	Malawi, southern Africa	Berries
Rhoicissus verdickii	Kaluma-kalendja	Zaire	Berries
Vitis labrusa L.	Fox grape	Madagascar	Berries
Vitis microdiptera Baker	.....	Madagascar	Berries
Vitis multistrata Baker	.....	Tropical Africa	Berries
Zingiberaceae			
Aframomum angustifolium K. Schum.	Longozy	Madagascar, Tanzania	Pulp
Aframomum daniellii K. Schum.	Bastard melengueta	Southern Africa	Pulp
Aframomum latifolium K. Schum.	.....	West Africa	Pulp

Scientific name	Common name	Where found	Part used
Aframomum sanguineum K. Schum.	Matungulu	Equatorial Africa	Pulp
Aframomum sulcatum K. Schum.	.....	West Africa	Pulp

6. Minor Fruits of Australia, Southeast Asia, and the Pacific Islands

Scientific name	Common name	Where found	Part used
Anacardiaceae			
Buchanania florida Shauer	Xang tao	Vietnam	Seeds
Buchanania sessilifolia Blume	.....	Malaysia	Pulp
Dracontomelum dao Merr. et Rolfe	Dao	Indonesia, Philippines	Pulp
Dracontomelum edule Skeels	Lamio	Indonesia	Pulp
Dracontomelum sylvestre Blume	.....	Indonesia	Pulp
Dracontomelum vitiense Engler	.....	Fiji	Pulp
Gluta renghas L.	.....	Indonesia, Malaysia	Seed
Gluta velutina Blume	Paknam	Indonesia, Malaysia, Thailand	Pulp
Mangifera altissima Blanco	Pahutan	Malaysia, Philippines	Pulp
Mangifera balba Gen.	.....	Indonesia	Pulp
Mangifera caloneura Kurz.	.....	Thailand	Pulp
Mangifera camptosperma	.....	Thailand	Pulp
Mangifera cochichinensis Engler	.....	Indonesia, Malaysia	Pulp
Mangifera dupperreana Pierre	Queo	Vietnam	Pulp
Mangifera equina Gen.	Xoai ngua	Vietnam	Pulp
Mangifera gracilipes	.....	Thailand	Pulp
Mangifera kemanga Blume	Kemang	Malaysia	Pulp
Mangifera lagenifera Griff.	Lanjut	Malaysia	Pulp
Mangifera laurina Blume	Monjet	Indonesia	Pulp
Mangifera longipes Griff.	.....	Malaysia	Pulp
Mangifera longipetiolata King	.....	Malaysia, Thailand	Pulp
Mangifera macrocarpa Blume	.....	Indochina, Indonesia	Pulp

Scientific name	Common name	Where found	Part used
Mangifera maingayi Hook. f.	.....	Malaysia	Pulp
Mangifera microphylla Griff.	.....	Malaysia	Pulp
Mangifera minor Blume	.....	Indonesia to Pacific Islands	Pulp
Mangifera oblongifolia Hook. f.	.....	Malaysia, Thailand	Pulp
Mangifera oryza Gen.	.....	Indochina	Pulp
Mangifera pentandra	.....	Thailand	Pulp
Mangifera pentaphylla Hook. f.	.....	Malaysia	Pulp
Mangifera reba Pierre	Xoai som	Vietnam	Pulp
Mangifera rumphii Pierre	.....	Indonesia	Pulp
Mangifera siamensis Warb.	.....	Thailand	Pulp
Mangifera sylvatica Roxb.	.....	Indochina	Pulp
Mangifera verticillata C. B. Rob.	Bauno	Philippines	Pulp
Semecarpus atra Veill.	.....	New Caledonia	Seeds
Semecarpus cassuvium Roxb.	.....	Indonesia, Malaysia	Fruit stalk
Semecarpus cuneiformis Blanco	Ligas	Philippines	Fruit stalk
Semecarpus gigantifolia Vidal	Mandu	Philippines	Fruit stalk
Annonaceae			
Alphonsea elliptica Hook. f. et Thoms.	.....	Malaysia	Pulp
Alphonsea ventricosa Hook. f. et Thoms.	Nogacola	Malaysia	Pulp
Aphania ochnoides Pierre	.....	Thailand	Pulp, seed
Aphania viridis Pierre	.....	Thailand	Pulp, seed
Arytera littoralis Blume	.....	Indonesia, Malaysia	Pulp
Cyathocalyx globosus Merr.	.....	Philippines	Pulp
Desmos mesnyi Pierre	Unone	Indochina	Pulp
Goniothalamus repevensis Pierre	.....	Indochina	Pulp

Scientific name	Common name	Where found	Part used
Oxymitra biglandulosa Scheff.	.....	Malaysia	Pulp
Polyalthia fruticosa Lour.	Cay bogie	Burma, Malaysia, Vietnam	Pulp
Sphaerocoryne aberrans Ridl.	.....	Malaysia, Vietnam	Pulp
Stelechocarpus burahol Hook. f.	Kepel	Indonesia, Malaysia	Pulp
Uvaria dulcis Dun.	.....	Indonesia, Malaysia	Pulp
Uvaria lancifolia Merr.	Calabao	Philippines	Pulp
Uvaria macrophylla Roxb.	.....	Malaysia	Pulp
Uvaria purpurea Blume	.....	Indonesia, Malaysia	Pulp
Uvaria redleyi King	.....	Malaysia	Pulp
Uvaria rufa Blume	.....	Indonesia, Malaysia	Pulp
Uvaria sorzogonensis Presl.	.....	Philippines	Pulp
Apocynaceae			
Chilocarpus denudatus Blume	.....	Indonesia, Philippines	Pulp
Leuconotis eugeniifolius DC.	.....	Malaysia	Pulp
Melodinus monogynus Roxb.	.....	Malaysia	Pulp, seed
Ochrosia littoralis Merr.	.....	Philippines	Seeds
Ochrosia oppositifolia K. Schum.	.....	Tropical Asia	Seeds
Parameria paniculatum Benth.	Serapit	Indonesia	Pulp
Urceola elastica Roxb.	.....	Malaysia	Seeds
Vallaris heynii Spreng.	Chama net	Malaysia, Thailand	Pulp
Willughbeia coriacea Wall.	.....	Malaysia	Pulp
Willughbeia dulcis Ridl.	.....	Malaysia	Pulp

Scientific name	Common name	Where found	Part used
Willughbeia edulis Roxb.	Goul	Burma, Malaysia	Pulp
Barringtoniaceae			
Barringtonia acutangula Gaertn.	Kamdol	Vietnam	Nut
Barringtonia asiatica Kurz.	.....	Tropical Asia, Pacific Islands	Nut
Barringtonia butonia Forst.	.....	Pacific Islands	Nut
Barringtonia edulis Seem.	.....	Fiji	Nut
Barringtonia excelsa Blume	.....	Pacific Islands	Nut
Barringtonia magnifica Lauter	.....	Pacific Islands	Nut
Barringtonia procera Knuth.	.....	Pacific Islands	Nut
Barringtonia scortechinii King	.....	Malaysia	Nut

Figure 40.—*Uvaria lancifolia*, its bright red fruits borne in a cluster.

Scientific name	Common name	Where found	Part used
Bignoniaceae			
Oroxylum indicum Vent.	Sward fruit tree	Tropical Asia	Young fruit
Bombacaceae			
Boschia microphylla Griff.	Plum mango	Tropical Asia	Pulp
Durio carinatus Mast.	.....	Borneo	Seeds
Durio dulcis Beccari	.....	Borneo	Pulp
Durio grandiflorus Kostermans & Soegeng	.....	Southeast Asia	Pulp
Durio graveolens Beccari	.....	Southeast Asia	Pulp
Durio griffithii Bakh.	.....	Thailand	Pulp
Durio lowianus Scorb.	.....	Thailand	Pulp
Durio malaccensis Planch.	.....	Thailand	Pulp
Durio mansoni Bakh.	.....	Thailand	Pulp
Durio oxleyanus Griff.	Durian daun	Southeast Asia	Pulp
Durio pinganianus Rd.	.....	Thailand	Pulp
Lahia kutejensis Hassk.	.....	Indonesia, Malaysia	Pulp
Burseraceae			
Canariellum oleiferum Engler	.....	New Caledonia	Nut
Canarium amboinensis Hochr.	Java almond	Indonesia	Nut
Canarium decumanum Gaertn.	.....	Indonesia	Nut
Canarium denticulatum Blume	.....	Indonesia	Nut
Canarium grandiflorum Benn.	.....	Malaysia	Nut
Canarium littorale Blume	Kikanari	Indonesia, Malaysia	Nut
Canarium luzonicum A. Gray	Elemi	Malaysia, Philippines	Nut
Canarium mehenbetene Gaertn.	.....	Pacific Islands	Nut
Canarium nitidum Benn.	.....	Malaysia	Nut
Canarium nungi Guill.	.....	Pacific Islands	Nut
Canarium patentinervium Miq.	.....	Indonesia	Nut

Scientific name	Common name	Where found	Part used
Canarium polyphyllum K. Schum.	.....	Indonesia, New Guinea	Nut
Canarium rufum Benn.	.....	Indonesia, Malaysia	Pulp
Canarium secundum Benn.	.....	Malaysia	Nut
Canarium solomonenge Burtt.	.....	Pacific Islands	Nut
Canarium venosum Craib.	.....	Thailand	Nut
Canarium williamsii C. B. Rob.	Gisau	Philippines	Nut
Dacryodes expansa H. J. Lam.	Sabal	Borneo	Pulp
Dacryodes macrocarpa H. J. Lam.	.....	Indonesia	Pulp
Garuga floribunda Decne.	.....	Indonesia	Pulp
Protium javanicum Burm. f.	Bernang	Indonesia	Pulp
Santiria grandiflora Kalkman	.....	Indonesia	Pulp
Santiria laevigata Blume	.....	Indonesia, Malaysia	Pulp
Santiria tomentosa Blume	.....	Indonesia, Malaysia	Pulp
Scutinanthe brunnea Thw.	.....	Indonesia, Malaysia	Pulp
Capparidaceae			
Capparis horrida L. f.	.....	Philippines	Pods
Capparis loureeri Tanaka	.....	Philippines	Pods
Capparis micrantha DC.	.....	Tropical Asia	Pods
Capparis mitchelii	Native orange	Australia	Pods
Crataeva nurvala Hamilt.	Garlic pear	Tropical Asia	Pods
Crataeva roxburghii R. Br.	.....	Cambodia	Pods
Crataeva speciosa Volkens.	Abich	Pacific Islands	Pods

Scientific name	Common name	Where found	Part used
Celastraceae			
Kurrima paniculata Wall.	.....	Malaysia, Thailand	Pulp
Salacia flavescens Kurz.	.....	Malaysia, Thailand	Pulp
Salacia grandiflora Kurz.	Ampedal ajam	Malaysia	Pulp
Salacia macrophylla Blume	.....	Malaysia	Pulp
Salacia naumannii Engler	.....	Pacific Islands	Pulp
Salacia prinoides DC.	.....	Tropical Asia	Pulp
Salacia roxburghii Wall.	Salacia	Vietnam	Pulp
Siphonodon celastrinum Griff.	Xungda	Malaysia, Vietnam	Pulp
Chrysobalanaceae			
Parinaria corymbosa Miq.	.....	Indonesia	Pulp
Parinaria excelsa Sabine	Gray plum	Malaysia	Pulp, seed
Parinaria nanda F. Muell.	Nanda	Australia	Pulp
Combretaceae			
Terminalia angustifolia Jacq.	.....	Malaysia	Seeds
Terminalia bellerica Roxb.	Belleric	Tropical Asia	Seeds
Terminalia chebula Retz.	.....	Malaysia	Seeds
Terminalia copelandii Elmer	.....	Indonesia, Philippines	Seeds
Terminalia longespicata Sloot.	.....	Indonesia	Pulp
Terminalia microcarpa Decne.	.....	Indonesia	Pulp
Terminalia sepicana Diels	.....	Indonesia	Pulp
Terminalia solomonensis Exell	.....	Eastern New Guinea	Pulp

Scientific name	Common name	Where found	Part used
Cornaceae			
Alangium slaviifolium Wangerin	Akola	Malaysia	Pulp
Cycadaceae			
Cycas media R. Br.	.....	Australia	Kernels
Cycas revoluta Thunb.	Japanese sago	Tropical Asia, Japan	Kernels
Dichapetalaceae			
Dichapetalum timoriense Engler	.....	Malaysia	Pulp
Dilleniaceae			
Dillenia elliptica Thunb.	.....	Indonesia	Pulp
Dillenia megalantha Merr.	.....	Indonesia	Pulp
Dillenia meliosmifolia Hook. f.	.....	Malaysia	Pulp
Dillenia mindanensis Elm.	.....	Philippines	Pulp
Dillenia obovata Hoogl.	.....	Indonesia, Malaysia	Pulp
Dillenia ovata Wall.	Thiu	Indonesia	Pulp
Dillenia philippensis Rolfe.	Kalmon	Philippines	Pulp
Dillenia reifferscheidia F. Vil.	.....	Malaysia, Philippines	Pulp
Dillenia talaudensis Hoogl.	.....	Malaysia, Indonesia	Pulp
Dipterocarpaceae			
Dryobalanopsis aromatica Gaertn.	.....	Indonesia, Malaysia	Pulp
Dryobalanopsis oblongifolia Dyer	Keladang	Malaysia	Pulp
Shorea apetara Buck	Bornes shorea	Indonesia, Malaysia	Nut
Shorea gisok Foxw.	Gisok	Philippines	Nut
Shorea robusta Gaertn.	Sal tree	Indochina, Malaysia	Nut

Scientific name	Common name	Where found	Part used
Shorea stenoptera Burck	.....	Indonesia	Nut
Ebenaceae			
Diospyros chamaethamnus Millbr.	.....	Australia	Pulp
Diospyros ehretioides Wall.	.....	Thailand	Pulp
Diospyros glandulosa Lace.	.....	Thailand	Pulp
Diospyros lycioides Desf.	.....	Australia	Pulp
Diospyros mollis Griff.	.....	Thailand	Pulp
Diospyros montana Roxb.	Tandam	Southeast Asia, Australia	Pulp
Diospyros packmanii L. B. Clarke	.....	Thailand	Pulp
Diospyros pallens F. White	.....	Australia	Pulp
Diospyros peregrina Guerke	Gab	Tropical Asia	Pulp
Diospyros pyrrhocarpa Miq.	Anang	Philippines	Pulp
Diospyros siamensis Hochr.	.....	Thailand	Pulp
Maba buxifolia Per.	.....	Pacific Islands	Seeds
Ehretiaceae			
Cordia dichotoma Forst. f.	Clammy cherry	Tropical Asia	Pulp
Cordia myxa L.	Sapistan	Tropical Asia	Pulp
Cordia subcordata Lamk.	.....	Pacific Islands	Seeds
Elaeocarpaceae			
Elaeocarpus calomala Merr.	Kalomala	Philippines	Pulp
Elaeocarpus edulis Tejsm. et Binn.	.....	Indonesia, Papua New Guinea	Pulp
Elaeocarpus jackianus Wall.	.....	Malaysia	Pulp
Elaeocarpus madopetalius Pierre	Cana	Vietnam	Pulp

Scientific name	Common name	Where found	Part used
Elaeocarpus oppositifolius Miq.	Belimbin	Indonesia	Pulp
Muntingia calabura L.	Manila cherry	Pantropics	Pulp
Eleagnaceae			
Elaeagnus latifolia L.	Bastard oleaster	Malaysia	Pulp
Elaeagnus philippensis Perk.	Lingaro	Philippines	Pulp
Ericaceae			
Gautheria cumingiana Vidal	.....	Philippines	Pulp
Gautheria fragrantissima Wall.	Indian winter-green	Malaysia	Pulp
Vaccinium hasseltii Miq.	.....	Malaysia	Pulp
Vaccinium malaccense Wight	.....	Malaysia	Pulp
Vaccinium myrotoides Miq.	Philippine blue-berry	Philippines	Pulp
Vaccinium whitfordii Merr.	.....	Philippines	Pulp
Euphorbiaceae			
Aleurites moluccana Willd.	Candle nut	Pacific Islands	Nut
Antidesma dallachyanum Baill.	.....	Australia	Pulp
Antidesma diandrum Spreng.	Amli	Southeast Asia	Pulp
Antidesma fruticosa Muell.-Arg.	.....	Indochina	Pulp
Antidesma ghaesembilla Gaertn.	Heloch	Tropical Asia	Pulp
Antidesma montanum Blume	.....	Southeast Asia	Pulp
Antidesma stipulare Blume	.....	Indochina, Malaysia	Pulp
Antidesma tomentosa Blume	.....	Java	Pulp
Antidesma velutinosum Blume	.....	Malaysia	Pulp
Aporosa prainiana King	.....	Malaysia	Pulp

Scientific name	Common name	Where found	Part used
Baccaurea bracteata Muell.-Arg.	.....	Malaysia, Sumatra	Pulp
Baccaurea brevipes Hook. f.	.....	Malaysia	Pulp
Baccaurea dulcis Muell.-Arg.	Chupa, tupa	Southeast Asia	Pulp
Baccaurea griffithii Hook. f.	.....	Malaysia	Pulp
Baccaurea lanceolata Muell.-Arg.	.....	Malaysia	Pulp
Baccaurea macrophylla Muell.-Arg.	.....	Malaysia	Pulp
Baccaurea malayana King	Tampoi	Malaysia, Sumatra	Pulp
Baccaurea parviflora Muell.-Arg.	.....	Malaysia	Pulp
Baccaurea polyneura Hook. f.	.....	Malaysia	Pulp
Baccaurea pyriformis Gage	.....	Malaysia	Pulp
Baccaurea sapida Muell.-Arg.	Leteku	Tropical Asia	Pulp
Baccaurea sylvestris Lour.	.....	Vietnam	Pulp
Baccaurea velutina Ridl.	.....	Malaysia	Pulp
Baccaurea wallichii Hook. f.	.....	Malaysia	Pulp
Baccaurea wrayi King	.....	Malaysia	Pulp
Blumeodendron kurzii J. J. Smith	.....	Malaysia	Pulp
Bridelia minutiflora Hook.	.....	Tropical Asia	Pulp
Bridelia retusa Spreng.	.....	Tropical Asia	Pulp
Elateriospermum tapos Blume	.....	Thailand	Pulp
Euphorbia cambodiana L.	.....	Indochina	Pulp
Fluggia virosa Baill.	.....	Tropical Asia	Pulp
Gelonium multiflorum A. Juss.	Ban-naringa	Malaysia	Pulp
Hymenocardia wallichii Tul.	.....	Malaysia	Pulp
Macaranga tanarius Muell.-Arg.	.....	Philippines	Pulp
Phyllanthus gomphocarpus Hook. f.	.....	Southeast Asia	Pulp

Scientific name	Common name	Where found	Part used
Phyllanthus pectinatus Hook. f.	.....	Malaysia	Pulp
Phyllanthus urinaria L.	.....	Tropical Asia	Pulp
Fagaceae			
Castanopsis argentea A. DC.	Sanintero	Indonesia, Malaysia	Nut
Castanopsis inermis Benth. et Hook. f.	.....	Malaysia, Sumatra	Nut
Castanopsis javanica A. DC.	.....	Indonesia	Nut
Castanopsis malaccensis Gamble	.....	Malaysia	Nut
Castanopsis philippensis Vidal	Philippine chestnut	Philippines	Nut
Castanopsis wallichii King	.....	Malaysia	Nut
Flacourtiaceae			
Flacourtia euphlebia Merr.	Lanagon	Philippines	Pulp
Flacourtia sepiaria Roxb.	Indian plum	Tropical Asia	Pulp
Hemiscorpia trimera Sloot.	.....	Indonesia	Pulp
Homalium cochinchinensis Druce	Acomas	Vietnam	Pulp
Hydnocarpus anthelmintica Pierre	.....	Thailand to Malaysia	Pulp
Pangium edule Reinw.	.....	Philippines	Seeds
Ryparosa caesia Blume	.....	Indonesia	Pulp
Ryparosa hullettii King	Pitoling	Malaysia	Pulp
Ryparosa multinervosa Sloot	Mausea uru	Indonesia	Pulp
Scolopia spinosa Wark.	Rukem	Malaysia	Pulp
Gnetaceae			
Gnetum brunonisnum Griff.	.....	Indonesia, Malaysia	Pulp

Scientific name	Common name	Where found	Part used
Gnetum genmonoides Brongn.	.....	Indonesia	Pulp
Gnetum latifolium Blume	Bulso	Indonesia, Philippines	Seeds
Gnetum tendifolium Ridl.	Barringtonia climer	Malaysia	Pulp, seed
Guttiferae			
Calophyllum inophyllum L.	Maria	Pantropics	Young seeds
Calophyllum pulcherrimum Wall.	.....	Malaysia	Pulp
Garcinia atroviridis Griff.	Buruguru	Malaysia to Thailand	Pulp
Garcinia bancana Miq.	.....	Indonesia, Malaysia	Pulp
Garcinia barretiana Wester	Kadis	Philippines	Pulp
Garcinia benthamii Pierre	.....	Philippines	Pulp
Garcinia binucao Choisy	Binukau	Philippines	Pulp
Garcinia celebica L.	Boras	Philippines	Pulp
Garcinia cochinchinensis Choisy	Buanha	Vietnam	Pulp
Garcinia costata Hemsl.	.....	Malaysia	Pulp
Garcinia cowa Roxb.	.....	Thailand	Pulp
Garcinia globulosa Ridl.	.....	Malaysia	Pulp
Garcinia gracilis L.	.....	Thailand	Pulp
Garcinia hombroniana Pierre	.....	Malaysia	Pulp
Garcinia macrophylla Miq.	.....	Philippines	Pulp
Garcinia mindanensis Merr.	.....	Philippines	Pulp
Garcinia microstigma Kurz.	Thung-thale-anee	Southeast Asia	Pulp
Garcinia mooreana Wester	.....	Philippines	Pulp
Garcinia negrolineata Planch.	Kandis hutan	Malaysia	Pulp
Garcinia oliveri Pierre	Bua rung	Indochina	Pulp

Scientific name	Common name	Where found	Part used
Garcinia parviflora Miq.	Yellow kandis	Indochina, Malaysia	Pulp
Garcinia planchoni Pierre	.....	Indochina, Malaysia	Pulp
Garcinia prainiana King	Cherapu	Malaysia, Philippines	Pulp
Garcinia rubra Merr.	.....	Philippines	Pulp
Garcinia schomburghiana Pierre	.....	Thailand	Pulp
Garcinia sizygiifolia Pierre	Funi	Indonesia, Vietnam	Pulp
Garcinia subelliptica Merr.	.....	Philippines	Pulp
Garcinia tetrandra Pierre	Temil	Indochina, Philippines	Pulp
Garcinia venulosa Choisy	Gatasan	Philippines	Pulp
Garcinia vidalii Merr.	Pilis	Philippines	Pulp
Garcinia vilersiana Pierre	Vang nhura	Indochina	Pulp
Lauraceae			
Cinnamomum iners Reinw.	.....	Tropical Asia	Pulp
Cryptocarva wilsonii Guill.	.....	Pacific Islands	Pulp
Litsea glutinosa C. B. Robins.	Robbins	Tropical Asia	Pulp
Micropora curtisii Hook. f.	.....	Malaysia	Pulp
Leeaceae			
Leea indica Merr.	.....	Tropical Asia	Pulp
Leea rubra Blume	.....	Indonesia, Malaysia	Seeds
Leguminosae			
Cassia acutifolia Del.	Sudan senna	Thailand	Pods
Cassia angustifolia Vahl	Indian senna	Thailand	Pods

Scientific name	Common name	Where found	Part used
Castanospermum australe A. Cunningh. et Fraser	Moreth bay chestnut	Australia	Seeds
Dialium laurinum Baker	.....	Malaysia	Pulp
Dialium maingayi Baker	Keranji	Malaysia	Pulp
Dialium patens Baker	.....	Malaysia	Pulp
Dialium platysepalum Baker	Monkey kerang	Malaysia	Pulp
Parkia biglandulosa Wight. et Arn.	.....	Malaysia	Pulp
Parkia biglobosa Benth.	.....	Malaysia	Pulp, seed
Parkia intermedia Hassk.	Petir	Indonesia, Malaysia	Seeds
Parkia javanica Merr.	Kedawung	Indonesia, Malaysia	Seeds
Parkia speciosa Hort.	Petai	Indonesia, Malaysia	Young seeds
Pithecellobium affine Baker	.....	Malaysia	Pulp
Pithecellobium bulbalinum Benth.	Keredas	Malaysia	Pulp, seed
Pithecellobium dulce Benth.	Madras thorn	Pantropics	Pulp
Pithecellobium lobatum Benth.	Djering	Tropical Asia	Pulp
Pongamia pinnata Merr.	Robinier	Tropical Asia	Pulp
Whitfordiodendron erianthum Dunn.	Tulang daeng	Malaysia	Pulp
Melastomataceae			
Clidemia hirta D. Don	.....	Malaysia	Pulp
Marumia stellulata Blume	.....	Indonesia	Pulp
Medinilla hasseltii Blume	.....	Indonesia	Pulp
Memecylon caeruleum Jacq.	Javanese kulis	Tropical Asia	Pulp
Memecylon edule Roxb.	Ironwood tree	Tropical Asia	Pulp
Ochtocharis borneensis Blume	.....	Indonesia, Malaysia	Pulp

Scientific name	Common name	Where found	Part used
Meliaceae			
Aglaia acida Koord. et Val.	Langsatan	Java	Pulp
Aglaia elliptifolia Merr.	.....	Philippines	Pulp
Aglaia everettii Merr.	Bunguas	Malaysia, Philippines	Pulp
Aglaia glabriflora Hiern.	.....	Malaysia	Pulp
Aglaia glomerata Merr.	Karamiras	Philippines	Pulp
Aglaia harmsiana Perk.	Melatumbaga	Philippines	Pulp
Aglaia kingiana Ridley	.....	Malaysia	Pulp
Aglaia oligantha DC.	Mantan	Philippines	Pulp
Aglaia rufibardis Ridley	.....	Malaysia	Pulp
Aglaia trichostema Ridley	.....	Malaysia	Pulp
Chisocheton glomeratus Hiern.	.....	Malaysia	Pulp
Chisocheton penduliflorus Planch.	.....	Malaysia	Pulp
Dysoxylon excelsum Blume	.....	Malaysia	Pulp
Lansium dubium Merr.	Mamata-babae	Philippines	Pulp
Sandoricum nervosum Blume	Kechapi	Indonesia, Malaysia	Pulp
Sandoricum radiatum King	Kechapi	Malaysia, Philippines	Pulp
Walsura elata Pierre	.....	Indochina	Pulp
Walsura villosa Wall.	.....	Indochina	Pulp
Menispermaceae			
Limacia scandens Lour.	.....	Vietnam	Pulp
Moraceae			
Artocarpus blancoi Merr.	Antipolo	Philippines	Pulp
Artocarpus camansi Blanco	Kamansi	Philippines	Pulp, seed
Artocarpus chaplashus Roxb.	.....	Thailand	Pulp

Scientific name	Common name	Where found	Part used
Artocarpus cumingiana Trec.	.....	Philippines	Pulp
Artocarpus dudak Miq.	.....	Sumatra	Pulp
Artocarpus glauca Blume	.....	Java	Pulp
Artocarpus gomeziana Wall.	Tapang	Malaysia	Pulp
Artocarpus involucrata K. Schum.	.....	Papua New Guinea	Pulp
Artocarpus lakoocha Roxb.	Monkey jack	Tropical Asia	Pulp
Artocarpus lanceaefolius Roxb.	.....	Thailand	Pulp
Artocarpus odoratissima Blanco	Morang	Philippines	Pulp
Artocarpus polyphema Pers.	.....	Java	Pulp, seed
Artocarpus rotundata Merr.	.....	Indonesia, Malaysia	Pulp
Broussonetia papyrifera L'Herit. ex Vent.	Paper mulberry	Tropical Asia	Pulp
Cudrania cochinchinensis Kudo.	.....	Tropical Asia	Pulp
Ficus aspera Forst.	Tongue fly	Australia, Pacific Islands	Pulp
Ficus auriculata Lour.	Timla	Tropical Asia	Pulp
Ficus benghalensis L.	Banyan	Malaysia	Pulp
Ficus conora King	.....	Indonesia	Pulp
Ficus glomerata Roxb.	Cluster fig	Tropical Asia	Pulp
Ficus hirta Vahl	.....	Tropical Asia	Pulp
Ficus hispida L. f.	Gobla	Tropical Asia	Pulp
Ficus lacor Hamilt.	Kahimal	Malaysia	Pulp
Ficus nota Merr.	.....	Philippines	Pulp
Ficus obpyramidata King	.....	Malaysia	Pulp
Ficus pilosa Reinw.	.....	Indonesia, Malaysia	Pulp
Ficus pumila L.	.....	Pantropics	Pulp
Ficus rostata L.	.....	Malaysia	Pulp
Ficus rumphii Blume	.....	Malaysia	Pulp
Ficus septica Thunb.	.....	Indonesia, Malaysia	Pulp
Ficus ulmifolia Lam.	.....	Philippines	Pulp
Ficus variegata Blume	.....	Tropical Asia	Pulp

Scientific name	Common name	Where found	Part used
Gymnartocarpus woodii Merr.	.....	Philippines	Seeds
Parartocarpus venenosus	Malanangka	Philippines	Pulp
Myricaceae			
Myrica javanica Blume	.....	Indonesia	Pulp, seed
Myrica sapida Wall.	Box myrtle	Tropical Asia	Pulp
Myristicaceae			
Horsefieldia australiana Blake	.....	Australia	Pulp
Horsefieldia ridleyana Warb.	.....	Malaysia	Pulp
Horsefieldia sylvestris Warb.	.....	Indonesia, Malaysia	Pulp
Knema laurina Warb.	.....	Malaysia	Pulp
Myristica argentea Warb.	Papua nutmeg	Papua New Guinea	Seeds
Myristica cagayanensis Merr.	.....	Philippines	Seeds
Myristica crassa King	.....	Malaysia	Seeds
Myrsinaceae			
Ardisia lurida Blume	.....	Southeast Asia	Pulp
Ardisia squamulosa Presl.	.....	Philippines	Pulp
Embelia philippinensis DC.	Lendo	Philippines	Pulp
Embelia ribes Burm. f.	.....	Tropical Asia	Pulp
Myrtaceae			
Decaspermum fruticosum Forst.	.....	Tropical Asia	Pulp
Eugenia aherniana C. B. Rob.	Turana	Philippines	Pulp
Eugenia mananquil Blanco	.....	Philippines	Pulp
Eugenia polycephaloides C. B. Rob.	Maigang	Philippines	Pulp

Scientific name	Common name	Where found	Part used
Syzygium accuminatissimum DC.	.....	Indonesia, Malaysia	Pulp
Syzygium arnottianum Walp.	.....	Indonesia	Pulp
Syzygium calubcob Merr.	Kalubkub	Philippines	Pulp
Syzygium claviflorum Wall.	Borsrem	Malaysia, Philippines	Pulp
Syzygium curanii Merr.	Lipoti	Philippines	Pulp
Syzygium densiflorum Brongn. et Gris	Kelat asam	Indonesia, Malaysia	Pulp
Syzygium grande Wall.	.....	Indochina to Indonesia	Pulp
Syzygium jambos Alston	Roseapple	Pantropics	Pulp
Syzygium lineatum Merr. et Perry	Guava berry	Indonesia, Malaysia	Pulp
Syzygium oblatum Wall.	.....	Malaysia	Pulp
Syzygium polycephalum Merr. et Perry	Gowok	Southeast Asia	Pulp
Syzygium punctulatum Wall.	.....	Malaysia	Pulp
Syzygium simile Merr.	Panglomboien	Philippines	Pulp
Syzygium xanthophylla	Lapini	Philippines	Pulp
Nyssaceae			
Nyssa javanica Wangerin.	.....	Tropical Asia	Pulp
Ochnaceae			
Ochna integerrima Merr.	Mai bong vang	Vietnam	Pulp
Olacaceae			
Anacolosa luzonensis Merr.	Galo nut	Philippines	Nut

Scientific name	Common name	Where found	Part used
Ochanostachya amentacea Masters	.....	Malaysia	Pulp
Olax inbricata Roxb.	.....	Burma, Malaysia	Pulp
Olax scandens Roxb.	Dheniani	Indonesia, Malaysia	Pulp
Scorodocarpus borneensis Becc.	.....	Indonesia, Malaysia	Pulp
Oxalidaceae			
Connaropsis grifithii Planch.	Pupoi	Malaysia	Pulp
Connaropsis macrophylla King	.....	Malaysia	Pulp
Connaropsis monophylla Planch.	.....	Malaysia	Pulp
Palmae			
Actinorhytis calapparia H. Wendl. et Druce	Tangalo	Malaysia, Philippines	Pulp
Adonidia merillii Becc.	Manila palm	Southeast Asia	Nut
Areca caliso Becc.	.....	Philippines	Nut
Arenga pinnata Merr.	Sugar plum	Tropical Asia	Nut
Calamus litoko West.	Litoko	Philippines	Pulp
Calamus mitis Becc.	Tebdas	Philippines	Pulp
Calamus ornatus Blume	Puffed rattan	Indonesia, Malaysia	Pulp
Calamus salicifolius Becc.	Lempeak	Vietnam	Pulp
Calamus usitatus Blanco	Abet	Philippines	Pulp
Corypha utan Lam.	Buri palm	Tropical Asia	Young seeds
Daemonorhops palembanicus Blume	Uwi nangga	Indonesia	Pulp
Daemonorhops periacanthus Miq.	Rotan gelang	Indonesia, Malaysia	Pulp
Daemonorhops ruber Mart.	Pendjalin sepet	Indonesia, Malaysia	Pulp
Eugeissona triste Griff.	.....	Malaysia	Young fruit
Latania commersonii J. F. Gmel.	Bourbon palm	Tropical Asia	Pulp

Scientific name	Common name	Where found	Part used
Livistona cochinchinensis Blume	.....	Vietnam	Pulp
Livistona saribas Merr.	.....	Tropical Asia	Pulp
Onocosperma tigillaria Ridl.	Anibong	Tropical Asia	Pulp
Phoenix paludosa Roxb.	.....	Malaysia, Thailand	Pulp
Phoenix pusilla Gaertn.	Inchu	Malaysia	Pulp
Raphia vinifera Beauv.	Wine raffia	Malaysia	Pulp
Salacca affinis Blume	Salak batool	Malaysia	Pulp
Salacca clemensiana Becc.	Dalubi	Philippines	Pulp
Salacca conferta Griff.	Salak hutan	Indonesia, Malaysia	Pulp
Salacca glabrescens Griff.	.....	Malaysia	Pulp
Salacca wallichiana Mart.	Kumbur	Malaysia	Pulp
Veitchia joanennis H. Wendl.	.....	Fiji	Nut
Pandanaceae			
Freycinetia milnei Seem	.....	Fiji	Pulp
Pandanus brosimos Merr. et Perry	.....	Pacific Islands	Seeds
Pandanus conoideus Lam.	Marita	Southeast Asia	Pulp, seed
Pandanus dubius Spreng.	Knob-fruited screwpine	Southeast Asia	Seeds
Pandanus fischerianus Mart.	.....	Pacific Islands	Seeds
Pandanus houlletii Carr.	Malay screwpine	Malaysia	Pulp
Pandanus jiulianettii Mart.	.....	Pacific Islands	Seeds
Pandanus obliquus Kanehira	.....	Pacific Islands	Pulp
Pandanus spodiophyllus B. C. Stone	.....	Papua New Guinea	Pulp
Pandanus tectorius Sol.	.....	Pacific Islands	Seeds, pulp

Scientific name	Common name	Where found	Part used
Podocarpaceae			
Podocarpus neriifolia D. Don	.....	New Guinea	Seeds, pulp
Proteaceae			
Grevillea elacocarpifolia Guill.	.....	Pacific Islands	Seeds
Kermadecia leptophylla Guill.	.....	Pacific Islands	Seeds
Kermadecia sinuata Brongn. et Gris	.....	Pacific Islands	Seeds
Rhamnaceae			
Hovenia dulcis Thunb.	Chinese raisin	Asian subtropics	Peduncle
Sageretia oppositifolia Brongn.	Drangu	Indonesia	Pulp
Sageretia theezans Brongn.	.....	Indochina	Pulp
Ziziphus agrestis Roem. et Schul.	Cay na	Indochina	Pulp
Ziziphus attoensis Pierre	.....	Indochina	Pulp
Ziziphus calophylla Wall.	.....	Malaysia	Pulp
Ziziphus cambodiana Pierre	Putrea	Indochina	Pulp
Ziziphus funiculosa Ham.	.....	Malaysia	Pulp
Ziziphus hoaensis Pierre	.....	Vietnam	Pulp
Ziziphus oenoplia Mill.	Anor	Tropical Asia	Pulp
Rhizophoraceae			
Bruguiera eriopetala W. et A.	.....	Pacific Islands	Pulp
Carallia brachiata Merr.	Carallia wood	Malaysia	Pulp
Rosaceae			
Angelesia splendens Korth.	.....	Indonesia, Malaysia	Pulp

Scientific name	Common name	Where found	Part used
Rubus copelandii Merr.	Pinit	Philippine Islands	Pulp
Rubus ellipticus Sm.	Yellow Himalayan raspberry	Asian subtropics	Pulp
Rubus elmeri Focke	Bunut	Philippines	Pulp
Rubus elongatus Smith	.....	Indonesia	Pulp
Rubus fraxinifolius Poir.	Palanau	Indonesia, Philippines	Pulp
Rubus macgregorii F. V. Muell.	.....	New Guinea	Pulp
Rubus moluccanus L.	Ceylon blackberry	Tropical Asia	Pulp
Rubus niveus Thunb.	Pilai	Philippines	Pulp
Rubus pectinellus Maxim.	Atkbulnak	Philippines	Pulp
Rubus rolfei Vidal	Dutung	Philippines	Pulp
Rubus sorbifolium Maxim.	.....	Tropical Asia	Pulp
Rubiaceae			
Anthocephalus cadamba Benth.	Meo	Tropical Asia	Pulp
Anthocephalus morindaefolius Korth.	.....	Tropical Asia	Pulp
Canthium horridum Blume	.....	Tropical Asia	Pulp
Canthium micrantha DC.	.....	Tropical Asia	Pulp
Ixora arguta R. Br.	Mata pelandok	Malaysia, Thailand	Pulp
Morinda citrifolia L.	Indian mulberry	Pantropics	Young fruit
Morinda umbellata L.	.....	Tropical Asia	Young fruit
Nauclea maingayi Hook. f.	.....	Malaysia	Pulp
Nauclea subdita Merr.	.....	Malaysia	Pulp
Pavetta indica L.	.....	Tropical Asia	Pulp
Randia anisophylla Hook. f.	.....	Malaysia	Pulp
Randia dumetorum Lam.	Maindal	Malaysia	Pulp
Randia esculenta Merr.	.....	Indochina	Pulp
Randia uliginosa Poir.	Pindalu	Malaysia	Pulp

Scientific name	Common name	Where found	Part used
Rutaceae			
Acronychia pedunculata Miq.	Bai bai	Tropical Asia	Pulp, leaves
Aegle marmelos Corr.	Bengal quince	Tropical Asia	Pulp
Glycosmis citrifolia Lindl.	.....	Malaysia, Thailand	Pulp
Glycosmis pentaphylla Corr.	Ban nimbu	Tropical Asia	Pulp
Hesperethusa crenulata Swingle	.....	Indochina	Pulp
Murraya paniculata (L.) Jacq.	Jasmin orange	Tropical Asia	Pulp
Toddalia asiatica Lam.	Daung	Philippines	Pulp
Sabiaceae			
Meliosma nitida Blume	.....	Indonesia, Malaysia	Pulp
Santalaceae			
Champereia griffithiana Planch.	.....	Burma, Malaysia	Pulp
Eucarya acuminata Sprague et Summerhayes	Quandong nut	Australia	Seeds
Santalum lanceolatum R. Br.	Plum bush	Australia	Pulp
Sapindaceae			
Allophyllus cochinchinensis H. Lec.	Schmidelia	Malaysia	Pulp
Cubilia blancoi Blume	Kubili nut	Indonesia, Philippines	Pulp
Erioglossum rubiginosum Blume	Mertajam	Tropical Asia	Pulp
Euphoria didyma Blanco	Alupag	Philippines	Pulp
Euphoria nephelioides Radlk.	.....	Philippines	Pulp
Hedyachras philippinensis Radlk.	Mala-chico	Philippines	Pulp
Litchi philippinensis Radlk.	Camingi	Philippines	Pulp, seed

Scientific name	Common name	Where found	Part used
Mishocarpus sumatranus Blume	.....	Indonesia, Malaysia	Pulp
Nephelium bassacense Pierre	.....	Malaysia, Vietnam	Pulp
Nephelium chryseum Blume	.....	Philippines	Pulp
Nephelium hypoleucum Kurz.	.....	Thailand	Pulp
Nephelium philippense	Bulala	Philippines	Pulp
Nephelium obovatum L.	.....	Thailand	Pulp
Nephelium xerospermoides R. D. K.	Aluao	Philippines	Pulp
Otophora alata Blume	Chinese averrhoa	Tropical Asia	Pulp
Otophora cambodiana Pierre	.....	Malaysia, Thailand Vietnam	
Otophora fruticosa Blume	Lunan nut	Tropical Asia	Nut
Otophora furcata Pierre	Chon chom	Vietnam	Pulp
Otophora spectabilis Blume	.....	Indonesia, Malaysia	Pulp
Palaqium burkii Lam.	Siak ilipe nut	Indonesia, Malaysia	Pulp
Palaqium hexandrum Engl.	.....	Malaysia	Pulp, nut
Palaqium javense Burck.	Java nato tree	Indonesia	Nut
Palaqium macrocarpum Burck.	.....	Indonesia, Malaysia	Pulp
Palaqium oleiferum Blanco	.....	Malaysia	Nut
Palaqium philippense C. B. Rob.	.....	Philippines	Pulp
Palaqium rostratum Burck.	.....	Indonesia, Malaysia	Pulp
Palaqium semaran Lam.	Samaran	Indonesia	Nut
Palaqium walsurifolium Pierre	Butam	Indonesia, Malaysia	Pulp

Scientific name	Common name	Where found	Part used
Xerospermum intermedium Radlk.	.....	Burma, Malaysia	Pulp
Xerospermum laevigatum Radlk.	.....	Malaysia	Pulp
Xerospermum macrophyllum Pierre	Truong	Vietnam	Pulp
Xerospermum wallichii King	.....	Malaysia	Pulp
Sapotaceae			
Imbricaria malabarica Poir.	.....	Indonesia	Pulp
Madhuca esculenta Fletch.	.....	Thailand	Pulp
Madhuca grandifolia Fletch.	.....	Thailand	Pulp
Madhuca lancifolia Lam.	Kelaki	Indonesia	Seeds
Madhuca latifolia Macbr.	Butter tree	Tropical Asia	Seeds
Madhuca leerii Merr.	Edoloyan	Tropical Asia	Pulp
Madhuca obovatifolia Merr.	Manik	Malaysia, Philippines	Pulp
Manilkara hexandra Dubard	.....	Tropical Asia	Pulp
Mimusops manilkara G. Don.	.....	Philippines	Pulp
Mimusops parviflora R. Br.	Wild dilly	Philippines, Pantropics	Pulp
Saxifragaceae			
Davidsonia pruriens Muell.-Arg.	Davidson's plum	Australia	Pulp
Sonneratiaceae			
Sonneratia caseolaris Engler	Perepat	Indonesia, Malaysia, Vietnam	Pulp
Sonneratia grifithii Kurz.	.....	Malaysia	Pulp
Sonneratia ovata Back.	Bogan	Indonesia	Pulp

Scientific name	Common name	Where found	Part used
Sterculiaceae			
Sterculia apetala Karst.	.....	Pantropics	Seed
Sterculia cermica R. Br.	.....	Philippines	Seed
Sterculia foetida L.	Java olive	Pantropics	Seed
Sterculia oblongata R. Br.	.....	Philippines	Seed
Strychnaceae			
Strychnos nux-vomica L.	Strychinin	Indonesia	Pulp
Strychnos pungens Solered.	Botter klapper	Australia	Pulp
Tetrameristaceae			
Tetramerista glabra Miq.	Poonah	Indonesia, Malaysia	Pulp
Thymeliaceae			
Phaleria capitata Jack.	.....	Indonesia, Malaysia	Pulp
Tiliaceae			
Diplodiscus edules Merr.	.....	Philippines	Seeds
Diplodiscus eriocarpa Juss.	.....	Philippines	Pulp
Diplodiscus paniculatus Turcz.	Balobo	Philippines	Seeds
Diplodiscus stylocarpa Warb.	.....	Philippines	Seeds
Grewia eriocarpa Juss.	Bariu-an	Tropical Asia	Pulp
Grewia fibrocarpa Mast.	.....	Indonesia, Malaysia	Pulp
Grewia latifolia Mast.	.....	Malaysia	Pulp
Grewia philippinensis Perk.	Balukok	Philippines	Pulp
Grewia stylocarpa Juss.	Muling	Philippines	Seeds
Grewia subinaequalis DC.	Phalsa	Tropical Asia	Pulp

Scientific name	Common name	Where found	Part used
Microcos paniculata L.	.....	Tropical Asia	Pulp
Microcos stylocarpa Burrett.	.....	Philippines	Pulp
Urticaceae			
Hullettia dumosa King et Hook. f.	.....	Malaysia	Pulp
Lapourtea stimulans Miq.	Jelatang	Indonesia, Malaysia	Fruit stalk
Procris laevigata Blume	.....	Tropical Asia	Pulp
Steblus asper Lour.	.....	Tropical Asia	Pulp
Taxotrophis macrophylla Boerl.	.....	Indonesia, Malaysia	Pulp
Verbenaceae			
Gmelina arborea L.	Malay bush beech	Malaysia	Pulp
Vitex glabrata R. Br.	.....	Burma, Malaysia, Thailand	Pulp
Violaceae			
Rhionera pachycarpa Craib.	.....	Malaysia, Philippines, Thailand	Pulp
Vitidaceae			
Ampellocissus martinii Planch.	Bika	Southeast Asia	Pulp
Cissus quadrangularis L.	.....	Pantropics	Pulp
Cissus triloba Merr.	.....	Indochina	Pulp
Tetrastigma harmandii Planch.	Ayo	Malaysia, Philippines	Pulp
Tetrastigma lanceolarium Planch.	Ojod	Tropical Asia	Pulp
Tetrastigma loheri Gagnep.	.....	Philippines	Pulp
Vitis lawsoni King	.....	Malaysia	Pulp
Vitis pallida Wight et Arn.	.....	Tropical Asia	Pulp

Scientific name	Common name	Where found	Part used
Zingiberaceae			
Phaenomeria atropurpurea K. Schum.	Ondje	Indonesia, Malaysia	Pulp
Phaenomeria speciosa Koord.	O'ıdji	Tropical Asia	Pulp
Vanoverbergia sepulchrei Merr.	.....	Philippines	Pulp

7. Minor Fruits of the Indian Subcontinent and Adjacent Places

Scientific name	Common name	Where found	Part used
Alangianciae			
Alangium lamarckii Thw.	Akola	India, Indochina	Pulp
Alangium salviifolium Wang.	Akola	India, Indochina	Pulp
Anacardianceae			
Bouea burmanica Griff.	Marian fruit	India, Indochina, Burma	Pulp
Buchanania angustifolia Roxb.	Pedda sara	India	Pulp
Buchanania lancifolia Roxb.	.....	India	Pulp
Buchanania lanzan Spreng.	Piyal	India, Burma	Seeds
Buchanania latifolia Roxb.	.....	India, Burma	Seeds
Mangifera sylvatica Roxb.	.....	India, Indochina	Pulp
Mangifera zeylanica Hook. f.	Ceylon mango	Sri Lanka	Pulp
Nothopegia colebrookiana Blume	.....	India, Sri Lanka	Pulp
Sorindeia madagascariensis DC.	Grape mango	India	Pulp
Spondias acuminata Roxb.	.....	India	Pulp
Spondias boronica	.....	Mauritius	Pulp
Annonaceae			
Alphonsea ventricosa Hook. f. et Thoms.	Noga-cola	India	Pulp
Cyathocalyx martabanicus Hook. f.	.....	India, Burma, Assam	Pulp
Fissistigma polyanthum Merr.	.....	India	Pulp
Fissistigma verrucosum Merr.	.....	India	Pulp
Miliusa velutina Hook. f. et Thoms.	.....	Indochina, Burma, Bangladesh	Pulp
Polyalthia cerasoides Benth. et Hook. f.	.....	India	Pulp

Scientific name	Common name	Where found	Part used
Polyalthia longiflora Benth. et Hook. f.	.....	India	Pulp
Polyalthia suberosa Thw.	.....	India, Burma	Pulp
Saccopetalum tomentosum Hook. f. et Thoms.	.....	India	Pulp
Uvaria macrophylla Roxb.	.....	India, Sri Lanka	Pulp
Apocynaceae			
Carissa lanceolata Dalz.	.....	India	Pulp
Carissa macrophylla Wall.	.....	India	Pulp
Carissa opaca Stapf.	Karaunda	India	Pulp
Carissa paucinowia DC.	.....	India	Pulp
Carissa spinarum L.	Karaunda	India	Pulp
Melodinus monogynus Roxb.	.....	India	Pulp, seed
Ochrosia oppositifolia K. Schum.	.....	India	Pulp
Urceola esculenta Benth.	.....	India, Burma, Sri Lanka	Pulp
Burseraceae			
Boswellia serrata Roxb.	Olinanum	India	Nuts
Canarium bengalense Roxb.	.....	India, Burma, Sri Lanka	Nut
Canarium strictum Roxb.	Black dammer	India, Indochina	Nut
Canarium zeylanicum Blume	Kekuna	India, Sri Lanka	Nut
Garuga pinnata Roxb.	Khapat	India	Pulp
Capparidaceae			
Capparis micrantha DC.	.....	India, Indochina, Burma	Pods
Maerua arenaris Hook. f. et Thoms.	.....	India	Pulp

Scientific name	Common name	Where found	Part used
Combretaceae			
Terminalia bellerica Roxb.	.....	India, Sri Lanka	Nut
Terminalia chebula Retz.	.....	India, Sri Lanka, Pakistan	Seed (oil)
Connaraceae			
Rourea commutata Planch.	.....	India, Burma	Aril
Dilleniaceae			
Dillenia aurea Sm.	Sempoor	India	Pulp (spice)
Dillenia indica L.	Elephant apple	India	Pulp
Dillenia pentagyna Roxb.	Aggai	India	Pulp
Dillenia scabrella Roxb.	Banj-ou	India	Pulp
Pentagyna coromandeliana DC.	.....	India	Pulp
Dipterocarpaceae			
Vateria acuminata Hayne.	.....	India, Sri Lanka	Pulp
Ebenaceae			
Diospyros chloroxylon Roxb.	Ninei	India	Pulp
Diospyros ebenum Koenig	Ceylon ebony	India, Sri Lanka, Pakistan	Pulp
Diospyros exculpa Ham.	.....	India	Pulp
Diospyros lanceaefolia Roxb.	.....	Burma, India, Nepal	Pulp
Diospyros maritima Blume	.....	India	Pulp
Diospyros melanoxylon Roxb.	Coromandel ebony	India, Sri Lanka	Pulp
Diospyros montana Roxb.	.....	India, Sri Lanka	Pulp
Diospyros peregrina Guerke	Gab	India	Pulp
Diospyros pyrrhocarpa Miq.	.....	India	Pulp
Diospyros ramiflora Roxb.	.....	India	Pulp

Scientific name	Common name	Where found	Part used
Diospyros tomentosa Roxb.	Tendu	India	Pulp
Diospyros toposia Ham.	Toposi	India, Sri Lanka	Pulp
Maba major Forst. f.	.....	India	Pulp
Maba nigrescens Dalz.	Ruktoora	India	Pulp
Ehretiaceae			
Cordia dichotoma Forst. f.	Clammy cherry	India	Pulp
Cordia myxa L.	Sapistan	India	Pulp
Cordia rothii Roem. et Schlecht.	.....	India, Pakistan	Pulp
Cordia vestita Hook. f. et Thoms.	Kúm-paiman	India	Pulp
Ehretia laevis Roxb.	Chamror	India	Pulp
Elaeocarpaceae			
Elaeocarpus serratus L.	Veralu	Sri Lanka	Pulp
Eleagnaceae			
Eleagnus kologa Schlecht.	.....	India	Pulp
Eleagnus latifolia L.	Mirica-tenga	India	Pulp
Ericaceae			
Vaccinium leschenaultii Wight	.....	India, Sri Lanka	Pulp
Euphorbiaceae			
Aleurites moluccana Willd.	Indian walnut	India	Seeds
Antidesma acuminatum Wall.	Paniheloch	India	Pulp
Antidesma menasu Muell.-Arg.	Kumbyung	India, Burma Andamam Island	Pulp
Aporosa lindleyana Baill.	Vittil	India	Pulp
Baccaurea courtallensis Muell.-Arg.	.....	India	Pulp
Baccaurea dulcis Muell.-Arg.	.....	India	Pulp

Scientific name	Common name	Where found	Part used
Baccaurea parviflora Muell.-Arg.	.....	India	Pulp
Bridelia retusa Spreng.	Kuhir, khaja	India	Pulp
Bridelia stipularis Blume	.....	India	Pulp
Caragana ambigua Stocks	.....	India	Pods
Fluggea leucopyrus Willd.	.....	India	Pulp
Gelonium multiflorum A. Juss.	Ban-naringa	India	Pulp
Macaranga roxburghii Wight	Chanda	India	Pulp
Phyllanthus reticulatus Poir.	.....	India	Pulp
Trewia nudifolia L.	Bhillaura	India, Sri Lanka	Pulp
Fagaceae			
Castanopsis argentea DC.	.....	India	Nut
Castanopsis diversifolia King	.....	India, Burma	Nut
Castanopsis indica DC.	Hinguri	India, Indochina, Burma	Nut
Castanopsis tribuloides DC.	Phul-hingori	India	Nut
Lithocarpus xylocarpus Markgraf.	.....	India	Nut
Flacourtiaceae			
Flacourtia montana J.	Attak	India	Pulp
Flacourtia sepiaria Roxb.	Indian plum	India	Pulp
Gnetaceae			
Gnetum ula Brongn.	.....	India	Seeds
Guttiferae			
Calophyllum apetalum Willd.	Poonstar	India	Pulp
Calophyllum inophyllum L.	Maria	India	Pulp

Scientific name	Common name	Where found	Part used
Garcinia atroviridis Griff.	Guru-guru	India	Pulp
Garcinia cambogia Desrouss.	Goraka	India, Sri Lanka	Pulp
Garcinia campanulata Roxb.	Bitmara	India	Pulp
Garcinia cornea L.	.....	India	Pulp
Garcinia cowa Roxb.	Cowa	India	Pulp
Garcinia indica Choisy	Kokambutter tree	India	Pulp, seed
Garcinia lanceaefolia Roxb.	.....	India	Pulp
Garcinia morella Desr.	Tamal	India	Pulp
Garcinia paniculata Roxb.	Bubi-kowa	India	Pulp
Garcinia pedunculata Roxb.	Tikul	India, Indochina	Pulp
Mesua ferrea L.	Nag champa	India, Indochina	Pulp
Ochrocarpus longifolius Benth.	Nag kesar	India	Pulp
Hippocastanaceae			
Aesculus indica Colebr.	Indian chestnut	India, Nepal	Seeds
Lauraceae			
Litsea glutinosa C. B. Robins.	.....	India	Pulp
Leeaceae			
Leea aspera Edgew.	Kawá okhár	India	Pulp
Leea crispa L.	.....	India, Burma	Pulp
Leea indica Merr.	.....	India	Pulp
Leguminosae			
Bauhinia vahlii Wight. et Arn.	Maljhan	India	Seeds
Cassia fistula L.	Purging cassia	India	Seeds
Dialium ovoideum Thw.	Velvet tamarind	Sri Lanka	Pulp
Entada phaseoloides Merr.	Modama	India	Seeds
Flemingia macrophylla O. Kze.	.....	India	Pods
Flemingia semialata Roxb.	.....	India, Pakistan	Pods

Scientific name	Common name	Where found	Part used
Humboldtia bourdilloni Plain.	.....	India	Pulp
Parkia biglandulosa Wight et Arn.	.....	India, Indochina	Pulp
Pithecellobium dulce Benth.	Madras thorn	India	Pulp
Pithecellobium lobatum Benth.	Djering	India	Pulp
Malvaceae			
Abutilon asiaticum G. Don	Kanghi, mudra	India, Sri Lanka	Seeds
Melastomataceae			
Melastoma malabathricum L.	Singapore rhodendron	India	Pulp
Memecylon caeruleum Jack.	Kulis	India	Pulp
Meliaceae			
Aglaia edulis A. Gray	Late maheva	Burma, Assam	Pulp
Aglaia roxburgiana Miq.	Yerra aduga	India, Sri Lanka	Pulp
Moraceae			
Artocarpus lakoocha Roxb.	Monkey jack	India	Pulp
Artocarpus nobilis Thw.	Wild bear fruit	Sri Lanka	Pulp, seed
Chlorophora excelsa Benth. et Hook. f.	Iroko fustic tree	India	Pulp
Ficus auriculata Lour	Timla	India	Pulp
Ficus benghalensis L.	Banyan	India, Pakistan	Pulp
Ficus cunia Buch.-Ham.	Khewnaw	India, Burma	Pulp
Ficus glomerata Roxb.	Gular	India, Pakistan	Pulp
Ficus heterophylla L.	.....	India	Pulp
Ficus hirta Vahl	.....	India	Pulp
Ficus hispida L.	Goblá	India	Pulp
Ficus lacor Buch.-Ham.	Kahimal	India	Pulp
Ficus lanceolata Buch.-Ham.	.....	India	Pulp

Scientific name	Common name	Where found	Part used
Ficus mysorensis Heine	.....	India	Pulp
Ficus nemoralis Wall.	Dudhla	India	Pulp
Ficus palmata Forsk.	Fagwara	India	Pulp
Ficus pomifera Wall.	.....	India	Pulp
Ficus religiosa L.	Peepul	India, Sri Lanka	Pulp
Ficus rumphii Blume	Pilkhan	India, Burma	Pulp
Ficus virgata Roxb.	Anjir	India	Pulp
Myricaceae			
Myrica integrifolia Roxb.	Sophee	India, Indochina	Pulp
Myrica sapida Wall.	Box myrtle	India	Pulp
Myrsinaceae			
Ardisia humilis Vahl	.....	India, Sri Lanka	Pulp
Ardisia neriifolia Wall.	.....	India	Pulp
Ardisia polycephala Wall.	.....	India, Burma, Sri Lanka	Pulp
Ardisia willisii Mez.	.....	Sri Lanka	Pulp
Maesa argentea Wall.	.....	India	Pulp
Maesa indica Wall.	.....	India	Pulp
Myrsine semiserrata Wall.	.....	India, Burma	Pulp
Myrtaceae			
Careya arborea Roxb.	Tummy wood	India	Pulp
Cleistocalyx obovatum Merr.	Kiamoni	Burma, Bangladesh	Pulp
Syzigium arnottianum Walp.	.....	India, Sri Lanka	Pulp
Syzygium calophyllifolium Walp.	.....	India, Sri Lanka	Pulp
Syzygium claviflorum Wall.	Borsrem	India	Pulp
Syzygium cordifolium Klotz.	.....	India, Sri Lanka	Pulp
Syzygium mabaeoides Wight	.....	India, Sri Lanka	Pulp
Nyssaceae			
Nyssa javanica Wang.	.....	India	Pulp

Scientific name	Common name	Where found	Part used
Olacaceae			
Olax scandens Roxb.	Dheniana	India	Pulp
Oleaceae			
Olea cuspidata Wall.	Kahu	India	Pulp
Olea dioica Roxb.	Parrjamb	India	Pulp
Palmae			
Areca concinna Thw.	.....	Sri Lanka	Nut
Calamus erectus Roxb.	.....	India	Nut
Calamus extensus Roxb.	.....	India	Nut
Calamus rotang L.	Rottan	India	Pulp
Calamus tenius Roxb.	Bet	India	Pulp
Nannorhops ritchieana H. Wendl.	Manzani	India, Pakistan	Pulp
Phoenix acaulis Roxb.	.....	India, Burma	Pulp
Phoenix hanceana Haud.	Khajur	India	Pulp
Phoenix lourliri Kunth.	Wild date	India, Burma, Indochina	Pulp
Phoenix paludosa Roxb.	.....	India	Pulp, seed
Phoenix pusilla Gaertn.	Inchu	India	Pulp
Phoenix robusta Hook. f.	.....	India	Pulp
Phoenix sylvestris Roxb.	Wild date	India	Pulp
Phoenix zeylanica Trin.	Ceylon date	India, Sri Lanka	Pulp
Raphia vinifera Beauv.	Wine raffia	India	Pulp
Pandanaceae			
Pandanus andamanensium Kurz.	.....	Andaman Island	Pulp
Pandanus lerana Jones	.....	Nicobar	Pulp

Scientific name	Common name	Where found	Part used
Rhamnaceae			
Ziziphus nummularia Wight et Arn.	.....	India	Pulp
Ziziphus oenoplia Mill.	Anor	India	Pulp
Ziziphus rugosa Lam.	Bhand	India, Burma	Pulp
Ziziphus xylopyrus Willd.	Kat-ber	India	Pulp
Rosaceae			
Rosa odorata Sweet.	Manipur wild tea rose	India	Pulp
Rubus ellipticus Sm.	Yellow Himalayan raspberry	India	Pulp
Rubus moluccanus L.	Ceylon blackberry	Sri Lanka, India	Pulp
Rubus niveus Thunb.	Mysore raspberry	Sri Lanka, India	Pulp
Rubiaceae			
Anthocephalus cadamba Benth. et Hook. f.	Meo	India	Pulp
Gardenia campanulata Roxb.	.....	Burma	Pulp
Gardenia gummifera L.	.....	India	Pulp
Gardenia latifolia Ait.	Boxwood gardenia	India	Pulp
Gardenia lucida Roxb.	.....	India, Burma	Pulp
Ixora arguta R. Br.	.....	Burma	Pulp
Ixora parviflora Vahl	.....	India	Pulp
Morinda citrifolia L.	Indian mulberry	India	Pulp
Morinda tinctoria Roxb.	Indian mulberry	India	Pulp
Morinda tomentosa Heyne	.....	India	Pulp
Morinda umbellata L.	.....	India	Pulp
Pavetta indica L.	.....	India	Pulp
Randia dumetorum Lam.	Mamdal	India	Pulp
Randia macrantha DC.	.....	India	Pulp
Randia uleginosa Poir.	Pindálu	India, Burma	Pulp

Scientific name	Common name	Where found	Part used
Rutaceae			
Acronychia pedunculata Miq.	Bai bai	India, Indochina	Pulp
Glycosmis pentaphylla Corr.	Orangeberry	India	Pulp
Hesperethusa crenulata Swingle	Naibel	India, Burma, Indochina	Pulp
Toddalia aculeata Pers.	Wild orange tree	India, Sri Lanka	Pulp
Salvadoraceae			
Azima tetracantha Lam.	Kantagur-kamai	India	Pulp
Salvadora oleoides Decne.	Kabbar	India	Pulp
Santalacaceae			
Champeria griffithiana Planch.	Sansi	India, Burma	Pulp
Pyrularia edulis DC.	.....	India	Pulp
Sapindaceae			
Allophylus cobbe Blume	.....	India	Pulp
Chrysophyllum roxburgii G. Don	.....	India	Pulp
Lepisanthes tetraphylla Radik	.....	India	Pulp
Mishocarpus sumatranus Blume	.....	India	Pulp
Mishocarpus sundanicus Blume	.....	India	Pulp
Schleichera oleosa Merr.	.....	India, Sri Lanka	Pulp
Sapotaceae			
Madhuca latifolia Roxb.	Mauwa	India	Seed (oil)
Madhuca longifolia Macbr.	Mowa	India	Seed (oil)
Manilkara hexandra Dubard	.....	India	Pulp
Mimusops bojiri A. DC.	.....	Sri Lanka, Mauritius	Pulp

Scientific name	Common name	Where found	Part used
Sideroxylon elengioides Benth. et Hook. f.	Pala	India	Pulp
Sonneratiaceae			
Sonneratia alba Smith	.....	India, Burma	Pulp
Sonneratia caseolaris Engler	.....	India, Sri Lanka, Indochina	Pulp
Sonneratia grifithii Kurz.	.....	Burma	Pulp
Sterculiaceae			
Pterospermum canescens Roxb.	.....	India	Pulp
Sterculia apetala Karst	Panama nut	India	Seed
Sterculia coccinea Roxb.	.....	India	Seed
Strychnaceae			
Strychnos nux-vomica L.	Strychinin	India, Sri Lanka	Pulp
Strychnos potatorum L.	Clearing nut	India	Pulp
Tiliaceae			
Grewia damine Gaertn.	Bather	India	Pulp
Grewia flavescens Juss.	Areicha	India	Pulp
Grewia hainesiana Hole.	Phalsa	India	Pulp
Grewia hirsuta Vahl	Kakarundah	India, Indochina	Pulp
Grewia oppositifolia Buch.-Ham.	Biul	India	Pulp
Grewia rhothii DC.	.....	India	Pulp
Grewia subinaequalis DC.	Phalsa	India, Sri Lanka	Pulp
Grewia tenax Asch. et Schwf.	.....	India	Pulp
Grewia tiliaefolia Vahl	Phalsa	India	Pulp
Grewia villosa Willd.	Padekhado	India	Pulp

Scientific name	Common name	Where found	Part used
Ulmaceae			
Holoptelea integrifolia Planch.	Kanji	India	Unripe fruit
Urticaceae			
Pseudostreblus indica Bureau.	.....	India	Pulp
Taxotrophis macrophylla Boerl.	.....	India	Pulp
Verbenaceae			
Faradaya spendida F. V. Muell.	.....	India	Pulp
Gmelina arborea L.	Gamhár	India	Pulp
Gmelina asiatica L.	Badhara	India	Pulp
Lantana salvifolia Jacq.	.....	India	Pulp
Vitex glabrata Br.	.....	India, Burma	Pulp
Vitex leucoxylon L. f.	Goda	India, Burma	Pulp
Vitidaceae			
Ampelocissus rugosa Planch.	Bhinana	India, Burma	Pulp
Cissus edulis Dalz.	.....	India	Pulp
Cissus repens Lam.	.....	India	Pulp
Commiphora caudata Engler	Hill mango	India	Pulp
Diploknema butylacea Lam.	Indian butter tree	India	Nut (oil)

Of the many thousands of fruits in the Tropics, most of the best have been fairly well distributed, although even these are frequently underutilized. Nevertheless, there are good fruits still to be distributed, still to become part of every backyard scene in the Tropics, and still to be commercialized in the Tropics and the Temperate Zone. Of these, most are from the American Tropics, and the rest are from the Asian Tropics. From the African Tropics have come many thousands of minor but very few major fruits.

The discussions concerning care of tropical fruits with potential have not been complete with respect to fertilization because in most cases good information is not available for minor tropical fruits and because tropical soils vary so much in fertility. Nevertheless, it can be assumed that all trees need added nutrients to obtain maximum growth and production. Tropical soils with sufficient nitrogen are rare.

As a general rule, a 10-10-10 fertilizer (nitrogen, phosphorus, potassium) can be used when trees are small. This is applied several times a year at the rate of 100 to 200 grams per centimeter of the trunk diameter at each application. The area under the tree is cleaned of vegetation; and the mineral fertilizer is placed on the soil well under the outside edge of the crown. It is sometimes buried in shallow holes or is broadcast after very light disking. Fertilizer applied to the surface should be carried into the soil by a penetrating irrigation.

The same fertilizer mixture can be applied to mature orchards at the maximum rate of 2,000 kilograms per hectare per year.

Organic materials such as compost and manure, when well rotted, can be applied on the soil, under the ground, or carefully disked into the soil. They should not be applied near the trunk.

Careful observations should always be made so that the appropriate amounts of fertilizer to stimulate growth without damaging the foliage are learned with experience.

No single judge is capable of selecting the fruits that will be great in tomorrow's world. Some of the commonest, most extended fruits in the Tropics—the tamarind, for example—are not great. It is tempting to believe that some really great fruits just wait to be discovered. There is no sharp line between fruits of great potential and just ordinary fruits, part of the difference depends on human actions. Three such borderline fruits worthy of mention are the black sapote, the morang, and the okari nut. These fruits are discussed in the final parts of the following sections concerning tropical American and Southeast Asian fruits.

Fruits of the American Tropics

The mamey sapote, *Calocarpum sapota* Merr. (family Sapotaceae), is one of the most notable and talked-about fruits of the Tropics (fig. 41). While not appealing at first to all palates, its flavor is rich and distinctive, and very much appreciated by its fans. Little known outside the American Tropics, the mamey sapote is found chiefly in Mexico, Central America, northern South America, Cuba, Haiti, and the Dominican Republic. It is also found in Florida, where its popularity is increasing. It is not well known in Puerto Rico or the Lesser Antilles. Occasional trees are found elsewhere throughout the Tropics, but nevertheless the species can be considered poorly extended.

The mamey sapote is an attractive medium-sized tree seldom reaching 20 meters in height and 45 centimeters in trunk diameter in very old age. It tends to be uniform and hemispherical.

The leaves are entire, obovate or oblanceolate, and 20 to 45 centimeters long. They are dark green and shiny on the upper surface, with yellowish veins, and light

Figure 41.—Mamey sapote, terminal leaves and subterminal flowers and fruits.

green on the underside. The leaves are grouped in whorls of 8 or 10 near the ends of young branches.

The flowers, small and almost sessile, develop in large numbers along bare branches below young leaves. The calyx consists of 8 to 10 imbricated sepals; the corolla is 5 white petals united in a tube. Within are five fertile stamens, five staminodes, and a conical, pilose pistil terminating in a simple stigma. The ovary consists of five carpels with a single ovule in each cell.

The fruit is ovoid or ellipsoid. The calyx persists at the base, and sometimes the remnants of the pistil are seen at the apex. The fruit is 10 to 25 centimeters long and 8 to 12 centimeters wide and has a thin but strong exocarp with a rough, rusty-brown surface. The pulp is from salmon to reddish brown in color, thick, and very sweet and aromatic. Usually, a fruit contains only one seed, ellipsoidal or spindle shaped, 5 to 6 centimeters or more long with a hard, shiny testa and a large cream colored or opaque hilum, but fruits of some varieties commonly contain 2 or 3 seeds.

Varieties of mamey sapote are being developed. In the past the species has been propagated almost exclusively by seedlings, which are quite variable, especially with respect to form and size of the fruit, and the color and quality of the pulp. In El Salvador, 'Magana' is known for its very large fruit (up to 1.5 kilograms). This variety was introduced in Florida in 1962 and is now cultivated commercially. Another variety in Florida is 'Cubana No. 1', with fruits up to 23 centimeters long and 1 kilogram in weight. Several other selections are being evaluated at Homestead, Fla.

Very good trees can be obtained through sexual propagation, although this technique is not recommended as explained above. If attempted, the seeds should be planted free of flesh but fresh from the fruit because viability decreases rapidly as the seeds dry. Increased and more uniform germination has been achieved by removing the testae carefully and planting the seeds in a sterile medium.

Asexual propagation, though difficult, is preferred. The most successful technique is approach grafting. The seedling that is to be the stock is suspended in its container near the branch that is to be grafted. Similarly sized and shaped portions of the stems are cut from the stock and the branch, and the two are carefully pressed together, wrapped with tape, and sealed with vinyl tape. After months the grafted branch is progressively cut from the mother tree until it is entirely supported by the stock.

The mamey sapote is best adapted to tropical lowlands, but its adaptation is wide, and the tree is also found in the subtropics and in tropical highlands. It does not tolerate frost. It seems to be well adapted to various soils and has been found growing in sands, calcareous soils, and heavy clays. The optimum soil seems to be fairly deep and acid, with moderate permeability, good drainage, and at least average fertility.

Trees should be transplanted about 6 to 8 meters apart in prepared fields at the beginning of the rainy season. Seedlings are generally larger than grafted trees and need more space.

Young trees need regular fertilization. Liquid 20-20-20 should be applied during the first year at the rate of 25 grams per tree each 3 months. The fertilization rate should gradually be increased to about 5 kilograms per year, with half applied at the beginning of spring rains and half at the beginning of flowering. Although the mamey sapote is somewhat resistant to drought, young trees should be watered regularly, and weeds should be removed. Very little pruning is necessary.

Because the mamey sapote has not been grown in large plantings, little is known of its diseases and pests. Termites make their nests in the trees. Anthracnose (*Colletotrichum* spp.) is a rare but severe disease. The sugarcane root borer, *Diaprepes abbreviatus* L., sometimes damages roots. No treatments are registered for these conditions in the United States.

Healthy seedling trees begin to produce after about 7 years, while grafted trees produce earlier. The fruits mature after 10 to 15 months on the tree. Maturity must be judged carefully by the size of the fruit and a slight internal color change, which can be revealed by scraping the fruit with a fingernail. An immature fruit is green inside, while a mature fruit is yellow or reddish. The fruits should be picked when mature but still hard. They will then ripen in a few days. The pulp is normally consumed fresh, but it is also used in drinks or milkshakes and in jellies and preserves.

The canistel, *Pouteria campechiana* Baehni (family Sapotaceae), is a widely adapted yet little known fruit that, while delicious, requires some development of appreciation (fig. 42). It has several relatives somewhat similar in appearance and usage.

The canistel is best known in Mexico, Central America, the Greater Antilles except Puerto Rico, southern Florida, and northern South America. It has been introduced in various other tropical countries, where it is usually no more than a curiosity in the botanical garden.

Figure 42.—Canistel, several good varieties shown.

The climatic requirements of the canistel are flexible. The tree prefers rather dry tropical lowlands but nevertheless is found up to 1,800 meters of altitude and in humid climates with frequent heavy rainfall. In Florida it adapts very well to the superficial soils on limestone rock. It can also be grown on very sandy soils and heavy clays. Its best development occurs where soils are not too heavy and rainfall is moderate.

The tree is small to medium; in deep soils it is rarely very large. The crown is usually somewhat open and thin. The branches tend to hang downward with age, especially when fruiting heavily.

The leaves are alternate, oblanceolate on a short petiole, smooth, and 10 to 25 centimeters long. They occur in rather loose clusters near the tips of young branches.

The flowers are small and inconspicuous. They occur among the leaves of young branches and are usually produced at the beginning of the rainy season or a little later. The calyx consists of four to six sepals, and the corolla, of five to six petals. There are five fertile stamens and five staminodes. The ovary of six carpels is topped with an erect style. Fruits are often produced over a long period of the year.

Outside, the mature fruit is yellow, orange, or pinkish. The exocarp is thin and easily damaged, and may be slightly rough. The fruit is spherical to slightly elongated, often prominently pointed at the stylar end. The pulp is yellow or orange and mealy or very smooth. Some compare the pulp's appearance with an egg yolk's. The seed (there may be one or several in a fruit) is large, with a thick, smooth, shiny, dark-brown testa. The hilum is lighter brown.

Very little has been done to develop better varieties of canistel. There are great differences among trees, and outstanding trees with high yields of large, flavorful fruit containing seeds can be propagated easily by grafting branches onto seedlings. The cleft graft has proved very useful in Puerto Rico; veneer grafting has given good results in Florida. Propagating from cuttings or air layers is difficult. Propagation by seeds is still the chief technique and gives rise to some excellent trees. Seeds should be cleaned and planted while quite fresh, for the dried seed loses its viability rapidly.

Little is known about the nutritional requirements of the canistel. In deep soils of normal fertility, a balanced mineral fertilizer such as 10-10-10 should be used each 3 months at the rate of 50 grams per application per tree, and this should be increased as the tree grows. Mature trees need nitrogen (up to about 0.5 kilogram of pure nitrogen) two or three times each year, potassium once a year, and phosphorus about every 3 years. In poor sandy or calcareous soils or in shallow soils, these quantities should be doubled.

The trees should be planted 7 to 12 meters apart, 7 meters being more appropriate for grafted trees because they will fruit while still quite small. Newly planted trees should be watered frequently until well established. Mature trees need no pruning except to shape them as desired and remove dead branches.

Because large orchards have not yet been developed, there has been little opportunity to study pests and diseases. White scales may reach serious proportions and may encourage the growth of fungus that disfigures the fruit. Rust is occasionally seen and may cause the loss of mature leaves. The fruits are relatively resistant to fruit flies.

The canistel should be harvested just before it is fully ripe. It is eaten out of hand when soft, sometimes with a little lime juice. The pulp is used to flavor milkshakes,

ice cream, and baked goods. Cooking intensifies the flavor. The fruit is a good souce of vitamin A and carbohydrates.

The peach palm, *Guilielma gasipaes* (H.B.K.) Bailey (family Palmae), is poorly named, for neither the tree nor fruit bears any resemblance to the peach (fig. 43). The fruit is delicately flavored, making it perhaps the best of the palm fruits after the coconut and the date. The plant is economically important for its heart of palm as well as its fruit. It is almost unknown in the Eastern Hemisphere, and it is not as widely distributed in the Western Hemisphere as its value merits.

The peach palm is distributed chiefly through the tropical lowlands of Central America and northern South America, especially in Costa Rica, Panama, Venezuela, Colombia, and Ecuador. It is also found in tropical South America, where it is believed to have been introduced, although its origin is uncertain. A few trees in Puerto Rico have grown and fruited very well. We believe that the peach palm could be grown successfully in many areas of the Tropics, even at elevations up to 1,500 meters.

The trees are tall, reaching 20 meters in exceptional cases. They tend to be straight and slender (diameters of 15 to 20 centimeters. Most trees are protected by wide circular rings of long, sharp, black spines, but some are spineless. Spines make harvest more difficult. The trunk is unbranched but tends to sucker at the base, so that several mature trees will often be found in a clump. These suckers can be used as new plants. Many trees do not form suckers readily, and these are difficult to propagate asexually.

The leaf is pinnately compound, 3 to 4 meters long, and graceful in appearance. Its large rachis often is slightly spiny. The flowering clusters are produced among or just below the leaves. A spathe opens and falls when the flowers are ready to open.

Both male and female flowers, small and yellowish white, are produced in large racemes. There are many more male than female flowers. The male flower consists of a small lobed corolla and three pairs of stamens. The female flower is characterized by a leathery calyx, a three-lobed corolla, and a three-chambered ovary with three short stigmas.

The fruits occur in clusters of 10 kilograms or more. Several clusters are produced each season. Since several stems are often in a clump, the total production per tree can be very high. Fruits need about 6 months

Figure 43.—Peach palm, crown and spiny trunk.

to mature and may change color slightly on maturing. The fruits are conical or ovoid and from 2.5 to 5 centimeters long. The leathery calyx is persistent. The outer skin is thin but tough and may be green, yellow, or red. The flesh around the seed is dry, firm, and mealy, or may be slightly to very oily, and varies from yellow to dark orange. The large angular seed is black, with a kernel resembling a coconut.

Peach palm is adapted to areas of medium to strong tropical rains. It is generally found on fairly heavy clay soils typical of many areas of the Tropics. Although the method is not recommended, many trees are propagated from seed. Seeds should be cleaned of pulp and planted while fresh. The offspring will vary in size and fruit quality as well as in yield and tendency to sucker. Seedless varieties, which are the most highly valued, cannot, of course, be propagated this way.

The best propagation method is planting suckers taken from the base of top-quality trees. On separating the suckers from the mother plant, care should be taken to avoid damage to either. Suckers should be grown in

containers or nursery beds to permit the establishment of a good root system before transplanting. The transplanting should be done at the beginning of the rainy season, and the trees should be placed 5 to 6 meters apart. Newly planted trees need considerable care, especially watering.

As the tree begins to grow, some of the suckers that develop at the base are left to form a clump. Others are removed for propagation or to keep the clump from becoming too large and therefore unproductive. A tree will begin to fruit in about 6 years and will produce for 50 to 75 years. However, as individual trunks grow in height, the harvest of the fruit becomes progressively more difficult. Therefore, old trunks are removed and new suckers are allowed to grow.

The mature fruits are marketed in bunches or are cooked and sold in small amounts, often as a snack food. The uncooked fruits last for about 2 weeks. The fruits need a long boiling time, about 3 hours, in salt water. They are then used in many ways. The mealy flesh is eaten. The boiled fruits may be retained for several days before eating, or they may be dried and stored for months and then reconstituted by boiling again. The dried fruits may also be ground into a meal. The kernels of the seeds are also eaten.

The food value of the pulp is high (roughly 3 percent protein, 7 percent fat, 41 percent carbohydrate), and indeed the fruit is a staple food in some parts of Latin America; at times little else may be eaten. There is much interest in this palm as a source of hearts of palm. Selections which sucker freely are particularly desirable for this purpose.

The asai, or Para palm, *Euterpe oleracea* Mart. (family Palmae), is neglected outside of Brazil, but it is a tree of much promise for other parts of the Tropics. While it has been introduced into India, Sri Lanka, Malaysia, and to a lesser degree elsewhere, it remains unknown to most people in the Tropics. It is a tree of many uses, considerable economic value, and much potential.

The asai is at its best in tropical lowlands. In the Amazon basin, it occurs in frequently flooded lowlands as well as on firm land. In many parts of Para, Brazil, it is the principal and dominating tree of the landscape. It occurs in large clusters of up to 25 trunks or more because it suckers at the base. A cluster generally consists of trunks of all ages, and as older trunks die, younger trunks grow to fill their places. Thus, a clump of trees has an indefinitely long lifetime.

The individual trunk is slim and tall (reaching 20 meters). The long pinnate leaves have pendulous segments. The tree is elegant in appearance, a choice palm for gardens. It flowers and fruits the year around, but during the dry season the fruit is most abundant.

The fruit, in large clusters, is small and round, 12 to 15 millimeters in diameter. Its collection from large trees is a difficult and dangerous task.

The fruit pulp has an unusual flavor described as similar to raspberries or blackberries but with a nutty taste also. It can be eaten fresh, out of hand. It is very popular crushed in drinks, and it is made into a sirup or sauce to be used with other food. In Brazil it is especially appreciated cooked with cassava meal. The fruit is also used in many baked products.

In addition, the asai is one of the best sources of palm cabbage. Because the tree occurs in clusters, old trunks can be removed for cabbage without destroying the tree itself.

The fruit pulp is high in calories because of its starch and sugar contents. It is also a good source of vitamin A. Its calcium, phosphorus, and iron contents are significant.

The buriti and miriti palms, *Mauritia vinifera* Mart. and *M. flexuosa* L. (family Palmae), are closely related trees of great potential value. They are found almost exclusively in equatorial Brazil, the former at low elevations in acid soils. They occur in groves, characteristically along rivers and around lakes, as if planted by design. They are said to be the most magestic trees of the Amazon basin.

The trees are tall (25 meters) and have thick trunks (30 to 60 centimeters). The crown consists of 15 to 20 feathery fan-shaped leaves arranged openly. These fall to the ground as they age. The inflorescences of the two species differ in detail, but in both they are large and pendent, with up to 100 fruits each. Five to eight of these fruit bunches, in various stages of maturity, can be found in a tree at any one time.

The fruit of both species are globose or oblate, covered with rhomboidal shiny-brown scales. The mesocarp is a rather thin cap of spongelike pulp around the large, hard seed. The fruits fall from the tree mature but still unripe.

The fruits are used chiefly to prepare a drink. They are immersed several days in water to make it easier to remove the skin. During this period, they soften. The pulp is crushed to remove the juice, which is then used in drinks and in desserts and baked products. The pulp is also used to make a thick jellied candy.

In addition to these uses for the fruit, the trunk is a source of starch similar to sago. The sap is used as a drink or is fermented to yield a wine. The leaves are used as a source of fiber for cords and ropes.

The mamey or mammee apple, *Mammea americana* L. (family Guttiferae), is widely adapted throughout the American tropics (fig. 44). It probably originated in the West Indies, where wild trees are still common. It must have been introduced very early into South America, for it has spread throughout the Amazon basin. It is usually grown as a dooryard fruit and is often harvested from the wild.

The attractive tree is medium to large, occasionally reaching 25 meters. The dark trunk is straight and upright, with large lateral branches having dense foliage. The leaves are paired, elliptical in shape, with short, thick petioles. The blade is coriaceous and shiny, with the margin entire. Trees bear either hermaphroditic or male flowers. The hermaphroditic flowers are several centimeters in diameter, with calyx and corolla spreading. They consist of many stamens around a simple pistil.

The fruit is large, weighing up to several kilograms. It is covered with a thick, brownish, leathery exocarp that can be cut open easily and peeled away. This exocarp protects the fruit well during transport. Within, the flesh is yellow to dark orange, firm and meaty, slightly aromatic. It is appreciated by most people, even on first contact. Imbedded in the fruit are one to four very large seeds (each 100 grams or more in weight). These have rough woody testae.

The mamey is found in many tropical climates, but not at high altitudes. It appears to do best where the rainy season is long and strong followed by a pronounced dry season. Its soil requirements seem to be flexible, for trees are often found in sand, sterile laterites, and heavy clays.

Mamey trees are most easily grown from seed. Seeds germinate on the forest floor under conditions of heavy rainfall. Seeds should be selected from trees that produce large quantities of high-quality fruit. They are best planted in a permanent site, 10 meters apart, in a rich soil mixture that includes perhaps moss or organic material to help maintain humidity. The seeds germinate in 2 to 3 weeks and produce vigorous seedlings rapidly. These need lots of water until well established; then they are relatively drought resistant. Mamey is also propagated by bud and terminal grafting of good trees, but formally propagated varieties are almost unknown.

Figure 44.—Mammee apple, thick, firm, edible flesh.

Little information is available on postplanting care of the trees. Protection from weeds and regular fertilization would of course be necessary. Pruning should rarely be necessary. Young trees begin to bear at 7 or 8 years of age.

When ripe, the fruits fall to the ground and are often damaged. Damage can easily be avoided by harvesting the fruit when it is mature but not ripe. It is not possible to determine the degree of maturity by color, but fortunately the time of harvest is quite flexible. Mature fruits ripen satisfactorily after harvest.

The fruits are normally eaten fresh, out of hand, or sliced for serving. The best are sometimes compared to apricots. The pulp is also stewed as a preserve, incorporated into pies, or made into a liqueur.

All parts of the mamey have insecticidal properties. Although the fruit is widely eaten, it may be detrimental to health in large, regular amounts. Even so, it appears

to have many good qualities and must be considered a neglected potentially great fruit.

The giant granadilla, *Passiflora quadrangularis* L. (family Passifloraceae), is a relative of the common yellow passion fruit, *Passiflora edulis flavicarpa* Deg. While it is extensively distributed throughout the Tropics, it is not well known anywhere. But it has may attractive qualities that should serve commercial purposes, if carefully handled.

The giant granadilla is a vigorous woody vine having a fairly short lifetime (5 to 10 years). The stem is quadrangular and with its large ovate leaves, serves to distinguish it from other *Passiflora* species. The vine climbs with tendrils, and so it is best maintained on a trellis that limits its height. Flowering is seasonal. The flowers are large (10 to 12 centimeters in diameter) and attractive, in shades of purple and maroon.

The fruit of the giant granadilla is up to 10 centimeters in diameter and 15 to 30 centimeters long. It is light green, with a thin, easily damaged epidermis over a soft pulp. The cavity of the fruit is filled with seeds surrounded by juicy arils.

The giant granadilla is summer flowering, and to assure good fruit set, hand pollination, easily accomplished with a small brush, is recommended. The species appears to be self-compatible. On the other hand, some plants set fruits well without hand pollination. These can be propagated by rooting stem cuttings.

Many forms of the species are quite similar. Variation could be introduced by crossing with the related *P. alata* L.

The young fruits of the giant granadilla are cooked as a vegetable. A drink is made from the juice of the arils. A common technique for eating the fruit is to prepare the juice and sprinkle it over cubes of the pulp. The flavor is pleasant, aromatic, and subacid.

The atemoya (family Annonaceae) is an excellent fruit that is widely adapted in the Tropics and subtropics and has promise for widespead cultivation in the future. It originated as manmade hybrid between the sugar apple, *Annona squamosa* L., and the cherimoya, *A. cherimola* Mill. The best varieties of atemoya combine the best qualities of both parent species and are adapted to a wider range of environmental conditions than either of them. The atemoya is well known now in Australia, Central America, Florida, India, Israel, New Zealand, into the Philippines, South Africa, and South America, and has been introduced into many other places.

The plant is a small tree. Mature specimens can reach a height and spread of 10 meters, but for successful commercial production the tree is kept smaller by periodic pruning. The leaves are alternate, 10 to 20 centimeters long and 4 to 8 centimeters wide. They may be lanceolate, elliptic, or ovate. The tree loses its leaves for a time each year, the length of time depending upon climatic conditions. The trees make one main bloom per year and usually an additional minor bloom. The period from bloom to fruit maturity is 5 to 6 months.

The fruit is spherical, conical, or ovate, with a weight of 250 to 600 grams. The shape and surface texture of the fruit are quite variable, even among fruit from the same tree. The fruit surface may be relatively smooth, or the distal ends of the individual carpels may project as rounded protuberances. The fruit has a thin green rind that becomes yellowish green at ripeness. The flesh of good varieties makes up a large proportion of the fruit weight. It is very sweet, with a pleasant flavor, and is soft when ripe. The hard black seeds are 10 to 15 millimeters long, and there are 15 to 40 of them per fruit.

The atemoya is a relatively new crop, and little work has been done on selection and propagation of superior varieties. Some named varieties are 'Mammoth', or 'Pink's Prolific', and 'Island Gem' (Australia); 'Bernitski', 'Gefner', 'Hette', 'Kabri', 'Kaller', and 'Malamud' (Israel); and 'Bradley', and 'Page' Florida, U.S.A. Seedling progeny of atemoya are extremely variable, and possibilities for further variety improvement are excellent. It is advisable to grow seedling populations in all areas where this crop is adapted and to make selections that are adapted to local conditions. Plants can be grown from seed easily and will bear fruit at 3 to 5 years of age.

The best method of vegetative propagation is grafting. The best time appears to be near the end of the dormant period, but it can be done at other times if necessary. Successful rootstocks include pond apple, *Annona glabra* L.; custard apple, *A. reticulata* L.; and atemoya seedlings.

The atemoya tree is adapted to a variety of soils. Trees on atemoya or custard apple rootstocks should be planted in well-drained sites, but trees on pond apple rootstocks can tolerate poor drainage to some extent. Where the soil is infertile or fruit production is heavy, the trees respond well to fertilizer, particularly nitrogen. The tree is best adapted to areas of moderate rainfall but can be grown in dry areas with irrigation.

The fruit can be harvested when mature but still firm and will ripen to excellent eating quality. This allows it

to be shipped to distant markets successfully. The fruit finds a ready market wherever people are acquainted with it. Most people like the flavor at first trial. The atemoya is a superb fruit for fresh consumption. The pulp can be used in sherbets and ice creams. The fruit is a good source of phosphorus and a fair to good source of thiamine and ascorbic acid.

The white sapote, *Casimiroa edulis* La Llave et Lex. (family Rutaceae), surely ranks among the really good but neglected fruits of the world (fig. 45). A native of the highlands of Central America and Mexico, the white sapote appears to be well adapted and can be found from the warm Temperate Zone to the hot lowland Tropics. Although the literature often reports that it is of limited value in the Tropics below 900 meters of elevation, we have seen the tree grown successfully at low elevations in Florida, Hawaii, and Puerto Rico. A relative, the wooly-leafed white sapote, *C. tetrameria* Millsp. is found in the highlands of South America. It also grows and produces very well in Florida. We believe that the white sapotes have not yet been widely enough introduced and tested.

The white sapote is a medium-sized spreading tree with a much-branched trunk. The alternate leaves are palmately compound, normally with five leaflets. They are light green and have undulated but usually entire margins. The very small flowers are produced on terminal or axillary inflorescences, and the fruits follow, sometimes in clusters of 10, 12, or more.

The fruits vary from 4 to 9 centimeters long at maturity, usually according to the number of seeds they contain. The fruit is green at first but ripens to a pale yellow. The epidermis is thin and easily damaged.

Figure 45.—White sapote, leaves and fruits.

The pulp of the fruit is white, cream, or yellowish and very soft, without fiber. It is sweet but has a characteristic bitter taste that some people do not like. Varieties vary in bitterness and acceptability; the most bitter, distasteful fruits to some, are the most delicious to others. Within the fruit there are usually one to five large seeds, but some trees consistently produce small seedless fruits.

The white sapote prefers a subtropical climate. It is adapted to many soils, however, and to poor fertility, and will tolerate a heavy rainy season. It is normally planted from seed, although improved varieties developed in California and Florida can be propagated by budding and grafting. These include 'Blumenthol', 'Coleman', 'Dade', 'Harvey', 'Pike', 'Suebell', and 'Wilson'. Trees from seed fruit in 7 or 8 years; grafted trees fruit in 4 or 5 years.

The jaboticaba, *Myrciaria cauliflora* Berg. (family Myrtaceae), is a common everyday fruit in some parts of Brazil, including Rio de Janeiro, but one that has hardly been introduced elsewhere (fig. 46). As far as can be seen at the present time, the jaboticaba is subtropical; although introductions made so far in humid tropical lowlands grow very well, they do not flower. The fruit is attractive, readily accepted, and marketable, and it would probably be of much use in other tropical countries. Collection of a wide range of germplasm, including related species, appears desirable so that adaptable forms can be obtained for all parts of the Tropics.

Although the jaboticaba reaches a height of 12 meters, most trees in cultivation are much smaller and indeed begin to fruit when only 2 or 3 meters tall. The tree has an irregular, ill-defined, very much branched trunk with a very smooth bark. The leaves are simple and opposite. The leaflets are 2.5 to 8 centimeters long, sessile or almost so, ovate and entire, very dark green, and leatherlike.

Small white flowers are borne on the trunk and main branches in small clusters. The fruits grow rapidly and mature in 1 month. They are almost spherical, dark purple to black, and 1.3 to 5 centimeters in diameter. The skin is tough; the pulp is very soft, juicy, and subacid. One or a few seeds are found in each fruit. The flavor is attractive and said by some to resemble that of grapes. The fruit is eaten fresh or made into jellies. It makes a good red wine. Several fruit crops can be produced each year.

Jaboticabas are grown perhaps exclusively from seeds. These germinate readily to produce small, slow-growing trees similar to the mother tree. Nucellar embryony is

Figure 46.—Jaboticaba tree loaded with fruits.

believed to be the cause of the similarity. Trees can be maintained for up to 2 years in plastic bags or other containers, until they are ready for transplanting to the field. Plants may require 10 years or more to flower and fruit, a principal obstacle to their popularization. Young trees in Florida grow better in peat with complete mineral nutrients added. Approach grafting of mature trees on younger seedlings is sometimes done to stimulate earlier fruiting.

Jaboticaba seems to be well adapted to sands, acid soils, and even heavy clays. It appears to tolerate very wet climates, but it sets fruit poorly in dry regions.

The lucmo, *Pourteria obovata* H.B.K. (family Sapotaceae), is one of the excellent fruits of South America that has hardly been distributed from its area of origin. It is quite similar to the canistel, but judged by many to be superior. A fruit of many uses and with a distinctive flavor, it is not readily appreciated by adults who try it the first time, but introduced gradually, it becomes a favorite.

The lucmo is from the low Andes and the foothills and even coastal plains of Chile, Peru, Ecuador, and Colombia. It is most highly developed in areas of moderate rainfall, but it is not as widely adapted as the related canistel. The temperatures where it occurs are cool to warm. It is very important for the lucmo to have good drainage; the tree will not stand flooding.

The lucmo is a large tree of the forest, but it begins to produce when quite small and can be maintained small. The tree has a straight strong trunk and numerous lateral branches. The crown is hemispherical and attractive. The alternate leaves are elliptic, lanceolate, or oblanceolate, tapering at the base to a short petiole; they reach 25 centimeters in length and 10 centimeters in width. The margins are entire, and the surface is dark shiny green. The petioles and young twigs are pubescent.

The hermaphroditic flowers are 1 centimeter wide and 2 centimeters long. They are borne in moderate numbers among the lowermost leaves near the tips of branches.

The fruits are more or less spherical or somewhat flattened, often with a prominent point on the stylar end, and 4 to 17 centimeters in diameter. They are green colored but often change to a pale yellow or orange as they ripen. The epidermis is smooth to wrinkled and may be slightly scaly; it is thin and easily broken. Inside, the pulp is yellow, smooth, mealy, soft or hard according to the variety, and dry. Several large seeds are embedded in the pulp. The odor of the fruit is strong and penetrating, and intensifies with cooking.

The lucmo is propagated from seeds. In common with many tropical fruit seeds, they should be planted while fresh and before drying. In Peru they are stored and stratified before planting, but this may not be necessary. Seeds can be started in seedbeds, and the seedlings can be transplanted to containers until large enough for planting in fields.

Seedlings about 1 centimeter in diameter are used for grafting. Although the scion can be obtained from any tree with high yields and good fruit quality, selected varieties (stocks) are now available in Peru. Trees to graft are kept rather dry for about 3 weeks before grafting, and then they are well watered the last few days to initiate new growth. The terminal cleft graft is suitable for the lucmo.

Newly grafted trees need special care until the graft union is well formed. Four to six meters should be left between transplanted trees. Newly planted trees need regular irrigation but within a short time can stand short periods of drought.

Fertilization has hardly been studied, and general recommendations are difficult to make. Mineral fertilizers at the rate of 50 grams four times a year may be applied to each tree the first year. Thereafter, fertilization should be twice yearly. Weeds must be controlled to give the young trees the opportunity to grow rapidly. Pruning is done chiefly to form the tree and in later years to restrict the growth of the tree. Diseases and insects will vary from one place to another, so general procedures cannot be given.

The fruits should be harvested before they are completely mature. They can then be handled and transported easily. Mature fruits ripen 6 to 10 days after harvest.

The fruit is often eaten fresh, and it has great potential for cooking in pies, cakes, preserves, breads, puddings, etc. The fruit is rich in carotene, niacin, and carbohydrates.

The cupuazu, *Theobroma grandiflorum* Schum. (family Sterculiaceae), is a very important fruit of the Amazon basin of Brazil. Related to the cocoa, *T. cacao* L., the cupuazu is generally used for its pulp, although the seeds are sometimes used to make chocolate. They contain good quantities of the stimulant alkaloids caffeine and theobromine. The cupuazu is almost unknown outside Brazil, where, in some regions, it is found in almost every dooryard.

The tree fruits when quite small (6 to 10 meters) but has the potential of reaching 20 meters in height. The leaves are 25 to 35 centimeters long, coriaceous, and short petioled. The flowers occur singly or in small groups in the axils of the leaves or along the bare branches. The fruit is ellipsoidal or oblong, 12 to 25 centimeters long, 10 to 12 centimeters in diameter, and up to 1.5 kilograms in weight. The woody pericarp is easily broken open to expose the edible aril around the individual seeds. The mature fruit can last for about 10 days. The pulp is used fresh or in wines, is made into fresh drinks, or is stewed.

The bacury, *Platonia insignis* Mart. (family Gutifferae), is almost unknown outside its native Brazil and Paraguay, where it is well distributed and widely used. It is a large (25 meters) tree that tends to become weedy, to spread, and to dominate adjacent vegetation. The trunk is strong and straight, supporting an inverted-cone-shaped crown. The leaves are opposite, elliptical, thick, and shiny green, with slightly undulate margins.

The attractive, pink flowers are large (7-centimeter diameter) and have five petals and numerous stamens partially united in five groups. The flowers are produced during the dry season and mature as the rainy season begins.

The fruit is large and ovoid or almost globose and weights about 900 grams. The fruit contains one to several segments (like those of an orange) of white pulp with an agreeable flavor. Each segment may contain one large seed, but some fruits are seedless; these are preferred. The pulp may be eaten fresh, out of hand, or it may be made into a drink or stewed.

The tree is considered very easy to grow and may sprout from the roots. Because of its weedy tendency and persistence, it should be tried in new regions with extreme caution.

The caimito, *Chrysophyllum cainito* L. (family Sapotaceae), is a widely distributed tree, but the fruit is not used extensively in any region (fig. 47), including its native West Indies and Central America. Individual seedlings are sometimes of excellent quality, and the preservation and distribution of these as clonal varieties would probably make the species successful. This can be done by marcottage, inarching, or cleft grafting.

The tree prefers coastal forests where monsoon climates prevail, but it can probably be found, at least occasionally, throughout the Tropics. It has been introduced into Brazil and Guiana, where it is both cultivated and wild.

Figure 47.—Caimito, typical fruits and velvety leaves.

The tree, medium to large, with open spreading crown, is attractive. The alternate elliptic leaves of medium length (10 to 12 centimeters) are usually dark green or bright on the upper surface and orangish or rusty brown below. The brownish color is caused by a fine silky pubescence. The inflorescence consists of 10 to 30 small flowers in axillary umbels. Flowering and fruiting may occur several times a year.

The fruit is a spherical berry 6 to 9 centimeters in diameter, light or dark green, often tinged or colored deeply purple by anthocyanin. The pulp of the mesocarp is somewhat jellylike , greenish or purplish, and amply supplied with white latex, which becomes less as the fruit ripens. The pulp is sweet and free of acidity, and has a weak distinctive taste. Within the pulp are 1 to 10 flat seeds 1 to 2 centimeters long. Ripe fruits do not fall from the tree but must be handpicked when mature but beginning to soften.

The black sapote, *Diospyros ebenaster* Retz (family Ebenaceae), is a popular fruit in subtropical and tropical reaches of Mexico, and it has been introduced into Florida and, to a small extent, the West Indies (fig. 48). The tree is small, with dark glossy leaves, and grows rapidly when well taken care of. The fruits are up to 8 centimeters in diameter, with a green exterior, a thin skin, and a soft blackish-brown pulp. The appearance discourages some people, but the taste is attractive. This fruit, while eaten fresh, could well be used in puddings and ice creams, where its contribution would be appreciated. It is rich in vitamin C.

Figure 48.—Black sapote, a handsome tree with fruits that are dark green until ripe.

Fruits of Southeast Asia

The mangosteen, *Garcinia mangostana* L. (family Guttiferae), is surely one of the world's best fruits (fig. 49). It is so aromatic and delicious that everyone who tries it enjoys it. The tree itself is attractive and would make a fine ornamental in any garden. Nevertheless, the mangosteen is almost unknown in the Western Hemisphere. It merits extensive trial throughout the humid tropics.

The mangosteen is a fruit of the hot, humid regions of tropical Asia, especially the Malay peninsula, Indonesia, Cambodia, Vietnam, Thailand, and the Philippines. It has been introduced on a small scale into Central America and the Caribbean, where it has adapted very well in hot, humid areas.

The tree is small, with a columnar or slightly pyramidal form. It reaches a height of 12 meters and a trunk diameter of 0.6 meter only in advanced age. The straight, very dark trunk produces numerous upright or horizontal branches.

The evergreen opposite leaves are large (7 to 13 centimeters wide and 15 to 25 centimeters long), and elliptical and oblong. They are coriaceous and smooth, with entire margins.

Figure 49.—Mangosteen fruits, with juicy sections, and leaves.

The attractive flowers, solitary or in pairs, are 3.8 to 5.0 centimeters in diameter and female; male flowers are not produced. The flowers have four thick petals and four sepals.

The fruit is almost spherical or slightly flat and 5 to 8 centimeters in diameter. The cortex rapidly changes color from a rusty green to a dark purple as the fruit matures. Inside, the fruit is divided into white, juicy, translucent segments, the largest of which contain seeds. The seeds vary in size.

The mangosteen does not grow in a wide variety of soils. It definitely fails in sandy soils, calcareous soils, soils with poor water-holding capacity, and soils that are subject to frequent drying out. On the other hand, it tolerates relatively heavy soils and high water tables, but it should not be flooded frequently. A high content of organic material is desirable. Trees are frequently found growing by lakes and streams.

The mangosteen is propagated from seeds; grafting and vegetative techniques have not been successful. Since the seeds are asexually produced, all trees are exactly like the mother tree. The only disadvantage of propagation from seeds is that the trees grow very slowly. During the first 3 years, seedlings may produce no more than four or five pairs of leaves.

Seeds for planting should be cleaned as free of pulp as possible and should soon after be placed in loamy soil. The best technique is to plant several seeds in the site a tree will occupy when mature. (This site can be improved with better soil, and so on.) Only the most vigorous seedling should be permitted to live. Since the mangosteen is such a small tree for many years, the distance between trees need only be 5.5 to 7 meters. Mangosteens grown in containers are difficult to transplant. First of all, the containers should be deep, and transplanting should be done on a cool or cloudy day, with much care. The trees should then be watered regularly, probably the most important cultural requirement, for they will die back during the dry season otherwise. Light shade should be provided during establishment and should not be removed—then only gradually—until the tree is 3 or 4 years old.

During the first few years of growth fertilizer requirements will be light but important. Twenty-five grams of 20-20-20 should be applied three or four times a year to each tree. Later, fertilize twice a year, when growth begins at the start of the rainy season and when flowering begins. About 6 to 8 kilograms of mineral fertilizer per year is needed for a mature tree.

Mangosteen trees should be kept free of weeds. They are so small and slow growing that a few weeks of weed growth can completely hide them. The trees require little pruning except to remove deadwood and repair injuries.

Few pests have been found attacking mangosteen. A tree exposed to light and air movement seldom is attacked. After diseases and insects have been identified, treatments used for other species can be tried.

Under very good conditions a mangosteen tree may begin to produce fruit in 7 years, but most trees require 10 to 15 years. The trees are still small when they begin to produce; with time and care, a tree will produce from 500 to 1,500 fruits a year.

The fruit's purplish color increases with maturity. When the pericarp softens slightly, the fruit may be picked. It can be opened with a cut around the "equator" or can be pried open with the thumbs. Mangosteens are eaten out of hand.

The durian, *Durio zibethinus* Murr. (family Bombbacaceae), is perhaps the most controversial fruit of the Tropics (fig. 50). To those that love it, there is no better fruit. To those who can't eat it, even the odor is offensive. In areas where the fruit is used, restrictive laws have been passed to protect those who wish to avoid it. From Southeast Asia to the Philippines, everyone knows the durian, and whether it is loved or not, it is always talked about.

The durian is distributed through the hot, humid Tropics of Asia, especially in Indonesia, the Philippine Islands, Malaysia, and Thailand. It is scarcely known in Africa or the American Tropics. It should be a remarkable fruit wherever it is introduced, if given a reasonable chance to establish itself and become known.

The durian is strictly tropical in its growth requirements. It is found from sea level to about 300 meters of altitude. It prefers a humid climate and especially a very long rainy season. Little is known about optimum soils, but durian does occur where soils are acidic and heavy and where organic material has accumulated.

The tree ranges from medium to very tall (20 to 40 meters). At times it is pruned to maintain a single straight trunk with a few lateral branches, but at other times large principal branches are allowed to develop. The crown is irregular and dense. The dark-gray bark has conspicuous fissures and a tendency to flake away

in large pieces. The small branches are covered with fine scales colored from copper to gray.

The leaves are alternate with short petioles. They are more or less eliptical to obovate and measure 6 to 25 centimeters in length by 2.4 to 9 centimeters in width. The thick leaves are smooth, dark green, and shiny on top and finely pubescent and gray to yellowish on the underside.

The flowers are produced on the lateral leafless branches, close to the trunk. They fall the day after blooming unless fruit set occurs. They have a bad odor, which attracts insects and bats that pollinate them. Self-pollination may occur within the bud.

The fruits vary in size from that of a grapefruit to an unhusked coconut. They are covered with short, thick, pyramidal spines. As the fruits mature, the color changes from green to clear yellow, and with over-maturity, to copper brown or cream-and-coffee. When the fruit is sufficiently ripe, a slight pressure will break it into five valves, or segments. These consist of a white cortex and a chamber for the seeds. Each chamber contains one to three seeds, each surrounded by an aril colored from white to yellow (fig. 51). This pulp is soft, smooth, and attractive, but it has a strong odor. The seed, too, is attractive, with a brown or cream seedcoat and a broad area where the pulp is attached.

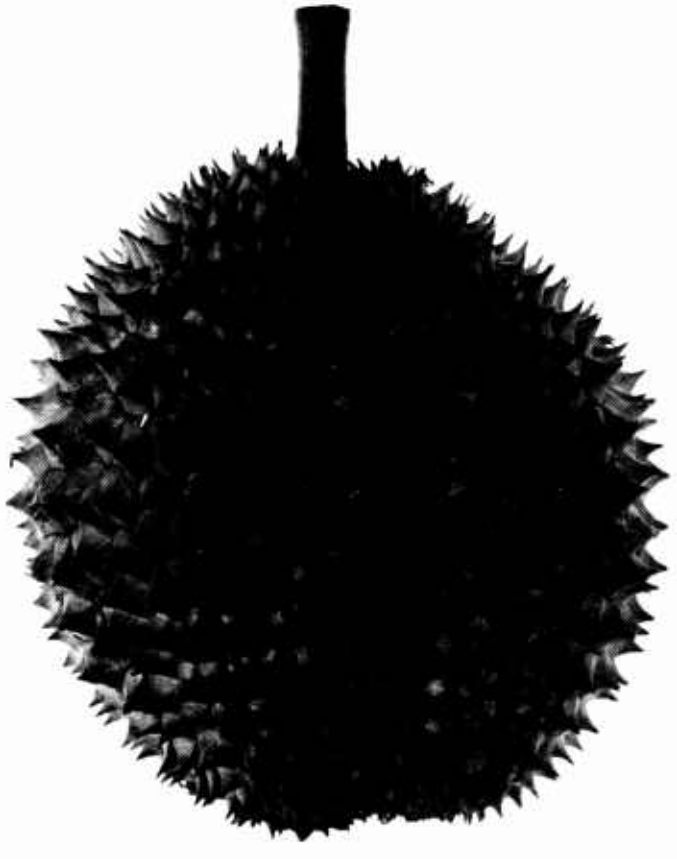

Figure 50.—Durian fruit with its thick, prickly spines.

Most durian trees in Asia are grown from seed, and in general, the exact parentage is unknown. Almost all of the fruits are edible, although some have an odor that is just too strong for comfort. In Thailand and Malaysia excellent varieties are known, and these are conserved by asexual propagation. A good variety of durian is characterized by high yields, large fruits with small or rare seeds, and abundant pulp. The best varieties have only a touch of the strong odor that characterizes this fruit, and have a light, agreeable appearance. Improved varieties have been introduced into the Western Hemisphere only as isolated instances, and they are not now available.

Until improved varieties are available, the best way to establish durian is by seed. These should be obtained from fresh, mature fruits. The pulp is removed and the seed is washed well. The seed can be superficially dried but should not be completely dried before planting. The seeds retain their viability only 3 or 4 days under normal circumstances, but their lifetime can be prolonged for 2 to 3 weeks at cool temperatures. A seed should be planted under 3 to 5 centimeters of humid soil. Germination begins within days. The first sign of germination is the emergence of the crooked neck of the hypocotyl, and this may need several weeks to emerge completely. (It is useful to establish seedlings in containers of 4 to 5 liters of soil until they are ready for field planting.) Seedlings can be grafted at 1 year of age by bud or wedge techniques.

Planting is best made at the beginning of the rainy season, with normal precautions. Very little experience with fertilization is available, but the soil used for

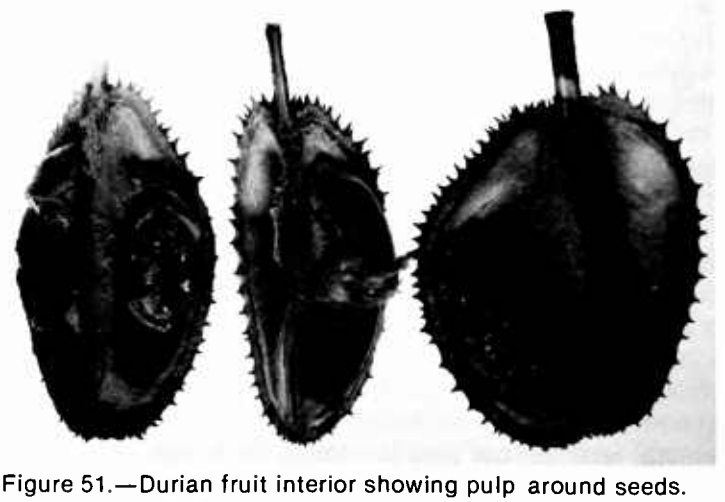

Figure 51.—Durian fruit interior showing pulp around seeds.

transplanting should be fertile, and mineral fertilizers as well as organic materials can be used as the tree becomes established. Newly planted trees should be watered regularly and copiously. Light shade is useful during the first year or two of growth. Diseases and pests are almost unknown in the Western Hemisphere, but they will probably occur as soon as orchards are established.

The trees grow rapidly and begin to produce in 7 or 8 years. The fruits mature during the rainy season, and if not harvested from the tree, fall to the soil 1 to 4 days before opening and can be injured. Therefore, almost-ripe fruits should be harvested. The ripe fruit is delicate and cannot be easily transported long distances.

The pulp is eaten fresh or, in Indonesia, in a fermented dish made from rice, sugar, salt, onion, and vinegar, and cooked. The seed is eaten also roasted or sliced and fried.

The pummelo, *Citrus grandis* (L.) Osbeck (family Rutaceae), is an extremely appealing citrus fruit more characteristic of the Tropics than are most related cultivated species (fig. 52). It originated in subtropical China and evolved in Thailand, Burma, Malaysia, and Indonesia. It is easy to produce, easy to use, and easy to enjoy.

The pummelo is widely distributed and well known in the Asian Tropics; it is known but not widly distributed in tropical Africa and in the Americas. In Asia it is best known in China and Thailand, where the best varieties have developed, but it is also well known in Malaysia and Indonesia.

The pummelo is one of the most versatile of the citrus species. It is more frost tolerant than lime, more or less like grapefruit, and can be grown in both wet and dry regions of the Tropics. It grows in the warmest parts of the United States. Nevertheless, the pummelo grows best in the hot, humid Tropics.

The tree is large for a citrus, ranging from 5 to 19 meters in height. The central trunk is very much divided into principal branches with brown bark. New branches are angled and pubescent, and often have long spines.

The leaves are thick, coriacious, shiny, alternate, large, ovate or ovate-elliptic, with the tip blunt, the base rounded broadly or subcordate, the principal vein frequently pubescent. The wings of the petiole are broadly extended, sometimes continuous with the leaf blade.

The flowers, also, are very large for a citrus, measuring from 3 to 7 centimeters in diameter. They develop singly or in small groups in the axis of the leaves, or as subterminal inflorescences. They are white or cream and have 5 sepals and 5 petals, 20 to 25 stamens with large anthers, and a globose ovary of 12 to 18 segments.

The pummelo is probably the largest citrus fruit, for it reaches 60 centimeters in diameter and 10 kilograms in weight, although most fruits are 20 to 25 centimeters in diameter. The fruit is globose, oblate, or pyriform. The peel is very thick; green, yellow green, or yellow; and easy to remove. The segments of the fruit are easily separated, and the membrane, while tough, is easily separated from the juice sacs without spilling liquid. The pulp is white, pale green, pink, or red. The seeds are large, thick, and rough.

Although there are many varieties of pummelo, few are known outside of their area of origin. They can be divided into three groups, the Chinese, the Thailandese, and the Indonesian, distinguished by form, quality, and minor details. The principal varieties in the Western Hemisphere are 'Nakon', 'Kao', 'Panne', 'Kao Phunag',

Figure 52.—Pummelo tree with several fruits.

'Thong Dee', 'Chandler', 'Reinking', 'Mato Butan', 'Amoy', 'Banpeiyu', 'Herado Butan Pandan Bener', 'Pandan Wangi', 'Red Shaddock', 'Webber', 'Tambun', and 'African'.

Although the pummelo is frequently propagated from seeds, the quality of the seedlings is quite variable and is usually inferior to that of grafted, named varieties. Both bud and terminal grafts are satisfactory, and seedlings of any variety can be used for the stock. A few varieties, such as 'Tresca' in Puerto Rico and Florida, can be propagated easily by cuttings. Air layering is also used. Trees are normally established in plastic bags before field planting.

The pummelos of Thailand are grown in heavy soils with a high water table and are exposed to and tolerate high levels of salt. Most varieties tolerate a wide variety of soils and even grow well in soils not usually used for agricultural purposes (tin tailings in Malaysia, for example).

Young trees are normally planted 7 to 10 meters apart at the beginning of the rainy season. A good mixture of soil should be used to fill the holes so as to stimulate growth. Trees should be watered at planting and regularly thereafter. Once trees are established, about 100 grams of a balanced mineral fertilizer should be applied each 4 months. For minor-element fertilization and pest and disease control, local recommendations for other citrus species should be followed.

Young trees should be pruned to a few principal branches, and a mature, spreading form will gradually emerge. Little other pruning is required.

Normally, the peel color will change slightly as the fruits ripen, and in a cool climate, the color change will be more pronounced. Since the ripe fruit does not fall, it is necessary to know the proper time and stage for harvest. The fruit of some cultivars will dry out if left on the tree too long. The fruit lasts well and can be transported with minimum risk.

The tree is almost always eaten fresh as a dessert or snack. First, it must be peeled carefully, the segments separated, and the membrane removed. The pulp is sweet and aromatic, and appeals to everyone. The rind is often made into a citronlike candy.

The rambutan, *Nephelium lappaceum* L. (family Sapindaceae), is another well-known fruit of Southeast Asia that is still almost unknown in the Western Hemisphere (fig. 53). A relative of the more familiar litchi and the lesser known pulasan, the rambutan is the most tropical of the group and probably adaptable to even the hottest parts of the Tropics. Sporadic introductions have shown that while seedlings are hard to establish, mature trees can be produced and are fruitful in the American Tropics.

Rambutan is apparently native to Malaysia, and its chief variations appear from Thailand to Indonesia. It is less common in India, and it has apparently been introduced into Madagascar. About 20 fruiting trees are found in Puerto Rico.

The tree is of medium stature, reaching about 10 meters at maturity, but trees as small as 5 meters can be found. The trunk, which reaches 30 centimeters in diameter, is upright, with rather large branches. The bark is very dark and rugose. The crown is somewhat open.

The leaves are pinnately compound and consist of 2 to 4 pairs of leaflets and sometimes a terminal leaflet. The leaflets are oblong or elliptical, shiny dark green

Figure 53.—Rambutan tree with heavily fruiting branch.

above and lighter below. The leaf measures 5 to 10 centimeters in length and 2 to 10 centimeters in width.

The flower cluster consists of terminal or axillary panicles. Trees are male, female, or mixed. The male flowers have five to eight stamens 3 to 4 millimeters long with pubescent anthers. The female flowers consist of a pistil formed by two carpels. Normally a fruit develops from only one carpel, although bicarpellate fruits are sometimes seen.

The fruit is an ovate or ellipsoidal drupe 3 to 8 centimeters long and 2 to 4 centimeters wide, with a short, thick pedicel. The pericarp is red or yellow and is covered with smooth appendages that look like curved thorns but that are soft and flexible. The interior aril is smooth, white, translucent, juicy, and sweet. The seeds, usually one to a fruit, are ellipsoidal and 2 to 3 centimeters long.

The rambutan is strictly tropical and prefers a long rainy season. It does not do well in subtropical areas such as Florida, even where other tropical trees thrive. Its soil requirements are generally not demanding except that a chlorosis apparently stemming from poor mineral nutrition is common in small seedlings. A cure for this condition, which can be fatal, is not known.

Named varieties of rambutan are well known in their native regions. As in the case of many fruits, the grafted varieties are far superior to the average seedling.

But when propagating from seed, clean and plant the seed promptly after its removal from the fruit. Seedlings can be started in seedbeds and transplanted to plastic bags for establishment. They need 8 to 12 months before they are transplanted to the field or are used for grafting. The patch bud technique, cleft graft, approach graft, and aerial layering (marcot) are all successful propagation techniques. Young trees should be planted 7 meters apart.

Little information on fertilization is available, and many trees in Southeast Asia are not fertilized or are treated only with mulch and manure. Nevertheless, regular fertilization of young trees is recommended to avoid the chlorotic condition previously described. Applications of mineral fertilizer should gradually increase to a maximum of 8 kilograms per tree per year.

Because the rambutan is a tree of the hot, humid Tropics, it needs regular irrigation, especially during transplanting, establishment, and prolonged droughts. Weed control is also necessary. Pruning to shape the tree and remove deadwood should be done as necessary.

Rambutan trees may begin to bear as early as the third year of growth, but they normally begin after 5 or 6 years. The fruits can be collected when they begin to turn from green to reddish. The greater part of the harvest is eaten out of hand. In Southeast Asia some rambutan is canned, alone or with other fruits. While it is not great, the rambutan is a pleasant fruit that eveyone likes.

The longan, *Dimocarpus longan* Lour. = *Euphoria longana* Lam. (family Sapindaceae), is well known and esteemed in Asia, where it is cultivated from southern China to India (fig. 54). It has been introduced widely into the tropical and warm subtropical areas of the world, but it has not yet become an important crop outside Asia. It has good potential as a commercial crop elsewhere.

The tree, a handsome evergreen with a dense, rounded canopy, grows to a height of about 12 meters and a spread of about 14 meters. The dark-green leaves are pinnately compound, with 6 to 12 leaflets up to 30 centimeters long. The small greenish-yellow flowers are borne in large terminal panicles. Bloom occurs once a year, and the fruit takes about 4 months to mature. The fruit, borne in large clusters, is spherical to ovoid and 2 to 4 centimeters in diameter, and has a thin, leathery, brown pericarp. The edible pulp is a translucent, clear to whitish aril surrounding a single dark-brown shiny seed. The pulp is juicy and sweet, and has low acidity.

Superior varieties have been propagated vegetatively in Asia for a long time, particularly in China and Thailand.

Figure 54.—Longan trees, young but fruiting.

Some of them are 'Blackball' (China); 'E Bure,' 'E Dol', and 'E Haw' (Thailand); and 'Shek Kip' (Hong Kong). In the United States, 'Kohala' was developed in Hawaii. In Florida, no varieties have been selected yet because of the erratic bearing of all the plantings made so far.

Trees can be grown from seed easily, but since they require 6 to 9 years before bearing and since their fruit quality is not predictable, seedlings are not recommended for the home garden or commercial planting. Air layering is widely used in Asia for vegetative propagation. It is also used in Florida, but grafting has proved to be more dependable there. Longan seedlings are used as rootstocks.

The longan tree grows best in a well-drained soil of good fertility, but its requirements are not exacting, and it can be grown in a variety of soils. Like the litchee, mature longans can tolerate brief exposure to temperatures a few degrees below freezing without severe injury. For successful flowering, the tree needs prior exposure to cool weather, so it does not flower dependably in lowland areas where the temperature is uniformly high the year round.

The longan blooms and fruits erratically even where environmental conditions are favorable. Bearing in alternate years can be partly corrected by removing some of the flower clusters in years of heavy bloom. The consequent reduction in crop size evidently reduces the depletion of the tree's reserves and increases the chance of an adequate bloom the following year. Thinning of flower clusters has the additional advantage of increasing the size of the fruit; fruit size is greatly influenced by the total production of the tree.

The fruit can be eaten fresh, frozen, canned, or dried. It is a fair source of vitamin C.

The lanson or langsat, *Lansium domesticum* Correa (family Meliaceae), is a tree of the wet forest and seems to resist cultivation away from other trees (fig. 55). The fruit's unique appearance and flavor are widely appreciated.

The lanson is best known in Malaysia, Indonesia, and the Philippines; it is less frequently seen in India and other parts of the Asian Tropics. It has been introduced into a few isolated spots in the Western Hemisphere, where it appears to have adapted. It has great promise as a new fruit for the American Tropics.

The tree is erect and symmetrical, reaching about 15 meters of height. The branches are horizontal or slightly inclined toward the ground. The bark is greenish brown to brown, with long fissures. When cut the trunk exudes a white latex.

The leaves are large and pinnately compound, with five to nine leaflets. The entire leaf reaches 30 to 50 centimeters in length; the petiole is an additional 5 centimeters. The leaflets are 15 to 30 centimeters long by 7 to 13 centimeters wide. The upper side is shiny dark green, whereas the lower is pubescent and light green. The inflorescence is a spike up to 30 centimeters long that is produced on the trunk or the large branches. The yellow flowers are perfect, 1 to 1.5 centimeters in diameter, and have 5 petals, 5 sepals, and 10 united stamens. A panicle usually produces 10 to 30 fruits.

The fruit is ellipsoidal and up to 5 centimeters long. It is first green but changes to a light yellow or a grayish yellow as it matures. The peel is rather parchmentlike and, while tough, is easily peeled away. Inside the peel are five segments of usually different but sometimes equal size. They are whitish, translucent, juicy, and subacid. The larger segments contain soft seeds that may reach 2 centimeters in length.

Lanson does not tolerate cold or long dry seasons, and is not recommended for altitudes over 650 meters; it is at its best in a monsoon climate with a short dry season. Judging from its growth in different countries, it seems to tolerate a variety of soils, but it prefers a slightly acid soil rich in organic material.

The varieties we have seen in the Western Hemisphere do not vary much. A special type, duku, which is preferred in Indonesia and Malaysia, differs from the usual types by being a more spreading tree with less latex and having larger, rounder fruit, with a thicker peel. Both the regular and duku types are grown from seed. The seeds are short lived and should be well cleaned of

Figure 55.—Lanson, a cluster of fruits.

pulp and planted immediately without a chance to dry. Reproduction has not been studied much, but it may be by apomixis. The seed germinates readily and needs no special care. Trees are also propagated by grafting, from cuttings, and from air layers.

The trees should be planted about 8 meters apart in their permanent site when they are about 1 meter high. Experience in Puerto Rico suggests that light shade is desirable at first. This can be gradually reduced as the tree grows, but some shade may always be desirable. Newly planted trees need careful and frequent watering until well established.

Insect pests that have been seen in Puerto Rico are the sugarcane root borer, *Diaprepes abbreviatus* L.; various scales; and spider mites *(Tetranychus* species). Anthracnose caused by *Colletotrichum* species is the only important fungus disease that has been seen.

The lanson fruit is most often eaten out of hand, but it may also be candied.

The salak, *Zalacca edulis* Reinw. (family Palmae), grows wild in the dense shade of lowland Asian rain forests, and it is also cultivated widely for its fruits (fig. 56). Although geographical range would be restricted by its particular climatic requirements, there are many areas of the Tropics where it could be grown. At the present time salak is almost entirely confined to the Asian Tropics, from Malaysia through Indonesia to the Philippine Islands. It is particularly popular in Java. The fruit is attractive in appearance and taste, and while it is not great, it would normally be appreciated on first taste and should find a ready market.

The salak is a small compact palm. It seldom reaches 5 meters in height, and it produces its fruit only a few feet above the ground. The palmate fronds are long, with long petioles. All parts of the plant except the flowers and fruit are covered with long, sharp spines that make fruit harvest hazardous.

Male and female inflorescences are borne on separate plants. These develop at the base of the fronds and consist of large numbers of flowers, in panicles, on short rachises. Pollination is probably by wind, and to insure good pollination, one male palm is needed for each five or six females.

The fruit is produced in large clusters very close to the trunk among the bases of the fronds. The fruits vary from 2.5 to 10 centimeters in length and from 5 to 8 centimeters in width and are globular or top shaped. The fruit surface is covered with overlapping scales like the skin of a reptile. These are dark brown, shiny, and attractive. The scales can be easily peeled away to reveal a translucent whitish or yellowish flesh.

The salak palm can be propagated from seeds, but asexual propagation of trees known to produce high quality fruit is recommended. Seeds should be obtained from a tree that produces good fruit and from a fruit with two or more seeds because single-seeded fruits produce mostly males. The seeds should be cleaned free of pulp and planted while fresh and undried. Unlike many palm seeds, salak seeds germinate readily.

The easiest vegetative propagation technique is layering: the trunk is placed horizontally on the ground and new plants grow from the nodes. Basal shoots can also be used for propagation, but they are difficult to remove from a palm without damaging it.

Salak palms prefer the wet, heavy soils of the rain forest. They can best be seeded or planted from offshoots directly in their permanent site, perhaps below the shade of larger fruit trees. Sunny locations should

Figure 56.—Salak palm, a young tree.

be avoided. Extra shade can be provided by temporary plantings of banana around the new trees. The palms should be protected from weed competition, watered frequently, and fertilized regularly.

The fruits can be shipped and handled easily. In Asia they are readily sold. They are eaten when fully ripe and softening, and by then they are delicate and easily split. Most fruits are eaten out of hand, but they are also stewed or pickled.

The gandaria, *Bouea macrophylla* Griff. (family Anacardiaceae), is well known in Southeast Asia for its many forms of sweet or sour mangolike fruits. A careful attempt should be made to obtain representative materials for transfer to the Western Hemisphere, where the species is almost unknown.

The gandaria is a medium-sized tree about 10 meters in height. The trunk is thick, dark, and often branched near the base. The young branches are horizontal or drooping. The leaves are opposite, 10 to 35 centimeters long, thick, and glabrous; they resemble a mango's leaves. The small flowers are male or hermaphroditic and occur in large clusters.

The fruits are ovoid or ellipsoid, smooth surfaced, yellow or orange when ripe, and 3 to 5 centimeters long by 3 to 4 centimeters wide. The epidermis is thin; the pulp is thick and juicy, orange or yellow, and resinous in flavor like that of many mangoes.

The gandaria is planted from seeds. Selected clones are known, however, and any special tree can be propagated by the techniques used for mangoes. Orchards are unknown; so far, the gandaria is strictly a dooryard tree.

The sweet forms of gandaria are eaten out of hand. Sour forms are pickled or used in chutneys.

Some *Spondias* species (family Anacardiaceae) are valued for their fruit (fig. 57). The most important of these are the ambarella, or golden apple, *Spondias dulcis* Parkins; the yellow mombin, *S. mombin* L.; and the red or purple mombin, *S. purpurea* L. The ambarella is native to the islands of the South Pacific, while the yellow mombin and red mombin are native to tropical America. All of them have been distributed widely in the Tropics and are potentially important because of their wide adaptation and abundant production of nutritious fruit.

The ambarella and yellow mombin are large trees; the red mombin is relatively small. All have open, spreading canopies and pinnately compound leaves. The trees lose their leaves for a time during the year. The wood of the trees is weak, and the limbs are easily broken by windstorms, but the trees recover from such damage rapidly.

The small flowers are borne in panicles, either terminally on new growth or laterally on small or large branches. The fruit occurs singly or in clusters of a few to many. The fruit of the ambarella and the yellow mombin is yellow. The red mombin has both red and yellow forms. The fruits are ellipsoid to obovoid in shape and range in length from 2.5 to 4 centimeters for the red and yellow mombin to 5 to 7.5 centimeters for the ambarella. The yellow pulp adheres to a single seed, which in some varieties is smooth and in others is rough, with strong woody fibers projecting into the flesh.

All of these species may be grown from seed, but vegetative propagation is preferable because some of the superior trees have few viable seeds and, in any case, the species do not breed true. The most widely used method is the rooting of mature cuttings. Large limbs cut from the tree and set directly in the ground will form roots and grow if conditions are favorable. The *Spondias* species can be propagated by grafting and budding also.

There is much variation in fruit quality in the *Spondias* species. Superior selections have been made and propagated in some areas, but they have not been described in the literature or disseminated to other areas. There are great possibilities for improvement of these crops through collection and dissemination of existing selections. The various forms of the red mombin probably have the greatest possibility for future development.

Figure 57.—Yellow mombin tree loaded with fruits.

The *Spondias* species are primarily plants of hot lowlands, although the red mombin can be found up elevations of 1,500 to 1,800 meters. They are not well adapted to cool climates. Small trees are killed by exposure to freezing temperatures. Larger trees are injured severely by frost, but they will recover quickly if conditions are favorable.

The *Spondias* species are well adapted to a variety of soils. Usually they are grown without application of fertilizer, although they will respond well to fertilizer application in infertile soils. The trees tolerate dry conditions very well.

The fruit of better varieties is sweet and has a pleasant flavor. Most is consumed fresh. Where the trees are widely planted, the fruit is sold in local markets and undoubtedly is an important part of the diet when in season. The fruit can be dried or made into jellies, sauces, or preserves. The fruit is a good source of minerals and vitamin C.

The mabolo (also known as velvet apple and butter fruit), *Diospyros discolor* Willd. (family Ebenaceae), is perhaps the best of the tropical persimmons (fig. 58) (The kaki must be regarded as temperate to subtropical.) It is native to the Philippine Islands and is cultivated to a smaller extent in Malaysia and Indonesia. The mabolo has been introduced widely, but always on a small scale, and so remains almost unknown.

The mabolo tree is medium to large, reaching 25 meters in height. It begins to flower when small to medium. Unless pruned, the tree is upright, with a heavy dark trunk and numerous drooping branches.

The attractive leaves are simple, alternate, long (25 centimeters by 8 centimeters wide), with short petioles, shiny, and usually elongate or elliptical. They are evergreen, somewhat coriaceous, and slightly pubescent below.

The trees are male, female, or hermaphroditic. Isolated female trees usually bear seedless fruits, but at times, a few fertile seeds are produced, probably because the trees have occasional male flowers. The flowers are small (male, 0.60 centimeter in diameter; female, 1.2 centimeter) white, waxy, and aromatic. They are borne on the axils of the leaves or the undersides of young woody branches.

The fruit, about the size and often the shape of a peach, is covered with a thick soft pubescence (which can sting the skin) colored from orange to black, or in some cases, from pink to red. Seedless fruits are flat or top shaped. The rind is thin and easily broken open to reveal a dry, cream-colored, mealy pulp. Up to eight brown seeds are embedded in the pulp.

Figure 58.—Velvet apple, cut open to reveal seedless flesh.

The mabolo is most often propagated from seeds, which germinate readily and give rise to rapidly growing, healthy trees. Beyond its being a strictly tropical species, little is known about its growth requirements. It does appear to be more drought resistant than many tropical fruits, yet it also grows in very wet areas, so it appears to be broadly adaptable. It shows iron deficiency symptoms in the calcareous soils of Florida, easily corrected with iron chelates.

The fruits are generally eaten when ripe and soft. The mealy flesh has a strong odor and unusual but pleasant taste.

The champedak, *Artocarpus champeden* Spreng. (family Moraceae), the breadfruit, and the jackfruit are the three best fruits of this large genus (fig. 59). But

whereas the breadfruit has been introduced throughout the Tropics and the jackfruit is sporadically distributed, the champedak is almost unknown outside tropical Asia. The fruit has many uses, and is liked by almost everyone.

The tree is medium sized (up to 18 meters), somewhat smaller than the jackfruit. The trunk is straight, with smooth grayish bark. New shoots, including petiole and pedicels, are covered with thin, brown, wiry hairs. Like its relative, the sap is milky in appearance and sticky. The tree is widely branched with a full crown.

The leaves are evergreen, alternate, with short petioles, sometimes three lobed, but on older trees obovate or elliptical and entire. The upper side is green and shiny and almost glabrous, and the lower side is covered with long brownish hairs and short white ones. The leaves are about 5 to 25 centimeters long and 5 to 10 centimeters wide.

The small flowers are borne in dense spikes that later become the fruit. Male and female flowers are borne in different inflorescences, the females on large branches or the trunk itself.

The large multiple fruit is quite similar in appearance to jackfruit but much more cylindrical. The fruits reach 35 centimeters in length and up to 15 centimeters in diameter. Thus, the fruit is much smaller than most jackfruits and much more convenient to utilize. The rind is covered with hundreds of polygonal raised projections similar to those of the jackfruit. Beneath the rind is a very attractive yellow pulp in which 30 or more large seeds are embedded.

Figure 59.—Champedak, a young tree.

The champedak can be easily propagated from fresh seeds chosen from good trees. It is also possible to propagate good trees by.bud grafting. Because of the latex of the tree, the modified Forkert method is used.

Even trees grown from seed bear fruits in 5 years. They need very little attention and are successful in many soils. They are, however, limited to the hot, humid Tropics.

The fruits of the champedak must be watched very carefully and harvested when they begin to soften. The fruit is sliced near the stem end and the core is pulled out. The seeds with their fleshy arils can then be easily removed. The fleshy aril is eaten as a dessert. It is soft and pleasantly aromatic. The seeds are eaten after boiling or roasting.

With its simple growth habits, the champedak should be easy to introduce. What is needed is a modern Captain Bligh.

The carambola, *Averrhoa carambola* L. (family Oxalidaceae), has been cultivated since ancient times, but only recently has it been considered to have commercial potential in the Western Hemisphere (fig. 60). It is grown extensively from southern China to India, and although it is known throughout the Tropics, it is relatively rare outside Asia. Small commercial plantings have been made in Florida in recent years.

The tree is relatively small, reaching a maximum height of 7.5 to 9 meters and a spread of 6 to 7.5 meters. The canopy is dense and attractive. The leaves are alternate, pinnately compound, and dark green. The leaves are retained on the tree throughout the year. The small pink flowers are borne in clusters on young branches,

Figure 60.—Carambola, fruits and leaves.

older branches, or the trunk of the tree. There are several flushes of bloom during the year and hence several successive crops of fruit. Mature healthy trees can produce 130 to 180 kilograms or more of fruit per year if they receive good care.

The fruit is ovoid to ellipsoid, with four to six prominent longitudinal ribs; in cross section it has a star shape. The fruit is 7 to 15 centimeters long and 5 to 10 centimeters wide, and when ripe, it may be white, yellow, or orange. The flavor varies from sweet and acidless to very sour. The rind is thin and tender and is generally consumed with the pulp. The surface of the fruit is smooth and waxy. The fruit attains best eating quality if ripened fully on the tree, but it is easily injured at this stage by handling during harvest. Fruit harvested when it is not quite fully colored is easier to handle without injury and will ripen to good eating quality.

Seedling trees require 6 to 10 years to come into bearing, and their fruit quality is likely to be poor. Therefore, it is best to grow vegetatively propagated trees of superior varieties such as 'Dah Pon', 'Mih Tao', and 'Tean Ma' (Taiwan); 'Maha'; 'Fwangtung' (Thailand); 'Golden Star' and 'Newcomb' (Florida, U.S.A.). The most reliable method of vegetative propagation is grafting on carambola seedling rootstocks. Air layering is used extensively in many areas, but under some conditions it is less dependable than grafting.

The carambola tree grows best in warm tropical lowlands with medium to high rainfall and a well-drained, moderately acid soil. In soils of high PH, deficiencies of zinc, manganese, and iron are likely to occur. The tree will tolerate a seasonal dry period well, but if dry conditions are severe and prolonged, some irrigation is needed to prevent defoliation and maintain fruit production. Mature trees can survive a brief exposure to temperatures a few degrees below freezing, so the carambola can be grown in areas where frost occurs occasionally, provided that the climate is otherwise favorable.

Research in Florida indicates a probable self-incompatibility and cross-incompatibility associated with a condition of distyly in the flowers. So to assure good yields of fruit, it is advisable to plant trees of more than one variety together, although some varieties are known to bear a satisfactory crop in isolation.

The carambola tree is a beautiful ornamental, and the fruit has good prospects for expanded commercial production. The green immature fruit can be cooked and eaten as a vegetable. The ripe fruit is eaten fresh or squeezed to make a refreshing juice. The fruit can be preserved in both the immature and mature stages. It is a good source of vitamin C and a fair source of vitamin A.

Figure 61.—Okari nut tree, young but vigorous.

The morang, *Artocarpus odoratisima* Blanco (family Moraceae), is native to and best known in northern Borneo; it is somewhat known from Thailand to the Philippine Islands. The fruit resembles in many ways a jackfruit. The fruits are smaller, however, and the pulp is white. The pulp is sweet, aromatic, and much more delicate than that of jackfruit. The seeds are roasted, as in the case of related species.

The okari nut, *Terminalia kaernbachii* Warb. (family Combretaceae), is a large tree of Papua New Guinea, the Solomon Islands, and scattered locations in Southeast Asia and the Pacific Islands (fig. 61). It is a handsome tree with large leaves covered below with a rusty-colored pubescence. The large, somewhat flat fruit, 10 centimetes long, contains a single seed with a large (5 to 6 centimeters in diameter) edible kernel. Unlike the common *T. catappa* L., the fruit can be easily split open to release the kernel. It is considered a prize nut wherever grown.

References

Adamson, R. S., and T. M. Salter.
1950 Flora of the Cape Peninsula. Juta and Co., Ltd., Cape Town.

Akamine, E. K., John H. Beaumont, F.A.I. Bowers,
1956 and others.
Passion fruit culture in Hawaii. Hawaii Coop. Ext. Serv. Circ. 345, 35p.

Almeyda, N., and F. W. Martin.
1976a Cultivation of neglected tropical fruits with promise. Part 1. The mangosteen. U.S. Agr. Res. Serv. Rep. S-155, 2p.

_____ and F. W. Martin.
1976b Cultivation of neglected tropical fruits with promise. Part 2. The mamey sapote. U.S. Agr. Res. Serv. Rep. S-156, 2p.

Araque, R.
1963 La parcha granadina. Serie de cultivos No. 4, 16 p. Consejo de Bienestar Rural, Caracas, Venezuela.

_____
1968 El merey. Serie de cultivos No. 15, 20 p. Consejo de Bienestar Rural, Caracas, Venezuela.

_____
1969 El cultivo de la vid en Venezuela. Proc. Trop. Reg. Amer. Soc. Hort. Sci. 13:300-312.

Audas, J. W.
1952 Native trees of Australia. 369 p. Whitcombe and Tombs Pty., Ltd., Melbourne.

Badillo, V. M.
1971 Monografía de la familia Caricaceae. 221 p. Facultad de Agronomía, Universidad Central de Maracay, Venezuela.

Bailey, L.H.
1922 Brassica. Gentes Herbarum 1(2).

_____
1949 Manual of cultivated plants. 1116 p. The Macmillan Co., New York.

_____
1953 Standard cyclopedia of horticulture. 3 vols. The Macmillan Co., New York.

Baker, J. G.
1877 Flora of Mauritius and the Seychelles. 557 p. L. Reeve and Co., London.

Blatter, E.
1926 The palms of British India and Ceylon. 600 p. Oxford University Press, London.

Britton, N. L., and J. N. Rose.
1963 Cactaceae. Second edition. Dover Publications, New York.

Brown, F.B.H.
1931 Flora of southeastern Polynesia. I. Monocotyledons. Bernice P. Bishop Museum Bul. 84, 194 p.

Brown, W. H.
1920 Minor products of Philippine forests. 3 vols. Manila, Bureau of Printing.

_____
1951 Useful plants of the Philippines. 3 vols. Manila,
56 Bureau of Printing. Manila.

Burkill, I .H.
1935 A dictionary of the economic products of the Malay Peninsula. 2 vols. Crown Agents for the Colonies, London.

Camacho, E.
1969 El pejibaye como un alimento potencial de gran importancia para las familias campesinas de los trópicos americanos. Proc. Trop. Region, Amer. Soc. Hort. Sci. 13:275-284.

Campbell, C. W.
1967 The mamey sapote in southern Florida. Proc. Fla. State Hort. Soc. 80:318.

_____
1974 Research on the caimito in Florida. Proc. Trop. Region, Amer. Soc. Hort. Sci. 18:123-127.

_____
1976 Selection and propagation of the Spanish lime in Florida. Proc. Fla. State Hort. Soc. 89:227-229.

_____ and S. E. Malo.
1968 The lychee. Fla. Coop. Ext. Serv., Fruit Crops Fact Sheet No. 6, 2 p.

_____ and S. E. Malo.
1972 The carambola. Fla. Coop. Ext. Serv., Fruit Crops Fact Sheet No. 12, 2 p.

_____ and R. L. Phillips.
1980 The atemoya. Fla. Coop. Ext. Serv., Fruit Crops Fact Sheet FC-64, 3 p.

Campbell, C. W.
1967 The sapodilla. Fla. Coop. Ext. Serv., Fruit Crops Fact Sheet No. 1, 2 p.

Cavalcante, P. B.
1972 Frutas comestíveis da Amazonia. I. Publicaçoes Avulsas No. 17, 84 p. Museu Paraense Emilio Goeldi, Belém, Pará.

_____
1974 Frutas comestíveis da Amazonia. II. Publicaçoes Avulsas No. 27, 73 p. Museu Paraense Emilio Goeldi, Belém, Pará.

_____
1979 Frutas comestíveis da Amazonia. III. Publicaçoes Avulsas No. 33, 61 p. Museu Paraense Emilio Goeldi, Belém, Pará.

Chatt, E. M.
1953 Cocoa. 302 p. Interscience, New York.

Chittenden, F. J.
1956 Dictionary of gardening. 4 vols. Clarendon Press, Oxford.

Chloricam, Khalil.
1962 Fruticultura colombiana. Editora Bedont, Medellín, Colombia.

Cobin, M.
1954 The lychee in Florida. Fla. Agr. Exp. Sta. Bul. 546, 35 p.

Coetzee, W.H.K., J. F. du T. Hugo, and F. F. Pratt.
1950 The Mexican hawthorn. Farming in South Africa, 1950 (Nov.):361-362.

Coit, J. E.
1949 Carob culture in the semiarid Southwest. 15 p. W. Rittenhouse, San Diego, Calif.

Condit, I.
1915 The loquat. Calif. Agr. Exp. Sta. Bul. 250, p. 251-284.

Cook, O. F.
1935 The Maya breadnut in southern Florida. Science 85:615-616.

_____ and G. N. Collins.
1903 Economic plants of Porto Rico. U.S. Nat. Herb. Contr. 8(2):51-616.

Dalziel, J. M.
1948 The useful plants of west tropical Africa. 612 p. Crown Agents for the Colonies, London.

Dastur, J. F.
1951 Useful plants of India and Pakistan. 260 p. Taraporevala Sons and Co., Bombay.

Eggeling, W. J.
1940 Indigenous trees of the Uganda Protectorate. 296 p. Government Printer, Entebbe.

Fairchild, D.
1939 The white sapote and the matasano. Occasional Paper No. 5, 7 p. Fairchild Tropical Garden, Miami.

_____
1943 The canistel. Occasional Paper No. 13, 3 p. Fairchild Tropical Garden, Miami.

_____
1945 The ramon tree of Yucatán. Proc. Fla. State Hort. Soc. 58:198-200.

Fernald, T. L., Kinsey, and Rollins.
1958 Edible wild plants. Harper & Bros., New York.

Fletcher, W. A.
1965 Tree tomato growing. New Zealand Dept. Agr. Bul. 306, 19 p.

Fonseca, E. T. da
1954 Frutas do Brasil. 281 p. Instituto Nacional de Lirro, Rio de Janeiro, Brazil.

Food and Agriculture Organization of the
1975 United Nations.
Production yearbook 28-1. 325 p. FAO, Rome, Italy.

Fouqué, A.
1974 Espèces fruitières d'Amérque tropicale. Institut Francais de Recherches Fruitières Outre-Mer, Paris.

Gamble, J.S.
1881 Manual Indians Timber. F.L.S. Government Printer.

Gattoni, L.
1957 La naranjilla. 28 p. Ministerio de Agricultura, Comercio e Industrias, Panamá.

Gómez, R. Pimentel.
1977 Fruticultura Brasileira. 446 p. Livaria Nobel, Sao Paulo, Brazil.

Grant, J. W., and A.N.P. Williams.
1949 Burma fruits and their cultivation. Dept. of Agric. Burma, Bull. 30.

Groff, G. W.
1921 The lychee and lungan. 188 p. Orange Judd Co., New York.

Gupta, B. L.
1928 Forest flora of the Chakrata, etc.

Habart, J. L.
1974 La baie de *l'Actinida chinensis* Planch. var. *chinensis*. Fruits 29(3):191-207.

Hamilton, R. A., and E. T. Fukunaga.
1959 Growing macadamia nuts in Hawaii. Hawaii Agr. Exp. Sta. Bul. 121, 51 p.

Harris, R. S., and H. E. Munsell.
1950 Edible plants of Central America. Home Econ. 42(8):629-631.

Hayes, W. B.
1957 Fruit growing in India. Kitabistan Publishers, Allahabad, India.

Hedrick, U. P.
1919 Sturtevant's notes of edible plants. 686 p. J.B. Lyon & Co., Albany, N.Y.

Heyne, K.
1927 De Nuttige Planten van Indonesie. Department van Landbouw, Netherlands.

Hodge, W. H.
1960 The South American "sapote." Econ. Bot. 14:203-206.

Hodgson, R. W.
1967 Horticultural varieties of citrus. *In* W. Reuther, H. J. Webber, and L. D. Batchelor, eds., The citrus industry, vol. 1, p. 431-591. University of California.

Hoehne, F. C.
1946 Frutas indigenas. 88 p. Publicacao Serie D. Instituto de Botanica, Sao Paulo.

Hunter, J. R.
1969 The lack of acceptance of the pejibaye palm and a relative comparison of its productivity to that of maize. Econ. Bot. 23:237-244.

Irvine, F. R.
1961 Woody plants of Ghana. 868 p. Oxford University Press, London.

Ishii, Y.
1944-56 Cyclopedia of horticulture. Seibundo-Shinkosha, Tokyo, Japan.

Iwasa, S.
1966 Illustrated Ceylon vegetables and fruits.

Jackson, G. C.
1967 Promising selections of the honeyberry (*Melicocca bijuga* L.) from Puerto Rico. J. Agr. Univ. P.R. 51:66-70.

Jardin, Claude.
1967 List of foods used in Africa. 320 p. Food and Agriculture Organization of the United Nations, Rome.

Johanessen, C. L.
1967 Pejibaye palm: physical and chemical analysis of the fruit. Econ. Bot. 21:371-378.

Kennard, W. C., and H. F. Winters.
1960 Some fruits and nuts for the Tropics. U.S. Dept. Agr. Misc. Publ. No. 801, 135 p.

Knight, R. J., Jr., and H. F. Winters.
1966 Fruit color segregation in a second-generation *Dovyalis* population. Proc. Trop. Region, Amer. Soc. Hort. Sci. 10:167-171.

Krezdorn, A. H., and G. W. Adriance.
1961 Fig growing in the South. U.S. Dept. Agr., Agr. Handbook No. 196, 26 p.

Le Cointe, P.
1934 Arvores e plantas úteis a Amaz. Brazil, Livraria Classica, Belém, Pará.

Ledin, R. B.
1952 The naranjilla. Proc. Fla. State Hort. Soc. 64:197-190.

———
1953 A tropical black raspberry for south Florida. Fla. Agr. Exp. Sta. Circ. S-56, 12 p.

———
1958 The Barbados or West Indian cherry. Fla. Agr. Exp. Sta. Bul. 594, 28 p.

Le Maout, E., and T. Decaisne.
1873 General system of botany.

Leon, J.
1965 Anales Científicos de la Univ. Agraria 3(1):38-41.

_____
1968 Fundamentos botánicos de los cultivos tropicales. 487 p. Instituto Interamericano de Ciencias Agrícolas, San José, Costa Rica.

_____
1969 A provisional list of tropical fruit crops. Conference on Propagation of Tropical and Subtropical Fruits, 17 p. London, England, September 22-24.

Little, E. L., R. O. Woodbury, and F. H. Wadsworth.
1974 Trees of Puerto Rico and the Virgin Islands. U.S. Dept. Agr., Agr. Handbook No. 449, 1024 p.

Liu, T.
1952 List of economic plants in Taiwan. Chen Chung Printing Co., Taipei.

Loumala, K.
1953 Ethnobotany of the Gilbert Islands. Bernice P. Bishop Mus. Bull 213.

Macmillan, H. F.
1943 Tropical planting and gardening. Fifth edition. 560 p. Macmillan and Co., Ltd., London.

Malo, S. E.
1970 Propagation of the mamey sapote. Proc. Fla. State Hort. Soc. 14:165-174.

Martin, F. W., and H. Y. Nakasone.
1970 The edible species of *Passiflora*. Econ. Bot. 24:333-343.

_____ N. Ameyda, R. Ruberté, and F. Jordan.
1976 Inventario de frutas tropicales en Puerto Rico. 38 p. Universidad de Puerto, Rico, Mayagüez.

Massal, E., and J. Barrau.
1973 Food plants of the South Sea Islands. Tech. Paper 94, South Pacific Commission, Noumea, New Caledonia.

Masters. M. T.
1866 Treasures of botany. Longmans, Green and Co., London.

Medsger, O. P.
1939 Edible wild plants. 323 p. The Macmillan Co., New York.

Molesworth, Allen, B.
1967 Malayan fruits. 245 p. Donald Moore Press Ltd., Singapore.

Montagut, G.
1972 Essais de culture du *Synsepalum dulcificum* au Dahomey. Fruits 27:219-221.

Moore, H. E., Jr.
1963 An annotated checklist of cultivated palms. Principles 7(4):118-184.

Mors, W. B., and C. T. Rizzini.
1966 Useful plants of Brazil. Holden-Day, Inc., San Francisco.

Morton, J. F.
1955 The emblic. Proc. Fla. State Hort. Soc. 68:315.

_____
1961 Cashew's brighter future. Econ. Bot. 15:57-78.

Muñoz, C.
1966 Sinopsis de la flora chilena. 500 p. Editorial Universitaria, Chile.

Munsell, H. E., et al.
1949-50 Composition of food plants of Central America. Food Research.

Neal, M. C.
1965 In gardens of Hawaii. Bernice P. Bishop Museum Special Publ. 50, 805 p.

Nihoul, E.
1976 Le yang tao (*Actinidia chinensis* Planchon). Fruits 31:97-109.

Olmo, H. P.
1970 Report to the government of India on grape culture. United Nations, FAO TA No. 2825, 99 p.

Ochse, J. J., and R. C. Bakhuisen van den Brink.
1931 Fruits and fruit culture in the Dutch East Indies. 180 p. Kolff, Batavia.

_____ M. J. Soule, Jr., M. J. Dijkman, and
1961 C. Wehlburg.
Tropical and subtropical agriculture, 2 vols. The Macmillan Co., New York.

Patiño, V. M.
1963 Plantas cultivadas y animales domésticos en América equinoccial. Vol. 1, Frutales. 547 p. Imprenta Departamental, Cali, Colombia.

Pennington, T. D., and J. Sarukhan.
1968 Manual para la identificación de campo de los principales árboles tropicales de México. INIF, SAF, FAO, México.

Pérez-Arbeláez, E.
1956 Plantas útiles de Colombia. 831 p. Librería Colombiana, Camacho Roldán, Bogotá.

Phillips, A .M., J. R. Large, and J. R. Cole.
1960 Insects and diseases of the pecan in Florida. Fla. Agr. Exp. Sta. Bul. 619, 84 p.

Pittier, H.
1908 Ensayo sobre las plantas usuales de Costa Rica. 176 p. H. L. & J. B. McQueen, Inc., Washington, D.C.

Popenoe, P. B.
1913 Date growing in the Old World and the New West India Gardens. 316 p. New Altadena, Calif.

Popenoe, W.
1917 The navel orange of Bahia with notes on some little-known Brazilian fruits. U.S. Dept. Agr. Bul. No. 445, 35 p.

———
1924 Economic fruit-bearing plants of Ecuador. Contrib. U.S. Natl. Herb. 24, part 5, p. 101-134.

———
1939 Manual of tropical and subtropical fruits. 474 p. The Macmillan Co., New York.

Pratt, D. S., and J. I. Del Rosario.
1913 Philippine fruits, their composition and characteristics. Philipp. Jour. Sci. 8:76.

Reiche, K.
1901 Los productos vegetales indigenas de Chile. 28 p. Imprenta Cervantes.

Romero-Castañeda, R.
1961 Frutas silvestres de Colombia. 726 p. Bogotá, Colombia.

Rosengarten, F.
1973 The book of spices. 475 p. Pyramid Books, New York.

Ruehle, G. D.
1959 Growing guavas in Florida. Fla. Agr. Ext. Serv. Bul. 170, 20 p.

——— and R. B. Ledin.
1956 Mango growing in Florida. Fla. Agr. Exp. Sta. Bul. 574, 88 p.

———H. Mowry, L. R. Toy, and H. S. Wolfe.
1958 Miscellaneous tropical and subtropical Florida fruits. [Revised by G. D. Ruehle.] Fla. Agr. Exp. Sta. Bul. 156A, 116 p.

Safford, W. E.
1905 Useful plants of the island of Guam. Contr. U.S. Nat. Herb. Vol. 9, 416 p.

———
1914 Classification of genus *Anona*. Contr. U.S. Nat. Herb. Vol. 18, part 1, 68 p.

Sargent, C. S.
1922 Manual of the trees of North America. 910 p. Houghton Mifflin Co., New York.

Sastrapradja, S.
1973 Tree fruits in Java, Madura, and Bali. *In* FAO/IBP, survey of crop genetic resources in their centres of diversity, p. 142-157, Rome.

———
1975 Tropical fruit germplasm in Southeast Asia. *In* J. T. Williams and C. H. Lamoureax, eds., Plant genetic resources in Southeast Asia, p. 33-46. Indonesia.

Sauls, J. W., R. L. Phillips, and L. K. Jackson.
1976 The avocado. Proceedings of the First International Tropical Fruit Short Course, 129 p. Fruit Crops Dept., Univ. Florida, Gainesville.

Schultes, R. E., and J. Cuatrecasas.
1953 Notes on the cultivated lulo. Harvard Univ. Botan. Mus. Leaflets 16(5):97-105.

Sharpe, R. H., and N. Gammon, Jr.
1958 Pecan growing in Florida. Fla. Agr. Exp. Sta. Bul. 601, 67 p.

Simmonds, N. W.
1959 Bananas. 466 p. Longmans, Green and Co., Ltd., London.

Singh, L. B.
1960 The mango: botany, cultivation and utilization. 438 p. Interscience, New York.

Standley, P. C.
1922 Trees and shrubs of Mexico. Contrib. U.S. Natl. Herb. 23(1-5) 1721 p.

_____ and J. A. Steyermark.
1946 Flora of Guatemala. Fieldiana 24(5):41.

Stevenson, N. S.
1932 The cohune palm in British Honduras. Tropical Woods 30:3.

Storey, W. B.
1959 Enumeration of macadamia nut species. Calif. Macadamia Soc. Yrbk. 5:42-45.

_____
1965 The ternifolia group of *Macadamia* species. Pacific Science 19:507-514.

Storey, W. B., and I. J. Condit.
1969 Fig. *In* F. P. Ferwerda and F. Wit., eds., Outlines of perennial crop breeding in the tropics. Misc. Papers No. 4:259-267. Landbouwhogeschool, Wageningen.

Sturrock, D.
1959 Fruits for southern Florida. 242 p. Southeastern Printing Co., Stuart, Fla.

Swingle, W. T. and P. C. Reece.
1967 The botany of citrus and its wild relatives. *In* W. Reuther, H. J. Webber, and L. D. Batchelor, eds., The citrus industry, vol. 1, p 190-430. University of California.

Tafurt, R., D. Rios-Castano, and R. Torres M.
1969 Cultivo de la vid en clima tropical. Proc. Trop. Reg. Amer. Soc. Hort. Sci. 13:285-298.

Tanaka, Tyozaburo.
1976 Tanaka's cyclopedia of edible plants of the world. 924 p. Keigaku Publishing Co., Tokyo.

Uphof, J. C. T.
1968 Dictionary of economic plants. 591 ,p. Hafner Publishing Co., New York.

Urquhart, D. H.
1962 Cocoa. 293 p. Longmans, Green and Co., Ltd.

Valmayor, R. V., D. B. Mendoza, Jr., H. B. Aycardo, and
1971 C. O. Palencia.
Growth and flowering habits, floral biology and yield of rambutan. Philippine Agriculturist 54(7 and 8):359-374.

Vangnai, Vichit.
1975 List of Thailand's fruit crops. 31 p. Dept. of Horticulture, Faculty of Agriculture, Kasetsart University, Bangkok, Thailand.

Watt, G.
1893 A dictionary of the economic products of India. 6 vols. W. H. Allen & Co., London.

Webster, P. J.
1924 The food plants of the Philippines. Philippine Bur. Agr. Bul. No. 39, 236 p.

Whitman, W. F.
1976 The South American sapote. Proc. Fla. State Hort. Soc. 89:226-227.

Yee, W., E. K. Akamine, G. M. Akoi, and others.
1970 Papayas in Hawaii. Univ. Hawaii Coop. Ext. Serv. Circ. 436.