

Maternity and medicinal plants in Vanuatu I. The cycle of reproduction

G. Bourdy^a and A. Walter^b

^aLaboratoire de Pharmacologie, Centre ORSTOM, B.P. A5, Nouméa (New Caledonia) and ^bCentre ORSTOM, B.P. 76, Port Vila (Vanuatu)

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Ethnobotanical data collection to select pharmacologically active species was carried out within a clearly defined therapeutic context: those plants used during the course of a woman's reproductive life. Extensive bibliographical and field data collection and cross-examination of the information thus gathered have provided us with a clearer picture of the effectiveness of these plant species. Various concepts, behaviours and practices relating to menstruation, pregnancy, birth and birth control were examined in detail from an ethnopharmacological point of view. A list of selected species of particular interest is proposed for further study.

Key words: sexual life; Vanuatu; ethnopharmacology; plants

Introduction

The Vanuatu archipelago, situated between 13°S and 21°S and between 163°E and 168°E, comprise 80 volcanic islands of varying size. Its total landmass is estimated at 12 200 km². Port Vila, the capital, is located on Vate Island. Vanuatu's native people are Melanesians; they numbered 130 000 at the most recent census (Gouvernement de Vanuatu, 1979).

Although the hospitals and outpatient clinics which exist on nearly every island are equipped to give up-to-date care, traditional medicine still thrives, especially on the more remote islands. Modern and folk medicine do not compete with one another, however, villagers tend to use the two systems as complements to one another. The general population is knowledgeable about local plants and every one knows a few medicinal recipes. Some individuals, well-versed in plantlore and skilled in treating the sick, have become known in their communities as true therapists. Some of them, combining plant knowledge with knowledge of the supernatural, are known as 'clevers', their skills involving the use of plants and demons for good or evil.

Traditional medicine, as practiced in Vanuatu,

has been little studied. In 1980, researchers from l'Institut Français de Recherche Scientifique pour le Développement en Coopération (ORSTOM) undertook complementary ethnological and ethnopharmacological studies, thus providing more detailed knowledge of the subject.

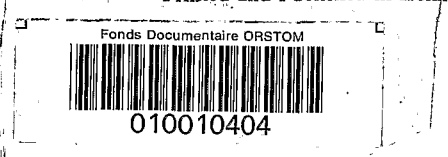
In this study, we chose to target plant species which have been claimed to be pharmacologically active within a clearly defined therapeutic context. This procedure had two advantages. Firstly, it kept the literature study within reasonable limits. Secondly, it improved our chances of obtaining good interview results. Healers are often reluctant to give information on their knowledge as a whole. If questioning was restricted to a single symptom or set of symptoms, healers not only would have a better understanding of what was expected of them, but would be more willing to reveal what amounted to restricted areas of their expertise.

The therapeutic context we chose focussed on the remedies used by women during pregnancy and delivery, or for birth control. Based on scrutiny of the literature, this appears to be the first time this subject has ever been studied in Vanuatu.

Methodology

We carried out ethnobotanical studies in Vanuatu from 1985 to 1987. One of the first

Correspondence to: G. Bourdy, Laboratoire de Pharmacologie, Centre ORSTOM, B.P. A5, Nouméa, New Caledonia.



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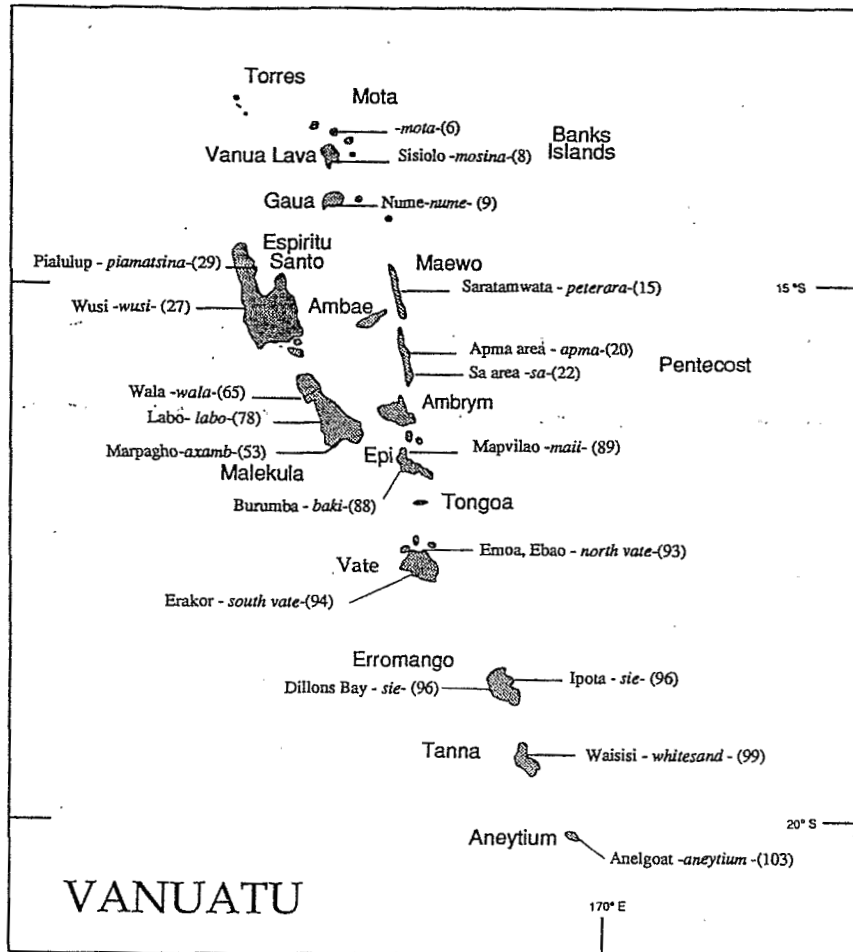


Fig. 1. Sites where the study was carried out. Studied villages are followed by the name of the language spoken in the area (in italics) and by their identification number (from Tryon, 1976).

priorities was to select the study sites: 104 different languages, mostly Austronesian, are spoken in Vanuatu, and several different languages may be spoken on any one island. For this reason, an island cannot be considered as a pertinent 'cultural area'. (A 'cultural area' refers to a region where the inhabitants share the same culture, defined by ideas, behaviour, techniques and social organisation.) Some island communities may have more in common with those of the islands opposite them than with communities adjacent to them on the same piece of land (Bonnemaison, 1985). Since the identification of homogeneous cultural zones has not yet been accomplished, we made our choice of study-sites based on linguistic, demographic and ecological considerations. Sites selected for this study are shown in Fig. 1.

A few days before setting out on a field trip, we had our arrival announced on the radio (local ser-

vice message) to give the chiefs and local representatives time to prepare for our arrival. Once in the village, we explained our work to the villagers. All discussions were carried out in 'bislama', which is the vehicular language of Vanuatu.

On every field trip, Annie Walter (the female ethnologist of the team) interviewed a group of old experienced women and midwives. This interview was based on an ethnological questionnaire (Walter, 1988), covering the most important aspects of women's reproductive life: menstruation, conception, pregnancy, birth, post-partum care, nursing, sterility, menopause and birth control techniques.

Apart from that group interviewed, there were no preconditions for the selection of informants: anyone willing to participate and able to provide information was heard, from mothers and fathers to healers, both male and female.

Plants were collected by the relevant informant

TABLE 1

PLANTS USED TO TREAT MENSTRUAL PROBLEMS

Species (Family) (Herbarium number according to collector) (GB, AW, PC, DB)	Locality ^a Vernacular name of the plant	Frequency of use ^b	Part of plant used	Indication Preparation
<i>Abelmoschus manihot</i> (L.) Medik. (Malvaceae) (GB796)	(37) <i>kabis island</i>	1	Leaves	Menorrhagia. Place a handful of leaves from <i>A. manihot</i> with a handful of leaves from an undetermined species in a bamboo stem over a fire until the stem turns black. Then squeeze out the juice of the cooked leaves. Drink the juice twice daily for six days.
<i>Achyranthes aspera</i> L. (Amaranthaceae) (AW133)	(65) (20) <i>nokorin</i>	1	Leaves	Amenorrhoea. Grind 10 leaves finely. Add half a cup of cold water and drink the juice.
<i>Alphitonia zizyphoides</i> (Solander) A. Gray (Rhamnaceae) (GB997)	(9) <i>vilivil</i>	1	Leaves	Menorrhagia. Grind 4-8 leaves finely, slowly adding cold water. Drink this preparation twice daily for 2 days, then stop for 2 days. If necessary, repeat the treatment.
<i>Artocarpus altilis</i> (Parkinson) Fosberg (Moraceae) (GB878bis)	(8) <i>per</i>	1	Latex	Menorrhagia. Mix an equal amount of latex of <i>Ficus adenosperma</i> Miq. (Moraceae) with the latex of <i>A. altilis</i> and drink the mixture.
<i>Breynia disticha</i> J.R. et G. Forst. (Euphorbiaceae) (GB1233)	(27) and (35) <i>kairave</i>	2	Living bark, leaves	Menorrhagia. Grind a handful of the living bark to a pulp, and add 50 ml of cold water. Drink three times daily. Another recipe is prepared with 4 leaves instead of the living bark.
<i>Codiaeum variegatum</i> (L.) B. (Euphorbiaceae) (DB29)	(103) <i>inloptahow</i>	1	Leaves	Amenorrhoea. Chew 3 leaves and swallow the juice.
	(99) <i>tangalao</i>		Leaf stem	Also another recipe is to chew 2 leaf stems and swallow the juice. (All parts of the plant are used as an emmenagogue, to induce abortion, or to facilitate parturition.)
<i>Entada phaseoloides</i> (L.) Merr. (Mimosaceae) (GB680)	(15) <i>raofaorv</i>	1	Leaves	Menorrhagia. Crush 4 leaves in the hands and then rub over on the abdominal area. Repeat three times daily.
<i>Evodia kajewski</i> Guillaumin (Rutaceae) (GB298)	(20) <i>butsu namsil</i>	1	Leaves	Dysmenorrhoea. Grind a few leaves and place them in cold water, then drink the water.
<i>Ficus adenosperma</i> Miq. (Moraceae) (GB878)	(8) <i>nonum</i>	1	Latex	Menorrhagia. See full recipe under <i>Artocarpus altilis</i> .
<i>Hibiscus rosa-sinensis</i> L. (Malvaceae) (GB1243)	(27) <i>tutuatchatch</i>	2	Leaves	Menorrhagia. Crush 6 leaves in water, and bring to boil. Cook and drink the preparation.

TABLE 1 (continued)

Species (Family) (Herbarium number according to collector) (GB, AW, PC, DB)	Locality ^a Vernacular name of the plant	Frequency of use ^b	Part of plant used	Indication Preparation
	(99) <i>nakelop</i>		Stem- bark	Menorrhagia. Grate a handful of bark, prepare a decoction, cool it and drink a maximum of 2 or 3 doses.
	(22) <i>warisisnos</i>		Flower	Amenorrhoea. Drink a decoction made from the petals.
<i>Musa troglodytarum</i> L. (Musaceae)	(20) <i>butsu sohak</i> <i>wasusup</i>	1	Rind of the fruit	Amenorrhoea. Pick up one skin of <i>Musa</i> sp. (Musaceae) and one skin of <i>M. troglodytarum</i> and crush them finely with a pestle, adding some water. Drink 3 spoonfuls of the juice, slightly heated, every month, until cure.
<i>Musa</i> sp. (Musaceae)	(20) <i>butsu is wul</i>	1	Rind of the fruit	Amenorrhoea. See full recipe under <i>Musa troglodytarum</i> .
<i>Phyllanthus ciccooides</i> M.-A. (Euphorbiaceae) (GB239)	(35) <i>ekame</i>	1	Stem- bark	Menorrhagia. Grind a small handful of inner bark with some water. Drink a small glass three times daily.
<i>Plectranthus</i> <i>scutellarioides</i> (L.) R. Br. (Labiatae) (AW11)	(9) <i>watatmer</i>	1	Leaves	Amenorrhoea. Crush 4-6 young leaves in the hands. Soak them in cold water for a few hours, and then drink the water.
<i>Pseuderanthemum</i> sp. (Acanthaceae) (AW493)	(53) <i>namlandr</i> <i>panpan</i>	1	Leaves	Menorrhagia. Squeeze a glassful of juice from the leaves. Drink once a day.
<i>Pteris ensiformis</i> Burm. (Polypodiaceae) (AW435)	(78) <i>mesongo mis</i>	1	Leaves	Dysmenorrhoea. Rub a handful of fronds over the abdominal area.
<i>Pterocarpus indicus</i> Willd. (Leguminosae) (GB153)	(20) <i>butsu nana</i>	1	Leaves	Amenorrhoea. Boil a handful of leaves in water. Allow to cool and drink once daily. At the same time, make a poultice for the abdominal area, using heated leaves.
<i>Syzygium richii</i> (A. Gray) Merr. et Perry (Myrtaceae) (AW744)	(78) <i>nepkeva</i>	1	Leaves	Menorrhagia. Mix the juice extracted from the leaves of <i>S. richii</i> , with the juice extracted from those of an undetermined species in equal parts. Add a little water and drink. Do not repeat the treatment.

^aFor locality code number, see Fig. 1.^bFrequency of use: 1, recipe indicated by a group of experienced women; 2, recipe in use by many communities.

TABLE 2
PLANTS USED TO FACILITATE BIRTH

Species (Family) (Herbarium number according to collector) (GB, AW, PC, DB)	Locality ^a Vernacular name of the plant	Frequency of use ^b	Part of plant used	Preparation
<i>Abelmoschus manihot</i> (L.) Medik. (Euphorbiaceae) (GB796)	(35) <i>era matua</i> (9) <i>sorosop</i>	2	Leaf bud	Squeeze a large handful of leaves and drink 2 to 3 spoonfuls of the juice, then wash the pubic area with the remaining juice. Also place 10 leaves in a pan, cover with water and bring to a boil. Cool decoction, drink a full glass.
<i>Begonia</i> sp. (Begoniaceae)	(6) <i>woter mowol</i>	1	Leaves flowers	Macerate the flowers and the leaves (Vienne, 1981).
<i>Canarium indicum</i> L. (Burseraceae) (AW400)	(78) <i>nindi</i> or <i>nangeigas</i> <i>malange</i>	1	Stembark, leaves	Take 4 leaflets on the right side of the compound leaf, add some water and squeeze into a small glass. Drink the juice. Also, use a handful of the bark and squeeze the juice.
<i>Cayratia trifolia</i> (L.) Domin (Vitidaceae) (GB597)	(8) <i>nagamat</i> <i>nding nding</i>	1	Leaves	Squeeze a large handful of leaves and drink the juice.
<i>Dioscorea bulbifera</i> L. (Dioscoreaceae) (AW113)	(20) <i>bwip</i>	1	Leaf bud, shoots	Eat 4 leaf buds and 4 shoots of this species to ease birth, or to aid the expulsion of a foetus who died 'in utero'.
<i>Dracontomelon vitiense</i> Engler (Anacardiaceae) (AW421)	(78) <i>nahu</i>	1	Stembark	Soak a hand-sized piece of bark in cold water until soft, then apply on the woman's navel.
<i>Dysoxylum aneytiense</i> Guillaumin (Meliaceae) (GB1170)	(27) <i>auchupe</i>	1	Bark	Place a hand-sized piece of bark over a fire. The woman must spread her legs so the smoke may reach the vaginal area.
<i>Dysoxylum gaudichaudianum</i> (Juss.) Miq. (Meliaceae) (GB1092)	(93) <i>nakau poa</i>	1	Leaves	Squeeze the juice of 10 leaves with some water. Drink it.
<i>Elatostema beccarii</i> H. Schoeter (Urticaceae) (GB144)	(96) <i>wamplenmpla</i>	1	Leaves	The leaves are squeezed and the juice drunk. May be used together with <i>Procris pedunculata</i> , <i>Schoenoplectus</i> sp., and <i>Scleria polycarpa</i> .
<i>Epipremnum pinnatum</i> (L.) Engler (Araceae) (GB951)	(9) <i>ragdalo</i>	1	Aerial root	Eat 4 aerial root tips.
<i>Hemigraphis reptans</i> (G. Forst.) T. Anders. ex Hemsl. (Acanthaceae) (AW88)	(20) <i>makadakada</i>	1	Root	Squeeze the juice of the root in a quantity of water; claimed to speed up delivery.
<i>Hibiscus tiliaceus</i> L. (Malvaceae) (GB1001)	(9) <i>var</i> (78) <i>burao</i> (96) <i>burao</i>	2	Stembark Sap	Squeeze a big handful of bark in the hands to obtain half a glass of juice and drink. Also, collect a glassful (100 ml) of sap from a slit in the trunk and drink.

TABLE 2 (continued)

Species (Family) (Herbarium number according to collector) (GB, AW, PC, DB)	Locality ^a Vernacular name of the plant	Frequency of use ^b	Part of plant used	Preparation
			Leaves	Similarly, squeeze a large handful of young leaves with some water and use the sap to wash the mother's abdominal area.
<i>Leea india</i> (Burman f.) Merr. (Leeaceae) (GB910)	(8) <i>saraouia</i>	1	Leaves, leaf buds	Crush a handful of leaves (or, in some cases, leaf buds), roast them over a fire. When hot, squeeze them with water to obtain a glassful of juice and drink.
<i>Macropiper latifolium</i> (L.F.) Miq. (Piperaceae) (GB598)	(22) <i>rah mwil</i> <i>mwil</i>	2	Leaves	Crush some leaves of this species with the leaves of an undetermined species, add some water and drink the juice (Jolly, 1979)
	(9) <i>womwogogo</i>		Leaf galls	Collect from the leaves 4 galls and eat them.
<i>Melochia odorata</i> L.f. (Sterculiaceae) (GB145)	(96) <i>nemlap</i>	1	Leaves	Pick 10 leaves of <i>M. odorata</i> and 10 leaves of <i>Merremia peltata</i> (L.) Merr. (Convolvulaceae), squeeze them together and drink the juice.
<i>Merremia peltata</i> (L.) Merr. (Convolvulaceae) (GB255)	(96) <i>nosivilyau</i>	1	Leaves	See full recipe under <i>Melochia odorata</i> L.f. (Sterculiaceae).
<i>Omalanthus nutans</i> (Forst. f.) Guillemin (Euphorbiaceae) (AW122)	(20) <i>butsu salingi</i>	1	Leaf bud	Eat a handful of leaf buds.
<i>Phyllanthus virgatus</i> Forst. f. (Euphorbiaceae) (DB31)	(103) <i>inparreiny</i>	1	Roots	See full recipe under <i>Codiaeum variegatum</i> .
<i>Pipturus argenteus</i> (Forst. f.) Wedd. (Urticaceae) (PC1171)	(88) <i>dame</i>	1	Sap	Mix sap and water in equal parts, then drink.
<i>Pometia pinnata</i> J.R. et G. Forst. (Sapindaceae) (GB266)	(29) <i>natsaria</i>	1	Stembark	Roast a hand-sized piece of bark over a fire. When the bark is warm, squeeze and mix with water. Drink the liquid.
<i>Pongamia pinnata</i> (L.) Pierre (Papilionaceae) (AW89)	(20) <i>kamtsi</i>	1	Stembark	Macerate the inner bark of the tree. Mix the water of a full green coconut. Drink all the coconut water.
<i>Procris pedunculata</i> (J.R. et G. Forst.) Wedd. (Urticaceae) (PC1401)	(96)	1	Leaves	See full recipe under <i>Elatostema becarii</i> .
<i>Schoenoplectus</i> sp. (Cyperaceae) (PC1372)	(96) <i>nilahela</i>	1	Leaves	See full recipe under <i>Elatostema becarii</i> .
<i>Scleria polycarpa</i> Boeckeler (Cyperaceae) (PC1372)	(96) <i>tae nmapram</i>	1	Leaves	See full recipe under <i>Elatostema becarii</i> .
<i>Selaginella firmuloides</i> Warburg (Selaginellaceae) (AW449)	(88) <i>mapula</i>	1	Leaves	Make a decoction with this plant, and drink it.

TABLE 2 (continued)

Species (Family) (Herbarium number according to collector) (GB, AW, PC, DB)	Locality ^a Vernacular name of the plant	Frequency of use ^b	Part of plant used	Preparation
<i>Senna occidentalis</i> (Mimosaceae) (GB143)	(96) <i>noki-noki</i>	1	Leaves	To induce birth: grind a large handful of leaves into a pulp, add some water and squeeze well. Drink the juice, repeat if necessary.
<i>Terminalia catappa</i> L. (Combretaceae) (GB1183)	(27) <i>mariri</i>	1	Bark	Boil 400 ml of water. Add a handful of bark, and reduce to 300 ml. Drink this preparation.
<i>Tetrastigma vitiense</i> (A. Gray) A.C. Smith (Ampelidaceae) (AW123)	(20) <i>uakas temit</i>	1	Leaves	Squeeze a handful of leaves into a half-full green coconut. Drink the coconut water.

^aFor locality code number, see Fig. 1.

^bFrequency of use: 1, recipe indicated by a group of experienced women; 2, recipe in use by many communities.

in the presence of Geneviève Bourdy, the female ethnobotanist of the team. Duplicate voucher specimens thus gathered were sent to the Museum of Natural History in Paris, to Kew Gardens in London, and to the ORSTOM centre in Nouméa (New Caledonia). A specimen of each plant was also kept in the National Herbarium of Vanuatu, in Port Vila. Identification of each herbarium specimen was confirmed by taxonomic specialists.

Our raw data is presented in Tables 1–5. The species are listed in relation to their medicinal use. We only retained remedies indicated by more than one informant (most of the time, a group of experienced women). This type of remedy is noted as 1 in the column 'Frequency of use'. We found that some remedies are very popular in all the archipelago and used by many communities. This type of remedy is noted as 2 in the column 'Frequency of use'. The communities where the information was gathered are identified by their identification number (Fig. 1), and the vernacular name of the species in the community is given under 'Localisation, vernacular name of plant' in Tables 1–5.

In a few cases, the recipe contains many species, prepared together. All these species are listed in the first column of Tables 1–5. In some cases, it was not possible to determine precisely all the plant ingredients, for a complex recipe. Nevertheless, we still present the full recipes in Tables 1–5.

Our field ethnopharmacological research from the outset has been aimed at compiling a list of

potentially active plants. Our final selection (Table 6) was made based on the following criteria:

- (i) A plant is used alone in a recipe, so that a clear relationship may be established between a species and its claimed pharmacological activity.
- (ii) A plant has been selected for a clear purpose, namely, abortifacient, contraceptive, enhancement of fertility, facilitation of delivery, aid to expulsion of a foetus which had died in utero, or prevention of post-partum hemorrhage or placental retention.
- (iii) A plant has been mentioned in cross-referenced information pertaining to its use, or uses, namely, true repetition (the same usage repeated in several sources), or indirect repetition (for example, menstruation-inducing and abortifacient properties). It was held that the higher the number or repetitions, the greater the probability would be that a plant species would indeed show the activity or activities noted.

Results

Menstruation

The onset of menstruation marks a woman's entry into reproductive life. Folk explanations of its origin, periodicity and links with fertility and/or sexuality are numerous and have led to various types of behaviour. In Vanuatu we observed three

TABLE 3

PLANTS USED TO EXPEL THE PLACENTA AND AS PROTECTIVE POST-PARTUM MEDICINE

Species (Family) (Herbarium number according to collector) (GB, AW, PC, DB)	Locality ^a Vernacular name of the plant	Frequency of use ^b	Part of plant used	Main use	Preparation
<i>Burckella obovata</i> (Forst. f.) Pierre (Sapotaceae) (GB301)	(29) <i>nabou</i>	1	Leaves	Used to quiet residual pain	Heat the leaves of <i>B. obovata</i> with the leaves of an undeter- mined species over a fire. Use as a poultice on the woman's abdominal area.
<i>Cayratia trifolia</i> (L.) Domin (Ampelidaceae) (GB597)	(6) <i>nagamat</i> <i>nding-nding</i>	1	Leaves	Used to clean the mother	Squeeze the leaves and drink the juice.
<i>Cocos nucifera</i> L. (Arecaceae)	(78) <i>nimit</i>	1	Roots	Used to restore strength	Crush the roots and add water. Drink the liquid just after delivery.
<i>Donax cannaeformis</i> (J.R. et G. Forst.) K. Schum. (Marantaceae)	(78) <i>netesmeswor</i> <i>kon</i>	1	Leaves	Used to draw placental fragments	Take the right side of the leaf blade, squeeze into a glass of water then drink it.
<i>Diplazium harpeoides</i> Moore (Athyriaceae) (AW25)	(20) <i>ilambet</i>	1	Leaves	Used to restore strength	Cook and eat as a vegetable.
<i>Ficus septica</i> Burm. f. var. <i>cauliflora</i> (Moraceae)	(78) <i>noboloboi</i>	1	Fruits	Used to draw placental fragments	Crush 10 fruits into a pulp, add enough water and drink.
<i>Graptophyllum</i> sp. (Acanthaceae) (GB146)	(96) <i>urubé</i>	1	Leaves	Used to clean the mother	Squeeze the juice of a handful of leaves and drink.
<i>Hibiscus rosa-sinensis</i> L. (Malvaceae) (GB1243)	(27) <i>tutuatchatch</i>	2	Leaves	Used to treat uterine hemorrhage	Squeeze 8 leaves with water, then boil for a few minutes. Drink this preparation. Repeat if necessary.
<i>Macropiper latifolium</i> (L.f.) Miq. (Piperaceae) (GB598)	(9) <i>womwogogo</i>	1	Leaves	Used to draw placental fragments	Collect 4 scales from the leaves, and eat them.
<i>Polyscias scutellaria</i> (Burm. f.) Fosberg (Araliaceae) (GB245)	(9) <i>ndosir</i>	2	Leaves	Used to clean the mother	Heat the leaves gently over a fire. When they are warm and soft, eat one or two. Repeat if necessary.
	(96) <i>umroki</i>		Leaves	Used to draw placental fragments	Also another recipe is to squeeze 4 leaves and drink the juice. Repeat twice daily for 2 days.
<i>Pterocarpus indicus</i> Willd. (Papilionaceae) (AW153)	(20) <i>butsu nana</i>	1	Leaves	Used to induce the first menstruation following childbirth	Prepare a tea with the leaves and drink a cold cup every day until menstruation returns. At the same time make a poultice with preheated leaves for the navel.
<i>Terminalia catappa</i> L. (Combretaceae) (GB1183)	(27) <i>mariri</i>	1	Leaves	Used to draw placental fragments	Prepare a strong tea with the leaves. Drink more than 3 cups in one sitting.
			Bark	Used to clean the mother	Prepare a strong tea with the bark. Drink 1 cup daily.

^aFor locality code number, see Fig. 1.^bFrequency of use: 1, recipe indicated by a group of experienced women; 2, recipe in use by many communities.

different attitudes towards menstruation, influenced by traditions now falling into disuse due to inroads made by Christianity and other socio-cultural changes.

The first type of attitude is displayed by groups living on the island of Santo (Piamatsina, Wusi, Wailapa), where marriages were traditionally arranged when girls were still very young — sometimes from birth. In the past, these girls left home at a very early age to live with their in-laws, where they had daily contact with their future husbands. Loss of virginity often occurred before the onset of the menses, which were considered an inevitable, but not shameful, occurrence.

In these societies, the menstruation phenomenon is still described as a small basket which is present in each woman's belly; this fills gradually with blood and tips over at regular intervals. In these groups puberty is seen as an event which occurs on a fixed schedule, independent of sexual relations: no attempt is made to provoke the onset of a girl's first period, and few folk recipes exist on this subject (see Table 1).

The second type of attitude is held by groups on Banks (Mosina, Nume), Maewo (Peterara), Malekula (Axamb, Ninde) and Pentecost (Apma) islands. Also relevant are the Lewo and Baki groups on Epi island.

In the Banks and Maewo groups, girls were traditionally married off at around the age of puberty and it was believed that a woman's husband was responsible for her first flow of blood. It was expected that a second loss of blood would occur from 1 month to 1 year after the first; a show of blood was then expected each month, thus establishing a young girl's menstrual cycle. If this chain of events did not occur, remedies were administered to provoke their onset. In these groups, menstruation is today considered as a special illness whose cause is sometimes attributable to men; it was here that we gathered the greatest number of recipes pertaining to menstruation.

On Pentecost, in the Apmas tribe, lack of menstruation is traditionally explained by an excessive dryness of the blood, or by insufficient blood supply. Menstrual flow is here again described as the monthly filling and emptying of a little basket. Absence of flow (late onset of puberty or lack of menstruation in non-pregnant women) is explained by saying that the basket is filling too slowly or improperly. Plants are then administered to make the blood more abundant or more fluid.

Finally, we encountered the third attitude in

groups living on the archipelago's southern islands (from Vate to Tanna), where girls traditionally married well after puberty. Menstruation was considered as the sign of sufficient bodily development, rendering a young girl fit for her first sexual relations and procreation. In these groups, no attempt is made to provoke a girl's first menstrual period. Few recipes were given to us on this subject.

Today these ancestral beliefs are being progressively abandoned as young girls choose to marry at a later age, well after puberty. All the women consulted, however, were in agreement that menstrual periods should not exceed 5 days to 1 week in length. Any prolongation is cause for worry and may indicate serious illness, often attributed to sorcery. Various medicinal plants are used to treat it. Pain during menstruation is considered normal and is generally not treated.

At some time after marriage, if all goes well, a young woman expects her first baby.

Pregnancy

A woman suspects that she may be pregnant when her menstrual symptoms fail to appear; after 2 months without her period her pregnancy is confirmed.

As soon as she knows she is pregnant, a woman consults a 'matron' who will treat her until delivery. The matron is responsible for preparing all plant remedies and for administering massages. If a woman gives birth at home, her matron will assist with the birth.

During the first months of pregnancy, a woman may experience a number of physical ailments typical of her condition, such as nausea, vomiting, weakness and back pain. These symptoms, considered as normal during pregnancy, are not always treated, for fear that treatment may lead to miscarriage. There are areas, however, where other opinions hold sway, such as in Wusi (Santo), Labo (Malekula), Erakor (Vate) and Pentecost, where we noted remedies for these types of ailments.

Other prescriptions are taken regularly until term by all pregnant women. Their purpose is to keep mother and foetus 'happy', in other words, to prevent miscarriage, strengthen the mother and protect her from witchcraft, to which she is considered to be especially vulnerable. The preventive, rather than curative properties of these numerous recipes mirror the overall goals of Vanuatu's traditional medicine. Among these prescriptions for pregnant women, a primary element is a type of red, clayey earth, roasted or smoked in a copra

TABLE 4

PLANTS USED AS CONTRACEPTIVES AND TO INDUCE/REVERSE STERILITY

Species (Family) (Herbarium number according to collector) (GB, AW, PC, DB, MD)	Locality ^a Vernacular name of the plant	Frequency of use ^b	Part of plant used	Type ^c	Preparation
<i>Acalypha grandis</i> Benth. (Euphorbiaceae) (GB240)	(96) <i>normomp i navlag</i>	1	Leaves	3 No	Mix 2 to 3 young leaves of <i>A. grandis</i> , 3 young fronds of <i>Lomagamma polyphylla</i> and 2 leaves and the grated bark of an undetermined species. Wrap these plants around a hot stone. When the plants are hot, unwrap and eat them. To reverse sterility, take the same ingredients, squeeze and add water. Drink the juice.
<i>Alstonia pacifica</i> Seem. (Apocynaceae) (MD2156)	(103)	1	Sap	1 No	Drink a decoction of the plant.
<i>Alstonia vitiensis</i> Seem. var. <i>neo-ebudica</i> Monachino (Apocynaceae) (DB26)	(103) <i>niete tel</i>	1	Bud of leaves	3 No	To induce sterility, prepare a macerate, in water, of leaf buds of <i>A. vitiensis</i> with leaf buds of <i>Glochidion</i> sp. (Euphorbiaceae), and drink a small glass every day for 2 months. In order to reverse sterility, use the aerial part of <i>Apulda mutica</i> , the leaves of <i>Cyclosorus truncatus</i> and the leaves, stem, aerial tuber of <i>Dioscorea bulbifera</i> . Crush all these ingredients with some water, drink one cup before the expected menstruation; during the treatment, menstrual flow still occurs.
<i>Apulda mutica</i> L. (Poaceae) (DB24bis)	(103)	1	Aerial part of plant	3 No	See full recipe under <i>Alstonia</i> <i>vitiensis</i> var. <i>neo-ebudica</i> .
<i>Asplenium nidus</i> L. (Aspleniaceae) (PC839)	(65) (91)	2	Leaves	3 No	To induce sterility, eat two young coiled fronds, just after menstruation, in the morning. To reverse sterility, squeeze the leaves of <i>Hemigraphis reptans</i> (G. Forst.). T. Anders. ex Hemsl. (Acanthaceae) with some water to obtain 2 × 300 ml of extract. Drink 300 ml one morning, then drink the other 300 ml the next day.
<i>Barringtonia edulis</i> Seem. (Lecythidaceae) (AW311)	(20) <i>butsu vel</i>	1	Bark	4 No	A strong tea is claimed to induce definitive sterility.
<i>Casuarina equisetifolia</i> J.R. et G. Forst. (Casuarinaceae) (AW469)	(53) <i>niyar</i>	2	Bark and leaves	4 No	To induce sterility, eat a handful of raw leaves, and drink juice squeezed from the grated bark. This must be done 5 days following childbirth.

TABLE 4 (continued)

Species (Family) (Herbarium number according to collector) (GB, AW, PC, DB, MD)	Locality ^a Vernacular name of the plant	Frequency of use ^b	Part of plant used	Type ^c	Preparation
	(96) <i>yorset</i>			1 No	To prevent conception, chew 5–10 cm of the young stems of <i>C. equisetifolia</i> with 5–10 cm of the young stems of <i>Pterocarpus indicus</i> from Monday to Friday. Swallow the juice, spitting out the fibrous part. Also another recipe is to chew the young stems of <i>C. equisetifolia</i> with the young stems of <i>Phyllanthus ciccoides</i> from Monday to Friday. Swallow the juice, spitting out the fibrous part.
<i>Cayratia trifolia</i> (L.) Domin (Vitidaceae)	(6) <i>Nagamat</i> <i>nding-nding</i>	1	Fruit	1 No	To prevent conception, eat the raw fruits (Vienne, 1981).
<i>Cyclosorus truncatus</i> Farv. (Thelypteridaceae) (DB28)	(103) <i>inmotwa nthan</i>	1	Leaves	3 No	See full recipe under <i>Alstonia vitiensis</i> var. <i>neo-ebudica</i> .
<i>Dioscorea bulbifera</i> L. (Dioscoreaceae) (DB27)	(103) <i>nabon</i>	1	Leaves, stem aerial tuber	3 No	See full recipe under <i>Alstonia vitiensis</i> var. <i>neo-ebudica</i> .
<i>Elatostema macrophyllum</i> Brongn. (Urticaceae) (PC2139)	(96) <i>naghulu nu</i>	1	Whole plant	4 No	Squeeze one handful of leaves with some water. Drink one glass of aqueous extract.
<i>Flagellaria indica</i> L. (Flagellariaceae) (GB1317)	(5) <i>narakpu i</i>	1	Leaf buds	4 No	To induce definitive sterility, crush a handful of leaf buds with some water and salt. At any time of the month, drink a glass of this juice before breakfast, and continue for the following 4 days.
<i>Glochidion</i> sp. (Euphorbiaceae) (DB25)	(103) <i>namlahow</i>	1	Leaf buds	3 No	See full recipe under <i>Alstonia vitiensis</i> var. <i>neo-ebudica</i> .
<i>Hemigraphis colorata</i> (Bl.) Hall. f. (Acanthaceae)	(6) <i>noyon</i> <i>gengen</i>	1	Leaf buds	3 Yes	Squeeze the sap of the leaf buds with some water. Drink at dawn, for 4 days (Vienne, 1981).
<i>Hibiscus rosa-sinensis</i> L. (Malvaceae) (GB1243)	(99) <i>rropol</i>	2	Leaves	4 Yes	To induce sterility, squeeze a large handful of leaves into 250 ml of water. Drink all at once during menstruation. Repeat during the following period. (Abstinence: 1 month).
<i>Kopsia</i> sp. (Apocynaceae) (GB715)	(15) <i>somnu</i>	1	Leaf buds	2 No	To prevent conception, heat 4–6 buds over a flame and eat them on the third day of the menstrual period, repeat each month. Avoid salt during the treatment.

TABLE 4 (continued)

Species (Family) (Herbarium number according to collector) (GB, AW, PC, DB, MD)	Locality ^a Vernacular name of the plant	Frequency of use ^b	Part of plant used	Type ^c	Preparation
<i>Lomagrumma polyphylla</i> Brackenridge (Lomagrammaceae) (GB236)	(96) <i>tampal tampal</i> <i>imelwo</i>	1	Leaves	3 No	See full recipe under <i>Acalypha grandis</i> .
<i>Pandanus tectorius</i> Parkinson (Pandanaceae)	(53) <i>pandanus</i>	1	Stem bark	4	To induce sterility, mix a small cup of grated coconut flesh with a spoonful of grated bark. Eat this preparation at any time. (Abstinence: 2 years).
<i>Phyllanthus ciccoides</i> M.-A. (Euphorbiaceae) (GB239)	(96) <i>fonfati</i>	1	Bark	1 No	See full recipe under <i>Casuarina equisetifolia</i> .
<i>Pipturus argenteus</i> (Forst. f.) Wedd. (Urticaceae) (GB234)	(88) <i>dame</i>	1	Inner bark	4 No	To induce sterility, mix an equal amount of grated dry coconut flesh with the grated bark of this plant, and eat.
<i>Pneumatopteris glandulifera</i> (Brackenridge) Holtt. (Thelypteridaceae) (GB978)	(9) <i>wutubo</i>	1	Leaves	4 Yes	To induce sterility, eat four young fronds at one sitting. (Abstinence 1 year).
<i>Pterocarpus indicus</i> Willd. (Leguminosae) (GB153)	(96) <i>yatrang rong</i>	1	Bark	1 No	See full recipe under <i>Casuarina equisetifolia</i> .
<i>Pyrrosia confluens</i> (R. Br.) Ching (Polypodiaceae) (GB791)	(93) <i>natali nin</i> <i>nanui</i>	1	Stem	4 No	To induce sterility, cut 12 finger-length pieces of stem. Roast a banana (with the skin) over a fire, peel it. Stick the 12 pieces of stem in the banana and eat the lot on the first day following the menstrual period.
<i>Scaevola sericea</i> Vahl (Goodeniaceae)	(5) <i>negeelao</i>	1	Leaf buds	4 No	To induce sterility, heat a handful of leaf buds over a fire, squeeze them with some water and drink.
<i>Ventilago neo-caledonica</i> Schlecht. (Rhamnaceae) (AW124)	(20) <i>labalaba</i>	1	Leaf buds	4 No	To induce sterility, eat 4-5 young leaves at one sitting.

^aFor locality code number, see Fig. 1.

^bFrequency of use: 1, recipe indicated by a group of experienced women; 2, recipe in use by many communities.

^cType of contraception method: Yes, this prescription is accompanied by a ban on sexual relations of variable duration; No, there is no ban on sexual relations; 1, the effect is believed to be reversible, ending as soon as the remedy is no longer taken, the remedy must be taken every day; 2, the effect is claimed to be reversible, the remedy must be taken at regular intervals; 3, the remedy is reputed to cause temporary sterility, which can be reversed by using another remedy; 4, remedy is claimed to induce definitive sterility.

drier. A women may eat as much of it as she wishes until the birth of her child. It is possible that this mixture provides a necessary mineral supplement. In the past, certain foods were forbidden, but nowadays this type of restriction is rarely adhered to.

Towards the seventh month of pregnancy, attention focuses on the baby's position in the uterus. Many women ask their midwives — or other skilled women — for massages, which may be done with or without the use of coconut oil. The leaves of *Macropiper latifolium* (Piperaceae) are also

TABLE 5

PLANTS USED TO INDUCE ABORTION

Species (Family) (Herbarium number according to collector) (GB, AW, PC, DB)	Locality ^a Vernacular name of the plant	Frequency of use ^b	Part of plant used	Preparation
<i>Alphitonia zizyphoides</i> (Soland.) A. Gray (Rhamnaceae) (GB997)	(99) <i>viviliv</i>	1	Bark	Drink the juice extracted from the stem.
<i>Barringtonia edulis</i> Seem. (Lecythidaceae) (AW311)	(20) <i>butsu vel</i>	1	Bark	Infusion.
<i>Bischofia javanica</i> Bl. (Bischofiaceae) (AW11)	21	1	Bark	Grind the bark to a pulp, add some water. After filtration, drink 1 l a day of this red juice, for 2 days. On the third day, prepare another bottle with the residue of the second day.
<i>Carica papaya</i> L. (Caricaceae)	(91) <i>popo</i>	1	Fruits	Swallow 4 small green fruits, with 4 tablets of nivaquine and the juice of 2 limes.
<i>Codiaeum variegatum</i> (L.) Bl. (Euphorbiaceae) (DB29)	(103) <i>inloptahow</i>	1	Whole plant	All part of the plants are used to induce abortion.
<i>Dysoxylum gaudichaudianum</i> (Juss.) Miq. (Meliaceae) (GB799) (GB1092)	(35) <i>eamopul</i> (93) <i>nakau poa</i>	2	Leaves	Sun-dry 12 leaves and prepare them into a strong tea and drink.
<i>Hibiscus rosa-sinensis</i> L. (Malvaceae) (GB1243)	(22) <i>warimisos</i>	1	Flowers	Prepare an aqueous extract.
<i>Nothocnide repanda</i> (Bl.) Bl. (Urticaceae) (GB696)	(15) <i>rawe mandisi</i>	1	Leaves	Pound a handful of leaves, add some water and squeeze. Drink the juice. Repeat the treatment until an abortion occurs.
<i>Omalanthus nutans</i> (Forst. f.) Guillemain (Euphorbiaceae) (GB900)	(6) <i>sala</i>	1	Fruits	Eat 30 small fruits at one sitting.
<i>Plectranthus scutellarioides</i> (L.) R. Br. (Labiatae) (AW11)	(20) <i>bwinga</i> <i>tebungu</i>	1	Leaves	Pound 10 leaves of <i>P. scutellarioides</i> with 10 leaves of an undetermined species and some water. All the juice is drunk at once. Repeat the treatment if necessary.
<i>Pemphis acidula</i> J.R. et G. Forst. (Lythraceae) (GB1149)	(96) <i>nasasake</i>	1	Sap	Prepare an infusion with a handful of bark. After filtration, drink at once.
<i>Pongamia pinnata</i> (L.) Pierre (Papilionaceae) (AW89)	(20) <i>kamtsi</i>	1	Bark	Grind a handful of bark into a pulp. Add some water, squeeze well and drink the juice.
<i>Sterculia banksiana</i> Guillaumin (Sterculiaceae)	(6) <i>maploa panoi</i>	1	Leaves	Squeeze leaves in water and drink the juice (Vienne, 1981).

^aFor locality code number, see Fig. 1.^bFrequency of use: 1, recipe indicated by a group of experienced women; 2, recipe in use by many communities.

TABLE 6

SPECIES CONSIDERED TO BE PHARMACOLOGICALLY INTERESTING^a

Species	Main uses (references)	Part of plant used
<i>Abelmoschus manihot</i> (L.) Medik. (Euphorbiaceae)	Abortifacient (Yun Cheung Kong, 1986) Menorrhagia ^b Facilitates delivery ^b Contraceptive (Parham, 1939)	Flower/seed Leaves Leaf buds Leaves
<i>Achyranthes aspera</i> L. (Amaranthaceae)	Ammenorhea ^b Abortifacient (Yun Cheung Kong, 1986) Facilitates delivery (Hu, 1945)	Leaves Root Root
<i>Alphitonia zizyphoides</i> (Soland.) A. Gray (Rhamnaceae)	Menstrual troubles ^b (MacCuddin, 1974; Weiner, 1971) Abortifacient ^b	Leaves Bark Bark
<i>Asplenium nidus</i> L. (Aspleniaceae)	Contraceptive ^b Facilitates delivery (Burkill, 1935)	Leaf buds Leaves
<i>Bischofia javanica</i> Bl. (Bischofiaceae)	Abortifacient ^b (Rageau, 1973) Fertility-enhancing ^b Emmenagogic (Rageau, 1973)	Bark Bark Bark
<i>Codiaeum variegatum</i> (L.) Bl. (Euphorbiaceae)	Abortifacient ^b Induces labour ^b Emmenagogic ^b	All parts of plant All parts of plant All parts of plant
<i>Dysoxylum gaudichaudianum</i> (Juss.) Miq. (Meliaceae)	Abortifacient ^b Facilitates delivery ^b Emmenagogic (Qisumbing, 1951)	Leaves Leaves Bark
<i>Flagellaria indica</i> L. (Flagellariaceae)	Contraceptive ^b (Webb, 1960)	Leaves whole plant
<i>Hemigraphis reptans</i> (G. Forst.) T. Anders. ex Hemsl. (Acanthaceae)	Facility-enhancing ^b Facilitate delivery ^b	Root, leaves Root
<i>Omalanthus nutans</i> (Forst. f.) Guillemain (Euphorbiaceae)	Abortifacient ^b Contraceptive ^b Facilitates delivery ^b	Fruit Fruit Leaf bud

TABLE 6 (continued)

Species	Main uses (references)	Part of plant used
<i>Pipturus argenteus</i> (Forst. f.) Wedd. (Urticaceae)	Contraceptive ^b Facilitates delivery ^b (Pajmans, 1976)	Bark Sap Bark
<i>Plectranthus scutellarioides</i> (L.) R. Br. (Labiatae)	Abortifacient ^b Contraceptive (Teysman, 1874) Emmenagogic (Rageau, 1973) ^b (Heyne, 1950)	Leaves Sap Whole plant Leaves
<i>Polyscias scutellaria</i> (Burm.) Fosberg (Araliaceae)	Retention of placental fragments ^b	Leaves
<i>Pongamia pinnata</i> (L.) Pierre (Papilionaceae)	Abortifacient ^b (Guerrero, 1921) Facilitates delivery ^b	Bark Bark
<i>Senna occidentalis</i> (Mimosaceae)	Emmenagogic (Rageau, 1973) Abortifacient (Seaforth et al., 1963; Wong, 1976) Facilitates birth (Weniger et al., 1982) Facilitates birth (Rageau, 1973) Induces birth ^b	Seeds Root Leaves Root Leaves

^aBased on uses in Vanuatu and relevant literature.^bData derived from field observations and interviews.

widely used for this purpose: they are soaked in water, then applied to the woman's belly and slowly rotated.

Just before the approximate due date, the woman prepares for the birth itself by drinking potions which are meant to increase the efficiency of the contractions moving the baby from the uterus into the birth canal.

Very few remedies exist for use in the event of accidents during pregnancy. Extra-uterine pregnancies remain undiagnosed and are blamed on causes unrelated to the pregnancy. Most miscarriages occurring during the early months go unnoticed. Even cases of confirmed miscarriage usually receive little or no medical attention; it is expected that nature will make the repairs. On the other hand, during her subsequent pregnancy, a woman who has previously miscarried will be treated from the start with preventive plant remedies.

We noted only two recipes used to help expulse a foetus which died in utero. In this serious case, a woman makes every attempt to reach the nearest clinic.

Delivery

When given a choice, most women prefer to give birth in a clinic. If a clinic is too far away, however, births will take place at home, where women are assisted by experienced women. There are not many true midwives in Vanuatu; most of the time, it is an old woman, who had had many children herself and has a good knowledge of medicinal plants, who assists the parturient woman.

As contractions begin, plants are administered to speed the delivery process and, sometimes, to ease the accompanying pain. Some plants are used throughout the archipelago; examples are 'burao' (*Hibiscus tiliaceus*, Malvaceae) and an orchid, whose long stem 'leans over and falls head first' (*Dendrobium* sp.) (Table 2).

When the first contractions are delayed, preparations are administered to induce them, although a few weeks' delay is not seen as abnormal. Expulsion of the placenta is said to be facilitated by external massage. Slow placental descent is viewed with concern; each group has its own remedy or remedies for such cases (Table 3).

Post-partum care and nursing

After the placenta has been expulsed, a mother's thighs and belly are washed and she is given potions to drink which will 'clense' her insides and prevent hemorrhaging: these preparations are also intended to help her system expel the lochia and are administered for the duration of confinement, until every discharge has stopped. Other herbal teas are also administered to ease residual post-partum pains and to strengthen the mother (Table 3).

In the past, a newborn baby was given the breast within hours of birth. Today babies are not breastfed until the day following birth and the colostrum is unfortunately lost. In order to have plenty of milk, mothers are kept on a diet of taro, sweet potato and cooked papaya fruit, supplemented with small portions of the young fronds of edible ferns, lightly boiled (*Cyathea* sp., *Diplazium* sp., *Tectaria latifolia*, *Microlepia speluncae* and *Hypolepis* sp.). New mothers are encouraged to drink a great deal of liquids: mainly coconut water, either fresh or after the coconut had been roasted on a fire. Sometimes the sap of

plants (such as *Ipomoea* sp., *Merremia peltata*, or *Ficus adenosperma*) is added to the coconut water. Mashed rhizome of *Tapeinochelos* sp. may also be added for the same purpose. Another aid to facilitate lactation may be prepared by heating or softening *Ficus septica* leaves, *Abelmoschus manihot* leaves or *Plectranthus scutellarioides* flowers in a small quantity of hot water and apply the preparation on the nipples.

Regulation of fertility

Vanuatu differs from many other traditional societies in that large families are not especially prized. The 'ideal' family consists of 4-6 children, born at regularly spaced intervals and of alternating sex. Families of 8 or more children are unusual. The average number of children per family has increased, however, due to the influence of Christian ideology, with its emphasis on large families. In addition, better sanitary conditions have lowered early childhood mortality rates.

To attain this 'ideal family', several methods are used.

(i) *Abstinence*. Abstinence is the preferred contraceptive method in Vanuatu.

Formerly, the period of abstinence began with pregnancy (sexual relations during pregnancy are believed to endanger the foetus) and lasted until weaning, at approximately 16 months, when a child's psychomotor development is well established and when he/she is able to eat the full range of foods.

At present, sexual abstinence is no longer as strictly observed due to monogamy, which has resulted in increased sexual pressure on the part of husbands towards their wives.

(ii) *Other contraceptive methods*. Contraceptive plants are rarely used as methods for spacing births; abstinence during breastfeeding is more prevalent. Plants are more commonly used in cases where no more children are desired. Their role thus becomes that of sterilization. If a woman's oldest child is of marriageable age and therefore able to have children of his/her own, she is not encouraged to plan another pregnancy. If her children have died early, however, and she finds herself growing 'old' without children, or if she is widowed and remarries, she is free to plan another child.

Birth control pills are freely available in Vanuatu, but are seldom used. They are unpopular because of their inconvenience, while the side-effect that worries women most is the decrease in the length and volume of their menstrual periods.

Women are apt to treat these symptoms with medicinal plants and in the end abandon the pill in favour of the more traditional contraceptive plants.

Such plants are known to healers (Table 4, types 1-4). Some plants must be taken daily, as long as a woman wants to prevent conception. Their effect is believed to be reversible, ending as soon as the plants are no longer taken. These are the least numerous of the remedies listed in Table 4. Others must be taken at regular intervals in order to be effective. Some are reputed to cause temporary sterility and claimed to be reversed by using another plant. This method can cause problems in cases where a woman decides to conceive again, but can no longer find the healer who had prescribed the contraceptive plant. It is interesting to note that none of the plants used to reverse 'induced sterility' is used to reverse 'natural sterility'. Another interesting fact is that a recipe for ending 'sterility' may contain the same elements as that used to induce it, but prepared differently (a practice noted in Erromango). The last category is also the largest and most widely used (Table 4). These are remedies which are known as definitive sterilizing measures; they are taken once or repeated for several days. This type of prescription may be accompanied by a ban on sexual relations of variable duration, which is supposed to help 'shrink' the uterus.

None of these plant preparations is claimed to interfere with the menstrual cycle.

(iii) *Abortion techniques.* Abortion may be used as a birth control method. According to the accounts given by several ethnographers, ni-Vanuatu women have always had recourse to several abortion techniques. These can be 'mechanical' (attempts to achieve spontaneous abortion through excessive fatigue) or potions made of plants known for their abortifacient properties (Table 5). We did not find any technique involving the introduction of an object into the cervix.

Abortion remedies are administered orally. 'Matrons' and some healers are aware of them, but since the use of such preparations is now outlawed, it was difficult for us to research the subject. As a general rule, women feel that it is permissible to abort a pregnancy up to 3 months. After that time, a mother's life is felt to be at risk and abortion is seen as a dangerous practice.

The plants we have been able to document are claimed to lead to abortion after one or several doses, but may also cause illness such as kidney or liver problems which appear to be the most com-

mon side effects of these preparations, or sterility. Others are believed to act as a violent purgative, irritating the gastro-intestinal tract and provoking nausea and vomiting. It appears, however, that some plants claimed to be effective may cause little or no side-effects. In urban areas, preparations containing chloroquine pills, lime juice, the juice of unripe papayas and alcohol are used, usually by younger women, who circulate this type of recipe among themselves.

The reputation of the efficacy of some of these plants may be exaggerated; women sometimes take them as soon as their menstrual periods are delayed, when pregnancy is not yet confirmed. In the same way, it has been difficult to determine whether some plants are abortifacient or contraceptive, since certain 'contraceptive' plants when administered late are claimed to produce abortion. Many plants are also used for several purposes, such as for contraception, abortion, menstruation-induction and as an aid to delivery, etc. One explanation could be that the pharmacological effects searched for are in some cases very similar and an active principle present in the plant that stimulates birth could very well provoke an abortion if it is administered during early pregnancy.

Discussion and Conclusions

Of the 1200-odd species of Vanuatu flora (Cabalion et al., 1991), 10% are used for purposes relating to human reproduction, a fact that bears witness to the wealth and variety of this still-thriving traditional pharmacopoeia.

After analysing our raw data (Tables 1-5) (see list of criteria in Methodology) based on the results obtained in the Vanuatu archipelago and a review of the relevant literature, we prepared a list of species which appeared to be particularly interesting (in order not to repeat the work done elsewhere, some species already mentioned by Farnsworth et al. (1975a,b) and *Dioscorea bulbifera* (Dioscoreaceae), the main source of steroids used in birth-control pills, were excluded (Table 6)).

From this list, the following five species were selected for preliminary pharmacological screening: *Asplenium nidus*, *Hemigraphis reptans*, *Dysoxylum gaudichaudianum*, *Omalanthus nutans*, *Pemphis acidula*. *A. nidus* and *H. reptans* are linked by complementary usage: the use of the latter is claimed to reverse sterility induced by the former. *D. gaudichaudianum* and *O. nutans* are known

among the informants as foolproof abortive agents. The last species, *P. acidula*, known to be used only in Vanuatu, is not mentioned in the literature surveyed.

The evaluation of the biological activity of these species will be described in detail in part II of this series of papers.

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