LOCAL NAMES
Bengali (bangara); English (white hoary pea,hoang pea,white tephrosia); French (indigo sauvage,requie'nie); Hindi (boga medalo,kulthi,lashtia,masethi); Indonesian (enceng-enceng,poko tom,kapeping badah); Javanese (enceng-enceng); Pidgin English (pis pea); Vietnamese (cot khi)

BOTANIC DESCRIPTION
Tephrosia candida is an erect herb, shrub or small tree, up to 3.5 m tall, with straggling branches from the base.

Leaves spirally arranged, imparipinnate; stipules 5-11 x 0.8-1.5 mm, often caducous; rachis (including the petiole) up to 22.5 cm long, with brown indumentum, 6-13 pairs leaflets, opposite, narrowly ovate, elliptical to narrowly obovate, 1.3-7.5 x 0.5-1.7 cm, glaucous green, soft, with silvery indumentum, base and apex acute, long-mucronate, venation distinct below.

Inflorescence a terminal, axillary or leaf-opposed pseudo-raceme, 2.5-40 cm long; basal bracts few, leaflike, upper bracts narrowly triangular, 2.2-6 x 0.5-1.5 mm, often caducous; flowers in fascicles of 5-13, 13-26 mm long, white, silky, with dark brown hairs on the outside; calyx campanulate, standard broadly ovate to obovate, 13-25 x 11-25 mm, apex rounded to emarginate, acuminate, claw 1-5 mm long, wings 12-20 x 5.5-13 mm, glabrous, claw 1-4.4 mm long; keel 11-20 x 3-10 mm, glabrous, lateral pockets sometimes bulging, claw 1.5-5 mm long, stamens 10, vexillary filament free at base, connate half way, other filaments alternately longer and shorter.

Pod linear, 7-12 cm x 0.5-1 cm, green or brown with silky hairs, slightly convex around the 10-15 seeds. Seed broadly ovoid, 4-5.5 x 3-4 mm, brown or greyish-brown with dark patches.

The specific name means pure white in Greek.

BIOLOGY
Flowering times range from all year round in Malaysia to only 2 months of the year in Vietnam. Overmature pods will shatter and lose their seeds.

ECOLOGY
The habitat of T. candida is primary and secondary forest, higher locations in sago-palm swamps and disturbed places such as roadsides, riverbanks, steep slopes and fields. It grows in the seasonally dry tropics and does not tolerate frost or waterlogging.

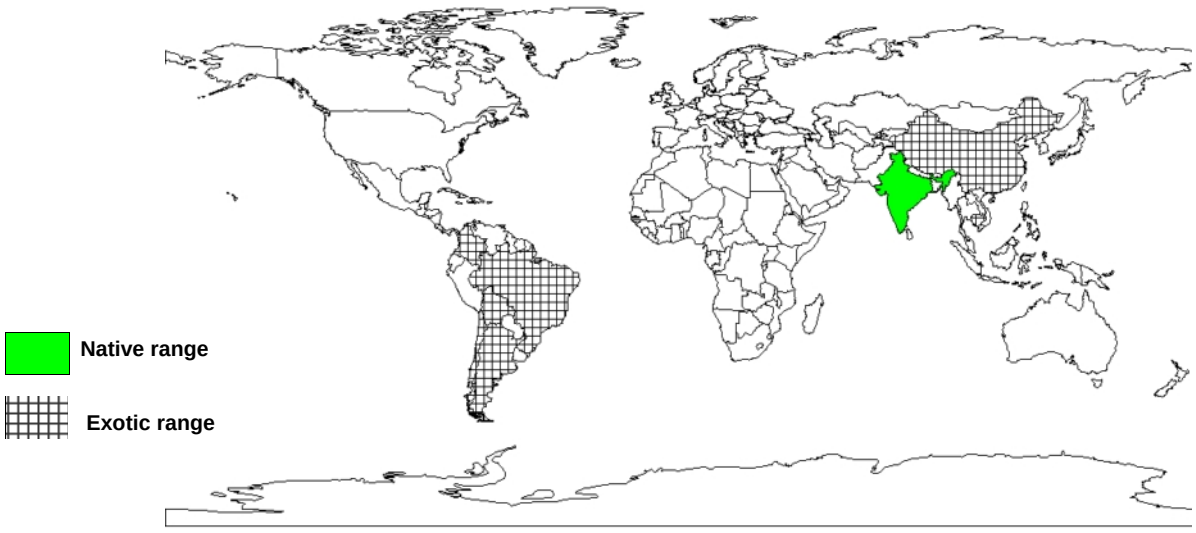
BIOPHYSICAL LIMITS
Altitude: Up to 1 600 m or more, Mean annual temperature: 18-28 deg. C, Mean annual rainfall: 700-2 500 mm

Soil type: Grown on sandy soils in coastal areas and on very poor, eroded upland soils and mine spoils where few other crops can grow. It tolerates a pH of 3.5-7; the more acidic soils seem to be more suitable.

DOCUMENTED SPECIES DISTRIBUTION

Native: India

Exotic: Antigua and Barbuda, Argentina, Bahamas, Barbados, Bolivia, Brazil, Cambodia, Chile, China, Colombia, Cuba, Dominica, Dominican Republic, Ecuador, French Guiana, Grenada, Guadeloupe, Guyana, Haiti, Indonesia, Jamaica, Japan, Laos, Malaysia, Martinique, Myanmar, Netherlands Antilles, New Zealand, Papua New Guinea, Paraguay, Peru, Philippines, Puerto Rico, Solomon Islands, Sri Lanka, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Surinam, Thailand, Trinidad and Tobago, United States of America, Uruguay, Venezuela, Vietnam, Virgin Islands (US)



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

PRODUCTS
Fodder: The leaves of T. candida are high in protein and can be used as fodder for pigs and cattle.

Fuel: When the species becomes woody with age, it provides suitable fuelwood.

Poison: Powdered leaves are used as an insecticide. There are unconfirmed reports of the bark and roots being used as a fish poison.

SERVICES
Erosion control: Planted to provide ground cover between perennial crops.

Shade or shelter: In newly planted perennial crops such as citrus, coconut, coffee, rubber and tea, it is grown as a temporary shade crop.

Reclamation: The species is suitable for rehabilitating degraded land.

Nitrogen fixing: Forms root nodules with Bradyrhizobium and fixes large amounts of atmospheric nitrogen.

Soil improver: T. candida not only provides nitrogen but also raises soil phosphorus and potassium levels in proportion to increased levels of organic matter. Soil structure improves, water-holding capacity and permeability increase, and soil losses caused by water erosion decrease. It can yield well on acid soils; for example, in Vietnam, green-matter content of the soil increased from 1.7 to 4%.

Ornamental: T. candida is occasionally utilized as an ornamental.

Boundary or barrier or support: Suitable for making hedges along contours, around fields and homegardens, as it is not eaten by domestic animals such as buffaloes and goats. It is commonly used for hedgerows, providing mulch for different upland crops.

Intercropping: T. candida is widely grown in mixed cultivation, for example with pineapple, maize and other annual crops, and it is said to improve the quality of tobacco. Cassava is a shade-sensitive species and needs regular lopped hedgerows, for which T. candida is a very suitable species. It has been tried as an alley crop with cassava planted in 7-m-wide interrows. Preliminary results indicate a greatly increased yield of cassava and a considerable reduction of erosion.

TREE MANAGEMENT
T. candida is deep rooting and slow to establish but grows steadily thereafter. Young plants should be kept free from weeds. On poor soils, it responds well to fertilizers, especially phosphorus. On fertile soils, 25-30 t/ha of green matter can be harvested annually in 3 cuttings. Maximum growth normally takes place in the 2nd year after planting, but with regular pruning a dense cover can be maintained for many years. Spacings of 40-90 x 10 cm are reported for intercropping, depending on the associated crop.
Produces biomass of about 12-18 t/ha per year when mixed with cassava, and 20-40 t/ha per year or more in monoculture.

GERMPLASM MANAGEMENT
Seed storage behaviour is orthodox. No loss in viability following 3 years in either open storage or hermetic storage at room temperature with 13% ± 2% mc. There are between 300 and 500 seeds/kg.

PESTS AND DISEASES
In Indonesia, the tephrosia beetle (Araeocerus fasciculatus) attacks young pods; it used to be a serious pest, making seed difficult to obtain, but can now be easily controlled with insecticides. T. candida is susceptible to the root fungi Ganoderma spp. and Rosellinia spp. and to the nematode Heterodera radicola. When weakened by shade and woody with age, it becomes liable to attack by Fomes spp.

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SUGGESTED CITATION

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