Tephrosia purpurea

(L.) Pers.

Fabaceae - Papilionoideae

LOCAL NAMES
English (wild indigo,purple tephrosia,fish poison); Filipino (balba-latong); French (indigo sauvage); Gujarati (unhali); Indonesian (pohon nila hutan); Lao (Sino-Tibetan) (s'az kh'am moyz); Sanskrit (sharpunkha); Thai (ve c[as]i)

BOTANIC DESCRIPTION
Tephrosia purpurea is an erect or spreading annual or short-lived perennial herb, sometimes bushy, 40-80 cm tall, rarely up to 1.5 m; indumentum sericeous, strigose or velutinous; stem slender, erect or decumbent at base.

Leaves imparipinnate; stipules narrowly triangular, 1.5-9 mm x 0.1-1.5 mm; rachis up to 14.5 cm long, including the petiole of up to 1 cm; petiolule 1-3 mm long; leaflets 5-25, obovate to narrowly elliptical, terminal leaflet 7-28 mm x 2-11 mm, lateral leaflets 5-30 mm x 2-11 mm, acute at base, apex rounded to emarginate, venation usually distinct on both surfaces.

Inflorescence an axillary or leaf-opposed pseudo-raceme, (1.5-)10-15(-25) cm long, sometimes with basal leaf-like bracts; flowers in fascicles of 4-6; bracts to fascicles and to flowers small, bracteoles usually absent; pedicel 2-6 mm long; flower 4-8.5 mm long, purplish to white; calyx campanulate, persistent, cup 1.4-2.3 mm x 1.5-3.2 mm, unequally 4-toothed, teeth pubescent inside; standard broadly ovate, 3.5-7.3 mm x 5-10 mm, clawed; wings 2.5-6 mm x 1.5-3.8 mm, auricled on vexillary side, clawed; keel 2.2-4.5 mm x 2-3 mm, auricled on vexillary side, clawed; stamens 10, staminal tube 4-6 mm long, filaments alternately longer and shorter, free part up to 3.5 mm long, vexillary filament free at base, connate halfway, 5-8 mm long; style up to 4.5 mm long, upper half glabrous, stigma penicillate at base.

Pod flat, linear, 2-4.5 cm x 3-5 mm, somewhat up-curved towards the end, convex around the seeds, flattened between, margins thickened, dehiscent with twisted valves, 2-8(-10)-seeded.

Seed rectangular to transversely ellipsoid, 2.5-5 mm x 1.8-3 mm, light to dark brown to black, sometimes mottled.

T. purpurea is a very variable species and many subclassifications exist. Most characteristic is the shape of its pod: convex around the seeds with a distinctive flat area in between. The name T. purpurea is often erroneously applied to the cultivated T. noctiflora Bojer ex Baker which has longer inflorescences, a very long carinal calyx tooth and reticulately ridged seeds.

For South-East Asia T. purpurea is subclassified as follows; (a) subsp. barbigera Bosman & de Haas: vexillary filament and staminal tube velutinous; occurring in the Philippines, New Guinea and Australia. Based on flower and inflorescence lengths, further subdivided into 2 varieties: var. barbigera (flower 7-8 mm long, longest inflorescence 11-19.5 cm long) and var. rufescens Benth. (flower 5-6 mm long, longest inflorescence 4.5-11 cm long). (b) subsp. purpurea : characteristics and distribution as described for the species; vexillary filament and staminal tube glabrous.

BIOLOGY
It flowers throughout the year in Java.

This is a self regenerating crop and highly drought hardy. Once seeding mostly holds good. It can be used as a green manure in paddy under irrigated as well as in rain fed conditions for other crops as well. (Daniel Anand Raj)

Seeds yellowish to light brown; irregularly shaped; 1,5 - 2,5 mm in diameter. (Botha R)

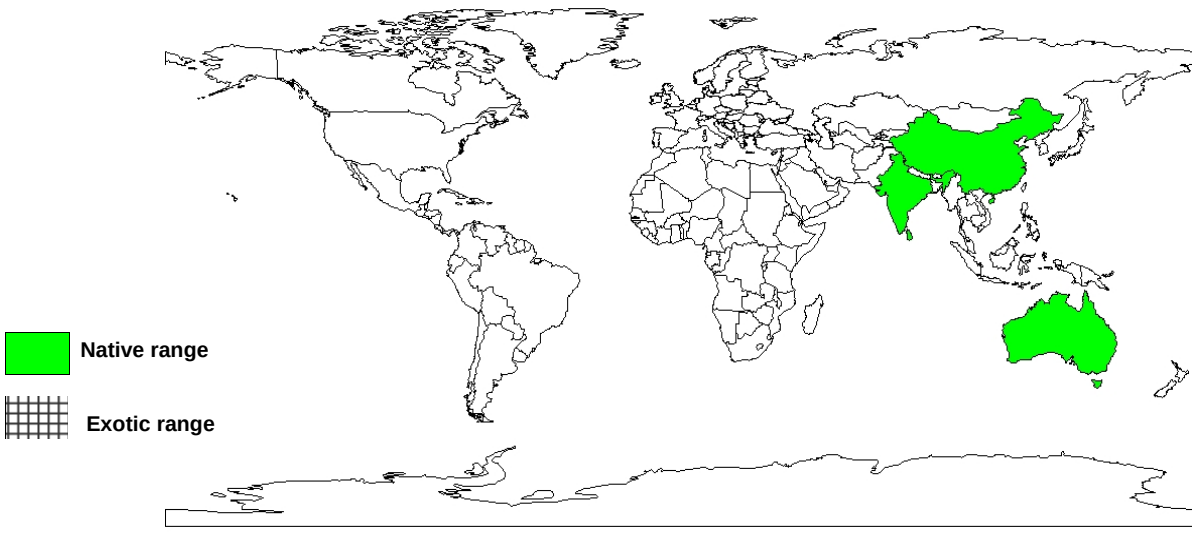
ECOLOGY
T. purpurea occurs naturally in grassy fields, waste places and thickets, on ridges, and along roadsides, in Java. In Hawaii, it grows near the seashore.

BIOPHYSICAL LIMITS
Altitude: Up to 400 m altitude, it generally grows at low altitudes, but may be found to 1300 m altitude.

Soil types: It prefers dry, gravelly or rocky and sandy soils, but in Madras (India) it grows well on loamy soils. It is tolerant of saline-sodic soil conditions.

DOCUMENTED SPECIES DISTRIBUTION

Native: Australia, China, India, Sri Lanka
Exotic:



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: Information on the fodder value of T. purpurea is conflicting. In India and in South Africa, it is used as a fodder before flowering, but in Australia it is reported to cause livestock poisoning.

Fuel: The energy value of the wood of T. purpurea is 14 500 kJ/kg. In northern India, dry plants are collected for fuel.

Medicine: Medicinally, all parts of the plant have tonic and laxative properties. The dried plant is deobstruent, diuretic and useful in treating bronchitis, bilious febrile attacks and obstructions of the liver, spleen and kidneys. It is also recommended as a blood purifier, in the treatment of boils and pimples and is considered a cordial treatment. In southern India, a decoction of the fruit is given against intestinal worms and a fruit extract is used to relieve bodily pains and inflammatory problems. The roots are bitter and a decoction is used as a nematicide for treatment against Toxocora canis larvae which cause a lung disease in Sri Lanka; it is also used against dyspepsia, colic, and chronic diarrhoea and as anthelminthic.

Poison: The toxic properties of T. purpurea are due to the presence of flavonoids; those recorded include rotenone and several of its isomers named deguelins. One of the deguelins, tephrosin, is poisonous to fish, but not to mammals. The leaves contain up to 2.5% rutin (a flavonol glucoside). Pounded leaves are used to stupefy and catch fish.

Tannin or dyestuff: The leaves are occasionally used to dye orange-brown, or, in a mixture with Mucuna cyanosperma Schumann, black.

Other products: In Indo-China the seeds are used as a substitute for coffee.

SERVICES
Shade or shelter: It is applied as temporary shade.

Soil improver: T. purpurea is used as green manure for vegetables, rice, coconut and banana, especially in India and Sri Lanka, and on a more limited scale in Indonesia, Malaysia and southern China. When grown as a green manure on saline-sodic soils in Rajastan (India), it is most successful in reducing soil salinity and lowering the pH.

TREE MANAGEMENT
T. purpurea is associated with the vesicular-arbuscular mycorrhizal fungi Glomus heterosporum and Sclerocystis microcarpus in waste sites of coal mines and calcite mine spoils, and is nodulated by Rhizobium.

Its growth is often not very luxuriant, limiting its value as a temporary shade crop or green manure. When added to the soil as green manure it increases humus content and induces the formation of large, stable soil aggregates. It produces ample seed and builds up a large seedbank in the soil.

GERMPLASM MANAGEMENT

PESTS AND DISEASES

FURTHER READNG

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SUGGESTED CITATION

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