

PESTICIDAL PLANT LEAFLET

Tephrosia vogelii Hook. f



Taxonomy and nomenclature

Family: Fabaceae

Vernacular/common names: (English): fish bean, fish-poison bean, vogel's tephrosia (Lao (Sino-Tibetan)): hu kata (Swahili): kibaazi, kibazi, mibaazi, mtupa, utupa wa kibaazi, utupa wa kingindo, utupa wa mrima.

Distribution and habitat

Tephrosia vogelii is native to tropical Africa. It is found in widely varying habitats, including savanna-like vegetation, grasslands, forest margins and shrublands, waste lands and fallow fields. It occurs in climates with annual rainfall of 850-2650 mm and annual mean temperature of 12.5-26.2°C and is found up to 2100 m altitude. It is encountered most abundantly where cultivated.

Uses

Tephrosia vogelii is a known nitrogen-fixing species, cultivated as green manure in Indonesia and many other parts of Africa. It is also planted as a windbreak and as a temporary shade crop. Crude extract from leaves of *Tephrosia vogelii* is potentially used to control ticks and worms in the Ugandan animal production systems. It has also been used to control larval stages of mosquitoes and is effective against soft bodied insects and mites including aphids and red spider mites. Dried leaves have the potential to protect stored legume seeds from damage by the bruchids as used by farmers in Southern Africa. For control of weevils (less effective) and grain borer, mix 100-250 g powdered dry leaves to 100 kg of beans or cowpea. Before eating beans, wash thoroughly. *Tephrosia vogelii* plant extracts were once used as fish poison but now many countries term this as illegal. To make the insecticide, mix dry powdered leaves 10% w/v in water containing 1% liquid soap for 24 hours. Dilute 5-10 times to give 1-2% concentration and spray in the early evening to reduce exposure to sunlight and lessen effects against beneficial insects.



Botanical description

Tephrosia vogelii is a soft, woody branching herb or small tree with dense foliage, 0.5-4 m tall, with velutinous to sericeous indumentum. Stems and branches tomentose with long and short white or rusty-brown hairs. Leaves arranged spirally, imparipinnate; stipules 10-22 x 3-3.5 mm, early caducous; rachis 5-25 cm long, 1.5-5 mm long including petiolule; leaflets in 5-14 pairs, narrowly elliptical to elliptical-oblongate, up to 7 x 2 cm, base acute to obtuse, apex rounded to emarginate, venation most distinct on lower surface, silky tomentose. Inflorescence a terminal or axillary pseudo-raceme, 8-26 cm long, rusty tomentose; basal bracts leaf like, peduncle stout, as long as pseudo-raceme; flower 18-26 mm long, fragrant when fresh, white, violet-purple or blue; pedicel up to 23 mm long; bracteoles sometimes present on calyx.

Note: Always verify your plant specimen and deposit a voucher in a verified herbarium.

Fruit and Seed description

The pod is linear, slightly turgid, measuring 5.5-14 cm x 0.8-1.8 cm, brown or green, woolly to sericeous and 6-18-seeded. The dark brown to black seed is ellipsoid to kidney-shaped and measuring 5-7 mm x 3-5 mm. Seedling is with epigeal germination. The cotyledons are rather thin, leaf-like, green and long persistent, where the first leaf is simple while the second is usually 3-foliolate.

Flowering and fruiting habit

The flowers are bisexual, borne in compact clusters. The stigma is receptive when pollen is released, and self-pollination occurs. Large carpenter bees (*Xylocopa brazilianorum*) have been reported as principal pollinators. Seed set is low.

Harvesting

Harvesting is done by shaking the branches and pulling the pods with a hook in order to release them on canvas spread on the ground.

Processing and handling

Pods should be dried in the sun for a few days, and then threshed in a gunny bag by using a stick. After extraction, the seeds are cleaned by sieving, winnowing or using a mechanical blower. Cleaned seeds are dried to moisture content between 6 and 10% prior to storage.

Storage and viability

Seed storage behavior is orthodox; viability can be maintained for several years in hermetic storage at 10°C. Seed can also be stored for at least a year if kept dry and insect free.

Propagation and pre-treatment

The seeds should be soaked in cold water for 24 hours before sowing to enhance germination. For maximum leaf yield sow 35,000 seeds per hectare.

Safety measure

Always use gloves, protective clothing and caution when handling and applying plant materials to field crops or stored commodities and minimise exposure of consumers. Avoid contact with the skin. In case of accidental contact, immediately wash the affected area with clean running water.

Selected readings

Belmain, S.R., Amoah, B.A., Nyirenda, S.P., Kamanula, J.F. and Stevenson, P.C. (2012) Highly variable insect control efficacy of *Tephrosia vogelii* chemotypes. *Journal of Agricultural and Food Chemistry*. 60(40), 10055–10063.

Stevenson, P.C., Kite, G.C., Lewis, G.P., Nyirenda, S.P., Forest, F., Belmain, S.R, Sileshi, G., and Veitch, N.C. (2012) Distinct chemotypes of *Tephrosia vogelii* and implications for their use in pest control and soil enrichment. *Phytochemistry*, 78, 135-146.

World Agroforestry Centre: Species database.

Matovu, H. and Olila, D., (2007). Acaricidal Activity of *Tephrosia vogelii* Extracts on Nymph and Adult Ticks. *International Journal of Tropical Medicine*, 2: 83-88.

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Pesticidal plant leaflets are a series of species wise extension leaflets on botanical pesticides. Leaflets are compiled from existing literature and research available at the time of writing. In order to currently improve recommendations, ICRAF, MSBP and the University of Greenwich encourage feedback from users and researchers who have experience with the species. Comments, corrections, improvements and amendments will be incorporated into future edited leaflets.

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