Vernonia amygdalina

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PESTICIDAL PLANT LEAFLET

Vernonia amygdalina Del.

World Agroforestry Centre

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Kew ROYAL BOTANIC GARDENS

Taxonomy and nomenclature

Family: Asteraceae
Synonym: *Gymnanthemum amygdalinum* (Del.) Schultz-Bip.
Vernacular/ Common names:
(English): Bitter leaf
(Luhya): Lisabakhwa
(Luo): Olusia, Omororia

Distribution and habitat

V. amygdalina occurs naturally along rivers and lakes, in forests margins, woodland and grassland up to 2800 m altitude, in regions where mean annual rainfall is 750-2000 mm. It requires full sunlight and prefers humid environment. It grows on all soil types but prefers humus-rich soils. In Kenya, it is found at Kona national reserve in Tana River district (420 m), in the eastern side of Mbololo forest in Taita (1400 m), in Narok (2100 m), in the Nguruman escarpment (900 m) and Ol Donyo Orok (1400 m).

Uses

Insecticidal - Essential oil from the leaves is toxic to *Sitophilus zeamais* while the activity against bruchids suggests it is effective when mixed with *Ocimum* spp.
Food - Bitter leaf eaten as raw vegetables and cooked in soups. Roots and twigs chewed as appetizer.
Medicinal - It is used as a medicine for relieving fevers, stomach disorders, to treat hepatitis, malaria, bilharzias, spots on skin and nausea.
Fodder - Leaves and shoots used as fodder.
Fuel - The tree is used for firewood and charcoal.
Apiculture - It produces very light honey.
Timber - The termite-resistant branches are used as stakes to line plantations or live fence.

Botanical description

V. amygdalina is a small tree up to 10 m tall; bark light grey or brown; fissured, brittle branches. Leaves lanceolate oblong; up to 28 x 0 cm, but usually 10-15 x 4-5 cm. Leaf, medium to dark green, with or without sparse hairs above, with fine, soft, pale hairs below and conspicuous red-veining; apex and base tapering, base always almost symmetric, margin entire or very finely toothed; petiole usually very short but may be 1-2 cm long. Flower heads thistle like, small, creamy white, 10 mm long, grouped in dense heads, axillary and terminal, forming large flat clusters, 15 cm in diameter, sweetly scented.

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

Fruit and Seed description

Fruit, a 10-ribbed achene, 1.5-3.5 mm long, pubescent and glandular, brown to black, crowned by the much longer pappus bristles; seedling with epigeal germination.

Flowering and fruiting habit

The tree flowers between December and March and in July-August. Fruits ripen in April-May and August-September. Flowers are bisexual.

Harvesting

During rainy seasons, harvesting is by cutting of the leafy shoots allowing new shoots to grow, which can then be harvested a few weeks later. During dry seasons, only leaves are picked.

Processing and handling

Fresh mature fruits appear yellow and ripen in various sizes. Fruits are dried at 30^{o}C to 35^{o}C for three to four days, when fruit turns to brown colour, seeds are extracted by gently rubbing the fruit between fingers to squeeze out the mucus like paste that cushions the seeds, the seeds are then washed in running water to separate seeds from the pulp. Clean seeds are placed on open tray to dry under shade for a period of two to three days.

Propagation

Propagation is possible by seed collected from dry flowerheads but mostly stem cuttings are used as they grow faster. Cuttings are planted erect or slanted at 45^{0} to obtain more side shoots. Seeds can be broadcasted on nursery beds prepared of humus-rich soil, shaded from excessive heat or sunlight with regular supply of water to germinate. Seedlings can be transplanted 4-6 weeks after emergence. Commercial farmers prefer to plant new crop at the beginning of a season or after the second year. It can also be micropropagated in vitro.

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.

Caution: This plant is invasive.

Selected readings

FAO- Species database.

World Agroforestry Centre- Species database.

Grubben, G.J.H., Plant Resources of Tropical Africa (PROTA).

Mugisha-Kamateresi, M., Deng, A.L., Ogendo, J.O., Omolo, E.O., Buyungo and Bett, P.K. (2008). Indigenous knowledge of field insect pests and their management around lake Victoria basin in Uganda. *African Journal of Environmental Science and Technology*, 2 (8). 342-348.

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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.
Please write your comments to: p.anjarwalla@cgiar.org or d.ofori@cgiar.org