

# PESTICIDAL PLANT LEAFLET

## *Strychnos spinosa* Lam.



### Taxonomy and nomenclature

Family: Loganiaceae

Vernacular/common names: (English): elephant orange, kaffir orange, monkey ball, monkey orange, Natal orange, spiny monkey ball, spiny monkey orange. (Swahili): mtonga, mpapa.

### Distribution and habitat

*S. spinosa* occurs in savannah forests all over tropical Africa and grows in open woodland and riverine fringes. Native: Ethiopia, Kenya, Madagascar, Mali, Mauritius, Seychelles, Sudan, Tanzania, Uganda, Zambia. Exotic to: South Africa, United States of America. The tree can be found growing singly in well-drained soils. It is found in bushveld, riverine fringes, sand forest and coastal bush from the Eastern Cape, to Kwazulu-Natal, Mozambique and inland to Swaziland, Zimbabwe, northern Botswana and northern Namibia, north to tropical Africa. This tree prefers sandy soils and grows fast in rocky areas. Prefers full sun and requires moderate amount of water.

### Uses

**Pesticidal** - *S. spinosa* is among plant species commonly used as pesticides in Southern Africa. Aqueous extracts of *S. spinosa* show potential as alternatives to synthetic pesticides but little is known about their level of toxicity. The unripe fruit pulp can be extracted and diluted in water to about 10% w/v and after filtering through muslin sprayed onto cattle (5L/animal).

**Medicinal** - Compounds from the tree have been shown to have anti-trypanocidal activity.

**Other uses** - The wood can be used for general carpentry. Timber from *S. spinosa* produces handles, fighting sticks and hut poles. It is also used for carving. Dried fruit, after the seeds are removed, are often used as sounding-boxes for musical instruments such as the marimba. They are also carved and sold as curios. The fruit is

edible and often sun dried as a food preserve. There is no evidence of the occurrence of strychnine in the plant although the chemistry of seeds has not been reported so they should be avoided as they may be poisonous or could have purgative effects.



### Botanical description

*S. spinosa* is a small to medium sized, spiny deciduous tree with leaves turning yellow in autumn. The canopy is flattish and irregular and the tree is heavily branched. Leaves simple, opposite, elliptic-ovate to almost circular, 1.5-9 x 1.2-7.5 cm, light to dark green and glossy at the base; veins pale green and curving along the margin; apex tapering to rounded, sometimes notched; base tapering, rounded or slightly lobed; margin entire, inclined to be wavy; petiole 2-10 mm long.

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

### Fruit and flower description

Fruit spherical, woody shelled, 5-12 cm in diameter, deep yellow to yellow-brown when mature, contains

many tightly packed flat seeds surrounded by a fleshy, edible covering pulp.

Flowers creamy green, up to 6 mm long, in compact heads about 3.5-4 cm, terminal on short lateral twigs, densely crowded together on short stalks about 10 mm long (September-February/Spring - summer).



### Fruit collection

Fruits are harvested when the color turns from green to yellow brown. Harvesting is by cutting the branches holding the fruit using a pair of secateurs. A canvas could be spread on the ground to hold the fruits during harvesting.

### Processing and handling

After collection, fresh fruits are soaked in water to soften the fresh pulp and are extracted by rubbing with hands to remove the pulp; they are then squeezed to release the seeds. Cleaned seeds are spread on open trays to dry under-shade. These are about 1800 seeds/kg.

### Propagation

The species can be regenerated from root suckers and coppice or seeds. Seeds are soaked in hot water or the hard coat is burned to facilitate and improve germination. It can also be propagated vegetatively.

### Storage and viability

Seed storage behaviour is orthodox; long-term storage.

### Conservation status

The species is not selected or highlighted as potential taxa for conservation concern for detailed assessment and hence given an automated status as Least Concern in the red list of South African plants.

### 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

Madzimure, J., Nyahangare, E.T., Hamudikuwanda, H., Hove, T., Belmain, S.R., Stevenson, P.C., Mvumi, B.M. (2013) Efficacy of *Strychnos spinosa* (Lam.) and *Solanum incanum* L. aqueous fruit extracts against cattle ticks. *Tropical Animal Health and Production*. (in press).

Nyahangare, E.T., Hove, T., Hamudikuwanda, H., Belmain, S.R., Stevenson, P.C., Mvumi, B.M. (2012) Toxicity of the pesticidal plants *Strychnos spinosa* Lam., *Bobgunnia madagascariensis* (Desv.) J.H. Kirkbr. & Wiersama *Vernonia amygdalina* Del. and *Cissus quadrangularis* L. in BALB/c mice, *Journal of Medicinal Plants Research*. 6(13), 2674-2680.

Schmidt, E., Lötter, M. & McClelland, W. 2002. Trees and shrubs of Mpumalanga and Kruger National Park. Jacana, Johannesburg.

Authors: L. Mwaura, P. Anjarwalla, D. A. Ofori, R. Jamnadass, P. Stevenson, and P. Smith.

**ISBN 978-92-9059-344-7**

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: [d.ofori@cgiar.org](mailto:d.ofori@cgiar.org) or [l.mwaura@cgiar.org](mailto:l.mwaura@cgiar.org)