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Balanities aegyptica

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Published in:
Seed Leaflet

Publication date:
2000

Document version
Publisher's PDF, also known as Version of record

Citation for published version (APA):
Jøker, D. (2000). Balanities aegyptica. *Seed Leaflet*, (21).

Download date: 13. Nov. 2026

SEED LEAFLET

No. 21 September 2000

Balanites aegyptiaca (L.) Del.

Taxonomy and nomenclature

Family: Balanitaceae

Synonyms: *Ximenia aegyptiaca* L. (excl. *Balanites roxburghii* Planch), *Agialida senegalensis* van Tiegh., *Agialida barteri* van Tiegh., *Agialida tombuctensis* van Tiegh., *Balanites ziziphoides* Milbr. et Schlechter, *Balanites latifolia* (van Tiegh.) Chiov.

Vernacular/common names: desert date, soapberry tree, thorn tree, Jerico balsam, simple-thorned torchwood (Eng.); heglig (Arabic); corona di Jesus (Sp.).

Savannah, Ethiopia. Photo: Henrik Keiding, DFSC.

Distribution and habitat

Natural distribution is obscured by cultivation and naturalisation. It is believed indigenous to all dry lands south of the Sahara (Sahel), extending southwards to Malawi in the Rift Valley, and to the Arabian Peninsula. Introduced into cultivation in Latin America and India.

It has wide ecological distribution, but is mainly found on level alluvial sites with deep sandy loam and free access to water.

After the seedling stage it is intolerant to shade and prefers open woodland or savannah for natural regeneration. It is a lowland species growing up to 1000 m altitude in areas with mean annual temperature of 20-30°C and mean annual rainfall of 250-400 mm.

Uses

The fleshy pulp of both unripe and ripe fruits is edible and eaten dried or fresh. The fresh and dried leaves, fruits and sprouts are all eaten by livestock. An experiment in Burkina Faso showed that *B. aegyptiaca* contributed up to 38% of the dry-matter intake of goats in the dry season.

The wood is hard, durable and easy to work, but the small stem size and the tendency to fluting make sawmill processing difficult.

Botanical description

Multibranched, spiny shrub or tree up to l0 m tall. Crown spherical, in one or several distinct masses. Trunk short and often branching from near the base. Bark dark brown to grey, deeply fissured. Branches armed with stout yellow or green thorns up to 8 cm long. Leaves with two separate leaflets; leaflets obovate, asymmetric, 2.5-6 cm long, bright green, leathery, with fine hairs when young. Flowers in fascicles in the leaf axils, fragrant, yellowish-green.

Fruit and seed description

Fruit: a rather long, narrow drupe, 2.5-7 cm long, 1.5-4 cm in diameter. Young fruits green and tormentose, turning yellow and glabrous when mature. Pulp bitter-sweet and edible.

Seed: the pyrene (stone) is 1.5-3 cm long, light brown, fibrous and extremely hard. It makes up 50-60% of the fruit. There are 500-1500 dry, clean seeds per kg.

Flowering and fruiting habit

Flowers are small, inconspicuous, hermaphroditic and pollinated by insects. The species has, especially in the equatorial zone, a pronounced diffuse flowering and fruiting habit; flowers and fruits occur during a prolonged season although a peak is always encountered. In areas with pronounced seasonal climate (northern and southern part of the distribution range) fruit maturation occurs before the rainy season.

In most of the Sahelian region the main flowering season is between October and March, the main fruiting season between December and April. In southern Africa (Zambia-Zimbabwe) flowering is in September - December, fruiting is between April and August. Flowering in Nigeria varies between November and April with ripe fruits becoming available in December and January and occasionally later, from March to July. Elsewhere, fruiting and foliage production occur at the height of the dry season.

Seeds are dispersed by ingestion by birds (e.g. hornbills) and larger animals (baboons, ruminants). The tree begins to flower and fruit at 5-7 years of age and maximum seed production is when the trees are 15-25 years old.

Harvest

Fruits are harvested when they turn yellow and the flesh becomes soft and sweet. In areas with abundant hornbills, fruits will not persist long on the tree. Discharged stones can be collected under the trees, but they are often prone to insect (seed borer) attack. Consequently, usually only a fraction of the fruits can be collected. Due to the prolonged fruiting season several collections may be necessary.

The fruits are collected by spreading a tarpaulin under the tree and shaking the branches until the fruits are released. Climbing is inconvenient because of the long branch thorns. A mature tree may yield up to 10,000 fruits per year which equals about 100-150 kg, or 55-80 kg of seed. Usually a smaller amount is harvestable due to the prolonged fruiting season and predation. Seeds may also be obtained from fruits that are being processed for other purposes.

Processing and handling

The outer fruit pulp must be removed as soon as possible to avoid fermentation. If extraction is not possible in the field, the fruits should be kept dry and spread in a thin layer during temporary field storage. The fruit pulp can be removed after soaking the fruits in water. Alternatively the fruits may be fed to livestock (cattle) and the stones picked from the droppings. The latter method will kill possible insects in the seeds. After extraction the stones are dried in the sun before storage.

Storage and viability

Seed storage behaviour is orthodox and moisture content for storage should be 6-10%. Cleaned, dried and free of insects, the seeds will remain viable for about 1 year at ambient temperature, 2 years at cool temperatures and several years in hermetic storage at 3°C.

Dormancy and pretreatment

Seeds that have passed the digestive tract of ruminants are said to germinate well without pretreatment. Fresh seeds need no pretreatment but seeds that have been stored will normally need manual scarification. Soaking in hot water for 12-18 hours, soaking in water for 24 hours at room temperature or boiling for 7-10 minutes and left to cool in the water are methods that have been reported to improve germination.

Sowing and germination

The seed should be sown vertically with the stalk end down. Germination occurs in 1-4 weeks and the seedlings are kept in the nursery for about 12 weeks

Phytosanitary problems

A major problem during storage is susceptibility to insect attack (seed borers). Short boiling (which may also serve as a pre-treatment before storage), insecticides or storage in CO_2 may kill present insects and further attack is prevented by storage in air-tight containers.

Selected readings

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