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Artocarpus lakoocha

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Artocarpus lakoocha Roxb.

Taxonomi and nomenclature

Family: Moraceae

Synonyms: *Artocarpus lacucha* Buch.-Ham., *Artocarpus mollis* Wall.

Vernacular/common names: monkey jack (Eng); barhar, badahar (Nepal); lakuch, badhal, dhau, dephal (India); tampang (Malaysia); myankdok (Myanmar); lokhat (Thailand); lakuch (trade name).

Distribution and habitat

The area of natural distribution is from India through Nepal, Bhutan, Bangladesh and Myanmar to Malaysia. It grows in areas with annual rainfall of 700-2000 mm and a dry season up to 3 months. The altitude range is from the lowlands and up to 1300 m, in well protected spots occasionally reaching up to 1600 m. It prefers deep permeable soils with a good supply of moisture.

In many places the populations are gradually decreasing due to extensive exploitation and poor seed viability.

Uses

In Nepal it is highly valued as a fodder tree in the lower foothills of the Himalayas. The leaves contain about 16% crude protein and one tree produces between 60 and 200 kg fresh fodder in a year. It is fed to lactating animals and considered one of the most important milk producing forages.

The fruits and male flowers are used for human consumption. The wood is hard and termite resistant with a weight of about 640 kg/m^3 and is used for heavy construction, poles, furniture and plywood.

Botanical description

A medium to large tree with spreading crown. The bark is grey and the slash is deep red with milky latex. Leaves are alternate, 10-25 cm long and leathery. Flowers are unisexual with male and female flowers in separate heads but on the same tree. Male flowers are yellow-orange while the female are reddish.

Fruit and seed description

Fruit: the fruit is a syncarp, i.e. the entire female inflorescence forms a fruit. The fruits are irregularly rounded, the size differs but the diameter is typically 5-10 cm. Fruit weight is very variable but most fall in the range of 200-350 g. The number of seeds per fruit varies accordingly, but typically there are 10-30 seeds in one fruit. Young fruits are green, turning yellow at the time of maturity and then later brown.

Seed: like the fruits, the seeds are irregular and vary in size. At maturity, most seeds are about one cm long, more or less flattened and pointed at the embryo end, the seedcoat thin and white. The seeds contain a sticky white latex. There are 1600-5000 seeds per kg.

Fruits at different stages of maturity. Collection from seed source in Nepal. Photo: Dorthe Jøker, DFSC.

Seeds extracted from fruits shown above. Photo: D. Jøker

Flowering and fruiting habit

In Nepal the trees flower in April towards the end of the dry season. Ripe fruits are collected from the end of June to early August in most places but there can be considerable variations.

The tree is deciduous, dropping its leaves for a short time at the beginning of the dry season. The pollination system of this species is not known but the fragrant flowers indicate insect pollination.

Harvest

When the fruits have turned yellow the seeds inside are mature. Seeds that are extracted from green fruits have low viability and only ripe fruits should be collected. As the ripe fruits are readily predated by monkeys and birds collection must be well timed. The fruits should be collected from the tree.

Freshly collected fruits and seed have a very high moisture content and must be treated gently. They must be packed in bags that allow ventilation, protected from direct sun and brought to the processing site as quickly as possible. A tree will typically yield about 80 kg of fruit and 1 kg of fruit will give about 50 g of seed.

Processing and handling

The traditional procedure is to leave the seeds inside the fruit until just before sowing and if a cold store is not available this is probably the best solution. However, seed stored inside the fruit will not stay viable for more than one week.

To extract the seeds, the fruits are depulped manually with or without water. As the seedcoat is thin the seeds are fragile and once they have been extracted they must be treated gently.

Storage and viability

Mature seeds extracted from yellow fruits have a moisture content of 50-55% and they do not tolerate drying to low moisture content. A recent trial in Nepal showed that the seeds could be dried from 53% (freshly harvested seed) to 40% moisture content without loss of viability. Seeds that were dried to 30% moisture content lost more than half of their viability.

The results also showed that the seeds can be stored in coldstore. Seeds with moisture content of 50% were stored at 5°C. Before storage germination was 70%. After 4 weeks the seeds still maintained 55% germination while after 8 weeks germination had dropped to almost nothing.

The results are preliminary and still need to be confirmed but the tolerance to low temperature seems conclusive. Based on this it can be recommended to store fruits and seeds at 5°C when possible. There is also some indication that extracted seed can store for longer periods than seeds inside fruits even at room temperature. If the seeds are extracted before storage they should be dried down slightly and never below 40% moisture content.

Dormancy and pretreatment

The seeds has no dormancy and pretreatment is not necessary.

Sowing and germination

The seeds can be sown in polypots (10 x 18 cm) or in seedbeds. Normally two seeds per pot are sown and surplus seedlings pricked out into another pot. 20-25% compost should be added to the potting mixture.

If sowing in seedbeds, the seedbed should be raised, and about 1 kg of seed used per m^2. After 3-4 weeks when the seedlings are about 5 cm tall they are pricked out. The seedlings are fairly robust and two to three weeks after germination, shade against sun and rain is no longer needed. However, the seedlings must be protected from frost.

Because of the short viability of the seed, sowing is done during the monsoon and the seedlings must remain in the nursery until the next monsoon, nearly one year. By then the seedlings are 20-25 cm tall.

Tree habit. Photo: Sushim R. Baral

Selected readings

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THIS NOTE WAS PREPARED IN COLLABORATION WITH THE TREE IMPROVEMENT AND SILVICULTURE COMPONENT, NEPAL.

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