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A VERY POPULAR WILD FRUIT OF THE CENTRAL HIMALAYA (KAAPHAL OR KAFAL)

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COMMON NAME

Box berry ,box myrtle, bayberry, "Katphal" in Sanskrit, "Kaiphal" in Urdu, "Nagatenga" in Assam, 'Soh-phi' in Khasi and north eastern India ,"Box myrtle" in English, "Kaaphal or Kafal" in Nepal, "kaafo" in kumaon language,
In scientific journals, kafal is mostly called ***Myrica esculenta***, but also referred as ***Myrica integrifolia*** and ***Myrica nagi***.

Scientific Name	: *Myrica esculenta*
Family	: Myricaceae
Order	: Fagales
Kingdom	: Plantae

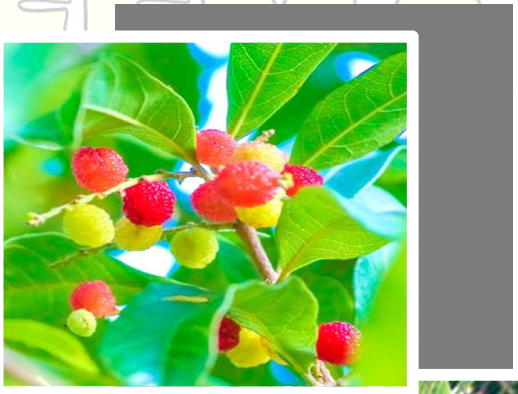
AREA AND DISTRIBUTION

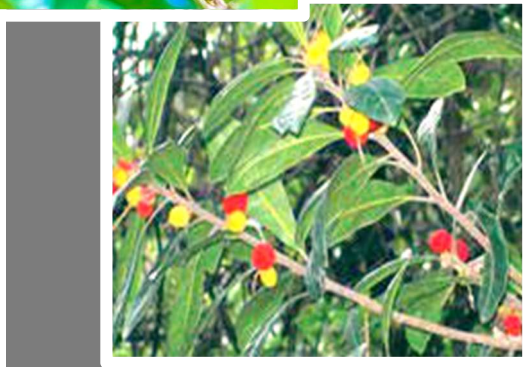
Kafal is found in the subtropical Himalayas i.e Ranikhet, Almora, Nanital district of Uttrakhand, Himachal Pradesh and is distributed from Khasi, Jaintia, Naga and Lushi hills in North eastern India to Malaya, Nepan (western) Singapore, China, Japan farther East.

PHYSIOLOGY

- Tree has a medium height i.e 20 to 30 feet (6-8m), soft and brittle bark,

- Leaves are conjoint, 30–60 cm (1–2 ft) feet long that has leaflets in pairs of 6 to 9 and has a width of 19 mm (0.75 in).





- Flowers are of white colour and are found in bunches.

- Fruit : The raspberry-looking fruit with sweet and tangy flavors has a thin fruit coating with a large stone core, thus it's a drupe barely have any pulp, globose in shape and 1.1–1.3 cm (0.43–0.51 in)in diameter; average mass 670 mg (10.3 gr) and has refreshing taste.

- Seeds are triangular in shape and are astringent in taste.

VARIETIES

According to Ayurveda, it has two varieties based on the color of flower:

Shweta (white) and Rakta (red).

CHEMICAL CONSTITUENTS

The bark is yellow and contains the chemical substances myricetin, myricitrin and glycosi des. Leaves of the plant also contain flavone-4'-hydroxy-3',5,5'-trimethoxy-7-O-β-I-D-glucopyranosy)(1→4)-α-L rhamnopyranoside; flavone-3',4'-dihydroxy-6-methoxy-7-O-α-L-rhamnopyranoside; β-sitosterol; β-sitosterol-β-D-glucopyranoside and quercetin.

CLIMATIC REQUIREMENTS

Kafal found in the hilly region which are high in altitude. It grows well especially at an elevations of 900–1,800 m (3,000–6,000 ft). It is also found at elevations below 1,500 m (4,900 ft) in the midhills of Nepal. It can tolerate stress conditions such as drought.

IMPORTANCE AND USES

About 57 compounds were isolated and identified from *M. esculenta*

- *M. esculenta* is known for its edible fruits and other by-products
- Kafal is known to have a symbiotic relationship with nitrogen-fixing soil microorgnisms.
- It contains vitamins, iron and have antioxidant properties.
- Bark: bark of the kafal is used to cure number of diseases including mental illness and has anti- allergic, anti-microbial, anti-oxidant, anti-helminthic properties which helps in reducing cancer. Bark is also used for making paper and ropes and reduce tanning fromskin in summers. Powder of bark is used to reduce headache.
- Fruit: it possess anti-asthmatic property and help in reducing ulcer, constipation, acidity, cold, fever, cough and urinary related problems.

Fruit and bark together are used for making red and yellow dye. Fruits has cooling effect during summers,
Various products like squash, syrup, jam, refreshing drink (help in digestion) can be prepared from ripe fruits.

- Flower: oil is extracted from the flowers of kafal which is used to treat diarrhoea,paralysis etc.
- Seeds: seeds of kafal can be used as tonic.
- Leaves: used as good fodder for cattle.
- Branches: branches of the tree are used as fuelwood.

MATURITY INDICES

Kafal changes to reddish purple color ellipsoid-shape fruit at its maturity.The completely ripen kafal has dark red or blackish color and it tastes amazingly sweet. The half ripen has pinkish color and taste sour and sweet.

HARVESTING

Its fruiting season commences from early May and continues till mid-June. The fresh fruits have a reputation for being a little acidic even when they are ripe, but more sour when unripe. They have a limited harvesting period and available for a short period of time only.

STORAGE

Self life of kafal is very short. It can not be stored for more than 2-3 days.

Note: The recent upsurge in *M. esculenta* use and demand has led to illicit harvesting by the horticultural trade and habitat loss, pushing the plant to the brink of extinction**.**

REASON OF DECLINING

1. As male kafal tree do not bear fruits so people used them for fuelwood purpose which affect pollination and regeneration of species.
2. It prefers pine forests(open canopy) for growth and development which are more prone to frequent fires during summers.
3. Due to climate change, some part of Uttrakhand have reported early fruiting of Kafal.The changing socio-economic and environmental pressure on temperate forests have led to a sharp decline in availability of kafal tree.
4. Kafal is generally propagated by seeds but since the seed coat is impermeable, the physical dormancy remains resulting in irregular and erratic germination pattern, which affects the species regeneration potential and the new kafal trees have high heterogeneity in terms of male or female trees.

IMPACT OF COVID-19 ON KAFAL:

Farmers of wild fruit say that the outbreak of coronavirus has severely impacted their trade. " Every year, villagers collect kafal and sell it at prices ranging between Rs. 100 and Rs. 150 per kilogram.

The fruit is quite popular among tourists and thus farmers are able to earn good profits from its sales every year. Due to the pandemic villagers have not been able to market kafal this year, resulted in huge economical loss to the farmers. Kafal is always high demand among the tourists but from last year covid-19 scare has hit the business of villagers.

STORIES RELATED TO KAFAL:

Kafal is celebrated with unprecedented number of songs and stories unlike any foods in the region. Even a surname "*Kafle*" is said to be in honor of those *kafal* trees that gave fruits to people for millennia. There are many songs about *kafal* such as *reli khola bagar, kafal pakyo lahar* (Nepal), *kafal gedi kutukai* (Nepal), *Kafal pakyo hola banma* (Nepal), and *Rangeelo kumaon kafal kheja* (Uttarkhand).

Kafal is celebrated with unprecedented number of songs and stories.

1. A Nepali tale of a brother who leaves his sister to join an army. He promises to return every year to enjoy *kafal* together. He never returns, but she continues to send message every year when *kafal* ripens. Even after her death, she now returns as a bird to let us know "*kafal pakyo*" or *kafal* is ripe".
2. Another story from Indian state of Uttarakhand is about a mom, who picks up a basketfull of *kafal* to sell. She asks her daughter to look after the *kafal* basket and not to eat any fruit. When mom returns, she realizes the *kafal* has lost some weight. Suspecting her daughter must have eaten some, mom punishes her by beating. The daughter kept on crying that she didn't taste any *kafal*. It rains and *kafal* gain back some weight that they had lost due to scorching summer heat. Unfortunately the girl died, and now she comes back every year in *kafal* season as a bird to sing *"kafal pakko, meil ni chakkho*" or *kafal* has ripened, but i didn't taste them."Often these stories are tragic, may be ripening of *kafal* symbolizes the change of season and end of beautiful Spring, *kafal* being one last sweet fruits of Spring before a harsh Summer.

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