MyricaensculataSny. MyricaNegi is a medium to large woody, evergreen, dioecious, subtropical tree belonging to family myricaceae (Nandkarni, 2000) Commonly known as bey berry in English, Kaifal in Hindi, Katphal in Sanskrit, Kaifal in urdu is an important medicinal tree distributed in India, Nepal, China, Pakistan, and Malaya Islands. This review presents detailed survey of literature on classification, traditional uses, Phytochemical study, phytocemistry, pharmacognosy, pharmacology, nutritional value, dyeing properties, application in nutraceutical filed, future aspect.

KEY WORDS: Myrcaensculata,Pharmacognosy,Phytochemistry, Pharmacology

INTRODUCTION

MyricaensculataSny. MyricaNegiis a medium to large woody, evergreen, dioecious, subtropical tree belonging to family myricaceae (Nandkarni, 2000) Commonly known as box berry or bey berry in English, Kaifal in Hindi, Katphal in Sanskrit, Kaifal in urdu is an important medicinal tree distributed in India, Nepal, China, Pakistan, and Malaya Islands. In India Myricaensculata is found in Arunachala Pradesh, Meghalaya, Nagaland, Manipur, Mizoram. Khasia, Synlet, Himachal Pradesh, Jaintia, Shimla, Bengal, Naga and Lushai hills (Annonymous, 1962) (Mahat, 2005). The tree yields a drupaceous fruit which is one of the tastiest wild fruits of the sub-Himalayan region. This fruit tree carries a lot of commercial importance and every year its fruits worth thousands of rupees are sold. These fruits are very much liked by all. (Parmar and Kaushal, 1982)

Botanical classification (Annonymous, 1962):

- **Kingdom:** Plantae
- **Division:** Magnoliophyta
- **Class:** Magnoliopsida
- **Order:** Violes
- **Family:** Myricaceae
- **Genus:** Myrica
- **Species:** M.ensculata

Traditional uses: In Ayurveda and Yunani system of medicines, this tree is utilized for its bark, flowers, fruits and roots. In Ayurvedic system of medicine, the bark is quoted as acrid, bitter, pungent, heating and finds its application in reducing inflammations. This tree is also utilized for its applications such as acting as a great remedy in anemia, asthma, bronchitis, cough, chronic dysentery, fever, liver complaints, nasal catarrh, piles, sores, throat complaints, tumors, ulcers, urinary discharges. However, AyurvedicSamhita mentions Myricaesculenta be harmful to liver and spleen. In contrary to this, oil extracted from the flowers acts as a tonic, and has been used useful in earache, headache, diarrhea and paralysis (Kiritkar and Basau, 1988) (Chatterjee and Pkrashy, 1994)(Kumari, 2011). Fruit constituents exhibit healing properties in case of different ulcers, it also finds application in retention of placenta and bone fracture (Nadkarni, 2002). In present drug manufacturing industry, there is a constant rising demand for herbal drugs (Maiti, 2011). Due to the high medicinal values, the leaves and bark of this medicinally important tree are imported and exported (Verma, 2008). Fruits are utilized in food industries in Himalayas in different forms like syrups, jam, and squash (Dhyani, 1994). Locals in Arunachal Himalaya, India, utilize the tree as timber, for fuel wood and as a wild edible fruit in their diet. (Dollo, 2009). Even the yellow color extracted from the bark is used as a Medicinal colorant (Semwal, 2012) (Kumar, 2004). Traditionally, it was found that the bark of the tree has been used as a fish poison (Pala, 2010).

Pharmacognosy:

**Morphology:** Tree attains height of 12 to 15 meters. The peak flowering season was observed to occur during the first fortnight of March. However flowering season starts from fortnight of February and continues till second fortnight of April Similarly the fruiting season started from the first week of May and continued till the last week of this month (Parmar Cand Kaushal, 1982).Leaves are lanceolate, 9cm long, 3cm broad, lower surface-pale green, upper surface-dark green. Generally leaves are crowded towards the end of branches. Flower are minute, unisexual and glandular, sessile, solitary and bracteate; sepals and petals, either absent or not visible; inflorescence, a catkin, 4.2 cm long, axillary, bearing about 25 flowers; only a thread-like style visible with the unaided
Fruits are Adrue, ellipsoid or ovoid shaped, in length 0.7-1.0cm, 0.5-0.7cm wide brown coloured, Surface is tuberled and sourish sweet in taste. Seeds are ovoid 0.6cm long and 0.3cm wide. Surface of seed are very smooth, light brown in colour and oily in test. Bark is quill or thick pieces, about 1 to 2 inches long and 0.5 inches in thickness; outer surface rough and it’s colour is grey to brownish-grey inner surface dark brown in colour and smooth fractured hard and bitter in test. Odour nauseating.

Microscopy
Fruit: Shows epicarp cells isodimetric in surface view, mass of reddish-brown, thin-walled, parenchymatous cells, a few elongated tuberced cells with smooth walls endocarp hard and stony consisting of sclerenchymatous cells. Seed: Seed coat shows single layered, thick, brown coloured cell; cotyledons composed of single layered, thin walled epidermal cells containing oil globules and aleucrenic grains; mesophyll cell thin-walled, isodimetric and fully packed with oil globules and aleucrenic grams.

Seed powder: yellowish-brown; show rectangular to hexagona, thin walled seed coat and polygonal epidermal cell in surface view; tuberclesparenchymatous cells, oil globules and aleucrenic grains.

Bark about 4.5 m.m. thick, the cork cells are 6-15 layered thick walled rectangular and lignified, the individual cells measure R., 15.5-18.6 –21.7 μT., 21.0 –24.8-37.2μ. The phellem cells are 5-8 layers of narrow and tangentially flattened parenchyma cells and measure R., 15.5 –21.7 –24.8 31.0 μ; T., 31.0–37.2 –42.0μ. Small groups of thick walled lignified stone cells are also found in this region. They are more or less round to slightly oval in shape and measure R., 12.4 –21.7 –31.0 –31.0 μ; T., 27.9 –155.0 –37.2 –124. μ. Some of the stone cells are, however much elongated with a narrow lumen measuring up to 370.0μ in length. The phloem tissue is composed of sieve tubes, companion cells, phloem parenchyma phloem fibres, stone cells and some of the crystal fibres and traversed by medullary rays. Phloemparenchyma and sieve tube elements are slightly thick walled. The phloem fibres are thick walled lignified and measure 9.3 –15.5 –21.7 –24.8 μ in length. The medullary rays are 13 cells wide, tangentially elongated, larger towards the outer region of the bark, measuring R., 27.9 –31.00–46.5–62.0 μ; T., 93.0 -62.0 –62.0–108.5μ and smaller in inner region, measuring R., 31.0 –27.2 -46.6–61.0 μ; T., 15.5 –31.0 –37.2 μ. Bark powder, Powder of the M. esculenta in yellowish brown in colour and rough in touch. On the microscopic examinations it reveals some diagnostic characters which are: Numerous calcium oxalate crystals up to 24.8 μ in size. Simple starch grains, the individual grain being spheroidal and up to 15.5 μ in diameter. Rounded or rectangular stone cells up to 370 μ in length, usually in groups, thick walled and lignified (Singh J, 1986).

Physical consent: Singh J, 1986, calculated the percentage extractives W/W in different solvents, total ash and acid insoluble ash of Bark are tabulated in (Table 1).

### Table 1. Percentage extractive and ash in the bark of M. esculenta

<table>
<thead>
<tr>
<th>Item</th>
<th>Percentage(W/W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Extractives</td>
<td></td>
</tr>
<tr>
<td>I Ether extractive</td>
<td>1.8400</td>
</tr>
<tr>
<td>II Chloroform extractive</td>
<td>3.0400</td>
</tr>
<tr>
<td>III Alcohol extractive</td>
<td>28.3200</td>
</tr>
<tr>
<td>IV Water extractive</td>
<td>21.2800</td>
</tr>
<tr>
<td>b. Ash values</td>
<td></td>
</tr>
<tr>
<td>I Total ash</td>
<td>3.3312</td>
</tr>
<tr>
<td>II Acid insoluble ash</td>
<td>1.2300</td>
</tr>
</tbody>
</table>

Phytochemical: Fruit Phytochemical studies by Chandra S. et al., show the presence of Carbohydrate, Glycoside, flavanoids, Saponins, Tanins, Sterols, studies also show the absence of Alkaloids and Resin. Bark: Phytochemical studies by Singh J 1986, show that water extract of Myrica esculenta give positive result for Carbohydrate, Tanins, Mucilage, Protein and Glycoside and alcoholic extract give positive result for Resin Volatile oil and Sterol studies also show the absence of Alkaloids and Fat and Fatty acid.

Phytochemistry: Large number of studies has been carried out to indentify various chemical constituents of Myrica esculenta.

Leaves: Two flavonoid glycosides identified as flavone 4'-hydroxy-3',5',5'-trimethoxy-7-O-β-D-glucopyranosyl(1→4)-α-L-rhamnopyranoside (1) and flavone 3',4'-dihydroxy-6-methoxy-7-O-α-L-rhamnopyranoside (2) with three known compounds β-sitosterol, β-sitosterol-β-D-glucopyranoside and quercetin have been isolated from the leaves of Myrica esculenta. Their structures were elucidated on the basis of spectroscopic evidences and chemical studies (Bamola, 2009).
Fruit: The fruits of Myricanagi have been reported for reducing sugars, tannins, and vitamin C. (Rastogi, 1995) (Barnes J, 2002) Gallic acid, Catechin, chlorogenic acid and p-coumaric acid in the ethenolic extract of the fruit.

Bark: The bark constitute gallic acid, myricanol, myricanone, epigallocatechin 3-O-gallate, two prodelphinidin dimmers [epigallocatechin-(4β→8)-epigallocatechin 3-O-gallate and 3-O-galloylepigallocatechin-(4β→8)-epigallocatechin3-O-gallate], hydrolysable tannin castalagin. Prodelphinidin units with 2,3-cisconfiguration having average of 5000 mean molecular weight (Mr) were found in the higher mean molecular weight (Mr) fractions. The terminal unit of the polymer has epigallocatechin 3-O-gallate, the extender units were also known to have galloyl group at C-327. Gallic acid, lupeol, oleanolic acid and stigmasterol were evaluated by HPTLC in bark extract.

Dyeing property: The dye was prepared by boiling the powdered barks, of Myrica esculenta, with water for 6 hrs at 75-80°C and filtered. The dye uptake was calculated with the following equation, Dye uptake = (A₀ - Aₐ)/ A₀ X 100, where A₀ and Aₐ absorbance measured value before and after dyeing respectively. It has been found that the Myrica esculentadyes are acidic in nature and have yellow but the colour is change to camel on addition of mordants. (Ruhi Akhtar, 2012)

Nutritional value: The level of nutrients such as crude protein, carbohydrates, crude fiber, and ash content 1.3, 16.13, 3.4, and 1.25 %, and minerals as calcium, magnesium, potassium and phosphorus 1.0, 8.4, 1.98 and 0.24 mg/gm respectively. (Seal T, 2011) (Salkani S, 2012)

MEDICINAL IMPORTANCE OF MYRICA ENSCULATA

The bark of Myrica nagi Thunb. is said to possess many medicinal properties. It is heating, stimulating and useful in catarrhal fever, cough and in the affections of the throat. An oil prepared from it is dropped into ears to stop earache. The bark to be acid, bitter, pungent, useful in disorders relating to vata and kapha, fever, asthma, urinary discharges, piles, bronchitis, throat complaints, turnours, anaemia, chronic dysentery and ulcers. Its snuff is useful in headache and in curing eye diseases. The oil from the flowers is a tonic, useful in earache, diarrhoea, inflamunations and paralysis. The bark is used as an aromatic, a stimulant, an astringent, carminative and an antiseptic in indigenous medicine and is considered to be useful in fevers, asthma and cough.

CONCLUSION

Myrica esculenta is a small tree or large shrub native to Hills of Nepal and northern India. Plants have been used in the traditional healthcare system from time immemorial, particularly among the local and indigenous communities. The M. esculenta possesses unique medicinal and industrial values. The bark of the species is known to possess many medicinal properties and have industrial uses as well. Bark is used for tanning and dyeing, yellow coloured dye. It is astringent, carminative and possesses antiseptic properties. Decoction is considered to be useful in asthma, diarrhoea, fever, chronic bronchitis, lung infections, dysentery and stomach problems.

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