ISSN: 0974-2115
www.jchps.com Journal of Chemical and Pharmaceutical Sciences

2REVIEW ON *MYRICA ENSCULATA* A POPULAR PLANT OF HIMALAYAN REGION

[1]Shobharam Sahu, [1]Chhaya R Sahu*, [1]Ajay Yadav, [2]Priyanka Rathod, [1]Sujit Chaturvedi, [1]Rupma Tripathi
[1]Rajiv Gandhi College of Pharmacy NautanwaMaharajganj U.P.
[2]RKDF school of Pharmaceutical Science,Bhopal,M.P.
*** Corrosponding Author: Email: chhaya_rathod2002@yahoo.com, phone +919648080476**

ABSTRACT

*Myricaensculata*Sny. *MyricaNegi* is a medium to large woody, evergreen, dioeious, subtropical tree belonging to family myricaceae (Nandkarni,2000) Commonly known as bey berry in English, Kaifal in Hindi, Katphal in Sanskrit, 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, phytochemistry, pharmacognosy, pharmacology, nutritional value, dyeing properties, application in nutraceutical filed, future aspect.

KEY WORDS: Myricaensculata,Pharmacognosy,Phytochemistry, Pharmacology

INTRODUCTION

*Myricaensculata*Sny.*MyricaNegi*is a medium to large woody, evergreen, dioeious, subtropical tree belonging to family myricaceae (Nandkarni, 2000) Commonly known as box berry or bey berry in English, Kaifal in Hindi, Katphal in Sanskrit, Kaiphal 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*to 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 (Kirtikar and Basau, 1988) (Chatterjee and Pakrashi, 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 Februrary 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

eye.FruitsareAdrupe, ellipsoid or ovoid shaped, in length 0.7-1.0cm, 0.5-0.7cm wide dark brown coloured, Surface is tuberled and sourish sweet in taste.Seeds are ovoid 0.6cm long and0.3 cm 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 browenish-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 tubercled cell with smooth walls endocarp hard and stony consisting of sclerenchymatouscells.**Seed**: Seed coat shows single layered, thick, brown coloured cell; cotyledons composed of single layered, thin walled epidermal cells containing oil globules and aleurecnic grains; mesophyll cell thin-walled, isodimetric and fully packed with oil globules and aleuronic 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 aleuronic 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 phelloderm 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. μSome 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, stonecells and some of the crystal fibres and istraversed by medullary rays. Phloemparenchyma and sieve tube elements areslightly thick walled. The phloem fibres arethick walled lignified and measure 9.3 –15.5 –21.7 –24.8 μ inlength. Themedullary 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,calculatedthe 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*

	Item	Percentage(W/W)
a.	**Extractives**	
	I Ether extractive	1.8400
	II Chloroform extractive	3.0400
	III Alcohol extractive	28.3200
	IV Water extractive	21.2800
b.	**Ash values**	
	I Total ash	3.3312
	II Acid insolubleash	1.2300

Phytochemical: Fruit Phytochemical studies by Chandra S. etal.,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 *Myricaensculata* give positive result for Carbohydrate , Tannins, 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 Faty acid

Phytochemistry: Large number of studies has been carried out to indentify various chemical constituents of Myricaensculata

Leaves: Two flavonoid glycosides identified as flavone 4'-hydroxy-3',5,5'-trimethoxy-7-O-β-I-D-glucopyranosy)(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 *Myricaesculenta*. 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 vitamine 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. Theterminal unit of the polymer has epigallocatechin 3-O-gallate, theextender units were also known to have galloyl group at C-327.Gallic acid, lupeol, oleanolic acid andstigmasterol were evaluated by HPTLC in bark extract.

Dyeing property: The dye was prepared by boiling the powdered barks, of *Myricaesculenta*, with water for 6 hrs at 75-80°C and filtered. The dye uptake was calculate with the following equation, Dye uptake $=(A_b-A_a)/ A_bX$ 100, where $A_b$and $A_a$absorbance measured value before and after dyeing respectively. It has been found that the *Myricaesculenta*dyes areacidic in nature and have yellow but the colour is change to camel on addition of mordants. (RuhiAkhtar, 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 acrid, bitter, pungent, useful in disorders relating to vota 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, inflanunations 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 systemfrom time immemorial, particularly among the local andindigenous communities.The M. esculenta possesses unique medicinal and industrial values. The bark of the species is known topossess many medicinal properties and have industrial useas well. Bark is used for tanning and dyeing, yellow coloreddye. It is astringent, carminative and possesses antisepticproperties. Decoction is considered to be useful in asthma,diarrhoea, fever, chronic bronchitis, lung infections,dysentery and stomach problems.

REFERENCES

Agnihotri S, Essential oil of *Myricaesculata*Buch. Ham, Composition, antimicrobial and topical anti-inflammatory activities, Nat. -Product Res, 2012, DOI 10.1080/14786419.2011.652959

Annonymous, The Wealth of India C.S.R.I, New Delhi, 1962, 472.

Bamola A, Flavonoid glycosides from Myricaesculenta leaves Journal of the Indian Chemical Society 2009, 86(5), 535-536

Barnes J, Herbal medicines, Second edition Pharmaceutical press, London 2002, 71

Bhatt ID, Dhar U Factors controlling micropropagation of *Myricaesculenta*buch.-Ham. ex D. Don: A high value wild edible of Kumaun Himalaya, Afr J Biotechnol, 3, 2004, 534-540

Chatterjee A, Pakrashi SC The Treatise on Indian Medicinal Plants, Reprinted Edition, 1st vol. New Delhi: Publications andInformation Directorate, 1994, 32-33.

Chen C, Lv G, Huang X, Liao XP, Zhang WH, Shi B Bayberry Tannin as Stabilizer for the Synthesis of Highly Active and Reusable Heterogeneous Pd Catalysts and Their Application in the Catalytic Hydrogenation of Olefins, Bull Korean ChemSoc,33(2), 2012, 403-408.

Dhyani PP, Dhar U Box Myrtle (*Myricaesculenta*, Kaiphal): A promising underexploited tree crop of Himalaya. Himavikas occasional publication, 3rd ed, GB Pant Institute of Himalayan Environment and Development, Almora; 1994, 33.

Dollo M, Samal PK, Sundriyal RC, Kumar K Environmentally sustainable traditional natural resource management and conservation in Ziro valley, Arunachal Himalaya, India. J AmerSci, 5, 2009, 41-52.

Jain VK,Antihelmenintic Activity of ethenolicextract of Bark of Myricaensculata, J Pharm sci, 1, 2010, 129-131.

Khary RN, MateriaMedica of India and their therapeutics the caxton works, Bombay, 1903, 571.

Kirtikar K R, Basu B D, Indian Medicianl Trees, 3rd vol, Allahabad (India), Lalit Mohan Basu publishers, 1988, 2350-2351.

Kumar JK, Resurgence of natural colourants, A Holistic view. Nat product let, 18, 2004, 59-84.

Kumari P, Joshi GC, Tewari LM, Diversity and status of ethnomedicinal trees of Almora district in Uttarakhand, India, IntJBiodversconserve, 3, 2011, 298-326.

Mahat RB, Ethnomedical study and antibacterial activities of selected plants of palapa district Nepal Scientific World, 3, 2005, 3.

Maiti B, Nagori BP, Singh R, Kumar P, Upadhyay N, Recent trends in herbal drugs: A review, Int J Drug Res Technol, 1(1), 2011, 17-25.

Nandkarni KM, Indian MateriaMedica Vol.1 Bombay popular prakashan, 2002, 828

Pala NA, Negi AK, Todaria NP Traditional uses of medicinal plants of PauriGarhwal, Uttrakhand, NatSci, 8(6), 2010, 57-61.

Parmar, C and M.K, Kaushal,Myricanagi Wild Fruits, Kalyani Publishers, New Delhi, India,1982, 49–53.

Patel T, Anti Inflammatory activity of myricanegi Linn, Ancient Sci life,30, 2011, 100-103.

Patel T, Mastcell stabilizing activity of myricanagi bark Journal of Pharmacognosy and Phytotherapy, 3(8), 2011, 114-117.

Phanjom P, Zoremi E, Mazumder J, Saha M, Baruah BS Green Synthesis of Silver Nanoparticles using Leaf Extract of *Myricaesculenta,*Int J NanoSci Nanotech,3(2), 2012, 73-79.

Rastogi R.P, Compendium of Indian medicinal plants Vol.I, National institute of science communication, NewDelhi, 1985,491

Rawat S, Assesment of antioxidant properties in fruit of myricaensculata, A popular plant wild edible species in Indian Himalayan Region, ECAM, 2010:1-8

RuhiAkhtar, Determination of dyeing property of some medicinally important plant species of Uttarakhand Himalayas, Indian Journal of traditional knowledge, 11(3), 2012, 528-531.

Salkani S, Nutritional evalution, antimicrobial activity and phytochemical screening of wild edible fruit of myricanagi pulp, Int.Jpharm pharm science, 4, 2012, 407-501

Seal T Nutritional composition of wild edible fruits in Meghalay state of India and their ethnobotanical Importance, Research Journal of Botany, 6(2), 2011, 58-67

Semwal RB, Semwal DK, Kapoor P, Dyeing Properties of *Berberisaristata*DC with Natural and Synthetic Mordants, Trends Applied Sci Res, 7(5), 2012, 392-399.

Shah S, Tewari A, Tewari B, Singh R P Seed maturity indicators in *Myricaesculenta*, Buch-Ham. Ex. D.Don.: A multipurpose tree species of subtropical temperate Himalayan region, Springer New forests, 40, 2010, 9-18.

Singh J et al., Pharmacognostic evaluation of Katphala (The bark of MyricaesculentaBuch –Ham) Ancient Science of Life, 2, 1986, 85-87

Sun D, Tannins and other phenolics from myricalesculata Bark Phytochemistry, 9, 1991, 3077-3079

Verma S, Singh SP Current and future status of herbal medicines, Vet. World, 1, 2008, 347-350.