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Genetic variability of *Myrica esculenta* in temperate region

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Abstract: *Myrica esculenta* is globally distributed across Indo-Malesian region. It is found in hilly regions of northern India and Nepal especially in the regions of Garhwal and Kumaon of Uttarakhand, southern Bhutan and western Nepal especially at elevations of 900–1,800m. It is also found at elevations below 1,500 m in the midhills of Nepal. It is also found in Himachal Pradesh, India where it is known as Kafal. In India, genetic diversity has been recorded in Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh, Assam, Meghalaya, Nagaland, Manipur and Mizoram. It is evergreen tree found throughout the mid-Himalayas, starting from about 1,300 metres and going up to about 2,100 metres. The tree yields a drupaceous fruit which is one of the tastiest wild fruits of the sub-Himalayan region. It is rich source of antioxidant and polyphenol. Kafal is known for anti-aging property. Pulp content varied from 45-70%, fruit weight 5-25g, TSS 18-21.5%, yield/tree 12-25 kg/tree depending on canopy size. The fruits having poor shelf-life does not exceed 2-3 days. Juice content varied from 35-45%. The major problem in the case of this fruit is that the harvesting period is too long and fruits from a single tree have to be harvested in many pickings.

Key words: *Myrica esculenta* , genetic variability, Temperate region

INTRODUCTION

Myrica esculenta is also known as Box myrtle, bayberry, kaiphal, sohphi, katphala, belongs to family Myricaceae. It is delicious wild fruits found throughout mid-Himalayan region. The fruit looks somewhat like deep-red coloured raspberries. They

barely have any pulp, have a big round seed in the centre. The bark is yellow and contains the chemical substances myricetin, myricitrin and glycosides. Tree is medium to large woody, evergreen, dioecious, 12 to 15 metres high; trunk girth, ranges from 55-95 cm; the male and the female trees have almost similar

appearance. Leaves, almost crowded towards the end of branches, lanceolate, 9.2 cm long, 3.2 cm broad; lower surface, pale green; upper surface, dark green.

Pistillate flowers, very small, 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. Each staminate flower has about 12 stamens with a very short filament, a compound raceme inflorescence, about 3.5 cm long. The flowering season starts from the first fortnight of February and continues till the second fortnight of April. The peak flowering season was observed to occur during the first fortnight of March. Similarly the fruiting season started from the first week of May to last week of May. Light to dark red coloured succulent drupe, with a hard stone. The bark of kaphal is said to possess many medicinal properties. *Myrica esculenta* is commercially propagated from seeds, suckers and stem cutting. Propagation from seeds, require extraction of seeds from fully matured fruits. The seeds are stratified for 3 months in refrigerator. The stratified seeds are planted in the plastic bags or in the nursery for germination in the spring season. The seedlings of 10-15 cm height are planted in the field in late spring. For propagation from cuttings, soft or half ripened wood of 5-8 cm are taken in the month of July-August and treated with IBA 3000 PPM. If suckers are to be used for propagation, it should be taken in dormant season and plant them directly at the desired place.

Suitable ideotypes for *Myrica esculenta* genotypes

Plant height- 5-15 feet (dwarf stature)
Canopy size (EW) 2.0 -4.0 and 1.75-3.5 feet
Canopy size (NS) 1.75 -3.5 and 1.50-3.0 feet
Leaf size (LxW) 5-10 cm x 2.5-3.5 cm
Pulp content- 50-70%
Fruit weight- 20-50 g

Stone weight (seed)-2.0-10.2g
TSS- 15-20.5%
Yield/tree- 20-50 kg/tree
Shelf life- 7-10 days
Juice content- 40-50%.
Fruit colour- Blood red to dark red
Fruit size (LxB) 4.12 cm x 3.25 cm
Flowering period- Mid February – April end.
Harvesting period-May-June
Number of flowers per catkin- 20-30

Genetic variability and resources: Variability ranges for different characters of kaphal collected from different part of Himachal Pradesh-

Plant height-10-35 feet
Canopy size-2.5-5 feet-2.75-5.5 feet
Leaf size (LxW) -5-10 cm x 2.5-4.0 cm
Pulp content- 45-70%
Fruit weight- 5-25g
TSS- 18-21.5%
Yield/tree- 12-25 kg/tree (depending on canopy size)
Shelf life- 2-3 days
Juice content- 35-45%.
Fruit colour- light red to dark red
Fruit size (LxB)-1.2-3.5 cm x 1.1-3.25 cm
Stone weight (seed)-2.5-15.2g
Flowering period- Mid February – April end.
Number of flowers per catkin- 20-25

Two accessions viz. IC349959 and IC558086 were collected from midhills of Himachal Pradesh and have been established in the field gene bank. Germplasm is also maintained at the Regional Research Station, Kandaghat of Dr. YSP UHF, Solan

also at NBPGR Regional Station, Shillong (Rana and Verma, 2011). Genetic variability at ICAR-IARI, Regional Station, Shimla have also been

conserved and maintained for further characterization and utilization.

Kafal being rich in nutritional content, highly demanding fruit of temperate region it needs to standardise package of practices and further improvement for yield and quality parameters. There is requirement of conducting exhaustive survey of available natural variability in hill ecosystem and elite genotypes are need to be collected and conserved.

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