

Botanical features of *Melastoma malabathricum* (*Futukola* plant)-a food plant of wild tasar silkworm in Assam

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ABSTRACT

The plant *M. malabathricum* is an evergreen shrub native to Southeast Asian countries and also abundantly found in Assam. In India, this plant serves as a food plant of wild tasar silk producing insect *Antheraea frithi*. Presently the market demand of tasar silk has been increasing with vast scope to enhance livelihood security therefore the present investigation was conducted in two districts of Assam *i.e.*, Jorhat and Dhemaji to study the botanical features of the plant. The present study was conducted at College of Sericulture, Assam Agricultural University, Jorhat during the year 2019-20.

Key words : *Melastoma malabathricum*, *Tasar Silkworm*, *Ecology*, *Botany*, *Uses*.

Introduction

Assam is one of the biodiversity hotspots of many rare plant species that occupies a unique place in NE region of India which is located between 24°44' N to 27°45' N latitude and 89°41' E to 96°02' E longitude, covering 2.4% of the geographical area of the country (Patiri and Borah, 2007). The plant *Melastoma malabathricum* is a shrub originated in the tropical and subtropical regions and native to Indonesia, Malaysia, Japan and Australia. The plant is commonly known as Malabar malastoma, Indian rhododendron, Singapore rhododendron, planter's rhododendron which belongs to the family Melastomataceae. This plant is one of the most common wild weeds that grow particularly in the mountain forests, lowlands and wet areas. In United States of America, this plant is recognized as harmful weed, but in India it serves as a promising food plant of wild tasar *Antheraea frithi*.

Tasar silkworm is a lepidopteron silk producing insect belongs to the order Saturniidae. The rearing of tasar silkworm is a traditional practice that plays a crucial role in providing livelihood to rural populace in India. It has special significance due to its potential in providing self employment and also in terms of socio-cultural, socio economic and ethnic importance. Tasar rearing is carried out in outdoor condition and presently the market demand has been increasing with vast scope to enhance livelihood security. *Antheraea frithi* is a wild tasar silk worm found in the NE region of India. Primarily this silkworm species feed on oak plant but some populations feeds on *Melastoma malabathricum* plant. Therefore the present study was conducted to gain knowledge on botanical features for future use to develop scientific cultivation package of practice as well as commercial exploitation of the plant.

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Scientific classification

Kingdom: Plantae

Clade: Angiosperms

Order: Myrtales

Family: Melastomataceae

Genus: *Melastoma*

Species: *M. malabathricum*

Binomial name: *Melastomamalabathricum* L.

(Source: https://en.wikipedia.org/wiki/Melastoma_malabathricum)

Ecology

The plant *M. malabathricum* is found in waste land and roadside throughout the Southeast Asian countries, including Malaysia and India (Valkenberg *et al.*, 2001). *M. malabathricum* is an evergreen bush has green leaves all the year round that propagated by its berries. The berries are edible and dispersed by birds and water (Neal, 1965). Although the plant can grows in poor nutrient soil it prefers fertile, well-drained and moist soil. It grows well in sunny sites and vulnerable to drought and frost. In Assam, the plant is abundantly found in nearby areas of rice field and mostly tea gardens throughout Assam.

Materials and Methods

A field work was conducted in two districts of Assam, *i.e.*, Jorhat and Dhemaji, India during January, 2019 to March 2020. During the survey period the plant samples were collected from different localities following the routine method of plant collection and standard herbarium technique. The collected specimens were studied with the help of relevant taxonomic professional and confirmed with the authentic specimens.

Results and Discussion

Botanical features of the plant

The *M. malabathricum* is a perennial plant that blossoming throughout the year. It is an erect, branched and free-flowering shrub growing up to a height of 5m.

Root

The *M. malabathricum* plant develops somewhat straight tap root system from which many smaller lateral roots arise. The root is light to brown in colour.

Stem

The stems are reddish in colours, which are covered with bristly, small rough scales and minute hairs. The stems are for sided to subterete in nature. The branchlets are numerous and procumbent, densely covered with scales.

Leaf

The leaves of *M. malabathricum* are hairy, simple, narrowly elliptic, lanceolate with nearly smooth margin. The leaf tip and base is acute in shape. The size is up to 14 cm in length and 3.5 cm in breadth. The leaf petiole is hairy, reddish and 1 to 1.5 cm long. The upper surface of the leaf is moderate to slightly dark green where as the lower surface is light green in colour. The leaf venation is reticulate and has three reddish prominent longitudinal veins running from base to apex. Two secondary veins are found on each side of the main vein along with numerous tertiary veins.

Flower

The Inflorescences is subcapitate and flower is terminal that is having pedicel up to 7.5 cm. The flower is medium in size, pedicellate, bisexual, *epigynous* and five to six leaf like light coloured bracts are found at the base. The flowers having five to six reddish purple petals with rounded apex. The calyx lobes are lanceolate to ovate that covered by silvery scale with acuminate apex. The ovary and pedicel is densely covered with light coloured scales.

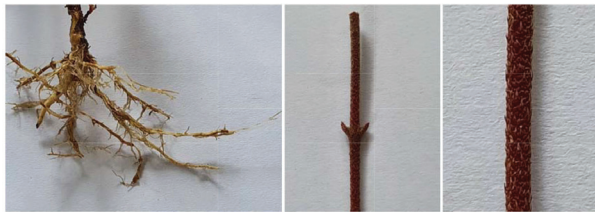
The flowers are short-lived and last only one to two days, grow in 5 to 10 clusters. The flower has two different types of stamens. There are ten numbers of stamens of which five to six large stamens with yellow colour filaments and purple curved at the upper parts including the anther. Remaining five stamens are smaller, yellow in colour with straight filaments and yellow anthers.

Fruit

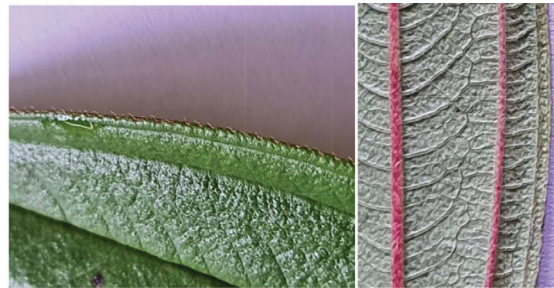
The fruits of *M. malabathricum* are edible and known as berry. Immature fruits are creamy white in colour but at ripening they break open irregularly to expose the soft, dark purple pulp and numerous seeds. The taste of fruit is fairly sweet.

Seeds

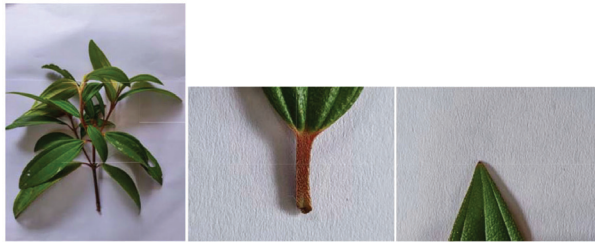
The tiny seeds contain or lacking embryos. The size of the fertile seeds is slightly larger than the infertile



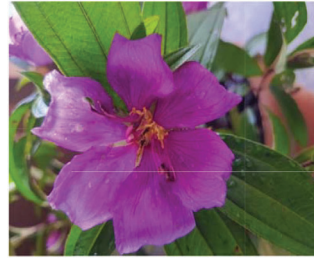
Root Stem Leaf tip



Leaf margin Mid vein and tertiary vein



Branchlets Leaf base Leaf tip



Flower



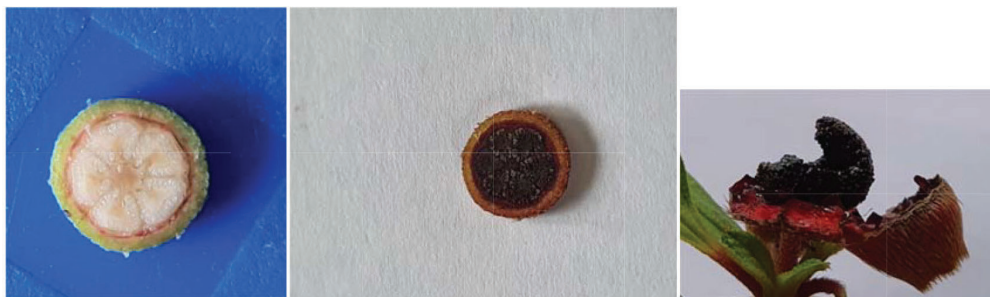
Under surface of leaf Upper surface of leaf



Bracts



Stamens



Breakopen fruit Ripened fruit Unripe fruit

seed. The fertile seed has light yellow, pale to dark cream-coloured testa where as infertile seeds have black or reddish black testa. The seeds are safe to eat but tasteless and they stain the tongue black.

Uses

M. malabathricum is a host plant of wild India tasar silkworm *Antheraea frithi*. In some country the plant is extensively used as raw material for ink. The leaf, shoot, bark, seed and root of the plant is used to prepare folk medicines to treat diarrhoea, dysentery, haemorrhoid, cuts and wounds, toothache and stomach-ache in China, Indonesia and Assam. It is believed that *M. malabathricum* plant has anti-inflammatory, wound healing and antioxidant activities. In Assam this plant is used as soil indicator for establishment of tea garden. Besides, in some place the plant is used to prepare dye.

Conclusion

In Assam, tasar culture is being practiced only in Karbi Anglong and Dima Hasao districts. During last few decades, the advancement in industrialization and urbanization has depleted the forest cover-

age which resulted in the erosion of biodiversity. Assam has a vast fertile alluvial tract with suitable climate for luxuriant growth of different types of plants. Therefore establishment of nursery and plantation of *M. malabathricum* plant for rearing tasar silkworm *A. frithi* may contribute to fuel for earning of additional income in Assam and other NE region of India. There is a need to aware the people about scientific method of propagation and cultivation for future welfare of the society.

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