

# STUDY OF MULBERRY CULTIVATION & MANAGEMENT IN NORTH REGION OF INDIA

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## INTRODUCTION

**Kashmir** has a wide range of varieties in **silk textile** designs. The weaves popularly known as 'chinon' and 'crepe de chine' are some of the fine qualities produced from the **silk yarn**.

Sericulture industry is supervised by the state government of Jammu & Kashmir.

As the state provides little raw-material for silk, weaving and printing of silk is not done on large scale in the valley.

But it's a known fact that the **Mulberry** cocoon reared in the state of Jammu and Kashmir is the superior quality in the Asia. It yields a very fine fiber can be compares with the best in the world.

The **White Mulberry** is scientifically notable for the rapid plant movement of the pollen release from its catkins. The flowers fire pollen into the air by rapidly (25  $\mu$ s) releasing stored elastic energy in the stamens. The resulting movement is in excess of half the speed of sound, making it the fastest known movement in the plant kingdom.

The species is native to northern China, and is widely cultivated (and even naturalized) elsewhere. It is also known as Tuta in Sanskrit and Tuti in Marathi.

On young, vigorous shoots, the leaves may be up to 30 cm long, and deeply and intricately lobed, with the lobes rounded. On older trees, the leaves are generally 5–15 cm long, unlobed, cordate at the base and rounded to acuminate at the tip, and serrated on the margins. The leaves are usually deciduous in winter, but trees grown in tropical regions can be evergreen. The flowers are single-sex catkins, with catkins of both sexes being present on each tree; male catkins are 2–3.5 cm long, and female catkins 1–2 cm long. The fruit is 1–2.5 cm long; in the species in the wild it is deep purple, but in many cultivated plants it varies from white to pink; it is sweet but bland, unlike the more intense flavor of the Red Mulberry and Black Mulberry. The seeds are widely dispersed by birds, which eat the fruit and excrete the seeds.

White Mulberry leaves are the preferred feedstock for silkworms, and are also cut for food for livestock (cattle, goats, etc.) in areas where dry seasons restrict the availability of ground vegetation. The fruit are also eaten, often dried or made into wine.

In Traditional Chinese Medicine, the fruit is used to treat prematurely grey hair, to "tonify" the blood, and treat constipation and diabetes. The bark is used to treat cough, wheezing, edema, and to promote urination. It is also used to treat fever, headache, red dry and sore eyes, as well as cough.

For landscaping, a fruitless mulberry was developed from a clone for use in the production of silk in the U.S. The industry never materialized, but the mulberry variety is now used as an ornamental tree where shade is desired without the fruit. A weeping cultivar of White Mulberry *Morus alba* 'Pendula' is a popular ornamental plant.

## **REVIEW OF LITERATURE**

Historically, sericulture was introduced for the first time, into China by Hsueh-min, the Queen of China. For a long time, sericulture was considered to be a national secret by the Chinese Government, and as an industry it was not known in other countries. Later, it was introduced into Europe and Japan as well. According to reports available, sericulture was introduced into India about 400 years back and the industry flourished as an agro-industry till 1857, with an annual production of two million pounds of silk fibre. The industry survived the onslaught of the Pebrine disease during the period from 1857 to 1895. However, after 1928, the sericulture industry showed a decline in its production owing to the fierce competition from advanced sericulture countries, such as Japan, China and European countries. After the Independence, the industry is flourishing as an agro-industry, giving employment to over 3.5 million people in the Country.

The annual production of silk in the world is estimated at 45,000 tonnes of which Japan and China contribute 18,936 and 13,200 tonnes respectively. South Korea, USSR and India are the other leading sericultural countries in the world. The industry has survived the stiff competition with the man-made fibres and it is now estimated by the Food and Agriculture Organisation of the United Nations that the total requirement of silk by 1980 would be of the order of 80,000 tonnes, leaving a demand of 35,000 tonnes. Japan, which is the premier silk-producing country, owing to its recent industrialisation, high cost of labour and the shortage of land available for mulberry cultivation, has its limitations in increasing its production. Further, owing to heavy internal consumption, Japan has become an importer of silk, thus widening the gap between production and demand. This situation has given a boost to the sericulture industry in the developing countries, e.g. India and South Korea.

Among the developing countries, India enjoys a very favourable position for doubling the present status of silk production of 2,969 tonnes owing to the low cost of labour. Sericulture is ideally suited for improving the rural economy of the country, as it is practiced as a subsidiary industry to agriculture. Recent research has also shown that sericulture can be developed as a highly rewarding agro-industry.

## **MULBERRY**

Mulberry is a genus of 10–16 species of deciduous trees native to warm temperate and subtropical regions of Asia, Africa, Europe, and the Americas, with the majority of the species native to Asia.

The closely related genus *Broussonetia* is also commonly known as mulberry, notably the Paper Mulberry, *Broussonetia papyrifera*.

Mulberries are fast-growing when young, but soon become slow-growing and rarely exceed 10-15 metres (33-49 ft) tall. The leaves are alternately arranged, simple, often lobed, more often lobed on juvenile shoots than on mature trees, and serrated on the margin.

The fruit is a multiple fruit, 2-3 centimetres (0.8-1.2 in) long. The fruits when immature are white or green to pale yellow with pink edges. In most species the fruits are red when they are ripening. A fully ripened mulberry in these species is dark purple to black, edible, and sweet with a good flavor in several species. The fruits of the white-fruited cultivar of the White Mulberry on the other hand are green when unripe and white when ripe; the fruit in this cultivar is sweet, and has a very mild flavor compared with the dark fruits.

### Common names

White Mulberry, Silkworm mulberry, murier (F), morera (Sp.), tut (Urdu, Farsi, Hindi)

### Species

The taxonomy of *Morus* is complex and disputed. Over 150 species names have been published, and although differing sources may cite different selections of accepted names, only 10–16 are generally cited as being accepted by the vast majority of botanical authorities. *Morus* classification is even further complicated by widespread hybridisation, wherein the hybrids are fertile.

The following species are generally accepted:

*Morus alba* - White Mulberry (E ASIA)

*Morus microphylla* - Texas Mulberry (MEXICO, TEXAS (USA))

*Morus australis* - Chinese Mulberry (SE ASIA)

*Morus australis* - Chinese Mulberry (SE ASIA)

*Morus celtidifolia* - . (MEXICO)

*Morus rubra* - Red Mulberry (E NORTH AMERICA)

*Morus insignis* - . (S AMERICA)

*Morus mesozygia* - African Mulberry (SOUTHERN and C AFRICA)

The following, all from eastern and southern Asia, are additionally accepted by one or more taxonomic lists or studies; synonymy, as given by other lists or studies, is indicated in square brackets:

Morus atropurpurea	Morus macrourea [M. alba var. laevigata]
Morus bombycis [M. australis]	Morus mongolica [M. alba var. mongolica]
Morus cathayana	Morus multicaulis [M. alba]
Morus indica [M. alba]	Morus notabilis
Morus japonica [M. alba]	Morus rotundiloba
Morus kagayamae [M. australis]	Morus serrata [M. alba var. serrata] - Himalayan Mulberry
Morus laevigata [M. alba var. laevigata; M. macrourea]	Morus tillaefolia
Morus latifolia [M. alba]	Morus trilobata [M. australis var. trilobata]
Morus liboensis	Morus wittiorum

**Table1. Raw Silk Production in India (1974)**

State	Production (intonnnes)	Production (intonnnes)	Production (intonnnes)	Production (in tonnes)
	Mulberry	Tasar	Eri	Muga
1.Andhra Pradesh	..	1	..	..
2.Assam	7	..	87	41
3.Bihar	..	234	3	..
4.Himachal Pradesh	2	..	..	..
5.Jammu and Kashmir	68	..	..	..
6.Karnataka	2,036	..	..	..
7.Madhya Pradesh	1	117	..	..
8.Maharashtra	..	1	..	..
9.Meghalaya	1	..	..	..
10.Orissa	..	19	..	..
11.Punjab	1	..	..	..

12.Tamil Nadu	9	..	..	..
13.Uttar Pradesh	4	..	..	..
14.West Bengal	316	21	..	..
15.Tripura	..	..	1	..
Total	2,445	393	91	41

## REFERENCES

- Angeloni, A. (2000). *Evolution of Research on Mulberry as Cattle and Sheep Feed in Central Italy*. In: *FAO Electronic Conference on "Mulberry for Animal Production"*.
- Burgess, K.S., Morgan, M., Deverno, L., & Husband, B. C. (2005). *Asymmetrical introgression between two Morus species (M. alba, M. rubra) that differ in abundance*. *Molec.Ecol.* 14: 3471–3483.
- Datta, R. K. (2002). *Mulberry cultivation and utilization in India*. In: Sánchez, M.D. (ed.) 2002. *Mulberry for Animal Production FAO Animal Production and Health Paper 147*. Rome, p. 45-62.
- Huo, Yonkang (2002). *Mulberry Cultivation and Utilization in China*. In: Sánchez, M. D. (ed.) 2002. *Mulberry for Animal Production FAO Animal Production and Health Paper 147*. Rome, p. 11-43.
- Iqbal, M. (1991). *NTFPs: a study on their income generation potential for rural women in North-West Frontier Province (NWFP), Pakistan*. *Planning and Development Department, Govt. of NWFP and ILO. Peshawar*.
- Kitahara, N., Shibata, S., Nishida, T. (2000). *Management and Utilisation of Mulberry for Forage in Japan. 1. Productivity of mulberry-pasture association and nutritive value of mulberry*. In: *FAO Electronic Conference on "Mulberry for Animal Production"*.
- Martin, G., Reyes, F., Hernandez, I. and M. Milera. (2002). *Agronomic studies with mulberry in Cuba*. In: Sánchez, M. D. (ed.) 2002. *Mulberry for Animal Production FAO Animal Production and Health Paper 147*. Rome, p. 103-113.
- Ohyama K., (1970). *Studies on the function of the root of the mulberry plant in relation to shoot pruning and harvesting*. *Bull. Seric. Exp. Stat.* 24: 1 – 132 (in Japanese with English Summary)
- Suttie, J. M. (undated). *FAO Report: Morus alba L.*
- Taylor, P. E., Card, G., House, J., Dickinson, M. H., & Flagan, R. C. (2006). *High-speed pollen release in the white mulberry tree, Morus alba L. Sexual Plant Reproduction 19 (1): 19-24 pdf file*
- Wang Zichun, (1987). *Sericulture in Ancient China's Technology and Science*. Compiled by the Institute of the History of Natural Sciences Chinese Academy of Sciences. Beijing, Foreign Language Press ISBN 0-8351-1001-x