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RESEARCH ARTICLE

BIODIVERSITY AND CONSERVATION STATUS OFMUGA SILKWORM FOR SUSTAINABLE ECONOMIC EMPOWERMENT OF WOMEN

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ABSTRACT

Sericulture is an agro based industry playing an important role in rural economy of the country. Mugaculture as an enterprise offers tremendous opportunity for sustainable employment and economic growth in states like Assam. The muga silkworm, *Antheraeaassamensis* exclusively confined to the Brahmaputra valley of Assam, India due to its unique ecological niche as it produces golden coloured silk of high economic value. Mugaculture can be used as an important tool for economic empowerment of women. In the global market, the muga silk gained importance, as it is the source of income for the rural tribal communities and cultural heritage. Muga culture is a part of culture, tradition and customs of the people of North-eastern region of India. It occupies a unique position in the global sericultural map for production of golden muga silk. The social relevance in Assam for the muga culture is very high. The preservation of the biodiversity is the most important global challenge of the present day. The impact of globalisation of silk trade plays a crucial role for a country like India. The combined efforts of the Forest, Tribal Welfare and the Department of Sericulture along with the local tribal rearers should be taken for the protection and the conservation of muga silkworm. Hence awareness should begiven to the public for conservation of food plants and muga silkworm, as it improves the conservation of biodiversity of both flora and fauna.

Key words: Muga silkworm, Conservation, Biodiversity, Muga culture, Global market, Antheraeaassamensis.

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INTRODUCTION

India is the homeland of all five varieties of silkworms viz. mulberry, tasar, oak tasar, muga and eri silk. In the Indian socio-economic context, income generation assumes great significance for women, especially rural women. Women constitute more than fifty per cent of the world's population, one third of the labour force, and perform nearly two thirds of all working hours. Tribal communities are the primary rearers of these silkworms. The choice of food plants of muga silkworms is unique because they prefer the allele chemics such as alkaloids, tannins and terpenoids as well as benzylisoquinoline (Peigler, 1989, Geissman *et al.* 1969).The north-eastern region of India is the natural abode of large number of sericogenous insects. Several wild silk moths have been reported from India and out of them four important commercial varieties of silkworm are exploited in this part, i.e. Tasar, Muga, Eriand Mulberry (Rangaswami et al. 1976).

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The sericogenous Saturniid *Antheraeaassamensis* Helfer (Chromosome number, n = 15) is a monospecies and exclusively confined to the Brahmaputra valley of Assam, India (Chowdhury, 1982, Rao, 1978) due to its unique ecological niche. It produces golden coloured silk of high economic value. North east region of India is considered as the floral and faunal gate way for Asian main land to Indian Peninsula. The region is also considered as one of the 25 biodiversity hot spots of the world (Myers *et al.,* 2000) and makes an ideal home for a number of sericigenous insects. For the people of Assam sericulture is the part of their culture and tradition, rather than a profitable business. Since, time immemorial muga and ericulture have been practiced in different pockets of this region. Fairly good reports on seribiodiversity of North East India are available (Thangavelu *et al.,* 1987*;* Singh and Maheswami, 2003; Chowdhury, 2004; Kakati and Chutia., 2009 and Ahmed and Ranjan, 2011). Rearing of Eri, Muga and Mulberry silkworm are playing an important role in the economic development of a large section of rural population of the state (Goswami and Bhattacharyya, 2013). Currently, in Assam, the muga food plants span over an

estimated area of 7800 hectares. Muga is more popular and used more or less by all sections of women (De and Das, 2010b; Goswami and Bhattacharyya, 2013).

Status of muga culture

Muga culture is a part of culture, tradition and customs for the people of Assam, Northeast India occupies a unique position in the global sericultural map for production of golden *muga* silk. About 30,000 families in Assam are directly associated with *muga* culture. Apart from Assam, *muga* culture is also practiced in certain pockets of Meghalaya, Nagaland, Arunachal Pradesh, Mizoram, Manipur and West Bengal. *Muga*reelers reel muga yarn in *Bhir*or*Bhawri* operated by two persons. Sipajhar in Darrang district was once an important muga growing area. The most important commercial muga cocoon growing areas are the Lakhimpur, Dibrugarh and Sibsagar districts. It is mainly grown in south of Jorhat and south-east of Sibsagar subdivision chiefly by the Ahom community. Sapekhati, Namrup, Nitaipukhuri etc. are the places where good seed cocoons are produced. Teok, Jhanji, Namti, Nahoroni etc. are healthy muga cocoon growing area. In Dibrugarh district, Jamira, Loruamouzas are important muga breeding tracts. In Lakhimpur district, Dhemaji, Ghilamara, Azad, Dhakuakhana, etc. are very important for production of major part of muga reeling cocoons. A long tradition of silk weaving since the 17th century, Sualkuchi is the prime centre of the silk hand-loom industry of Assam. Sualkuchi is well known for silk textiles both mulberry and muga silk. Sualkuchi an ancient craft village-having silk-rearing and weaving communities, potters, gold smiths and oil pressures. In fact muga, "the golden fibre" is produced only in Assam and it has also tremendous export potentiality. Such activities are intimately linked with the culture and tradition of the Assamese people since long past. Sualkuchi is a multi-caste town under of Kamrup (rural) district of Assam, situated on the North bank of the mighty Brahmaputra at a distance of 30 km West of Guwahati. The weaving industry of Sualkuchi received a big boost during the Second World War. The Census of Hand-looms in Sualkuchi conducted in 2002 reveals that Sualkuchi has 13752 active commercial hand-looms, of which 54.75% are performed by the woman weavers, who are basically hired from the outside of Sualkuchi. The Assam silk industry, now centered in Sualkuchi, is a labor-intensive industry. It's registered trademark is SUALKUCHI'S.

Muga farming – a mode of economic growth

The Dhakuakhana subdivision of Lakhimpur district has been a major muga growing area of the world. There are one lakh traditional muga farmers in Dhakuakhana growing som (PerseabombycinaKost), the muga food or host plant in an area of about 1,602 hectares of land averaging 0.15 hectare of holding of som plantation per family. Saikia, who runs an NGO called Wild Silk North-East, has proposed a unique plan of muga production for rural economic growth to the Government of Assam, which can contribute towards conservation and generating employment (Farhana Ahmed, NORTH LAKHIMPUR, The Assam Tribune Online, 2015).

Food Plants of Muga Silkworm

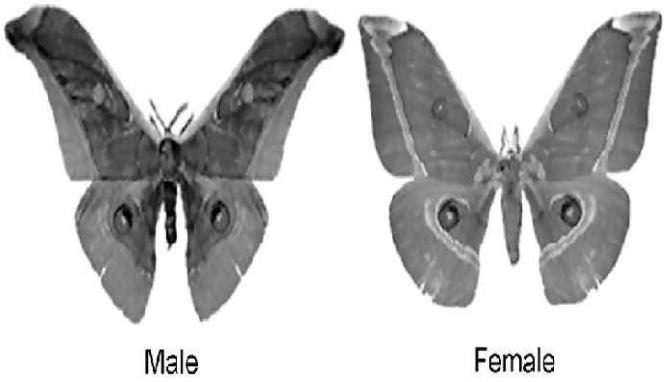
Muga silk is the product of the silkworm *Antheraeaassamensis* endemic to Assam.

som* (*Machilusbombycina)

***Sualu* (*Litsaeapolyantha*)**

Muga Silkworm larvae on Som tree

Muga cocoons



Antheraeaassamensis

Muga weaving

The larvae of these moths feed on *som* (*Machilusbombycina*) and *sualu* (*Litsaeapolyantha*) leaves. The silk produced is known for its glossy fine texture and durability.

Assam Traditional Costumes

Assam traditional costumes have a long traditional history; the dresses of Assam are made of muga silk fiber and very famous for its design and style. In Assam state, most of the women prefer to wear the traditional costume 'Muga' or 'Mekhela Chadar'. The designs are very beautiful used 'Eri' and 'Paat' to weave the cloth. 'Eri' used to create winter clothing particularly shawls and 'Paat' used for 'Mekhela Chadar'. Both dresses bring the attraction to the women.

Traditional Costumes of Assam Tribes

Especially the Silk saris of Assam are very popular and demand in India. The saris have fine delicate designs and rich patterns, made of fine woven. Embroideries are used to bring richness to the cloth. The state produces the hub silk, which has a number of silks like Eri, White Pat and Golden Muga. The Bodo Tribe women used Mekhla costume as their customary dress. Generally, the Bodos live in greenery and hilly areas, so their costume designs and colours also similar to their location. They wear the upper wrap, known as Riha worn with Chaddar. Men wear Dhoti and Chaddar.

Conservation Strategies ForFood Plants Of Muga Silkworm

The conservation of these plants in different ecologicalhabitats is need of the hour to increase the diversity in the population of *A. assamensis*. The followingstrategy should be adopted for proper conservation of these plants to restore the precious silkindustry of Assam (Ramesh Nath*et al.,* 2008).

- Germ plasm collection, documentation, evaluation and utilization have to be done in systematicway as per the International Board for Plant Genetic Resources (IBPGR).
- The Govt. as well as the concerned authorities should adopt effective control measure to minimizethe pollution caused by the industries like oil & natural gas and tea gardens etc.
- *In situ* conservation of food plants ismost important. Shrinkage of food plants growing areas dueto human intervention should be stopped by the Govt. enacting legislation. Govt. must bring inforce the laws, and violation of the same must be suitably penalized.
- In Assam, the social relevance of the muga culture is very high; therefore, awareness to the masspeople for conservation of these plants is very important to conserve the food plants.

Conclusion

Muga culture is the exclusive property of people of Assam. *Antheraeaassamensis* (Muga silkworm) and their host plants are good example of the wealth of Assam. The muga culture

may be the best option for income and employment generation at large by way of social innovation and bio-resource conservation. Sericulture as an enterprise offers tremendous opportunity for sustainable employment and economic growth in states like Assam. The future of muga silkworms is dependent on their food plants. Hence it is necessary to protect these plant species so as to save the muga silkworm and also to save our rich natural biodiversity. The promotion of Muga silks occupied a unique market status and a source of cash income for many rural tribal communities. The organization and the management of eco-tourism will be in a position to help the conservation programme. The preservation of the biodiversity is the most important global challenge of the present day. The combined efforts of the forest, tribal welfare and the department of Sericulture along with the local tribal rearers should be made for the protection and the conservation of muga silkworm and its food plants. The impact of globalisation of silk trade plays a crucial role for a country like India. The process may result in positive economic gain from rapid growth of export in terms of generation of employment opportunities and more earning capacity for rural women. To cope up with the international competition government should come forward to give adequate training facilities to the rural tribal communities for the benefit of the mugasilk industry.

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