

Enzymatic treatment on cooking and reeling of muga silk (*Antheraea assama*) cocoon

MAMONI PROBHA BORAH AND BULBUL BARUAH

Accepted : January, 2009

See end of the article for authors' affiliations

Correspondence to:

**MAMONI PROBHA
BORAH**

Department of Clothing and Textile, College of Home Science, Central Agricultural University, TURA (MEGHALAYA) INDIA

ABSTRACT

Cocoon is a protective shell made up of a continuous proteinous filament spun by the mature silk worm prior to pupation. Cooking of cocoon is essential to secure adequate quantity of reeling ends to reach out a composite thread of high cohesion and size of the yarn. Cooking of muga cocoon with pure papain of concentration 0.05 % and Na_2CO_3 , 0.20 % showed highest breaking load while cocoon treated with latex of concentration 0.05 % extracted from fresh green papaya and Na_2CO_3 0.15 % produced yarn of highest breaking load.

Key words : Enzyme, papain, Muga cocoon, Cooking and Reeling, *Antheraea assama*

The history of textile is an integral part of the history of civilization. There are many fibrous structures in nature but only few which have been classified as textile fibres. The chief natural fibres now in use are cotton, linen, wool and silk. Silk is produced by cultivated silkworm and was at one time the most priced of all the textile fibres. Traditionally, it originated in China about 2500 BC. According to Chinese legend, *si-ling-chi*, a Chinese emperor was the first to rear silkworm and spun silk thread, she made a rope of silk for her husband using the thread.

The north eastern region of India occupies an important position on account of its unique faunal and floral wealth. The climate is subtropical. The congenial atmosphere has made the region the natural home for many varieties of insects, moths and butterflies, particularly certain serigenous insects as well as their corresponding host plants. Therefore, the region can be called naturalistic paradise. The congenial atmosphere helps the healthy growth and development of the sericulture industry which covers mulberry, oak, tassar, eri and muga culture. Muga culture is predominant in this region and it is unique and confined particularly to the Brahmaputra valley. Muga silk is golden yellow in colour which makes it very attractive. No other silk has such unique colour in the natural state.

The scientific name of muga silk worm is *Antheraea assama* Westwood, belongs to Lepidoptera, family-Saturniidae. The muga is assiduously practised in the district of upper Assam and also in certain parts of lower

Assam in a smaller measure. The important commercial muga growing areas are North Lakhimpur, Dhemaji, Dibrugarh, southeast of Sibsagar and south of Jorhat and chiefly reared by the Ahom community.

The muga silkworm is polyphagous and thrives on various endemic plants mostly belonging to the family Lauraceae. The commonest laurel is "som" (*Machilus bombycina* or *odoratissima*) in upper Assam and "sualu" (*litsaea polyantha*) used in lower Assam, are primary host plants. The secondary host plants for muga silkworm are mejankari (*Litsea citrata*), chapa (*Magnolia sphenocarpa*) etc. Sericulture has been practiced for a long time in India but only during last decade the country has earned a good reputation in silk production. Indian enjoys the world monopoly for the fabulously famed golden yellow coloured muga silk which is multivoltine in nature.

Cocoon is a protective shell made up of a continuous proteinous filament spun by the mature silk worm prior to pupation. Due to environmental changes in different seasons and also due to changes in location, the life cycle of muga silk worm such as egg, larva, pupa, cocoon and adult moth may vary from brood to brood and race to race, thus affecting the quality and quantity of silk. Reeling cocoon has to be subjected to process of shifting with the object of killing pupa inside the cocoon so as to obtain the continuous filament after cooking of cocoon. Cooking of cocoon is essential to secure adequate quantity of reeling ends to reach out a composite thread of high cohesion and size of the yarn to produce high quality fabrics. The swelling of fibres helps to release the filament from the