EGG LAYING BEHAVIOUR AND CERTIFIED EGG PRODUCTION IN INDIAN WILD TASAR GILKOI *Anthorace mylitta* DRURY

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Tasar culture is practised in the tropical and temperate zones. Natural silks are broadly classified as mulberry and wild or non-mulberry. Non-mulberry silk culture is universally known as forest or wild sericulture. Nearly 95% of the global production of non-mulberry silks is tasar (Rangaswami *et al.* 1987). Although tasar cocoon production is gradually declining due to various reasons, it has been endowed by nature with vast potential (Mohanty and Mohanty 1997). The challenge before sericulturists is to utilise this potential systematically so as to bring about a balanced development of the tasar industry in general and of the rural economies of the developing nations in particular. Owing to a prolific wealth of food plants, abundant man power and ideal climatic conditions, tasar culture offers India an opportunity to boost silk production and the economic status of the tribal population.

In silk moth population, female moths are the source of attraction and attention of rearers, biologists and sericulturists because of their egg production. These eggs are termed as "reproductive seeds" or simply "seeds" since the eggs are the potential stocks for the future rearing or generation. The most important step in silkmoth rearing is the production of silkmoth eggs required for rearing. The seeds required for commercial rearing should be of high quality and free from diseases. The production and supply of disease-from silkmoth eggs (appropriately termed as "certified eggs") is highly a specialised work involving technical and scientific skills. As the total quality and quantity production depends upon the certified eggs, utmost care and precautions are desirable for seed production. Although some workers (Nanavty 1965, Jolly 1972, Ahsan *et al.* 1974, Griyaghey *et al.* 1974, Jolly 1974) have contributed in the fields of egg laying activities of tropical silk worm, attention on egg laying method in natural condition has not been paid.

Natural Egg Laying Behaviour

The unique features of male and female moths are meeting, mating and dying. After 2-3 hours of emergence the moths start to couple. The most preferable period is darkness, the peak period being midnight to 2.00 a.m. The healthy atmospheric condition for successful coupling is the lower temperature of about 24 -26° C and high relative humidity of 75-85%. Before coupling, male moths exhibit a premating flight which induces a better coupling aptitude. Normal fecundity and fertility is ensured within 2 -4 hours, but coupling continues for 10-12 hours. During coupling they usually never get separated even after being disturbed. In fact, longer coupling period does not have any effect on preoviposition period.

After a prolonged period of coupling (mating), the male moth gets separated and female moth gets ready to lay eggs. Females prefer any suitable portion most preferably the leaves (usually lower portion or dorsal part of foliages) to lay eggs. By this the eggs are protected from scorching sun light and rain water. This ecoclimatic natural protection offers the embryos a congenial environment to grow suitably. During egg laying process, the females start laying eggs one after another continuously taking a little pause in between. The abdominal portion lowers down just during laying eggs and raises up after that. This is followed by next egg laying and thus the process continues for about seven days till the completion of egg laying. The abdomen is packed with so many eggs that the moth lays almost 50% of eggs on the first day. Like coupling, egg laying is mostly preferred in darkness. The eggs are normally deposited in batches of 5-10 which are held together by a coffee coloured gummy substance secreted during the same period. During oviposition, each egg is observed to be coated with this sticky fluid. After 15-30 minutes of egg laying, the stickiness in eggs is felt by touching. Wings also play a vital role in smooth releasing of the eggs. The pressure and balance of the fore and hindwings enable a systematic egg release. This systematic egg laying one after another has got some similarity with that of marine turtles laying in sandy pits of sea coast.

Egg Laying process in domesticated condition

Basically tasar moths are wild in nature and behaviour which have been domesticated for convenient seed collection, grainage and cocoon production. Coupling and egg laying are performed in rearing places and rest of the events take place in nature grown areas of the rearing field. After completion of cocooning, harvesting is made and seed cocoons are brought to the grainage. In grainage house emergence of moth, coupling and egg laying activities are performed till hatching of the first instar larvae. The detailed difference between natural and captive egg laying methods are discussed in Table 1.

During this grainage operational procedure, the wings of mated female moths are cut down. After completion of coupling, female moths are brought to the sterilised formalinised) earthen cups or paper packets (sweet box) or plastic boxes for egg laying. Firstly due to dewinging, inconvenient egg laying is caused and secondly artificial captive conditions for egg laying is another unnatural and non-congenial environment for the same purpose. These two are important obstacles in releasing the whole mass of eggs. These artificial situations create delayed egg laying.

Suggested measures for successful egg laying

Natural surrounding need to be developed alongwith natural egg laying structures (host plant leaves) instead of plastic, paper or earthen containers.

Furthermore, chemically trated containers or structures shoul also be discouraged for better performance in egg laying,

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egg hatching and larval growth. Natural environment (temperature, ventilation and humidity) may be maintained in the grainage as far as possible. After completion of egg laying, eggs should be washed by water using turmeric or "bakhar" (a herbal product prepared by traditional rearers) instead of any chemicals.

Thus, the eggs need to be air dried and preserved properly for next rearing. These eggs are "certified eggs" (disease free) which should be supplied to the rearers. The rearers should be advised to use and handle the certified eggs carefully and scientifically to avoid infection or loss of production. Proper handling of certified eggs results in a high yield.

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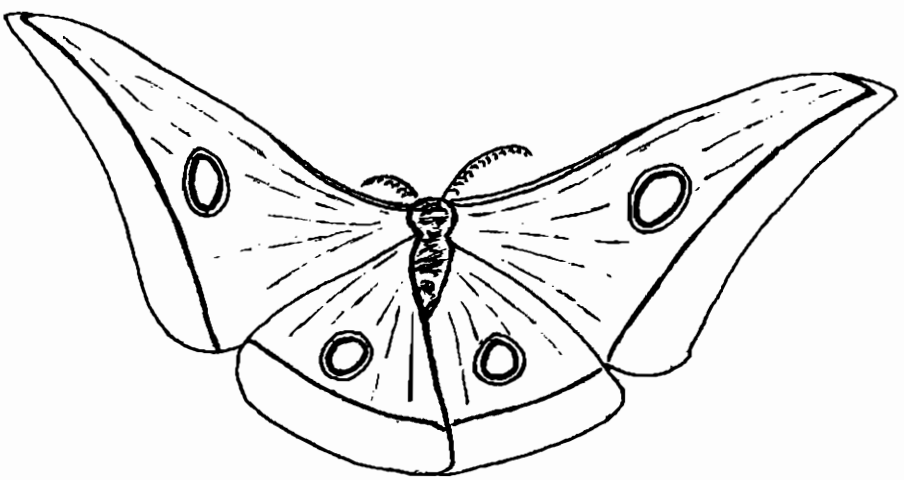
Table 1. Natural and Captive Egg laying Behaviour in *Antheraea mylitta* D.

Natural egg laying	Captive egg laying
1. Eggs are laid mostly in host plants.	Eggs are laid in hand-made or machine-made structures.
2. Usually leaves are used for egg laying.	Plastic, paper box or earthen cups are used for laying eggs.
3. Wings intact.	After coupling wings are cut.
4. Eggs are laid smoothly due to pressure and balance of the wings	Eggs are laid with difficulty because of trimming of wings.
5. Eggs are almost laid during first three days.	Eggs are laid within 6-7 days.
6. No inconvenience is caused due to free space.	Inconvenience caused due to limited space in the container
7. Eggs are not washed in any materials.	Eggs are washed in formalinised water followed by drying and packing.
8. The entire process occurs in natural environment.	The process occurs in grainage house.