THE SILK MOUTHS (LEPIDOPTERA: SATURNIIDAE) OF AMBA RESERVE FOREST, WESTERN GHATS, KOLHAPUR DISTRICT, MAHARASHTRA

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INTRODUCTION

Seri-biodiversity means the variability in sericigenous or silk producing moths and their host plants (Srivastava and Thangavelu, 2005). Non-mulberry silk moths are wild or semi-domesticated fauna which produce splendour silk. There are number of references regarding report about seri-biodiversity and their wide potential as a source of natural silk in Indian subcontinent (Arora and Gupta, 1979; Thangavelu, 1991; Nassig et al., 1996; Chinnaswamy, 2001; Thangavelu et al., 2002; Srivastava and Thangavelu, 2005). Arora and Gupta (1979) enlisted nearly 40 species in India alone. Jolly et al., (1975) recorded approximately 80 species in Asia and Africa producing silk of commercial importance.

The family Saturniidae contains about 1200-1500 species all over the world. Of which Indian subcontinent i.e. from Himalaya to Sri Lanka may comprises nearly 50 species (Nassig et al., 1996). As per classification of Lemaire and Minet (1998) Saturniidae is the largest family of Bombycoidea with about 1861 species of 162 genera and 9 subfamilies. Regier et al., (2008) stated that the family Saturniidae includes some of the largest and most beautiful species of all Lepidoptera are univoltine/multivoltine as per climate and are present in both temperate and tropical region. The paper deals with diversity of wild silk moth from Western Ghats.

MATERIALS AND METHODS

Study region
Amba Reserve Forest is a part of Western Ghats which is known as biodiversity hotspot. The topography of the study region is hilly which exhibit rugged terrain with steep slopes. The mean altitude is 713.53 m above mean sea level. The mean annual rainfall is 4400 mm with prolonged rainy season from June to October. The temperature ranges from 20 to 41ºC in summer and 12 to 30ºC in winter. Minimum and maximum relative humidity ranges from 55 and 85% respectively. The forest cover of Kolhapur District is 1,657km$^2$. Out of which 563 km$^2$ is reserved forest and 417 km$^2$ is protected forest. The geographical area of Amba Reserved Forest is 318.16 ha which lies towards northwest direction of Kolhapur district. The region covered during present course of study is included within the Survey of India Topo sheet no. 47H/13 on a scale 1:50,000 and is bounded by latitude 15º43’ to 17º10’ north and longitude 73º40’ to 74º42’ east.

Extensive surveys and collection were carried out in Amba Reserve Forest in the years 2007-2009. Adult moths were collected with the help of swip net. Fluorescence light trap (Inatachat and Woiwood, 1999) was also utilized during survey and collection. The moths were killed in insect killing bottle, brought to the laboratory in the Department of Zoology, Shivaji University, Kolhapur and identified with available literature (Hampson, 1894).

RESULTS AND DISCUSSION


Diagnostic characters
*Loepa katinka* Westwood (Fig. 1)
Bright and chrome yellow. Fore wing with grey costa, suffused with fuscous; a subbasal more or less angled pink line; a large rounded or oval ocellus at the end of cell, which is pinkish brown, having white and black marks; highly waved postmedian dark line, double submarginal lines, the inner line pink in colour and angled below the costa, the outer grey and terminating in black spot between veins 7 and 8 above which is a pinkish patch on the costa, edged exteriorly with white and pink, a series of almost marginal pale lunules. Hind wing differs from the fore wing in the first line being further from the base, narrow and dark; the subcostal patch and spot absent. Underneath with a pinmk and white apical patch to hind wing developed in sikkima anmd Javan form.

**Attacus atlas** Linnaeus (Fig. 2)

Head, thorax and abdomen red-brown; the basal segment and abdomen pale and each segment with a pale fringe; legs brown. Fore wing with the costa brown; the basal area brown and red-brown edged by red, pale and black lines, curved from the costa to vein 2, then oblique to near base of inner margin; medial area red-brown; a large triangular hyaline spot at end of cell with a black edge; one or two hyaline streaks above it touching the post-medial line, which is black, pale, and red and curved inwards from the subcostal to vein 2, then outwards to inner margin; outer area shading from pink through purplish fuscous to tawny brown; apical area yellow shading to pink; the membrane below the costa crimped and suffused outwardly with blue-grey and ending in a black spot; a dark red streak below vein 8; a yellow-brown marginal band with a highly waved black line on it. Hind wing similar to fore wing; the antemedial line nearly straight; no streak above the hyaline triangular mark; the post-medial line angled towards inner margin but not curved; apical area not variegated; a series of black spots within the black submarginal line which is less waved.

**Actias selene** Hubner (Fig. 3)

Head, thorax and abdomen white; palpi pink, prothorax with a dark pink band; legs pink. Fore wing very pale green, white at the base, a dark pink costal fascia, darkest along subcostal nervure; an outwardly-oblique pale yellow antemedial line; two inwardly-oblique slightly curved submarginal lines; a pale yellow marginal band; a dark red-brown linule at the end of cell, with a grey line on it, bounding inwardly a round ochreous spot with pinkish centre. Hind wing similar to the forewing; the central portion of the tail pinkish.

**Cricula trifenesstra** Helfer

Brown, ochreous, yellowish or reddish. Forewing with a waved antemedial dark line; a small hyaline spot beyond the end of the cell, with one or two others above it, the upper one...
generally represented by a dark spot; an oblique line from the apex to the inner margin beyond the middle, the area beyond it suffused with grey. Hind wing with the oblique line continued to the inner margin before the middle; a hyaline spot beyond the cell; a submarginal waved line. Underside with the basal area suffused with purple.

**Antheraea mylitta Drury** (Fig. 4)

Mandibles and labial palpi rudimentary. Terminal parts of maxillae are modified into vestigial proboscises. On fore wings postmedian line is prominent and red with white line on its border. The antemedian line is black or dark brown and is bordered on the inside with a white line. In addition there is a black or dark brown oblique line with a white inner border. The ocellus with hyaline area is prominently positioned at the centre of the wing. On hind wings, the black antemedian line is devoid of white inner border. The area between ocellus and centre of the wing. On hind wings, the black antemedian line is devoid of white inner border. The area between ocellus and the postmedian line by a wavy margin. Oblique line is absent. Wing scales are usually conical or narrow and bristle like with up to seven spines of different lengths.

Arora and Gupta (1979) enlisted 40 species of silk moths from India alone. Whereas the present study revealed 5 species in Amba Reserve Forest constituting about 12.5% silk entomofauna of India. Seitz (1933) recorded 19 species of wild silk producing lepidopterans from entire North Eastern India including Sikkim and Assam. As far as geographical area of the region under study and number of species of silk moths recorded during present study are considered and compared it reflected diversity and richness of sericigenous moths in Amba Reserve Forest.

The results of the present study are more or less consistent with Chowdhary (1983) and Thangavelu (1991) recorded 10 and 9 sericigenous species respectively without mentioning limits of their studies. Kakati and Chutia (2009) reported 14 and 9 sericigenous species respectively without mentioning with Chowdhary (1983) and Thangavelu (1991) recorded 10 species belonging to 8 genera of silk moths from Nagaland, India.

According to Dumbre et al., (1985) in Maharashtra ‘Vanya Silk Cultivation’ is confined since long back to the districts of Chandrapur and Bhandara. While conducting present study, personal communication with Range Forest Officer revealed that the host plant *Terminalia tomentosa* of *A. mylitta* is available plentifully (approximately 30% forest land area) in and around Amba Reserve Forest. This means there is great potential to exploit rearing of *A. mylitta* on commercial base as far as in and around area of Amba Reserve Forest is concerned.

Ministry of Environment and Forest, Government of India is also boosting since long back to the forest dwellers to undertake Tasar rearing as ‘Vanya Silk Cultivation’ to uplift their socio-economic status utilizing natural resources such as *Terminalia tomentosa* through “Guidelines for diversion of forest land for non-forest purposes under Forest (Conservation) Act, 1980 for Tasar cultivation as Vanya Silk Cultivation vide letter F. No. 2-1/2003-FG (P-III) dated 7th June, 2004”.

The data generated during the present study is quite encouraging as far as ‘Vanya Silk Cultivation’ is concerned. Being a forest based industry, Sericulture in and around the region under study may play crucial role in rearing of silk moths for commercial exploitation utilizing natural resources and to uplift socio-economic status of forest dwellers as well as sustainable development with conservation.

In future concentrated efforts will be made so as to study diversity of silk moths in forested areas of Kolhapur district, their host plant range, commercial exploitation for sustainable development and conservation.

**REFERENCES**


