

Study on Silk Moths (Lepidoptera: Saturniidae) of Akola District, Maharashtra, India

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Abstract

The present study deals with the diversity of silk producing moths (Lepidoptera: Saturniidae) in Akola District of Maharashtra State, India. An intensive survey was conducted during 2020-2021. Study revealed the presence of three species namely *Actias selene* (Hubner, 1807), *Antheraea mylitta* (Drury, 1773) and *Attacus taprobanis* (Moore, 1882-1883)

Key words: Akola, Lepidoptera, Maharashtra, Saturniidae, Silk Moths.

Introduction

The world around us is a kaleidoscope of ever changing patterns of diversity. Diversity is a cornerstone of life whose pattern changes from place to place with time to time of the day and the season of year. This diversity refers to all species of plants, animals and micro-organisms existing and interacting within an ecosystem (Gadgil 2002). The seri-biodiversity refers to 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 comprise 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 Akola District of Maharashtra State.

Materials and Methods

Akola district is one of the most diversified Regions in Maharashtra State of India, with respect to biodiversity. Its healthy climate, mountainous terrain, rugged configuration and sudden fall in elevation are phenomenal. It is located between 20.7000° north and 77.0142° east. It has a total area of 5428 square

kilometers. The climatic condition of this district is characterized by a hot summer, well-distributed rainfall during the south-west monsoon season and generally dry weather during rest of the year. The cold season is from December to February. The average annual rainfall in the district is 795.7 mm. During summer the mean daily maximum temperature in summer was 44.2° C to minimum as 26.7° C while it decreased toward winter with the mean daily maximum temperature was 27.8° C and minimum 14.9° C (Falling Rain Genomics, 2020-2021). Extensive survey and collection was carried out in during 2020-2021. Adult moths were photographed and indentified with the help of available literature (Hampson, 1894; Inatachat and Woiwood, 1999).

Observations and Results

A periodic survey was conducted during 2020-2021 which revealed the presence of three species belonging to three genera namely *Actias selene* (Hubner, 1807), *Antheraea mylitta* (Drury, 1773) and *Attacus taprobanis* (Moore, 1882-1883)

Actias selene (Hubner, 1807)

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.

Antheraea mylitta (Drury, 1773)

Mandibles and labial palpi rudimentary. Terminal parts of maxillae are modified in to vestigial proboscises. On fore wings postmedian line is prominent and red with white line on its border. The antemedial 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 antemedial 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.

Figure 1: Silk Moths (Lepidoptera: Saturniidae) of Akola District, Maharashtra, India*Actias selene* (Hubner, 1807)*Antheraea mylitta* (Drury, 1773)*Attacus taprobanis* (Moore, 1882-1883)***Attacus taprobanis* (Moore, 1882-1883)**

Head, thorax, and abdomen were red-brown; the basal segment and abdomen pale, abdominal segment with a pale fringe; legs brown. Fore wing with the brown costa, the basal area brown and red-brown edged by red, pale, and black lines are curved from the costa to vein 2, then oblique to near base of inner margin. Medial area was red-brown; a small triangular hyaline spot present at end of cell with a black edge; 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 that of fore wing; the antemedial line nearly straight and no streak above the hyaline triangular mark; the postmedial 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.

Discussion

Arora and Gupta (1979) enlisted 40 species of silk moths from India alone. Whereas the present study revealed three species namely *Actias selene* (Hubner, 1807), *Antheraea mylitta* (Drury, 1773) and *Attacus taprobanis* (Moore, 1882-1883). Study area constituting about 7.5% 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 study area.

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 species belonging to 8 genera of silk moths from Nagaland, India. Aland *et al* (2011) observed five species of Silk Moths (Lepidoptera: Saturniidae) from Amba Reserve Forest, Western Ghats, Kolhapur District, Maharashtra. Dar *et al.*, (2021) studied the moth diversity, species composition, and distributional pattern in Aravalli Hill Range of Rajasthan, 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 concerned study area.

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.

Conclusion

The Present study revealed the occurrence of three species of silk producing moths (Lepidoptera: Saturniidae) namely *Actias selene* (Hubner, 1807), *Antheraea mylitta* (Drury, 1773) and *Attacus taprobanis* (Moore, 1882-1883). In future concentrated efforts will be made so as to study diversity of silk moths in Akola district, their host plant range, commercial exploitation for sustainable development and conservation.

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