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Research article

THE WILD SILK MOTHS (LEPIDOPTERA: SATURNIIDAE) OF KHASI HILLS OF MEGHALAYA, NORTH EAST INDIA

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ABSTRACT: Seri biodiversity refers to the variability in silk producing insects and their host plants. The study deals with the diversity of wild silk moths from Khasi Hills of Meghalaya, North East India. A survey was conducted for a period of three years (2011-2013) to study wild silk moths, their distribution and host plants of the moths. During the study period, a total of fifteen species belonging to nine genera were recorded. Maximum number of individuals was recorded during the monsoon period and lesser in the pre and post monsoon period.
Key words: Seri biodiversity, host palnts, Khasi Hills, Meghalaya.

INTRODUCTION

The wild silk moths belong to the family Saturniidae and Super Family Bombycoidea. The family Saturniidae is the largest family of the Super family Bombycoidea containing about 1861 species in 162 genera and 9 sub families [9] there are 1100 species of non-mulberry silk moths known in the world [11]. The family Saturniidae comprises of about 1200-1500 species all over the world of which the Indian sub-continent, extending from Himalayas to Sri Lanka may possess over 50 species [10].Jolly et al (1975) reported about 80 species of wild silk moths occurring in Asia and Africa.[8]Singh and Chakravorty (2006) enlisted 24 species of the family Saturniidae from North East India.[12]Arora and Gupta (1979) reported as many as 40 species of wild silk moths in India alone.[1] Kakati (2009), during his study on wild silk moths recorded 14 species of wild silk moths belonging to eight genera from the state of Nagaland, North East India. [9]While a few survey reports on wild sericigenous insects in the North Eastern India are available [2,3,13,14,] information on species diversity and distribution pattern of silkmoths in the State of Meghalaya is generally lacking. Gupta (2000) recorded 20 species of wild silk moths from Meghalaya. [4]Lepidoptera is probably one of the most suitable groups for most quantitative comparisons between insect faunas to be valid, for the many reasons elaborated by Holloway. [5,6,7] .The wings of many species of the wild silk moths are variously and differently marked and coloured making these Lepidopterans strikingly beautiful.

STUDY SITES

Meghalaya situated in the Eastern Himalayas comprises of an area of 22,549 sq. Km, and lies between 25°02' and 26°07' north latitude and 89°49' and 92°50' east longitude. The elevation ranges from 60m to 1950m above sea level. Average maximum and minimum temperatures in the state varies from 5^0C to 32^0C and average rainfall as high as 1200 cm in some areas. It has a forest cover of 9,496 sq. km which is 42.34% of the total geographic area of the State. The Meghalayan sub tropical forests have been considered among the richest botanical habits of Asia. Meghalaya currently has 11 districts. These are: East Garo Hills, East Khasi Hills, Jaintia Hills, Ri-Bhoi, South Garo Hills, West Garo Hills, West Khasi Hills, West Jaintia Hills, East Jaintia Hills, South West Khasi Hills, North Garo Hills and South West Garo Hills. The western part of the plateau, comprising the Garo Hills Region with lower elevations, experiences high temperatures for most of the year.

MATERIALS AND METHODS

Field surveys were conducted in various locations inKhasi Hills of Meghalaya This include Sohra 25° 16.48.2' N and 091° 43.770E, Siatbakon (25° 14.447' N and 091° 56.418E), Pynursla (25°18'38.2N and 091°54'18.7E),Umshing Mawkynroh Shillong (25° 17.447' N and 091° 56.418E), Mawroh (25°36'35.7N and $091^0$54'30.2E), Mawiong (25°38'20.81N and $091^0$53'36.9E) and Mawklot (25° 33.099' N and 091° 50.084S) East Khasi Hills district, Mawkyrwat ($25^0$36.528N and $91^0$44.928E).

Mairang West Khasi Hills District, Umran (25^0 46.384'N and 091^0 52.043'S), Nongpoh (25^o74.109'N and 091^o 90.920), Umsning$25^0$45'41.61N and $091^0$52'47.2ERi-Bhoi District and Nongbah 25.51113N and 092.24455E, Jaintia Hills District during the time period to study wild silk moths along with their host plants.

The collection of the eggs and larval stages was done by hand picking; adults were collected with the help of light traps, torches, a white screen which attract the moths and a moth collecting net. White light is used along with a 3mX5m white cloth placed at the collection site for three to four hours. Field photographs of the moths with the different stages and their host plants were recorded digitally. The larval stages are reared outdoor and indoor on specific host plants. GPS coordinates were recorded for each site.

RESULTS

During the survey a total of fourteen species belonging to nine genera have been collected which include *Attacus atlas* (Linnaeus,1758),*Archaeoattacusedwardwsii* (White, 1859), *Samiaricini* (Boisduval, 1854) ,*Samiacanningi* (Hutton,1860),*Actiasselene* (Hubner,1807), *Actiasmaenas* (Doubleday,*1847) Antheraearoylei* (Moore,1859), *Antheraea assamensis* (Helfer,1837), *Caligula simla* (Westwood,1847), *Caligula thibeta* (Westwood,1853) *Caligula zuleika* (Hope,1843), *Leopakatinka* (Westwood,1848), *Rhodinianewara* (Moore,1872) *Criculatri fenestrata* (Helfer,1837), The larval stages of some of these species along with the host plants have also been collected and identified given in Table 1.

Table 1: Wild silk moths of Khasi Hills of Meghalaya and their host plants

Species	Distribution in Meghalaya	Host plants
Antheraeaassamensis (Helfer)	Nongpoh, NEHU	*Perseabombycina* (Som), King *Litseapolyantha* (Soalu)Juss
Samiaricini (Donovan)	Pynursla, NEHU	*Ricinuscommunis* (castor oil plant), *Manihotesculenta* (tapioca),Crantz *Heteropanaxfragrans* (kesseru), Seem *Evodiaflaxinifolia* (payam) Hook
Caligula simla	MawlaiMawroh, NEHU	*Litsea* species, *Dociniaindica* (wild apple), *Exbuclandiapopulnea* (pipli tree), *Grevillearobusta* (silver oak)
Actiasselene (Hubner)	NEHU, Mawkyrwat,	*Exbuclandiaopulnea* (pipli tree)
Samiacanningi (Hutton)	NEHU, Pynursla	Citrus (lemon plant), *Ricinuscommunis* (castor oil plant), *Manihotesculenta* (tapioca),Crantz *Heteropanaxfragrans* (kesseru), Seem *Evodiaflaxinifolia* (payam) Hook

Attacus atlas (male) *Archaeoattacus edwarsii* (male) *Samia ricini* (male)

Samia ricini (female) *Samia canningi* (male) *Samia canningi* (female)

Actias selene (male) *Actias selene* (female) *Actias maenas* (male)

Actias maenas (female) *Antheraea assamensis* (male) *Antheraea assamensis* (female)

Anheraearoylei(male) *Caligula simla* (male) *Caligula simla* (female)

Caligula zuleika (male) *Caligula thibeta* (male) *Caligula thibeta* (female)

Cricula trifenestrata (male) *Cricula trifenestrata* (female) *Loepa katinka* (male)

Loepa katinka (female) *Rhodinia newara* (male) *Rhodinia newara* (female)

Fig 1: Some of the wild silk moths of Khasi Hills OfMeghalaya

DISCUSSION

A maximum number of 11 species of wild silk moths have been recorded from East Khasi Hills, followed by 4 species from Ri- Bhoi District, 3 species from West Khasi Hills and two species have been recorded from Jaintia Hills District during the study. Also four new records of the Saturniid moths have been reported during the study period which include two species of the genus Samia, *Samiaricini* and *Samiacanningi*, and two species of the genus Caligula, *Caligula simla and Caligula thibeta* even two the first two species that is *Samiaricini* and *Samiacanningi* are also found in other North Eastern states of India. It is seen that *Actiasselene* and *Caligula simla* are very common in Khasi Hills of Meghalaya. Seitz (1933) recorded 19 species of wild sericigenouslepidopterans from the entire North Eastern India including Sikkim and Assam. I.J Gupta (2000) has reported thirteen species of wild silk moths from Meghalaya as compared to fourteen species from the present study. Literature review has shown that 10 species previously recorded from Meghalaya have not been recorded during the present study. Kakati (2009) reported fourteen species of wild silk moths belonging to eight genera from the State of Nagaland with 10 common species as compared to those recorded from Khasi Hills of Meghalaya during the study which include *Attacus atlas*, *Archaeoattacusedwardsii*, *Samiaricini*, *Samiacanningi*, *Actiasselene*, *Actiasmaenas*, *Antheraeaassamensis*, *Antheraearoylei*, *Criculatrifenestrata*, *Loepakatinka*. The genetically useful and important traits of these wild silk moths such as hibernation, reelability may be a sound basis for all future breeding programmes of other domesticated silk moths in evolving commercially and economically desirable improved strains of species [10]. The moths exhibit diversity in their life cycle from egg to adult moth with variations in shape, size and colour among different species. The diversity shows the capacity of the silk moths to adjust to different ecological conditions and reveals the potentiality and genetic adaptability through interaction with environment to struggle and sustain in varying ecologicalniches [8].

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