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S Rathikannu

Ph.D Scholar, Department of
Agricultural Entomology, Tamil
Nadu Agricultural University,
Coimbatore, Tamil Nadu, India

N Chitra

Associate Professor, Department
of Agricultural Entomology,
Tamil Nadu Agricultural
University, Coimbatore, Tamil
Nadu, India

Preliminary report on crambid moths (Lepidoptera: Pyraloidea: Crambidae) from different places in Tamil Nadu

S Rathikannu and N Chitra

Abstract

A preliminary study on the occurrence of crambid moths in various locations of Tamil Nadu viz., Kodaikanal (10°12.329'N 077°20.257'E), Ooty (11°24.87'N 76°44.122'E), Yercaud (11°47.73'N 078°12.710'E) and Coimbatore (76°55.759N 11°00.986'E) was carried out. A total of 42 species of Crambidae were recorded. Among them, the subfamily Spilomelinae was the dominant group with 37 species followed by Pyraustinae, Crambinae and Cybalomiinae.

Keywords: pyraloidea, crambidae, light trap, forest ecosystem, Distribution

1. Introduction

The order Lepidoptera is the second largest order with over 1, 60,000 ^[1] described species of which over 12,000 species are recorded from India ^[2]. The superfamily Pyraloidea is the third largest having more than 16,000 described species worldwide ^[3]. The familial composition of the Pyraloidea has changed markedly over the past 30 years, with a general decrease in the number of families and currently with only two families, Pyralidae and Crambidae. At the generic level, the family Pyralidae contains 1,067 genera and 6,233 described species and Crambidae contains 9,654 species classified into 1,018 genera ^[4] but many more species are undescribed, especially in the tropics. The Crambidae is the larger family with 10,000 described species worldwide. Amongst Lepidoptera, Crambidae perhaps show the most diverse life history adaptations and behavioural characteristics. They have great economic importance as many species cause serious damage to agricultural crops such as sugarcane, maize, tomato, brinjal, cabbage, cotton, oil seed and bamboo ^[5] and also in forest ecosystems. The caterpillars of most of the species feed on living plants either internally or externally as leaf rollers, leaf webbers, leaf miners, borers, root feeders, seed feeders and some are adapted to life under water (Acentropinae). Tamil Nadu is endowed with a rich biodiversity. So far there is no extensive study made on the crambid moth fauna in Tamil Nadu ^[6] except who has published Crambid species from Nilgris. In the view of afore said background this study was undertaken.

2. Materials and Methods

2.1 Study Area: Sampling was carried out in Coimbatore (26 September 2015–27 September 2015; 76°55.759N 11°00.986'E), Yercaud (14 October 2015–16 October 2015; N11°47.73' E078°12.710'), Ooty (14 December 2015 – 15 December 2015; N11°24.87 E76°44.122') and Kodaikanal (7 January 2016 – 9 January 2016; N10°12.329' E077°20.257'). Kodaikanal and Ooty are located in the Western Ghats having monsoon influenced subtropical highland climate; the temperature is cool throughout the year due to high elevation. Coimbatore is having tropical wet and dry climate. Yercaud is located in the Shervaroy range of hills in the Eastern Ghats, Salem District. Situated an altitude of 1515m above the sea level and have a moderate humid subtropical climate.

2.1 Collection of Moths: Moth collection was carried out from light trap (Fig.1) with 400 watts Mercury lamp using white moth cloth of size 1.5 x 5.5m. Collection was made between 6.00pm to 6.00am. The moths were collected by using killing bottles with ethyl acetate as killing agent and the collected moths were transferred individually into the butter paper covers to avoid the damage.

Correspondence**S Rathikannu**

Ph.D Scholar, Department of
Agricultural Entomology, Tamil
Nadu Agricultural University,
Coimbatore, Tamil Nadu, India

Later the moths were properly pinned in the laboratory and identified by following the keys [6] and reference collection available in the Insect Biosystematics Laboratory, Department of Agricultural Entomology, TNAU, Coimbatore. The scientific names have been updated as per Lepindex [7] (<http://www.nhm.ac.uk/entomology/lepindex>).



Fig 1: Light trap collection

Result

Crambidae moths were attracted to light trap from 7.00 pm onwards and attraction increased from 8.00 pm to 11.00 pm. The collection was made at waxing crescent phase in Yercaud, Ooty and waning crescent phase in Kodaikanal and Coimbatore. Crambidae moths were identified based on their sitting posture as antennae placed backwards over the body, abdomen raised and tympanum characters in which praecinctorium is present (Fig.2).



Fig 2: Praecinctorium present on the tympanum of Crambidae

During the study period, richness of species was observed in the subfamily Spilomelinae (37 species), Pyraustinae (2 species), Crambinae (2 species) and Cybalomiinae (1 species). Among the Spilomelinae, *Glyphodes* was represented by five species viz., *G. bivitalis*, *G. caesalis*, *G. canthusalis*, *G. pulverulentalis*, *G. stolalis* followed by *Palpita* with three species viz., *P. annulifer*, *P. nigropunctalis* and *P. unionalis*. The species *Maruca vitrata* (Fabricius, 1787) (Spilomelinae) and *Pagyda salvalis* Walker, 1859 (Pyraustinae) were found to be abundant in all the locations. A total of 42 species were recorded from the study area furnished in Tab 1.

Table 1: Crambidae moth fauna from Coimbatore, Yercaud, Ooty and Kodaikanal

S. No	Subfamily	Name of the species	Location	Occurrence
1	Spilomelinae	<i>Agathodes ostentalis</i> Geyer,1837	Yercaud	C
2		<i>Agrioglypta eurytusalis</i> (Walker,1859)	Yercaud, Kodaikanal	R,U
3		<i>Agrioglypta zelimalis</i> (Walker,1859)	Kodaikanal	R
4		<i>Antigastra catalaunalis</i> (Duponchel,1833)	Coimbatore	C
5		<i>Botyodes asialis</i> Guenee,1854	Coimbatore	U
6		<i>Cirrhrochrista aetherialis</i> Lederer,1863	Yercaud, Ooty	R,U
7		<i>Cnapalocrocis medinalis</i> (Guenee,1854)	Yercaud, Coimbatore	R,C
8		<i>Cydalima laticostalis</i> (Guenee,1854)	Kodaikanal	C
9		<i>Cryptographis indica</i> (Saunders,1851)	Yercaud, Kodaikanal, Coimbatore	U,R,C
10		<i>Conogethes punctiferalis</i> Guenee,1854	Coimbatore	C
11		<i>Endocrossis flavibasalis</i> Moore,1867	Coimbatore	U
12		<i>Filodes fulvidorsalis</i> Hubner,1832	Yercaud	R
13		<i>Glyphodes bivitalis</i> Guenee,1854	Yercaud, Ooty	R,R
14		<i>Glyphodes caesalis</i> Walker,1859	Yercaud, Ooty	U,U
15		<i>Glyphodes canthusalis</i> Walker,1859	Coimbatore	U
16		<i>Glyphodes onychinalis</i> (Guenee,1854)	Yercaud, Ooty, Coimbatore	U,U,C
17		<i>Glyphodes pulverulentalis</i> Hampson,1896	Kodaikanal, Coimbatore	C,C
18		<i>Glyphodes stolalis</i> Guenee,1854	Yercaud, Kodaikanal	R,R
19		<i>Herpetogramma bipunctalis</i> (Fabricius, 1794)	Yercaud, Ooty	U,U
20		<i>Herpetogramma licarsisalis</i> (Walker,1859)	Yercaud,Kodaikanal	U,U
21		<i>Ichnurges gratiosalis</i> Walker,1859	Yercaud, Ooty, Coimbatore	U,R,R
22		<i>Maruca vitrata</i> (Fabricius,1787)	Yercaud, Kodaikanal, Ooty, Coimbatore	C,C,C,C
23		<i>Mimudea ablactalis</i> (Walker,1859)	Yercaud, Coimbatore	R,C
24		<i>Nausinoe geometralis</i> (Guenee,1854)	Coimbatore	U
25		<i>Omiodes indicata</i> Fabricius,1775	Yercaud, Kodaikanal, Ooty	U,R,R
26		<i>Palpita annulifer</i> Inoue,1996	Yercaud, Kodaikanal	C,R
27		<i>Palpita nigropunctalis</i> Bremer,1864	Yercaud, Kodaikanal	U,U
28		<i>Palpita unionalis</i> Rossi,1794	Yercaud, Kodaikanal, Ooty	R,U,U
29		<i>Parotis marginata</i> (Hampson,1893)	Yercaud, Coimbatore	R,U
30		<i>Psara basalis</i> Walker,1865	Coimbatore	C
31		<i>Pycnarmon meritalis</i> (Walker, 1859)	Kodaikanal	R

32		<i>Pycnarmon</i> sp	Yercaud	R
33		<i>Pygospila tyres</i> (Cramer,1780)	Yercaud, Coimbatore	R,R
34		<i>Pyrausta testalis</i> (Fabricius,1794)	Coimbatore	U
35		<i>Salbia haemorrhoidalis</i> Guenee,1854	Yercaud, Kodaikanal	U,U
36		<i>Sameodes cancellalis</i> (Zeller, 1852)	Yercaud, Kodaikanal	U,U
37		<i>Spoladea recurvalis</i> (Fabricius,1775)	Yercaud, Kodaikanal, Ooty, Coimbatore	R,R,U,C
38	Pyraustinae	<i>Paliga machoralis</i> Walker, 1859	Coimbatore	U
39		<i>Pagyda salvalis</i> Walker, 1859	Yercaud, Kodaikanal, Coimbatore	C,C,C
40	Crambinae	<i>Chilo sacchariphagus indicus</i> Kapur,1950	Coimbatore	U
41		<i>Chilo partellus</i> Swinhoe,1885	Coimbatore	U
42	Cybalomiinae	<i>Hendecaesis duplifascialis</i> Hampson,1891	Coimbatore	R

(C- more than 20; U – more than 5 and upto 10; R- with in 5)

3. Discussion

Our knowledge of the insect fauna of Indian forests is largely based on earlier studies by Hampson ^[8]. The tropical regions are known for their richness of species diversity ^[9] and insects comprise about 90% of tropical forest biomass ^[10]. The subfamily Spilomelinae is the most speciose group among the Pyraloidea with 3,500 species worldwide ^[11]. Being most ecologically diverse group, the present study revealed the relative abundance of (37 species) from Spilomelinae when compared to other subfamilies. Gadhikar ^[12] reported that Spilomelinae species were recorded as common in the fauna of Amravati, Maharashtra. Chandra ^[13] studied the moth diversity of Madhya Pradesh and Chhattisgarh and recorded 142 species from 90 genera in 16 families, with families Noctuidae and Crambidae as dominant in that area and Gurule ^[14] reported 26 species of Crambidae from Northern Maharashtra. Elanchezhian ^[15] studied moth fauna in Western ghats, Maruthamalai hills as a good habitat for biodiversity of Pyraloidea. Regarding light trap collections, most authors observed a decline in the catch under the influence of the moon. Howell ^[16] found that on moonless nights, the collecting sheet was covered by an uncountable multitude of insects. Garcia ^[17] collected the highest number of individuals by waning moon and the smallest number of full moon. According to Gustafson ^[18] the period from the last quarter of the new moon is the best time for light trapping. From the point of collection, the intensity of illumination plays an important role and during waxing and waning crescent phases relatively a bright night will attract as many as insect towards light trap.

4. Conclusion

The study was an attempt to explore the diversity of crambid moth fauna from different places and it was a contribution towards the updating of crambidae species in Tamil Nadu. Collections of insects were made at different locations with various climatic conditions which influence the relative abundance of insects attracted to light trap. A further study is required on the diversity with the influence of waxing and waning crescent phase of the moon.

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