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TAXONOMIC STUDY OF THE SUBFAMILY GLAPHYRIINAE (CRAMBIDAE: LEPIDOPTERA) FROM TAMIL NADU, INDIA

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Abstract

The study was carried out to depict the presence of different species of Glaphyriinae among the different parts of Tamil Nadu and studied with their morphology and genitalia structure. The study was carried out at Tamil Nadu Agricultural University and the study revealed that the species *Crocidolomia pavonana* (Fabricius, 1794), *Hellula undalis* (Fabrircius, 1781) and *Noorda blitealis* Walker, 1859 were distributed in different parts of Tamil Nadu. Male and female genitalia of these species were descried.

Key words: Glaphyriinae, Light trap, Genitalia, Taxonomy, Tamil Nadu.

Introduction

Species belonging to the family Crambidae are of great economic importance as many species cause serious damage to agricultural and horticultural crops. The subfamily Glaphyriinae comprise about 326 species in 51 genera (Regier *et al*., 2012) of small to midsized moths distributed mainly in the New World, with a few species of the genus *Hellula* in the Old World (Munroe, 1999). Based on the molecular studies the combination of Evergestinae + Glaphyriinae + Noordinae was proposed by Regier *et al*., 2012. *Hellula* includes ten or eleven putatively valid species (Munroe, 1995; Landry and Albelo, 2008). Few Glaphyriinae species *viz*., *Crocidolomia suffusalis*; *C. pavonana*, *Hellula undalis*, *Noorda blitealis* and *N. moringae* were occurring throughout Southern India (Nair, 1970; Ayyar, 1963; Fletcher, 1914). With this background, the present study was aimed to account the species of Glaphyriinae in different parts of Tamil Nadu.

Materials and Methods

• Study Area: Collection of insects were carried at TNAU, Coimbatore; Anaikatti; Horticultural Research Station, Ooty and Yercaud; Central Sheep and Wool Research Institute (CSWRI), Mannavanur and Kavunji, Kodaikanal; Horticultural College and Research Institute, Periyakulam.

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Collection of moths was carried out with white moth cloth (1.5 × 5.5 m) and mercury lamp (400 Watts) from 6.00pm to 6.00am. The larvae from the host plant were also collected and reared in the laboratory. The insects were curated and labeled as per Johnson and Triplehorn, (2005). The moths were identified as per Hampson, (1896) and by comparing with reference collection of IBL, TNAU, Coimbatore. The generic and species nomenclature follows Beccaloni, (2003) and Nuss, (2003).

Result

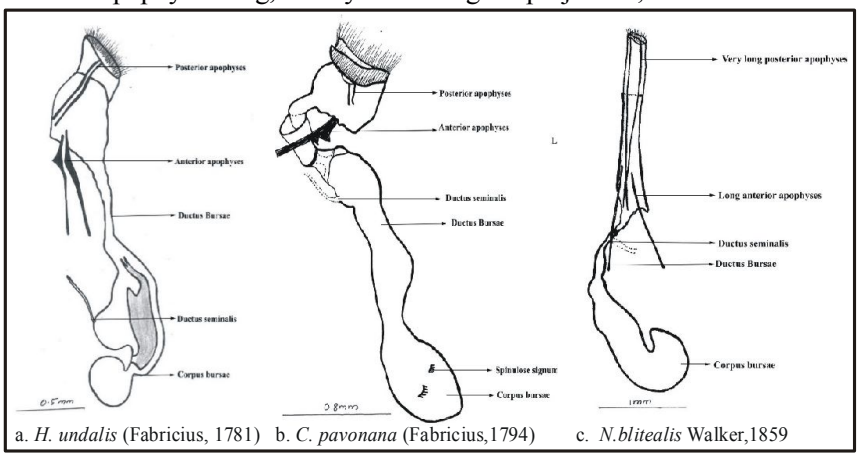
During the study, three species coming under the genus *Crocidolomia*, *Hellula* and *Noorda* under the subfamily Glaphyriinae were collected from different parts of Tamil Nadu and the host plant recorded for the species *C. pavonana* and *H. undalis* was Cauliflower; *N. blitealis* was recorded on drumstick. Morphology and genitalia were studied and descried as follows:

***Hellula undalis* (Fabricius, 1781)**

• Male genitalia: Uncus short, anterior part triangular; gnathos absent. Tegumen longer, teguminal ridges sclerotized; vinculum short, sclerotized and saccus broadly U shaped. Valva long, apex narrow; covered with dense setae; costa prominent, sclerotized with sharp spine near apex; sacculus broad, weakly sclerotized; harpe absent; transtilla composed of triangular lateral projections meeting mid line; juxta oblong, sclerotized ring-like. Aedeagus straight, vesica with three well sclerotized long

spine-like cornuti (Fig. 2.a).

• Female genitalia: Anal papillae densely setose. Anterior apophyses long, basally with triangular projection; posterior apophyses almost equal to anterior apophyses. Ostium membranous, antrum long, broadly sclerotized; ductus seminalis originate at middle of lateral expansion of ductus bursae. Ductus bursae wide and membranous and expanding abruptly into rounded corpus bursae; signum absent (Fig. 1.a).



a. *H. undalis* (Fabricius, 1781) b. *C. pavonana* (Fabricius,1794) c. *N.blitealis* Walker,1859

Fig. 1: Female genitalia of *H. undalis*, *C. pavonana* and *N. blitealis.*

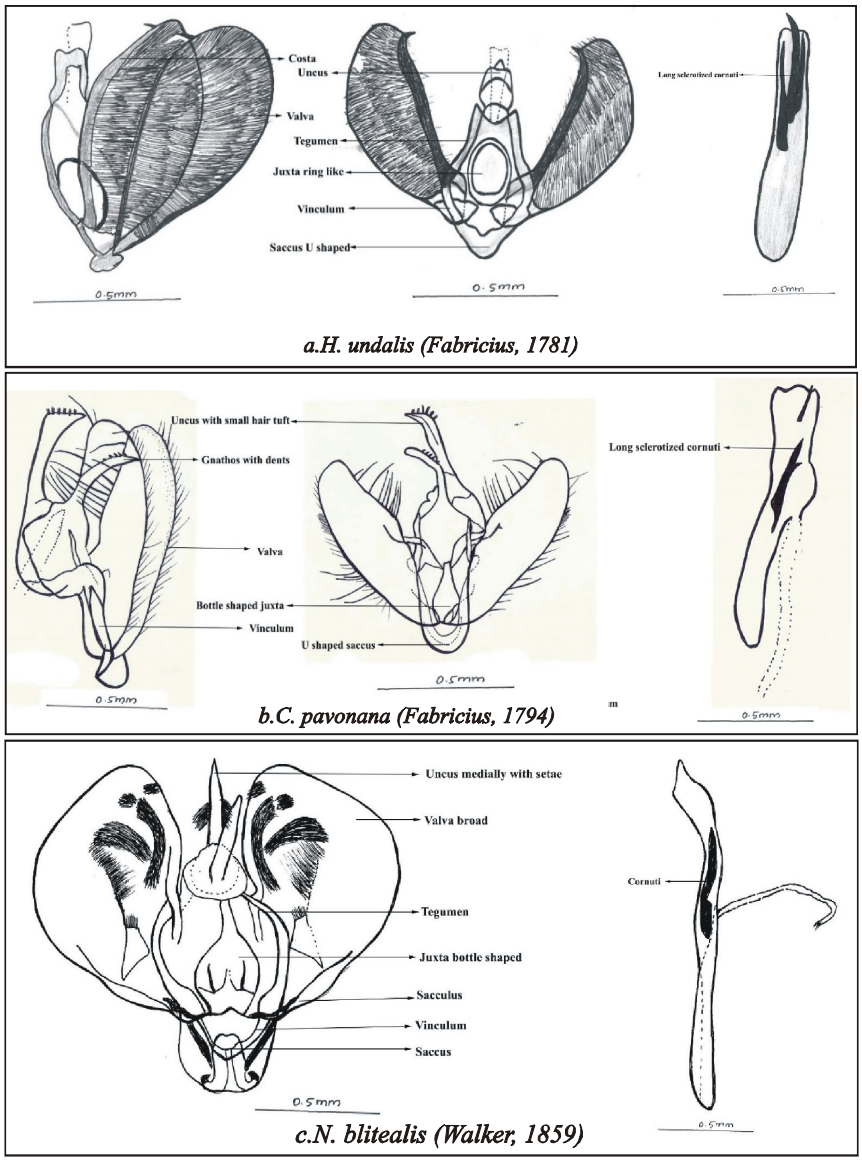


Fig. 2: Male genitalia of *H. undalis*, *C. pavonana* and *N. blitealis.*

***Crocidolomia pavonana* (Fabricius, 1794)**

• Male genitalia: Uncus long, beak-shaped, apex with six group of small hair tufts on dorsal surface. Gnathos conspicuous, curved, well developed and six prominent dents on dorsal surface; subscaphium thin, prominent. Tegumen broad; vinculum long, weakly sclerotized; saccus broadly U shaped. Valva long and tapered from base to apex; costa poorly defined with ten long setae; harpe absent, sacculus poorly demarcated. Transtilla long, ribbon-like; juxta bottle-shaped and distally well sclerotized. Aedeagus moderately long, nearly straight; vesica with three well developed, heavily sclerotized cornuti (Fig. 2.b).

• Female genitalia: Anal papillae oval, fringed with long setae. Anterior apophyses long and broader than posterior apophyses with triangular expansion medially. Ostium prominent, membranous; antrum funnel-shaped. Ductus bursae moderately long, posterior portion quite broadened and membranous; ductus seminalis originate at caudal end of ductus bursae below antrum. Corpus bursae more or less rounded, membranous with two small spinulose signum (Fig. 1.b).

***Noorda blitealis* Walker, 1859**

• Male genitalia: Uncus long, apex narrow and fringed with long setae at middle; gnathos absent. Subscaphium long, shorter than uncus. Tegumen wider, membranous; vinculum almost long, membranous and saccus broad, tongue shaped. Valva long, wide at middle with narrow base, membranous; apex with two bunch of short hairs and one bunch of long hairs extend to middle of valva;

middle valva fringed with sparse to dense hairs; costa weakly sclerotized; sacculus inconspicusous, weakly sclerotized; harpe long, triangular fold-like, apically fringed with setae. Transtilla membranous; juxta bottle-shaped; membranous, basally sclerotized. Aedeagus almost straight, sheath weakly sclerotized; long, sclerotized, slightly curved cornuti (Fig. 2.c).

• Female genitalia: Anal papillae with sparse setae. Anterior apophyses long, medially with angular projection; posterior apophyses very long, slender, two time longer than anterior apophyses. Ostium membranous, antrum short, sclerotized; ductus seminalis originate at middle of ductus bursae. Ductus bursae long, slender and membranous; inverted question mark shaped corpus bursae, membranous with minute sclerotized dots; signum absent (Fig. 1.c).

Discussion

Solis and Adamski, (1998) defined the subfamily Glaphyriinae by the absence of chaetosemata on the head, gnathos of the male genitalia and the presence of sclerotized antrum in the female genitalia. Genitalia descriptions were confirmed with Landry and Albelo, (2008) described the presence of dorsoapical spine in valva in *Hellula undalis*. It is originally an Old World species described first from Italy and two species of *Hellula* from the Galapagos Islands were also described of which *H. phidilealis* was new species. Kumar, (2013) studied *H. undalis* collected from different parts of North India.

Zeller, (1852) erected the genus *Crocidolomia* with *C. binotalis* Zeller, 1852 as its type species. Marion, (1952) included *Crocidolomia* in the subfamily Evergestinae and Regier *et al*., 2012 synonymized Evergestinae with Glaphyriinae. Thus *Crocidolomia* currently belongs to the subfamily Glaphyriinae. In *C. pavonana* sexual dimorphism was observed and description was confirmed with Rose, (1982) and Kumar, (2013). Chen and Wang, (2013) reviewed three species of *C. pavonana*, *C. suffusalis* and *C. subhirsutalis* occurring in China and state that *C. pavonana* is similar to *C. luteolalis* but differs in the pale yellow FW. *Noorda* synapomorphies having unusual tympanal organs that are partially embedded into the thorax and have a reduced, unilobed and blade-like praecinctorium and B… genitalia characterized by broadly rounded valvae, a long and slender uncus and a gnathos with a very short median element (Minet, 1980).

Conclusion

The three species were taxonomically studied and widely distributed in different parts of Tamil Nadu. The species *C. pavonana* and *H. undalis* were reported in Cauliflower and *N. blitealis* was reported in Drumstick. Since hilly areas are endowed with rich flora and fauna, further research work is needed on Glaphyriinae to report the diversity and also to conserve the species in Tamil Nadu.

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