



Moths of Superfamily Pyraloidea (Lepidoptera) from Western Ghats (India)

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Abstract: Twenty-three species belonging to twenty-one genera i.e., *Nomophila* Hübner, *Palpita* Hübner, *Glyphodes* Guenée, *Botyodes* Guenée, *Tyspanodes* Warren, *Dichocrocis* Lederer, *Agrotera* Schrank, *Cnaphalocrocis* Lederer, *Syngamia* Guenée, *Terastia* Guenée, *Meroctena* Lederer, *Polythlipta* Lederer of subfamily Spilomelinae; *Agathodes* Guenée, *Phlyctaenia* Hübner, *Nausinoe* Hübner, *Syllepte* Hübner, *Aetholix* Lederer, *Filodes* Guenée, *Nevrina* Guenée of subfamily Pyraustinae and *Nymphula* Schrank subfamily Nymphulinae and *Eoophila* Swinhoe of subfamily Acentropinae of family Crambidae of Superfamily Pyraloidea has been collected from the different localities of Western ghats.

Keywords: India, Lepidoptera, Moths, Pyraloidea, Western ghats

The Western Ghats are quite diverse and unique due to their topography and climatic conditions. It covers an area of about 160,000 Km² and stretches for 1600 km from the mouth of river Tapti in the North to Cape Camorin in the South. Due to great diversity in flora and fauna, it is one of the hot biodiversity spots of India. The mountain ranges are with an average height of about 1200MSL running parallel to the Western coast of Southern India in the six states i.e., Maharashtra, Goa, Karnataka, Gujarat, Tamil Nadu and Kerala. Except single major gap of about 24 km called as 'PalGhat gap' along with some small passes like 'Goa gap', 'Bhor Ghat' and 'ThalGhat', these ranges of the Western Ghats are almost continuous up to the last end. The Western Ghats are also known by different states i.e., as the Sahyadri mountains in Maharashtra and Karnataka, Nilagirimalai in Tamil Nadu and Sahyaparvatam in Kerala. The highest peak (2,695 MSL) Anaimudi peak of the Western Ghats which lies in the ranges of the state of Kerala. The Anaimudi peak acts as a central point from where three ranges radiate to different directions viz., the Anaimalai hills (North), the Palni hills (North-East) and the Cardamom hills (South). The order Lepidoptera is divided into primitive Lepidoptera, Early Heteroneura, Lower Ditrysia and Higher Ditrysia. Further, the Lower Ditrysia, the larvae of which are often concealed rather than external feeders, includes the Superfamilies viz., Tineoidea, Gracillarioidea, Yponomeutoidea, Gelechioidea, Cossioidea, Tortricoidea, Castnioidea, Sesiioidea, Zygaenoidea, Immoidea, Copromorphoidea, Schreckensteinoidea, Urodoidea, Epermenioidea, Alucitoidea, Pterophoroidea, Hyblaeioidea, Thyridoidea and

Pyraloidea (Scoble 1995). Four subfamilies i.e., Spilomelinae, Pyraustiinae, Nymphulinae and Acentropinae moths belonging to family Crambidae of Superfamily Pyraloidea were collected and have been dealt with during the present investigations from the area, under reference.

MATERIAL AND METHODS

Survey-cum-collection tours were conducted from different localities of states Goa, Maharashtra, Karnataka, Tamil Nadu and Kerala falling in the jurisdiction of Western Ghats during March 2003 to October 2006 (Map attached). The details of the localities and their coordinates are provided (Table 1). Due to nocturnal behaviour, adult moth diversity referable to family Crambidae, the adults have been collected with the help of a portable light trap (Photo 1). The portable trap comprises a funnel (diameter top 30 cm, bottom 6 cm, height 30 cm) fitted with baffle plates so that the moths once visiting the light get trapped around the lamp. The source of light to attract the moths was a 125w Mercury Vapour lamp fixed in the funnel. The funnel is fixed on the top of a collecting chamber (30cm x 30cm x 12 cm) fitted with a sliding collecting trays (29cm x 29cm). The collecting chamber used to be charged/fumigated with 1, 1, 2, 2- Tetrachloroethane as a killing agent for the adult moth. The petri dish containing cotton soaked with the aforesaid chemical was placed in one of the corners of the tray. Some of the moths were captured individually in glass killing tubes of various sizes (2cm x 7cm to 5cm x 15cm) charged with ethyl acetate poured over the plaster of Paris dried at the bottom of the tube from near the

Restaurants, Hotels, Forest Rest Houses, Bus Depots and Railway Stations around the localities being visited. Besides the portable light trap, some collection was also made by hanging the source of light (125w Mercury Vapour lamp) on a white sheet or a whitewashed wall. As per techniques being used in Lepidopterology (Lindquist 1956, Hodges 1958, Tagestad 1974, Zimmerman 1978, Nielson 1980, Sokoloff 1980, Mikkola 1986, Landry and Landry 1994), the entire collected specimens were processed for further biosystematics studies.

RESULTS AND DISCUSSION

Twenty-three species belonging to 21 genera of moths family Crambidae were collected and identified from the available literature (Hampson 1896, Roonwal et al 1964, Singh 1976, Pajni and Rose 1977, Nielson 1980, Mandal and Bhattacharya 1980, Sokoloff 1980, Singh 1984, Rose and Singh 1985, 1988, Kirti and Rose 1987, 1989, 1990, 1992, Nayar et al 1990, Rose and Kirti 1989, Srivastava 1996, Atwal and Dhaliwal 2008) and also with the reference collections housed in the National Pusa Collection, Division of Entomology, IARI, New Delhi and also from the Museum of Department of Zoology & Environmental Sciences, Punjabi University, Patiala. All the collections are deposited in the Museum of Department of Zoology & Environmental Sciences, Punjabi University, Patiala. The details are provided below:

Higher Classification:

Phylum: Arthropoda
 Subphylum: Hexapoda
 Class: Insecta
 Order: Lepidoptera

Superfamily: Pyraloidea

Family: Crambidae

The presently studied genera and number of species are provided (Table 2).

Superfamily Pyraloidea

Forewing with vein 1A vestigial or absent. Hindwing with vein Rs partly fused with or approximated to vein Sc+R, beyond cell for some distance, vein M₁ stalked with or approximated to vein vein Rs, vein 1A always present.

Family Crambidae

Subfamily spilomelinae

I. *Nomophila* hübner

Nomophila Hübner 1825, Verz.: 368 (Type- species: *noctuella* Schiffermuller and Denis)

Nomophila noctuella (Schiffermüller & Denis)

Nomophila noctuella Schiffermuller & Denis, syst. Verz. Schm. Wien, p. 136 (1775) (*Tinea*).

Material examined: India: Karnataka: Dist. Kodagu, Medikeri, 1100mASL, 25.ix.2003, 03♂♂; Dist. Kodagu, Baghamandala, 900mASL, 01.viii.2004, 01♂; Dist. Uttar Kannada, Ganeshgudi, 480mASL, 14.x.2005, 03♂♂; Dist. Uttar Kannada, Jog Falls, 480mASL, 08.viii.2006, 01♂; Maharashtra: Dist. Sindhudurg, Amboli, 850mASL, 11.x.2005, 04♂♂; Gujarat: Dist. The Dangs, Saputara, 970mASL, 30.ix.2005, 01♂; Dist. The Dangs, Waghai, 180mASL, 31.viii.2005, 02♂♂, coll. A. Katewa.

Distribution: Universal distribution (Hampson 1896); Himachal Pradesh, Uttar Pradesh, Jammu and Kashmir, Chandigarh, Punjab, Haryana (Singh 1976).

Remarks: Though, the species *Nomophila noctuella* (Schiffermüller & Denis) has been considered to be universal in distribution, yet knowing the precise localities will define

Table 1. Visited states/localities

State	Visited localities (Coordinates)
Goa	Keri (15.4593°N, 73.9977°E), Mollem (15.3758°N, 74.2269°E), Ponda (15.4027°N, 74.0078°E)
Gujarat	Dharpur (20.5401°N, 73.1792°E), Vaghai (20.7737°N, 73.4976° E), Ahava (20.7606°N, 73.6912°E), Saputara (20.5786°N, 73.7507° E).
Maharashtra	Allefata (19.1766°N, 74.1108°E), Malshej Ghat (19.3406°N, 73.7746°E), Sanjay Gandhi National Park Bombay (19.2205° N, 72.9128°E), Satara (17.6805°N, 74.0183°E), Mahableshwar (17.9307°N, 73.6477°E), Amboli (15.9647°N, 74.0036°E)
Karnataka	Londa (15.4567° N, 74.4936° E), Ganeshgudi (15.2843° N, 74.5302° E), Khanapur (15.6407° N, 74.5170° E), Ramnagar (12.7209° N, 77.2799° E), Nagargalli (15.4163° N, 74.6119° E), Karwar (14.8074° N, 74.1299° E), Kasarkod (14.2687° N, 74.4335° E), Shimoga (13.9299° N, 75.5681° E), Shettihalli (13.7955° N, 76.1719° E), Honnawar (14.2798° N, 74.4439° E), Jog Falls (14.2004° N, 74.7922° E), Bhagwati (15.1553° N, 74.7615° E), Chickmagalur (13.3161° N, 75.7720° E), Kemangundi (13.5500° N, 75.7500° E), Kallatgiri Falls (13°33'0"N 75°47'17"E), Medikeri (12.4244° N, 75.7382° E), Kulgi (15.1664° N, 74.6373° E), Dandeli (15.2361° N, 74.6173° E) Gundya (12.5218° N, 76.8951° E), Baghamandala (12.3866° N, 75.5287° E).
Tamil Nadu	Ooty (11.4102°N, 76.6950°E), Coonoor (11.3439°N, 76.7945°E), Dodabetta (11.4007°N, 76.7358°E), Kanyakumari (8.0844°N, 77.5495°E), Coimbatore (11.0168°N, 76.9558°E).
Kerala	Mukkali (11.0587°N, 76.5402°E), Agli (11.1014° N, 76.6471° E), Neyyar WLS (8.5341°N, 77.1503°E), Shendumi WLS (8.8578°N, 77.2175°E), Vithura (8.6753°N, 77.0852°E), Rani (9.3866° N, 76.7856° E), Vadasarikera (11.6084°N, 75.5917°E), Kumli (9.6037°N, 77.1675°E), Periyar WLS (9.4631°N, 77.2287°E), Vallakadavu (8.4750°N, 76.9195°E), Deviculam (10.0564° N, 77.1198° E), Maryur (10.2762° N, 77.1615°E) and Parambiculam WLS (10.4667° N, 76.8333°E).

exact limits of its distribution. Accordingly, the collection of the species, under reference, are first additional records from the Western Ghats.

II. PALPITA HÜBNER

Hübner 1808, Erste Zut. Zur. Samm. Exotisch. Schmetterlinge, 1808, Augsburg (monotype: *Palpita normalis unionalis* Hübner).

Type-species : *Pyralis unionalis* Hübner.

(2) *Palpita unionalis* (Hübner)

Hübner 1796, Samml. Eur. Schm. Horde **6**: 21, t. 20, f. 132 (*Pyralis*); 1806-24, Samml. Exot. Schm. Pyr., 2, C, a, f. 4; 1826, Verz. bek. Schm., 1826: 358 (*Margaronia*).

Material examined: India: Karnataka: Dist. Belgaum, FRH, Khanapur, 370mASL, 21.iii.2003, 01♂; Dist. Kodagu, Medikeri, 1100mASL, 16.xi.2002, 01♂; Dist. Uttara Kannada, Ganeshgudi, 480mASL, 13.xi.2003, 05♂♂, 22.vii.2004, 01♂, 16.x.2005, 01♂; Dist. Dakshin Kannada, Gundya, 40mASL, 28.vii.2004, 04♂♂, Dist. Shimoga, Shettihalli WLS, 320mASL, 10.vi.2003, 01♂; Dist. Kodagu, Nisergdhama, 1080mASL, 17.xi.2002, 02♂♂; Kerala: Dist. Kollam,

Chendruni, 70mASL, 03.ix.2004, 02♂♂, 01♀; Gujarat: Dist. The Dangs, Hawa, 520mASL, 29.ix.2005, 04♂♂, coll. Amit Katewa.

Distribution: South Europe, South and West Africa, Madagascar, Mauritius, Aden, throughout India, Ceylon, Australia (Hampson 1896); Chandigarh, Punjab, Haryana, Jammu and Kashmir (Kirti and Rose, 1992).

Remarks: Though the species, under reference, is widely distributed in many parts of world, including India yet the same is reported from the states of Karnataka, Kerala and Gujarat with precise localities for the first time.

Table 2. Number of Subfamilies/genera and number of species

Superfamily	Pyraloidea		
Family	Crambidae		
Subfamily	Genera	No of species	
Spilomelinae	<i>Nomophila</i> Hübner	01	
	<i>Palpita</i> Hübner	01	
	<i>Glyphodes</i> Guenée	01	
	<i>Botyodes</i> Guenée	01	
	<i>Tyspanodes</i> Warren	01	
	<i>Dichocrocis</i> Lederer	02	
	<i>Agrotera</i> Schrank	01	
	<i>Cnaphalocrocis</i> Lederer	01	
	<i>Syngamia</i> Guenée	02	
	<i>Terastia</i> Guenée	01	
	<i>Meroctina</i> Lederer	01	
	<i>Polythlipta</i> Lederer	01	
	Pyraustinae	<i>Agathodes</i> Guenée	01
		<i>Phlyctaenia</i> Hübner	01
<i>Nausinoe</i> Hübner		01	
<i>Syllepte</i> Hübner		01	
<i>Aetholix</i> Lederer		01	
<i>Filodes</i> Guenée		01	
Nymphulinae	<i>Nymphula</i> Schrank	01	
	<i>Eoophila</i> Swinhoe	01	



Map: Area surveyed



Photo 1. Portable light trap

III. GLYPHODES GUENÉE

Guenée, Delt. & Pyral., p. 292 (1854) - Lederer, Wien. Ent. Monatschr., Z, p. 401 (1863. -Meyrick, Trans. Ent. Soc. London, p. 297 (1884).

Type-species: *stolalis* Guenée

(3) *Glyphodes stolalis* Guenée

Guenée 1854, Delt. & Pyral., 1854: 293, t. 3, f. 11 (male) (*Glyphodes*) (India?). - Walker, 1859, Car. Lep. Het. Brit. Mus., 17: 497 (*Glyphodes*).

Material examined India: Gujarat: Dist. The Dangs, Saputara, 970mASL, 30.ix.2005, 04♂♂; Dist. The Dangs, Ahwa, 520mASL, 27.xi.2005, 01♂; Karnataka: Dist. Belgaum, FRH, Londa, 420mASL, 24.iii.2003, 01♂; Dist. Kodagu, Baghamandala, 900mASL, 25.xi.2003, 03♂♂; Dist. Uttar Kannada, Ganeshgudi, 480mASL, 13.xi.2003, 01♂, 21.vii.2004, 01♂, 16.x.2005, 01♂; Dist. Kodagu, Sampaje, 100mASL, 13.xi.2002, 01♂, coll. Amit Katewa.

Distribution: Nepal, Sikkim, Assam, Borneo, Ceylon, Australia (Hampson, 1896); Assam, Sikkim, Meghalaya, Nagaland, Manipur and Arunachal Pradesh (Rose and Kirti, 1989).

Remarks: *Glyphodes stolalis* Guenée is being reported for the first time from the Western Ghats.

(IV) *Botyodes guenée*

Guenée, delt. & Pyral., p. 320 (1854)., - Walker, Cat. Lep. Het. Brit., Mus., 18, p. 550 (1859).

Type-species: *asialis* Guenée.

(4) *Botyodes asialis* Guenée

Guenée, Delt. & Pyral., p. 321 (female) (1854) (*Botyodes*) (India). - Walker, Cat. Lep. Het. Brit. Mus., 18, p. 551 (1859).

Material examined: India: Karnataka: Dist. Belgaum, FRH, Londa, 420mASL, 24.iii.2003, 03♂♂; Dist. Kodagu, Baghamandala, 900mASL, 25.xi.2003, 06♂♂; Dist. Uttar Kannada, Ganeshgudi, 480mASL, 13.xi.2003, 1♂, 16.x.2005, 01♂; Gujarat: Dist. The Dangs, Saputara, 970mASL, 30.ix.2005, 04♂♂; Dist. The Dangs, Ahwa, 520mASL, 29.ix.2005, 01♂, coll. Amit Katewa.

Distribution: Throughout India, Ceylon, Burma (Hampson, 1896); Dehradun, Chakrata, Chandigarh (Kirti and Rose, 1990).

Remarks: Though *Botyodes asialis* Guenée is known to occur throughout India (Hampson, 1896), yet could be collected from only two other states (Karnataka and Gujarat) comprising this area/ hot biodiversity spot.

(V) *Tyspanodes Warren*

Tyspanodes Warren 1891, A. M. N. H. (6) 7: 425 (Type-species: *nigrilinealis* Moore).

(5) *Tyspanodes linealis* Moore

Propachys linealis Moore, 1867, P.Z.S., 1867: 665, pl. 33.

f. 17. Moore, Proc. Zool. Soc. London, p. 665, t. 33, f. 14 (1867) (*Tyspanodes*).

Material examined: India: Kerala: Dist. Kollam, Chendruni, 70mASL, 03.ix.2004, 01♂; Karnataka: Dist. Belgaum, FRH, Khanapur, 370mASL, 21.iii.2003, 01♂; Dist. Kodagu, Medikeri, 1100mASL, 16.xi.2002, 01♂; Dist. Uttar Kannada, Ganeshgudi, 480mASL, 22.vii.2004, 02♂♂, 16.x.2005, 01♂; Dist. Dakshin Kannada, Gundy, 40mASL, 28.vii.2004, 04♂♂; Dist. Shimoga, Shettihalli WLS, 320mASL, 10.vi.2003, 01♂; Dist. Kodagu, Nisergdharma, 1080mASL, 17.xi.2002, 01♂; Maharashtra: Dist. Sindhudurg, Amboli, 850mASL, 11.x.2005, 02♂♂, coll. Amit Katewa.

Distribution: Dharamshala, Sikkim, Ceylon, Andamans (Hampson 1896); Assam, Mizoram (Singh 1984).

Remarks: During the present studies, the collection of the species *Tyspanodes linealis* Moore the Western Ghats becomes new record from this hot biodiversity spot in India.

(VI) *Dichocrocis Lederer*

Lederer, Wien, Ent. Monatschr., 7, p. 477 (1863). - Hampson, Fauna Brit. India, 4, p. 305 (1896);

Type-species: *frenatalis* Lederer = *pandamalis* Walker

(6) *Dichocrocis leptalis* Hampson

Hampson 1892, *Fauna Br. India* (Moths) 1: 383 (nom. Preocc.).

Material examined: India: Karnataka: Dist. Kodagu, Medikeri, 1100mASL, 25.ix.2003, 04♂♂; Dist. Kodagu, Baghamandala, 900mASL, 01.viii.2004, 01♂; Dist. Uttar Kannada, Ganeshgudi, 480mASL, 14.x.2005, 02♂♂; Dist. Uttar Kannada, Jog Falls, 480mASL, 08.viii.2006, 03♂♂; Dist. Chikmagalur, Kallathy Falls, 960mASL, 26.vii.2004, 01♂; Gujarat: Dist. The Dangs, Waghai, 180mASL, 31.viii.2005, 02♂♂; Maharashtra: Dist. Sindhudurg, Amboli, 850mASL, 11.x.2005, 01♂, coll. Amit Katewa.

Distribution: Throughout India (Hampson 1896); Dehradun, Shimla, Solan (Singh 1976).

Remarks: Contrary to the information that the species *Dichocrocis leptalis* Hampson is available throughout in India (Hampson 1896), yet the same has been reported from only three localities in Western Himalaya (Pajani and Rose 1977). The present collection data of the species, under reference, further explores its distribution in the Western Ghats.

(7) *Dichocrocis nilusalis* Walker

Walker 1859, Cat. Lep. Het. Brit. Mus., 18: 685 (male) (*Botys*) (Borneo). - Swinhoe, 1900, Cat. Lep. Het. Oxford Mus., 2: 484.

Material Examined: India: Kerala: Dist. Idukki, Vallakadavu, 780mASL, 09.ix.2004, 01♂, 10.ix.2004, 02♂♂, 12.ix.2004, 01♂; Dist. Idukki, Maryur, 960mASL, 15.ix.2004, 01♂; Dist. Kollam, Chendruni, 70mASL, 03.ix.2004, 01♂; Karnataka: Dist. Uttar Kannada, Ganeshgudi, 480mASL,

20.vii.2004, 01♂, 21.vii.2004, 03♂♂, 16.xi.2005, 02♂♂; Dist. Uttar Kannada, Jog Falls, 480mASL, 24.vii.2004, 01♂; Maharashtra: Dist. Pune, Malshej Ghat, 690m, 02.x.2005, 01♂; Gujarat :Dist. The Dangs, FRH, Ahwa, 520mASL, 29.ix.2005, 01♂, coll. Amit Katewa.

Distribution: Nagas, Khasis, Ceylon, Borneo, Java (Hampson, 1896); Jatinga, North Cachaa Hills, Khasi Hills (Pajni and Rose, 1977).

Remarks: *Dichocrocis nilusalis* Walker is being collected from the aforesaid localities of the Western Ghats for the first time. Accordingly, it becomes new record from this hot biodiversity spot in India.

(VII) *Agrotera* Schrank

Schrank, Fauna Boica, 2 (2), p. 163 (1802). - Guenée, Delt. & Pyral., p. 217 (1854).

Type-species: *nemoralis* Scopelodes

(8) *Agrotera scissalis* (Walker)

Walker, Cat. Lep. Het. Brit. Mus., 34, p. 1526 (male) (1865) (*Aediodes*) (Java).

Material examined: India: Kerala: Dist. Thiruvananthapuram, FRH, Vithura, 120mASL, 04.ix.2004 01♂; 05.ix.2004, 01♂; Dist. Idukki, Vallakadavu, 780mASL, 12.ix.2004, 01♂; Tamil Nadu : Dist. Nilgiris, Dodabetta, 2640mASL, 01.x.2003, 02♂♂; Gujarat: Dist. The Dangs, Saputara, 970mASL, 30.ix.2005, 03♂♂, coll. Amit Katewa.

Distribution: Sikkim, Khasis, Nagas, Ceylon, Java (Hampson, 1896); Hardwar, Garhwal, Dehradun (Rose and Singh, 1988).

Remarks: The aforesaid distribution record of *Agrotera scissalis* (Walker) reveals that it has been recorded from only three states of the Western Gats is not only additional distribution record but also new from this hot biodiversity spot.

(VIII) *Cnaphalocrocis* Lederer

Lederer, Wien. Ent. Monatschr., 7, p. 384 (1963). - Meyrick, Trans. Ent. Soc. London, p. 303 (1884). Type-species: *medinalis* Guenée

(9) *Cnaphalocrocis medinalis* (Guenée)

Guenée, Delt. & Pyral., p. 201 (female) (1854) (*Salbia*) (E. India). - Walker, Cat. Lep. Het. Brit. Mus., 17, p. 361 (1859) (*Salbiar*).

Material examined: India: Kerala: Dist. Thiruvananthapuram, FRH, Vithura, 120mASL, 05.ix.2004, 01♂; Dist. Palakkad, Mukkali, 560mASL, 19.ix.2004, 01♂, 21.ix.2004, 01♂, 22.ix.2004, 04♂♂; Dist. Idduki, Maryur, 960mASL, 15.ix.2004, 03♂♂; Karnataka: Dist. Kodagu, Medikeri, 1100mASL, 16.xi.2002, 01♂, 25.ix.2003, 01♂; Dist. Uttar Kannada, Ganeshgudi, 480mASL, 16.x.2005, 02♂♂; Dist. Kodagu, Sampaje, 100mASL, 14.xi.2002, 01♂;

Dist. Kodagu, Nisergdhama, 1080mASL, 17.xi.2002, 01♂; Dist. Uttar Kannada, Kulgi, 360mASL, 16.vii.2004, 01♂, coll. Amit Katewa.

Distribution: Japan, Throughout Oriental, India, Russia (Hampson 1896); Dehradun, Kalka, Kurukshetra, Srinagar, Punjab, Chandigarh (Singh 1976).

Remarks: *Cnaphalocrocis medinalis* (Guenée) is a minor pest of rice and commonly known as rice leaf roller (Nayar and David 1990, Srivastava 1996, Atwal and Dhaliwal 2002). The above distributional data shows its prevalence in two states of the Western Ghats, as well.

(IX) *Syngamia* Guenée

Guenée, Delt. & Pyral., p. 187 (1854). - Walker, Cat. Lep. Het. Brit. Mus., 17, p. 333 (1859). Type-species: *florellalis* Guenée = *florella* Cramer

(10) *Syngamia abruptalis* (Walker)

Walker, Cat. Lep. Het. Brit. Mus., 17, p. 371 (1859) (*Asopia*?) (Cylon). - Felder & Rognohofer, Reise Novara, Lep. (Het.), p. 4, t. 135, f. 10 (1874) (*Botys*) (Bengal).

Material examined: India: Karnataka: Dist. Uttar Kannada, Ganeshgudi, 480mASL, 20.vii.2004, 03♂♂, 21.vii.2004, 04♂♂; Dist. Uttar Kannada, Jog Falls, 480mASL, 24.vii.2004, 01♂; Dist. Uttar Kannada, Kulgi, 360mASL, 17.vii.2004, 01♂; Kerala: Dist. Idukki, Vallakadavu, 780mASL, 10.ix.2004, 03♂♂, coll. Amit Katewa.

Distribution: North Africa, Throughout India, Ceylon, Burma, Andamans, Java, Australia, Fizi (Hampson 1896); Meghalaya, Assam, Mizoram, Uttar Pradesh (Singh 1984).

Remarks: Except fro three-four states, no precise distribution record of *Syngamia abruptalis* (Walker) is available in India (Hampson 1896). Its collection from the states of Karnataka and Kerala in the Western Ghats proves its extended distribution.

(11) *Syngamia falsidicalis* (Walker)

Guen, 1854, Delt & Pyr.: 187.

Material examined: India: Karnataka: Dist. Kodagu, Baghamandala, 900mASL, 31.vii.2004, 01♂; Dist. Uttar Kannada, Ganeshgudi, 480mASL, 20.vii.2004, 02♂♂, 21.vii.2004, 01♂, coll. Amit Katewa.

Distribution: North- Western Himalaya, Khasis, Nilgiris, Ceylon (Hampson 1896); Assam, Meghalaya, Arunachal Pradesh, Mizoram (Singh 1984).

Remarks: Hampson (1892) reported *Syngamia falsidicalis* (Walker) from the Nilgiris in South India and its collection from the aforesaid localities in the state of Karnataka enriches the distributional data of the species, under reference. As such, the species is being reported for the first time from the state of Karnataka.

(X) *Terastia* Guenée

Guenée, Delt. & Pyral., p. 211 (1854). - Walker, Cat. Lep.

Het. Brit Mus., **17**, p. 379 (1859).

Type-species: *meticulosalis* Guenée.

(12) *Terastia egialiealis* (Walker)

Walker, Cat. Lep. Het. Brit. Mus., **17**, p. 383 (1859) (*Megaphsa*) (India). - Swinhoe & Cotes, Cat. Moths India, **5**, p. 632 (1888) (*Megaphysa*)

Material examined: India: Karnataka: Dist. Uttara Kannada, Ganeshgudi, 480m, 16.x.2005, 01♂; Gujarat: Dist. The Dangs, Saputara, 970mASL, 30.ix.2005, 01♂, Dist. The Dangs, Ahwa, 520mASL, 29.ix.2005, 03♂♂, 02♀♀, coll. Amit Katewa.

Distribution: Dharamshala, Sikkim, Java (Hampson, 1896); Dehradun, Dharamshala (Singh, 1976).

Remarks: *Terastia egialiealis* (Walker) is being reported for the first time from the Western Ghats.

(XI) *Meroctena Lederer*

Lederer, 1863, Wien. Ent. Monatschr., **7**: 392 (type-species: *staintoni* Lederer). - Hampson 1896, 1896, fauna Brit. India Moths, **4**: 376.

Type-species: *Botys tullalis* Walker.

(13) *Meroctena tullalis* (Walker)

Walker 1859. *Cat Lep.* 18: 649; *Meroctena*. Hampson, *III Het* 9. Pl. 172, f. 11.

Material Examined: India: Tamil Nadu: Dist. Nilgiris, Dodabetta, 2640mASL, 1.x.2003, 01♀, coll. Amit Katewa.

Distribution: Sikkim, Assam, Nilgiri hills (Hampson 1896); Assam, Meghalaya (Singh 1984).

Remarks: The species *i.e.*, *tullalis* Walker is the type-species of monotypic genus *Meroctena* Lederer. Hampson (1896) reported this species from the Nilgiris and during the course of present surveys a single female specimen could be collected from another locality *i.e.*, Dodabetta in Nilgiris. The species has restricted distribution in the Western Ghats.

(XII) *Polythlipta Lederer*

Lederer 1863, *Wien. Ent. Monatschr.*, **7**: 389, t. 5, f. 20. - Moore, 1886, *Lep. Ceylon*, **3**: 310.

Type-species: *Polythlipta macralis* Lederer.

(14) *Polythlipta macralis* Lederer

Lederer 1863, *Wien. Ent. Monatschr.*, **7**: 389, 477 (*maceratalis* err.), t. 12, f. 14 (male) (*Polythlipta*) (Amboina).

Material examined: India: Kerala: Dist. Idukki, Vallakadavu, 780mASL, 11.ix.2004, 02♂♂, coll. Amit Katewa.

Distribution: Sikkim, Khasis, Nilgiris, Ceylon (Hampson 1896); Assam (Rose and Singh 1985).

Remarks: The species *Polythlipta macralis* Lederer is being reported for the first time from the state of Kerala in the Western Ghats in India. As per its collection, it appears to be quite rare.

Subfamily Pyraustinae

(XIII) *Agathodes* Guenée

Guenée, Delt. & Pyral., p. 207 (1854).- Moore, *Lep. Ceylon*, **3**, p. 555 (1887).- Meyrick, *Trans. Ent. Soc. Lond.*, p. 218 (1887). **Type-species:** *ostentalis* Hübner.

(15) *Agathodes ostentalis* (Hübner)

Hübner, *Zutrage Samml. Exot. Schm.*, **5**, p. 11, f. 833, 834 (1837) (*Perinephela*) (Java). - Walker, *Cat. Lep. Het. Brit. Mus.*, **17**, p. 378 (1859) (*Agathodes*).

Material examined: India: Karnataka: Dist. Kodagu, Medikeri, 1100mASL, 25.ix.2003, 06♂♂; Dist. Uttara Kannada, Jog Falls, 480mASL, 08.viii.2006, 01♂; Dist. Chikmagalur, Kallathy Falls, 960mASL, 26.vii.2004, 04♂♂; Dist. Kodagu, Baghamandala, 900mASL, 01.viii.2004, 01♂; Dist. Uttara Kannada, Ganeshgudi, 480mASL, 14.x.2005, 03♂♂; Maharashtra: Dist. Sindhudurg, Amboli, 850mASL, 11.x.2005, 03♂♂; Gujarat: Dist. The Dangs, Saputara, 970mASL, 30.ix.2005, 01♂; Dist. The Dangs, Waghai, 180mASL, 31.viii.2005, 05♂♂, coll. Amit Katewa.

Distribution: Throughout India, Ceylon, Burma (Hampson, 1896); Uttaranchal (Singh, 1976).

Remarks: On the basis of present surveys, twenty four individuals of the aforesaid species have been collected from the Western Ghats and accordingly, it can be inferred that the species is quite common to this hot biodiversity spot.

(XIV) *Phlyctaenia* Hübner

Hübner, *Verz. bek. Schm.*, p. 359 (1825) (*Sine fixat. typi generis*; 2 sp.). - De Joannis, *Ann. Soc. Ent. Fr.*, **98** (1928), p. 686 (1930).

Type-species: *tyres* Cramer

(16) *Phlyctaenia tyres* (Cramer)

Cramer, *Pap. Exot.*, **3**, p. 124, t. 263, f. C (1782) (*(Phalaena) (Pyralis)*) (Coromandel). - Lederer, *Wien. Ent. Monat-schr.*, **7**, p. 404 (1863) (*Pygossypila*).

Material examined: Kerala: D i s t . Thiruvananthapuram, FRH, Vithura, 120mASL, 04.ix.2004 01♂; 05.ix.2004, 02♂♂; Dist. Idukki, Vallakadavu, 780mASL, 12.ix.2004, 05♂♂; Karnataka: Dist. Uttara Kannada, Ganeshgudi, 480mASL, 21.vii.2004, 02♂♂; 16.x.2005, 01♂; Dist. Kodagu, Sampaje, 100mASL, 13.xi.2002, 01♂; Maharashtra: Dist. Pune, Malshej Ghat, 690mASL, 02.x.2005, 01♂; Dist. Satara, FRH, Mahabaleshwar, 1320m, 09.x.2005, 11♂♂, 06♀♀; Tamil Nadu: Dist. Nilgiris, Dodabetta, 2640mASL, 01.x.2003, 02♂♂; Gujarat : Dist. The Dangs, Saputara, 970mASL, 30.ix.2005, 03♂♂, 08♀♀; Dist. The Dangs Dharpur, 150mASL, 27.ix.2005, 02♂♂, coll. Amit Katewa.

Distribution: Throughout India, Ceylon, Burma, Java (Hampson 1896); Shimla, Dehradun, Pahalgam (Singh 1976).

Remarks: *Phlyctaenia tyres* (Cramer) is widely distributed in India (Hampson 1896) and during the course of present

studies, it has been collected from all the states of the Western Ghats except Goa.

(XV) *Nausinoe* Hübner

Hübner, Verz. bek. Schm., p. 362 (1825) (since fixat, typi generis; 2 sp.)- Moore, Lep. Ceylong, **3**, p. 309 (1886).

Type-species: *neptalis* Hübner

(17) *Nausinoe geometralis* (Guenée)

Guenée, Delt. & Pyral., p. 278, t. 8, f. 6 (1854) (*Lepyrodes*) (Central India). - Walker, cAt. Lep. Het. Brit. Mus., **17**, p. 465 (1859) (*Lepyrodes*).

Material examined: India: Karnataka: Dist. Uttar Kannada, Jog Falls, 480mASL, 08.viii.2006, 03♂♂; Dist. Chikmagalur, Kallathy Falls, 960mASL, 26.vii.2004, 01♂; Gujarat : Dist. The Dangs, Saputara, 970mASL, 30.ix.2005, 01♂; Dist. The Dangs, Waghai, 180mASL, 31.viii.2005, 06♂♂, coll. Amit Katewa.

Distribution: China, Formosa, throughout India, Ceylon, Burma, Java, Australia, West Africa (Hampson 1896); Dehradun, Nainital, Jammu, Chandigarh, Hoshiarpur, Solan (Singh and Rose 1992).

Remarks: The collection of the species *Nausinoe geometralis* (Guenée) from the aforesaid localities in the Western Ghats will definitely enriches its distributional record which could be useful to study its life history and applied aspects (Nayar and David 1990, Srivastava 1996, Atwal and Dhaliwal 2008).

(XVI) *Syllepte* Hübner

Syllepte Hübner 1823, Zutrage Samml. Exot. Schmett. **2** : 18, figs. 285-286 (Type-species: *incomptalis* Hübner). (Type-species: *occlusalis* Dognin).

(18) *Syllepte derogata* (Fabricius)

Phalaena derogata Fabricius, 1779, Syst. Ent. : 641

Material examined: India: Karnataka: Dist. Kodagu, Medikeri, 1100mASL, 25.ix.2003, 01♂; Dist. Kodagu, Baghamandala, 900mASL, 01.viii.2004, 01♂; Dist. Uttar Kannada, Ganeshgudi, 480mASL, 14.x.2005, 01♂; Dist. Chikmagalur, Kallathy Falls, 960mASL, 26.vii.2004, 01♂; Maharashtra: Dist. Sindhudurg, Amboli, 850mASL, 11.x.2005, 02♂♂; Gujarat: Dist. The Dangs, Saputara, 970mASL, 30.ix.2005, 06♂♂; Dist. The Dangs, Waghai, 180mASL, 31.viii.2005, 07♂♂, coll. Amit Katewa.

Distribution: Throughout India (Hampson 1896); Himachal Pradesh, Uttar Pradesh, Haryana (Singh 1976).

Remarks: The species *Syllepte derogata* (Fabricius) is a most common pest of cotton and is generally called as cotton leaf roller (Srivastava, 1996; Atwal and Dhaliwal 2002). On the basis of present surveys, it appears that it is moderately common in the Western Ghats.

(XVII) *Aetholix* Lederer

Lederer, 1863, Wien. Ent. Monatschr., **7**: 437.- Hampson,

1896, Fauna Brit. India Moths, **4**: 286.

Type-species: *Aediodes flavibasalis* Guenée.

(19) *Aetholix flavibasalis* (Guenée)

Guenée 1854, Delt. & Pyral., 1854: 193 (male) (*Aediodes*) (Bombay) Walker 1859, Cat. Lep. Het. Brit. Mus., **17**: 347 (female) (*Aediodes*).

Material examined: India: Kerala: Dist. Palakkad, Mukkali, 560mASL, 19.ix.2004, 02♀♀, coll. Amit Katewa.

Distribution: Bombay, Andamans and Kalimpong (Hampson 1896, Roonwal et al 1963, Mandal and Bhattacharya 1980), Assam (Singh 1984).

Remarks *flavibasalis* (Guenée) is the type-species of the genus *Aetholix* Lederer and has limited distribution data available in literature. The collection of only two female specimens from the Western Ghats shows that it quite rare in the Western Ghats.

(XVIII) *Filodes* Guenée

Guenée 1854, Delt. & Pyral 1854: 317. – Lederer 1863, Wien. Ent. Monatschr. **7**: 390.

Type-species: *Pinacia fulvidorsalis* Geyer.

(20) *Filodes fulvidorsalis* (Geyer)

Geyer in Hübner 1832, Zutrage Samml. Exot. Schm., **4**: 15 nr. 322, f. 643, 644 (*Pinacia*) (Java). – Guenée, 1854, Delt. & Pyral., 1854: 317 (*Filodes*).

Material Examined: India: Kerala: Dist. Thiruvananthapuram, FRH, Vithura, 120mASL, 05.ix.2004, 04♂♂; Dist. Palakkad, Mukkali, 560mASL, 22.ix.2004, 02♂♂; Dist. Pathanmthitta, Vadaserikera, 30mASL, 7.ix.2004, 01♂; Dist. Kollam, Chendruni, 70mASL, 03.ix.2004, 02♂♂, coll. Amit Katewa.

Distribution: Assam and Sikkim (Hampson 1896), Meghalaya, Assam, Nagaland (Singh 1984).

Remarks: *Pinacia fulvidorsalis* (Geyer) is the type-species of the genus *Filodes* Guenée. The present and earlier collection record reveals that it occurs only in either of the biodiversity hot spots in India. It is a new report from the Western Ghats.

(XIX) *Nevrina* Guenée

Guenée 1854, Delt. & Pyral 1854: 313. –Lederer 1863, Wien. Ent. Monatschr., **7**: 395.

Type-species: *Phalaena* (= *Pyralis*) *procopia* Stoll.

(21) *Nevrina procopia* (Stoll)

Stoll in Cramer 1781, Pap. Exot. , **4**: 152, t. 368, f. E. (*Phalaena Pyralis*). – Guenée, 1854, Delt. & Pyral., 1854:317 (*Nevrina*).- Lederer, 1863, Wein. Ent. Monatschr., **7**: 396 (*Neverina*).

Material examined: India: Kerala: Dist. Idukki, Vallakadavu, 780mASL, 09.ix.2004, 01♂; Dist. Palakkad, Mukkali, 560mASL, 21.ix.2004, 01♂; Dist. Idukki, Maryur, 960mASL, 15.ix.2004, 01♂; Tamil Nadu: Dist. Nilgiris, Dodabetta,

2640mASL, 01.x.2003, 01♂, coll. Amit Katewa.

Distribution: Throughout India (Hampson 1896); Assam, Mizoram (Singh 1984).

Remarks: It has already been precisely reported from one of the hot biodiversity spot *i.e.*, North Eastern Himalaya of this megadiversity nation. The present report becomes the second one from the other hot biodiversity spot *i.e.*, the Western Ghats.

Subfamily Nymphulinae

(XX) *Nymphula* Schrank

Schrank, Fauna boica, **2**, (2), p. 162 (1802). - Hübner, Verz. bek. Schmett., p. 362, no. 3465 (1816) (1827) (Type-species: *N. potamogalis*).

Type-species: *nymphaeata* Linnaeus.

(22) *Nymphula depunctalis* (Guenée)

Guenée, Delt. & Pyral., p. 274 (1884) (*Hydrocampa*) (E. India). - Walker, Cat. Lep. Het. Brit. Mus., **17**, p. 461 (1859) (*Hydrocampa*).

Material examined: India: Kerala: Dist. Idukki, Vallakadavu, 780mASL, 09.ix.2004, 02♂♂, 10.ix.2004, 03♂♂, 11.ix.2004, 02♂♂; Dist. Idukki, Maryur, 780mASL, 15.ix.2004, 04♂♂; Karnataka: Dist. Kodagu, Medikeri, 1100mASL, 26.ix.2003, 01♂, 29.vii.2004, 01♂; Dist. Kodagu, Baghamandala, 900mASL, 25.xi.2003, 01♂, 31.vii.2004, 02♂♂, 01.viii.2004, 01♂; Dist. Kodagu, Sampaje, 100mASL, 27.ix.2003, 01♂; Dist. Uttar Kannada, Ganeshgudi, 480m, 21.vii.2004, 02♂♂, 14.x.2005, 02♂♂, 16.x.2005, 08♂♂; Gujarat : Dist. The Dangs, Ahwa, 520mASL, 29.ix.2005, 02♀♀; Maharashtra: Dist. Sindhudurg, Amboli, 850mASL, 13.x.2005, 01♂, coll. Amit Katewa.

Distribution: South Africa, Throughout India, Java, Australia (Hampson 1896); Mussorie, Dehradun, Chakrata, Hardwar, Solan, Hoshiarpur, Kurukshetra (Rose and Pajni 1985).

Remarks: Rather than from throughout India (Hampson, 1896), the species *Nymphula depunctalis* (Guenée) has been reported from the aforesaid localities in North-West India only. The present collection data of the species enriches its distribution from the Western Ghats.

Subfamily Acentropinae

(XXI) *Eoophila* Swinhoe

Swinhoe, Cat. East. Austral. Lep. Het. Oxford Mus., **2**, p. 442 (1900). - Shibuya, Journ. Fac. Agr. Hokkaido Imp. Univ., **22**, p. 152 (1928).

Type-species: *peribocalis* Walker

(23) *Eoophila gibbosalis* (Guenée)

Guenée, Delt. & Pyral., p. 262 (1854) (*Oligostigma*) (E. India). - Walker, Cat. Lep. Het. Brit. Mus., **17**, p. 431 (1859) (*Oligostigma*).

Material examined: India: Kerala: Dist. Idukki, Vallakadavu, 780mASL, 10.ix.2004, 01♂; Dist. Palakkad, Mukkali,

560mASL, 22.ix.2004, 02♂♂; Dist. Kollam, Chendruni, 70mASL, 03.ix.2004, 01♂; Karnataka: Dist. Uttar Kannada, Ganeshgudi, 480mASL, 21.vii.2004, 01♂; Dist. Uttar Kannada, Jog Falls, 480mASL, 29.vii.2004, 01♂; Dist. Uttar Kannada, Kulgi, 360mASL, 17.vii.2004, 02♂♂; Dist. Dakshin Kannada, Gundy, 40mASL, 28.vii.2004, 04♂♂, coll. Amit Katewa.

Distribution: Java, Celebes (Hampson 1896); Dharamshala, Kullu (Singh 1976).

Remarks: This species is only known from two localities in the state of Himachal Pradesh from India. Accordingly, this species is being reported for the first time from the Western Ghats.

CONCLUSIONS

Twenty-three species belonging to twenty-one genera of moths family Crambidae of the order Lepidoptera were collected and identified from the six states. Highest number of species were reported in Subfamilies Spilomelinae with fourteen, Pyraustinae with seven and Nymphulinae and Acentropinae with one each species.

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