

## GELECHIID DIVERSITY (LEPIDOPTERA) FROM SIWALIK HILLS OF NORTH- WESTERN HIMALAYA

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According to Chitkara (1998), the elevation of the Siwaliks range extends up to 1500m and demarcated between river Kali in Uttaranchal and river Indus in Jammu and Kashmir. During the course of present surveys conducted between 1997 and 2001, we visited localities such as Jammu, Katra, Mansar Lake (Jammu & Kashmir), Kangra, Palampur, Dharamshala, Tanyhar, Sarkaghat, Baijnath, Anndhretta, Solan, Dharampur, Nauni, Sabthu, Renuka lake, Nahan, Paunta Sahib (Himachal Pradesh), Dehradun, Haridwar, Vikasnagar (Uttaranchal), Kalka, Pinjore (Haryana), Pathankot, Hoshiarpur, Dasua, Dhar, Roopnagar, Dunera, Mirzapur, Nawanshahar and Anandpur (Punjab) in the Siwaliks of north-western Himalaya.

Gelechiid moths were collected at night with the help of portable light traps. In addition to this, some specimens were also collected by hanging the source of light (125-Watt mercury vapour lamp) on a white sheet or white washed wall. The newly collected insects were killed using 1,1,2,2, tetrachloro ethane or ethyl acetate. The specimens collected from various localities were processed as per methodology discussed by workers such as Lindquist (1956), Tigestad (1974), Zimmerman (1978), Mikkola (1986) and Landry and Landry (1994). For wing venation standard techniques given by Zimmerman (1978) and for genitalia Robinson (1976) was followed. Various morphological characters (Robinson, 1976; Hodges, 1998; Park, 1995), wing venation (Zimmerman, 1978; Common, 1970) and external genitalia (Klots, 1970) were described. All illustrations were made using a Camera Lucida attached to a stereoscopic light microscope (Nikon SMZ-10, Japan). All specimens were photographed prior to dissection.

The collected material were assigned to various taxa following (Meyrick, (1905, 1907, 1908a, 1908b, 1909, 1910, 1911, 1912-1916, 1913, 1914, 1916-1923, 1923-1930, 1930-1936), Gaede (1937); Clarke (1969a, 1969b); Park and Omelko (1994), Robinson, *et al.* (1994), Park and Hodges (1995), and Ueda (1995). All specimens deposited in the Lepidoptera Laboratory, Department of Zoology, Punjabi University, Patiala.

### Superfamily: Gelechioidea

#### Diagnosis

Vertex and frons decorated with smooth scales; labial palpus three segmented, upturned, third segment long, acute; forewing with veins R<sub>4</sub>+R<sub>5</sub> stalked; hind tibia with dorsal surface furnished with long slender scales.

### Family: Gelechiidae

Gelechiidae Stainton, 1854, *Insecta Br. Lepid. Tineina*, 10 (key) and 75 (spelled as Gelechidae).

Type-genus: *Gelechia* Hübner, (1825) 1816, *Vertz. bekannter Schmett.*, 415.

#### Diagnosis

Vertex and frons covered with smooth scales; antenna smaller than 3/4<sup>th</sup> length of forewing; labial palpus upturned, second segment long, acute; hindwing with veins R<sub>1</sub> and Sc united from base of wing or R<sub>1</sub> running into Sc beyond base of wing, discocellular perpendicular to long axis of wing or directed at 45° angle toward base of wing from M<sub>2</sub>, termen excavated.

### Subfamily: Gelechiinae

Gelechiinae Stainton, 1854, *Insecta Br. Lepid. Tineina*, 10 (key) and 75 (as Gelechidae).

Type-genus: *Gelechia* Hübner [1825] 1816, *Verz. bekannter Schmett.*, 415.

#### Diagnosis

Abdominal sternum-2 with a pair of venulae + a pair of apodemes (if a pair of venulae only, then forewing with veins CuA<sub>1</sub> and CuA<sub>2</sub> separated); female genitalia lacking secondary bursa from corpus bursae.

### I. Genus: Anarsia Zeller

*Anarsia* Zeller, 1839, *Isis, Leipzig*, 190.

*Anarsia* Amsel, 1959, *Stuttg. Beitr. Naturk.*, 28: 32.

Type-species: *Anarsia lineatella* Zeller, 1839, *Isis, Leipzig*, 190.

Type-species: *Tinea spartiella* Schrank, 1802, *Fauna Boica*, 2(2): 104, by subsequent designation: Meyrick, 1925, In Wytzman, *Genera Insect.*, 184: 153.

#### Diagnosis

Labial palpus second segment covered with long or small scales, the latter arranged subtriangularly, third segment relatively reduced in male, long and acute in female; antenna filiform, less than 3/4<sup>th</sup> length of forewing; forewing with pterostigma between vein Sc and wing margin (costa) ending at R<sub>1</sub>, R<sub>4</sub>+R<sub>5</sub> stalked, sometimes M<sub>1</sub>+R<sub>4</sub>+R<sub>5</sub> stalked, R<sub>5</sub> to costa; hindwing with Rs+M<sub>1</sub> stalked, M<sub>3</sub> and CuA<sub>1</sub> connate; metathoracic legs with hair like scales on hind tibia; male genitalia with well developed socii present; gnathos absent; tegumen long or small; saccus absent or present; valvae asymmetrical, cucullus with modified scales; female genitalia with papillae anales sparsely setose; anterior apophyses rod-like, longer than posterior apophyses, broader at base; ductus bursae often coiled near corpus bursae; corpus bursae ovate or subovate in shape; signum present, crescent shaped.

### 1. *Anarsia tegumentus* Rose and Pathania

*Anarsia tegumentus* Rose and Pathania, 2003, *Entomon* 28(4): 330-332.

#### Material examined:

Holotype: Male, 2.vi.1998, Forest Research Institute Campus, Dehradun, Dist. Dehradun, Uttaranchal, 700m, coll. P.C. Pathania  
Paratypes: 2 males, 2.vi.1998, Forest Research Institute Campus, Dehradun, Dist. Dehradun, Uttaranchal, 700m, coll. P.C. Pathania  
Larval host plant: Unknown

### 2. *Anarsia patulella* (Walker)

*Gelechia patulella* Walker, 1864, *List Specimens lepid. Insects Colln Br. Mus.*, 29: 635.

*Gelechia patulella* Walsingham, 1887, in Moore, *Lepid. Ceylon*, 3: 510.

*Anarsia patulella* Meyrick, 1913, *J. Bombay nat. Hist. Soc.*, 22: 168.

*Anarsia patulella* Meyrick, 1925, in Wytzman, *Genera Insect.*, 184: 153, nr. 17.

*Anarsia patulella* Caradja & Meyrick, 1935, *Microlep. Kiangsu*, 69.

Material examined: 1 male, 3.iv.1999; 1 male, 21.iv.1999; 15 males, 8 females, 23.iv.1999; 3 males, 2 females, 25.iv.1999; 1 male, 23.vi.1999; 1 female, 17.iv.2000; 2 males, 18. iv.2002, Forest Research Institute

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Campus, Dehradun, Dist. Dehradun, Uttaranchal, 700m, coll. P.C. Pathania

Distribution: India, Thailand, Sri Lanka, Taiwan and Australia (Park and Ponomarenko, 1996).

Larval host plant: Unknown

### 3. *Anarsia valvata* Rose and Pathania

*Anarsia valvata* Rose and Pathania, 2003, *Entomon* 28(4): 335-337.

Material examined:

Holotype: Male, 10.ix.1998, University of Horticulture and Forestry, Nauni, Dist. Solan, Himachal Pradesh, 1360m, coll. P.C. Pathania  
Paratypes: 1 male, 10.ix.1998; 3 females, 12.ix.1999, University of Horticulture and Forestry, Nauni, Dist. Solan, Himachal Pradesh, 1360m; 1 female, 17.vii.1999, Tanyhar, Dist. Mandi, Himachal Pradesh, 1120m, coll. P.C.Pathania

Larval host plant: Unknown

### 4. *Anarsia renukaensis* Rose and Pathania

*Anarsia renukaensis* Rose and Pathania, 2003, *Entomon* 28(4): 337-339.

Material examined:

Holotype: Male, 13.iv.1999, Renuka Lake, Dist. Sirmour, Himachal Pradesh, 740m, coll. P.C. Pathania  
Paratypes: 1 male, 13.iv.1999; 2 females, 14.iv.1999, Renuka Lake, Dist. Sirmour, Himachal Pradesh, 740m, coll. P.C.Pathania

Larval host plant: Unknown

### 5. *Anarsia didymopa* Meyrick

*Anarsia didymopa* Meyrick 1916, *Exot. Microlepid.*, 1: 583.

*Anarsia didymopa* Meyrick 1925, in Wytsman, *Genera Insect.*, 184: 154, nr 28.

Material examined: 1 male, 1 female, 9.viii.1999; 1 male, 19.viii.1999; 1 male, 28.ix.1999; 1 male, 6.x.1999, Forest Research Institute Campus, Dehradun, Dist. Dehradun, Uttaranchal, 700m; 2 females, 12.viii.1999, Punjabi university, Patiala, Dist. Patiala, Punjab, 250m, coll. P.C.Pathania  
Old distribution: India (Pusa, Bengal) and Thailand (Park & Ponomarenko, 1996).

Larval host plant: *Capparis horrida* (Fletcher, 1921).

### 6. *Anarsia parkae* Rose and Pathania

*Anarsia parkae* Rose and Pathania, 2003, *Entomon* 28(4): 341-343.

Material examined:

Holotype: Male, 16.vii.1999, Tanyhar, Dist. Mandi, Himachal Pradesh, 1120m, P.C.Pathania coll.  
Paratypes: 1 male, 1 female, 16.vii.1999; one male, 17.vii.1999, Tanyhar, Dist. Mandi, Himachal Pradesh, 1120m, coll. P.C. Pathania

Larval host plant: Unknown

### 7. *Anarsia tanyharensis* Rose and Pathania

*Anarsia tanyharensis* Rose and Pathania, 2003, *Entomon* 28(4): 343-346.

Material examined:

Holotype: Male, 16.vii.1999, Tanyhar, Dist. Mandi, Himachal Pradesh, 1120m, coll. P.C. Pathania  
Paratypes: 2 males, 16.vii.1999, Tanyhar, Dist. Mandi, Himachal Pradesh, 1120m, coll. P.C.Pathania

Larval host plant: Unknown

### 8. *Anarsia triglypta* Meyrick

*Anarsia triglypta* Meyrick, 1933, *Exot. Microlepid.*, 4: 354.

Material examined: 1 female, 24.iii.1998; 3 males, 1 female, 30.viii.1998; 1 male, 1 female, 31.viii.1998; 3 male, 1 female, 31.ix.1998; 2 males, 13.ix.1999; 3 males, 1 female, 14.ix.1999; 1 female, 15.ix.1999; 1 female, 16.ix., 1999; 1 female, 22.ix.1999; 1 male, 1 female, 23.ix.1999; 1 female, 27.ix.1999; 2 males, 30.ix.1999; 2 females, 3.x.1999; 4 males, 6.x.1999; 3 males, 13.x.1999, Punjabi university, Patiala, Dist. Patiala, Punjab, 250m, coll. P.C. Pathania

Old distribution: India (Bihar, Pusa) (Clarke, 1969).

Larval host plant: *Acacia catechu* (Clarke, 1969).

### 9. *Anarsia veruta* Meyrick

*Anarsia veruta* Meyrick, 1918, *Exot. Microlepid.*, 2: 148.

*Anarsia veruta* Meyrick, 1925, in Wytsman, *Genera Insect.*, 184: 29.  
Material examined: 1 female, 24.vi.1999; 1 male, 26.vi.1999; 2 males, 17.iv.2000, Krishi Vishwavidalaya, Palampur, Dist. Kangra, Himachal Pradesh, 700m, coll. P.C.Pathania

Old distribution: India (Bengal, Pusa) (Clarke 1969).

Larval host plant: *Inga dulcis* (Fletcher, 1921).

### 10. *Anarsia reciproca* Meyrick

*Anarsia reciproca* Meyrick, 1920, *Exot. Microlepid.*, 2: 300.

Material examined: 4 males, 5 females, 2.vi.1998; 5 males, 3 females, 3.vi.1998, Forest Research Institute Campus, Dehradun, Dist. Dehradun, Uttaranchal, 700m; 5 females, 27.vi.1998, Tanyhar, Dist. Mandi, Himachal Pradesh, 1120m, coll. P.C.Pathania

Old distribution: India (Madras), Coimbatore (Clarke, 1969).

Larval host plant: Unknown

## II. Genus: *Stegasta* Meyrick

*Stegasta* Meyrick, 1904, *Proc. Linn. Soc. N.S.W.*, 29: 258 (key), 313.

Type-species: *Stegasta variana* Meyrick, 1904, *Proc. Linn. Soc. N.S.W.*, 29: 313 (key), 314, by original designation.

### Diagnosis

Labial palpus upturned, third segment long and acute; antenna filiform, about 3/4<sup>th</sup> length of forewing, creamish and fuscous band alternatively; forewing with expansible pencil of creamy white scales in a costal fold on the ventral surface in males and by the characteristic pattern of the forewing, vein R<sub>1</sub>+R<sub>2</sub> stalked, M<sub>3</sub>+CuA<sub>1</sub> stalked; hindwing with veins Rs+M<sub>1</sub> stalked, Rs to costa, M<sub>1</sub> to termen, M<sub>3</sub> free; male genitalia with uncus bifid; socii well developed; gnathos absent; saccus absent; valvae rather slender, broader toward base, expanded distally, numerous strong setae on inner surface of distal part, with a strong spine-like projection near base of cucullus; aedeagus tubular, with one or two long horn shaped lobes; cornutus present or absent; female genitalia with papillae anales large, broad, densely setose; anterior apophyses rod-like, broader at base; corpus bursae membranous, bulb-shaped; signum sickle-shaped.

### 11. *Stegasta comissata* Meyrick

*Stegasta comissata* Meyrick, 1923, *Exot. Microlepid.*, 3: 18.

Material examined: 1 female, 15.ix.1998; 1 female, 29.ix.1998; 3 females, 28.x.1998; 1 male, 7.xi.1998; 1 male, 10.iii.1999; 1 male, 12.x.1999; 2 males, 4.xi.1999; 4 males, 6.iii.2000; 1 male, 9.iii.2000; 2 males, 10.iii.2000; 1 female, 16.iii.2000; 5 males, 28.iii.2000; 2 males, 2 females, 5.iv.2000; 2 males, 10.iv.2000; 2 males, 16.v.2000; 2 males, 17.v.2000; 18 males, 23.ix.1999, Forest Research Institute Campus, Dehradun, Dist. Dehradun, Uttaranchal, 700m; 3 males, 18.v.2000; 2 females, 24.v.2000, Punjabi University, Patiala, Dist. Patiala, Punjab, 250m; 3 males, 2 females, 9.xi.2001, Jammu University Campus, Dist. Jammu, 350m, coll. P.C. Pathania

Old distribution: Brazil, Obidos, Santarem, Parintins, Manaus (Clarke, 1969a).

Larval host plant: Unknown.

### 12. *Stegasta* sp

Material examined: 2 males, 13.iv.1998; 1 male, 1 female, 10.ix.1998; 6 males, 2 females, 5.iv.2000; University of Horticulture and Forestry, Nauni, Dist. Solan, Himachal Pradesh, 1360m; 14 males, 4 females, 13.iv.1999, 9 males, 2 females, 21.iv.2000, Renuka Lake, Dist. Sirmour, Himachal Pradesh, 740m; 2 males, 16.ix.2001, Dharampur, Dist. Solan, Himachal Pradesh, 1500m; 6 males, 27.v.2001, Krishi Vishwavidalaya, Palampur, Dist. Kangra, Himachal Pradesh, 700m, coll. P.C.Pathania  
Larval host plant: Unknown.

## III. Genus: *Hypatima* Hübner

*Hypatima* Hübner, [1825], *Verz. bekannter Schmett.*, 415.

Allocota Meyrick, 1904, *Proc. Linn. Soc. N.S.W.*, 29: 258. Type-species: *Allocota simulacrella* Meyrick, 1904, *Proc. Linn. Soc.*

N.S.W., 29: 420.

*Allocotiana* Stand, 1913, *Arch. Nat.*, 79(42): 43. Type-species: *Allocota simulacrella* Meyrick, 1904, *Proc. Linn. Soc. N.S.W.*, 29: 420.

*Chelaria* Haworth, 1828, *Lepid. Br.*, 526. Type-species: *Chelaria conscripta* Haworth, 1828, *Lepid. Br.*, 526.

*Cymatomorpha* Meyrick, 1904, *Proc. Linn. Soc. N.S.W.*, 29: 258. Type-species: *Cymatomorpha euplecta* Meyrick, 1904, *Proc. Linn. Soc. N.S.W.*, 29: 57 (key) 411.

*Episacta* Turner, 1919, *Proc. R. Soc. Qd.*, 31: 161. Type-species: *Chelaria discissa* Meyrick, 1916, *Exot. Microlepid.*, 1: 581.

*Semodictis* Meyrick, 1909, *Ann. Trans. Mus.*, 2: 16. Type-species: *Semodictis tetraptial* Meyrick, 1909, *Ann. Transv. Mus.*, 2: 16.

Type-species: *Tinea conscriptella* Hübner, 1805, *Samml. eur. Schmett.*, 8: pl.41. fig.283 by subsequent designation by Walsingham & Durrat, 1909, *Entomologists mon. Mag.*, 45: 48.

### Diagnosis

Labial palpus long, upturned, second segment with a long loose hair like scaletuft, the latter divided into two parts, third segment long, acute, usually with a rough scaletuft dorsally; antenna long, 3/4<sup>th</sup> length of forewing; metathoracic leg with hair like scales on hind tibia; forewing elongate, veins R<sub>4</sub>+R<sub>5</sub> out of the stalk of M<sub>1</sub> or M<sub>1</sub> free, R<sub>5</sub> to costa; hindwing with Rs+M<sub>1</sub> stalked, Rs to costa, M<sub>1</sub> to termen, M<sub>3</sub> and CuA<sub>1</sub> connate or stalked, a brush of long hair pencil between veins CuA<sub>1</sub> and CuA<sub>2</sub> directed toward base of wing present or absent; male genitalia uncus broader at base narrowed towards apex, bearing small hair like setae, socii lacking; gnathos stout; tegumen with setose lobe at base; vinculum with a pair of processes, symmetrical or asymmetrical; aedeagus broader basally, apically pointed, bend at middle; female genitalia with papillae anales sparsely setose; ostium bursae with a heavily sclerotized ring shaped structure posteriorly; ductus bursae long and coiled; corpus bursae ovate or subovate shaped; signum small or large, kite-shaped.

### 13. *Hypatima tephroptila* (Meyrick)

*Chelaria tephroptila* Meyrick, 1931, *Exot. Microlepid.*, 4: 70

Material examined: 2 females, 23.iv.1999; 2 males, 2 females, 25.iv.1999, Forest Research Institute Campus, Dehradun, Dist. Dehradun, Uttaranchal, 700m; coll. P.C.Pathania

Old distribution: India (Bombay, Mahableshwar) (Clarke, 1969).

Larval host plant: Unknown

### 14. *Hypatima vinculata* Pathania and Rose

*Hypatima vinculata* Pathania and Rose, 2003, *Pest Management and Economic Zoology*, 11(2): 166-168.

Material examined:

Holotype: Male, 29.viii.1998, Punjabi university, Patiala, Dist. Patiala, Punjab, 250m, coll. P.C.Pathania

Paratypes: 2 males, 27.ix.1999, Punjabi university, Patiala, Dist. Patiala, Punjab, 250m, coll. P.C.Pathania

Larval host plant: Unknown

### 15. *Hypatima spathota* (Meyrick)

*Chelaria spathota* Meyrick, 1913, *J. Bombay nat. Hist. Soc.*, 2: 165. *Chelaria spathota* Gaede, 1937, *Lepid. Cat.*, : 414.

*Chelaria spathota* Clarke, 1969, *Cat. Type Specimens Microlepid. BMNH.*, (6): 426, fig. 3.

Material examined: 2 females, 25.v.1998; 2 females, 13.iv.1999, Renuka Lake, Dist. Sirmour, Himachal Pradesh, 740m; 5 males, 23.iv.1999; 2 males, 25.iv.1999; 1 female, 3.iv.1999, Forest Research Institute Campus, Dehradun, Dist. Dehradun, Uttaranchal, 700m; coll. P.C.Pathania

Old distribution: India (Khasi Hills, Konkan) (Park, 1995).

Larval host plant: Unknown

### Subfamily: Dichomeridinae

Dichomeridinae Hampson, 1918, *Novit. zool.*, 25: 386.

Type-genus: *Dichomeris* Hübner, 1818, *Zutr. Samml. exot. Schmett.*,

1: 25.

### Diagnosis

Abdominal sternum-2 with a pair of venulae only; forewing usually with CuA<sub>1</sub> and CuA<sub>2</sub> stalked and directed posteriorly from end of cell; female with secondary bursa arising from corpus bursae.

### IV. Genus: *Hypelictis* Meyrick

*Hypelictis* Meyrick, 1905, *J. Bombay nat. Hist. Soc.*, 16: 600.

Type-species: *Hypelictis acrochlora* Meyrick, 1905, *ibidem.*, 16: 600.

### Diagnosis

Labial palpus long, arm-like, strongly upturned, covered with scales; antenna long, filiform, 3/4<sup>th</sup> length of forewing; metathoracic leg with hair like scales on hindtibia; forewing with veins R<sub>4</sub>+R<sub>5</sub> very long stalked, R<sub>5</sub> to costa, CuA<sub>1</sub>+CuA<sub>2</sub> stalked; hindwing with vein R<sub>1</sub> running into Sc, Rs+M<sub>1</sub> connate, R<sub>5</sub> to apex, M<sub>1</sub> to termen, M<sub>3</sub>+CuA<sub>1</sub> stalked, 1A+2A forked at base; male genitalia with uncus narrowed towards apex, setose; socii absent; gnathos small, hook-like; two setose, one Y-shaped and one elongated arm like lobe on vinculum; valvae small, broader distally, inner surface densely setose; aedeagus long, with long plate and cornutus present; female genitalia with papillae anales sparsely setose; anterior apophyses absent; ostium bursae broad; corpus bursae large, sclerotized, with hair-like projection near basal half; ductus seminales arising near middle of corpus bursae; signum absent or present.

### 16. *Hypelictis acrochlora* Meyrick

*Hypelictis acrochlora* Meyrick, 1905, *J. Bombay nat. Hist. Soc.*, 16: 600; Meyrick, 1925, In Wytsman, *Genera Insect.*, 184, p.110, nr.2.

Material examined: 2 males, 22.iv.1999; 2 males, 23.iv.1999, 2 females, 18.iv.2000, Forest Research Institute Campus, Dehradun, Dist. Dehradun, Uttaranchal, 700m; coll. P.C. Pathania

Old distribution: Maskeliya, Ceylon (Clarke, 1969).

Larval host plant: Unknown

### V. Genus: *Dichomeris* Hübner

*Dichomeris* Hübner, 1818, *Autr. Samml. exot. Schmett.*, 1: 25.

Type-species: *Dichomeris ligulella* Hübner, 1818, *ibidem.*, 1: 25, pl. [25], figs 143, 144, by subsequent designation: Walsingham, 1911, *Biologia cent.-am., Zool., Lepid. Heterocera*, 4: 87.

### Diagnosis

Labial palpus long, upturned, with or without brush of scales, the latter directed anteriorly, third segment long and acute; antenna filiform, less than 3/4<sup>th</sup> length of forewing; hindtibia of the metathoracic leg with small hair-like scales; forewing with vein R<sub>4</sub>+R<sub>5</sub> stalked, R<sub>5</sub> to costa or apex, R<sub>5</sub> sometime absent, CuA<sub>1</sub>+CuA<sub>2</sub> stalked; hindwing with vein Rs+M<sub>1</sub> stalked, M<sub>3</sub>+CuA<sub>1</sub> stalked or connate; male genitalia with uncus dilated distally; culcitula present; gnathos hook-like; tegumen with setose lobe at base; sicae symmetrical or asymmetrical present; valvae long, cucullus bearing setae on the inner surface; aedeagus with rod-like lateral lobe present; female genitalia with anterior apophyses very short, stout; corpus bursae densely spiculate in part; heavily sclerotized ring near base of ductus seminalis; lacking sclerotized signum.

### 17. *Dichomeris sicaellus* Pathania and Rose

*Dichomeris sicaellus* Pathania and Rose, 2003, *Him. J. Env. Zool.*, 17(1): 10-11.

Material examined:

Holotype: Male, 5.iv.2000, University of Horticulture and Forestry, Nauni, Dist. Solan, Himachal Pradesh, 1360m, coll. P.C. Pathania

Larval host plant: Unknown

### 18. *Dichomeris sicaellus acuminata* (Staudinger)

*Mesophleps* (?) *acuminatus* Staudinger, 1876, *Ent. Ztg. Stett.*, 37: 148.

*Hyposolophus ianthes* Meyrick, 1887, *Trans. ent. Soc. Lond.*, 273 .

*Dichomeris ianthus*; Gaede, 1937, *Lepid. Cat.*, 79: 434; Issiki, 1957, *In. Heterocerorum Japonicorum Coloribus Naturalibus.*: 42, pl. 6, fig. 176; Clarke, 1969, *Cat. Type Specimens Microlepid. BMNH.*: 27, pl. 13, fig. 3; Moriuti, 1982, *Moths of Japan.*: 1/284, 2/215, pl. 13, fig. 33.

*Ypsolophus rusticus* Walsingham, 1891, *Proc. zool. Soc. Lond.*: 525.

*Ypsolophus lotellus* Constant, 1893, *Ann. Soc. ent. France*, 62: 398.

*Ypsolophus ammoranthus* Meyrick, 1904, *Proc. Linn. Soc. N.S.W.*, 29: 430.

*Ypsolophus ochrophanes* Meyrick, 1907, *J. Bombay nat. Hist. Soc.*, 17: 981.

*Dichomeris acuminatus*; Zimmermann, 1978, *Insects of Hawaii*, 9(2): 1706, figs. 1262-1267.

*Dichomeris acuminata*; Hodges, 1986, *The Moths of America north Mexico*, 7: 38, pl. 4, figs. 1, text fig. 9; Park & Hodges 1995, *Inst. Koreana*, 12: 28.

Material examined: 1 male, 11.ix.1998, University of Horticulture and Forestry, Nauni, Dist. Solan, Himachal Pradesh, 1360m; 3 males, 24.ix.1999, Forest Research Institute Campus, Dehradun, Dist. Dehradun, Uttaranchal, 700m; coll. P.C. Pathania

Old distribution: Taiwan, Japan, Widely distributed in oriental and Australian region (Park and Hodges, 1995).

Larval host plant: *Medicago sativa*, *Camopsis* sp., *Desmodium gyroides*, *Cajanus cajan*, *Sebania Serica* and *Tephrosia* sp. (Park & Hodges, 1995).

#### 19. *Dichomeris sicaellus rasilella* (Herrich-Schaffer)

*Anacampsis rasilella* Herrich-Schaffer, 1855, *Schmett. Eur.*, 5: 202.

*Brachmia rasilella* Rebel, 1901, *Famil. Pyralidae-Micropterygidae.*: 157.

*Gomphocrates rasilella* Meyrick, 1925, in Wytsman, *Genera Insect.*: 184.

*Uliaria rasilella* Dumont, 1921, *Bull. Soc. ent. France.*, 329; Issiki, 1957, *In. Heterocerorum Japonicorum Coloribus Naturalibus.*: 39, pl. 5, fig. 161; Moriuti, 1982, *Moths of Japan*, 1/286, 2/215, pl. 13: 47; Park, 1983, *Insecta* 9: 505, fig. 167, Park & Hodges 1995, *Inst. Koreana*, 12 : 52.

Material examined: 1 male, 12.ix.1999; 3 males, 5.iv.2000, University of Horticulture and Forestry, Nauni, Dist. Solan, Himachal Pradesh, 1360m; 2 females, 13.iv.1999, Renuka Lake, Dist. Sirmour, Himachal Pradesh, 740m; coll. P.C. Pathania

Old distribution: Taiwan, Japan, Korea, Chiana, Russia, Europe (Park & Hodges, 1995)

Larval host plant: Unknown

#### VI. Genus: *Helcystogramma* Zeller

*Helcystogramma* Zeller, 1877, *Horae Soc. ent. ross.*, 13: 369.

*Ceratophora* Heinemann, 1870, *Schmett. Dtl. Schweiz*, (2)(1): 325.

Type-species: *Recurvaria rufescens* Haworth, 1828, *Lepid. Br.*, 555.

*Teuchophanes* Meyrick, 1914, *Trans. ent. Soc. Lond.*: 274. Type-species: *T. leucopleura* Meyrick, 1914, *Trans. ent. Soc. Lond.*, 274.

*Psamathoscopa* Meyrick, 1937, *Exot. Microlepid.* 5: 96. Type-species: *Onebala simplex* Walsingham, 1900, *Bull. Lpool. Mus.*, 3: 2.

*Anathyrstotis* Meyrick, 1939, *Trans. R. ent. Soc. Lond.*, 89 : 55. Type-species: *A. ceriochranta* Meyrick, 1939, *Trans. R. ent. Soc. Lond.*, 89 : 55.

Type-species: *Gelechia (Helcystogramma) obseratella* Zeller, 1877, *Horae Soc. ent. ross.*, 13: 371, pl. 5, fig. 127, by subsequent designation: Meyrick, 1910, *Entomologist's mon. Mag.*, 46: 282.

#### Diagnosis

Labial palpus long, sickle shaped, third segment long and acute; antenna filiform approaching at 3/4<sup>th</sup> length of forewing; forewing with veins R<sub>4</sub>+R<sub>5</sub> stalked, R<sub>4</sub> to costa, R<sub>5</sub> to termen or apex, CuA<sub>1</sub>+CuA<sub>2</sub> stalked, discal cell closed; hindwing somewhat quadrate, vein Rs+M1 stalked, Rs to apex, M<sub>1</sub> to termen, M<sub>3</sub>+CuA<sub>1</sub> stalked, CuP vestigial or absent, discal cell open; male genitalia with uncus broader at apex, narrowed basally, small hair on inner surface; socii absent; gnathos

strongly sclerotized, hook-like, tegumen hood-like, valvae with paired setose lobe arising from lateral arms, valvae long, broader distally, setose densely; saccus present; coremata present or absent; aedeagus broader basally, apically acute; female genitalia with papillae anales sparsely setose; anterior and posterior apophyses almost equal in length; ductus seminalis arising from right posterior of corpus bursae; corpus bursae with slightly sclerotized portion at juncton of ductus seminalis.

#### 20. *Helcystogramma hibisci* (Stainton)

*Gelechia* (?) *hibisci* Stainton, 1859. *Trans. ent. Soc. Lond.*, (2)5, p. 117.

*Onebala Hibisci*: Meyrick, 1925, in Wytsman, *Genera Insect.*, p. 138; Gaede, 1937 *Lepid. Cat.*, p. 377.

*Gelechia (Helcystogramma) obseratella* zeller, 1877, *Horae Soc. ent. Ross.*, 13, p. 371.

*Crosophora eudela* Turner, 1919, *Proc. Roy. Soc. Queensland*, 31, p. 160.

Material examined: 2 females, 13.iv.1999, Renuka Lake, Dist. Sirmour, Himachal Pradesh, 740m; 1 male, 23.iv.1999, Forest Research Institute Campus, Dehradun, Dist. Dehradun, Uttaranchal, 700m; 2 males, 19.viii.1999, Punjabi university, Patiala, Dist. Patiala, Punjab, 250m, three males, 5.iv.2000, University of Horticulture and Forestry, Nauni, Dist. Solan, Himachal Pradesh, 1360m, coll. P.C. Pathania

Distribution: India (Kolkata), S. China, Taiwan, Sri Lanka, Java and Australia (Park & Hodges, 1995).

Larval host plant: *Hibiscus exculentus* (Fletcher, 1921), Okra (Butani and Jotwani, 1984).

#### 21. *Helcystogramma clarkei* Rose and Pathania

*Helcystogramma clarkei* Rose and Pathania, 2003, *Pb.Univ. Res. J.(Sci)*, 53: 84-86.

Material examined:  
Holotype: Male, 23.x.1998, Punjabi University, Patiala, Dist. Patiala, Punjab, 250m, coll. P.C. Pathania

Paratypes: 2 males, 1 female, 23.iv.1999, Forest Research Institute Campus, Dehradun, Dist. Dehradun, Uttaranchal, 700m; 1 female, 21.vii.1998, 2 males, 3.x.1999; 1 male, 4.x.1999; 1 male, 5.x.1999; 1 male, 13.x.1999; 1 male, 15.xii.99, Punjabi University, Patiala, Dist. Patiala, Punjab, 250m, coll. P.C. Pathania

Larval host plant: Unknown

#### 22. *Helcystogramma uedai* Rose and Pathania

*Helcystogramma uedai* Rose and Pathania, 2003, *Pb.Univ. Res. J.(Sci)*, 53: 86-88.

Material examined:  
Holotype: Male, 11.iv.1999, Renuka Lake, Dist. Sirmour, Himachal Pradesh, 740m, coll. P.C. Pathania

Paratypes: 3 females, 6.ix.1998, Punjabi university, Patiala, Dist. Patiala, Punjab, 250m; 1 female, 3.iv.1999, Forest Research Institute Campus, Dehradun, Dist. Dehradun, Uttaranchal, 700m; 1 male, 5.vi.1999, Tanyhar, Dist. Mandi, Himachal Pradesh, 1120m; 1 male, 11.iv.1999; two females, 21.iv.2000, Renuka Lake, Dist. Sirmour, Himachal Pradesh, 740m; coll. P.C. Pathania

Larval host plant: Unknown

#### DISCUSSION

The main characteristic of the family Gelechiidae are "Vertex and frons covered with smooth scales, antennae smaller than 3/4<sup>th</sup> length of forewings, labial palpus upturned, second segment long, acute, hindwing with veins R<sub>1</sub> and Sc united from base of wing or R<sub>1</sub> running into Sc beyond base of wing, discocellular perpendicular to long axis of wing or directed at 45 degree angle toward base of wing from M<sub>2</sub>, termen excavated.

In the subfamily Gelechiinae, *Anarsia* Zeller with labial palpus second segment beset with small sacles, the latter arranged

subtriangularly, third segment reduced in male, male genitalia with valvae asymmetrical, cucullus with modified scales on the inner surface, tegumen longer and socii present. *Stegasta* Meyrick is being characterized by the presence of creamish-white scales in a costal fold on the ventral surface of the forewing, male genitalia with uncus bifid, aedeagus tubular in shape and female genitalia with corpus bursae bulb-like. In *Hypatima* Hübner the labial palpus with second segment beset with relatively longer scales, directly anteriorly, third segment well developed in male and male genitalia with socii absent.

In the subfamily Dichomeridinae the genus *Hycleptis* Meyrick is characterized with labial palpus arm-like, second and third segment scales and *Dichomeris* Hübner with forewing vein  $R_5$  to costa or apex (absent in *rasilella* Herrich-Schaffer) and male genitalia with culcitula, sicae present and aedeagus with well developed lateral lobes but in genus *Helcystogramma* Zeller forewing vein  $R_5$  to termen and male genitalia with out culcitula and sicae and aedeagus without such lobes.

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