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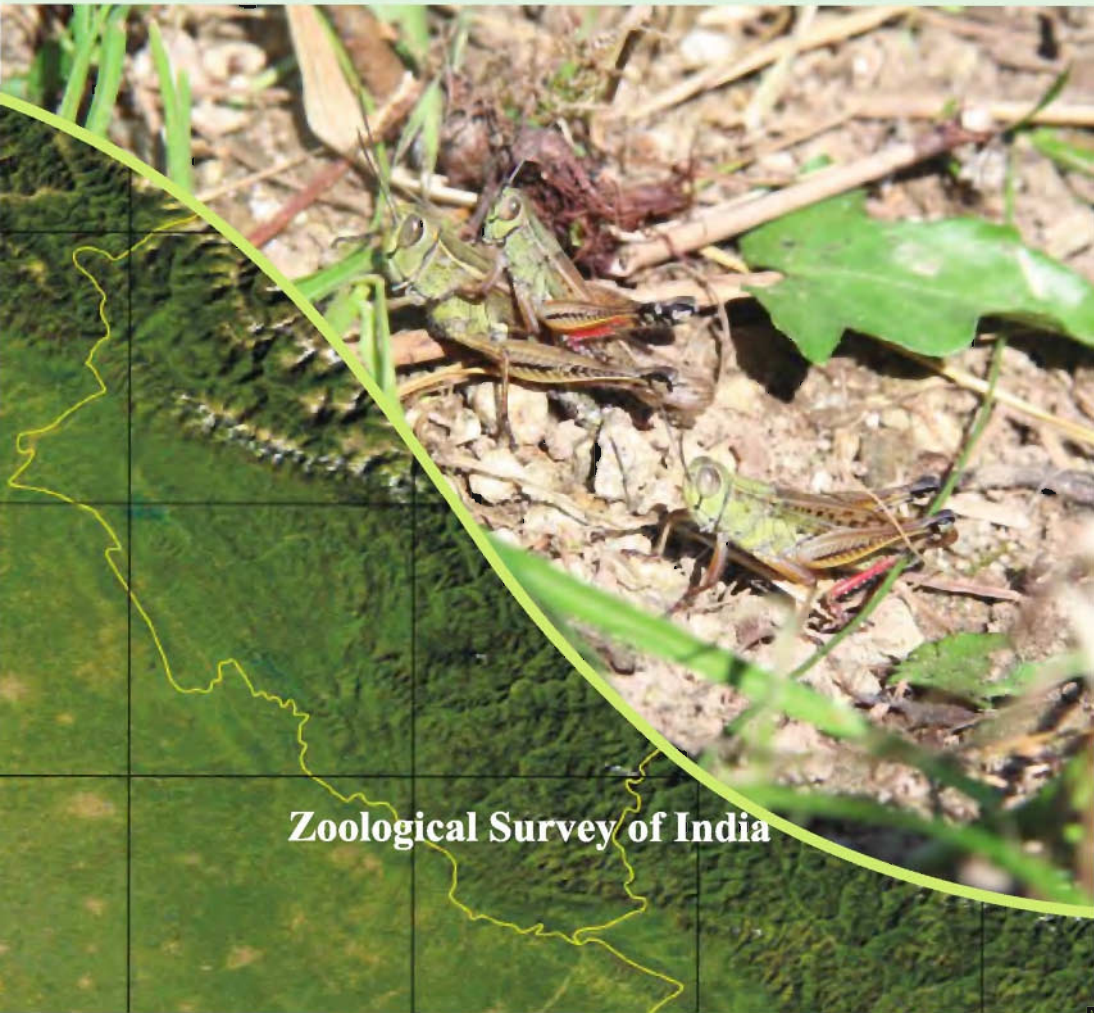
United Nations Decade on Biodiversity

A Pictorial Handbook on

Grasshoppers of Western Himalayas

G. SRINIVASAN and D. PRABAKAR



Zoological Survey of India

A Pictorial Handbook on
Grasshoppers of Western Himalayas

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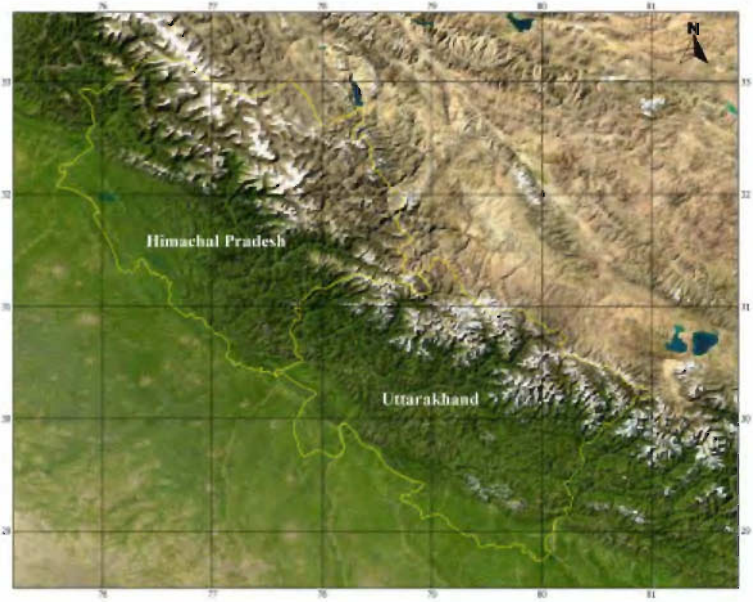
CONTENTS

INTRODUCTION

The Western Himalayas extends west from the Gandaki River in Nepal, through the Indian states of Uttar Pradesh and Himachal Pradesh, and into Jammu and Kashmir eastern Pakistan. Despite being relatively thinly populated some seventy percent of the conifer forest has been cleared or degraded, partly to make way for terrace cultivation. However it still contains some of the least disturbed forests in the western Himalayas. Several distinct forest types are found in this ecoregion. Fir trees (*Abies spectabilis*) in places grow in nearly pure stands. In other areas they mix with oaks (*Quercus semecarpifolia*). *Rhododendron campanulatum*, *Abies spectabilis*, and birch (*Betula utilis*) form another common assemblage. Elsewhere mixed-conifer forests are made up of *Abies spectabilis*, Blue Pine (*Pinus wallichiana*) and spruce (*Picea smithiana*). *Cupressus torulosa* and *Cedrus deodara* are also found here.

Order Orthoptera includes short horned and long horned grasshoppers, crickets and grouse locusts. These insects range from sizes less than 5 mm to 115 mm. The antennae are filiform but in some they are ensiform. Tarsi 2 to 4 segmented; hind femora enlarged and modified for jumping. Wings fully developed or brachypterous or not present. Fore wings are generally in the form of leathery tegmina, hind wings membraneous and fan like. The female has external long or short ovipositor. Male of most species produce sound female generally do not produce sound. Bhowmik (1985), Bhowmik and Halder (1984), Ingrisch & Rentz (2009), Julka *et al.* (1982), Kirby (1914), Metha *et al.* (2002), Shishodia *et al.* (2003 & 2010), Uvarov (1921) studied the orthoptera fauna of Indian subcontinent earlier. There are about 1033 species/subspecies belonging to 400 genera and 21 families recorded from India . The present communication is based on the Faunistic surveys undertaken in different districts such as Panali, Bilaspur District; Gohura, Giripool, Ghumarwain, Sadhupool, Rajhgarh, Kaload, Kumarhati, Rundangowda, Solan District; Simbalwara WLS, Renukaji Temple, Sermour Dristrict; Sadhukund, Chamba District; Bhota, Jwalamukhi, Deotsidh, Hamirpur District; Bindraban, Gopalpur, Ballah, Dharmasala, Kangra District; Bharwain, Barnoh, Una District; Koti village, Ravi river, Bagaradu, Paror, Lahaul, Dalhousie, Khajjiar lake, Tissa, Chamba District; Kalpa, Cholling, Recong Peo, Kaza, Tabu, Kinnaur District; Sangla valley, Bangara camp Lahual& Spiti Districts of Himachal Pradesh and Gangeria,


Study Area


N
Himachal Pradesh
Uttarakhand

Gauchara, Chamoli District; Nanaksagar, Dhanolti, Gajora, Bhowali, Jeolikota, Bhimtal, Nainital District; Augusthamuni, Rudraprayag District; Devaprayag, Chota Sheuta, Bhuniyala, Rishikesh Tehri garhwal District; Kasauni, Ranikhet, Almora District; Chandighat ,Haridwar District; Sahasradhara, Karwapani, Mussourie, Bibiwala, Dehradun District; Srinagar, Pauri Gharwal District; Pithoragarh District; Gangotri, Bhojbasa, Uttarkashi Districts Of Uttarakhand were the areas surveyed and are represented by 35 species of 28 genera of 2 families.

The grasshoppers were collected by sweep net and handpicked, killed by ethyl acetate and preserved as dry specimens. The pinned specimens were subjected to taxonomic studies by using Olympus SZX10 microscope. The map for the study area is also presented.

The earlier workers had presented the Taxonomic studies and check lists but in this study for the first time field documentation of about 35 species in their natural habitat has been presented which will help field identification and specimen collection.

A systematic account of the same is presented below:

SYSTEMATIC LIST

Order ORTHOPTERA

Suborder CAELIFERA

Superfamily ACRIDOIDEA

Family ACRIDIDAE

Subfamily ACRIDINAE

Tribe **Acridni** Macleay, 1821

Genus ***Acrida*** Linnaeus, 1758

1. *Acrida exaltata* (Walker, 1859)
2. *Acrida gigantea* (Herbst, 1794)
3. *Acrida turrita* (Linnaeus, 1758)

Genus ***Phlaeoba*** Stal, 1860

4. *Phlaeoba infumata* Brunner Von Wattenwyl, 1893
5. *Phlaeoba panteli,* Bolivar, 1902

Subfamily CATANTOPINAE Brunner Von Wattenwyl, 1893

Genus ***Choroedocus*** Bolivar, 1914

6. *Choroedocus illustris* (Walker, 1870)
7. *Choroedocus robustus* (Serville, 1839)

Genus ***Pachyacris*** Uvarov, 1923

8. *Pachyacris vinosa* (Walker, 1870)

Tribe **Oxyrrhepini** Tinkham, 1940

Genus ***Oxyrrhepes*** Stal, 1873

9. *Oxyrrhepes obtusa* (Haan, 1842)

Tribe **Catantopini** Brunner Von Wattenwyl, 1893

Genus ***Xenocatantops*** Dirsh & Uvarov, 1953

10. *Xenocatantops humilis humilis* (Serville, 1839)
11. *Xenocatantops karnyi* (Kirby, 1910)

Genus ***Diabolocatantops*** Jago, 1984

12. *Diabolocatantops innotabilis* (Walker, 1870)

Genus ***Stenocatantops*** Dirsh & Uvarov, 1953

13. *Stenocatantops splendens* (Thunberg, 1815)

Subfamily CYRTACANTHACRIDINAE Kirby, 1902

Genus ***Chondracris*** Uvarov, 1923

14. *Chondracris rosea* (De Geer, 1773)

Tribe **Cyrtacanthacridini** Kirby, 1902

Genus ***Cyrtacanthacris*** Walker, 1870

15. *Cyrtacanthacris tatarica* (Linnaeus, 1758)

Genus ***Patanga*** Uvarov, 1923

16. *Patanga succincta* (Johansson, 1763)

Subfamily EYPREPOCNEMIDINAE

Brunner Von Wattenwyl, 1893

Genus ***Tylotropidius*** Stal, 1860

17. *Tylotropidius varicornis* (Walker, 1870)

Tribe **Eyprepocnemidini** Brunner Von Wattenwyl, 1893

Genus ***Eyprepocnemis*** Fieber, 1853

18. *Eyprepocnemis alacris alacris* (Serville, 1839)

19. *Eyprepocnemis rosea* Uvarov, 1942

Subfamily GOMPHOCERINAE

Tribe **Arcypterini** Shumakov, 1963

Genus ***Aulacobothrus*** Bolivar, 1902

20. *Aulacobothrus luteipes luteipes* (Walker, 1871)

Subfamily HEMIACRIDINAE Dirsh, 1956

Tribe **Hieroglyphini**

Genus ***Hieroglyphus*** Krauss, 1877

21. *Hieroglyphus banian* (Fabricius, 1798)

Subfamily OEDIPODINAE

Genus ***Dittopternis*** Saussure, 1884

22. *Dittopternis venusta* (Walker, 1870)

Tribe **Parapleurini** Brunner Von Wattenwyl, 1893

Genus ***Ceracris*** Walker, 1870

23. *Ceracris striata* Uvarov, 1925

Tribe **Locustini** Kirby, 1825

Genus ***Gastrimargus*** Saussure, 1884

24. *Gastrimargus africanus africanus* (Saussure, 1888)

25. *Gastrimargus marmoratus* (Thunberg, 1815)

Genus ***Oedaleus*** Fieber, 1853

26. *Oedaleus abruptus* (Thunberg, 1815)

Tribe **Sphingonotini** Johnston, 1956

Genus ***Sphingonotus*** Fieber, 1852

27. *Sphingonotus (Sphingonotus) longipennis,* Saussure, 1884

Genus ***Trilophidia*** Stål, 1873

28. *Trilophidia annulata* (Thunberg, 1815)

Subfamily **OXYINAE**

Genus ***Gesonula*** Uvarov, 1940

29. *Gesonula punctifrons,* Stal, 1860

Genus ***Caryanda*** Stål, 1878

30. *Caryanda parvicina* (Willemse, 1925)

Genus ***Oxya*** Serville, 1831

31. *Oxya fuscovittata* (Marschall, 1836)

Subfamily SPATHOSTERNINAE Rehn, 1957

Tribe **Spathosternini** Rehn, 1957

Genus ***Spathosternum*** Krauss, 1877

32. Spathosternum prasiniferum prasiniferum (Walker, 1871)

Superfamily PYRGOMORPHOIDEA Brunner von Wattenwyl, 1874

Family PYRGOMORPHIDAE Brunner von Wattenwyl, 1874

Subfamily PYRGOMORPHINAE

Tribe **Atractomorphini** Bolivar, 1905

Genus ***Atractomorpha*** Saussure, 1862

33. *Atractomorpha crenulata* (Fabricius, 1793)

Tribe **Chrotogonini** Bolivar, 1904

Genus ***Chrotogonus*** Serville, 1838

Subgenus ***Chrotogonus*** Serville, 1838

34. *Chrotogonus* (*Chrotogonus*) *trachypterus trachypterus* (Blanchard, 1836)

Tribe **Poekilocerini** Bolivar, 1884

Genus ***Poekilocerus*** Serville,1831

35. *Poekilocerus pictus* (Fabricius, 1775)

SYSTEMATIC ACCOUNT

Key to families

1. Foveolae of the vertex contiguous, superior and forming the extremity of the fastigium; stridulatory mechanism absent..... .....PYRGOMORPHIDAE

- Foveolae of the vertex lateral or inferior, never forming the tip of the fastigium; stridulatory mechanism present..... ..... ACRIDIDAE

Key to Subfamilies of ACRIDIDAE

1. Prosternal tubercle or process usually present 2

- Prosternal tubercle or process absent 8

2. Prosternal tubercle or process conical 3

- Prosternal tubercle or process spathulate .... SPATHOSTERNINAE

3. Radial area of tegmen with a series of regular parallel, stridulatory veinlets ..... HEMIACRIDINAE

- Stridulatory veinlets of radial area of tegmen absent 4

4. Lower external lobe of hind knee with spine- like apex .... OXYINAE

- Lower external lobe hind knee with apex rounded, angular or subacute but not spine like 5

5. Mesosternal lobes rounded or obtuse- angular or acute – angular, but not rectangular 6

- Mesosternal lobes rectangular .... CYRTACANTHACRIDINAE

6. Dorsum of pronotum flat or weakly tectiform, with median and lateral carinae linear

   (linear carinae sometimes obliterated); male cercus with strongly compressed, lobiform or subacute, down curved apex .... EYPREPOCNEMIDINAE

- Dorsum of pronotum of variable shape; lateral carinae, if present, not linear; male circus variable, but not as mentioned above ..... CATANTOPINAE

7. Stridulatory file present in posterior femora ....GOMPHOCERINAE

- Stridulatory file absent in posterior femora 8

8. Head with more acute in profile, and with a more acute angle of frons; tegmina without intercalary vein(if present, weak, irregular and not serrated even in male)..... ACRIDINAE

- Head with rounded in profile, face almost vertical, rarely oblique and generally broadly rounded; tegmina always with an intercalary vein in median area (mostly well developed).... ..... OEDIPODINAE

Subfamily ACRIDINAE

Key to genera

1. Head conically ascending; hind femora with a spine on the dorso- external and dorso-internal genicular lobes .... ***Acrida*** Linnaeus.

- Head not ascending; hind femora with rounded dorso- external and dorso-internal genicular lobes ..... ***Phlaeoba*** Stål

Genus ***Acrida*** Linnaeus, 1758

Key to species

1. Wing-cells not centered with fuscous 2

- Wing-cells not centered with fuscous. Tegmina without distinct coloured margin ..... ***exaltata*** (Walker)

2. Body and tegmina without pinkish markings ; pronotum without black lines..... ***turrita*** (Linnaeus)

- Body and tegmina with pinkish markings ; pronotum with black lines .....***gigantea*** (Herbst)

1. ***Acrida exaltata*** (Walker, 1859)

1859. *Truxalis exaltata* Walker, *Ann. Mag. Nat. Hist.,* **4**(3): 222

1893. *Truxalis brevicollis*, Bolivar, *Feuille Jeunes. Nat.* xxiii, pp.162, 164.

1902. *Acrida lugubris*, Burr, *Trans. Ent. Soc. Lond.* Pp. 157, 170.

1914. *Acrida exaltata*, Kirby, *Fauna of British India:* Vol. I (Acrididae):99.

1914. *Acrida lugubris*, Kirby, *Fauna of British India:* Vol. I (Acrididae):99.

1936. *Acrida curta* Uvarov, *Zool. J. Linn. Soc.*, **39** : 536.

1954. *Acrida exaltata,* Dirsh, *Bull. Soc. Faud. Ent.,* **38** :149.

1956. *Acrida lugubris astigmata,* Prasad, *Proc. Nation. Acad. Sci. India,* **1:** 22.

1969. *Acrida exaltata*, Tandon & Shishodia, *Oriental Ins.*, **3**(3): 267.

Diagnostic characters: Body green in colour; fastigium of vertex broad, laminate and truncate at extremity; head conically ascending, basal part narrow and as long as the pronotum; pronotal disc weakly tectiform; transverse sulcus of pronotum placed near the middle of disc; tegmina without pointed apex, a little produced beyond the hind

Acrida exaltata (Walker,1859)

knees; wings slightly shorter than tegmina and yellowish hyaline in colour; the cells in the posterior part of the wings are cloudy in the middle; hind femora is smaller than tegmina; the male subgenital plate is long.

Habitat: This species is associated with grass. Nymphs and adults occur almost throughout the year. There are probably three generation per year and cause damage to crops like paddy, maize, oat, sorghum, wheat, and vegetables like brinjal, milch, tomato etc. Sometimes attack on wheat, millet, cowpea. Maximum population observed in the month of September and minimum in February.

Distribution : India : Andaman & Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere*: Afghanistan, Bangladesh, Iran, Pakistan, Saudi Arabia, South East Tibet, Sri Lanka, Yemen and West Aden.

2. ***Acrida gigantea*** (Herbst, 1794)

1794. *Truxalis gigantea*, Herbst, *Fuessly Archiv.*,: 191.

1914. *Acrida gigantea,* Kirby, *Fauna of British India,* Vol. I (Acrididae): 98.

Diagnostic characters : Head slightly, if at all, longer than the pronotum, and often shorter. Green ; head and pronotum with 2 or 3 pale pink bands on each side ; tegmina with two broad pink longitudinal bands, between which is often a whitish line, generally broken into long spots, bordered with blackish ; wings hyaline. Lateral carinae of pronotum edged within with a black line.

Habitat : This has been collected from the cultivated fields with maize and crops near roadsides and water channels having tall grasses.

Distribution: India: Himachal Pradesh, Madhya Pradesh, Tamil Nadu and Uttarakhand. *Elsewhere*: Africa and Nepal and Pakistan.

Acrida gigantea (Herbst, 1794)

3. ***Acrida turrita*** (Linnaeus, 1758)

1758. *Gryllus* (*Acrida*) *turritus*, Linnaeus, *Systema Naturae per Regna tria naturae* (10th ed.) 1:427.

1908. *Acrida turrita,* Karny, *Filchner Exped. China-Tibet zool. bot. Ergebn.* **10**(1) : 53.

Diagnostic characters : Green ; tegmina long, narrow and pointed, extending when closed beyond the abdomen ; head slender, longer than the pronotum by the length of the fastigium in front of the eyes ; wings hyaline, pointed at the extremity.

Habitat : It has been collected from thick grasses and maize fields near roadsides and water channels.

Distribution: India: Himachal Pradesh. *Elsewhere*: Africa, Asia, Pakistan, South Europe.

Remarks : The species is first record to India.

Acrida turrita (Linnaeus, 1758)

Genus ***Phlaeoba*** Stål, 1860

Key to species

1. Antennae shorter than the head and pronotum together; wings bluish hyaline.....***panteli*** Bolivar.

- Antennae as long as the head and pronotum together; wings fusco-hyaline.....***infumata*** Brunner.

4. ***Phlaeoba infumata*** Brunner Von Wattenwyl, 1893

1893. *Phlaeoba infumata*, Brunner Von Wattenwyl, *Ann. Mus. Genova,* xxxii, p.124.

1914. *Phlaeoba infumata*, Kirby, *Fauna of British India: Vol. I* (Acrididae):103.

1921. *Phlaeoba infumata*, Uvarov, *Ann. Mag. Nat. Hist. London*, **7**(9) 486.

Diagnostic characters : Size medium. Brownish testaceous coloured body; fastigium of the vertex short and concave above. Head and pronotum equally broad shaped; Antennae unicoloured and ensiform; pronotum tricarinate; abdomen shorter than the tegmina and wings. The wings have smoky colouration at apex. Hind femora dotted with black on the outer carinae; hind tibiae with white spines tipped with black.

Habitat : It is a common species of India and is known to occur in plains and hill region. It is a minor pest of paddy, sorghum, maize, millets. Both adults and nymphs are generally found throughout the year in moist area. Maximum population observed in the month of November. Probably it is three generation per year.

Distribution: India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Haryana, Himachal Pradesh, Madhya Pradesh, Manipur, Meghalaya, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal. *Elsewhere***:** Bangladesh, East Nepal, Hainan Islands, Myanmar, South & North Malacca, South China, Tenasserim and Yunnan.

Phlaeoba infumata Brunner Von Wattenwyi,1893

5. ***Phlaeoba panteli*** Bolivar, 1902

1902. *Phlaeoba panteli*, Bolivar, *Annal. Soc. Ent. Fr.,* **70**: 581.

1910. *Phlaeoba walhousci*, Kirby, *Syn. Cat. Orth.,*: 138.

1914. *Phlaeoba panteli*, Kirby, *Fauna of British India:* Vol.I (Acrididae):103.

Diagnostic Characters: Size medium; antennae ensiform and shorter than head and pronotum together, brown at apex; pronotum truncated in front, obustly angulated behind; head and pronotum very rugose, the callosities being irregularly serrated; wings narrow, bluish hyaline, with many of nervures greenish; colour ferruginous brown with scattered black dots.

Habitat : The specimens of this species have been collected from grasses near roadsides and cultivated fields of maize, rice, millets, ground nut, alfalfa and sugarcane crops.

Distribution: India : Andhra Pradesh, Arunachal Pradesh, Bihar, Himachal Pradesh, Madhya Pradesh, Manipur, Meghalaya, Tamil Nadu, Tripura, Uttarakhand and West Bengal. *Elsewhere*: Afghanistan.

Phlaeoba panteli, Bolivar, 1902

Subfamily CATANTOPINAE Brunner Von Wattenwyl, 1893

Key to genera

1. Male cercus wide ; prosternal tubercle acuminate, bent backwards at an angle about the middle. subgenital plate conical, slightly recurved, truncate, subtruncate or rounded at apex..... ..... ***Choroedocus*** Bolivar.

- Subgenital plate simple 2

2. Male cercus elongate and conical; prosternal process conical; subgenital plate acuminate, pointed .....***Pachyacris*** Uvarov.

- Prosternal tubercle neither conical nor cylindrical.....3

3. Prosternal tubercle laterally compressed and slightly bent backwards. Subgenital plate trilobite .....***Oxyrrhepes*** Stål.

- Prosternal tubercle cylindrical.....4

4. Pronotum sub cylindrical, slightly narrowing forwards ; prosternal tubercle thick, cylindrical or slightly antero-posteriorly compressed, with rounded apex ***Diabolocatantops*** Jago.

- Pronotum not sub cylindrical; prosternal tubercle not cylindrical, and never with rounded apex 5

5. Pronotum constricted; prosternal tubercle conical..... .....***Xenocatantops*** Dirsh & Uvarov.

- Pronotum flattened (not constricted) ; prosternal tubercle laterally compressed (very slender body) .....***Stenocatantops*** Dirsh & Uvarov.

Genus ***Choroedocus*** Bolivar, 1914

Key to species

1. Tegmina with small scattered brownish dots throughout disc excluding costal area..... ***illustris*** (Walker).

- Tegmina yellowish, subhyaline and without small scattered brownish dots throughout disc .....***robustus*** (Serville).

6. ***Choroedocus illustris*** (Walker, 1870)

1870. *Heteracris illustris*, Walker, *Cat. Derm. Salt. Brit. Mus.*, iv, p. 663.

1914. *Heteracris illustris*, Kirby, Fauna of British India: Vol.I (Acrididae) : 263.

1976. *Choroedocus illustris,* Tandon, *Rec. Zool. Surv. India, , Occ. Pap.* No., **3** : 12.

Diagnostic characters: Size large; fastigium of vertex distinctly depressed, obtusely and roundly angulate in front; pronotum with lateral carina distant only up to end prozona; prosternal process cylindrical, a little inclined back; subgenital plate conical, up curved; posterior tibiae with more pilose.

Habitat: The species is mostly seen on the river banks on barren grounds with grass. Copulation takes place during the month of September.

Distribution: India: Andhra Pradesh, Himachal Pradesh, Madhya Pradesh, Maharashtra, Tamil Nadu and Uttarakhand.

Choroedocus illustris (Walker, 1870)

7. Choroedocus robustus (Serville, 1839)

1839. *Acridium robustum*, Serville, *Orthopteres*, : 647.

1870. *Heteracris ducalis*, Walker, *Cat. Derm. Salt. Brit. Mus*., iv, p. 663.

1914. *Heteracris robusta*, Kirby, *Fauna Brit. India, Orth.,* : 262.

1976. *Choroedocus robustus,* Tandon, *Rec. Zool. Surv. India, Occ. Pap*. No., **3** : 12.

Diagnostic characters: Body large robust; Antennae filiform; fastigium rounded in front, frontal ridge narrowing between antennae; prosternal tubercle gradually tapering apically, weakly incurved and pubescent; tegmina without spots; supra-anal plate tongue shaped, apex broadly rounded; circus wide, thick, strongly compressed, incurved and down curved.

Habitat : The species is mostly seen on the river banks on barren grounds with grass.

Distribution: India : Andhra Pradesh, Arunachal Pradesh, Assam, Himachal Pradesh, Manipur, Meghalaya, Nagaland, Sikkim, Tripura and West Bengal. *Elsewhere*: Bangladesh.

Choroedocus robustus (Serville, 1839)

Genus ***Pachyacris*** Uvarov, 1923

8. ***Pachyacris vinosa*** (Walker, 1870)

1870. *Acridium venosum,* Walker, *Cat. Derm. Salt. Brit. Mus.,* **3** : 588.

1910. *Cyrtacanthacris vinosa*, Kirby, *Syn. Cat. Orth.*, : 452.

1914. *Orthacanthacris vinosa,* Kirby, *Fauna. Brit. India, Orthoptera (Acrididae)* :228.

1923. *Pachyacris vinosa*, Uvarov, *Ann. Mag. Nat. Hist.* (i) **11** : 478.

Diagnostic characters: Almost uniform reddish brown, slightly varied with pale yellow behind the eyes and on the sides of the pronotum ; antennae yellowish. Pronotum thickly punctured, narrowly streaked with yellow on the hind border. Tegmina brown. Wings brownish hyaline, with the base red. Legs brown, hind femora banded with lighter and darker brown, and whitish on the sides. Hind tibiae with 8-11 whitish black- tipped spines.

Habitat: It was seen on forest grounds covered with tall grasses.

Distribution: India: Karnataka, West Bengal, Assam, Bihar, Goa, Himachal Pradesh, Mizoram, Odisha, Uttar Pradesh. *Elsewhere***:** Myanmar, China, Nepal.

Pachyacris vinosa (Walker, 1870)

Subfamily TROPIDOPOLINAE
Tribe **Oxyrrhepini** Tinkham, 1940
Genus ***Oxyrrhepes*** Stål, 1873
9. ***Oxyrrhepes obtusa*** (Haan, 1842)

1842. *Acridium (Oxya) obtusa* Haan, *Gesch. Ned. Overszee.* Bezitt, 2 : 155.

1859. *Acridium extensum,* Walker, *Ann. Mag. Nat. Hist.*, **4** (3) : 222.

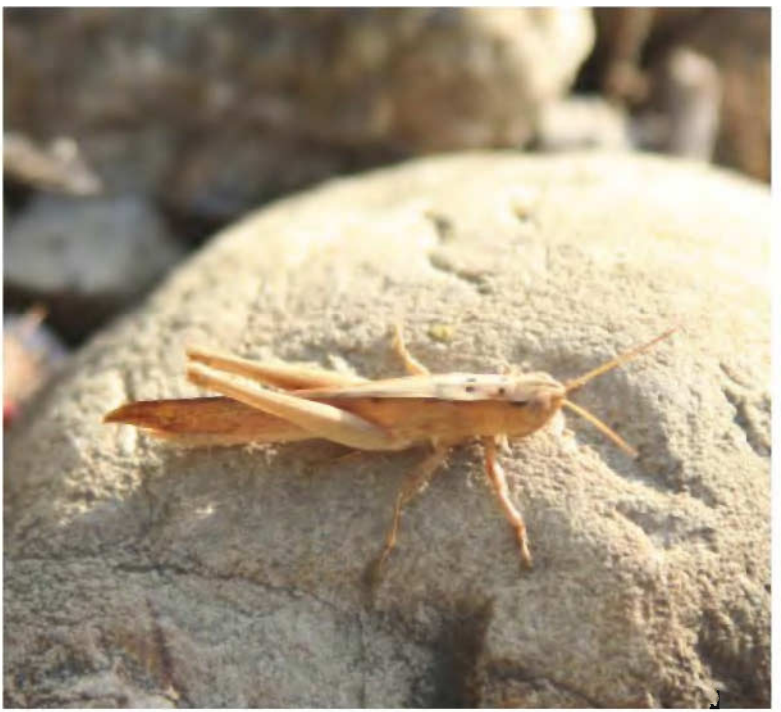
1870. *Opolama lineatitarsus*, Walker, *Cat. Derm. Salt. Brit. Mus.,* iv, p. 511.

1870. *Heteracris strangulata*, Walker, *Cat. Derm. Salt. Brit. Mus.*, iv, p. 665.

1870. *Heteracris antica*, Walker, *Cat. Derm. Salt. Brit. Mus.*, iv, p. 668.

1914. *Oxyrrhepes extensa,* Kirby, *Fauna of British India*: Vol.I (Acrididae):209.

1931. *Oxyrrhepes celebesia,* Willemse, *Truebia, Buitenzorg*, : **12** : 234.



Oxyrrhepes obtusa (Haan, 1842)

1939. *Oxyrrhepes quadripunctata,* Willemse, Natuurh. Maandbl., Maastricht, **28** : 75.

1955. *Oxyrrhepes obtusa,* Willemse, Publites natuurh. Genoot. Limburg, **8** : 32, 33.

Diagnostic characters: Head short. Fastigium obtuse at the apex. Vertex with a median and two lateral longitudinal darker lines. Antennae filiform, shorter than the head and pronotum together. Median carina of pronotum crossed by three transverse sulci. Prosternal tubercles compressed laterally and curved backwards. Elytra and wings extend beyond the apex of posterior femora.

Habitat : It was seen in forest areas covered with high grasses and leaf litters.

Distribution : India : Arunachal Pradesh, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Manipur, Meghalaya, Nagaland, Odisha, Rajasthan, Sikkim, Tamil Nadu, Uttarakhand and West Bengal. *Elsewhere* **:** China, Indo-China, Indonesia, Java, Lombok, Myanmar and Sri Lanka.

Tribe CATANTOPINI Brunner Von Wattenwyl, 1893

Genus ***Xenocatantops*** Dirsh & Uvarov, 1953

Key to species

1. Male cercus showing no clear apical bifurcation, but apically bilaterally compressed and little curved..... .....***humilis humilis*** (Serville)

- Male cercus clearly bifurcate apically..... ***karnyi*** (Kirby)

10. ***Xenocatantops humilis humilis*** (Serville, 1839)

1839. *Acridium humile,* Serville, Ins. Orth., p.662.

1914. *Catantops humilis, Kirby*, *Fauna of British India,* Vol. I (Acrididae) : 250.

1953. *Xenocatantops humilis humilis,* Dirsh & Uvarov, *Tijdschr. Ent.*, **96**(3) : 237.

Diagnostic characters: General appearance slender, and medium in size; pronotum slightly constricted, metazoan divergent posteriorly; Median segments of antennae twice as long as broad; prosternal tubercle slightly inclined backwards, conical, with obtuse apex; tegmina surpassing hind knee for more than half pronotal length; external disc of hind femur yellowish, with two brown fasciae, broadening forwards the lower margin and fused with the brown lower margin femur; subgenital plate short, sub conical.

Xenocatantops humilis humilis (Serville,1839)

Habitat: This species is generally inhabitant of forest, heavy infestation of this species has been found on hill slops adjoining to the cultivated fields such as mature paddy, maize, oat, cow pea. Adults are almost found in every month and nymphs are also found in groups under the leaves.

Distribution : India : Andaman & Nicobar Islands, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere*: Bangladesh, Borneo, Indo-China, Java, Lombok, Malaysia, Myanmar, Nepal, New Guinea, Philippines, Sumatra, Sri Lanka, Thailand, Tibet, Vietnam and Yunnan.

11. ***Xenocatantops karnyi*** (Kirby, 1910)

1907. *Catantops pulchellus*, Karny (nec Walker), *Sitz. Akad. Wiss. Wien, Math. Nat.* Cl.cxvi, pp.317, 339.

1910. *Catantops karnyi*, Kirby, *Syn. Cat. Orth.* iii, p. 483.

Diagnostic characters: Head considerably produced between the antennae, eyes almost touching above, vertex sloping into the broad frontal ridge, an irregular dark band behind eyes; pronotum thickly punctured, legs testaceous; hind femora with two oblique bands on the sides, the lower outer carina spotted with black; hind tibiae with 8 to 9 black tipped spines and black spots near the base. Tegmina brown; wings hyaline.

Habitat: It causes minor damage to Millet, Cotton, Maize, Rice, Tea, Teak etc. This species has probably biannual generation. Maximum population observed in the month of October. Both adults and nymphs are found from March to first week of December.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Chhattisgarh, Delhi, Himachal Pradesh, Maharashtra, Odisha, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere*: Nepal.

Xenocatantops karnyi (Kirby, 1910)

Genus ***Diabolocatantops*** Jago, 1984

12. ***Diabolocatantops innotabilis*** (Walker, 1870)

1860. *Acridium* (*Catantops*) *pingue*, Stal, *Eugenie's Resa, Orth*., p. 330.

1870. *Acridium innotabile*, Walker, *Cat. Derm. Salt. Brit. Mus*., iv, p. 629.

1870. *Caloptenus ferrugineus*, Walker, *Cat. Derm. Salt. Brit. Mus*., iv, p. 705.

1871. *Acridium obtusiferum*, Walker, *Cat. Derm. Salt. Brit. Mus*., 5, p. 63-67.

1871. *Caloptenus immunis*, Walker, *Cat. Derm. Salt. Brit. Mus*., 5, p. 63-67.

1902. *Catantops indicus*, Bolivar, I., *Ann. Soc. Ent. France*, lxx, p. 626.

1914. *Catantops pinguis*, Kirby, *Fauna of British India*, Vol. I (Acrididae) : 252.

1953. *Catantops pinguis innotabilis*, Dirsh & Uvarov, *Tijdschr. Ent*., **96**(3) : 233.

1984. *Diabolocatantops innotabilis*, Jago, *Trans Amer. Entomal. Soc*., **110**(3) : 371.

1990. *Diabolocatantops innotabilis*, Ingrisch, *Spixiana* (Munich), **13** : 174.

Diabolocatantops innotabilis (Walker, 1870)

Diagnostic Characters : Lateral lobe of pronotum without coloured pattern; external disc of hind femur without black median spot below upper carinula; male circus more up curved, with more broadened at apex and more projecting upper apical angle.

Habitat: It causes minor damage to Millet, Cotton, Maize, Rice, Tea, Teak etc. This species has probably biannual generation. Maximum population observed in the month of October. Both adults and nymphs are found from March to first week of December.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Lakshadweep Island, Madhya Pradesh, Maharashtra, Meghalaya, Manipur, Nagaland, Odisha, Rajasthan, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere* : Afghanistan, Bangladesh, Borneo, Cambodia, China, Hong Kong, Indo-China, Japan, Java, Korea, Maldive Island, Malaysia, Myanmar, Nepal, New Guinea, Pakistan, Philippines, Sri Lanka, Sumatra, Tibet and Thailand.

Genus ***Stenocatantops*** Dirsh & Uvarov, 1953

13. ***Stenocatantops splendens*** (Thunberg, 1815)

1815. *Gryllus splendens*, Thunberg, *Mem. Acad. Petersb.* v, p. 236.

1839. *Acridium luteolum*, Serville, *Ins. Orth.*, p. 661.

1842. *Acridium(Oxya) infuscatum* Haan, *Temminck, Verh. Orth.*, **16** : 155.

1859. *Acrydium rufitibia*, Walker, *Ann. & Mag. Nat. Hist.* (3) iv, p. 223.

1870. *Cyrtacanthacris nana*, Walker, *Cat. Derm. Salt. Brit. Mus.*, 3, p. 568.

1870. *Cyrtacanthacris ferrina*, Walker, *Cat. Derm. Salt. Brit. Mus.*, 3, p. 568.

1870. *Acridium ceramicum*, Walker, *Cat. Derm. Salt. Brit. Mus.*, 3, p. 591.

1870. *Cyrtacanthacris tenella*, Walker, *Cat. Derm. Salt. Brit. Mus.*, 4, p. 618.

1870. *Acridium corcanum*, Walker, *Cat. Derm. Salt. Brit. Mus.*, 4, p. 629.

1870. *Oxya infuscata*, Walker, *Cat. Derm. Salt. Brit. Mus.*, 4, p. 647.

1870. *Oxya lutcola*, Walker, *Cat. Derm. Salt. Brit. Mus.*, 4, p. 648.

1871. *Cyrtacanthacris obliqua*, Walker, *Cat. Derm. Salt. Brit. Mus.*, 5, p. 58.

1873. *Catantops splendens*, Stal, *Recens Orth.*, **1** : 71.

Stenocatantops splendens (Thunberg,1815)

1953. *Stenocatantops splendens,* Dirsh & Uvarov, *Tijdschr. Ent.*, **96** : 237.

Diagnostic characters: Size medium ; body more or less slender, elongated; brownish testaceous in colour; antennae thin, weakly compressed dorso-ventrally, longer than the head and pronotum together; Middle joints of the antennae about twice or thrice as long as broad. pronotum moderately compressed laterally; tegmina projecting beyond the hind knees by length of head and pronotum together or less. Prosternal tubercle strongly curved and bent backwards; hind femur moderately slender; subgenital plate weakly acute-conical; circus slightly broadened at base, narrowing and incurved towards apex.

Habitat : It is a pest of rice field, attacks members of the family Cucurbitacea.

Distribution : India : Andaman & Nicobar Islands, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Odisha, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal. *Elsewhere* **:** Borneo, China, Celebes, Hainan, Java, Korea, Malaysia, Moluccas Island, Myanmar, Nepal, New Guinea, Philippines, Sri Lanka, Sumatra, Taiwan, Thailand and Vietnam.

Subfamily CYRTACANTHACRIDINAE Kirby, 1902

Key to genera

1. Prosternal tubercle strongly curved backwards, touching or almost touching the mesosternum, inflated in middle, with conical apex.....2

- Prosternal tubercle straight, vertical or slightly incurved backwards but far from reaching the mesosternum, conical or compressed.....3

2. Pronotum strongly tectiform, integument strongly rugose, median carinae of pronotum sharp; male cercus incurved at base, about half as wide as its length .....*Chondracris* Uvarov.

- Pronotum moderately tectiform, slightly constricted, integument fairly rugose or dotted; costal area of tegmina with coarse net like reticulations; male cercus with subacute apex .... *Cyrtacanthacris* Walker

3. Tegmina with straight venation in apical part, transverse veins forming almost right angle with principal veins; hind tibiae with 8 spines on outer dorsal margin; prosternal tubercle almost cylindrical with rounded apex; male subgenital plate long, curved, apex pointed ..... *Patanga* Uvarov.

Genus ***Chondracris*** Uvarov, 1923

14. ***Chondracris rosea*** (De Geer, 1773)

1773. *Acrydium roseum*, De Geer, *Mem. Ins.* iii, p. 488, n. 3, pl. 41, fig. 1.

1870. *Cyrtacanthacris lutescens*, Walker, *Cat. Derm. Salt. Brit. Mus.*, iii, p. 566.

1914. *Cyrtacanthacris rosea,* Kirby, *Faun. Brit. India*, Vol. I (Acrididae) : 230.

1923. *Chondracris rosea* : Uvarov, *Bull. Ent. Res.* London, **14** (1) : 39.

1924. *Chondracris rosea rosea,* Uvarov, *Ann. Mag. Nat. Hist.* London, **14**(9) : 108.

1924. *Chondracris rosea brunneri,* Uvarov, *Ann. Mag. Nat. Hist.* London, **14**(9) : 108.

1975. *Chondracris rosea*, Tandon, *Dr. B.S. Chauhan Comm. Vol. Zool. Soc. India,* Kolkata : 396.

Chondracris rosea (De Geer, 1773)

Diagnostic characters: Large in size, body robust, coarsely punctured, uniformly green in colour; fastigium of vertex strongly sloping; median carina of pronotum moderately raised in prozona, straight in metazona; metazona feebly tectiform, disc forming distinct angles with the lateral lobes; tegmina exceeding the hind knee by one fourth of their total length; wings hyaline, with the base rose colour; hind tibiae and tarsi red.

Habitat : The species is seen in maize fields and feeding on banana leaves.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Goa, Himachal Pradesh, Kerala, Madhya Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand and West Bengal. *Elsewhere*: Bangladesh, Bhutan, China, Hainan, Indonesia, Japan, Java, Korea, Manchuria, Myanmar, Philippines, Taiwan, Thailand and Vietnam.

Tribe **Cyrtacanthacridini** Kirby, 1902

Genus ***Cyrtacanthacris*** Walker, 1870

15. ***Cyrtacanthacris tatarica*** (Linnaeus, 1758)

1758. *Gryllus (Locusta) tataricus*, Linnaeus, *Systema Naturae per Renga Tria naturae*, (10th ed.) : 432.

1804. *Acridium peregrinum*, Olivier, *Voy. Emp. Othom.* iv, p.388, notes.

1813. *Gryllus (Locusta) ranacea* Stoll, *Ajtb. Beschr. Zabeteh Trekspringhanen* : 30.

1815. *Gryllus migratorius*, Thunberg, *Mem. Sc. Petersb.* V, p.244.

1815. *Gryllus rufescens*, Thunberg, l.c.,p.245.

1838. *Gryllus ruficorne Serville, Histoire Naturelle des insects, Orthopteres*, : 643.

1838. *Acridium flaviventre*, Burmeister, *Handb. Ent.* ii, p.631.

1839. *Acridium aeruginasum,* Burmeister, *Handbunch der Entomologie*, 2 : 630.

1870. *Acridium compta*, Walker, *Cat. Derm. Salt. Brit. Mus.*, 4 : 605-801.

1870. *Acridium concisa*, Walker, *Cat. Derm. Salt. Brit. Mus.*, 4 : 485-594.

Cyrtacanthacris tatarica (Linnaeus, 1758)

1870. *Cyrtacanthacris internexa*, Walker, *Cat. Derm. Salt. Brit. Mus.*, 4 : 613.

1870. *Cyrtacanthacris subliturata*, Walker, *Cat. Derm. Salt. Brit. Mus.*, 4 : 365, 560, 565.

1870. *Acridium sellatum*, Walker, *Cat. Derm. Salt. Brit. Mus.*, iii,p.585

1914. *Schistocerca tatarica*, Kirby, *Faun. Brit. India,* Vol. I (Acrididae) : 232.

1923. *Cyrtacanthacris tatarica*, Uvarov, *Ann. Mag. Nat. Hist.*, (**9**)11 : 139.

Diagnostic characters: Body yellow colour with brown and white markings. A dark colour stripe is seen on both the sides of the occiput. Cheeks sometimes with indefinite dark spots. Pronotum with a velvet blackish brown band on both sides. Tegmina with dense and thick reticulation. Wings hyaline. Hind tibiae yellowish below. Hind tarsi red.

Habitat : This grasshopper occurs both in plain as well as in the hilly regions. It has been found in scattered vegetation of grasses, herbs and shrubs. There is one generation in a year. It is a minor pest of paddy, sorghum and cow pea. Nymphs are collected from middle of July to end of August. The adults are very active and can travel long distances.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Odisha, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand and West Bengal. *Elsewhere* : Africa, Bangladesh, Central America, Hainan, Indonesia, Madagascar, Mediterranean Region, Myanmar, Nepal, Pakistan, Philippines, Red-sea, Sahara, Saudi Arabia, Seychelles, Sri Lanka, South West Asia, Sumatra and Thailand.

Genus ***Patanga*** Uvarov, 1923

16. ***Patanga succincta*** (Johansson, 1763)

1763. *Gryllus Locusta succinctus*, Johansson, *Centuria Insectorum rariorum. Amoenitates Academicae*, 6 : 383.

1813. *Gryllus Locusta ranaceus*, Stoll, *Spectres, Saut.*, p.30, pl. 11b, fig.53.

1846. Acridium assectator Fischer, *Bull. Moscou, Moscow*, **19** : 235.

1870. *Acridium elongatum*, Walker, *Cat. Derm. Salt. Brit. Mus.*, **4** : 636.

1870. *Cyrtacanthacris fusilinea*, Walker, Cat. Derm. Salt. Brit. Mus., **4** : 564, 565, 586, 588.

1870. *Cyrtacanthacris inficita*, Walker, *Cat. Derm. Salt. Brit. Mus.*, **4**, p. 565.

1870. *Acridium rubescens*, Walker, *Cat. Derm. Salt. Brit. Mus.*, **4** : 588.

1910. *Cyrtacanthacris succincta*, Kirby, *Syn. Cat. Orth.*, 380.

1910. *Cyrtacanthacris succinctus sternocardias,* Bolivar, I., Trab. Mus. Cienc. Nat. Madr., **6** : 88.

1914. *Cyrtacanthacris ranacea* , Kirby, *Faun. Brit. India*, Vol. I(Acrididae) : 231.

Patanga succincta (Johansson, 1763)

1914. *Orthacanthacris succincta*, Kirby, Faun. Brit. India, Vol.I (Acrididae): 227.

1923. *Patanga succincta*: Uvarov, Ann. Mag. Nat. Hist., **11**(9) : 364.

Diagnostic characters: Size large; pronotum stouter, shorter, hind margin obtuse to rectangulate ; tegmina with a straight venation in apical part, transverse veins forming almost right angle with principal veins, wing base roasy violet or colourless, male subgenital plate long, curve upwards conical and apex pointed.

Habitat : It is popularly known as Mumbai locust and widely distributed in India. In the past this species was a major pest of many crops in swarming phase. Adults and nymphs feed on variety of plants such as oat, sorghum, paddy, cow pea, maize etc. There is one generation in a year during the rains. The adults are very active and can travel long distances.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Himachal Pradesh, Jammu & Kashmir, Kerala, Lakshadweep Island, Maharashtra, Manipur, Meghalaya, Odisha, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand and West Bengal. *Elsewhere* **:** Australia, Borneo, China, Hainan Island, Japan, Java, Malaysia, Myanmar, Pakistan, Philippines, Saudi Arabia, Sri Lanka, South East Asia, Sumatra and Taiwan.

Subfamily EYPREPOCNEMIDINAE
Brunner Von Wattenwyl, 1893

Key to genera

1. Posterior femur moderately long, produced beyond abdomen, neither inflated basally nor strongly narrowing on apical half; prosternal tubercle with rounded or inflated at apex ....*Eyprepocnemis* Fieber.

- Posterior femur long, produced far beyond apex of abdomen, inflated basally and strongly narrowing at apical half; prosternal tubercle almost spathulate with rounded or sometimes slightly inflated at apex .....*Tylotropidius* Stål.

Genus ***Tylotropidius*** Stål, 1860

17. ***Tylotropidius varicornis*** (Walker, 1870)

1870. *Heteracris varicornis*, Walker, *Cat. Derm. Salt. Brit. Mus.*, **4,** p. 667.

1893. *Tylotropidius ceylonicus*, Brunner Von Wattenwyl, *Ann. Mus. Civ. Stor. Nat.Giacomo Doria Genova*, Ser 2, 13(33) : 164.

1914. *Tylotropidius varicornis* : Kirby, *Faun. Brit. India*, Orth., : 255.

Diagnostic characters: Size medium; fastigium of vertex with two depressions at the base; front of head oblique prosternal process compressed, truncate and a little notched in the of apex; posterior femora thick at base, very slender and long towards apex; supra – anal plate of male elongato- triangular and sulcated; dorsum of pronotum dark brown, tegmen with a row of triangular strip in coastal area.

Habitat: There is one generation in a year. It is a minor pest of maize, oat and paddy. Maximum population observed in the month of October.

Tylotropidius varicornis (Walker, 1870)

Distribution : India : Andhra Pradesh, Bihar, Chhattisgarh, Delhi, Goa, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Rajasthan, Tamil Nadu, Tripura, Uttarakhand and West Bengal. *Elsewhere* : Myanmar, Sri Lanka.

Tribe **Eyprepocnemidini** Brunner Von Wattenwyl, 1893

Genus ***Eyprepocnemis*** Fieber, 1853

Key to species

1. Hind wing colourless at base; body large in size..... *alacris alacris* (Serville)

- Hind wing pinkish at base; body small in size....*rosea* Uvarov

18. ***Eyprepocnemis alacris alacris*** (Serville, 1839)

1839. *Acridium alacre*, Serville, *Ins. Orth.*, p. 682.

1859. *Acrydium deponens*, Walker, *Ann. Nat. Hist.*, (3) iv, p.222.

1870. *Heteracris rudis*, Walker, *Cat. Derm. Salt. Brit. Mus.*, **4,** p.662, 664.

1902. *Euprepocnemis plorans, var. intermedia*, Bolivar, Ann. Soc. Ent. France, lxx, p.630.

1914. *Eyprepocnemis alacris*, Kirby, *Faun. Brit. India, Orth.*, : 267.

1958. *Eyprepocnemis alacris alacris*, Dirsh, *Proc. R. Ent. Soc. Lond.*, (B) 27(3-4):40.

Diagnostic characters: Body slightly larger than the medium in size. Fastigium of vertex little concave, with low apical carinula, separating it from frontal ridge. Antennae filiform, as long as the

Eyprepocnemis alacris alacris (Serville, 1839)

head and pronotum together. Dorsum of pronotum flat. Pronotum above with a characteristic narrow dark spot; lateral carinae of pronotum converging forwards; prozona about as long as metazoan; elytra with numerous brown spots; dark spots present on the wings. Posterior femora with a long and black streak. Posterior tibiae bluish-grey with two whitish ring at the base and reddish at apex; male circus gradually narrowing towards apex, incurved and down curved.

Habitat: Nymphs and adults occurs among long coarse grass with bushes. This species considerably causes damage to paddy, maize, cucumber, oat, cowpea and fodder like grasses. Both adults and nymphs are found in the month of April, May to November. The trend of population suggests biannual generation.

Distribution: India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere*: Afghanistan, Bangladesh, Iran, Iraq, Pakistan and Sri Lanka.

19. ***Eyprepocnemis rosea*** Uvarov, 1942.

1942. *Euprepocnemis roseus* Uvarov, *Ann. Mag. Nat. Hist.* (**11**) **9**: 597.

1976. *Eyprepocnemis rosea*: Tandon, *Rec. Zool. Surv. India, Occ. Paper* No. 3: 13.

1995. *Eyprepocnemis rosea*, Hazra *et al., Fauna of Meghalaya, State Fauna Series* **4**: 269.

Diagnostic characters: Size small i.e. 19-27 mm.; pronotum relatively short, obtusely tectiform above; median carinae well distinct, lateral carinae distinct in prozona and obsolescent in metazoan; all the sulci distinct, typical sulcus placed behind the middle; prosternal tubercle

Eyprepocnemis rosea Uvarov, 1942.

tongue shaped; lost tergite with a broad and shallow median excision, flanked by weak projections; supra-anal plate elongate; triangular; cercus longer than the plate, sub genital plate short, obtusely conical. Tegmina reaching the apex of abdomen plate in male, and to the middle of supra- anal plate in female; wings light rose basally; hind tibiae with 8 external and 9 internal spines. Hind tibiae red in colour.

Habitat: The species is a pest on Maize and paddy. Breeding takes place in the month of September in the field during harvesting season.

Distribution : India: Andhra Pradesh, Himachal Pradesh, Jammu & Kashmir, Madhya Pradesh, Meghalaya, Uttarakhand and Uttar Pradesh. *Elsewhere*: Bangladesh, Myanmar, Pakistan and Thailand.

Subfamily GOMPHOCERINAE

Tribe **ARCYPTERINI** Shumakov, 1963

Genus ***Aulacobothrus*** Bolivar, 1902

20. ***Aulacobothrus luteipes luteipes*** (Walker, 1871)

1871. *Stenobothrus luteipes* Walker, *Cat. Derm. Salt. Brit. Mus.*, **5** : 82.

1910. *Stenobothrus luteipes*, Kirby, *Syn. Cat. Orth.*, 165.

1914. *Stenobothrus luteipes*, Kirby: *Fauna of British India*: Vol. I (Acrididae) : 121.

1921. *Aulacobothrus luteipes*: Uvarov, *Ann. Mag. Nat. Hist.*, **7**(9) : 482.

1971. *Dnopherula (Aulacobothrus) luteipes*: Jago, *Proc. Acad. Nat. Sci. Phil ad.*, **123**(8) : 243.

1983. *Dnopherula (Aulacobothrus) luteipes,* Bhowmik & Halder, *Rec. Zool. Surv. India,* 81(1-2) : 171.

1993. *Aulacobothrus luteipes luteipes,* Ingrisch, *Ent. Scand.*, **24**(3) : 321.

Aulacobothrus luteipes luteipes (Walker, 1871)

Diagnostic characters : Colour testaceous; vertex rounded in front; the outer angles of the vertex form small black depressions ; foveolae oval; visible from above; head with three broad blackish stripes behind the eyes. Centre part of the tegmina dusky, the costa and inner margin broadly pale. Wings sub hyaline. Hind femora with three blackish bands above. Tibiae red, yellowish towards the base, with 12 small black spines on the outer and 10 on the inner border.

Habitat: This species is a minor pest of paddy around the mixed vegetation. Biannual generation, nymphs and adults are found from March to December.

Distribution : India : Andaman & Nicobar Islands, Andhra Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Himachal Pradesh, Jammu & Kashmir, Karnataka, Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Sikkim, Tamil Nadu, Uttarakhand and West Bengal. *Elsewhere* : Bangladesh, China, Japan, Europe, Myanmar, Nepal, North America, Pakistan, Sri Lanka, Taiwan and Thailand.

Subfamily HEMIACRIDINAE Dirsh, 1956

Tribe **Hieroglyphini**

Genus ***Hieroglyphus*** Krauss, 1877

21. ***Hieroglyphus banian*** (Fabricius, 1798)

1798. *Gryllus banian*, Fabricius, *Ent. Syst. Suppl.*:194.

1839. *Acridium furcifer* Serville, *Orthopteres*, : 677.

1909. *Hieroglyphus furcifer,* Lefroy, *A manual of the insects of the plains(Tropical India).* : 87.

1914. *Hieroglyphus banian*, Kirby, *Fauna of British India,* Vol. I (Acrididae) : 204.

Diagnostic characters: Body including antennae green. Pronotum smooth, with four sulci, narrowly lined with black. Tegmina sub hyaline, densely reticulated and greenish at the base, with green nervures. Hind tibiae blue, with black tipped spines. Subgenital lamina of male moderately long.

Hieroglyphus banian (Fabricius, 1798)

Habitat: It is a major pest of paddy and it is commonly known as rice grasshopper. This is also a major pest of maize, oat, sugarcane and fodder grass like para grass. The hopper hatching at the end of July and August becoming adult in September to October. The population reaches its peak at the end of October when the paddy is fully matured. Single generation in a year. It occurs in swarms too.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere*: Afghanistan, Bangladesh, Bhutan, China, Myanmar, Nepal, Thailand and Vietnam.

Remarks: It is a pest of paddy.

Subfamily OEDIPODINAE Walker, 1871

Key to genera

1. Pronotum with a well developed medial crest 2
4. Pronotum without very distinct crest 3
2. Pronotal crest constricted in prozona, intersected by two grooves ..... ***Trilophidia*** Stål.
5. Pronotum with a continous strong crest or acutely tectiform... ..... ***Gastrimargus*** Saussure.
3. Pronotal disc with marks arranged so as to form X- shaped. Wings with well marked fascia ..... ***Oedaleus*** Fieber.
6. Pronotal disc without any X-marks. Wings without well marked fascia ..... ***Ceracris*** Walker.
4. Median carina of pronotum distinctly interrupted in the prozona by 2-3 transverse grooves..... ***Sphingonotus*** Fieber.
7. Median carina of pronotum complete or cut by one transverse groove..... ***Dittopternis*** Saussure.

Genus ***Dittopternis*** Saussure, 1884

22. ***Dittopternis venusta*** (Walker, 1870)

1870. *Oedipoda venusta*, Walker, *Cat. Derm.Salt. Brit. Mus.*, 4 : 736.

1888. *Dittopternis venusta*, Saussure, *Mem. Soc. Geneve,* xxx (1), p.40.

Diagnostic characters : Body brown above paler beneath; a blackish band runs backwards from each eye over the occiput and part of the pronotum. Antennae very long, banded with black and white. Pronotum strongly carinated, cut by the principal sulcus. Tegmina long, narrow, with a large yellow blotch at one-fourth of the length extending half across the tegmina. Wings hyaline, yellow at the base ; abdomen yellow, carinated with a black tapering median band above. Hind femora with black transverse

Dittopternis venusta (Walker, 1870)

bands ; hind tibiae black at the base, followed by a light yellow band, then blue.

Habitat: This species is associated with bare ground on small grass. It has biannual generation. Nymphs are found from March to November. It is a minor pest of paddy and cowpea.

Distribution : India : Andhra Pradesh, Chhattisgarh, Karnataka, Madhya Pradesh, Manipur, Meghalaya, Odisha, Tamil Nadu, Tripura and West Bengal. *Elsewhere*: Sri Lanka.

Remarks : This species is found mainly among the short grasses and occasionally in cultivated lands.

Tribe **Parapleurini** Brunner Von Wattenwyl, 1893

Genus ***Ceracris*** Walker, 1870

23. ***Ceracris striata*** Uvarov, 1925

1925. *Ceracris striata,* Uvarov, *Ent. Mitt.*, 14 : 16.

1985. *Ceracris striata*, Bhowmik, *Rec. Zool. Surv. India, Occ. Paper No.* **78** : 10.

2006. *Ceracris striata*, Mandal *et al., State Fauna Series,* **13 :** *Fauna of Arunachal Pradesh,* Part 2, Zool. Surv. India : 158.

Diagnostic characters: Size rather small; compressed ; tegmina with only a sharp defined narrow sulphurous stripe in scapular area; anal area greenish or only lightly paler than the rest of the tegmina; metazoan heavily punctured ; hind femora without fascia before the pale ring; hind tibiae black below, blackish blue above with the usual colour pattern near the base.

Habitat: It attacks various monopodial and sympodial bamboos, as well as some agricultural crops; but prefers *Phyllostachys pubescens*. Both adults and nymphs feed on bamboo leaves and outbreaks usually

Ceracris striata Uvarov,1925

cause complete defoliation of bamboo stands. Heavy and repeated defoliation will result in the death of bamboo plants. Nymphs hatch in May-June and take 46-69 days to develop fully, passing through five instars, to become adults during June-October. They gather on small bamboo plants for feeding and move on to bigger plants at the second instar stage. Nymphs feed in groups on leaves, starting from the top crown and moving downwards. Adults keep feeding for about 40 days before laying eggs. Eggs are laid in winter in egg-capsules in the soil. Nymphs and adults emerge from April to early August and from July to mid December, respectively. They rarely reach epidemic population level. Eggs are laid in capsules, each containing about 20 eggs, in the soil at 3-4 cm depth.

Distribution: India : Arunachal Pradesh, Himachal Pradesh and Mizoram.

Tribe **Locustini** Kirby, 1825

Genus ***Gastrimargus*** Saussure, 1884

Key to species

1. Internal ventral surface of hind femur blue-grey to blue-black ..... *africanus africanus* (Saussure).
- Internal ventral surface of hind femur straw- coloured .... *marmoratus* (Thunberg).

24. ***Gastrimargus africanus africanus*** (Saussure, 1888)

1815. *Gryllus transversus*, Thunberg, *Mem. Acad. Petersb.* V, p.233.

1838. *Oedipoda citrina*, Burmeister, *Handb. Ent.* ii, p.645.

1888. *Oedaleus (Gastrimargus) marmoratus*, var. *africana*, Saussure, *Mem. Soc. Phys. Hist. nat. Geneve,* **30** (1) : 39.

Gastrimargus africanus africanus (Sausssure, 1888)

Gastrimargus africanus africanus (Saussure, 1888)

1914. *Gastrimargus transversus*, Kirby, *Fauna of British India,* Vol. I (Acrididae) : 145.

1928. *Gastrimargus africanus,* variety *zebrata*, Sjostedt, *Kungl. Sven. Veten. Handl., Stockolm,* (3) 6(1) : 11.

1928. *Gastrimargus africanus orientalis,* Sjostedt, *Kungl. Sven. Veten. Handl., Stockolm*, (3) 6(1) : 11.

1982. *Gastrimargus africanus africanus* Ritchie, Bull. *Br. Mus. (Nat. Hist.) Ent.,* **44**(4): 248.

Diagnostic characters: Fastigium of vertex concave; tegmina surpassing hind knees by one-third to one-half of hind femur length, basal pale transverse band present; hind wings bright yellow at basal area, with complete dark-brown fasciae, apex infumate ; hind femur with three oblique dark transverse bands on external face, internal ventral surface suffused with blue-black in basal half.

Habitat: The species is found in submontane and savanna grass lands.

Distribution: India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Himachal Pradesh, Jammu & Kashmir, Madhya Pradesh, Maharashtra, Meghalaya, Nagaland, Odisha, Rajasthan, Sikkim, Tamil Nadu, Uttarakhand and Uttar Pradesh and West Bengal. *Elsewhere*: Africa, Myanmar, Nepal, Pakistan, Saudi Arabia, Sri Lanka, Thailand, Tibet and Yemen.

Remarks : Female specimens collected from Cherrapunji were wrongly identified by W. F. Kirby as *Gastrimargus transverses* (Thunberg), which are present in the National collections of Zoological Survey of India, Kolkata.

25. ***Gastrimargus marmoratus*** (Thunberg, 1815)

1813. *Gryllus flavus* Stoll, *Representation exactement color'ee d'apres nature des spectress on Phasmes, des mantes, des sauterelles, des grillns, des criqut et des blattes,* : 25.

Gastrimargus marmoratus (Thunberg, 1815)

Gastrimargus marmoratus (Thunberg, 1815)1

1815. *Gryllus virescens,* Thunberg, *Mem. Akad. Sci. St. Petersb.* 5 : 245.

1815. *Gryllus marmoratus,* Thunberg, *Mem. Acad. Petersb.* V, p. 232.

1815. *Gryllus assimilis,* Thunberg, *Mem. Acad. Petersb.* V, p. 246.

1838. *Oedipoda citrina* Burmeister, *Handbuch der Entomologie*, 2(2) : 645.

1884. *Gastrimargus marmoratus sundaicus,* Saussure, *Mem. Soc. Phys. Hist. Nat. Geneve*, 28(9) : 113.

1969. *Gryllus transverses*, Tandon & Shishodia, *Oriental Ins*., 3(3) : 267.

1982. *Gastrimargus marmoratus*, Ritchie, *Bull. Br. Mus. Nat. Hist. (Ent.),* **44:** 262.

Diagnostic characters : Fastigium of vertex slightly concave ; tegmina surpassing the hind knees by one-quarter to two-fifths of hind femur length ; internal ventral surface of hind femora straw coloured; hind tibiae light red ; hind wing fascia complete, dark pigments towards the apex, basal area pale yellow.

Habitat: The species is found in submontane, savanna grass lands and recorded as pest on paddy.

Distribution: India : Andhra Pradesh, Assam, Bihar, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Meghalaya, Nagaland, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere*: Bangladesh, Borneo, Celebes, China, Hong Kong, Japan, Java, Korea, Lombok, Malaysia, Myanmar, Nepal, New guinea, Philippines, Sulawesi, Sumatra, Taiwan, Thailand and Vietnam.

Genus ***Oedaleus*** Fieber, 1853

26. ***Oedaleus abruptus*** (Thunberg, 1815)

1815. *Gryllus abruptus*, Thunberg, *Mem. Acad. Petersb.* V, p. 233.

1873. *Pachytylus (Oedaleus) abruptus*, Stol, *Recens. Orth.* **I**, p.127.

1884. *Oedaleus abruptus*, Saussure, Mem. Soc. Phys. Hist. nat. Geneve, **28**(1) : 110, 117.

1910. *Oedaleus abruptus*, Kirby, *Syn. Cat. Orth.*, 226.

Diagnostic characters : Body green or testaceous, with brown and white markings. Pronotum brown with white cross- marks above. Tegmina brown with three pale bands before the middle. Wings very pale greenish yellow towards the base, with a brownish central fascia. Tibiae reddish, paler towards the base.

Oedaleus abruptus (Thunberg, 1815)

Habitat: Both adults and nymphs are geophilous, it was generally associated with bare ground, frequently with cultivation and both are found throughout the year. Adults may attack seedlings of sorghum, maize, millets and paddy. Maximum population observed in the month of August.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Bihar, Chhattisgarh, Delhi, Goa, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Odisha, Pudhucherry, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere*: Afghanistan, Bangladesh, China, Indo-China, Myanmar, Nepal, Pakistan, Sri Lanka, Taiwan, Thailand and Vietnam.

Tribe **Sphingonotini** Johnston, 1956

Genus ***Sphingonotus*** Fieber, 1852

27. ***Sphingonotus (Sphingonotus) longipennis*** Saussure, 1884

1878. *Sphingonotus longipennis*, Saussure, *Mem. Soc. Phys. Hist. nat. Geneva*, 25 : 78.

1884. *Sphingonotus longipennis*, Saussure, *Mem. Soc. Geneve*, xxviii (9), pp.197, 203.

1914. *Sphingonotus longipennis*, Kirby, *Fauna of British India*, Vol. I (Acrididae) : 156.

Diagnostic characters: Body medium size; wings bluish in the middle, followed by a broad black band, curving from the middle of the coasta to above the anal angle; hind femora blue ; inner surface black with a pale band before the tip, and with black bands above; hind tibiae alternately banded with blue and black.

Habitat: The species is seen on dry riverbeds covered with rocks and pebbles and in mountains with stones and rocks covered with small thorny bushes.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Himachal Pradesh, Jammu & Kashmir, Manipur, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttarakhand and West Bengal. *Elsewhere*: Afghanistan, Africa, Bangladesh, Europe, Magnolia, North East Nepal and South East Tibet.

Sphingonotus (*Sphingonotus*) *longipennis*, Saussure, 1884

Genus ***Trilophidia*** Stål, 1873

28. ***Trilophidia annulata*** (Thunberg, 1815)

1815. *Gryllus annulatus*, Thunberg, *Mem. Acad. Petersb.* v, p.234.

1815. *Gryllus bidens*, Thunberg, *Mem. Acad. Petersb.* v, p.235.

1842. *Acridium vulnerata,* Haan, *Gesch. Ned. Overszee. Bezitt*, 2 : 161.

1860. *Oedipodia cristella* Stal, *Kongl. Svensk. Fregat Eugen. Res. Omkring Jorden*, 3 : 344.

1870. *Epacromia turpis,* Walker, *Cat. Derm. Salt. Brit. Mus.*, 4 : 775.

1873. *Trilophidia annulata*, var.b., Stol, *Recens. Orth.* i, p.132.

1884. *Trilophidia annulata ceylonica,* Saussure, *Mem. Soc. Phys. Hist. nat. Geneve*, **28**(9) : 158.

1914. *Trilophidia annulata*, Kirby, *Fauna of British India*, Vol. I (Acrididae) : 149.

1914. *Trilophidia turpis*, Kirby, *Fauna of British India*, Vol. I (Acrididae) : 149.

1921. *Trilophidia annulata,* Uvarov, *Ann. Mag. Nat. Hist.* London, **7**(9) : 488.

Diagnostic characters: Body brown with black markings. Antennae slightly thickened. Pronotum rugosa, with a median carina, forming two teeth in front and with lateral carinae. Tegmina grey; wings yellow at the base, black beyond. Hind femora pale outside, spotted with brown. Hind tibiae brown with a pale band towards

Trilophidia annulata (Thunberg, 1815)

the base and with a slight pale band beyond the middle.

Habitat: This species is mainly found on bare ground by the side of pond or kachcha road along with green grasses. This species may attack on Paddy and Cowpea. Adults and nymphs are found throughout the year. It has tri annual generation. The highest population is seen in the month of August and less in February. It occurs in almost all types of vegetation.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Odisha, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere*: Afghanistan, Bangladesh, Borneo, China, Hong Kong, Japan, Java, Korea, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Sarawak, Singapore, Sri Lanka, Sumatra, Taiwan, Thailand and Vietnam.

Remarks : It can be easily distinguished by the shape of the lophi of male epiphallus.

Subfamily OXYINAE Brunner von Wattenwyl, 1893

Key to genera

1. Fastigium of vertex sloping and continous with the frontal ridge. Hind tibiae red near hind knees with 8 inner subapical spines ..... *Gesonula* Uvarov.

– Fastigium not as above. Fastigium of vertex horizontally produced and forming an angle with the frontal ridge. Hind tibiae mostly blue, dark near hind knees; with 9-10 inner subapical spines..... 2

2. External apical spine of hind tibiae present; 10th abdominal tergite (in male) with or rarely without furcula on hind margin; male epiphallus with ancorae..... *Caryanda* Stål.

8. External apical spine of hind tibiae absent; 10th abdominal tergite (in male) without furcula; male epiphallus without ancorae.... ..... *Oxya* Serville.

Genus ***Gesonula*** Uvarov, 1940

29. ***Gesonula punctifrons*** Stål, 1860

1861. *Acridium (Oxya) punctifrons* Stål, *Kongl. Freg. Eug. Resa. Omkring Jordan: Insecta*: 336.

1870. *Heteracris tenuis,* Walker, *Cat. Derm. Salt. Brit. Mus.*, **4** : 647, 668.

1910. *Racilia okinawaenis*, Shiraki, *Acrididen Japans,* : 58.

1963. *Gesonula punctifrons*, Mistchenko, *Locusts and grasshoppers of USSR and Adjacent countries, Catantopinae Leningrad* : 172.

Diagnostic Characters: Medium in size; eyes large; antennae longer than head and pronotum together; pronotum narrow, long and rugose; prosternal tubercle conical, lateral lobes of pronotum wide, anterior margin oblique, antero-ventral angles rounded: supra-anal plate spoon-shaped; hind tibiae at apex modified for swimming.

Gesonula punctifrons, Stal, 1860

Habitat: Both adults and nymphs were found on water hyacinth, but also occurred in low number at the edge of the paddy field. This species also attacked the *Colocasia* sp. Besides this there is a possibility of its occurrence in other areas as this species is known to occur in mixed habitat of grass and low vegetation. The population trend suggests it has two generation in one year.

Distribution : India : Andaman & Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Odisha, Punjab, Tamil Nadu, Uttar Pradesh and West Bengal. *Elsewhere*: Bangladesh, Borneo, China, Hainan, Japan, Java, Kalimantan, Malacca, Myanmar, North Vietnam, Philippines, Sri Lanka, Taiwan, Thailand and Tongking.

Remarks: First Record from the state of Himachal Pradesh.

Genus ***Caryanda*** Stål, 1878

30. ***Caryanda parvicina*** (Willemse, 1925)

1925. *Oxya parvicina,* Willemse, *Tidjschr. Ent.* , **68**: 55.

1975. *Caryanda parvicina*, Hollis, *Bull. Br. Mus. Nat. Hist. (Ent.),* **31** : 218.

Diagnostic characters: Fastigum of vertex , from above, pentagonal, wider than long, without median longitudinal carinula; frontal ridge sulcated; prosternal tubercle conical with subacute apex; median carina of pronotum weak, lateral carinae absent, weakly crossed by three transverse sulci; tegmina and hind wings normally reduced to micropterous or Brachypterous condition; tegmina barely touching mid dorsal line; 10^{th} abdominal tergite with a pair of small rounded furcula on hind margin; ventral surface of the subgenital plate of female without lateral longitudinal carinulae.

Habitat: It is a pest of maize also seen on the fodder crops.

Distribution: India: Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Sikkim.

Caryanda parvicina (Willemse, 1925)

Genus ***Oxya*** Serville, 1831

31. ***Oxya fuscovittata*** (Marschall, 1836)

1836. *Gryllus fuscovittatus*, Marchall, *Ann. Wien. Mus. Vienna,* 1(2) : 211.

1912. *Oxya turanica*, Uvarov, *Trudy Russk. Entomol. Obshch.* 40(3) : 28.

1925. *Oxya oryzivora*, Willemse, *Tidjschr. Ent.*, 68 : 25.

1969. *Oxya fuscovittata*, Tandon & Shishodia, *Oriental Ins.*, 3(3) : 266.

Diagnostic characters : Integument of the body finely pitted and shiny; females large in size. A black band is running behind the eyes up to the end of the lateral lobes of the pronotum. Anal circus of male compressed and weakly bifurcated. Ventral surface of subgenital plate broad and weakly concave ; posterior margin emarginate medially, straight, or with two very small medial spines.

Habitat: It is a major pest of paddy throughout the year. The maximum

Oxya fuscovittata (Marschall, 1836)

population is seen in the month of September to October in marshy places. This is probably two to three generation per year and can cause damage to seedling of rowing crops like paddy, maize, milch etc. It also damages cow pea, wheat, oat and millet etc. and in the vegetable like lady's finger, cabbage, cauliflower leaves in the winter season and different pulses crops.

Distribution : India : Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Odisha, Rajasthan, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere*: Afghanistan, Bangladesh, Nepal, Pakistan and USSR (South West).

Remarks: This species is associated with paddy fields.

Subfamily SPATHOSTERNINAE Rehn, 1957

Tribe **Spathosternini** Rehn, 1957

Genus ***Spathosternum*** Krauss, 1877

32. ***Spathosternum prasiniferum prasiniferum*** (Walker, 1871)

1870. *Heteracris prasinifera*, Walker, *Cat. Derm. Salt. Brit. Mus.*, **V**, Suppl., p. 65.

1871. *Caloptenus caliginosus*, Walker, *Cat. Derm. Salt. Brit. Mus.*, *op. cit.* p. 69.

1871. *Stenobothrus strigulatus*, Walker, *Cat. Derm. Salt. Brit. Mus.*, op. cit. p. 82.

1871. *Stenobothrus rectus*, Walker, *Cat. Derm. Salt. Brit. Mus.*, op. cit. p. 83.

1871. *Stenobothrus simplex*, Walker, *Cat. Derm. Salt. Brit. Mus.*, **5** : 65.

1914. *Spathosternum prasiniferum*, Kirby, *Fauna of British India*, Vol. **I** (Acrididae) : 208.

1936. *Spathosternum prasiniferum prasiniferum*, Tinkham, *Lingnan. Sci. J., Canton,* **15** : 51.

Diagnostic characters: Head considerably shorter than the pronotum; antennae short, not reaching the posterior margin of the pronotum.

Spathosternum prasiniferum prasiniferum (Walker,1871)

A broad black stripe running behind the lower part of the eyes and below the lateral carinae of the pronotum. Tegmina with a longitudinal black streak at the central area in the female. Tegmina reaching the end of the hind femora or slightly beyond it. Wings well developed. Hind femora with a rounded ventral genicular lobe.

Habitat : This species is associated with grass. Adults and nymphs occurs almost throughout the year. There are three generations in a year and cause damage to crops like paddy, maize and vegetables like brinjal, milch, tomato, etc. It may attack on leaves and grains of wheat, millet, oat in winter.

Distribution : India : Andaman & Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere*: Bangladesh, Hainan, Myanmar, Nepal, Pakistan, South & East China, Sri Lanka, Thailand, Vietnam and West Malaysia.

Remarks: It is associated with grasslands.

Superfamily PYRGOMORPHOIDEA
Brunner von Wattenwyl, 1874

Family PYRGOMORPHIDAE Brunner von Wattenwyl, 1874

Subfamily PYRGOMORPHINAE

Key to genera

1. Anterior margin of prosternum strongly reflexed and dilated ; body short and stout ; pronotum heavily rugose and much widened behind ..... *Chrotogonus* Serville

- Anterior margin of prosternum neither reflexed nor dilated; body slender; pronotum not rugose and not much widened behind.. 2

2. Antennae remote for the eyes, placed in front of ocelli ....*Atractomorpha* Fabricius

- Antennae placed near the eyes and placed below the ocelli ....*Poekilocerus* Serville

Tribe **Atractomorphini** Bolivar, 1905

Genus ***Atractomorpha*** Saussure, 1862

33. ***Atractomorpha crenulata*** (Fabricius, 1793)

1793. *Truxalis crenulatus*, Fabricius, Ent. Syst. ii, p. 28.

1815. *Truxalis scaber*, Thunberg, *Mem. Acad. Sci. St. Petersb.*, **5** : 266.

1842. *Acridium psittacium*, De Haan, pt., Temminck, *Verhandel., Orth*, p.149, pl. xxiii, fig. 1 (nec p. 146).

Atractomorpha crenulata (Fabricius, 1793)

Atractomorpha crenulata (Fabricius, 1793)

1859. *Truxalis porrecta*, Walker, *Ann. Mag. Nat. Hist.*, **4**(3) : 222.

1861. *Atractomorpha consobrina*, Saussure, *Ann. Soc. Ent. France,* (4) I, p. 475.

1905. *Atractomorpha crenulata*, var. prasina, Bolivar, *Bol. Soc. Espan. Hist. Nat.* v, pp.197, 201.

1914. *Atractomorpha crenulata,* Kirby, *Fauna of British India,* Vol. I (Acrididae) : 181.

Diagnostic characters: Body green, pubescent. Antennae short and stout. Pronotum punctured and sparingly granulated. Head and pronotum with the sides slightly sloping, crenulated behind the eyes, the crenulation often pink. Prosternum with an obtusely rounded tubercle. Tegmina pointed, extending for one-fourth of their length beyond the hind femora; wings shorter than the tegmina.

Habitat: Trend of population suggests that there are three generations per year, the first generation of hoppers hatching after the early rains, in the month of April-May and becoming adult July-August. It causes damage to seedlings of paddy, maize, milch, millet, oat, cow pea, tobacco. The adults of the second and third generation may attack on wheat, millet and oat.

Distribution: India : Andaman & Nicobar Islands, Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Lakshadweep Islands, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere*: Bangladesh, Cambodia, Laos, Maldive Island, Malaya, Myanmar, Nepal, Pakistan, South Vietnam, Sri Lanka, Sumatra and Thailand.

Tribe **Chrotogonini** Bolivar, 1904

Genus ***Chrotogonus*** Serville, 1838

Subgenus ***Chrotogonus*** Serville, 1838

34. ***Chrotogonus (Chrotogonus) trachypterus trachypterus*** (Blanchard, 1836)

1836. *Ommexecha trachypterum*, Blanchard, *Ann. Soc. Ent. France,* v, p. 618, pl. xxii, fig. 6.

1836. *Ommexecha gracile*, Blanchard, *Ann. Soc. Ent. France*, v, p. 619.

1836. *Ommexecha pallidus*, Blanchard, *Ann. Soc. Ent. France*, v, p. 623.

1884. *Chrotogonus incertus*, Bolivar, *Ann. Soc. Espan.* xiii, pp.38, 45.

1904. *Chrotogonus brevis,* Bolivar, *Bol. Soc. Espan. Hist. Nat.*, 4 : 92, 99.

1914. *Chrotogonus incertus*, Kirby, *Fauna of British India*, Vol. I (Acrididae) : 163.

1914. *Chrotogonus brevis*, Kirby, *Fauna of British India,* Vol. I (Acrididae) : 163.

1914. *Chrotogonus sordidus*, Kirby, *Fauna of British India*, Vol. I (Acrididae) : 162.

1958. *Chrotogonus trachypterus,* Arora & Singh, *Research Bulletin of Punjab university*, : 149-174.

Chrotogonus (chrotogonus) trachypterus trachypterus (Blanchard, 1836)

1959. *Chrotogonus trachypterus,* Kevan, *Publcoes cult. Co. Diam. Angola*, No.43: 48.

1976. *Chrotogonus trachypterus trachypterus,* Tandon & Shishodia, *Newsl. Zool. Surv. India*, **2**(2) : 58.

Diagnostic characters : Body brown in colour. Head short and broad. Antennae ringed with black. Eyes very prominent. Pronotum short and broad. Sternum yellowish, spotted with blackish. Tegmina short, brown, humped. Wings hyaline. Abdomen brown above. Hind legs short, femora as long as the abdomen.

Habitat : It is widely distributed in low grass and herbs, associated with a good deal of bare ground. Adults and nymphs are found throughout the year, suggesting three generations per year. It is a minor pest of cotton, sorghum, maize, wheat, ground nut, tobacco and paddy.

Distribution : India : Andhra Pradesh, Assam, Bihar, Chattisgarh, Delhi, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Madhya Pradesh, Maharashtra, Meghalaya, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Uttarakhand, Uttar Pradesh and West Bengal. *Elsewhere*: Afghanistan, Bangladesh, Iran, Nepal and Pakistan.

Tribe **Poekilocerini** Bolivar, 1884

Genus ***Poekilocerus*** Serville,1831

35. ***Poekilocerus pictus*** (Fabricius, 1775)

1775. *Gryllus pictus*, Fabricius, *Syst. Ent.* : 289.

1831. *Poekilocerus sonneratii*, Serville, *Ann. Soc. Nat.* xxxii, p. 276.

1904. *Poecilocerus tessellatus,* Bolivar, *Bol. Soc. Espan. Hist. Nat.*, 4 : 432.

1914. *Poecilocerus pictus,* Kirby, *Fauna of British India*, Vol. I (Acrididae) : 172.

Diagnostic characters: Blue-black with yellow markings and red wings. Antennae blue-black, ringed with yellow beyond the basal third of their length. Head with a broad yellow band within each eye, running back on the pronotum to the middle sulcus. Tegmina green with a longitudinal and transverse nervures low and the apex reddish. Wings brick-red. Legs yellow. Abdomen yellow, with transverse blue-black bands. Body large in size with finely rugose integument; head

Poekilocerus pictus (Fabricius,1775)

and pronotum with faint median carina and lateral carinae absent; The nymphs display spots of varied colours from yellow, orange to blue and green whereas the adults show yellow and blue striped on head and thorax, a bright red abdomen, green-yellow forewings and red hind wings which are seen only in flight. The adults grow to about 60mm. The colour in nymphs as well as adults is bright and warning and is explained due to the presence of toxic alkaloids present in Calotropis they feed on.

Habitat : It generally feeds on *Calotropis gigantia* plants. But also reported to feed on various crops, vegetables and fruit plants and occasionally causes considerable damage by feeding on young plants. It has single generation in a year. The nymphs and adults are found in groups. It is commonly known as Painted Grasshopper, and is one of the most colorful grasshoppers of India. The adults are capable of good flight. The adults are generally seen post-monsoon and, if conditions are favorable, they swarm.

Distribution : India : Andhra Pradesh, Assam, Bihar, Chhattisgarh, Delhi, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. *Elsewhere*: Afghanistan, Bangladesh, Nepal and Pakistan.

THE LIST OF SPECIES RECORDED FROM WESTERN HIMALAYAS WHICH ARE NOT ILLUSTRATED AND DISCUSSED

SYSTEMATIC ACCOUNT

Order ORTHOPTERA

Suborder CAELIFERA

Infraorder ACRIDIDEA

Superfamily ACRIDOIDEA

Family ACRIDIDAE

Subfamily ACRIDINAE

1. *Acrida indica* Dirsh, 1954
2. *Holopercna darjeelingensis* (Bolivar, 1914)
3. *Perella insignis* Bolivar, 1914
4. *Orthochtha indica* Uvarov, 1942
5. Phlaeoba *antennata* Brunner von Wattenwyl, 1893

Subfamily CALLIPTAMINAE

6. *Acorypha glaucopsis* (Walker, 1870)
7. *Peripolus pedarius* (Stål, 1876)

Subfamily CATANTOPINAE

8. *Choroedocus capensis* (Thunberg, 1815)
9. *Pachyacris violascens* (Walker, 1870)
10. *Diabolocatantops sukhdae* Bhowmik, 1985
11. *Catantopsis sacalava* (Brancsik, 1893)
12. *Cryptocatantops simlae* (Dirsh, 1956)
13. *Xenocatantops jagabandhui* Bhowmik, 1985
14. *Paraconophyma scabra* (Walker, 1870)

Subfamily COPTACRIDINAE

15. *Coptacra ensifera* Bolivar, 1902
16. *Eucoptacra praemorsa* (Stål, 1860)

Subfamily CYRTACANTHACRIDINAE

17. *Patanga japonica* (Bolivar, 1898)

Subfamily EYPREPOCNEMIDINAE

18. *Cataloipus himalayensis* Singh & Tandon, 1978
19. *Heteracris littoralis* (Rambur, 1838)
20. *Heteracris nobilis* (Uvarav, 1942)
21. *Heteracris pulcher* (Bolivar, 1902)
22. *Shirakiacris shirakii* (Bolivar, 1914)

Subfamily GOMPHOCERINAE

23. *Anaptygus rectus* Ragge, 1954
24. *Gelastorrhinus laticornis* (Serville, 1839)
25. *Gonista sagitta* (Uvarov, 1912)
26. *Chorthippus indus* Uvarov, 1942
27. *Chorthippus hammerstroemi hammerstroemi* (Miram, 1906)
28. *Chorthippus* (*Glyptobothrus*) *biguttulus biguttulus* (Linnaeus, 1758)
29. *Chorthippus* (*Glyptobothrus*) *vagans* (Eversmann, 1848)
30. *Aulacobothrus sinensis* (Uvarov, 1925)
31. *Aulacobothrus socius* Bolivar, 1902
32. *Dociostaurus (Dociostaurus) apicalis* (Walker, 1871)
33. *Madurea cephalotes* Bolivar, 1902
34. *Mesopsis cylindricus* (Kirby, 1914)
35. *Rhaphotittha simony* (Bolivar, 1902)

Subfamily HEMIACRIDINAE

36. *Clonacris finoti* (Kirby, 1914)

37. *Hieroglyphus concolor* (Walker, 1870)
38. *Hieroglyphus oryzivorus* Carl, 1916
39. *Parahieroglyphus bilineatus* (Bolivar, 1912)

Subfamily OEDIPODINAE

40. *Ceracris deflorata* (Brunner von Wattenwyl, 1893)
41. *Ceracris nigricornis nigricornis* Walker, 1870
42. *Ceracris nigricornis laeta* (Bolivar, 1914)
43. *Acrotylus humbertianus* Saussure, 1884
44. *Acrotylus insubricus inficitus* (Walker, 1870)
45. *Aiolopus thalassinus thalassinus* (Fabricius, 1798)
46. *Bryodema luctuosum indum* Saussure, 1884
47. *Bryodemella (Bryodemella) tuberculata* (Fabricius, 1775)
48. *Chloebora grossa* Saussure, 1884
49. *Gastrimargus africanus sulphureus* Bei-Bienko, 1951
50. *Heteropternis respondens respondens* (Walker, 1859)
51. *Locusta migratoria migratoria* (Linnaeus, 1758)
52. *Oedaleus senegalensis* (Krauss, 1877)
53. *Oedipoda himalayana* Uvarov, 1925
54. *Pternoscirta cinctifemur* (Walker,1859)
55. *Pusana laevis* (Uvarov, 1921)
56. *Pusana rugulosa* (Uvarov, 1921)
57. *Scintharista blanchardiana* (Saussure, 1888)
58. *Scintharista notabilis pallipes* Uvarov, 1941
59. *Sphingonotus octofasciatus* (Serville, 1839)
60. *Sphingonotus eurasius eurasius* Mishchenko, 1936
61. *Pseudosphingonotus savignyi savignyi* (Saussure, 1884)

Subfamily OXYINAE

62. *Oxya hyla hyla* Serville, 1831

63. *Oxya hyla intricata* (Stål, 1860)

64. *Oxya velox* (Fabricius, 1787)

Superfamily PYRGOMORPHOIDEA

Family PYRGOMORPHIDAE

Subfamily PYRGOMORPHINAE

65. *Aularches miliaris miliaris* (Linnaeus, 1758)

66. *Pyrgomorpha* sp.

67. *Tagasta marginella* (Thunberg, 1815)

SUMMARY

The present study deals with the pest of crops, vegetables and pasture of some economically important short horned grasshoppers. There are 35 species belonging to 2 Superfamilies, 2 Families, 10 Subfamilies and 28 genera. Keys for identification of Families, Subfamilies, Genera and species of Acrididae and Pyrgomorphidae along with field photographs have been depicted.

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