



A KEY AND SYSTEMATIC ACCOUNT OF THE SHORT HORNED GRASSHOPPER (ORTHOPTERA: PYRGOMORPHIDAE) IN SOUTH WESTERN RAJASTHAN

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ABSTRACT: A dichotomous colour key made for easy identification of the species of short horned grasshopper family Pyrgomorphidae in south western Rajasthan is provided. The systematic account of genera of pyrgomorphidae is also given.

KEY WORDS: Grasshopper, key, morphological characterization, Pyrgomorphidae

INTRODUCTION

The short horned grasshopper (Pyrgomorphids) is a major pest of Graminae family hence key becomes more relevant biosystematically. The short horned grasshoppers are placed under the super-family Acridoidea and family Pyrgomorphidae of the sub order Caelifera (Ander, 1939; Chopard, 1949; Uvarov, 1966 and Vinu Priya & Narendran, 2003). In a relatively recent account, Pyrgacridinae was removed from Pyrgomorphidae and given status of the family Pyrgacrididae within Acridoidea. Lithidiinae is raised to the level of family within Acridoidea. Dericorythinae, Conophyminae and Iranellinae (new subfamily), all previously included within Acrididae, are now placed in the new family Dericorythidae. The subfamily Illapeliinae is moved to Ommexechioae. Marelliinae is recognized as a new subfamily within Acrididae. Presence of a well-developed arch sclerite should be treated as a crucial character in defining the family Acrididae (David, 2000).

Key to species of Pyrgomorphid fauna in south western Rajasthan

- 1 Antennae larger than body, more than 30 segmented; tympanum present on fore tibia Ensifera
- Antennae shorter than body; less than 30 segmented; tympanum present on either side of the first abdominal segment Caelifera 2
- 2(1) Frons mostly flattened, cubital vein of tegmina and medial vein of hind wing unbranched. Antenna shorter than front femur; basal

- segment of hind tarsus with serrated margins or with teeth or at least with a basal externa tubercle Eumasticidae
- Frons not flattened, cubital vein of tegmina and medial vein of hind wing usually branched, antenna longer than front femur, basal segment of hind tarsus never serrated, never with tooth or tubercle 3
- 3(2) Fastigial furrow present; apical areolae generally present; lower basal lobe of hind femur longer than upper lobe (Plate-1) Pyrgomorphidae 4
- Fastigial furrow absent; apical areolae absent, lower basal lobe of hind femur shorter than or as long as upper lobe (Plate-1) Acrididae
- 4(3) Anterior margin of pronotum forming wide collar, covering posterior and lower part of mouth *Chrotogonus* 5
- Anterior margin of pronotum not covering posterior and lower part of mouth 6
- 5(4) Tegmina reaching upto apex of abdominal segment (Plate-2)... *trachypterus* Blanchard
- Tegmina reaching up to fourth abdominal segment (Plate-3) *oxypterus* Blanchard
- 6(4) Body slender; antennal bases located in front of lateral ocelli 7
- Body robust; antennal bases located between or behind lateral ocelli 10
- 7(6) Head conical rarely longer than pronotum gena with arrow of granules extending to the middle *Atractomorpha* 8
- Latero-posterior margin of pronotum with spine-like protrusion *Pyrgomorpha* 9

- 8(7) Tegmina green, hind wings red at base (Plate-4)*crenulata* F.
- 9 (7) Hind wing rather shorter, with the inner part of the disc rosy (Plate-5).....*bispinosa* Walk.
- 10(6) Posterior lobe of pronotum level, not raised; without rugae *Poecilocerus* 11
- 11(10) Antennae ringed with black and yellow (Plate-6)*pictus* F.

Systematic account of genera of Pyrgomorphidae:

A comprehensive systematic account of the Pyrgomorphid genera of the Indian sub-continent from available literature and databases has been presented here (Kerby, 1914):

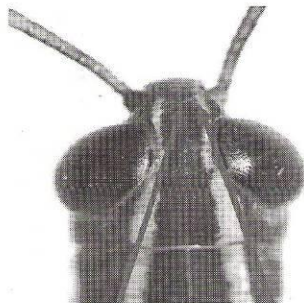
Genus *Chrotogonus* Serville

Chrotogonus, Serville, Ins. Orth. 1839, p. 702.
Type, *Ommexycha lugubre* Blanchard from Egypt.
Range, Africa, Asia, Australia.

Size small, body short and stout. Head small, narrowed towards the front; antennae short, filiform and inserted close together between the eyes. Pronotum more or less rugose (rough), much widened behind; hind border obtusely angulated or rounded. Tegmina generally shorter than the abdomen and nodose; wings often abbreviated. Hind femora moderately stout; hind tibiae slightly thickened towards the extremity, with no terminal spine on the upper carina; the other terminal spines of nearly equal length.

***Chrotogonus pallidus* Blanchard**
Ommexycha pallidum Blanchard, Ann. Soc. Ent.

- France, v, 1836, p. 623, pl. xxii, fig. 10.
- Chrotogonus brevis* Bolivar**
Chrotogonus brevis Bolivar, Bol. Soc. Espan. iv, 1904, pp. 92, 99.
- Chrotogonus incertus* Bolivar**
Chrotogonus incertus Bolivar, Ann. soc. Espan. xiii, 1884, pp. 38, 45, 494.
- Chrotogonus fuscescens*, sp. nov.**
- Chrotogonus robertsi*, sp. nov.**
- Chrotogonus concavus*, sp. nov.**
- Chrotogonus trachypterus* Blanchard**
Ommexycha trachypterus Blanchard, Ann. Soc. Ent. France, v, 1836, p. 618, pl. xxii, fig. 6.
- Chrotogonus liaspis* Blanchard**
Ommexycha liaspis Blanchard, Ann. Soc. Ent. France, v, 1836, p. 620, pl. xxii, fig. 8.
- Chrotogonus oxypterus* Blanchard**
Ommexycha oxypterus Blanchard, Ann. Soc. Ent. France, v, 1836, p. 622, pl. xxii, fig. 9.
- Chrotogonus saussurei* Bolivar**
Chrotogonus saussurei Bolivar, Ann. Soc. Espan. xiii, 1884, pp. 39, 47, 494 : id., Bol. Soc. Espan. iv, 1904, pp. 93, 104.
- Chrotogonus oxypterus*, Bolivar (*nec* Blanchard), Ann. Soc. Ent. France, lxx, 1902, p. 605.
- Chrotogonus brachypterus* Bolivar**
Chrotogonus brachypterus Bolivar, Ann. Soc. Ent. France, lxx, 1902, p. 605; id., Bol. Soc. Espan. iv, 1904, pp. 95, 109.
- Chrotogonus sordidus*, sp.n.**
- Chrotogonus hemipterus* Shaum 1853** (Toad Hopper)



Fastigial furrow and areolae absent
Family: Acrididae



Fastigial furrow and apical areolae present
Family: Pyrgomorphidae

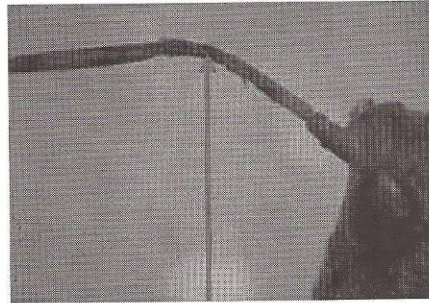
Plate 1. Morphological characterization for family Acrididae and Pyrgomorphidae



Anterior margin of pronotum forming wide collar covering posterior and lower part of the mouth



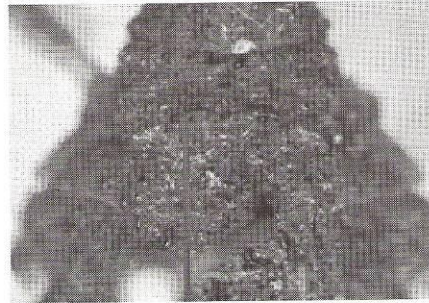
Tympanum present



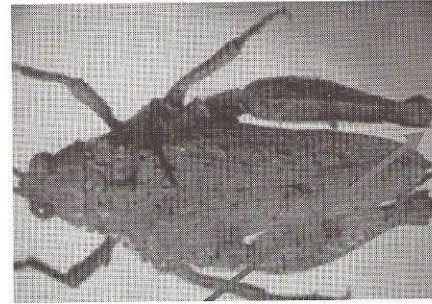
Antennae filiform



Frontal ridge raised before median ocellus, sulcus very narrow and ridges very closely set



Pronotum rugose



Tibiae reaching up to apex of abdomen

Plate 2. Morphological characterization for *Chrotogonus trachypterus* Blanchard

C. fumosus I. Bolivar 1884

C. rotundus Kirby 1902

C. rendalli Kirby 1902

***Chrotogonus homalodemus* (Blanchard 1836)**

Ommexecha homalodemum Blanchard 1836

C. lugubris Serville 1839

C. concavus Kirby 1914

***Chrotogonus senegalensis* Krauss 1877**

C. abyssinicus I. Bolivar 1904

C. lameerei I. Bolivar 1904

C. lameerei ituriensis Sjöstedt 1923

Genus *Aularches* Stal

Aularches Stal, Cefv. Vet.-Akad. Forh. xxx (4), 1873, p. 51.

Type, *Gryllus (Locusta) miliaris* Linnaeus

Range Indian region.

Size large, body stout, pronotum tuberculate, wings large, coloured. Head large, smooth; scutellum of the vertex very short, triangular, contracting uninterruptedly into a narrow sulcated frontal ridge ceasing below the antennae; lateral carinae very distinct, running within the eyes, and slightly divergent to the extremity of the clypeus, which is broad and truncated. Antennae rather long, placed between the eyes, and composed of a number of long joints. Pronotum strongly tuberculate above, with two large contiguous humps in front, cut by the three sulci, the last sulcus placed about the middle, the hinder area rugose and deeply pitted at the sides; deflexed lobes rounded behind. Tegmina long, moderately broad, subparallelsided, obtusely rounded behind, with callous spots; wings membranous, opaque, as long as the tegmina, and moderately broad. Abdomen slightly compressed legs long and slender. Hind femora unarmed, and only slightly thickened.

***Aularches miliaris*, Linnaeus**

Gryllus (Locusta) miliaris Linnaeus, Syst. Nat. (ed. x.) i, 1758, p. 432; Linnaeus, Mus. Lud. Ulric. 1764, p. 142.

Acrydium verrucosum De Geer, Mem. Ins. iii, 1773, p. 486, pl. xl, fig. 6.

Gryllus (Locusta) scabiosus Stool (*nec* Fabr.), spectres, Saut. 1813, p. 18, pl. 76, fig. 24.

Gryllus (Locusta) conspersus, Stoll, op. cit. 1813, p. 40, pl. 226, fig. 85.

Aularches miliaris Stal, Recens. Orth. i, 1873, p. 18.

***Aularches punctatus*, Drury**

Gryllus (Locusta) punctatus Drury, III. Exot. Ent.

ii, 1773, pl. xli, fig. 4.

***Aularches scabiosae* Fabricius**

Gryllus scabiosae Fabricius, Ent. Syst. ii, 1793, p. 51.

Genus *Poecilocerus* Serville

Poecilocerus Serville, Ann. Sci. Nat. xxii, 1831, p. 275; id., Ins. Orth. 1839, p. 595.

Poecilocerus Stal, Cefv. Vet.-Akad. Forh. xxx (4) 1873, p. 51.

Type, *Gryllus pictus* Fabricius

Range, Indian Region, Western Asia, North and East Africa.

Size large; body stout, subfusiform; wings opaque, coloured. Head and pronotum very slightly carinated, fastigium of the vertex convex, obtusely rounded in front, and distinctly sulcated, passing into the frontal ridge, which is sulcated throughout; lateral carinae only slightly divergent; antennae short and thick, with long joints. Pronotum gradually widened behind, the sulci well marked, the hind sulcus placed about the middle, the hinder lobe raised, and rounded behind; deflexed lobes narrowed below. Abdomen slightly carinated above. Tegmina and wings coloured, about as long as the abdomen. Legs rather stout, the fore front tibiae spined beneath at the extremity; hind femora slender, nearly as long as the abdomen, unarmed; hind femora slender, nearly as long as the abdomen, unarmed; hind tibiae spined above, with nearly equal terminal spines above and below.

Poecilocerus tessellatus Bolivar

Poecilocerus tessellatus Bolivar, Bol. Soc. Espan. Hist. Nat. iv, 1904, pp. 432-433.

Poecilocerus sp.

Poecilocerus pictus Fabricius

Gryllus pictus Fabricius, Syst. Ent. 1775, p. 289.

Poecilocerus sonneratii Serville, Ann. Sci. Nat. xxxii, 1831, p. 276.

Poecilocerus punctiventris Serville

Poecilocerus punctiventris Serville, Ins. Orth. 1839, p. 601.

Poecilocerus (?) *ornatus* Burmeister

Poecilocera ornata Burmeister, Handb. Ent. ii, 1838, p. 624.

Genus *Chlorizeina* Bruner

Chlorizeina Bruner, Ann. Mus. Genova, xxxiii, 1893, p. 130.

Type, *Chlorizeina unicolor* Bruner

Range, Burma.

Smooth, slender, subapterous body. Fastigium

of the vertex rather longer than the eye, sulcated; front very oblique, not sinuated. Antennae filiform, half as long as the head and pronotum together. Pronotum cylindrical, rounded behind, finely punctured, the sulci slightly marked, the hind sulcus placed beyond the middle. Tegmina and wings rudimentary. Metasternal lobes contiguous in the male, and slightly separated in the female. Hind femora slender, the genicular lobes slightly pointed; hind tibiae hairy, with six or seven spines on the outer carina, besides the apical one. Anal segment of the male triangularly emarginate; supra-anal lamina pointed; tarsi in the male very slender, compressed, curved, and obtuse at the extremity; subgenital lamina of the male slightly compressed and hooked.

Chlorizeina unicolor Brunner

Chlorizeina unicolor Brunner, Ann. Mus. Genova, xxxiii, 1893 p. 131, pl. v, fig. 51.

Genus *Pyrgomorpha* Serville

Pyrgomorpha Serville, Ins. Orth. 1839, p. 583.

Type, *Acridium conicum* Olivier

Range, Cosmopolitan.

Size small, body slender, more or less granulated. Head conical, fastigium of the vertex projecting considerably before the eyes; antennae inserted between and close to the eyes, short and narrowly ensiform. Pronotum rounded behind, carinated more or less continuously. Tegmina long and narrow, or abbreviated, more or less pointed at the extremity; wings hyaline, or red at the base. Metasternal foveolae separated by a transverse space; abdomen compressed, generally with transverse dark band. Legs long and slender.

Pyrgomorpha conica Olivier

Acrydium conicum Olivier, Encycl. Meth., lus, vi, 1791, p. 230.

Truxalis grylloides Latreille, Hist. Nat. Crust. Ins. xii, 1804, p. 148.

Truxalis rosea Charpentier, Hor. Soc. Ent. Ross. 1825, p. 128, pl. iii, fig. 8.

Truxalis linearis Charpentier, op. cit. 1825, p. 129, pl. iii, fig. 2.

Truxalis rhodoptila Herrich-Schaffer, Panzer, Faun. Ins. Germ. clvii, 1838, pl. 16.

Opomala cingulata Walker, Cat. Derm. Salt. B.M. iii, 1870, p. 517.

***Pyrgomorpha brachycera*, sp. nov.**

***Pyrgomorpha bispinosa* Walker**

Pyrgomorpha bispinosa Walker, Cat. Derm. Salt. B.M. iii, 1870, p. 499.

Pyrgomorpha indica Bolivar, Ann. Soc. Ent. France, lxx, 1902, p. 66.

Genus *Zarytes* Bolivar

Zarytes Bolivar, Bol. Soc. Espan. Hist. Nat. iv, 1904, p. 456; id. Gen. Ins. Orth. Acrid. Pyrg. 1909, pp. 27, 32.

Type, *Pyrgomorpha squalina* Bolivar
Range, India.

Long and slender, wings rudimentary. Head conical; fastigium of the vertex slightly contracted, rounded in front, not longer than the eye, and carinated above; front very oblique, frontal ridge compressed between the antennae, and sulcated; sides of face with an oblique row of granules. Antennae rather long and thick, triquetral at the base, brown, inserted between the eyes, which are oblong. Pronotum somewhat compressed, slightly emarginate dorsally in front, rounded behind; tricarinate, with the lateral carinae distinctly arched before the middle, the typical sulcus placed behind the middle; deflexed lobes scarcely higher behind, traversed within by an oblique branch from the carinae of the metazona; the lower margin straight, entire, rectangular behind, the hind border somewhat excised. Tegmina lanceolate, only slightly longer than the intermediate femora, overlapping on the inner edge; wings very short. Prosternum slightly tumid in front; metasternum with a trapezoidal space between the lobes, not twice as broad as the lobes. Legs compressed, front femora of male slightly thickened, hind tibiae with no outer terminal spine. Abdomen compressed, obtusely carinated above value of the ovipositor sinuated.

***Zarytes squalina* Bolivar**

Pyrgomorpha squalina Bolivar, Ann. Soc. Espan. xiii, 1884, pp. 422 423, 495; id., Ann. Soc. Ent. France, lxx, 1902, p. 606.

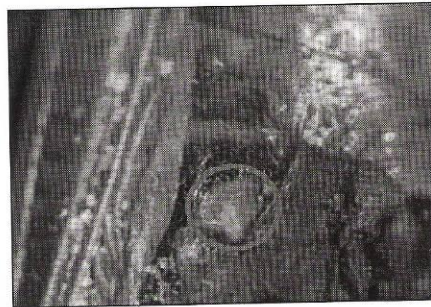
Genus *Anarchita* Bolivar

Anarchita Bolivar, Bol. Soc. Espau. Hist. Nat. iv, 1904, p. 459; id., Gen. Ins., Orth. Acrid. Pyrg. 1909, pp. 27, 33.

Type, *Pyrgomorpha aptera* Bolivar
Range, S. India.



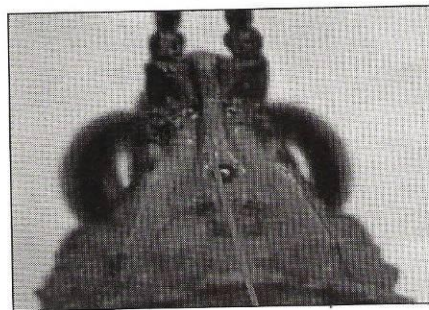
Anterior margin of pronotum forming wide collar covering posterior and lower part of the mouth



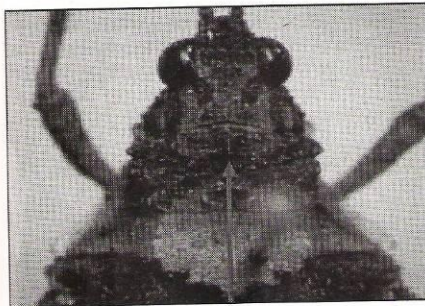
Tympanum present



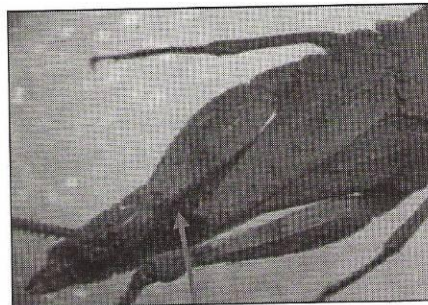
Antennae filiform



Frontal ridge raised before median ocellus, sulcus very narrow and ridges very closely

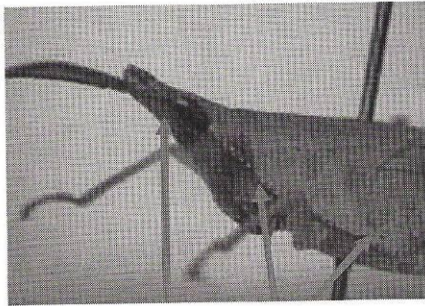


Pronotum rugose

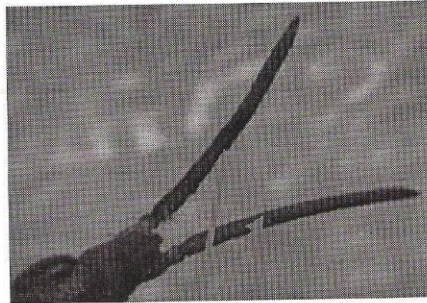


Tegmina reaching about 4th abdominal segment

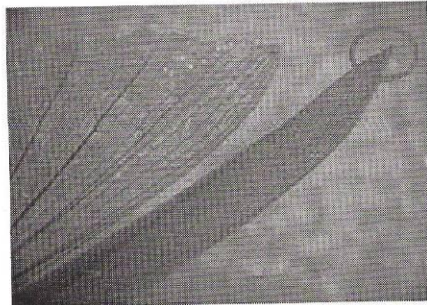
Plate 3. Morphological characterization for *Chrotogonus oxypterus* Blanchard



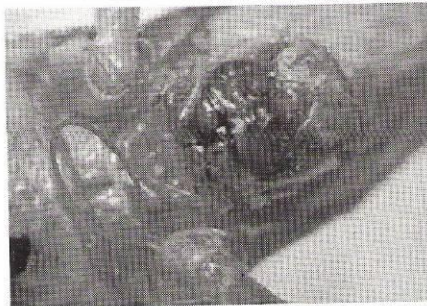
Head conical rarely longer than pronotum gena with arrow of granules extending to the middle coxae



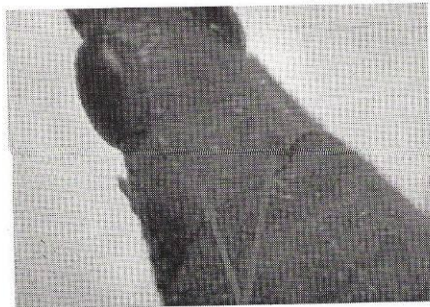
Antennae triquitral stout sub filiform



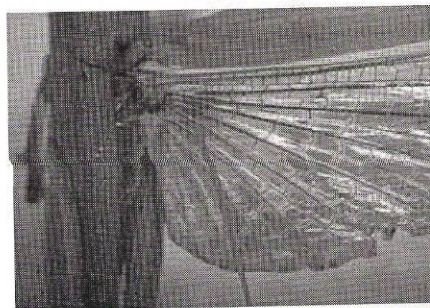
Tegmina pointed



Prosternal tubercle spatulate



Front of pronotum slightly emarginated



Tegmina green, hind wing red at base

Plate 4. Morphological characterization for *Atractomorpha crenulata* Fabricius

Slender, subfusiform, apterous. Head conical, longer than the pronotum, horizontally produced; fastigium horizontal, as long as the eye, tempora separated in front only by a short suture; front very oblique, bisinuate, costal ridge finely sulcated, but much compressed and entire between the antennae. Antennae short, filiform triquetral, but not dilated at the base, and inserted between the eyes; basal joints 3-6 subquadrate and subdilated in the male, in the female subtransverse and slightly expanded. Eyes oblong; cheeks with one oblique row of granules. Pronotum short, sinuated before and behind, the median carina slightly indicated, and interrupted by the principal sulcus much beyond the middle, the intermediate sulcus interrupted and curved forwards; the lateral carinae of the prozona parallel, and slightly curved inwards, those of the metazona diverging in front, and obliquely traversing the lateral lobes; deflexed lobes slightly expanded behind, the lower margin bisinuate, the hinder angle obtuse. Legs very short; four front femora ridged, the intermediate ones scarcely extending to the base of the hind femora; the hind femora shorter than the abdomen, with the externo-median area ridged, and the lower outer area slightly expanded; hind tibiae with rounded spines, and no outer terminal spine; tarsi very short. Prosternum tumid in front; mesosternal lobes separated by a curved trapezoidal space, broader behind; metasternal foveolae separated by a transverse space. Abdomen longitudinally striated; valve of the ovipositor sinuated.

***Anarchita aptera* Bolivar**

Pyrgomorpha aptera Bolivar, Ann. Soc. Ent. France, lxx, 1902, p. 607.

Genus *Tagasta* Stal

Type, *Mestra hoplosterna* Stal

Range. Oriental region

Body subfusiform, slightly compressed, pubescent above. Head conical, shorter than the pronotum, or of equal length; tempora widened in front, only separated by short suture; front very oblique, frontal ridge much flattened, hardly sulcated, shortly compressed between the antennae; the later concolorous, filiform, and inserted between the eyes, with joints about three times as long as broad, the basal joints slightly flattened, and the tip extending to the hind border of pronotum; eyes rounded; ocelli distinct, cheeks

granulated. Pronotum pubescent, roundly trunked in front, obtusely angulated or rounded behind, with the median carina slightly indicated, or obsolete, and the lateral carinae obsolete; the sulci slightly marked, and the hind sulcus placed behind the middle; the prozona considerably longer than the metazona; the deflexed lobes distinctly higher behind, the lower margin oblique, subsinuate, bordered with whitish the anal angle obtuse, nearly rectangular. Tegmina not or scarcely longer than the hind femora, with the costal area considerably expanded near the base. Wings distinctly shorter than the tegmina, red or hyaline. Legs long and slender; front femora distinctly thickened in the male, hind femora compressed, the outer area with radiating ridges; hind tibiae with rounded spines, and with an outer apical spine above. Prosternum strumose or armed with a tooth; mesosternal lobes separated by a longer or shorter space; metasternal foveolae separated by a transverse space. Valves of the ovipositor sinuated.

Tagasta Bolivar, Bol. Soc. Espan. Hist. Nat. v, 1905, p. 112.

Mestra Stal (*nec* Hubner), Cefv. Vet.-Akad. forh. xxxiv (10), 1877, p. 52.

Tagasta notata Brunner

Mestra notata Brunner, Ann. Mus. Genova, xxxiii, 1893, p. 130, pl. v, fig. 50.

Tagasta indica Bolivar

Tagasta indica Bolivar, Bol. Soc. Espan. Hist. Nat. v, 1905, pp. 112, 113.

Genus *Atractomorpha* Saussure

Atractomorpha Saussure, Ann. Soc. Ent. France, (4) i, 1861, p. 474.

Type, *Truxalis crenulatus* Fabricius

Range, Ethiopian, Oriental, and Australian regions.

Body long and slender, compressed. Head conical, rarely longer than the pronotum; fastigium about as long as the eye; front very oblique, frontal ridge compressed between the antennae, and usually sulcated to the extremity. Antennae short, triquetral, subfiliform, very slightly depressed and widened at the base in the female, and inserted at the tip of the fastigium; eyes oblong; cheeks with a row of granules extending to the middle coxae. Pronotum sub-emarginate in front, and obtusely angulated behind, very slightly tricarinate, the hind sulcus placed behind the middle; the deflexed lobes

almost perpendicular, broader behind, with the hind margin arcuately incised, and the hinder angle more or less produced behind. Tegmina rather pointed, with the costal area slightly expanded towards the base. Wings nearly as long as the tegmina, pointed at the tip, hyaline, often red at the base. Legs slender, hind femora with the externomedian area somewhat oblique and distinctly broader than the lower area; knees shortly bilobate; hind tibiae smooth, with pointed spines, and an outer terminal spine. Prosternum with an obliquely truncated tubercle in the middle, or submarginate, and concave in frons; metasternal lobes behind the foveolae separated by a transverse space. Abdomen slightly compressed, with the last dorsal segment angularly excised; supra-anal lamina trigonate, cerci short, conical; valves of the ovipositor sinuate, and slightly crenulated.

Atractomorpha crenulata Fabricius

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

Atractomorpha crenulata Saussure, Ann. Soc. Ent. France, (4) i, 1861, p. 475.

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

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

Atractomorpha scabra Thunberg

Truxalis scaber Thunberg, Mem. Acad. Petersb. v, 1815, p. 266.

Truxalis porrecta Walker, Ann. Mag. Nat. Hist. (3) iv, 1859, p. 222.

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

Atractomorpha psittacina de Haan

Acridium (Truxalis) psittacinum, De Haan, Temminck, Verhandl., Orth. 1842, p. 146.

Acridium crenulatum De Haan (*nec* Fabr.), op. cit. 1842, pl. xxiii, fig. 2.

Atractomorpha burri Bolivar

Atractomorpha burri Bolivar, Bol. Soc. Espan. Hist. Nat. v, 1905, pp. 197, 203.

Atractomorpha himalayica Bolivar

Atractomorpha himalayica Bolivar, Bol. Soc. Espan. Hist. Nat. v, 1905, pp. 198, 204.

Atractomorpha blanchardi sp. nov.

Genus *Orthacris* Bolivar

Orthacris Bolivar, Ann. Soc. Espan. xiii, 1884, pp.

24, 439, 496.

Type, *Orthacris filiformis* Bolivar

Range, India, Ceylon.

Body slender, apterous. head conical, fastigium horizontally produced before the eyes, vertex carinate, tempora very short, with a short suture in front; front very oblique, not sinuated, costal ridge compressed between the antennae, and sulcated throughout, lateral carinae distinct, but interrupted; antennae filiform, inserted between the eyes, joints 3 and 4 triquetral; eyes short, oblong, with a row of granules behind. Pronotum pubescent, not carinated, hardly expanded behind, pronotum pubescent, not carinated, expanded behind, the hinder sulcus placed at one-fourth of its length, the metazona very short; the deflexed lobes rounded, equally high before and behind and the lower margin more or less thickened. Legs short; fore front femora slender, rather compressed, the middle ones extending to the extremity of the hind coxae; hind tibiae pubescent at the base, with rather pointed spines towards the tip; outer terminal spine present or absent. Prosternum with a short pointed tubercle; sternal lamina long; mesosternal lobes rounded within, sub-contiguous, or separated by a very narrow space. Supra-anal lamina lanceolate; cerci curved at the tip in the male, straight and very short in the female; infra-genital lamina in the male hooked and slightly produced at the tip. Valves of the ovipositor sinuate.

Orthacris filiformis Bolivar

Orthacris filiformis Bolivar, Ann. Soc. Espan. xiii, 1884, pp. 439, 496, pl. ii, fig. 11.

Orthacris maindroni Bolivar

Orthacris maindroni Bolivar, Bol. Soc. Espan. Hist. Nat. v, 1905, p. 278.

Orthacris ruficornis Bolivar

Orthacris ruficornis Bolivar, Ann. Soc. Ent. France, lxx, 1902, p. 608.

Orthacris elegans Bolivar

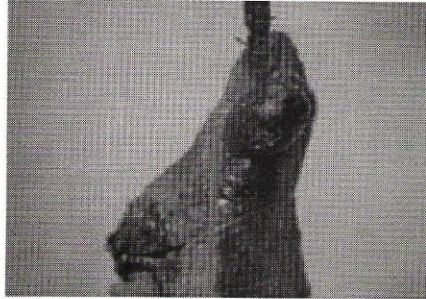
Orthacris elegans Bolivar, Ann. Soc. Ent. France, lxx, 1902, pp. 608, 609.

Orthacris acuticeps Bolivar

Orthacris acuticeps Bolivar, Ann. Soc. Ent. France, lxx, 1902, pp. 608, 610.

Orthacris simulans Bolivar

Orthacris simulans Bolivar, Ann. Soc. Ent. France, lxx, 1902, pp. 608, 611.



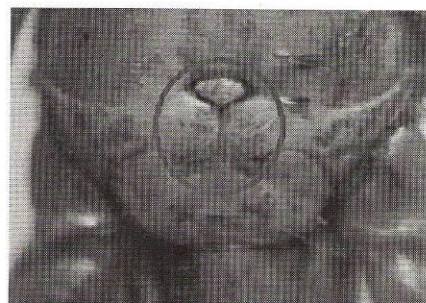
Head conical



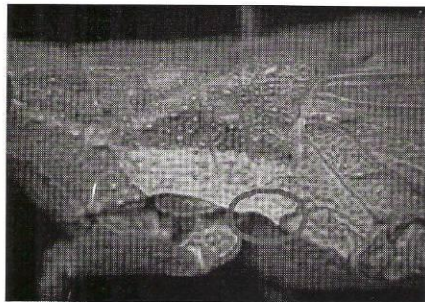
Antennae inserted between and close to eyes



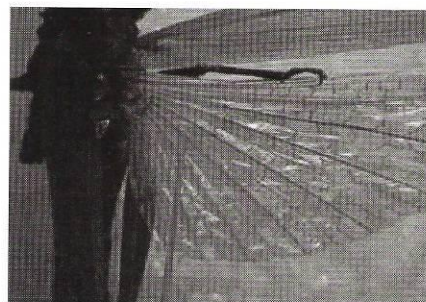
Fastigium of the vertex projecting up to pedicel of antennae



Metasternal foveolae separated by a transverse space

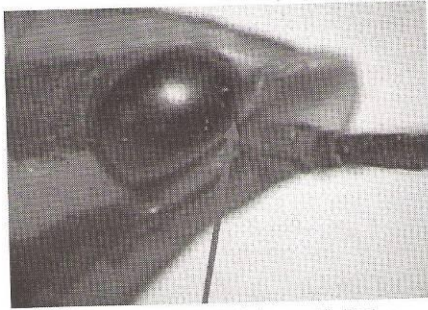


Latero-posterior margin of pronotum with spine-like protrusion

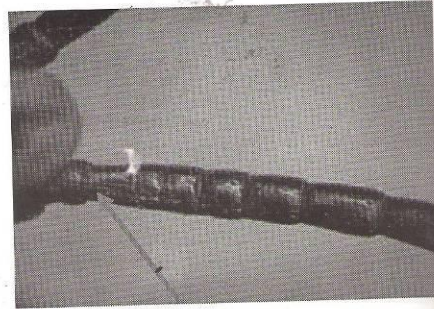


Hind wing pink, infuscate apically and in remigium

Plate 5. Morphological characterization for *Pyrgomorpha bispinosa* Walker



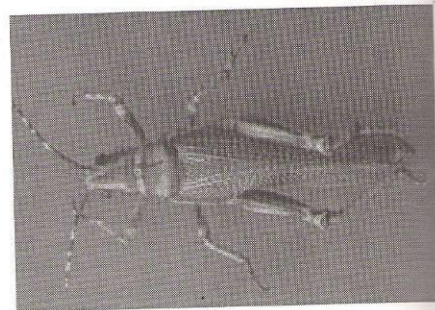
Antennal base located below and behind lateral ocelli



Antennae filiform with basal segment at least as long as wide



Frontal ridge raised only till base of antenna



Body length greater than 40 mm



Sub genital plate with pilose triangular depression ventrally



Prosternal tubercle interiorly placed, conical, abruptly narrowing distally

Plate 6. Morphological characterization for *Poecilocerus pictus* Fabricius

Genus *Colemania* Bolivar

Colemania Bolivar, Bol. Soc. Espan. Hist. Nat. x, 1910

Type, *Colemania sphenarioides* Bolivar

Range, India.

Body long, sub-cylindrical, fusiform in the male, and inflated in the middle. Fastigium of the vertex produced beyond the frontal ridge, longer than the eye, front sloping, slightly sinuated, antennae 19-jointed, tapering from the third joint to the tip; frontal ridge sulcated, compressed at the base, obsolete before the mouth, ridge sulcated, compressed at the base, obsolete before the mouth, lateral carinae slightly diverging, genae with a slightly marked row of granules; eyes small, longer than broad, truncated behind; ocelli visible, the middle one between the eyes, and the lateral ocelli placed before the eyes. Pronotum conical in the male. Cylindrical in the female, the two anterior sulci obliterated. The last continuous and placed much beyond the middle; the lateral lobes long, with the margins entire, the front margin oblique, the lower one straight, indistinctly sinuated behind. Tegmina very narrow, longer than the pronotum; wings obsolete. Prosternum acutely spined; mesosternal lobes long, in the male truncated and contiguous behind, in the female expanded in front and rounded behind; metasternal foveolae nearer together in the male than in the female. Legs short, front femora thickened in the male; hind femora slender, with the outer area narrow, with much indistinct pinnate rugae, the rugae, the genicular lobes angulately produced and tibiae slender, the apical third expanded, and smooth above, with nine outer and eleven spines, and apical spines on both sides; hind tarsi slender, the first joint twice as long as the second. Abdomen cylindrical, sub-clavate at the tip; last dorsal segment of the male transverse, trisinuated behind, supra anal lamina forming a long triangle, longer than the cerci sulcated and subulate at the tips in the male, short and straight in the female; subgenital laminae compressed, subcarinate behind; valves of the ovipositor short, sinuate.

Colemania sphenarioides

Colemania sphenarioides Bolivar, Bol. Soc. Espan. Hist. Nat. x, 1910, p. 320; Coleman, J. Bombay Soc. xx, 1911, p. 879; H. Maxwell Lefroy, J. Bombay Soc. xix, 1910, p. 1007.

Genus *Trigonopteryx* Charpenner

Trigonopteryx Charpenner, Orthoptera 1841 pl. v.

Type, *Trigonopteryx punctata* Charpenner

Range, Oriental region

Body long, much compressed. Head conical, compressed in front, vertex ascending, fastigium sinuated on the sides, and angulated in front, tempora narrow, separated by a very narrow suture: front oblique, sinuated, the frontal ridge between the antennae and the tip of the antennae raised, the margins separated forming a pyriform foveolae, obsolete before the ocelli; antennae rather long, triquetral, ensiform, externally dentated, inserted near the eyes, the apical-joint pubescent; eyes oblong, slightly sinuated, no lateral facial carinae. Pronotum compressed, back narrow, parallel-sided, rounded and slightly sinuated in front, behind obtusely angulated but not produced; the typical sulcus indistinct, placed rather beyond the middle; the deflexed lobes perpendicular, but with obtuse carinae, trapezoidal, considerably raised behind, with the inner margin straight, the hinder margin somewhat sinuated, and the hinder angle acute. Tegmina long, extending much beyond the hind femora, the anal nervure straight. Legs compressed; front femora short, the intermediate femora passing the extremity of the coxae, the hind femora compressed, with external median area well developed; hind tibiae slender, with an outer apical spine; tarsi very short. Prosternum with a short rounded tooth in the middle, sternal lamina very long, in front obtusely angulated; the mesosternal lobes broadly rounded on the inner side, with the intervening space much narrower. Supra-anal lamina in the female long, triangular, sulcated; cerci conical, very short; valves of the ovipositor compressed, sinuated.

Trigonopteryx punctata Charpenner

Trigonopteryx punctata Charpentier, Orthop. 1841, pl. v.

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