

ORTHOPTERAN FAUNA OF SILENT VALLEY, KERALA

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(With 33 Text figures)

INTRODUCTION

Though Annandale (1906), Bolivar (1900, 1902 and 1918), Hebard (1929), Henry (1937 and 1940), Singh and Kevan (1965), Tandon and Shishodia (1969) and Uvarov (1929) have mostly dealt with the taxonomic papers exclusively on the South Indian grasshoppers and crickets but none have studied the orthopteran fauna of Kerala, specially of this Silent Valley. Present paper deals with 33 species of orthoptera, out of which 16 species are new record for the area whereas one species i.e. *Eucoptacra binghami* Bolivar is new to India. Several new species will also be described somewhere else. Keys for the different species are presented here. Diagrams of different parts of the body of species are also incorporated. This study is based on the the material from the areas explored by different scientists including one of the authors (A. K. Hazra), of Zoological Survey of India. Thus the present study will add definitely an additional fauna of Orthoptera for the area which was not recorded upto now. We believe that there may be still a number of species of Orthoptera from the said area which have not yet been collected and described.

The following shrubs and herbs (grass) are the most predominant grassland flora in the valley :

Shrubs : *Strobilanthus* sp., *Leea aspera* ; *Sarcandra* sp. ; *Amomum* sp., *Ochlandra* sp. ; *Schummarianthus* sp. and *Elastostemma* sp.

Herbs (Grass) : *Themeda gigantea* and *Cymbopogus* sp.

Key to the species and subspecies of grasshoppers and crickets of silent valley.

Superficial Key To The Species And
Subspecies Of Grasshoppers And Crickets

1. Antennae longer than the body, many segmented ; tympanal organs present on the anterior tibiae ; male elytra transformed into a stridulatory organ called mirror ; ovipositor very large, usually extending far beyond the abdominal extremity. ... 2
- Antennae shorter than the body, with less than 30 segments ; tympanal organs, when present, at base of abdomen ; male elytra not transformed into a mirror ; ovipositor not enlarged. ... 6
2. Spines of posterior tibiae immovable, without hairs. ... 3
- Spines of posterior tibiae movable, pubescent. ... *Pteronemobius* sp.
3. Body very convex ; females with short elytra, which is contiguous on the median line. ... *Gryllopsis femorata* Chopard
- Body not so convex ; females with well developed elytra, never reduced to small, lateral pads. ... 4
4. Head flattened, specially in male ; in female head less flattened but the anterior ocellus is placed at the apex of the frontal rostrum ; mandibles of male strong and lengthened. ... *Velarifictorus aspersus* (Walker)
- Head rounded ; anterior ocellus is placed on the forehead ; mandibles of male weak and not lengthened. ... 5
5. Body stout and somewhat depressed ; head without yellow band between the lateral ocelli ; mirror of elytra as broad as long, divided behind the middle by a curved vein ; four or five oblique veins ; veins of lateral field regularly and feebly spaced. ... *Plebeigryllus guttiventris* (Walker)
- Body not stout, convex ; head with a narrow yellow band connecting the lateral ocelli ; mirror of elytra longer than wide, divided by a curved vein ; two oblique veins present ; veins of lateral field of elytra distant and strongly curved. ... *Modicogryllus confirmatus* (Walker)

6. Pronotum more or less cover the whole or the greater part of the abdomen ; elytra short, scale like, and lateral in position ; tympanal organs absent ; anterior and middle tarsi two segmented and the posterior tarsi three segmented ; arolium absent ; phallic complex reduced. 7
- Pronotum not cover the whole abdomen ; elytra well developed or reduced ; tympanal organs present ; all the tarsi three segmented ; arolium present ; phallic complex well developed. 8
7. Frontal costa widely forked between the ocelli, the rami strongly divergent ; pronotum compressed and foliaceous ; lateral lobes of pronotum not produced into spines. *Deltonotus gibbiceps* (Bolivar)
- Frontal costa not widely forked between the ocelli, the rami moderately divergent ; pronotum neither compressed nor foliaceous ; lateral lobes of pronotum produced into spines. *Eucriotettix flavopictus* (Bolivar)
8. Head acutely conical ; foveolae of vertex superior and forming the extremity ; fastigial furrow present ; prosternal tubercle present ; lower basal lobe of posterior femora mostly longer than the upper, or both of the same length ; stridulatory mechanism absent ; cingulum capsule like ; valves of penis paired, undivided ; epiphallus bridge shaped, with dorso-lateral appendices ; ancorae and sclerites absent ; lophi hook-like. 9
- Head of variable shape ; foveolae of vertex lateral or inferior ; fastigial furrow absent (rarely present, but apparently as a secondary formation) ; prosternal tubercle present or absent ; lower basal lobe of posterior femora mostly shorter than or equal to upper one ; stridulatory mechanism of various structure found ; ectophallus differentiated ; cingulum differentiated ; valves of penis paired, flexured or divided ; epiphallus mostly bridge shapped, sometimes disc shaped, sometimes divided ; ancorae and lophi present (sometimes lost). 11

9. Body usually subfusiform or cylindrical ;
elytra and wings completely absent. ... *Orthacris* sp.
- Body fusiform, slender and compressed,
or heavy, stout and strongly depressed ;
elytra and wings present. 10
10. Anterior margin of prosternum strongly
reflexed and dilated ; body short and
stout ; pronotum rugose, and much wide-
ned behind ; elytra short or extend upto
the apex of abdomen ; wings often abbrev-
iated ; posterior femora a little stout. ... *Chrotogonus* (*Ch.*) *oxypterus*
(Blanchard)
- Anterior margin of prosternum neither
reflexed nor dilated ; body moderately
slender, and compressed ; pronotum not
so rugose, and not much widened behind ;
elytra pointed and extend beyond the
apex of abdomen ; wings not abbreviated ;
posterior femora not so stout. *Atractomorpha crenulata*
(Fabricius)
11. Prosternal process or tubercle mostly
absent. 12
- Prosternal process or tubercle present ... 19
12. Stridulatory serration on internal side of
posterior femora absent. 13
- Stridulatory serration on internal side of
posterior femora present. *Aulacobothrus* sp.
13. Fastigium of the vertex rounded towards
the front, which is nearly vertical. ... 14
- Fastigium of the vertex not rounded
towards the front, which is oblique. ... 15
14. Dorsum of pronotum or its carina cut by
two grooves. *Trilophidia annulata* (Thunberg)
- Dorsum of pronotum or its carina cut by
one groove. *Pternoscirta cinctifemur* (Walker)
15. Antennae ensiform or flattened at the
base. 16
- Antennae filiform *Aiolopus* sp.
16. Foveolae of vertex obsolete or not visible
from above ; size of body a little larger. 17
- Foveolae of vertex visible from above ;
size of body smaller. *Bababuddinia bizonata* Boliver
17. Antennae unicolorous ; vertex and prono-
tum without broad yellow band on the
dorsal surface. *Phlaeoba* sp.
- Antennae ringed or tipped with obscure
yellow ; vertex and pronotum with a
broad yellow band on the dorsal surface,
which run upto the end of elytra. *Phlaeoba antennata* Brunner

18. Lower external lobe of hind knee with spine-like apex, 19.
 — Lower external lobe of hind knee with rounded, angular or subacute apex, but never spine-like. 21
19. Prosternal process with apex broadened, flattened, transverse and trilobate, ... *Chitaura indica* Uvarov
 — Prosternal process simple, conical with subacute or rounded apex. ... 20
20. Cercus of male conical, narrowing towards apex ; supra-anal plate with a small tubercle on either side of dorsal surface ; female sub-genital plate with two longitudinal ridge on ventral surface, which extend forwards from the posterior margin, these ridges often toothed. ... *Oxya hyla hyla* Serville
 — Cercus of male conical with obliquely truncate apex ; supra-anal plate of male without tubercles on either side ; female sub-genital plate on ventral surface with a subapical tooth on each side of a median spine. *Oxya nitidula* (Walker)
21. Last abdominal tergite in male with well developed furcula ; supra-anal plate mostly with attenuate or trilobate apex ; sub-genital plate with transverse fold. ... 22
 — Last abdominal tergite in male without well developed furcula ; supra-anal plate variable ; sub-genital plate without transverse fold. 24
22. Frontal costa distinctly widened between antennae and wider than the vertex between the eyes. *Eucoptacra binghami* Uvarov
 — Frontal costa not or scarcely wider between antennae. 23
23. Antennae distinctly ensiform ; head and pronotum without rugosity or granulations. *Coptacra ensifera* Bolivar
 — Antennae not ensiform ; head and pronotum with rugosely punctate and with raised granules. *Coptacra punctaria* (Walker)
24. Mesosternal inter-space closed. 25
 — Mesosternal inter-space open. 27
25. Antennae ensiform ; fastigium of vertex very long and slender. *Calamippa prasina* (Bolivar)
 — Antennae filiform ; fastigium of vertex short. 26

26. Prosternal tubercle compressed laterally, slightly bent backwards, not reaching the anterior margin of mesosternum obtuse at apex. *Oxyrrhepes obtusa* (De Haan)
- Prosternal tubercle very broad at lower surface, bent backwards, behind the middle, touching the anterior margin of mesosternum, broadly flattened behind the middle, apex more or less truncate. *Tristria pulvinata* (Uvarov)
27. Mesosternal lobes rounded or obtusangular. 28
- Mesosternal lobes rectangular. 32
28. Dorsum of pronotum flat or weakly tectiform, with median and lateral carinae; lateral carinae linear; male cercus with strongly compressed lobiform or subacute apex. 29
- Dorsum of pronotum of variable shape; lateral carinae, if present, not linear; male cercus variable, but not strongly compressed lobiform or subacute apex. 30
29. Prosternal tubercle bilobed at apex; posterior femora thickened at apex and very slender towards the apex. *Tylotropidius varicornis* (Walker)
- Prosternal tubercle straight, obtuse at apex; posterior femora thickened at base, not very slender towards the apex. *Eyprepocnemis alacris alacris* (Serville)
30. Pronotum not constricted in the middle; the stripe on the head and lateral lobe of pronotum is sometimes absent. 31
- Pronotum at least slightly constricted in the middle. *Xenocatantops humilis humilis* (Serville)
31. Elytra lateral and not reaching margin of second tergite; wings not traceable; male cerci not bifurcate. *Palniacris maculata* Henry
- Elytra and wings well developed, reaching upto the apex of abdomen; male cerci bifurcate. *Catantops henryi* Bolivar
32. Pronotum strongly tectiform, integument strongly rugose; median carina of pronotum sharp; wings rose coloured at base. *Chondracris rosea* (De Geer)

- Pronotum moderately tectiform, integument fairly rugose or dotted, almost smooth ; median carina of pronotum not sharp ; wings lemon-yellowish. ...

Cyrtacanthacris tatarica
(Linnaeus)

SYSTEMATIC ACCOUNT

Suborder	: ENSIFERA
Superfamily	: GRYLLOIDEA
Family	: GRYLLIDAE
Subfamily	: GRYLLINAE

1. *Gryllopsis femorata* Chopard

1935. *Gryllopsis femorata* Chopard, *Ann. Mag. nat. Hist.*, (10) 16 : 288.
1969. *Gryllopsis femorata*, Chopard, *Fauna of India, Grylloid.*, : 81.

Diagnostic characters : Size medium ; head big, globular, with feebly marked yellowish lines on the occiput ; antennae longer than the body, and filiform ; anterior tibiae perforated on their external face only ; posterior femora stout and short ; posterior tibiae short, with five to six spines on both sides ; elytra extend beyond the metanotum and meet on the median line ; oviposition short, and slender ; apical valves lanceolate.

Specimens examined : 2 ♀ ♀, Road to Mukkali, 8. xii. 1980, Dr. R. S. Pillai.

Distribution : India (Tamil Nadu, Karnataka and Meghalaya).

Remarks : Chopard (1969) recorded *Gryllopsis femorata* from Tamil Nadu and Karnataka. Later on Biswas et al (1975) have recorded this species from Meghalaya. It is recorded here for the first time from Kerala.

2. *Velarifictorus aspersus* (Walker)

(Fig. 1)

1869. *Gryllus aspersus* Walker, *Cat. Derm. Salt. Br. Mus.*, 1 : 39.
1936. *Scapsipedus aspersus*, Chopard, *Ceylon J. Sci.*, (B) 20 : 29.
1964. *Velarifictorus aspersus*, Randell, *Can. Ent.*, 96 : 1587.

Diagnosis characters : Size medium ; head flattened, with six yellow lines on the occiput and a yellow band between the ocelli ; face concave ; mandibles strong and lengthened ; antennae longer than the

body ; mirror lozenge-shaped, divided by a straight vein behind the middle ; two oblique veins present ; wings short ; genitalia agree with the original description of Chopard (1969).

Specimens examined : 1 ♂, Dam Site, 871 m, 4. xii. 1980, Dr. R. S. Pillai ; 1 ♂, way to Valiyaparathodu, 15. xii. 1980, Dr. R. S. Pillai.

Distribution : India (Maharashtra, Andhra Pradesh, Karnataka and Meghalaya) ; Tropical Asia ; China ; Taiwan ; Philippines.

Remarks : This species is recorded here for the first time from Kerala, and can be separated easily from the other species recorded here by its strong and lengthened mandibles.

3. *Plebeigryllus guttiventris* (Walker)

(Fig. 2)

1971. *Gryllus guttiventris* Walker, *Cat. Derm. Salt. Br. Mus*, 5, suppl., 6.

1964. *Plebeigryllus guttiventris*, Randell, *Can. Ent.*, 96 : 1598.

Diagnostic characters : Size medium ; head adorned with six short, light lines on the occiput ; frontal face normal ; antennae filiform, and longer than the body ; pronotum strongly transverse ; posterior femora short and thick ; posterior tibiae with six spines on each margin ; genitalia similar as illustrated by Chopard (1969).

Specimen examined : 1 ♀ (nymph), Road to Cardamom Estate, 11. xii. 1980, Dr. R. S. Pillai.

Distribution India (Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, Bihar, West Bengal and Orissa) ; Sri Lanka ; Burma ; Sudan.

This species has also been studied somewhere else from Andhra Pradesh.

Remarks : *Plebeigryllus guttiventris* (Walker) is widely distributed species and generally attracted on the light. It can be easily identified by its stout, and somewhat depressed body and short, thick posterior femora.

4. *Modicogryllus confirmatus* (Walker)

(Figs. 3, 4 & 5)

1859. *Acheta confirmata* Walker, *Ann. Mag. nat. Hist.*, (3) 4 : 221.

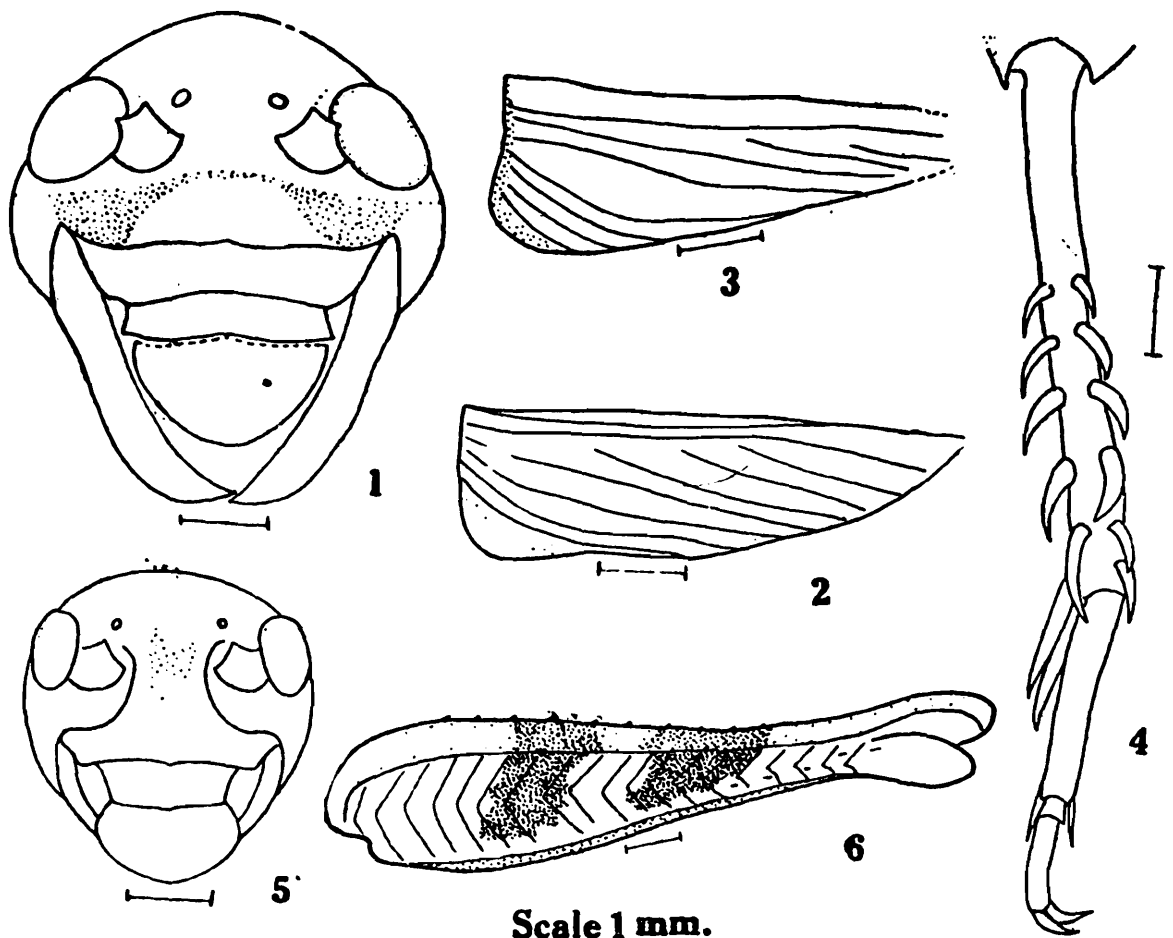
1869. *Gryllus confirmatus*, Walker, *Cat. Derm. Salt. Brit. Mus.*, 1 : 37.

1964. *Modicogryllus confirmatus*, Randell, *Can. Ent*, 96 : 1584.

Diagnostic characters : Size medium ; head adorned with six light markings on the occiput and a narrow yellow line connecting the lateral ocelli ; posterior tibiae with five to six spines on each margin ; elytra of male extend upto the apex of abdomen ; mirror longer than wide, divided by a curved vein ; two oblique veins present ; veins of lateral field of elytra distant and strongly curved ; elytra of female with three veins, and four branches of cubital ; ovipositor long, and lanceolate.

Specimens examined : 1 ♂, way to Valiaparathodu, 5. xii. 1980, Dr. R. S. Pillai ; 1 ♀, 2 kms. towards Mukkali, 6. xii. 1980, Dr. R. S. Pillai ; 1 ♀, Dam site, 9. xii. 1980, Dr. R. S. Pillai.

Distribution : India (Uttar Pradesh, Madhya Pradesh, Bihar, West Bengal, Orissa, Assam, Meghalaya, Karnataka, Tamil Nadu,



Scale 1 mm.

- Fig. 1. Front view of head of *Velarifictorus aspersus* (Walker).
 Fig. 2. Lateral field of elytra of *Plebeigryllus guttiventris* (Walker).
 Fig. 3. Lateral field of elytra of *Modicogryllus confirmatus* (Walker).
 Fig. 4. Posterior tibiae and tarsal segments of *Modicogryllus confirmatus* (Walker).
 Fig. 5. Front view of head of *Modicogryllus confirmatus* (Walker).
 Fig. 6. External side or disc of posterior femur of *Catantops henryi* Bolivar.

Maharashtra and Andaman Islands); Sri Lanka; Bangladesh; Nepal; Burma; Malaya; Indo-China; Philippines.

Remarks: *Modicogryllus confirmatus* is recorded here for the first time from Kerala, and can be easily separated out from other species described here by the disposition of the veins of the lateral field of the elytra, which are widely separated.

Subfamily : NEMOBIINAE

5. *Pteronemobius* sp.

Diagnostic characters: Size small; body pubescent; head globular; maxillary palpi brown with the two last joints white; antennae longer than the body; posterior tibiae with very long movable spines; mirror divided into two almost equal parts by an oblique vein; apical field of elytra reduce; wings absent.

Specimen examined: 1 ♂, 7 kms. from Mukkali, 15. i. 1980, Dr. S. K. Bhattacharya.

Remarks: The present specimen under discussion is a peculiar one, as it resembles with *Pteronemobius panteli* Chopard [or *P. pantelianus* Chopard; see below] in some characters but not agreeing fully with its all characters. This specimen is also not resembling with other Indian species of *Pteronemobius* J. & K. Hence, we are recording it here upto genus only, due to the lack of sufficient material for the determination of the species.

Both the names, *P. panteli* Chopard, 1969 and *P. pantelianus* Chopard, 1967, mentioned above are invalid under nomenclature rules. While the first is preoccupied by *P. panteli* (Hebard, 1913), the second is an unavailable name. This has been discussed in detail in a separate study under publication (Shishodia and Varshney, in press).

Suborder : CAELIFERA

Superfamily : TETRIGOIDEA

Family : TETRIGIDAE

Subfamily : CLADONOTINAE

6. *Deltonotus gibbiceps* (Bolivar)

(Fig. 8)

1902. *poecilotettix gibbiceps* Bolivar, *Annls Soc. ent. Fr.*, 70 : 580.

1906. *Deltonotus gibbiceps*, Hancock, *Genera Insect.*, fasc. 48 : 14.

1914. *Deltonotus gibbiceps*, Kirby, *Fauna British India, Orthoptera, Acrididae* : 16.

Diagnostic characters : Size small ; head short ; vertex obtusely produced in front of the eyes ; frontal costa widely forked between the lateral ocelli ; antennae longer than the anterior femora ; pronotum covers more or less whole body, compressed, foliaceous and acutely tectiform, in front obtusely angulated, behind truncated ; posterior femora thick and the upper carina minutely granulated, acutely sinuated before the apex ; first joint of posterior tarsi with three pulvilli of equal length.

Specimen examined : 1 ♀, 4 kms. South East of Valiaparathodu, 29. i. 1980, Dr. S. K. Bhattacharya, Registration No. 7836/H5.

Distribution : India (Tamil Nadu).

Remarks : *Deltonotus gibbiceps* (Bolivar) is recorded here for the first time from Kerala, and can be easily identified by the widely forked frontal costa, compressed and foliaceous pronotum which is acutely tectiform and projecting above the head and the absence of elytra and wings.

Subfamily : SCELIMENINAE

7. *Eucriotettix flavopictus* (Bolivar)

(Figs. 7 & 9)

1902. *Criotettix flavopictus* Bolivar, *Annls Soc. ent. Fr.* 70 : 582.

1914. *Acanthalobus flavopictus*, Kirby, *Fauna of British India, Orthoptera, Acrididae* : 41.

1938. *Eucriotettix flavopictus*, Günther, *Stettin. ent. Ztg.*, 99 : 133, 170, 180, 187.

Diagnostic characters : Size small ; frontal costa not widely forked, the rami divergent moderately ; head slightly raised above the pronotum ; vertex narrower than an eye or sometimes in female as broad as an eye ; antennae filiform and longer than the anterior femora ; eyes slightly elevated above the vertex, globular ; pronotum transverse anteriorly, subulate posteriorly and extend beyond the apex of posterior femora ; dorsum of pronotum and its median carina normal ; posterior angles of lateral lobes of pronotum produced into sharp spines, which are directed outwards ; elytra very small, rounded at apex ; wings caudate ; first segment of posterior tarsi longer than the third.

Specimens examined : 1 ♀, 4 kms. towards Kumatanthodu, 960 m. 18. i. 1980. K. R. Rao ; 3 ♂♂, Valiaparathodu, 940 m. 23. i. 1980,

K. R. Rao ; 3 ♂♂, 1 ♀, Around proposed Dam site, April-May, 1980, Dr. A. K. Hazra ; 1 ♀, way to Valiaparathodu, 5. xii. 1980, Dr. R. S. Pillai.

Distribution : India (Tamil Nadu, Karnataka, Kerala and Assam) ; Burma (Dawna Hills).

Remarks : This species is generally found in South India and can be easily recognised by the moderately forked frontal costa, narrower vertex, well raised eyes above the pronotum and outwardly directed spines of lateral lobes of pronotum.

Superfamily : ACRIDOIDEA
Family : PYRGOMORPHIDAE
Subfamily PYRGOMORPHINAE

8. *Orthacris* sp.

Diagnostic characters Size medium ; Body slender, head conical, not longer than wide ; foveolae of the vertex contiguous, superior and forming the extremity of the fastigium ; front not sloping ; antennae filiform, shorter than the body ; cheeks and lateral pronotal lobes with numerous tubercles ; pronotum not carinated ; supra-anal plate lanceolate ; cerci short and straight ; valves of ovipositor sinuated.

Specimen examined 1 ♀, Around Proposed dam, 15. i. 1980, Dr. S. K. Bhattacharya,

Distribution India (South India) ; Sri Lanka.

Remarks In absence of males we could not reach upto the specific level of identification.

9. *Atractomorpha crenulata* (Fabricius)

1793. *Truxalis crenulatus* Fabricius, *Entomologia systematica*, 2 : 28.
1861. *Atractomorpha crenulata*, Saussure, *Annls Soc. ent. Fr.*, (4) 1 : 475.
1914. *Atractomorpha crenulata*, Kirby, *Fauna British India, Orthoptera, Acrididae* : 181.
1969. *Atractomorpha crenulata*, Kevan, *Zool. J. Linn. Soc.*, 48 : 187.

Diagnostic characters : Size medium ; body long, slender, and compressed ; head conical, not longer than the pronotum ; fastigium about as long as the eye ; front very oblique ; antennae subfiliform, shorter than the body, and placed in front of the ocelli ; eye oblong ; lateral pronotal lobe with a membranous area near the posterior margin ; elytra extend one-third of their length beyond the apex of

posterior femora, narrow, pointed at apex ; wings shorter than elytra and rosy at base.

Specimen examined : 1 ♂, Road to Cardomom Estate, 11 xii. 1980, Dr. R. S. Pillai.

Distribution : India (West Bengal, Andhra Pradesh, Tamil Nadu, Andaman Islands, Madhya Pradesh, Rajasthan, Bihar, Jammu and Kashmir, Goa, Maldive and Laccadive Islands) ; Pakistan ; Bangladesh ; Sri Lanka ; Lower Burma ; South Vietnam ; Thailand ; Malaya ; N. W. Andalas.

Remarks : Though *Atractomorpha crenulata* is recorded here for the first time from Kerala but otherwise widely distributed in India. A large number of specimens were studied somewhere sise from Orissa, Uttar Pradesh, Punjab, Haryana, Arunachal Pradesh, Assam, Manipur, Tripura, Gajarat, Maharashtra etc. including above Indian States and found that the colour of the wings at base depend upon the maturation of the specimens.

10. *Chrotogonus (Chrotogonus) oxypterus* (Blanchard)

1836. *Ommexecha oxypterus* Blanchard, *Annl. Soc. ent. Fr.*, 5 : 622.

1914. *Chrotogonus oxypterus*, Kirby, *Fauna British India, Orthoptera, Acrididae*, : 166.

1959. *Chrotogonus (Chrotogonus) oxypterus*, Kevan, *Publcoes cult. Co. Diam. Angola*, 43 : 48.

Diagnostic characters : Size small but broader ; head small, narrowed towards the front ; foveolae of the vertex contiguous, superior, and forming the extremity of the fastigium ; antennae filiform, shorter than the body ; pronotum rugose and much widened behind ; anterior margin of prosternum strongly reflexed and dilated ; elytra shorter or extend upto the the apex of abdomen, surface nodulose ; wings often shorter than elytra and darker in colour.

Specimen examined : 1 ♀, Road to Cardomom Estate, 11. xii. 1980, Dr. R. S. Pillai.

Distribution : India (South India) ; Sri Lanka.

Remarks : *Chrotogonus (Chrotogonus) oxypterus* is reported to occur in South India but we have also studied somewhere else from other adjacent states like Maharashtra, Madhya Pradesh, Orissa, West Bengal and Bihar.

Subfamily : GOMPHOCERINAE

11. *Dnopherula* (*Aulacobothrus*) sp.

Diagnostic characters : Size medium ; head short ; vertex with long lateral margins which extend far over onto the occiput in the form of carinas ; occiput with distinct median carina which also extends onto the posterior part of the vertex ; antennae filiform, not longer than head and pronotum together ; pronotum flat, and bears lateral carinae ; elytra and wing well developed ; posterior femora with rounded dorsal genicular lobes.

Specimens examined : 1 ♀, 1 km from Mukkali towards dam site, 15. i. 1980, Dr. S. K. Bhattacharya ; 2 ♀ ♀, Base Camp, 1040 m, 23. i. 1980, K. R. Rao ; 1 ♂, 2 ♀ ♀, 1 km towards Dam site from Base Camp, 980m., 31. i. 1980, K. R. Rao.

Distribution : India (Madhya Pradesh, Maharashtra, Tamil Nadu, Karnataka, Sikkim, West Bengal, Assam, Bihar and Himachal Pradesh) ; South America.

This species is also studied somewhere else from Haryana, Delhi, Jammu and Kashmir, Uttar Pradesh and Orissa.

Remarks : At present this species is identified upto the genus level.

Family : ACRIDIDAE

Subfamily : OEDIPODINAE

12. *Trilophidia annulata* (Thunberg)

(Fig. 10)

1815. *Gryllus annulatus* Thunberg, *Mem. Acad. Sci. St-Petersb.*, 5 : 234.
 1910. *Trilophidia annulata*, Kirby, *Syn. Cat. Orth.*, 3 : 244.
 1914. *Trilophidia annulata*, Kirby, *Fauna British India, Orthoptera, Acrididae* : 149.
 1965. *Trilophidia annulata*, Hollis, *Trans. R. ent. Soc. Lond.*, 117 (8) : 251.

Diagnostic characters : Size medium ; vertex behind eyes with a pair of tubercles ; fastigium of vertex elongate-trapezoid, lateral carinae high, sinuous ; fastigial foveolae irregularly oval, wide, and deep ; antennae filiform in basal two-third and slightly thickened in apical part, longer than head and pronotum together ; pronotum tectiform, constricted in prozona. strongly tuberculate ; median carina in prozona forming two high, tooth-like projections, in metazona sharp ; dorsum of pronotum cut by two sulci ; lateral carinae of pronotum irregular in

front of first sulcus forming tooth-like tubercles ; elytra and wings considerably exceeding the tip of abdomen.

Specimens examined : 1 ♀ , Road to Cardomom Estate, 11. xii. 1980, Dr. R. S. Pillai ; 1 ♀ , Around Proposed Dam site, April-May, 1980, Dr. A. K- Hazra.

Distribution : Distributed in Oriental and eastern Palaearctic regions. In India it is widely distributed.

Remarks : This species can be easily identified by the peculiar well marked crest of pronotum, which is strongly bilobed in profile.

13. *Pternoscirta cinctifemur* (Walker)

1859. *Acridium cinctifemur* Walker, *Ann. Mag. nat. Hist.*, (3) 4 : 223.

1914. *Pternoscirta cinctifemur*, Kirby, *Fauna British India, Orthoptera, Acrididae* : 134.

Diagnostic characters : Size medium ; vertex short, wide, flat, with carina like margins ; foveolae irregularly or roundly triangular, not reaching the anterior margin of fastigium ; antennae slightly longer than the head and pronotum together ; ventral part of body and legs, specially the lower margins of the femora, with long dense hairs ; pronotum with small sparse tubercles, distinctly constricted medially ; median carina of pronotum sharp, moderately raised, intersected before the middle by a transverse groove ; elytra narrow, slightly expanded on the costa near the base, extend beyond the apex of posterior femora ; wings rose coloured at base, clouded hyaline towards apex ; posterior tibiae black, banded with yellow at base and blue beyond.

Specimens examined : 1 ♀ , Near Base Camp, 17. i. 1980, Dr. S. K. Bhattacharya ; 1 ♀ , 2 ♀ ♀ , Around Proposed Dam site, April-May, 1980, Dr. A. K. Hazra.

Distribution : India (Tamil Nadu. Goa and West Bengal) ; Sri Lanka.

This species has also been studied somewhere else from Nagaland, Orissa, Assam and Uttar Pradesh.

Remarks : *Pternoscirta cinctifemur* (Walker) is recorded here for the first time from Kerala, and can be easily recognised from the other species of the genus by the red colouration of the basal part of the wings.

14. *Aiolopus* sp.

Diagnostic characters Size medium ; fastigium of vertex elongato-angular, slightly concave, with well developed lateral carinulae ; antennae filiform, as long as, or longer than the head and pronotum together ; pronotum slightly tectiform, and slightly constricted on prozona ; lateral carinae of pronotum absent ; dorsum of pronotum cut by posterior sulcus only, posterior margin of pronotum obtuse-angular ; elytra and wings fully developed and extend beyond the apex of posterior femora.

Specimen examined : 1 ♀, Road to Cardomom Estate, 14. xii. 1980, Dr. R. S. Pillai.

Distribution : Widely distributed throughout the Old World south of latitude 50°N and north of latitude 40°S., extending westwards to the Cape Verde Islands eastwards to the Samoan Islands. It is widely distributed throughout in India.

Remarks : This species has much resemblance with *Aiolopus thalassinus tamulus* (Fabricius) but the punctations on the frontal ridge and the colouration of the posterior tibiae differ from the latter species.

15. *Bababuddinia bizonata* Bolivar

1918. *Bababuddinia bizonata* Bolivar, *Revta R. Acad. Cienc. exact fis. nat. Madr.*, 16 : 382.

Diagnostic characters : Size medium ; head subconical ; fastigium of vertex longer than its width, almost trapezoidal, convex, with transverse basal furrow and sharp marginal carinulae merging with carinulae of vertex ; fastigial foveolae hardly visible from above ; antennae flattened towards basal segments (from third to seventh segment) ; disc of pronotum flattened, crossed by one sulcus behind the middle of pronotum ; metazona shorter than prozona, roundly angular posteriorly ; lateral carinae convergent in middle, divergent behind the middle ; elytra and wings fully developed and slightly surpass the apex of posterior femora ; supra-anal plate roughly triangular, acute at apex ; cerci longer than the super-anal plate, obtuse at apex ; sub-genital plate acute at apex.

Specimen examined : 1 ♂, Base camp, 1040m, 23. i. 1980, K. R. Rao.

Distribution : India (Karnataka and Tamil Nadu).

Remarks *Bababuddinia bizonata* is recorded here for the first time from Kerala. It is very similar to *Dnopherula (Aulacobothrus)* Boliver in appearance but can be differentiated from the latter by the flattened basal segments of the antennae, longer prozona of pronotum and the curvature of the lateral carinae of pronotum in the middle.

16. *Phlaeoba* sp.

Diagnostic characters : Size medium ; head as long as, or shorter than the pronotum and equally broad ; face somewhat oblique ; fastigium produced in front of the eyes as much as behind, obtusely rounded at the extremity ; antennae ensiform, as long as head and pronotum together ; pronotum granulose, all the carinae well developed, parallel ; elytra and wings under development stages.

Specimen examined : 5 nymphs, Around Proposed Dam site, April-May, 1980, Dr. A. K. Hazra.

Distribution : Distributed in the Oriental Region. It is found throughout India.

Remarks : Due to the nymphal stages the specimens could not be identified upto the specific level.

17. *Phlaeoba antennata* Brunner

1893. *Phlaeoba antennata* Brunner, *Annali Mus. civ. Stor. nat. Giacomo Doria*, (2) 13: 125.

1914. *Phlaeoba antennata*, Kirby, *Fauna British India, Orthoptera, Acrididae* : 102.

Diagnostic characters : Size medium ; head as long as, or shorter than the pronotum and equally broad ; vertex short, slightly projecting forward ; foveolae absent ; face oblique ; antennae ensiform, slightly longer than head and pronotum together ; pronotum smooth ; lateral carinae run parallel ; elytra narrow, with obtusely rounded apex, not reaching upto the apex of abdomen ; wings bluish hyaline and slightly shorter than the elytra.

Colour olive-brown or olive-green, with a broad light yellow band running from the vertex to the end of the elytra ; antennae black with light yellow apex ; posterior femora brown ; posterior tibiae olive-green.

Specimen examined: 1 ♂, Way to Valiyaparathodu, 15. xii. 1980, Dr. R. S. Pillai.

Distribution India (Assam and Rajasthan); Burma; Malaya Peninsula; Sumatra; Borneoan; China (Hongkong); Hainan; Tonkin; Perak; Annam.

This species has also been studied somewhere else from Uttar Pradesh, West Bengal, Arunachal Pradesh, Manipur and Tripura.

Remarks: *Phlaeoba antennata* is recorded here for the first time from Kerala. It is found generally in the forest area.

Subfamily OXYINAE

18. *Chitaura indica* Uvarov (Fig. 13)

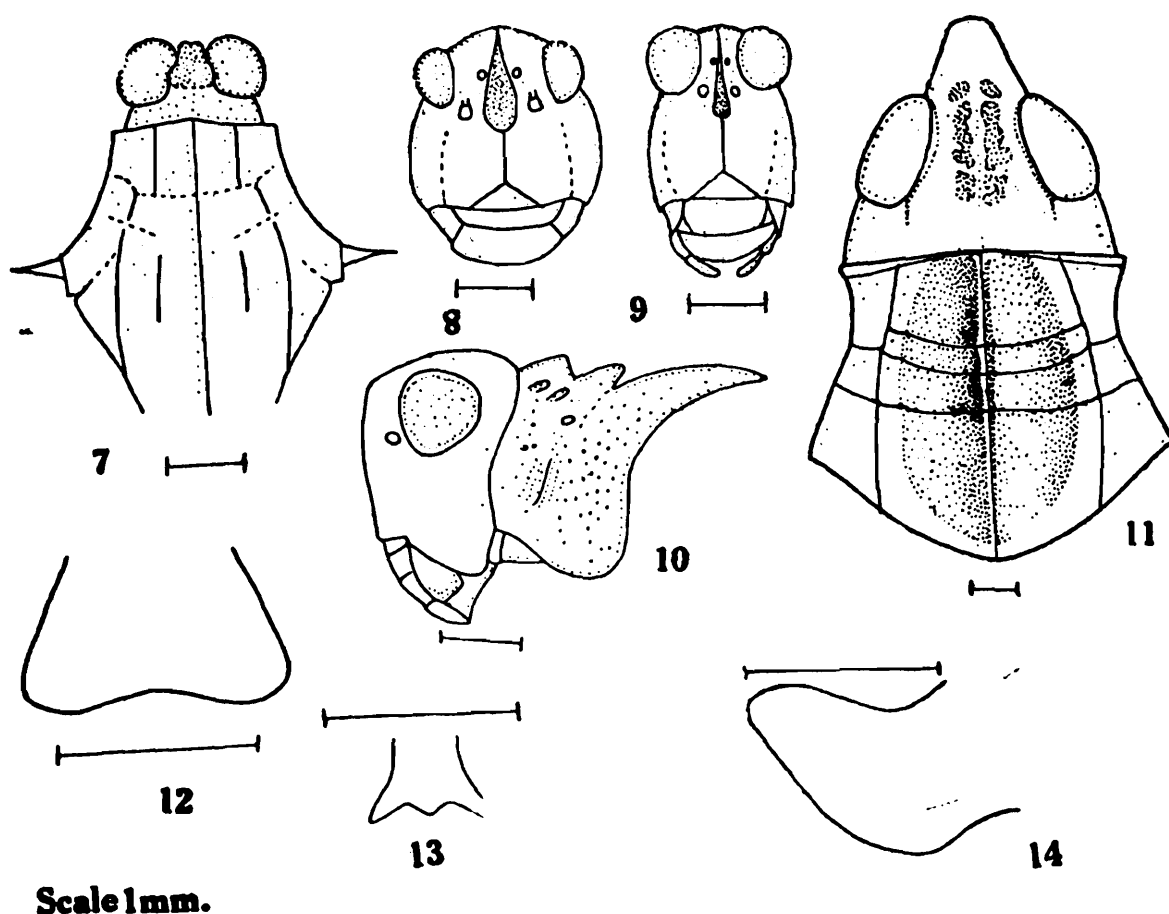
1929. *Chitaura indica* Uvarov, *Revue suisse Zool*, 36 : 553.

Diagnostic characters: Size medium; fastigium of vertex, from above, roundly triangular, as long as, or almost as long as wide; antennae filiform, about as long as head and pronotum together; pronotum smooth; prosternal tubercle with apex antero-posteriorly flattened, trilobate apically; elytra and wings reduced to micropterus form, scale like; tenth abdominal tergite of male with furcula on hind margin.

Specimens examined: 1 ♂, Silent Valley, 4 kms, towards Kumatanthodu, 960m, 18. i. 1980, K. R. Rao; 1 ♂, Silent Valley Base Camp, 1040 m, 21. i. 1980, K. R. Rao; 1 ♂, 1 ♀, Along Valiyaparathodu and Kunti river, 940 m, 22. i. 1980, K. R. Rao; 3 ♂ ♂, 1 ♀, Valiyaparathodu, 23. i. 1980 and 26. i. 1980, Dr. S. K. Bhattacharya and party; 2 ♂ ♂, 1 ♀, Around Proposed Dam site, April-May, 1980, Dr. A. K. Hazra; 2 ♂ ♂, way to Viliyaparathodu, 5. xii. 1980, Dr. R. S. Pillai; 4 ♀ ♀, 2 kms. towards Mukkali, 6. xii. 1980, Dr. R. S. Pillai; 4 ♀ ♀, Road to Mukkali, 8. xii. 1980, Dr. R. S. Pillai; 2 ♂ ♂, 1 ♀, Dam site, 9. xii. 1980, Dr. R. S. Pillai; 2 ♂ ♂, 1 ♀, Road to Valiyaparathodu, 10. xii. 1980, Dr. R. S. Pillai; 1 ♂, 1 ♀, Road to Cardomom Estate, 14. xii. 1980, Dr. R. S. Pillai.

Distribution: India (Karnataka and Kerala).

This species has also been studied somewhere else from Tamil Nadu.



- Fig. 7. Top view of head and thorax of *Eucriotettix flavopictus* (Bolivar).
 Fig. 8. Front view of head of *Deltonotus gibbiceps* (Bolivar).
 Fig. 9. Front view of head of *Eucriotettix flavopictus* (Bolivar).
 Fig. 10. Lateral view of head and pronotum of *Trilophidia annulata* (Thunberg).
 Fig. 11. Top view of head and pronotum of *Tylotropidius varicornis* (Walker).
 Fig. 12. Prosternal tubercle of *Tylotropidius varicornis* (Walker).
 Fig. 13. Prosternal tubercle or process of *Chitaura inäica* Uvarov.
 Fig. 14. Prosternal tubercle of *Oxysrhepes obtusa* (De Haan).

Remarks : It is very similar to the genus *Oxya* in appearance but can be differentiated from the latter by the flattened and trilobate prosternal tubercle and reduced elytra and wings.

19. *Oxya hyla hyla* Serville
 (Figs 15, 16, 19, 20 & 26)

1831. *Oxya hyla* Audinet-Serville, *Annls Sci. nat. (Zool.)*, 22 : 287.

1971. *Oxya hyla hyla*, Hollis, *Bull. Br. Mus. nat. Hist. (Ent.)* 26 no. 7 : 282.

Diagnostic characters : Size medium, fastigium of vertex, from above, short, with widely rounded or obtuse apex, antennae filiform, as long as, or slightly smaller than head and pronotum together ; prosternal tubercle conical with subacute or rounded apex ; elytra and wings well developed ; supra-anal plate with small tubercle on either side ; cercus conical or compressed laterally ; lower genicular lobe of posterior femora spined ; tenth abdomen tergite, in male, without furcula ; epiphallus with curved hook-like outer lophi and tooth like inner lophi ; valves of ovipositor with hook-like marginal spines ; ventral surface of sub-genital plate, in female, with a pair of median spines on posterior margin, and with a median longitudinal concavity, which is bordered on each side by a longitudinal ridge bearing short spines.

Specimens examined : 1 ♀, Dam site, Kunthipuzha river, 960 m, 19. i. 1980, K. R. Rao ; 2 ♂♂, 1 ♀, Valiyaparathodu and tributary of Kunti river, 960 m, 21. i. 1980, K. R. Rao ; 1 ♂, 2 ♀♀, Valiyaparathodu, 23. i. 1980, Dr. S. K. Bhattacharya ; 1 ♀, 6 kms West of Valiyaparathodu, 27. i. 1980, Dr. S. K. Bhattacharya.

Distribution : India (Uttar Pradesh, Madhya Pradesh, West Bengal, Bihar, Rajasthan, Orissa, Tripura, Arunachal Pradesh, Meghalaya, Assam, Tamil Nadu, Karnataka, Andhra Pradesh, Goa) ; Africa ; Madagascar ; Persia ; Afghanistan ; Pakistan ; Nepal ; Sri Lanka and Bangladesh.

This species has also been studied somewhere else from Himachal Pradesh, Haryana and Punjab.

Remarks *Oxya hyla hyla* Serville more or less occur throughout in India, but never has been recorded from Kerala.

20. *Oxya nitidula* (Walker)

(Figs. 21 & 25)

1870. *Acridium nitidulum* Walker, *Cat. Derm. Salt. Br. Mus.*, 4 : 631.

1871. *Oxya nitidula*, Walker, *Cat. Derm. Salt. Br., Mus., Suppl.*, : 64.

1971. *Oxya nitidula*, Hollis, *Bull. Br. Mus. nat. Hist. (Ent.)*, 26 no. 7 : 315.

Diagnostic characters : Size medium ; similar to the preceding species but the supra-anal plate without lateral tubercles ; cerci conical, with obliquely tuncate apex ; epiphallus with relatively

straight outer lophi and small inner lophi ; valves of ovipositor with tooth-like spines ; ventral surface of sub-genital plate with a pair of well developed submarginal lateral spines, posterior margin with a single medial spine and a pair of lateral spines.

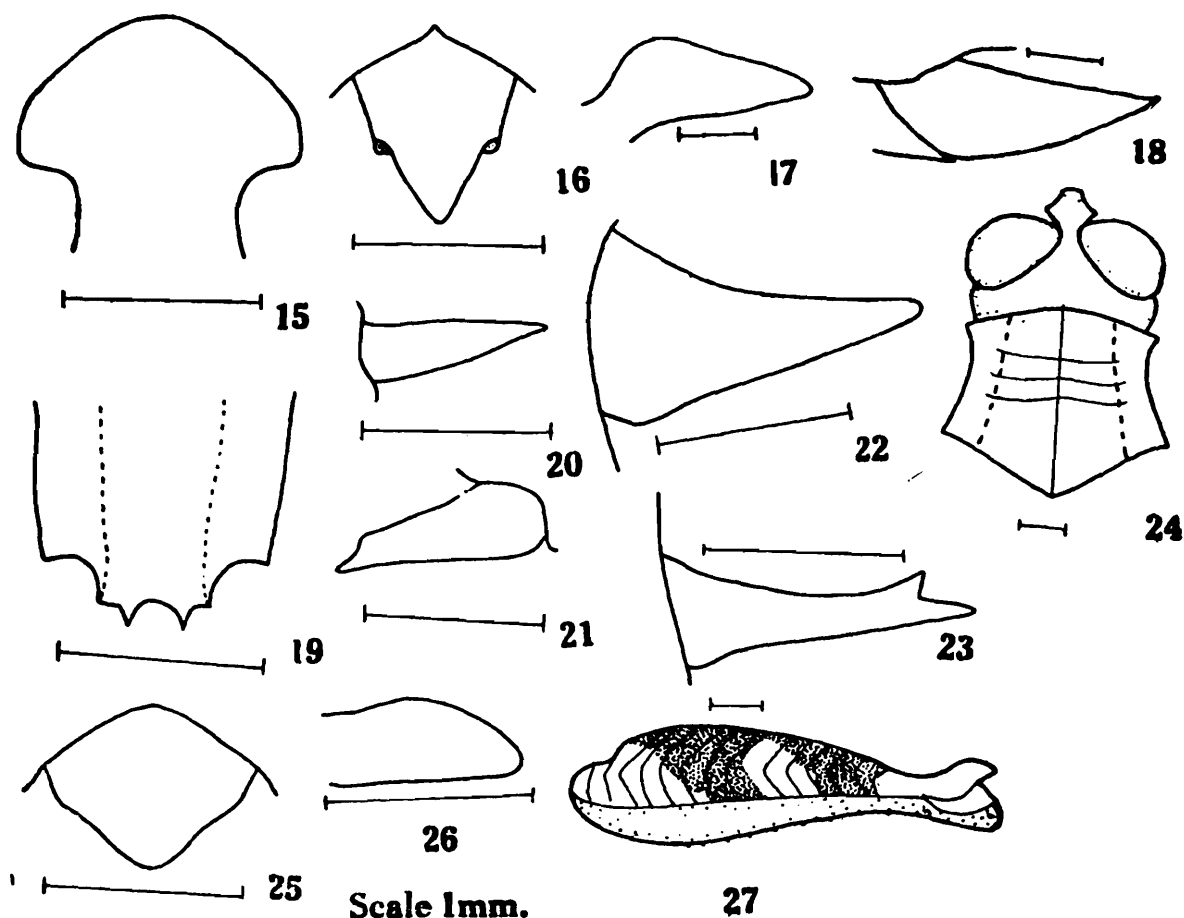


Fig. 15. Top view of fastigium of *Oxya hyla hyla* Serville.

Fig. 16. Dorsal view of supra-anal plate of male *Oxya hyla hyla* Serville.

Fig. 17. Lateral view of prosternal tubercle of *Cyrtacanthacris tatarica* (Linnaeus).

Fig. 18. Lateral view of sub-genital plate of male *Cyrtacanthacris tatarica* (Linnaeus).

Fig. 19. Ventral view of sub-genital plate of female *Oxya hyla hyla* Serville.

Fig. 20. Lateral view of cercus of male *Oxya hyla hyla* Serville.

Fig. 21. Lateral view of cercus of male *Oxya nitidula* (Walker).

Fig. 22. Lateral view of cercus of male *Cyrtacanthacris tatarica* (Linnaeus).

Fig. 23. Lateral view of cercus of male *Catantops henryi* Bolivar.

Fig. 24. Dorsal view of head and pronotum of *Xenocatantops humilis humilis* (Serville).

Fig. 25. Dorsal view of supra-anal plate of male *Oxya nitidula* (Walker).

Fig. 26. Lateral view of prosternal tubercle of *Oxya hyla hyla* Serville.

Fig. 27. External side of posterior femur of *Xenocatantops humilis humilis* (Serville).

Specimen examined 1 ♂, Road to Cardomom Estate, 11. xii. 1980, Dr. R. S. Pillai.

Distribution : India (Andhra Pradesh, Kerala, Karnataka, Tamil Nadu) ; Sri Lanka.

This species has also been studied somewhere else from Rajasthan, Orissa and West Bengal.

Remarks The structure of cerci of the present specimen differs from Hollis (1971) as it is not strongly truncate at apex.

Subfamily : COPTACRIDINAE

21. *Eucoptacra binghami* Uvarov

1921. *Eucoptacra binghami* Uvarov, *Ann. mag. nat. Hist.*, (9) 7 : 503.

1957. *Eucoptacra binghami*, Willemse, *Publties natuurh. Genoot. Limburg*, Reeks X : 444.

Diagnostic characters : Size medium ; head rugulose ; fastigium of vertex sloping, separated from the frontal ridge by an indistinct transverse keel or row of points ; frontal ridge flat ; frontal costa distinctly widened between the eyes ; antennae feebly flattened and dilated beyond the middle, as long as or slightly longer than head and pronotum together ; pronotum cut by the principal sulcus nearly in the middle ; elytra with a distinct, oblique, narrow callous fascia, a little behind the middle and extend beyond the apex of posterior femora, obliquely truncate at apex ; last abdominal tergite, in male, with well developed furcula ; posterior femora with a black spot before the middle of superio-external area ; sub-genital plate, in female, little triangularly expanded at the hind margin.

Specimens examined : 4 ♀ ♀, 1 km from Mukkali towards dam site, 15. i. 1980, Dr. S. K. Bhattacharya.

Distribution : Burma ; Thailand ; Tonkin ; Federation of Malaya State.

Remarks : Uvarov (1921) has described *Eucoptacra binghami* from Burma. He has also mentioned that the Pusa collection contains one male, without precise indication of locality. Later on Willemse (1957) studied the Acridoidea of the Indo-Malayan and adjacent regions and he mentioned India as the region of distribution but the part which

was included in it comes under Burma. Hence it is concluded that the present species is recorded here for the first time from India.

22. *Coptacra ensifera* Bolivar

1902. *Coptacra ensifera* Bolivar, 1902. *Annls Soc. ent. Fr.*, 70 : 621.

1914. *Coptacra ensifera*, Kirby, *Fauna British India, Orthoptera, Acrididae* : 239.

Diagnostic characters : Size medium ; fastigium shortly tricarinata between the eyes, the middle carina produced backwards ; frontal costa, not, or scarcely wider between the antennae ; antennae ensiform, as long as, or slightly longer than head and pronotum together ; pronotum rugose, slightly tectiform, crossed by all the three sulci, posterior margin obtusely angular ; lateral carinae of pronotum absent ; elytra as long as, or shorter, than the posterior femora, obliquely truncate at apex ; wings yellowish hyaline ; legs embeded with grey hairs ; posterior tibiae red.

Specimens examined : 3 ♂♂, Around Proposed Dam Site, April-May, 1980, Dr. A. K. Hazra.

Distribution India (Tamil Nadu and Karnataka).

Remarks Uvarov (1921) has recorded *Coptacra ensifera* from Karnataka (Belgaum) and remarked that the species has been described from Madura, Madras, but evidently distributed all over India. Later on Uvarov (1929) has again recorded it from Karnataka. Since then no record is available from other parts of India. During our present study we are recording it from Kerala for the first time. We think that the distribution of the species is restricted to South India only.

23. *Coptacra punctaria* (Walker)

1870. *Acridium punctarium* Walker, *Cat. Derm. Salt. Br. Mus.*, 4 : 639.

1914. *Bibractoides punctoria*, Kirby, *Fauna British India, Orthoptera, Acrididae* : 236.

1929. *Coptacra punctaria*, Uvarov, *Revue Suisse Zool.*, 36 : 561.

Diagnostic characters Size medium ; head short ; fastigium at apex slightly depressed, subhexagonal ; face with four distinct carinae, the inner carinae parallel, the outer carinae slightly diverge laterally ; antennae a little flattened, as long, or slightly longer than head and pronotum together ; head and pronotum rugose, tuberculate ; pronotum short, a little tectiform, posterior margin angulate ; median carina crossed by all the three sulci ; lateral carinae not traceable ;

prosternal tubercle stout at base, acutely rounded at apex; elytra extend a little beyond the apex of posterior femora, obliquely truncate at apex; wings yellowish with reddish nervures, as long as, or a little shorter than the elytra; posterior femora a little longer than the abdomen, with two black patches above; posterior tibiae bright red.

Specimen examined: 1 ♀, Silent Valley along Kuntipuzha, 17. i. 1980, K. R. Rao; 1 ♀, Base Camp, 21. i. 1980, K. R. Rao; 1 ♀, Around Proposed Dam Site, April-May, 1980, Dr. A. K. Hazra.

Distribution: India (Tamil Nadu).

Remarks: Walker (1870) has recorded this species from South India without giving any precise locality. Later on Uvarov (1929) has also reported it from Coonoor (Tamil Nadu). *Coptacra punctaria* (Walker) is recorded here for the first time from Kerala. This species differs from the other species of the genus by the black tubercles and rugosity on the head and pronotum.

Subfamily TROPIDOPOLINAE

24. *Calamippa prasina* (Bolivar)

1902. *Xenippa prasina* Bolivar, *Annls Soc. ent., Fr.*, 70 : 617.

1940. *Calamippa paasina*, Henry, *Trans. R. ent. Soc. Lond.*, 90 : 520.

Diagnostic characters: Size medium but very slender and elongate, somewhat depressed; head extend forward beyond the eyes; face reclinate; fastigium of vertex long, parabolic at apex; rounded tectate dorsally; foveolae not traceable; frontal ridge strongly compressed from tip of fastigium to base of antennae, thereafter gradually diverging; eyes depressed and elongate; antennae ensiform, shorter than head and pronotum together; pronotum rounded above, truncate in front, obtusely rounded behind, compressed, median and lateral carinae not traceable; disc of pronotum crossed by three shallow transverse sulci; prosternal tubercle slightly curve backwards at apex with dorsal rounded and ventral pointed teeth; elytra long, narrow, acutely rounded at apex, extend beyond the apex of posterior femora, not reaching upto the apex of abdomen; wings as long as, or shorter than elytra; posterior femora slender, rounded outwardly; cerci of male long, lanceolate, extend beyond the subgenital plate; cerci of female long, extend beyond the ovipositor.

Specimens examined : 1 ♂, 1 ♀, Around Proposed Dam site, April-May, 1980, Dr. A. K. Hazra.

Distribution : India (Tamil Nadu).

Remarks : *Calamippa prasina* (Bolivar) is recorded here for the first time from Kerala. It looks like *Mesopsis* Bolivar in appearance but can be differentiated from the latter by the characters mentioned above.

25. *Oxyrrhepes obtusa* (De Haan)

(Fig. 14)

1842. *Acridium (Oxya) obtusum* De Haan, *Verh. Ned. Overz. Bezitt. Orth.* : 155, 156.

1955. *Oxyrrhepes obtusa*, Willemse, *Publties, natuurh. Genoot. Limburg Reeks VIII* : 32, 33.

Diagnostic characters : Size a little larger than the medium ; head short ; fastigium short, sloping, obtuse at the apex, and with a depression in the middle ; vertex with a median and two lateral longitudinal darker lines or small spots ; antennae filiform or with slightly flattened segments, shorter than the head and pronotum together ; pronotum brown above, darker on the lateral lobes ; median carina crossed by three transverse sulci, posterior margin obtusely rounded ; prosternal tubercle compressed laterally, curved backwards at the apex, nearly reaching the anterior margin of mesosternum but not touching it ; elytra and wings extend behind beyond the apex of posterior femora ; supra-anal plate broad at base, conically pointed at apex ; sub-genital plate of male slender and narrowly pointed at apex.

Specimens examined : 1 ♂, Valiyaparathodu, 23. i. 1980, Dr. S. K. Bhattacharya ; 2 ♂ ♂, 13 kms South of Valiyaparathodu, 28. i. 1980, Dr. S. K. Bhattacharya ; 6 ♂ ♂, 6 ♀ ♀, Around Proposed Dam Site, April-May, 1980, Dr. A. K. Hazra ; 1 ♂, Road to Cardomom Estate, 14. xii. 1980, Dr. R. S. Pillai.

Distribution : India (Karnataka, Tamil Nadu, Madhya Pradesh, Rajasthan and Sikkim) ; Sri Lanka ; Burma ; Java ; China ; Indo-China ; Taiwan ; Palawan ; Lombok ; Sebesi Island ; Ceram ; Sulawesi and Gilolo Island.

Remarks : *Oxyrrhepes obtusa* is recorded here for the first time from Kerala, and can be identified easily by the shape of fastigium,

prosternal tubercle and the slender and pointed sub-genital plate of male.

26. ***Tristria pulvinata*** (Uvarov)

(Fig. 29)

1921. *Tapinophyma pulvinata* Uvarov, *Ann. Mag. nat. Hist.*, (9) 7 : 497,

1929. *Tristria pulvinata*, Uvarov, *Revue suisse Zool.*, 36 : 559.

Diagnostic characters : Size medium ; head obtusely conical, shorter than the pronotum ; fastigium of vertex short and obtuse, its margin obtuse and smooth ; eyes ovate with strongly narrowed towards the apex ; antennae dorso-ventrally flattened and weakly dilated in the middle, shorter than head and pronotum together ; pronotum sub-cylindrical, anterior and posterior margin roundly truncate ; median carina of pronotum crossed by three transverse sulci, lateral carinae low and with slight divergent posteriorly ; prosternal tubercle bent backwards and touch the mesosternum, its lower surface very broad, concave, trapezoidal with lateral margins raised and hind margin feebly excavated ; elytra and wings not reaching the apex of the abdomen ; supra-anal plate, of female, very narrow and elongate.

Specimens examined : 2 ♀ ♀ (nymphs), 1 km towards Dam site from Base Camp, 980 m, 31. i. 1980, K. R. Rao ; 6 ♀ ♀, Around Proposed Dam site, April-May, 1980, Dr. A. K. Hazra.

Distribution : India (Bihar, Karnataka, Tamil Nadu and Punjab) ; Sri Lanka.

This species has also been studied somewhere else from various localities of West Bengal, Assam and Haryana.

Remarks : *Tristria pulvinata* is recorded here for the first time from Kerala, and can be easily identified by the obtusely conical head and the specific shape of prosternal tubercle.

Subfamily : EYPREPOCNEMIDINAE

27. ***Tylotropidius varicornis*** (Walker)

(Figs. 11 & 12)

1870. *Heteracris varicornis* Walker, *Cat. Derm. Salt. Br. Mus.*, 4 : 667.

1914. *Tylotropidius varicornis*, Kirby, *Fauna British India, Orthoptera, Acrididae*, : 265.

Diagnostic characters : Size a little larger and stouter than the medium ; fastigium of vertex with two depressions at the base ; front of head oblique ; antennae filiform and as long as head and pronotum together ; dorsum of pronotum dark brown, anterior and posterior margin roundly angulate ; median carina of pronotum raised and crossed by three transverse sulci, lateral carinae pale in colour, converge posteriorly ; prosternal tubercle compressed, truncate and slightly notched in the middle at apex ; elytra with a row of triangular whitish spots upon the radial nervure and a pale longitudinal strip in the costal area, extend beyond the apex of abdomen, but not surpass the apex of posterior femora ; posterior femora thick at base, very slender and long towards the apex ; supra-anal plate, of male, elongato-triangular, sulcated ; cerci straight and acuminate.

Specimens examined : 1 ♂ (nymph), Silent Valley second Camp, 1040 m, 21. i. 1980, K. R. Rao ; 1 ♂, Silent Valley Base Camp, 1440 m. 23. i. 1980, K. R. Rao ; 4 ♂♂, 3 ♂♂, Around Proposed Dam site, April-May, 1980, Dr. A. K. Hazra.

Distribution : India (Tamil Nadu and Maharashtra) ; Sri Lanka ; Burma.

This species has also been studied somewhere else from Madhya Pradesh, Uttar Pradesh, Himachal Pradesh, Haryana, Karnataka, Andhra Pradesh and Meghalaya.

Remarks : *Tylotropidius varicornis* is recorded here for the first time from Kerala. It can be easily identified by the specific dark brown mark on the dorsum of pronotum, convergence of lateral carinae posteriorly ; slender and long posterior femora towards apex and bilobed prosternal tubercle at apex.

28. *Eyprepocnemis alacris alacris* (Serville)

1839. *Acridium alacre* Serville, *Histoire naturelle des insectes Orthopteres* : 682.

1958. *Eyprepocnemis alacris alacris*, Dirsh, *Proc. R. ent. Soc. London.*, (B) 27 : 40.

Diagnostic characters : Size slightly longer than the medium ; fastigium of vertex parabolic, a little concave ; frons oblique ; antennae filiform, as long as, or slightly longer than the head and pronotum together ; dorsum of pronotum almost flat, with a characteristic dark brown markings, truncate in front, rounded and subtruncate behind ; median and lateral carinae crossed by three transverse sulci, lateral

carinae slightly convergent in front ; elytra with numerous brown spots ; posterior femora with a long and black streak ; posterior tibiae bluish-grey, with two whitish rings at the base.

Specimen examined : 1 ♂, Road to Mukkali, 8. xii. 1950, Dr. R. S. Pillai.

Distribution : India (Throughout India) ; Pakistan ; Afghanistan ; E. Persia ; Sri Lanka.

Remarks : This species can be easily recognised by the fully developed elytra and wings, the specific dark brown markings on the dorsum of pronotum, colourless wings, dark brown spots on the elytra and the bluish grey posterior tibiae with two whitish rings at the base and reddish apex and tarsi.

Subfamily : CATANTOPINAE

29. **Xenocatantops humilis humilis** (Serville)

(Figs. 24 & 27)

1839. *Acridium humile* Serville, *Histoire naturelle des insectes Orthopteres* : 662.

1814. *Catantops humilis*, Kirby, *Fauna British India, Orthoptera, Acrididae* : 250.

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

Diagnostic characters : Size medium ; fastigium of vertex with slightly raised carinulae between the eyes ; interocular distance narrower ; antennae filiform, longer than head and pronotum together ; pronotum slightly constricted halfway its length, roundly truncate in front and roundly angulate behind ; sulci more distinct than in *Stenocatantops* Dirsh & Uvarov ; median carina crossed by three transverse sulci ; prosternal tubercle acutely conical ; elytra and wing surpassing the apex of posterior femora ; outer medial area of posterior femora with two transverse dark brown fasciae.

Specimen examined : 1 ♂, Base Camp, 21.i. 1980, K. R. Rao.

Distribution : India (Arunachal Pradesh, Assam, Meghalaya, Kerala, Tamil Nadu, Andaman Islands, West Bengal, Bihar, Madhya Pradesh, Uttar Pradesh) ; Tibet ; Sri Lanka ; Bangladesh ; Thailand ; Tibet ; Burma ; Malaya ; Indochina ; Yunnan ; Philippines ; Borneo ; Sumatra ; Java ; Lombok ; New Guinea.

This species has also been studied somewhere else from Himachal Pradesh, Manipur, Sikkim, Mizoram and Orissa.

Remarks : *Xenocatantops humilis humilis* (Serville) is generally found in thick forest regions and can be easily recognised by the slightly constricted pronotum in the middle, two dark brown fasciae on the external face of posterior femora.

30. *Palniacris maculatus* Henry

1940. *Palniacris maculatus* Henry, *Trans. R. ent. Soc. Lond.*, 90 : 531.

Diagnostic characters : Size medium ; occiput roundly-convex ; fastigium of vertex declivent, transversely furrowed, laterally bounded by carinulae and with small foveoles ; antennae filiform, and extend beyond the pronotum behind ; pronotum slightly tectiform, emarginate forward in the middle, roundly truncate behind ; median carina of pronotum crossed by three sulci, lateral carinae not distinct ; prosternal tubercle acutely conical at apex ; elytra reduced, lateral, lanceolate, not reaching the middle of second tergite, and with two black spots ; posterior femora extend beyond the apex of abdomen ; supra-anal plate triangular, sulcate medially at base ; cerci conical and compressed.

Specimen examined : 1 ♂, Road to Mukkali, 8. xii. 1980, Dr. R. S. Pillai.

Distribution India (Tamil Nadu and Karnataka).

Remarks : *Palniacris maculatus* is recorded here for the first time from Kerala. It can be identified easily by the shape of head and pronotum, and the reduced elytra with two black spots which are placed obliquely on the apex.

31. *Catantops henryi* Bolivar

(Figs. 6 & 23)

1918. *Catantops henryi* Bolivar, *Revta R. Acad. Cience. exact. fis. nat. Madr.*, 16 : 404.

1956. *Catantops henryi*, Dirsh, *Publcoes. cult. Co. Diam. Angola*, 28 : 90.

Diagnostic characters : Size medium ; head shorter than pronotum ; fastigium sub-pentagonal with convex anterior margin ; antennae filiform, shorter than head and pronotum together ; prosternal tubercle rounded at apex which is slightly inclined backwards ; elytra and wings extend beyond the apex of posterior femora ; posterior femora with two broad incomplete fasciae on the external

disc, the smaller being on the apex ; cerci short, bifurcated at apex, the internal lobe short with rounded apex.

Specimens examined : 1 ♂, 10 kms east of Valiyaparathodu Camp, 25. i. 1980, Dr. S. K. Bhattacharya ; 1 ♂, 1 km towards Dam site from Base Camp, 980 m, 31 i. 1980, K. R. Rao ; 2 ♂ ♂, 5 ♀ ♀, Around Proposed Dam site, April-May, 1980, Dr. A. K. Hazra ; 1 ♂, 2 ♀ ♀, 2 kms towards Mukkali, 6. xii. 1980, Dr. R.S. Pillai ; 1 ♂, Road to Valiyaparathodu, 10. xii. 1980, Dr. R. S. Pillai.

Distribution : India (Kerala, Karnataka, Maharashtra and Goa) ; upper Burma.

Remarks : *Catantops henryi* can be easily separated from the other species of the genus by the darker fasciae on the external disc of posterior femora and bifurcated cerci.

Subfamily CYRTACANTHACRIDINAE

32. *Chondracris rosea* (De Geer)

(Figs. 28, 30, 32 & 33)

1773. *Acrydium roseum* De Geer, *Memoires pour servir a l'histoire des insectes*, Stockholm 3 : 488.

1923. *Chondracris rosea*, Uvarov, *Bull. ent. Res.*, 14 : 39.

1975. *Chondracris rosea*, Tandon, *Dr B.S. Chauhan Comm. Vol.* : 396.

Diagnostic characters : Size large ; fastigium trapezoidal ; antennae filiform, and slightly longer than head and pronotum together ; pronotum compressed, tectiform, integument strongly rugose ; median carina of pronotum moderately to distinctly raised throughout, crossed by three transverse sulci ; prosternal tubercle slightly thick before the apex, then narrowing towards obtuse apex ; elytra extend beyond the apex of posterior femora ; wing rose coloured towards base ; supra-anal plate, of male, almost triangular ; cerci short, and acute at apex ; sub-genital plate acutely conical ; valves of ovipositor short, apex hooked.

Specimens examined : 1 ♀, Project side, Base Camp, 24 kms N.W. of Mukkali, April-May, 1980, Dr. A. K. Hazra ; 1 ♀, 12 kms towards Dam site from Base Camp, 1040 m., 27. i. 1980, K. R. Rao ; 1 ♂, 1 km towards Dam site from Base Camp, 980 m, K. R. Rao ; 2 ♂ ♂, 1 ♀, Around Proposed Dam site, April-May, 1980, Dr. A. K. Hazra.

Distribution : India (Arunachal Pradesh, Assam, Bihar, Madhya

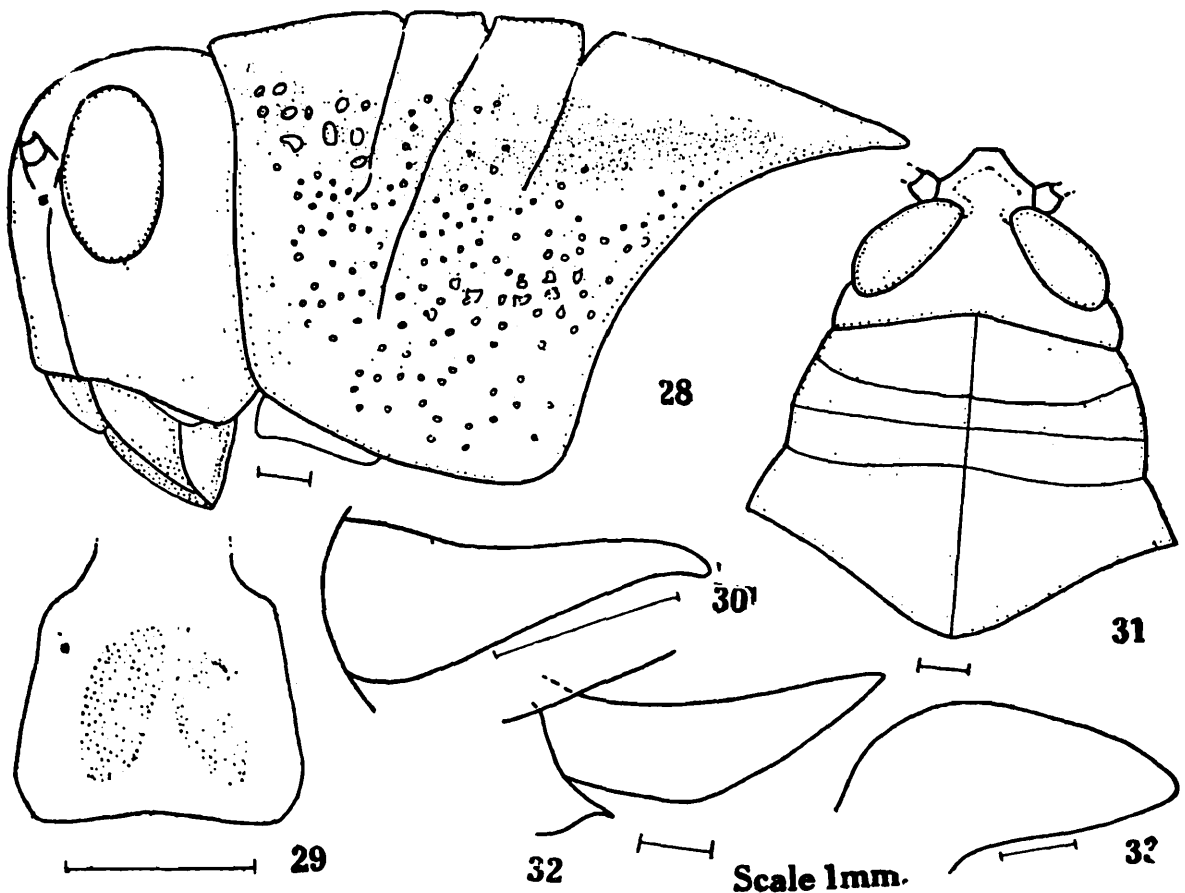


Fig. 28. Lateral view of head and pronotum of *Chondracris rosea* (De Geer).

Fig. 29. Ventral view of prosternal tubercle of *Tristria pulvinata* (Uvarov).

Fig. 30. Lateral view of Cercus of male *Chondracris rosea* (De Geer).

Fig. 31. Dorsal view of head and pronotum of *Catantops pulchellus* (Walker).

Fig. 32. Lateral view of sub-genital plate of male *Chondracris rosea* (De Geer).

Fig. 33. Lateral view of prosternal tubercle of *Chondracris rosea* (De Geer).

Pradesh, Manipur, Tripura, Uttar Pradesh, West Bengal, Sikkim, Kerala and Tamil Nadu); Bhutan; Bangladesh; Thailand; Indonesia; Korea; Japan; Vietnam; China; Java; Tainan; Philippines; Manchuria; Hainan Islands.

Remarks : This species can be separated from the other species discussed here by the larger size, pale-green colouration, tectiform pronotum and rose coloured basal area of hind wing.

33. *Cyrtacanthacris tatarica* (Linnaeus)

1758. *Gryllus locusta tataricus* Linnaeus, *Systema Naturae* (10th ed.) : 432.

1923. *Cyrtacanthacris tatarica*, Uvarov, *Bull. ent. Res.*, 14 : 39.

Diagnostic characters : Shorter than the *Chondracris rosea*; fasti-

gium of vertex angular, in middle depressed ; antennae filiform, as long as head and pronotum together ; pronotum moderately tectiform, slightly constricted, integument fairly rugose or smooth, posterior margin angular ; median carina of pronotum a little raised and crossed by three transverse sulci ; prosternal tubercle large, strongly curved backwards, almost touching mesosternum ; elytra extend beyond the apex of posterior femora supra-anal plate, of male, compressed, and with subacute apex ; sub-genital plate, of male, elongate and acutely conical ; valves of ovipositor moderately robust.

Specimens examined : 3 ♂♂, Around Proposed Dam Site, April-May, 1980, Dr. A. K. Hazra.

Distribution : India (Andhra Pradesh, Bihar, Rajasthan, Jammu and Kashmir) ; Africa except N. Africa and Sahara ; S. W. Asia including Sri Lanka, Thailand, Hainan, Philippines, Sumatra ; Madagascar and Seychelles.

This species has also been studied somewhere else from Himachal Pradesh, Haryana, Uttar Pradesh, Bihar, Rajasthan, Orissa, Karnataka, Maharashtra, Meghalaya, West Bengal, Arunachal Pradesh, Manipur, Tripura and Bangladesh.

Remarks *Cyrtacanthacris tatarica* is widely distributed species in India. It can be easily separated from the closely related genus *Patanga* Uvarov, by the prosternal tubercle which is curved backwards and touches the mesosternum. At present this species is reported here for the first time from Kerala.

SUMMARY

Present paper deals with 33 species of grasshoppers and crickets, out of which 20 species are new records for the area whereas one species i.e. *Eucoptocra binghami* Bolivar is recorded for the first time from India. Key to the species is provided. Diagrams of different parts of these insects are also incorporated.

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* Original not seen