

ON NEW AND LITTLE-KNOWN SPECIES OF PLANIPENNIA  
(ORDER NEUROPTERA) FROM INDIA

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ABSTRACT

Two new species, viz., *Neuroleon unpunctatus*, and *Bubopsis rubrapunctata* from India have been described. Also, the distribution of three genera, *Nohoveus* Navas, *Geyria* Esben-Petersen and *Bubopsis* MacLachlan, has been reported for the first time from India. Redescription of two species, *Cueta lineosa* (Rambur) and *Geyria lepidula* (Navas), have also been incorporated.

In course of studying the neuropteran material from Peninsular India, the author has come across several interesting forms. Amongst five species distributed over an equal number of genera in two families, *Neuroleon unpunctatus* of the family Myrmeleonidae from Rajasthan on the north and *Bubopsis rubrapunctata* of the family Ascalaphidae from Karnataka on the south of the Indian peninsula have been described as new to science. Also, three genera, viz., *Geyria* Esben-Petersen, *Nohoveus* Navas and *Bubopsis* MacLachlan, have been observed to constitute new locality records for India. Moreover, two species, namely, *Geyria lepidula* Navas and *Cueta lineosa* (Rambur) have been redescribed. The present classification has been adopted after Holzeli (1972) for the first family and, after Weele (1908) for the other, in accordance with the suitable convenience of the author.

SYSTEMATIC ACCOUNT

Order NEUROPTERA

The order comprising about 300 species from India, can be best recognised by rather equal and membranous wings with netted

venation. It is known to occur in both the Old and New World. It is characterised by being predatory on the insects injurious to the crops of economic importance. Imms (1957) classified the order into two suborders, viz., Planipennia and Megaloptera, of which the former is presently dealt with.

Suborder PLANIPENNIA

This suborder can be diagnosed by the branches of veins bifurcated at margin and Rs with numerous branches on both wings. It is known to be widely distributed in both the world. It is represented by about 250 species in eleven families from India, all of which have been listed by Ghosh & Sen (1977). Presently, only two families are dealt with along with the key as hereunder.

Key to families

Antenna short, weakly clubbed or flattened at apex ; hypostigmatic cell elongate and well-differentiated	... ..	Myrmeleonidae
Antenna long, strongly clavate at apex ; hypostigmatic cell not differentiated	... ..	Ascalaphidae

## 1. Family MYRMELEONIDAE

The family is the largest of all its allies known from India. It is almost widely distributed and represented by three subfamilies, of which only one is incorporated hereunder.

## Subfamily MYRMELEONINAE

This widely distributed subfamily is easily recognised by hind wing with Rs not arising close to the base, Cua distinctly forked and Cua 2 divergent. It is interesting to note that quite a number of tribes, being heterogeneously treated by Markel (1954), were sunk into the synonymy list of seven valid tribes by Holzel (1972). Of these, only three, as presently dealt with, were hitherto known mainly from the palaeartic region, though several other members of these tribes were also reported from the oriental region including India.

## Key to tribes

- |  |                |   |
|--|----------------|---|
| 1. Forewing 2A never angled but geniculate ; 2A and 3A distinct from each other ...                            | ...            | 2 |
| — 2A simple ; 2A & 3A fused with each other ...  | Distoleonini   |   |
| 2. Male with paired hairy structures at 6th & 7th or only at 7th abdominal segment ; axillary plate absent ... | Myrmecaelurini |   |
| — Male without hairy structure ; axillary plate present or absent ...  | Isoleonini     |   |

## Tribe MYRMECAELURINI

This tribe was represented by a single genus from India. Presently, one more is added new for India and, dealt with hereunder.

Genus *Nohoveus* Navas

1919 *Nohoveus* NAVAS, *Insecta*, 8 : 169.

Type-species : *Myrmeleon lepidus* Klug

*Diagnostic characters* : Gradate cross-veins in the apical field of hindwing present ; ectoproct in males long and reaching upto ventral end of abdomen.

*Distribution* : Africa (North), Anatolia, Arab, Asia (Central), Europe (South-east), India, Iran and Kazastan.

*Remark* : Only one species from India is dealt with hereunder.

*Nohoveus implexus* (Walker)

1853. *Myrmeleon implexus* Walker, *Cat. Brit. Mus. Neur.*, 376.

1868. *Myrmecaelurus implexus*, MacLachlan, *J. Linn. Soc.*, 9 : 279.

*Male* : Maxillary and labial palpi, labrum, clypeus and frons : yellow ; a brown spot on 3rd segment of labial palpus ; antenna : brown ; epicranium (Fig. 1, A) : two brown spots on either side of epicranial suture ; pronotum (Fig. 1, A) : yellow, with long and short white hairs on lateral margin ; a longitudinal brown median stripe extending upto the anterior transverse groove besides a longitudinal brown lateral one on either side of it ; mesonotum : broad ; prescutum anteriorly and scutum laterally blackish ; scutellum with a blackish brown spot at middle ; metanotum : laterally black and posteriorly with a small black spot ; wings (Pl. III, A) : broad and rounded at apices ; forewing veins yellow ; basal half of pterostigma brown and apical field with a row of cross-veins ; inner radial field with 5 cross-veins ; hindwing : shorter and narrower than forewing ; apical field without gradate veinlet ; otherwise similar to forewing ; leg : yellow ; femur with white bristles and hairs ; tibiae with black bristles ; a row of small

white hairs on foretibia ; hind tibia as long as femur and tarsus taken together ; spur of hind tibia almost equal to 1st and 2nd tarsal segments taken together ; claws brown ; abdomen (Fig. 1, B) : dorsum with a median and two lateral longitudinal brown stripes ; each segment with long white hairs ; 6th and 7th segments with bunch of hairs (Fig. 1, C) ;

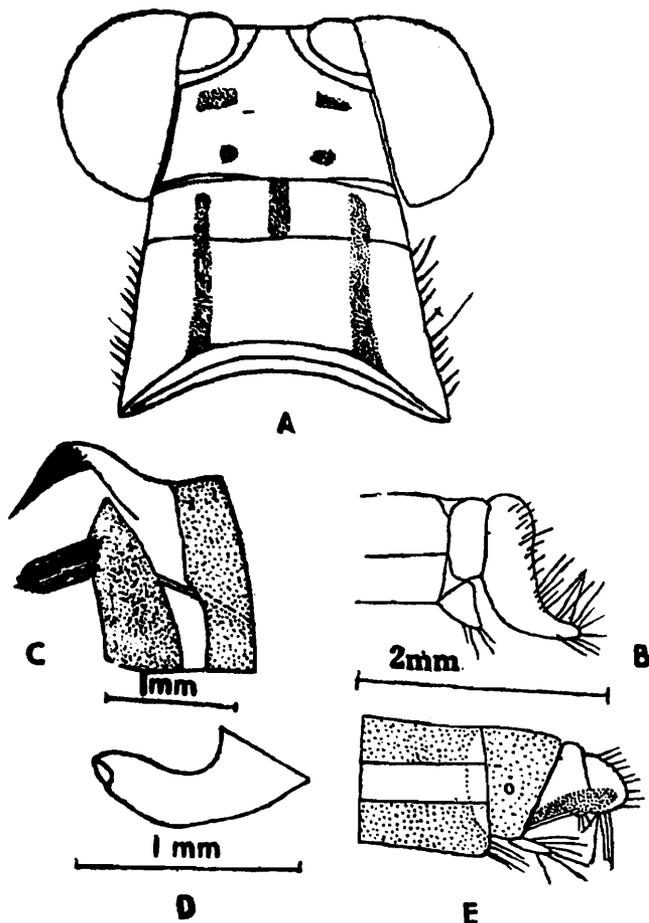


Fig. 1. (A-E) *Nohoveus implexus* (Walker), male : A. head & pronotum (dorsal) ; B. tip of abdomen (lateral) ; C. 6th and 7th segments of abdomen (lateral) ; D. coxopodite and paramere (lateral) ; female : E. tip of abdomen (lateral).

ectoproct long (Fig. 1, D). *Female* abdomen : terminal part as in Fig. 1, E.

*Measurements* ; ♂ : length of forewing, 20 mm ; of hindwing, 17 mm. ♀ : length of forewing, 16 mm ; of hindwing, 13 mm.

*Material* : 1 ♂ : India : Rajasthan, Bikaner, Kalayat, 14. ix. 1960 ; 1 ♀ : Pugal, 19. ix. 1960 ; (Coll. *M. Chandra*).

*Distribution* : India : Rajasthan.

*Remarks* : The species comes closer to *Nohoveus palpalis* (Kalapalek) in size, length of forewing and colouration of veins but can be easily differentiated by the bicoloured pterostigma. Moreover, considering the length of the ectoproct and the presence of gradate cross-veins in the apical field, the species is placed under the genus *Nohoveus* Navas.

#### Tribe ISOLEONINI

This tribe is represented by two genera from India, of which only one is presently dealt with.

#### Genus *Cueta* Navas

1911. *Cueta* Navas, *Insecta*, 1 : 242.

Type-species : *Myrmeleon lineosus* Rambur

*Diagnostic characters* : Inner radial field of hindwing with more than 5 cross-veins ; abdomen longer than wings ; ectoproct in male long and cylindrical.

*Distribution* : Afghanistan, Africa, Anatolia, Arab, Europe (South-east), India, Iran, Malagasy, Mongolia, Persia, Sri Lanka and Vietnam.

*Remark* : This genus is represented by six species and a subspecies from India excluding the present one, which is dealt with hereunder.

#### *Cueta lineosa* (Rambur)

1842. *Myrmeleon lineosus* Rambur, *Hist. Nat. Ins. Neur.*, 1389.

1853. *Myrmeleon morosus* Walker, *Cat. Brit. Mus. Neur.*, 389.

1968. *Cueta lineosa*, Holzel, *Beitr. Z. Naturk.*, 181 : 18.

*Redescription* : Labial and maxillary palpi, labrum, clypeus frons and antenna : brown ;

epicranium : with a broad, black, median interantennal mark encircling outwardly the base of antenna and extending upto the inner edge of each eye on either side ; vertex : brown with black spots as in Fig. 2, A ; pronotum (Fig. 2, A) : broader than long, with long and short white bristles on its lateral margin, with a median longitudinal black stripe and a similar stripe on either side of it ; meso- and metanotum as in Fig. 2, A ;

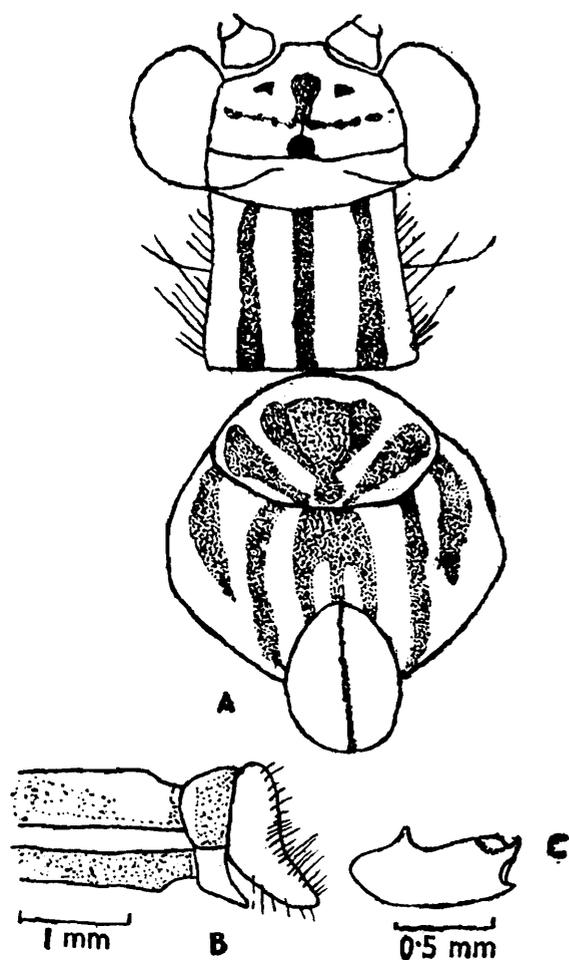


Fig. 2. (A-C) *Cueta lineosa* (Rambur), male : A. head, pro-, meso- and metanotum (dorsal) ; B. tip of abdomen (lateral) ; C. gonarcus (lateral).

wings as in Pl. III, D ; forewing : longitudinal veins yellow with dark brown stripes ; cross-veins either wholly or partially brown ; pterostigma brownish with a black marking ; a small brown spot at rhagma ; an oblique brown mark at the tip of Cua 2 extending

upto middle of intercubital area ; inner radial field with 8 cross-veins ; hindwing : same as forewing, but brown markings indistinct ; inner radial field with 6-7 cross-veins ; leg : yellow with brown markings ; femora with black dots besides a black longitudinal fascia on each mid- and hindfemur, which is with a row of long black hairs ; tibia as long as famur ; spur of hind tibia much shorter than basal tarsal segment, which is almost equal to 5th ; abdomen : dorsally yellow with three longitudinal black stripes extending from base to tip and also with short black hairs ; ventrally dark brown, tip of abdomen and genitalia in male as in Fig. 2, B-C.

*Measurements* : ♂ : length of forewing, 18-19 mm ; of hindwing, 14-15 mm.

*Material* : 1 ♂ : India : Rajasthan, Jaisalmer, Noah, 24. viii. 1960 (Coll. *M. Chandra*) ; 1 ♂ : Sambhar lake, 5. vii. 1959 (Coll. *A. K. Mukherjee*).

*Distribution* : Afghanistan, Africa, Anatolia, Arab, India, Iran and Kazastan.

#### Tribe DISTOLBONINI

This tribe is represented by only five genera from India, of which two, as keyed below, are presently dealt with.

#### Key to genera

Cup on forewing very short ; ectoproct in male cylindrical and longer than 8th abdominal segment

**Geyria**  
Esben-Petersen

Cup on forewing appreciably long ; ectoproct in male oval and shorter than 8th abdominal segment ...

**Neuroleon** Navas

#### Genus *Geyria* Esben-Petersen

1920. *Geyria* Esben-Petersen, *Arch. f. natur.*, **84**(9) : 146.

Type-species : *Geyria saharica* Esben-Petersen.

*Diagnostic characters* : *vide* Key.

*Distribution* : Afghanistan, Africa, Arab, India and Iran.

*Remark* : This small genus, a new record for India, comprises only three species, being hitherto restricted to the palaeartic region. Of these, *Geyria lepidula* (Navas) is redescribed hereunder.

### *Geyria lepidula* (Navas)

1912. *Macronemurus lepidulus* Navas, *Congr. Zool. Graz.*, 8 : 748.

1972. *Geyria lepidula*, Holzel, *Beitr. naturk. Forsch. SudwDtl.*, 1 : 44.

*Redescription* : Maxillary and labial palpi, labrum, clypeus and frons : yellow ; antenna : brownish ; epicranium : black at the base of antenna, with a median brown stripe and two rows of irregular brown spots ; pronotum : broader than long, yellow and with long white hairs on lateral margin, which is broadly black upto the anterior transverse groove ; with a v-shaped brown spot at middle besides two small brown spots on either side of it ; meso- and metanotum : yellow with two dark brown median longitudinal stripes ; meso- and metascutum : laterally black ; forewing (Pl. III, C) : long and oval, with pointed apex ; costal field with one row of cells ; pterostigma yellow with brown basal half ; apical field with a row of gradates ; banksian line absent ; Cup shorter than a cross-vein ; longitudinal veins yellowish with brown bands ; most of the cross-veins yellow with upper and lower portions brown ; forked veinlets at base on hind margin ; gradate veinlets in apical field and the cross-veins at base of hypostigmatic cell clouded with brown ; a brown oblique mark extending from tip of Cua 2+IA to intercubital field ; gradate veinlets from Cua 1+M<sub>1</sub> also clouded

with brown ; hindwing (Pl. III, C) : shorter than forewing ; cross-veins simple ; inner radial field with a single cross-vein ; Sc, R<sub>1</sub> and Cua with distinct brown bands ; membrane unmarked ; leg : fore- and midfemora yellow with distal brown spots ; with short white bristles besides long white hairs in the former ; hindfemur with a brown longitudinal stripe ; very long hairs and a few small white bristles ; fore- and midtibiae yellow ; dark brown at tip and with small brown spots throughout along with short white bristles ; hindtibia yellow but with brown tip, as long as femur and with long black bristles besides short hairs ; spur on hind tibia almost equal to the 1st segment of tarsus, which is brownish ; claw dark brown ; abdomen (Fig. 4, A) : dorsum dark brown with yellow longitudinal stripe on either side of each segment ; dark brown ventrally and with short white hairs ; ectoproct in male very long, cylindrical and with dark hairs.

*Measurements* : ♂ : length of forewing, 14 mm ; of hindwing, 13 mm. ♀ : length of forewing, 17 mm ; of hindwing, 15 mm.

*Material* : 1 ♂ : India : Rajasthan, Bikaner, Pugal, 19. x. 1960 ; 1 ♀ : Kalyat, 13. ix. 1960, (Coll. *M. Chandra*).

*Distribution* : India : Rajasthan ; Africa, Arab and Iran.

### Genus *Neuroleon* Navas

1909. *Neuroleon* Navas, *Act. Mem. Congr. Nat. Esp.*, 1 : 148.

Type-species : *Myremleon arenarius* Navas

*Diagnostic characters* : *vide* Key.

*Distribution* : Africa, Afghanistan, Arab, Europe, India, Indonesia, Iran, Malagasy, Malay, Pakistan.

*Remark*: The genus is represented by two species from India excluding the present one, which is described hereunder.

***Neuroleon unpunctatus* sp. nov.**

Labial palpus: yellow but apical segment dark brown; maxillary palpus, labrum, clypeus and frons: yellow; antenna: scape yellow with small black bristles on inner side; pedicel dark brown, but flagellum brown with

scutum black laterally and scutellum yellow; metanotum: yellow with several black hairs; wings (Pl. III, B): hyaline, without spots; veins luteous; dark hairs on veins; pterostigma not very distinct; venation as in Pl. III, B; leg: yellow with brown tarsus and claw; with black bristles; forefemur with small dark brown spots on outer side; hind tibia longer than hind femur and its spur equal to basal two tarsal segments taken together; 5th tarsal segment longest of all; abdomen: black with the tip and genitalia in male as in Figs. 3, B-C and tip of abdomen in female as in Fig. 3, D.

*Measurements*: 1 ♂: length of forewing, 25 mm; of hindwing, 21 mm. 1 ♀: length of forewing, 24 mm; of hindwing, 20 mm.

*Material*: 1 ♂ (Holotype): Rajasthan, Bikaner, Pugal, 17. ix. 1960. Regd. no. 961/H<sub>12</sub>; 1 ♀ (Allotype): Jaisalmer, Nokh, 29. viii. 1960. (Coll. *M. Chandra*). Regd. no. 962/H<sub>12</sub>.

*Distribution*: India: Rajasthan.

*Remark*: The species may be easily distinguished from all other species of *Neuroleon* Navas by the unspotted wings.

Family ASCALAPHIDAE

This family is represented by three subfamilies, viz., Protascalaphinae, Holophthalminae and Schizophthalminae. It is reported to occur mainly in tropical belts of both the Old and New World. Presently, one subfamily is dealt with.

Subfamily SCHIZOPHTHALMINAE

This subfamily, which is recognised by the horizontally subdivided eyes, is reported from the Palaearctic, Ethiopian and Indo-Australian regions of the Old World. It includes five tribes from India, of which only one is presently dealt with.

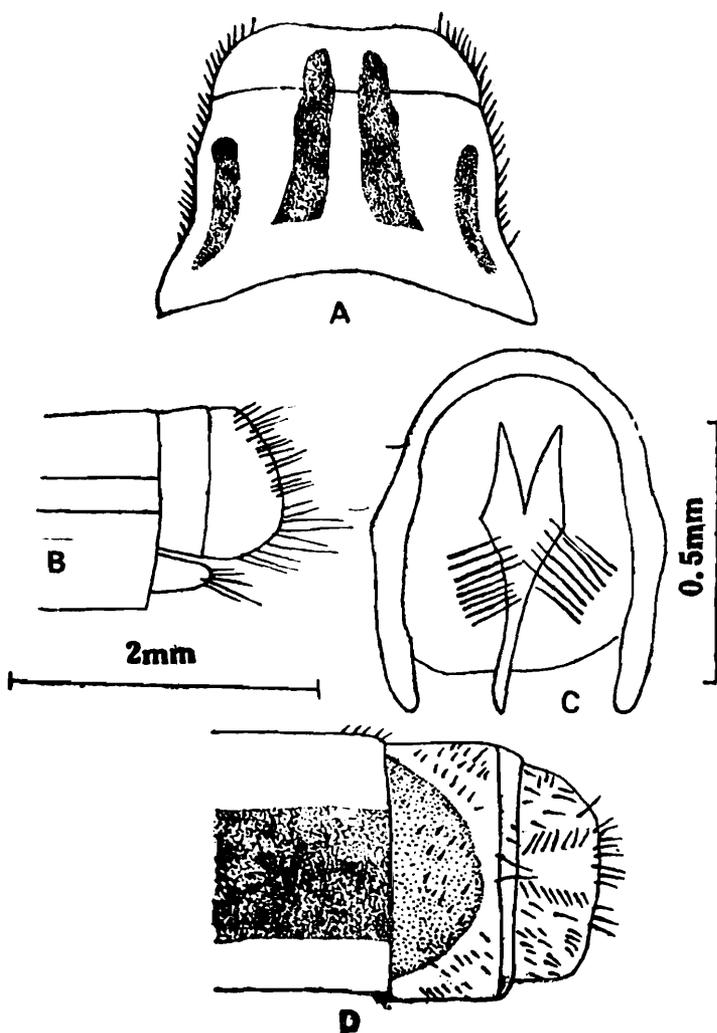


Fig. 3. (A-D) *Neuroleon unpunctatus* sp. nov., male: A. pronotum (dorsal); B. tip of abdomen (lateral); C. gonarcus and paramere (ventral); D. female: tip of abdomen (lateral).

small black hairs; pronotum (Fig. 3.A): two median longitudinal dark brown stripes present; mesonotum: prescutum with two irregular black longitudinal stripes; meso-

## Tribe ENCYOPOSINI

This tribe can be best recognised by wings with narrow pterostigma and male genital valve very small as compared to the superior appendix. It is mostly reported from the different corners of Asia and Africa and rarely from Western Australia. Only two genera are so far known from India and the distributional record of one more is newly added, as hereunder.

Genus **Bubopsis** MacLachlan

1898. *Bubopsis* MacLachlan, *Trans. ent. Soc. Lond.*, 159.

Type-species : *Bubo agrioides* Rambur

*Diagnostic characters* : Superior appendix in male very long, geniculate and with a branch at middle.

*Distribution* : Palaearctic and Oriental.

*Remark* : This genus is a new record for India, under which the new species is described below.

**Bubopsis rubrapunctata** sp. nov.

*Female* : Clypeus and labrum : brown ; labial and maxillary palpi : yellow ; mandible : brownish, but dark-brown at tip ; face : with long brownish and yellowish vestiture ; antenna : reddish brown, without hair and club blackish brown ; vertex : with long greyish and blackish hairs ; eye : divided, lower division about half the size of upper one ; pronotum : blackish brown, with long brown hairs specially on hind margin and with white hairs laterally ; mesonotum : concolorous with pronotum, with long brown hairs on convex areas and long white hairs on antero-lateral corners of mesoscutum ; metanotum : colouration same as for pronotum but with long white hairs ; pleura : brown with long brownish and whitish hairs ; wings

(Pl. III, E) : hyaline and the space between Sc and  $R_1$  with brown tinge ; forewing : costa yellowish ; Sc,  $R_1$ , Cua2, 1A and 2A red ; vein M and Cua1 red upto a certain distance from base of wing ; all other veins and cross-veins brown except for a few red veinlets at base of costa, before  $R_s$ , and amongst M, Cua1 and Cua2 ; 21 costal veinlets before brown pterostigma, latter with 4 cross-veins ; apical field beyond pterostigma with two rows of cells ; axillary angle broad and red ; hindwing : smaller than forewing ; costa, Sc and  $R_1$  conspicuously concolorous with forewing ; majority of the costal veinlets with smoky brown patches ; 20 costal veinlets before pterostigma, which is more elongated than that of forewing ; otherwise similar to forewing ; leg : femur reddish with long and dense white hairs ; tibia with long white bristles throughout and short black bristles only distally ; spur of hind tibia almost equal to 1st two tarsal segments taken together ; all tarsal segments with black bristles ; claws brown ; abdomen : rusty red ; 1st tergite covered with long brownish hairs ; 2nd segment with a cluster of moderately long white hairs at middle and with black hairs laterally ; superior appendages brown, broadened basally but narrowed distally and with short black bristles.

*Measurements* : length of body, 20 mm ; of antenna, 16 mm ; of forewing, 23 mm ; length of hindwing, 20 mm ; of abdomen, 14 mm.

*Material* : Holotype ♀ : India : Karnataka, Maruti Hills, Belgaum ; coll. nil, 27. xii. 1971, Regd. no. 963/H<sub>12</sub>.

*Male* : Variations are noted below : labium, labrum, clypeus, maxillary and labial palpi : yellow ; wings : costal field in hindwing tinged with brown ; costal veinlets with more

strikingly smoky brown patches; 23 costal cross-veins before pterostigma in forewing and 18 in hindwing; abdomen (Figs. 4, B-C): superior appendages brownish yellow, forcipated, almost equal to half of abdominal length and with white hairs at base and black bristles on the inner margin, each provided with a small outgrowth on the inner margin at a certain distance from base and also furnished with small black bristles

*Measurements*: length of body, 20 mm; of antenna, 17 mm; of forewing, 21 mm; of hindwing, 17 mm; of abdomen, 15 mm.

*Material*: Allotype ♂: Loc. data same as for female. Regd. no. 964/H<sub>12</sub>.

*Distribution*: India: Karanataka.

*Remark*: The species may be distinguished from all other species by the colouration of wings, legs and abdomen.

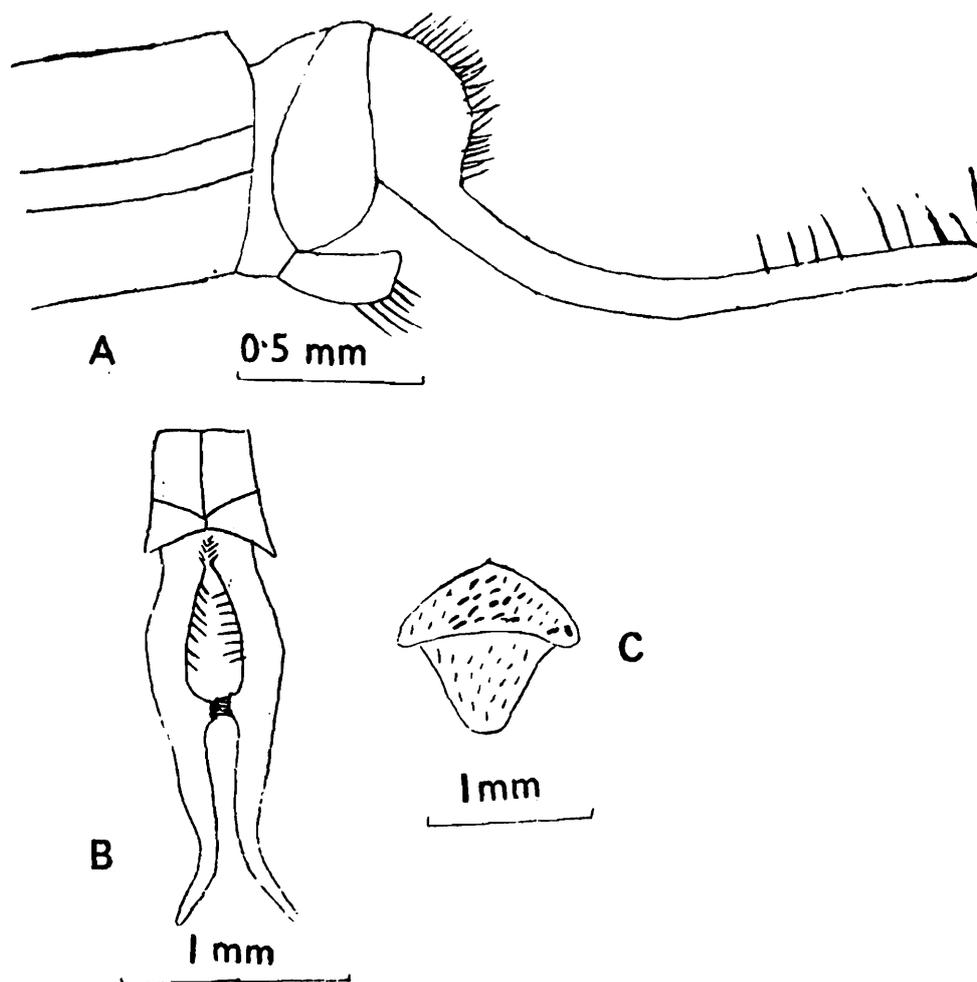


Fig. 4. (A) *Geyria lepidula* (Navas), male: A. tip of abdomen (lateral).

(B-C.) *Bubopsis rubrapunctata* sp. nov., male; B. superior appendages (dorsal); C. 9th sternite (ventral).

at tip; 9th sternite broad at middle, with a short pedunculate structure on each side, which is with white hairs and produced distally into a rounded protuberance bearing black hairs.

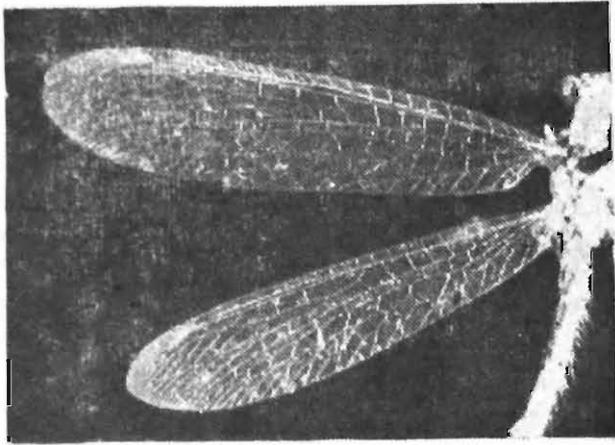
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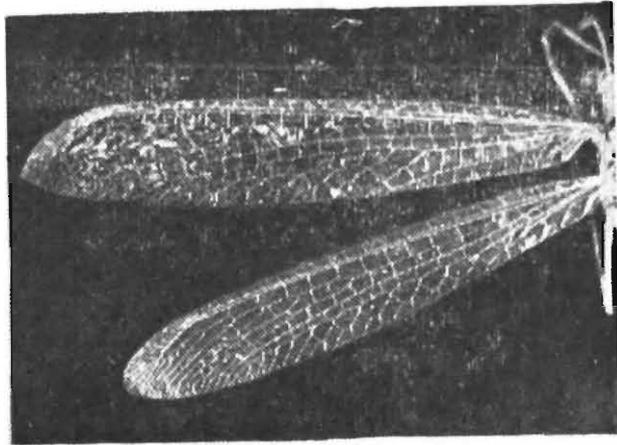
Section for numerous courtesies. My deepest appreciation and gratitude go to Dr. H. Holzel, Joanneumring 7, Graz, for critically reviewing the paper and confirming the identity of the species.

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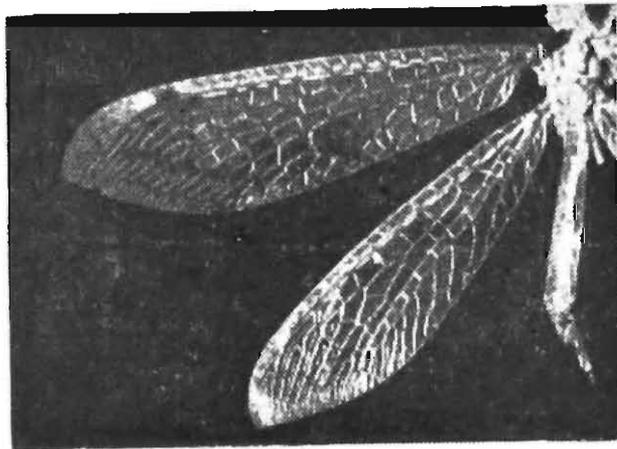
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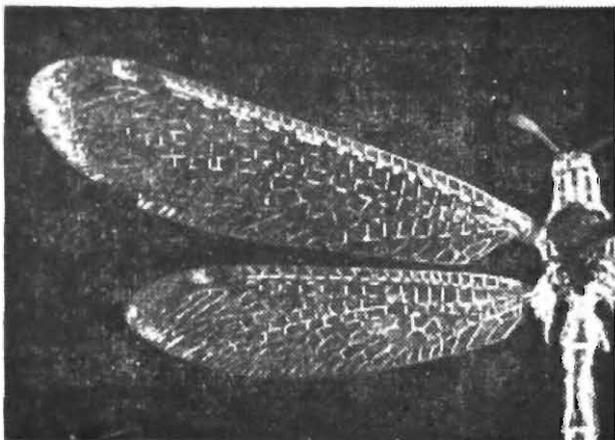
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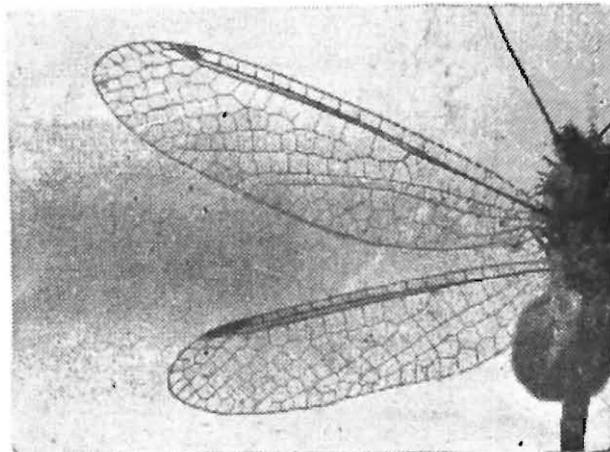
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C



D



E

- A. *Nohoveus implexus* (Walker), male : fore- and hindwing ;  
B. *Neuroleon unpunctatus* sp. nov., male ; fore- and hindwing ;  
C. *Geyria lepidula* (Navas), male : fore- and hindwing ;  
D. *Cueta lineosa* (Rambur), male : fore- and hindwing ;  
E. *Bubopsis rubrapunctata* sp. nov., male : fore- and hindwing.