

CONTRIBUTION TO THE TAXONOMICAL STUDIES  
OF NEUROPTERA (SUBORDER PLANIPENNIA)  
FROM EASTERN INDIA

II. FAMILY ASCALAPHIDAE

*By*

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INTRODUCTION

The Ascalaphids are beautiful insects and superficially resemble Odonata by the colour and form of the wings and, Rhopalocera of the order Lepidoptera by long and clubbed antennae. The present study has been undertaken to provide an account of the collections made by different survey parties of Zoological Survey of India from the eastern part of the subcontinent, viz., Sikkim, Arunachal Pradesh, Assam, Meghalaya, West Bengal and Orissa. It incorporates a brief review on earlier investigation, external morphological characters, classification and provides the taxonomical account of the concerned species along with the geographical distribution. Altogether fifteen species have so far been reported from eastern region, of which all but one have been included in the taxonomic account while the remaining one has been reviewed from literature. From the examined material, redescription of two species, description of a subspecies, additional characters and morphovariations of the known species have been incorporated and the new locality records have also been indicated. Besides, running keys to all the taxa examined, suitable illustrations and references have been provided.

## EARLIER INVESTIGATION

Ascalaphids are known from India on the basis of account rendered by various workers including Westwood (1848), Walker (1853), MacLachlan (1873), van der Weele (1908), Needham (1909), Banks (1911, 1914, 1933), Fraser (1922), Navas (1924), Alexandrov Martynov (1926), Kimmins (1949), Ghosh (1977, 1985) and Ghosh & Sen 1977). Amongst a total of thirtythree species reported by these workers from India, only fifteen are so far known to occur in the eastern Peninsular and Himalayan sectors.

## EXTERNAL MORPHOLOGICAL CHARACTERS

The author in his first report on the Family Myrmeleontidae from Eastern India which has been published (*vide occ. Pap. Rec. Zool. Surv. India, 52*), has given in detail the terminology of different morphological features. As this family closely resembles myrmeleontids, so author feels it unnecessary to provide the morphological details in this family. However, the diagnostic characters along with the male and female genitalic features (*vide Tjeder, 1977*) are briefed hereunder :

Antenna : long, slender and strongly clavate at apex ; eye : simple, entire or divided by a groove ; thorax : stout ; wings : with long or short excision at the extreme base of posterior margin ; axillary angle generally prominent ; hypostigmatic cell not differentiated ; pterostigma large or small ; 2-4 rows of apical cells beyond pterostigma ;  $Cu_2$  strong and free but running parallel and very close to 1A ; radial cuneate area always present (Comstock, 1918) ; leg : spur on hind tibia as long as first or equal to two or three basal tarsal segments taken together ; abdomen : laterally compressed ; shorter or longer than wings ; male genitalia : with ectoproct in the form of a pair of convex plates or forceps or projections and without trichobothria ; gonarcus hood-like and arch-like ; parameres either connected to gonarcus or immovably fixed to it apically ; pelta, a vertical plate, situated between the parameres ; pulvinus, a

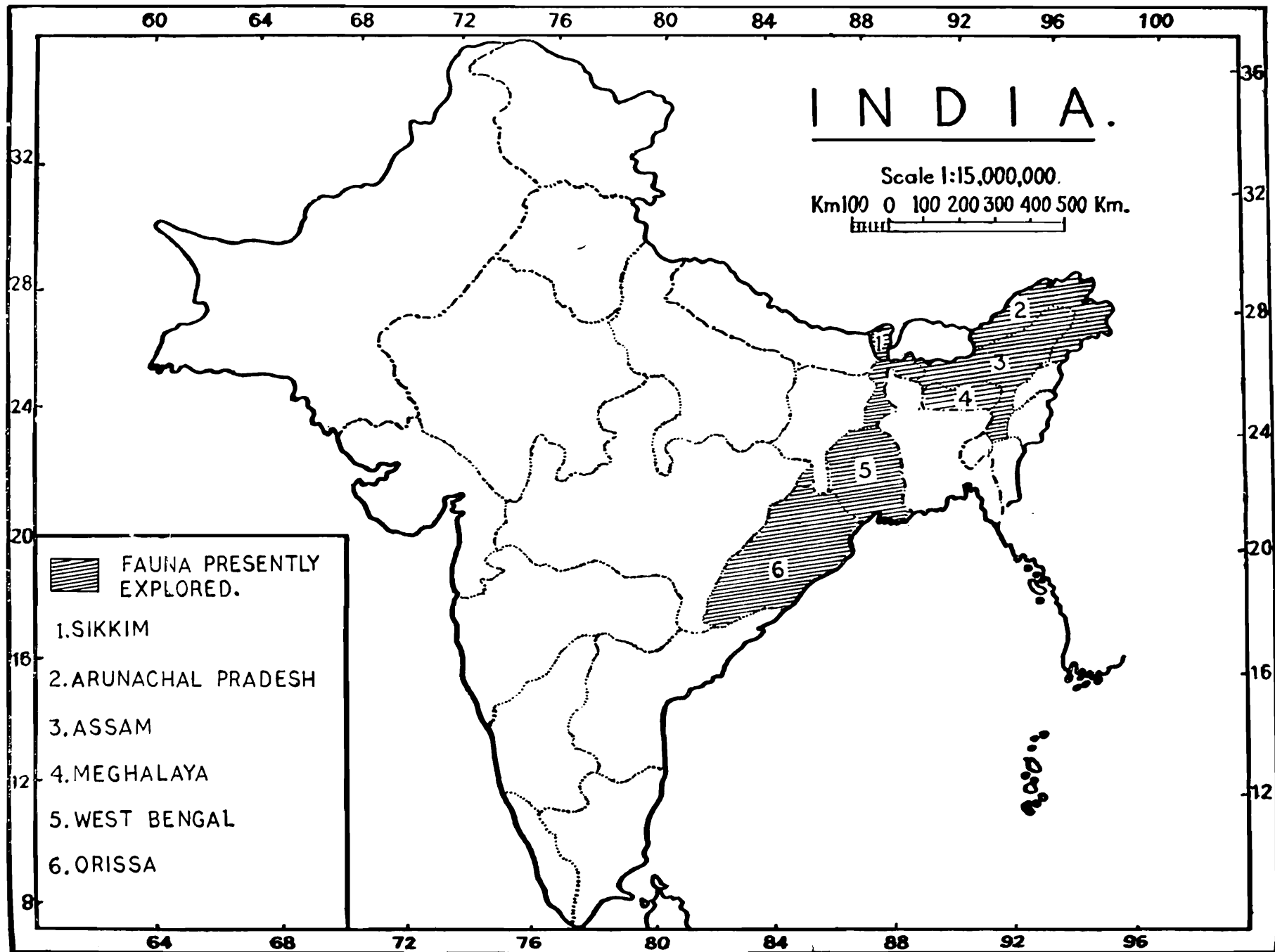
bag-like, thumb-like or finger-like eversion of the gonosaccus which is situated on either side of gonarcus and clothed with gonosetae ; hypandrium internum stem-like, very small, weakly sclerotised and unpigmented ; female genitalia : with ectoproct usually like a pair of convex plates ; ventrovalvae, a pair of hairy plates situated below the 8th tergite ; interdens, a plate with a downwardly directed tooth situated centrally or apically between the ventrovalve ; linguella, a tongue-like, usually unpaired structure situated under the lateral hind margin of 8th sternite ; distivalvae, a pair of hairy valvae situated distally of the linguella and ventrally of the 9th tergite ; spermatheca small, usually sclerotised and unpigmented.

#### BRIEF REVIEW ON CLASSIFICATION

Burmeister (1839), Lefebvre (1842), Rambur (1842), Walker (1853) and others grouped the earlier described species under the generic divisions or sections. MacLachlan (1873) attempted to arrange about 103 species in 27 new generic groups. Van der Weele (1908) classified the family into three subfamilies, viz., Protascalaphinae, Haplogleniinae and Ascalaphinae. The first two subfamilies have further been subdivided into several tribes to accommodate different genera while the tribal classification for the last one has been omitted by him (*loc. cit.*). The author has, however, principally adopted the classification given by van der Weele (*Loc. cit.*) without considering the tribes.

#### GEOGRAPHICAL DISTRIBUTION

The pattern of distribution of the fauna under study highlights certain important aspects. Out of a total of fifteen species known from Eastern India, *Idricerus decrepitus* (Walker) and *Ascalaphus dicax* (Walker) are represented from the Palaearctic region, the latter extending to the Papuan area. Of the remaining species from the Oriental region, eight are endemic in India. The material from Eastern India, constitute about 50% of the entire Indian fauna. The majority of these occur in the north-eastern Himalayas, particularly



Sikkim, Assam, Meghalaya and Darjeeling of West Bengal. It is interesting to note that five species constitute new locality records for the different states of India.

### SYSTEMATIC ACCOUNT

#### *Key to the subfamilies of the family ASCALAPHIDAE*

Eyes entire	...	<i>Haplogleniinae</i>
Eyes equally or unequally divided into two parts	...	<i>Ascalaphinae</i>

#### Subfamily *HAPLOGLENIINAE*

##### *Key to the genera of the subfamily Haplogleniinae*

Apical field of both wings with 3 cell rows ; without dark-coat ; antennae dark coloured but not ringed with light colour	...	<i>Protidrecerus</i> Van der Weele
Apical field of both wings with 2 cell rows ; crossveins more or less with dark-coat ; ante- nae pale or somewhat darker but always ringed with light colour	...	<i>Idricerus</i> MacLachlan

#### Genus *Protidrecerus* van der Weele

*Protidrecerus* van der Weele, 1908, *Cat. coll. Selys*, 8 : 61.

*Characters* : Antenna : naked, unicoloured and much shorter than forewing ; wings : membrane hyaline ; fore and hind border parallel ; tip blunt and rounded ; forewing : with semicircular excision at the base of inner margin ; apical filled with 3-rows of cells ; veins unicoloured and without any band ; axillary angle almost even ; hindwing : considerably shorter and narrower than forewing ; legs : spur of hindtibia as long as two basal tarsal segments taken together ; abdomen : unicoloured and shorter than hindwing in male.

*Type species* : *Idricerus exilis* MacLachlan.

*Distribution* : India, China and Japan.

*Remarks* : The genus is represented by only one species from India which is dealt with here.

**Protidricerus elwesi** (MacLachlan)

*Idricerus elwesi* MacLachlan, 1891, *Trans. ent. Soc. Lond.*, p. 512.

*Protidricerus elwesi*, van der Weele, 1908, *Cat. coll. Selys*, 8 : 63.

*Material examined* : 1 ♀ : India : Arunachal Pradesh, Tirap dist., Namdapha, Gibbon land, 2.v.1981, Coll. *S Biswas and party*.

*Remarks* : The details of the species have been provided in earlier paper (*vide* Ghosh : 1985).

Genus **Idricerus** MacLachlan

1871. *Idricerus* MacLachlan, 1871, *J. Linn. Soc.*, 11 : 200.

1908. *Idricerus*, van der Weele, 1908, *Cat. coll. Selys*, 8 : 65.

*Characters* : Antenna shorter than wings, straight ; club very large, broadly and shortly pyriform ; a dense tuft of hairs on face and between antennae ; eye : entire ; thorax : very villose ; wing : elongate, rather narrow, slightly dilated at middle ; apex subacute ; forewing : with a semicircular excision at the very base of inner margin followed by a small obtusely angular dilatation ; not appendiculate, with network moderately open ; leg : moderately stout ; spur of hind tibia hardly as long as 1st two tarsal joints taken together ; abdomen : shorter than wing.

*Type species* : *Ascalaphus decrepitus* Walker

*Distribution* : Central and South-East Asia.

**Indicerus decrepitus** (Walker)

*Ascalaphus decrepitus* Walker, 1859, *Trans. R. ent. Soc. Lond.*, (2) 5 : 197.

*Idricerus decrepitus*, MacLachlan, 1871, *J. Linn. Soc.*, 11 : 240.

*Idricerus decrepitus*, Weele, 1908 *Cat. Coll. Selys*, 8 : 66.

*Idricerus decrepitus*, Needham, 1909, *Rec. Indian Mus.*, 3 : 197.

*Measurement* : 1 ♀ : length of antenna, 24 mm ; forewing, 35 mm ; hindwing, 30 mm.

*Material examined* : India : Meghalaya ; Risa colony Shillong, 19.vii.1973, Coll. *M. Rynth*.

*Distribution* : INDIA : Meghalaya, Kashmir ; Turkestan.

*Remarks* : The specimen (Fig. 1) agrees well with the description given by Weele (1908).

Subfamily *ASCALAPHINAE**Key to the genera of the subfamily Ascalaphinae*

- |  |                               |
|--|-------------------------------|
| 1. Ectoproct in both sexes short. ...  | 2                             |
| — Ectoproct in both sexes especially in male long ...  | 5                             |
| 2. Forewing or both wings pterostigma short, as long as high ; apical field broad  | 3                             |
| — Pterostigma long, not less than twice as long as high ; apical field narrow ...  | 4                             |
| 3. Body long and densely hairy ; wing tip obtuse and angular ; hindwing distinctly broadened at hind margin, antenna long reaching pterostigma of forewing in length ... | <i>Agrionosoma</i> Weele      |
| — Body short and sparsely hairy, wing tip rounded ; hindwing not broadened at hind margin ; antenna short, not reaching pterostigma of forewing in length ...            | <i>Suupalacsa</i> Hagen       |
| 4. Abdomen of male as long as or longer than hindwing ; antenna straight ; legs slender ...  | <i>Suphalomitus</i> Weele     |
| — Abdomen of male distinctly shorter than hindwing ; antenna in either sex specially in male distinctly bent ; legs stout ...  | 6                             |
| 5. Wing tip angular ; abdomen longer than wings in males ; antenna denticulate internally at base ...  | <i>Acheron</i> Lefebvre       |
| — Wing tip rounded ; abdomen much shorter than wings ; antenna without teeth at base ...   | <i>Hybris</i> Lefebvre        |
| 6. Wings appendiculate ; spur of hind tibia as long as first two tarsal segments taken together ...  | <i>Glyptobasis</i> MacLachlan |
| — Wings not appendiculate ; spur of hind tibia as long as or shorter than 1st tarsal segment ...   | <i>Ascalaphus</i> Fabricius   |

Genus *Agrionosoma* Weele

*Agrionosoma* Weele, 1908, *Cat. Coll. Selys*, 8 : 169.

*Characters* : Body : Single coloured, dark, long and densely hairy ; head : small with long dense hairs ; antenna :

reaching up to pterostigma of forewing ; club elongate, spindle-shaped with apex rounded ; eye : lower and upper halves almost equal ; thorax : elongate and densely hairy ; wing : pterostigma short, as long as high ; apical field broad ; apex rounded ; hindwing : anal margin distinctly broadened ; leg : slender, dark and less hairy ; spur of hind tibia longer than 1st tarsal segment ; abdomen : bare, long, slender and longer than the hind wing.

Type-species : *Agrionosoma swinhoei* Weele

*Distribution* : India and Thailand.

### ***Agrionosoma dohrni* Weele**

*Agrionosoma dohrni* Weele, 1908, *Cat. Coll. Selys*, 8 : 171.

*Redescription* : Labrum, clypeus and frons : dark brown with concolorous hairs ; antenna : light brown but club dark and conspicuously ringed with yellow, reaching up to pterostigma of forewing ; vertex : with dark brown and grey hairs ; thorax : greyish brown and clothed with greyish brown long and soft hairs ; wing (Fig. 2) : hyaline ; apex obtuse and angular ; pterostigma yellow, almost as long as high ; venation brown ; pterostigma with 4 crossveins ; about 8 crossveins before Rs : apical field with 3 rows of cells ; hindwing : shorter and narrower than forewing ; 5 crossveins before Rs ; leg : black with black hairs, femur yellow with whitish and black hairs ; spur of hind tibia almost equal to first two tarsal segments taken together ; claw brown ; tibia and tarsus with black bristles ; abdomen : longer than hindwing but shorter than forewing ; dark brown with apex of each segment bordered black ; 1st segment with long black hairs at middle ; other segments with short black hairs.

*Measurements* : 1 ♂ : length of forewing, 33 mm ; hindwing, 27 mm ; abdomen, 29 mm.

*Material examined* : 1 ♂ : India : West Bengal : 1 km. S. W. of Re yana forest rest house on the way to Rambi Hill range, 400 m., Darjeeling, 31.iii.1973, Coll. *H. S. Sharma*.

*Distribution* : INDIA : Sikkim and West Bengal.

*Remarks* : Weele (1908) described this species from Sikkim from a male specimen. It is recorded for the first time from West Bengal.

### Genus **Subpalacsa** Lefebvre

*Subpalacsa* Lefebvre, 1842, *Guer. Mag. Zool.*, 4 : 92.

*Suphalasca* Hagen, 1866, *Stettin. ent. Ztg.*, 27 : 273.

*Suphalasca* (Part), Brauer, 1868, *Verh. Zool. bot. Ges. Wien.*, 18 : 397.

*Suphalasca*, MacLachlan, 1871, *J. Linn. Soc.*, 11 : 253.

*Subpalacsa*, Weele, 1908, *Cat. Coll. Selys*, 8 : 157.

*Characters* : Body : with scanty hairs ; antenna : straight approximately reaching about three fourth of the length of the forewing, but not reaching pterostigma ; club rounded and almost straight ; thorax : smaller than head and scarcely villose ; elongate and small, considerably reticulated ; anterior and posterior margins almost parallel ; forewing : broad, rounded and excised at base ; axillary angle not prominently excised ; pterostigma short and quadrilateral ; apical field with 3 rows (seldom 2) of cells ; hindwing : constricted at anal margin ; spur of hindtibia as long as 1st joint of tarsus ; straight, without appendices and half or three fourths of the length of hindwing.

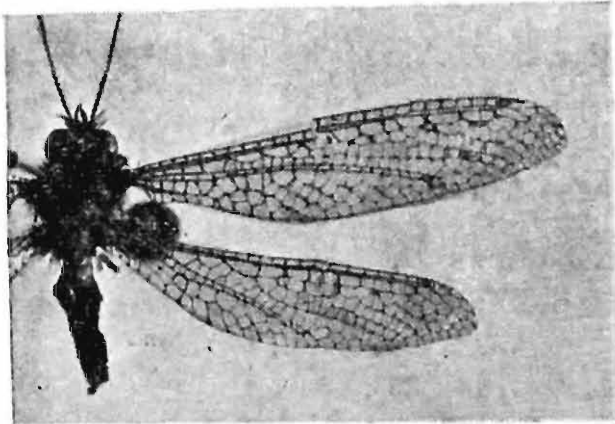
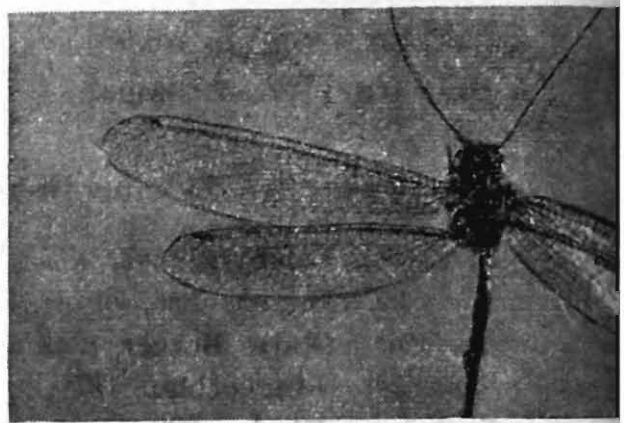
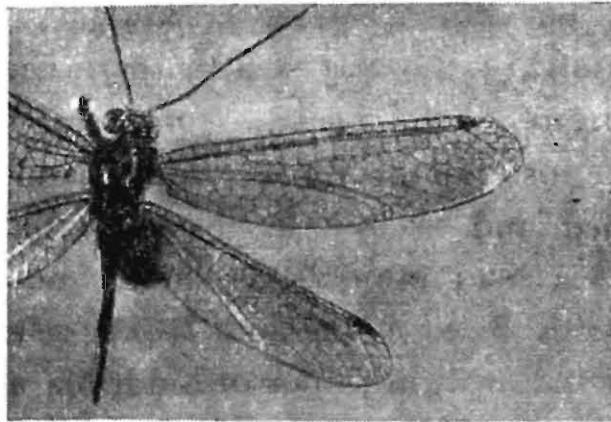
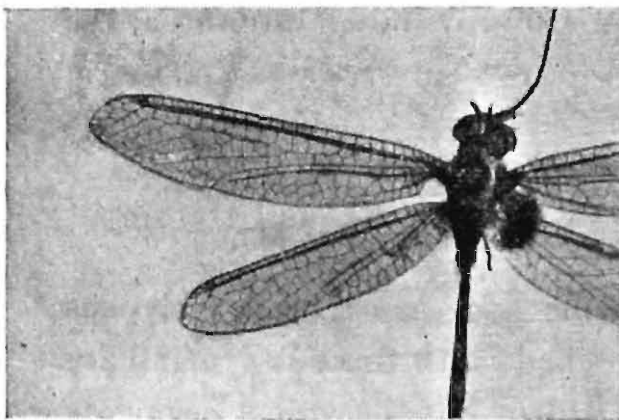
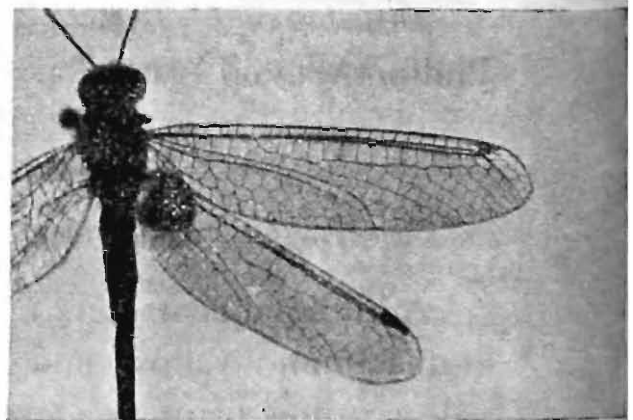
Type-species : *Ascalaphus flavipes* Leach

*Distribution* : Africa, Israel, Taiwan, India, Indonesia, the Philippines and Australia.

### **Subpalacsa orsedice** Banks

*Suphalasca orsedice* Banks, 1914, *Proc. Acad. nat. Sci.*, 66 : 617.

*Additional characters* : Frons and gena : black ; clypeus and labrum : yellow and blotched with fuscous ; maxillary palp : yellow ; antenna : pale brown but the apical segments and the club more darker ; pronotum : pale yellow ; with anterior and posterior margins bordered black ; mesoscutum : yellow with dark brown shades laterally ; metascutellum : pale yellow ; upper half of supraepisternum black ; wing (Fig. 3) : hyaline with yellowish suffusion at the extreme

**1****2****3****4****5**

Figs. 1-5. 1. *Idricerus decrepitus* (Walker), fore- and hindwing, 2. *Agrionosoma dohrni* Weele, fore- and hindwing, 3. *Suhpalacsa orsedice* Banks, fore- and hindwing, 4. *Suphalomitus verbosus* (Walker), fore- and hindwing, 5. *Suphalomitus brevis* Kimmins, fore- and hindwing.

base ; apex rounded ; all veins and crossveins brown ; forewing ; pterostigma brown ; axillary angle obtuse ; leg : coxa, tibia and tarsus black ; femur brownish yellow ; claw dark brown ; spur of hind tibia almost equal to 1st tarsal segment ; abdomen : blackish.

*Measurement* : 1 ♀, 1 ex. (without abd.) : length of antenna, 20 mm ; forewing, 29-30 mm ; hindwing, 25-25.5 mm.

*Material examined* : 1 ♀, 1 (without abd.) : INDIA : West Bengal : Rongpo rest house, Darjeeling, 31.v.1974, Coll. *Jo athan and party*.

*Distribution* : INDIA : West Bengal.

*Remarks* : Banks (1914), while describing the species, did not mention exact locality. But the present species is recorded here from West Bengal.

### Genus *Suphalomitus* Weele

*Suphalomitus* Weele, 1909, *Cat. Coll. Selys*, 8 : 181.

*Characters* : Body : dark grey or brown and sparsely hairy ; antenna : straight ; hindwing : distinctly shorter than forewing ; pterostigma elongate, at least twice as long as maximum width ; apex of wing angular and tongue-shaped ; leg : slender and dark ; abdomen : as long as or longer than hindwing in male ; cylindrical ; 1st abdominal tergite without elevation.

*Type-species* : *Suphalomitus verbosus* (Walker)

*Distribution* : Africa, Malagasy, India, Sri Lanka, the Phillipines, Australia.

### *Key to species of the genus Suphalomitus*

- |  |     |                          |
|--|-----|--------------------------|
| 2nd abdominal tergite without tuft of black bristles at base ; pterostigma elongate ; labrum and clypeus yellowish ; greyish hairs between bases of antennae | ... | <i>verbosus</i> (Walker) |
| 2nd abdominal segment with tuft of black bristles ; labrum and clypeus brownish ; dense blackish brown hairs between bases of antennae                       | ... | <i>brevis</i> Kimmins    |

**Suphalomitus verbosus (Walker)**

*Ascalaphus verbosus* Walker, 1853, *Cat. Brit. Mus. Neur.*, p. 426.

*Ascalaphus profanus* Walker, 1853, *Ibid.*, p. 428.

*Helicomitus verbosus*, MacLachlan, 1871, *J. Linn. Soc.*, 11 : 262.

*Helicomitus profanus* MacLachlan, 1871, *Ibid.*, p. 262.

*Suphalomitus verbosus*, Weele, 1908, *Cat. Coll. Selys*, 8 : 183.

*Suphalomitus verbosus*, Fraser, 1922, *Rec. Indian Mus.*, 24 : 514.

*Suphalomitus verbosus*, Kimmins, 1949, *Ann. Mag. nat. Hist.* (12) 2 : 4.

*Material examined* : 1 ♂ ; India : Motinagar, Shillong, Meghalaya, Coll. Jyrwa, 5.v.1973 ; 1 ♂ : Singlam, Sikkim, 300 m. 7.vii.1979, M. Prasad and party, Coll.

*Measurements* : 2 ♂ ♂ : length of forewing, 28-29 mm ; hindwing, 22 mm.

*Distribution* : INDIA : Karnataka, West Bengal, Meghalaya ; Sri Lanka.

*Remarks* : The specimens (Fig. 4) differ from each other in colouration of wing and also of pterostigma. In the specimen from Sikkim the wings are tinted with light brown all throughout and the pterostigma is dark brown in colour while the wings are clear and hyaline and the pterostigma is yellowish in specimen from Meghalaya. The species is for the first time recorded from Meghalaya.

**Suphalomitus brevis Kimmins**

*Suphalomitus brevis* Kimmins, 1949, *Ann. Mag. nat. Hist.*, (12) 2 : 15.

*Measurement* : 1 ♂ (?) ; length of forewing, 30 mm ; hindwing, 24 mm.

*Material examined* : 1 ♂ : INDIA ; West Bengal : Gayabari, Stn. No. 1, alt. 1236 m., Darjeeling, 24.iv.1971, Coll. A.R. Bhawmick and party.

*Distribution* : INDIA : Karnataka, Kerala, Tamil Nadu and West Bengal.

*Remarks* : The tip of abdomen is lost. So, the sex has been doubtfully determined by the measurement of the wings (Fig. 5) and also by the presence of a tuft of black bristles in the 2nd tergite of the abdomen.

Genus *Acheron* Lefebvre

*Acheron* Lefebvre, 1842, *Guer. Mag. Zool.*, 92 : 6.

*Hybris* (part) Hagen, 1866, *Stettin. ent. Ztg.*, 27 ; 273.

*Acheron*, MacLachlan, 1871, *J. Linn. Soc.*, 11 : 265.

*Acheron*, Weele, 1908, *Cat. coll. Selys*, 8 : 227.

*Characters* : Antenna : shorter than forewing ; denticulate internally at base ; club broadly pyriform ; eye : with upper division slightly larger than lower one ; thorax : elongate, dilated at middle, especially in females ; tip angular ; extreme base of fore-wing obliquely excised and followed by a slight dilatation ; rather densely reticulated ;  $Cu_2$  confluent with 1A in both wings ; pterostigma large with apical portion obliquely extended ; costal area in hindwings of female somewhat dilated at base ; leg : spur of the hind tibia hardly longer than the first tarsal joint ; abdomen : very long in male, much longer than the wings but in female shorter ; slender and laterally compressed in both sexes ; appendices absent ; gonopod short in males.

*Type-species* : *Ascalaphus trux* Walker.

*Distribution* : China, India, Bangladesh, Bhutan, Burma, Malay.

*Acheron trux* (Walker)

*Ascalaphus trux* Walker, 1853, *Cat. Brit. Mus. Neur.*, p. 432.

*Ascalaphus loquax* Walker, 1853, *Ibid.*, p. 434.

*Ascalaphus anticus* Walker, 1853, *Ibid.*, p. 434.

*Ascalaphus longus*, Walker, 1853, *Ibid.*, p. 453.

*Acheron longus*, MacLachlan, 1871, *J. Linn. Soc.*, 11 : 265.

*Helicomitus ctenocerus* Gerst., *Mitt. Naturw. ver. Neu Vorpomm. U. Rugen*, 15 : 101.

*Acheron trux*, Weele, 1908, *Cat. Coll. Selys*, 8 : 228.

*Acheron trux*, Fraser, 1922, *Rec. Indian Mus.*, 24 : 516.

*Distribution* : INDIA : Assam, Meghalaya, Sikkim, West Bengal ; Bhutan and Burma.

*Remarks* : Walker (1853) recorded four species of *Acheron* viz., *A. trux*, *A. loquax*, *A. longus* and *A. anticus*. Weele (1908) synonymized the last three species with the first and re-described it. He (*loc. cit.*) illustrated the female of that species

and also of *loquax* which was considered to be a subspecies. He, however, did not specifically mention the nomino-typical subspecies. On careful examination of a series of specimens available for study, the author came to the conclusion that one more subspecies, *A. trux trux* (Walker) may also be added from North-east India. Both the sexes of each subspecies differ from each other by the colouration of wings. These are dealt with here.

#### Key to subspecies of *Acheron trux* (Walker)

Wings sub-hyaline or pale brown in ♂ ;  
hindwing in female bright tawny except at  
tip ; subcostal region with dark brown tinge  
in both sexes ... *A. trux loquax* (Walker)

Wings hyaline in ♂ ; hindwing in female  
without tawny colouration ; subcostal region  
pale brown in both sexes ... *A. trux trux* (Walker)

#### *Acheron trux loquax* (Walker)

*Ascalaphus loquax* Walker, 1853, *Cat. Brit. Mus. Neur.*, p. 432.

*Acheron trux loquax*, Weele, 1908, *Cat. Coll. Selys*, 8 : 228.

*Description* : Male : Frons : brownish yellow with tawny hairs ; clypeus, labrum and vertex : dark brown with black hairs ; antenna : shorter than wings ; scape and pedicel blackish brown with greyish hairs intermingled with white ; flagellar segments brown, dentate at base but the dentation gradually diminishing in size towards apex ; pronotum : brown, darker anteroposteriorly ; mesonotum : brown with yellow markings and blackish hairs ; metanotum : brown with black hairs ; wings (Fig. 6) : tip angular ; membrane brown ; extreme base darkbrown ; costal and subcostal areas darker than other regions ; each costal blackish brown, broadly margined with brown clouds in forewing ; pterostigma darkbrown with 6 cross veins ; all other veins and cross veins blackish brown ; apical field with 4-rows of cells ; hairs on veins and marginal fringes short and black ; abdomen : longer than wings, dark brown ; 1st tergite laterally with a few, long, black, soft hairs and black bristles ; 3rd

tergite laterally with black bristles at base ; 4th tergite naked ; 5th to 8th tergite thickly clothed with short black hairs ; sternite dark brown with an yellowish brown spot at base of each segment from 4th to 8th ; ectoproct short with short black hairs except at tip which is with long and black hairs.

*Measurement* : 3 ♂ ♂ : length of forewing, 37-38 mm ; hindwing, 31-33 mm.

*Female* : Differs from ♂ by the following characters : forewing (Fig. 7) ; foreborder tinged with darkbrown along costal and subcostal areas before pterostigma ; crossveins before Rs and all but few between R and 1st branch of Rs clouded with brown ; hindwing : bright tawny except at tip ; abdomen : shorter than wings ; tergites orange-yellow ; 1st and 2nd tergites with long black hairs ; all other segments with short black hairs ; sternite black.

*Measurement* : 14 ♀ ♀ : Length of forewing, 41-43 mm ; hindwing, 37-39 mm.

*Material examined* : 1 ♂, 1 ♀ : India, Goalpara, date & Coll. nil ; 1 ♀ : Jamduar, 4.vi.1973, Coll. S. S. Saha ; 1 ♀, 1 ♂, upper Assam, date & Coll. nil ; 8 ♀ ♀ : Sibsagar, date & Coll. nil ; 1 ♂ : without locality data ; 1 ♀ : Meghalaya, Risa colony, 4.ix.1974, Coll. R. Mathur ; 1 ♀ : Assam, Kamrup, Mothorguri, Manas Sanctuary, 19.iii.1975, Coll. S. S. Saha ; 1 ♀ : Assam, Sibsagar, date & Coll. nil.

*Distribution* : INDIA : Assam, Meghalaya and Bengal

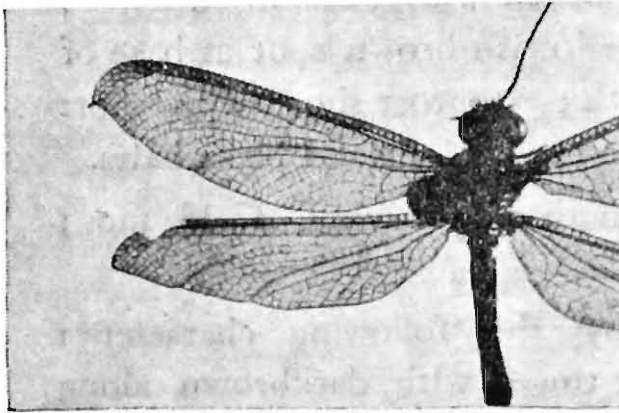
*Remarks* : The subspecies is for the first time recorded from Assam and Meghalaya.

### **Acheron trux trux** (Walker)

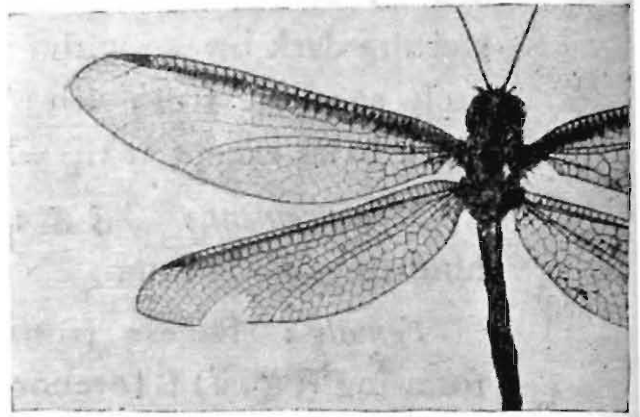
*Ascalaphus trux* Walker, 1853, *Cat. Brit. Mus. Neur.*, p. 432.

*Acheron trux*, Weele, 1908, *Cat. Coll. Selys*, 8 : 228-230.

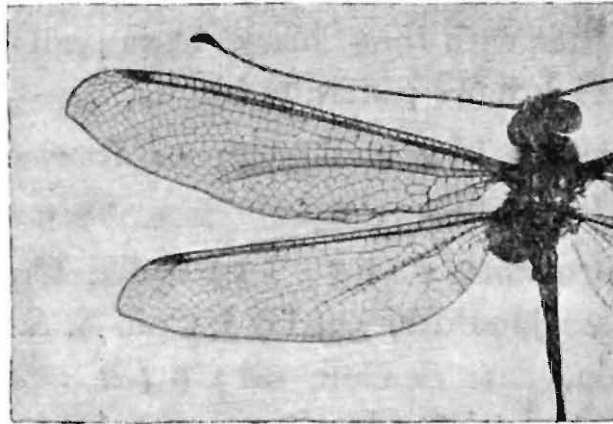
*Characters* : Labrum : with a row of black hairs at margin ; frons and vertex : with tawny hairs ; meso- and metapleura : yellow ; wings (Fig. 8) : pterostigma with 6 crossveins ; legs ; deep red ; spurs of hindtibia equal to two tarsal segments taken together ; abdomen : 1st, 2nd and



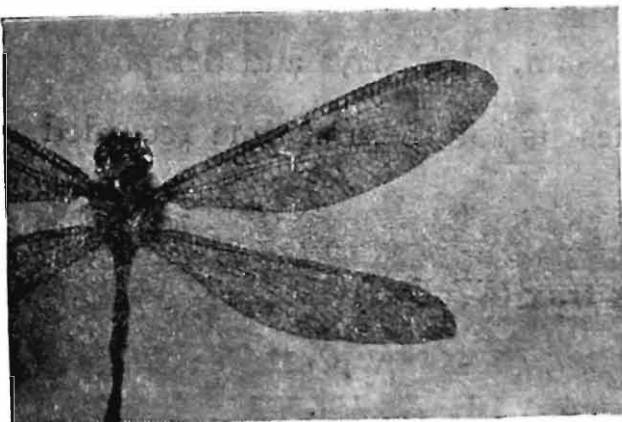
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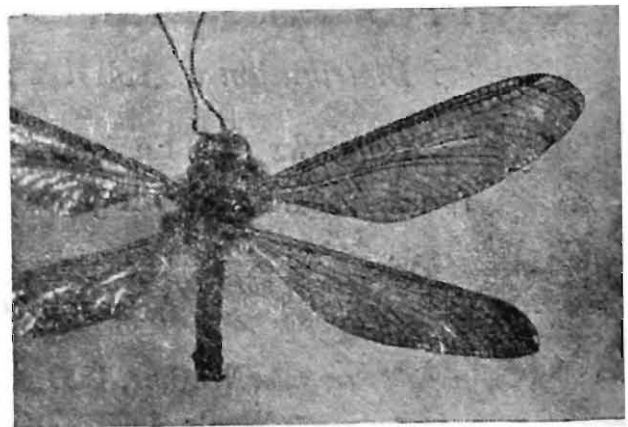
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8



9



10

Fig.s 6-10. 6. *Acheron trux loquax* (Walker), fore- and hindwing, male, 7. *Acheron trux loquax* (Walker), fore- and hindwing, female, 8. *Acheron trux trux* (Walker), fore- and hindwing, 9. *Hybris angulata* (Westwood), fore- and hindwing, 10. *Glyptobasis cornuta* Kimmins, fore- and hindwing.

3rd segments yellow with brown margin ; all other segments brown ; 1st and 2nd tergites with tawny wooly hairs and short, black bristles ; sternites with an yellow spot at base of each segment and also with black hairs ; 1st, 2nd and 3rd sternites with a longitudinal yellow stripe interrupted at middle with a narrow dark brown line.

*Measurement* : 4 ♂♂ : length of forewing, 37.40 mm., hindwing, 33-35 mm., 1 ♀ : length of forewing, 42 mm ; hindwing, 39 mm.

*Material examined* : 1 ♂ : India, Darjeeling, Rongpo, Andherikhola, 18.v.1979, Coll. *P. Haldar and party* ; 1 ♂, Assam, Mothorguri, Manas sanctuary, 13.v.1175, Coll. *S. S. Saha* ; 1 ♀ : Sibsagar, date—Nil, Coll. *S. E. P.* ; 1 ♂ : Meghalaya, Dawki, 10.v.1972, Coll. *S. Biswas* ; 1 ♂ : Shillong, Mawpa, 31.viii.1967, Coll. *R. K. Varshney*.

*Distribution* : INDIA : Sikkim, Assam, Maghalaya, West Bengal.

*Remarks* : In Assam specimens the pterostigmal colour is pale brown while in Darjeeling specimens the colour is dark brown. However, the subspecies constitutes a new locality record for Meghalaya.

### Genus *Hybris* Lefebvre

*Hybris* Lefebvre, 1842, *Guer Mag. Zool.*, 92 : 6.

*Hybris*, Hagen, 1866, *Stett. Ent. Ztg.*, 27 : 293.

*Hybris*, Brauer, 1868, *Verh. Zool. bot. Ges. Wien.*, 18 : 397.

*Hybris*, MacLachlan, 1873, *J. Linn. Soc.*, 11 : 266.

*Characters* : Antenna : as long as wing ; in males basal portion bent outwardly and without teeth or hair ; in female straight ; club shortly but broadly pyriform, almost truncate ; eye : upper half larger than the lower one ; wing : elongate, considerably dilated at middle ; forewing : with an excision near base ; axillary angle somewhat prominent ; leg : spur of hind tibia almost as long as 1st tarsal joint ; abdomen : shorter than forewing and laterally compressed in both sexes ; male with appendices somewhat long, cylindrical and forcipate, sometimes shorter and somewhat spoon-shaped.

*Type-species* : *Ascalaphus javanus* Burmeister

*Distribution* : China, India, Indonesia, Insulinde and Japan.

***Hybris angulata* (Westwood)**

*Ascalaphus (Ogcogaster) angulatus* Westwood, 1848, *Cabinet Orient.*, p. 69.

*Hybris angulata*, MacLachlan, 1873, *J. Linn. Soc.*, 11 : 267.

*Redescription* : Labrum, clypeus and frons : black brown with blackish hairs ; antenna : longer than hindwing and strongly curved at base, scape and pedicel concolorous to frons and with black long hairs intermingled with white hairs ; deep excavation between frons and antennal bases ; vertex : yellow with black hairs ; thorax : pronotum black at middle with anterior and posterior margin yellow ; a broad black stripe originating on either side of the pronotum extending obliquely to the middle of yellow meso-scutellum and a narrow, black median longitudinal line on prescutum of mesothorax joining on either side with aforesaid lateral black stripe ; mesothoracic pleura dark brown with one yellow stripe ; metathorax yellow ; wings (Fig. 9) : membrane with brownish tinge specially in apical half ; costal and subcostal areas more darkbrown at extreme base than any other part ; costal, Sc and R dark brown and all other longitudinal veins black brown ; pterostigma dark brown with 5 crossveins ; apical field with 4 rows of cells ; hairs on veins and margin short and black ; fringes on hind margin at extreme base long and greyish ; hindwing : shorter and narrower than forewing ; leg : blackish brown with long and short black hairs ; foretibia with comb-like hairs at inner margin ; fore femur yellow ventrally ; spur of hind-tibia equal to two tarsal segments taken together ; claws black and large ; abdomen : tergites 1-8 yellow with a black ring at the end of each segment ; ectoproct darkbrown, forcipate with an yellow spot at base, also with long black hairs at base and short black bristles at rounded tip ; 9th sternite large, black and with two lateral protruberance ; apex of 9th sternite elongate, angulated and placed below the ectoproct.

*Measurements* : 2 ♂♂ : Length of forewing, 34-36 mm., hindwing, 31-32 mm., abdomen (with ectoproct) 22-25 mm., 1 ♀ : length of forewing, 35 mm., hindwing, 30 mm.

*Material examined* : India : 1 ♂ : Meghalaya, Cachar, Loharband, 3.x.1975, Coll. N. Muraleedharan and party ; 1 ♂ : West Bengal, Nadia, Haringhata farm, 28.vii.1975, Coll. S. K. Ghosh and 1 ♀ : Calcutta, date & Coll. Nil.

*Distribution* : INDIA : Assam, Meghalaya and West Bengal ; Bangladesh ; Burma.

*Remarks* : The specimens from West Bengal differs from Meghalaya specimen by the clear hyaline wings except brownish tinge at the extreme base and apical field specially of the hindwing. However, the species is a new record for West Bengal and Meghalaya.

### Genus *Glyptobasis* MacLachlan

*Glyptobasis* MacLachlan, 1971, *J. Linn. Soc.*, 11 : 268.

*Glyptobasis*, Weele, 1908, *Cat. Coll. Selys*, 8 : 240.

*Characters* : Antenna : shorter than wings ; slightly bent proximally in males ; the bent portion being provided with a small sharp tooth or spine on each segment ; club in the form of a short truncate cone ; thorax : slightly villose ; wing : elongate, much dilated at middle ; densely reticulated ; Cu<sub>2</sub> confluent with 1A in both wings ; fore-wing : appendiculate at base ; leg : spur of hindtibia almost equal to two first tarsal joints taken together ; abdomen : rather shorter than wings, variably coloured with bright markings ; slender in males with a pair of claw-like corneous appendices ; appendix superiores not forming forceps.

*Type species* : *Ascalaphus dentifera* Westwood

*Distribution* : India, Burma and Sri Lanka.

**Key to species of the genus *Glyptobasis***

- Antenna angled near base ; 10th sternite with a pair of curved horns, each with a small and strong branch at the inner margin towards the base ... *cornuta* Kimmins
- Antenna without angle ; 10th sternite with a pair of curved claws, each strongly swollen at middle but without any branch at the inner margin towards base ... *dentifera* (Westwood)

***Glyptobasis cornuta* Kimmins**

*Glyptobasis cornuta* Kimmins, 1949, *Ann. Mag. nat. Hist.*, (12) 2 : 25.

*Measurement* : ♂ ♂ : length of body, 23-27 mm ; antenna 22-24 mm ; forewing, 31-32 mm ; hindwing, 27-30 mm.

*Material examined* : INDIA : 4 ♂ ♂ : Orissa : Nandanakanan, 27.vii.1974, coll. N. Acharya.

*Distribution* : INDIA : Orissa.

*Remarks* : Kimmins (1949) doubtfully recorded this species (Fig. 10) from India but this study shows the existence of the species in Orissa. The description of ♂ agrees well with the description given by Kimmins.

***Glyptobasis dentifera* (Westwood)**

*Ascalaphus (Ogcogaster ?) dentifer* Westwood, 1848, *Cab. Orient. Ent.*, p. 69.

*Ascalaphus dentifer* Walker, 1853, *Cat. Brit. Mus. Neur.*, p. 421.

*Glyptobasis dentifera*, MacLachlan, 1871, *J. Linn. Soc.*, 11 : 278.

*Glyptobasis dentifera*, Weele, 1908, *Cat. Coll. Selys*, 8 : 241.

*Glyptobasis dentifera*, Needham, 1909, *Rec. Indian Mus.*, 3 : 198.

*Glyptobasis dentifera*, Fraser, 1922, *Ibid.*, 24 : 516.

*Glyptobasis dentifera*, Kimmins, 1949, *Ann. Mag. nat. Hist.*, 12(2) : 19.

*Measurement* : ♀ ♀ : length of body, 25-26 mm ; antenna, 26-30 mm ; forewing, 33-36 mm ; hindwing, 30-32 mm. ♂ : length of body, 28 mm ; forewing, 33 mm ; of hind wing, 30 mm.

*Material examined* : 1 ♀ : INDIA : Orissa : Jhanpara, Angul, 30.ix.1972, Coll. K. Rai and party ; 2 ♀ ♀ : Orissa :

Inspection bungalow, Dhenkanal, 5-7.x.1972, Coll. *K. Rai and party* ; 1 ♂ : Orissa : Godianali, Dhenkanal, 8.x.1972, Coll. *K. Rai and party*.

*Distribution* : INDIA : Goa, Maharashtra, Punjab, Uttar Pradesh, South India, Orissa and West Bengal.

*Remarks* : The species (Fig. 11) agrees well with the descriptions given by Weele (1908) and Kimmins (1949).

### Genus *Ascalaphus* Fabricius

*Ascalaphus* Fabricius, 1775, *Syst. Ent.*, p. 313.

*Helicomitus* MacLachlan, 1871, *J. Linn. Soc.*, 11 : 261.

*Ascalaphus*, Tjeder, 1972, *Ent. scand.*, 3 : 153.

*Characters* : Antenna : shorter than wings ; often irregularly sinuous in basal half in male ; club short ; eyes : lower division shorter than upper one ; thorax : villose ; wings : appendiculate ; tip rounded ; apical field narrow and generally with two rows of cells ; pterostigma elongate ; inner margin of forewing hardly excised near base ; leg : spur of hindtibia as long as or shorter than first tarsal segment ; abdomen : shorter than hindwing ; ectoproct in both sexes short.

*Type-species* : *Myrmeleon barbarus* Linnaeus

*Distribution* : Africa (except the south-western and central parts of Sahara), Malagassy, Israel, India, Sri Lanka, Malay states, Sumatra, Java, the Philippines, Japan.

### *Key to the species of genus Ascalaphus*

1. Posterior lobe of prothorax in male large with two rounded processes ; mesoscutum in male with a small triangular process on either side ... *prothoracicus* (Kimmins)
- Posterior lobe of prothorax in male normal in size without any process ; mesoscutum in male without any process ... 2

2. 4th tergite of abdomen in male very much swollen ... *abdominalis* (Kimmins)
- 4th tergite of abdomen in male generally not swollen or very slightly swollen ... 3
3. 4th and 5th tergite of abdomen in male without long, black setae ; angle of anal lobe of forewing very much obtuse ... *dicax* (Walker)
- 4th and 5th tergite of abdomen in male with long, black setae ; angle of anal lobe of forewing less obtuse ... *sinister* (Walker)

### *Ascalaphus prothoracicus* (Kimmins)

*Helicomitus prothoracicus* Kimmins, 1949, *Ann. Mag. nat. Hist.*, (12) 2 : 6.

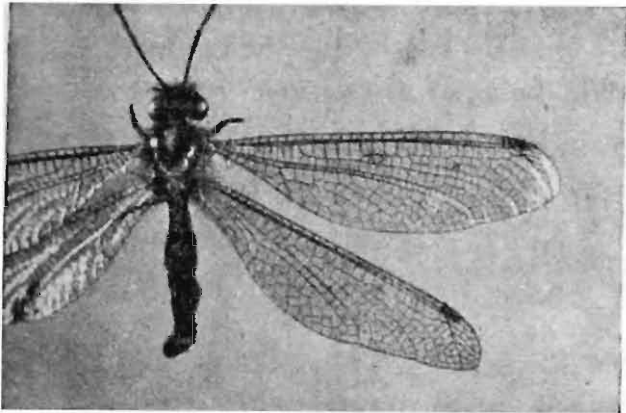
**Characters :** Antenna : shorter than hindwing ; pronotum : posterior lobe with long yellowish hairs intermingled with brown hairs in addition to tuft of backwardly directed black hairs on the rounded process ; wings (Fig. 12) : clear, hyaline or tinged with brownish ; venation darkbrown ; pterostigma brown with 5-6 cross veins ; two rows of apical cells beyond pterostigm ; abdomena : brown.

**Measurement :** ♂ : length of antenna, 16-19 mm ; forewing, 26-29 mm ; hindwing, 22-25 mm ; ♀ : length of antenna, 19-20 mm ; forewing, 30-31 mm ; hindwing, 25-26 mm.

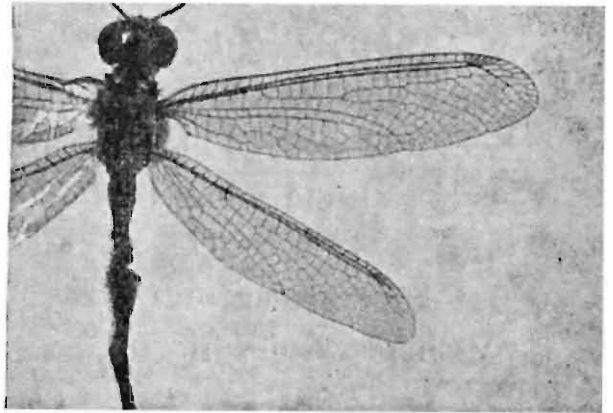
**Material examined :** 1 ♂ : India : Assam : Jamduar, 30.vi.1973, Coll. S. S. Saha and party. 1 ♂ : Calcutta, Maulali, 16.v.1975, Coll. S. S. Saha ; 1 ♂ : Sikkim, Rongpo, River bed, 28.v.1979, Coll. M. S. Shishodia & party ; 2 ♀ ♀ , 3 ♂ ♂ , Howrah, Botanical Garden, grass field near, 1982, Coll. A. K. Hazra & party.

**Distribution :** INDIA : Assam.

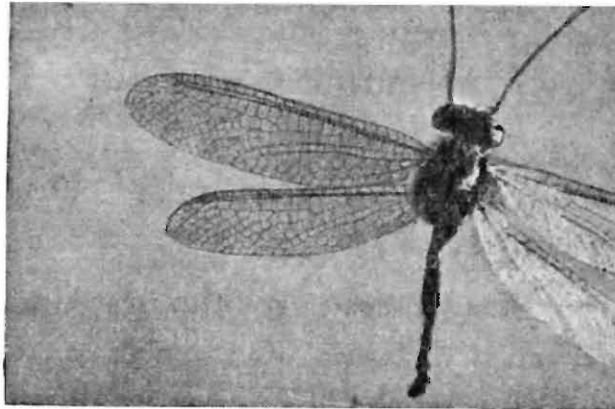
**Remarks :** Kimmins (1949), while recording the species, did not mention the exact locality. However, at present the species is reported from Assam, Sikkim and West Bengal.



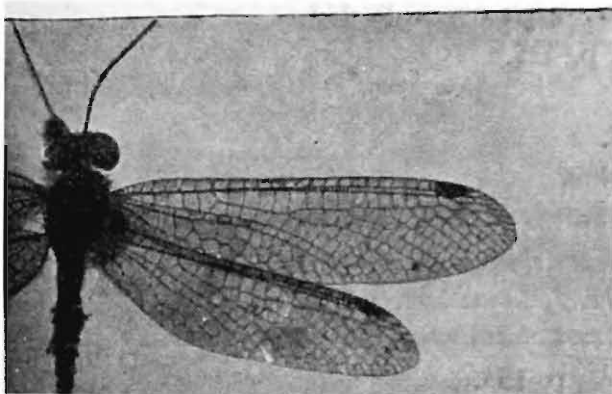
11



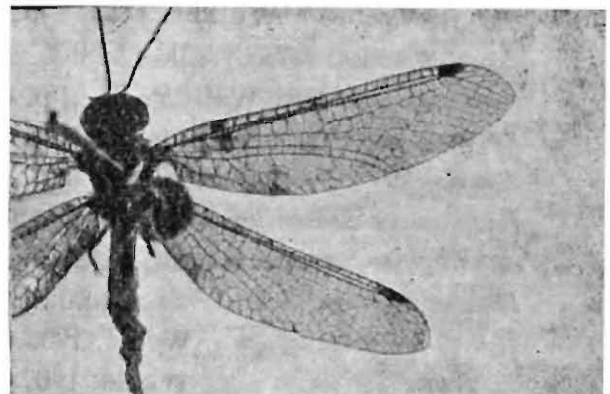
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**Figs. 11-15.** 11. *Glyptobasis dentifera* (Westwood), fore- and hindwing, 12. *Ascalaphus prothoracicus* Kimmins, fore- and hindwing, 13. *Ascalaphus abdominalis* Kimmins, fore- and hind wing, 14. *Ascalaphus dicax* (Walker), fore- and hindwing, 15. *Ascalaphus sinister* (Walker), fore- and hindwing.

**Ascalaphus abdominalis** (Kimmins)

*Helicomitus abdominalis* Kimmins, 1949, *Ann. Mag. nat. Hist.*, (12) 2 : 4-6.

**Morphovariation** : Face : yellowish with yellowish white hairs ; yellow hairs encircling the base of antenna ; vertex : elevated with black hairs intermingled with white ; pleura : pale yellow ; wings (Fig. 13) : pterostigma of wings brownish yellow with 6 cross veins and 2 rows of apical cells beyond it ; lateral margin of the 4th abdominal tergite without V-shaped excision.

**Measurement** : ♂♂ : length of antenna, 16-17 mm ; forewing, 24-26 mm ; hindwing, 20-22 mm.

**Material examined** : 1 ♂ : India : West Bengal : Malda College camp, Malda, 11.x.1975, Coll. *B. C. Nandi* ; 1 ♂ : Orissa : Angul, Inspection bungalow, 3.x.1972, Coll. *K. Rai & party* ; 1 ♂ : Nandankanan, -vii.1974, Coll. *L. M. Acharya*.

**Distribution** : INDIA : Karnataka, Orissa and West Bengal.

**Remarks** : The species is for the first time recorded from West Bengal and Orissa. The species varies from the original description by the characters as shown above.

**Ascalaphus dicax** (Walker)

*Ascalaphus dicax* Walker, 1853, *Cat. Brit. Mus. Neur.*, p. 423.

*Ascalaphus immotus* Walker, 1853, *Ibid.*, p. 425.

*Ascalaphus procox* Walker, *Ibid.*, p. 425.

*Ascalaphus odiosus* Walker, *Ibid.*, p. 426.

*Ascalaphus insimulans* Walker, *Ibid.*, p. 429.

*Ascalaphus insimulans* Westwood, 1888, *Trans. R. Ent. Soc. Lond.*, p. 1.

*Ascalaphus cervinus* Hagen, 1858, *Verh. Zool.-bot. Ges. Wien*, p. 481.

*Helicomitus insimulans* MacLachlan, 1871, *J. Linn. Soc.*, 11 : 262.

*Helicomitus insimulans*, Weele, 1905, *Notes Leyden Mus.*, 26 : 200.

*Helicomitus insimulans*, Weele, 1907, *Ibid.*, p. 153.

*Suphalasca cervinus* Gerstaecker, 1885, *Mitt. naturw. ver. Neu. vorpomm. u. Rugen*, 16 : 88.

*Suphalasca placida* Weele, 1906, *Notes Leyden Mus.*, 26 : 228.

*Suphalasca placida*, Weele, 1907, *Ibid.*, 28 : 156.

*Helicomitus dicax*, Weele, 1908, *Cat. coll. Selys*, 8 : 178.

*Helicomitus dicax*, Fraser, 1922, *Rec. Indian Mus.*, 24 : 514.

*Helicomitus dicax*, Kimmins 1949, *Ann. Mag. nat. Hist.*, (12) 2 : 2.

*Additional characters* : Vertex, gena, frons, clypeus and maxillary palp : yellow ; clypeus separated from frons by a deep excavation and vertex with long hairs ; antenna : basal segments with long yellowish hairs intermingled with brown ; reaching pterostigma of hindwing ; pro-meso-and metanotum : with long black hairs on lateral margin ; mesoscutellum yellow ; supra-episternum with long, black hairs on upper half and yellowish white on lower half ; forewing (Fig. 14) : pterostigma yellow with 3-4 crossveins ; 2 rows of apical cells beyond pterostigma ; leg : slender and yellow ; abdomen : smaller than antenna ; brown, but laterally black ; 1st segment with long, black hairs laterally but all other segments shortly ciliated.

*Measurement* : ♀ ♀ : length of body, 20-23 mm ; antenna, 18-20 mm ; forewing, 30-32 mm ; hindwing, 25-26 mm.

*Material examined* : 1 ♀ : India ; Orissa : Gadianali, Dhenkanal, 8.x.1972, Coll. *K. Rai and party* ; 1 ♀ : Assam : Jamduar, 30.vi.1973, Coll. *S. S. Saha and party* ; 1 ♀ : Calcutta, vi.1973, Coll. *R. Rahaman* ; 1 ♀ : Calcutta, 17.v.-1975, Coll. *D. K. Thakur* ; 2 ♀ ♀ , West Bengal, Bethuaduari Reserve Forest, 6.vii.1979, Coll. *A. K. Hazra & party* ; 1 ♀ : Orissa, Baligaon, Puri, 18.iii.1974, Coll. *S. K. Ghosh*.

*Distribution* : Arabia ; China ; India (Assam, West Bengal, Orissa) ; Sri Lanka ; Indonesia ; the Philippines ; New Guinea ; Japan.

### ***Ascalaphus sinister* (Walker)**

*Ascalaphus sinister* Walker, 1853, *Cat. Brit. Mus. Neur.*, p. 424.

*Helicomitus sinister* Kimmins, 1949, *Ann. Mag. nat. Hist.*, (12) 2 : 3.

*Additional characters* : Vertex : brown ; clypeus, labrum and frons : yellow ; frons with white hairs and vertex with blackish brown hairs intermingled with white ; maxillary palp : yellow to fuscous ; antenna : yellow, reaching almost the pterostigma of hindwing ; pronotum : with long black hairs on hind margin ; meso-and metascutellum : with white hairs on hind margin ; supra-episternum with dense, short,

black hairs on upper half and also with a few, long and white hairs on the lower half ; forewing (Fig. 15) : pterostigma brown with 6 crossveins and two rows of apical cells beyond it ; hindwing : pterostigma with 5 crossveins ; abdomen : orange yellow.

*Measurement* : ♀ ; Length of antenna, 18 mm ; forewing, 29 mm ; hindwing, 25 mm ; abdomen, 14 mm.

*Material examined* : 1 ♀ : India : Orissa : Amlapara, Dhenkanal, 5.x.1972, Coll. K. Rai and party.

*Distribution* : INDIA : Bombay, Orissa, West Bengal ; Sri Lanka.

*Remarks* : The species is for the first time recorded from Orissa.

#### SPECIES REVIEWED FROM LITERATURE

##### Genus *Ogcogaster* Westwood

*Ogcogaster* Westwood, 1848, *Cab. Orient. Ent.*, p. 69.

*Ogcogaster*, Hagen, 1866, *Stettin. ent. Ztg.*, 27 : 374.

*Ogcogaster*, Brauer, 1868, *Verh. Zool.-bot. Ges. Wien.*, 18 : 397.

*Ogcogaster*, MacLachlan, 1873, *J. Linn. Soc.*, 11 : 264.

*Ogcogaster*, Weele, 1908, *Cat. Coll. Selys*, 8 : 253.

*Type species* : *Ascalaphus* (*Ogcogaster*) *tesselatus* Westwood.

*Remarks* : Westwood (1848) while describing *tesselatus* under *Ascalaphus* Fabricius placed it in the subgenus *Ogcogaster*. Subsequent workers gave generic status to this subgenus and the species *tesselatus* Westwood (= *tesselata*) was included under the genus *Ogcogaster* which is so far known from India and Pakistan. Amongst a total of four species, viz., *O. kempi* Fraser, *O. kirbyi* Weele, *O. segmentator* (Westwood) and *O. tessellata* (Westwood), only the last one is so far reported from eastern India which is dealt with here.

##### *Ogcogaster tessellata* (Westwood)

*Ascalaphus* (*Ogcogaster*) *tessellatus* Westwood, 1848, *Cab. Orient. Ent.* p. 69.

*Ogcogaster tessellatus*, MacLachlan, 1873, *J. Linn. Soc.*, 11 : 265.

*Ogcogaster tessellata*, Fraser, 1922, *Rec. Indian Mus.*, 24 : 518.

*Distribution* : INDIA : Western Himalayas including Himachal Pradesh, Gujarat, Bihar ; Pakistan ; Rawalpindi.

*Remarks* : The description, as given by Westwood (1848) and Weele (1908) along with the illustration, provides ample scope to consider *O. tessellata* as a good species.

#### SUMMARY

The paper incorporates the taxonomic account along with earlier investigation, salient morphological characters, brief review on classification and geographical distribution of the family Ascalaphidae under the suborder Planipennia of the order Neuroptera from Eastern India. Out of a total of fourteen species examined, male of *Acheron trux loquax* (Walker) has been described, two species, viz., *Hybris angulata* (Westwood) and *Agrionosoma dohrni* Weele redescrbed, five species and two subspecies established as new locality records for the area under consideration. Running keys to all the taxa, their morpho-variations, relevant illustrations and references have been provided. Besides, the literature review of one more species has also been dealt with. Thus, an account of a total of fifteen species distributed over ten genera under two subfamilies of Ascalaphidae from Eastern India has been furnished in the paper.

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