SOME ORIENTAL ASCALAPHIDAE IN THE INDIAN MUSEUM.

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With one exception, the whole of the specimens dealt with in this paper are from within the limits of the Indian Empire. Four new species are dealt with, of which one is from Siam and the other three from purely Indian localities. The types of these will be preserved in the Indian Museum.

Individual species are difficult to determine from the wide variations met with in colouring both of body and wings. They pass through a teneral stage analogous to that met with in dragonflies and markings may be obscure, well-defined or entirely obliterated according to the age of individual specimens.

Very little is known of the life-histories of this family of insects so that the descriptions and illustrations of three new larvae will be of interest even though it is impossible to say with certainty to which species they belong. Dr. Tillyard writing to me three or four years ago described a method of obtaining the larvae which is best given in his own words: "There is a very simple trick not known to many, for the finding of these sorts of larvae and that is to go out into the dry bush (as we call it here), and study the large isolated trees, if you have them. I select a tree that is old and worn, with a good lean on it, and with loose rubbly soil around it (termite earth is very good). I then go down on my hands and knees, scoop the soil up in both hands, and let it run slowly through again, forming a mound slowly. Any larvae of Myrmeleontidae or Ascalaphidae hiding in the soil fall out, and can be seen at once, as they give a kick and begin to burrow again very quickly. I also examine bits of bark, etc., for the Ascalaphidae, which are usually more sluggish and like to hide under bark, debris, etc." Dr. Tillyard states that he has secured larvae of nearly every known local genus in this manner around Sydney. I have adopted his methods from time to time but have not met with any success Situations such as he describes are very common in parts of the Deccan and Punjab, but I have not found them to yield fruit although I have copied his instructions to the letter. Dry seasons, he further states, promote the increase of these Neuropterous groups, whilst wet weather nearly wipes them out. This does not appear to be the case in India as I have found Ascalaphids more common in the wet than the dry seasons, although their occurrence is scattered pretty well throughout the whole of the year. The termination of the monsoon is probably the best time to take most species, so that the latter part of the rainy season is at least spent in the senior larval state.

LARVAE.

1. A single specimen from Talewadi, near Castle Rock, N. Kanara District, Bombay Pres. (coll. *S. W Kemp*), almost certainly the larva of *Glyptobasis dentifera* which species was common in the same neighbourhood (Fig. 1.)

TEXT-FIG. 1.—Ascalaphid larva from Talewadi, Castle Rock, N. Kanara Dist.

Head quadrate, deeply fissured in front, coated with very short fine bristles and pigmented darkly save for a pale fascia which begins at the mid-line on a level with the eyes and runs out and backwards. Eyes deeply pigmented and furnished with a small chitinous horn-like process antero-laterally. Maxillae long and curved inward at a right angle near the tips. They are furnished with short spines of which three are much longer than the rest; of these latter, the two anterior are close together and the middle one longer than the two others.

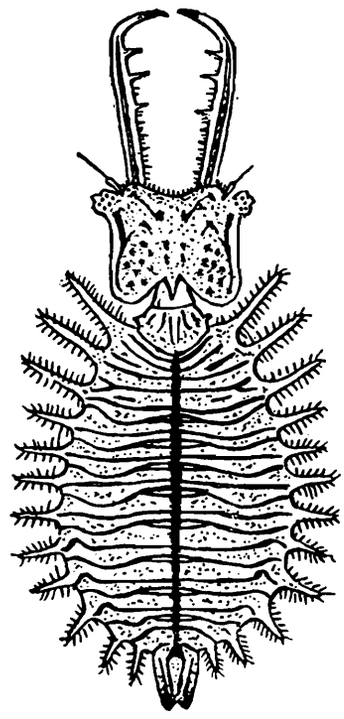
Prothorax very short and rather hidden, with no definite tubercles on the outer side.

The remainder of the body-segment furnished laterally with twelve stout spines all of which are beset with short, stiff setae. This armature forms an impassable rampart around the insect which serves to protect it from the attacks of ants, and is closely analagous to that found in various larvae of *Euthalia*. The presence of these spines serves readily to distinguish the larvae from those of Myrmeleonidae which otherwise are closely similar in form and sometimes size.

Legs short and slim and entirely hidden beneath the body.

With the exception of the last segment, the final seven are deeply pigmented as far inward as the subdorsum, including the stout spines.

2. A single specimen from Janakhmukh, Abor country, 600 ft., 29·xii·1911 (coll. *S. W Kemp*). Species? (Fig. 2.)



TEXT-FIG. 2.— Ascalaphid larva from Janakhmukh, Abor country.

Generally similar to the last in shape but differing as follows:—The maxillae are rather shorter and more robust and deeply pigmented. The

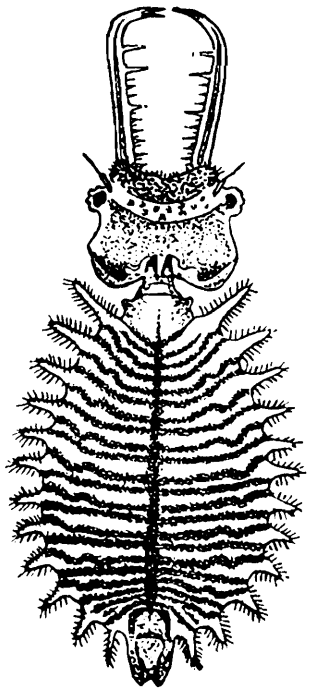
three spines on their inner side are equal in size and separated by approximately equal intervals. The head is not coated densely with short bristles; it is spotted above with dark brown and bears a fine, lateral streak of the same colour. The frontal notch is very shallow and wide. Eyes without the small, horn-like process.

The prothorax is longer and more evident and has on each side a short, stout, blunt tubercle.

The lateral spines on the remainder of the body-segment are longer and more slim. The mid-dorsum is marked with a dark pigmented line and each segment bears a couple of fine transverse lines of which the anterior is very sinuous and the posterior more or less straight. The whole body is paler and of a pale brown colour.

3. A single specimen from Rotung, Abor country, alt. 1300 ft., 7·iii·1912 (coll. *S. W Kemp*). Found under stones. (Fig. 3.)

Somewhat similar to the last but the head differing markedly in shape, much more rounded, the sides concave immediately posterior to the eyes. The frontal border somewhat crenate and the median notch narrow and shallow. Eyes without the horn-like process. Upper surface of head moderately deeply pigmented save for a pale band which passes between the eyes and is convex posteriorly. Maxillae long, not so sharply curved at the ends, one with its tip bifid, the three inner spines of equal length, the posterior one wider-spaced than the two anterior. Between them and posterior to the hinder, a short and a long series of smaller spines.



TEXT-FIG. 3.—Ascalaphid larva from Rotung, Abor country.

Prothorax narrow and well defined, with similar lateral tubercles to the last.

Lateral spines of the remainder of the body similar to those of the first described. Similar, but thicker and darker pigmented transverse lines traversing the dorsum.

No imagines were collected on the Abor Expedition so that one cannot give any opinion as to which species the two latter larvae belong to. All the larvae are juveniles, so no measurements have been given.

ADULTS.

Tribe SUHPALACSINI Ris.

Genus **Suhpalomitus** Ris.

Suphalomitus serratus sp. nov.

1 male, Meetaw Forest, W Rahang, Siam, alt. *ca.* 1000 ft. 4·iv·1913 (*C. S. Barton*).

Antennae yellowish, club broad, black and spatulate. Head thickly coated with light brown hair, face rather paler, also coated with brownish hair. Eyes reddish brown, about evenly divided.

Thorax moderately broad and short, striped longitudinally and alternately with dark brown and pale ochreous, the mid-dorsum dark brown followed outwardly by a narrow ochreous band and then by a broader, dark brown, humeral band on a level with the wing insertions. Laterally pale ochreous, chest pale brown.

Legs short and moderately slim, femora yellowish red, tibiae reddish brown, tarsi black, claws reddish. Posterior tibial spurs about as long as the basal joint of tarsus.

Abdomen long and slim, uniform dark reddish brown, the sides of the three basal segments coated with very short, very stiff hairs which stand out perpendicular to the surface.

Anal appendages very short, directed down and outwards, with a few long bristles projecting from the ends; genital flaps very short, conjoined, spatulate.

Wings hyaline, faintly tinted with brown, reticulation moderately close, reddish brown, subcostal field brown; this colour prolonged along all the nervures radiating from the subcosta and radius so as to form a narrow, serrated fascia extending from the base of the wing to the stigma. Pterostigma brown, traversed by 4 to 5 nervures, broad and rather long, its outer border rather oblique. The brown of the stigma is also prolonged along the costal margin as far as the apex of the wing. Apical field moderately broad, with 3 rows of cells. Axillary angle obtuse and very blunt.

Antennae 25 mm.; forewing 39 mm.; hindwing 32 mm.; abdomen 31 mm.

Suphalomitus verbosus Walk.

Ascalaphus verbosus, Walk., *Cat. B.M. Neur.*, no. 36, p. 426 (1853).
Ascalaphus profanus, Walk., *l.c.*, no. 39, p. 428 (1853).
Helicomitus verbosus, MacLach., *Journ. Linn. Soc., Zool.*, XI, p. 262, no. 4 (1871).
Helicomitus profanus, MacLach., *l.c.*, no. 5, p. 262 (1871).
Suphalomitus verbosus, Ris, *Cat. Coll. Selys, Ascalaphidae*, p. 183 (1908).

Type in Brit. Mus. from North India.

2 females, Coorg, 2000 ft., 1913, coll. *Hannyngton*, and Annarchardi, S. India, 1909.

2 females, Pashok, Darjiling Dist., alt. 2500 ft., vi·1916, (coll. *L. C. Hartless*).

A widely distributed species reported from Northern India, Mysore, Rangoon and Ceylon. The present examples do not differ markedly from type, the markings varying according to the age of individuals.

Genus Helicomitus MacLach.

Helicomitus dicax Walk.

Ascalaphus dicax, Walk., *l.c.*, no. 31, p. 423 (1853).
Ascalaphus sinister, Walk., *l.c.*, no. 32, p. 424 (1853).

Ascalaphus immotus, Walk., *l.c.*, no. 33, p. 425 (1853).
Ascalaphus procax, Walk., *l.c.*, no. 34, p. 425 (1853).
Ascalaphus odiosus, Walk., *l.c.*, no. 35, p. 426 (1853).
Ascalaphus insimulans, Walk., *l.c.*, no. 36, p. 429 (1853).
Helicomitus insimulans, Walk. and MacLach., *Journ. Linn. Soc., Zool.* XI, p. 262 (1871); Weele, *Notes Leyden Mus.* XXVI, p. 200 (1905); XXVIII, p. 153 (1907)
Ascalaphus cervinus, Hagen, MacLach., *l.c.*, p. 267 (1871).
Suphalasca cervinus, Hagen, Gerstaecker, *Mitt. natur. Ver. Neu.-Vorpomm. und Rugen*, 16, p. 88 (1885).
Suphalasca placida, Gerst., *l.c.*, p. 105 (893); Weele, *Notes Leyden Mus.* XXVI, p. 228 (1906); *l.c.*, XXVIII, p. 156 1907).
Helicomitus dicax, Ris, *Cat. Coll. Selys, Ascalaphidae*, p. 172 (1908).

Type in Brit. Mus.

1 ♀, Amarah, Mesopotamia (taken in a tent), x·1916 (coll. *F. P. Connor*); 3 ♂ ♂, Eden Gardens (at light) and Museum Compound, Calcutta; 2 ♀ ♀, Chowringhee, Calcutta, 27·iv·1914, 27·v·1921. 17·vi·1911, and 28·v·1911 (coll. *N. Annandale* and *F. H. Gravely*); 1 ♀, Khargpur, Bengal, 17–30·vi·1911 (coll. *R. Hodgart*).

The specimens exhibit in a small way the extreme variability of this insect, especially in the markings. The species is widely distributed. I have taken it on several occasions in Mesopotamia above Kerna, that is above flooding areas, and it becomes increasingly common towards Amarah and Kut. Extends from Asia Minor to the Philippines and has been reported from Arabia, India, Ceylon, Java, China and Celebes.

Genus **Suhpalacsa** Lefebr.

Suhpalacsa obscura, sp. nov.

1 ♂ (rather teneral), Khemsa, 2650 ft., 5·v·1913.

Head: Antennae pale yellowish brown, the club long and pyriform, finely ringed with blackish brown; about half the length of the forewing. Jaws and face pale yellow; vertex and occiput brown, coated thickly with long brown hair, eyes dark purplish, iridescent brown.

Thorax dark brown, unicolorous, coated thickly with long dark brown hair, the sides paler.

Legs moderately short and robust, palest brown with a sub-basal spot of black on the tibiae, coated with long whitish hairs.

Abdomen long and cylindrical, tapering at the end segments, shorter than the hindwing, purplish brown, with obscure apical black annules on each segment.

Anal appendages tumid, elliptical, moderately long; genital flaps foliate, notched in the middle.

Wings hyaline, reticulation moderately close, white spotted with black, the subcosta especially, which bears at its junction with each transverse nervure, a longitudinal black spot, so that it appears alternately black and white; stigma short, very pale brown, traversed by 4 nervures; apical field broad, 3 rows of cells

in forewing, 2 to 3 in the hind; 7 rows of cells at outlet of the discoidal field.

Forewing 37 mm.; hindwing 31 mm.; abdomen 23 mm.; antennae 19 mm.

I place this species with some doubt in genus *Suhpalacsa*, which so far has not been shown to contribute any species within Indian limits.

It is at least very closely allied to the genus. It bears a superficial resemblance to *Idricerus decrepitus* from which, however, it is of course easily separated by its bipartite eyes.

Tribe HYBRISINI Ris.

Genus **Acheron** Lefebr.

Acheron trux Walk.

Ascalaphus trux, Walk., *Cat. B.M.*, p. 432, no. 45 (1853).
Ascalaphus loquax, Walk., *l.c.*, no. 48, p. 434, (1853).
Ascalaphus antiquus, Walk., *l.c.*, no. 49, p. 434 (1853).
Ascalaphus longus, Walk., *l.c.*, no. 50, p. 435 (1853).
Helicomitus ctenocerus, Gerstaeck., *Mitt. natur. Ver. Neu-Vorpom. und Rugen* XXV, p. 101 (1893); Weele, *Notes Leyden Mus.* XXVI, pp. 200, 228 (1900).
Acheron trux, Ris, *Cat. Coll. Selys, Ascalaphidae*, p. 228 (1908).

1 ♂ and 2 ♀ ♀, Tura, Garo Hills, Assam, 1200–1500 ft., vi–viii, 1917 (coll. *S. Kemp*); 1 ♂, Pashok, alt. 3500 ft., Darjiling Dist., E. Himalayas, 26·v·1914 (coll. *F H Gravely*).

Type in Brit. Mus. from Bengal, but without precise locality. This species is very constant and has a fairly wide distribution. Localities from which this insect has been recorded are Burma, Sylhet, Darjiling, Bhutan, Bengal, Assam, Sikkim, Malacca, China and Formosa.

Genus **Glyptobasis** MacLach.

Glyptobasis dentifera Westwood.

Ascalaphus dentifer, West., *Cab. Ori. Ent.*, pl. xxxiv (1848).
Ogcogaster dentifer, West., *l.c.*
Ascalaphus dentifer, Walk., *Cat. B.M.*, p. 421, no. 26 (1853).
Glyptobasis dentifera, MacLach., *l.c.*, p. 268 (1871); Ris. *Cat. Coll. Selys, Ascalaphidae*, p. 241, fig. 197, 198, 199 (1908).

2 ♂ ♂ and 1 ♀, Talewadi, near Castle Rock, N. Kanara Dist., Bombay Pres., 3–10·x·1916 (coll. *S. Kemp*); 3 ♂ ♂, Mormugao, Portuguese Ind., ix·1916 (coll. *S. Kemp*); 1 ♀, Balugaon, Puri Dist., Orissa, 21–31·viii·1913 (coll. *N Annandale*); 1 pair, Parambikalam, Cochin State, 1700–3200 ft., 16–24·ix·1914 (coll. *F. H Gravely*), 2 ♂ ♂ and 2 ♀ ♀, Trichur, Cochin State, 0–300 ft., 1–4·x·1914; ♂, Kavalai, Cochin State, 300–3000 ft., 24–27·ix·1914 (coll. *F H Gravely*).

This species is the type of the genus. Type in Brit. Mus. (East India). MacLachlan's specimen is from Bombay and specimens have also been obtained from Goregaon, which is near Bombay. Bangalore is another locality mentioned for the species.

The Deccan and Western Ghats appear to be the districts to which this species is mainly restricted.

Glyptobasis nugax Walk.

Ascalaphus nugax, Walk., *Cat. B.M.*, p. 433, no. 47 (1853); Hagen, *Verh. zool.-bot. Ges. Wien.* VIII, p. 481, no. 66 (1858).
Ascalaphus incusans, Walk., *l.c.*, p. 442, no. 63 (1853); Hagen, *l.c.*, p. 481, No. 67 (1858).
Glyptobasis incusans, Walk., *l.c.*, p. 442, no. 2, p. 268 (1871).
Glyptobasis nugax, Ris, *Cat. Coll. Selys, Ascalaphidae*, p. 243, figs. 200 and 201 (1908).

Type, a ♀ from Ceylon, Mus. Griefwald.

One pair from Castle Rock, ix·1916; 2 ♀ ♀, Talewadi, near Castle Rock, Kanara Dist., Bombay Pres. (coll. *S. Kemp*); 1 ♂ and 2 ♀ ♀, Barkul, 0–1000 ft., Orissa, 1–3·viii·1914, "flying in thick jungle, in rain" (coll. *F H. Gravely*).

This species appears to be restricted to Southern India and Ceylon. With regard to the two females from Orissa I am not altogether sure of the determination and think that they may be varieties of the species. Females are, however, difficult to determine satisfactorily.

Glyptobasis brunnea, sp. nov.

1 ♀, foot-hills, Pegu Yomas, Thayetmyo Dist., Burma, Oct. 1911 (coll. *C. J Rogers*).

Antennae dark reddish brown, extending nearly to the level of the stigma, about 4/5ths the wing-length; club long and pyriform, very dark brown.

Labium bright yellow, rest of head and face dark blackish brown, coated thickly with coarse dark brown hair except the occiput which is pale yellow and nearly bald. Eyes brown with a metallic reflex, the upper hemisphere decidedly the larger.

Thorax sparsely hairy, dark brown with a broad mid-dorsal stripe of yellow which is encroached upon by an angular process of the ground colour. Laterally a moderately broad, bright yellow, oblique stripe. Legs dark brown, almost black, robust but short, the anterior tibiae with a cushion of short, thickly-set, yellow hairs on the flexor surfaces. Tibial spine of posterior tibia as long as the basal joint of the tarsus.

Abdomen blackish brown. Each of the four basal segments bearing a bright ochreous spot shaped like a leaf with a crenate border, the stalk connected to an apical ring of the same colour. On the other segments this spot is more quadrate or like a leaf without its stalk.

Wings long and broad, slightly enfumed throughout, but the apices for about the outer fourth of the wings dark reddish brown. There is also a streak of the same colour immediately posterior to the radius in the forewing. Stigma dark brown, with five nervures, very obliquely pointed outwardly; reticulation close, black; the appendix very acute and rather long; apical field moderately

broad, with 3 rows of cells; 10 cells at the outlet of the discoidal field.

Anal appendages short, tumid, elliptical; genital valves, two rounded, convex, vertical flaps furnished with stiff black hairs.

Abdomen 23 mm.; forewing 38 mm.; hindwing 36 mm.; antennae 38 mm.

Genus **Siphlocerus** MacLach.

Siphlocerus Minius, Walk.

Ascalaphus minius, Walk., *l.c.*, p. 429, no. 40 (1853).
Ascalaphus luctifer, Walk., *l.c.*, p. 432, no. 46 (1853).
Siphlocerus minius, Walk., and MacLach., *Journ. Linn. Soc., Zool* XI, p. 261, no. 1 (1871); Ris, *l.c.*, p. 246, figs. 202, 203, 204, (1908).

1 ♂, Dharampur, Patiala State, 12·vii·1911 (Mus. coll.); 1 ♂ and 2 ♀ ♀, Shahzadpur, Allahabad Dist., 29·viii·1910 (Mus. coll.).

Not differing from type, which is in Dr. Ris' collection. Only so far reported from North India and North Bengal.

Genus **Ogcogaster** Westwood.

Ogcogaster tessalata West.

Ascalaphus tessalatus, West., *Cat. Orient. Ent.* 34, fig. 1 (1848); Walk., *l.c.*, p. 420, no. 24 1853).
Ogcogaster tesselatus, West., MacLach., *Journ. Linn. Soc., Zool.* XI, p. 265, no. 1 (1871).
Ogcogaster tessalata, Ris, *l.c.*, p. 253 (1908).

1 ♀, Kumaon, 6075 ft., W Himalayas, vii·1914 (coll. *Tytler.*)

Type in Brit. Mus., a female. No localities have hitherto been recorded for this insect except the broad term "India."

The single specimen is a very large one, its measurements being: abdomen 15 mm.; forewing 38 mm.; hindwing 32·5 mm.; antennae 25 mm.

The discoidal spots of brown are missing but the brown marking in conjunction to the stigma is well defined and forms with the stigma a very conspicuous arrowhead-shaped marking.

Ogcogaster kempi, sp. nov.

Two pairs from Talewadi, near Castle Rock, N. Kanara Dist., Bombay Pres., 10·x·1916 (coll *S. Kemp*).

Male.

Antennae bright yellow, a little longer than half the length of the wing; club broad, dark brown.

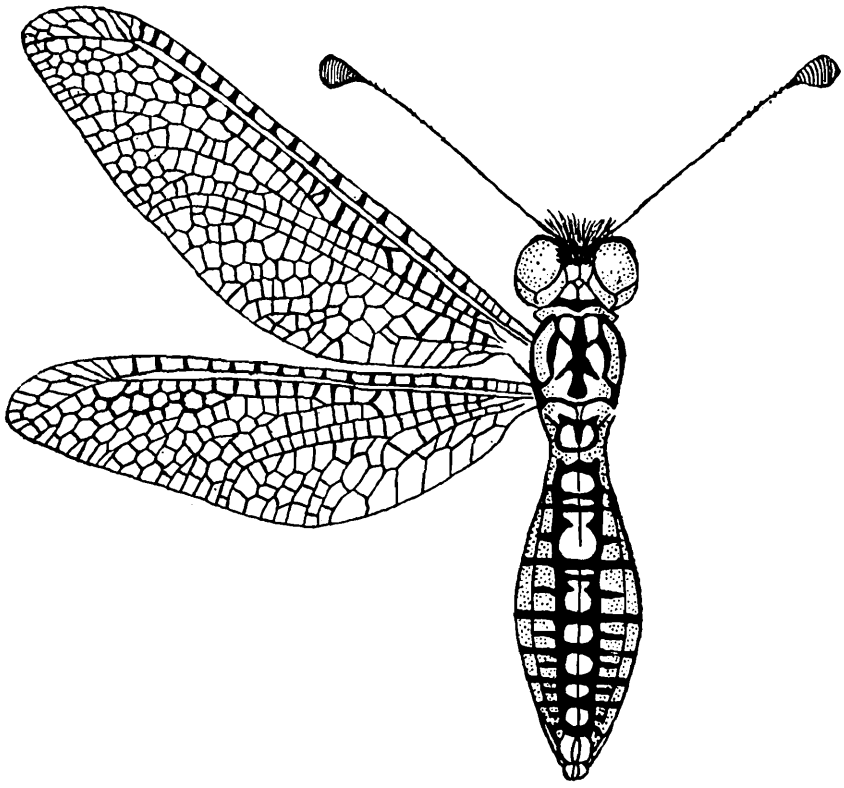
Head bright yellow except the vertex which is black and coated thickly with long dark brown hair; a tuft of bright yellow hair in front of and between the antennae; eyes dark reddish brown with an iridescent sheen.

Thorax bright yellow marked with black as follows:—a narrow, dorsal, transverse, black mark on middle of prothorax, on middorsum of thorax from before back, a broad, "T" shaped mark, followed by a marking shaped like an inverted anchor. The arms

of the "T" prolonged out and back as far as the root of the forewing and on each side of its stem with a parallel stripe which runs back and joins the arms of the anchor-mark. Posterior to the latter, a transverse black line and then another, smaller "T" shaped mark.

Laterally pale yellow marked with two fine, black and rather sinuous lines which pass down from the root of each wing to run between the first and second, and second and third pairs of legs respectively. A third line borders the metepimeron below and runs forward behind the last pair of legs.

Legs golden yellow, the femora with a ferruginous tinge on the extensor surface; tarsi and extreme distal ends of tibiae black; a longitudinal broad stripe of brown on the distal two-thirds of



TEXT-FIG. 4.—*Ogcogaster kempi*, sp. nov. ♀ : × 2.

the extensor surface of femora. Tibial spines as long as the first joint of tarsus.

Abdomen yellow marked with black. On the dorsum, each segment is outlined in black enclosing a bright yellow spot, and from the lateral black line, on each segment runs an apical and a medial fine, black line, the former passing right under the ventrum to join up with its fellow from the other side and the latter or medial stopping short at the level of the spiracles.

Wings similar to those of *segmentator*, rather rounded at the apex, membrane hyaline, reticulation black except the main nervures which are bright yellow, especially the subcosta and radius. The transverse nervures along the costa of both wings, at the base and over a small area of the wing posterior to the

stigma in the hindwing and a similar area of the same wing along the posterior border opposite the stigma suffused with dark brown; stigma bright citron yellow, traversed by 5 yellow nervures which bear minute, black spines.

Appendages very short, genital flaps projecting horizontally out and forwards.

Female very similar to the male, differing as follows:—

The eyes are puce coloured; legs black except the knee-joints and extensor surface of tibiae which are yellow, this colour being more extensive on the anterior tibiae than the middle pair and on the middle than the posterior pair.

Genital flaps very broad, bluntly triangular, not differing markedly from those of *segmentator*.

Abdomen ♂ 16 mm., forewing ♂ 40 mm.; hindwing ♂ 35 mm., antennae ♂ 27 mm. Abdomen ♀ 16 mm.; forewing ♀ 37 mm.; hindwing ♀ 32 mm.; antennae ♀ 25 mm.

This species is readily distinguished from *tessalata* and *kirbyi* by the bright yellow stigma (black in the latter two species), and from *segmentator* by the absence of the broad, black, midventral line, by the antennae being yellow, the face quite unmarked and by the very short anal appendages of the male.