

New Asiatic Telenominæ (Hym., Proctotrupoidea). By
G. E. J. NIXON, B.A., Department of Entomology,
British Museum of Natural History.

THE material on which the following paper is based
has been received from the Imperial Institute of Entomology
for identification.

The types of all new species have been deposited in
the collections of the British Museum.

Subfamily *Telenominæ*.

The generic classification of the Telenominæ is largely
in a state of confusion. I think, therefore, that a few
remarks concerning the position of the species described
below will not be inappropriate.

Kieffer has been, to a large extent, responsible for
the existing chaos, owing to his objectionable practice
of relying on inadequate descriptions for the inter-
pretation of species. Having satisfied himself as to the
correct identity of the host of species described by Walker,
Ashmead, Thomson, and others—a conclusion frequently
based on assumption, since the authors cited were seldom
explicit about the very characters on which he lays
stress,—Kieffer proceeded to redistribute them within
a scheme of genera formulated by himself. For example,
there is *Liophanurus* Kieff., a motley assortment of
species, belonging to *Microphanurus* Kieff., *Telenomus*

Hal., and *Phanurus* Thoms. It is a genus erected on what is, in my experience, a highly improbable combination of characters, namely, bare eyes and unsculptured second abdominal tergite, and it is significant that Kieffer himself places none of his own species within it. But I do not propose to spend more time discussing such a shadowy concept as the genus *Liophanurus*.

Dodd has recognized two genera to contain the greater part of the Telenominæ. These are *Telenomus* Hal. and *Neotelenomus* Dodd. In *Telenomus*, Dodd has placed species both with and without hairy eyes (*i. e.* his *Telenomus* contains also *Microphanurus* Kieff.). *Neotelenomus* Dodd differs from *Telenomus* sensu Dodd in that the antennæ of the female have only 10 segments instead of the usual 11.

Hence Dodd, as I interpret him, divides those Telenominæ in which the mesonotum is without parapsidal furrows, the fore wings have a well-developed stigmalis and a more or less well-developed postmarginalis, and tergite 2 has at least a costate furrow at base, as follows :—

- | | |
|---|-----------------------|
| (A) Antennæ 10-segmented in ♀; eyes bare ? or hairy ? | <i>Neotelenomus</i> |
| | [Dodd.] |
| (B) Antennæ 11-segmented in ♀; eyes bare or hairy | <i>Telenomus</i> Hal. |

Kieffer assumed that *Neotelenomus* Dodd had bare eyes, and hence failed to sink it under his own *Aholcus*, with which it is undoubtedly identical. My only justification for establishing this synonymy is that it is, in every way, consistent with my experience of the Telenominæ as a whole.

In an earlier paper (Trans. R. Ent. Soc. Lond. 1935, p. 77), I sank *Aholcus* Kieff. as a synonym of *Telenomus* Hal. I have come to regard this step as unnecessary for two reasons: first, the name *Aholcus* is useful as a label for a well-defined species-group, so long as only females are considered; second, the character separating this species-group from *Telenomus* proper is an absolute one, namely, the difference between ten and eleven. A careful study of many species of both *Telenomus* s. str. and "*Aholcus*" has revealed, so far, no other constant difference than the one I have just mentioned. It is my intention, therefore, to regard *Aholcus* Kieff. as a subgenus of *Telenomus* Haliday.

It will now be necessary to say something about *Phanurus* Thomson. Thomson (Öfv. K. V. Ak. Förh. 1860, p. 169) divides the Swedish Telenominæ as follows :—

- (A) Frons punctata ; abdomen feminæ terebra
 haud exserta *Telemonus* Hal.
 (B) Frons lævis ; abdomen feminæ terebra exserta. *Phanurus* Thoms.

The latter of the two characters mentioned is of doubtful value, since I have found that in individuals of the same species the ovipositor is sometimes exerted, sometimes concealed. The other character, the sculpture of the frons, is at best only of subsidiary generic importance. In describing *Phanurus* further, Thomson says of the second abdominal tergite, "basi plerumque lævi." On the other hand, Kieffer redescribes *Phanurus* as having at least the second tergite not striated, and assigns to the genus hairy eyes, although Thomson does not mention which of his species within the Telenominæ have this characteristic. So far I have seen no Telenomine in which the second tergite is without at least a very short costate furrow at its extreme base, and I have no hesitation in saying that the form of this furrow provides no character of generic value.

In view of the above remarks, I propose sinking *Phanurus* Thoms. as a synonym of *Telenomus* Hal.

In the 'Entomological Magazine,' vol. i. p. 271, Haliday cites *Telenomus ater* first in his diagnosis of the genus. This species, of which Haliday apparently knew only the male sex, should, strictly speaking, be regarded as the genotype. But as the description is too short to be of any value, and as no specimen can be found which could possibly be the type, the name *ater* should be rejected in favour of *brachialis*, the second species given by Haliday in his diagnosis of *Telenomus*. Through the kindness of Mr. A. W. Stelfox, of the Dublin Museum, I have been able to examine the unique specimen of *brachialis*, a female, existing in Haliday's collection in the National Museum of Ireland. This specimen bears the name "*brachialis*" in Haliday's own handwriting, and, in view of the fact that Haliday never designated types, can safely be regarded as the type of the species in question. This insect is a typical *Telenomus*, and, having hairy eyes, falls naturally within Kieffer's interpretation of the genus.

Hence, for that great complex of species which is characterized by having hairy eyes without parapsidal furrows, or bare eyes with sometimes short parapsidal furrows posteriorly, fore wings with a well-defined stigmalis and more or less well-defined postmarginalis, second abdominal segment with at least a costate furrow at extreme base—for all these species I use two genera which I separate as follows:—

- | | |
|---|--|
| 1. Eyes bare (usually strongly sculptured species) | <i>Microphanurus</i> |
| Eyes hairy, but sometimes the hairs very minute. | [Kieff.] |
| (Species with tergite 2 showing at least a very short costate furrow at base) | 2. |
| 2. Antenna of ♀ 11-segmented | <i>Telenomus</i> Hal. |
| Antennae of ♀ 10-segmented | <i>Telenomus</i> , subg.
[<i>Aholcus</i> Kieff.] |

In my revision of the African Telenominæ (*loc. cit.*), I have tabulated the differences between *Telenomus* and *Microphanurus*.

TELENOMUS.

The following seven species all fall within the subgenus *Aholcus*, as defined above. Several of them are alike in all characters save the genitalia of the males. This structure, as I discovered while working on the African species of *Telenomus*, continues to show excellent and easily appreciated specific differences; to examine it is really the only satisfactory way of separating critical species.

With regard to the figures of male genitalia, which are from drawings made by me, I should like to emphasize that, from an anatomical point of view, they are incomplete, since all details that did not seem to be of specific value or were difficult to make out have been omitted.

The following keys are not very satisfactory, but, used in conjunction with the figures of the male genitalia and records of hosts, they may be helpful.

TELENOMUS (subg. AHOLCUS).

♀♀.

- | | |
|--|---------------------------|
| 1. Antennal club clearly 5-segmented, that is, funicle 4 much nearer in size to 5 than to 3. (Species with the vertex evenly rounded between the posterior ocelli) | <i>molorchus</i> , sp. n. |
| Antennal club more or less 4-segmented or ill-defined, that is, funicle 4 not clearly nearer in size to 5 than to 3. (Species with the vertex sharply angled between the posterior ocelli) | 2. |

- | | |
|---|----------------------------|
| 2. Hind wings very narrow, more or less parallel-sided beyond the nervature, the fringe at widest part of wing being slightly longer than the width of the wing at the same point. (Very small species, c. 0.47 mm., with the legs pale transparent yellow throughout and the abdomen noticeably yellowish-brown) | <i>ulusalus</i> , sp. n. |
| Hind wings clearly not parallel-sided beyond the nervature, the fringe at widest part of wing never as long as the width of the wing at the same point | 3. |
| 3. Thorax clearly a little flattened dorso-ventrally. (Species with the legs entirely pale yellow throughout) | <i>turbatæ</i> , sp. n. |
| Thorax not at all flattened dorso-ventrally, the mesonotum strongly and evenly convex | 4. |
| 4. Tergite 2 striate over basal third, at least medially. (Species with the head only very slightly wider than the thorax) | <i>stigiæ</i> , sp. n. |
| Tergite 2 with only a costate furrow at base, or at most over basal quarter feebly striate | 5. |
| 5. Legs (except the coxæ) and the antennal scape bright yellow | <i>adenyus</i> , sp. n. |
| Legs with at least the femora and the antennal scape darkened | 6. |
| 6. Head only very slightly wider than the thorax, not markedly crescentic as seen from above. | <i>talauis</i> , sp. n. |
| Head markedly wider than the thorax and markedly crescentic as seen from above. | <i>incommodus</i> , sp. n. |

♂♂.

- | | |
|--|----------------------------|
| 1. Antennæ with 10 segments | <i>ulusalus</i> , sp. n. |
| Antennæ with 12 segments | 2. |
| 2. Funicle 1-3, especially 3, extraordinarily dilated, 3 being fully twice as wide as the following segments | <i>stigiæ</i> , sp. n. |
| Funicle 1-3 at most slightly dilated | 3. |
| 3. Antennæ and legs very pale transparent yellow. | <i>turbatæ</i> , sp. n. |
| Antennæ and legs not pale transparent yellow. | 4. |
| 4. Funicle 1-2 conspicuously longer than wide. | <i>molorchus</i> , sp. n. |
| Funicle 1-2 at most a little longer than wide. (Species with the antennæ similar.) | 5. |
| 5. Legs, except the coxæ, bright yellow | <i>adenyus</i> , sp. n. |
| Legs with at least the femora darkened | 6. |
| 6. Head only slightly wider than the thorax. | <i>talauis</i> , sp. n. |
| Head very distinctly wider than the thorax. | <i>incommodus</i> , sp. n. |

Telenomus (Aholcus) molorchus, sp. n.

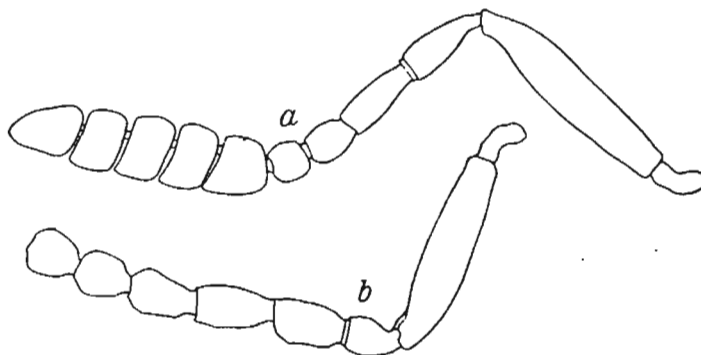
♂♀.—Black. Antennæ of ♀ dark brown throughout, of ♂ pale brown throughout. Legs brownish-yellow.

♀.—*Head*, seen from above along a line perpendicular to a line between the posterior ocelli, not at all markedly crescentic, distinctly wider than the thorax, 22:19. Vertex between the ocelli and to the sides of the anterior ocellus evenly scaly-reticulate, with hardly an indication

of punctures; further, the vertex is evenly rounded between the posterior ocelli. Occipital margin well defined right down to the peristomium, the surface, at about its mid-lateral point (the head being seen from above), falling away very sharply from the ridge. Shortest distance between the eyes across the frons not much greater than the width of the eyes as seen from above. Antennæ long; funicle with an unmistakably 5-segmented club; funicle 1 hardly less than twice as long as its greatest width (fig. 1, *a*).

Thorax: Mesonotum rather dull, the scaly-reticulate sculpture being very close and somewhat uneven. Fore

Fig. 1.



Antennæ of *Telenomus (Aholcus) molorchus*, sp. n.: *a*, ♂; *b*, ♀.

wings: venation very distinct; stigmalis long; post-marginalis well defined, fully $1\frac{1}{2}$ times as long as the stigmalis. Hind wings much widened in the middle; fringe at widest part of wing very slightly less than half the width at that point.

Abdomen only slightly longer than wide. Tergite 2 with striations extending beyond the basal furrow and covering nearly one-third—at least medially—of the segment; also this tergite is almost exactly as long as wide.

♂.—Antennæ: funicle 1-3 clearly longer than wide (fig. 1, *b*); 4-9 more or less bead-like. Genitalia (fig. 4, *e*).

Length: ♂♀, 1 mm.

CEYLON (Pussellawa), *J. C. Hutson*: large series of ♀♀ and 2 ♂♂, bred, 22. xi. 1920, from eggs of *Lenodora vittata* Walk.

Characteristic of this species are the 5-segmented antennal club of the female, evenly rounded vertex, and broad hind wings. It belongs to a different group from the other species described in this paper, and in many respects appears to be closely related to the African *cybele* Nixon. The genitalia of the males of the two species are, however, very different in appearance.

Telenomus (Aholcus) ulusalus, sp. n.

This is a tiny species, about half a millimetre in length.

♀.—First five segments of the antennæ, and the legs throughout, pale transparent yellow; the funicular segments are sometimes darker than the legs. Brownish-black species with the abdomen clearly paler than the head and thorax.

Head strongly transverse, large in comparison with size of thorax and abdomen, very distinctly wider than the thorax, 4:3, and markedly crescentic when seen from above. Eyes rather small, the shortest distance between them compared with their width, as seen from above, as 7:4. Vertex very sharply angled immediately behind the posterior ocelli, the declivous part falling away perpendicularly to the occipital foramen, there being no trace of an occipital margin (fig. 2, *b*). Antennæ: funicle 4 clearly shorter and narrower than 5, so that, if size alone of segments be considered, the club is more or less 4-segmented.

Thorax: Mesonotum strongly convex, but with the usual feeble sculpture. Scutellum virtually smooth and shining all over. Fore wings faintly yellowish; stigmalis short, very indistinct; hind wings very narrow, the fringe at the widest part of the wing being slightly longer than the width of the wing at the same point.

Abdomen not much longer than wide, about 5:8. Tergite 2 with only a feeble costate furrow at extreme base.

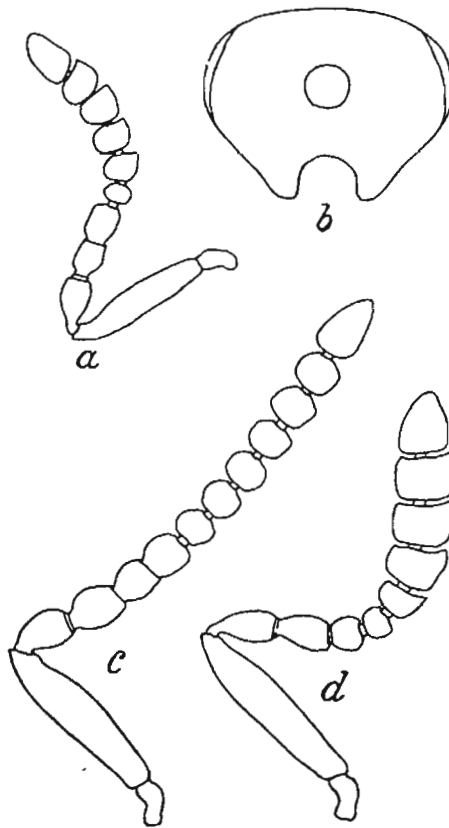
♂.—Antennæ 10-segmented, distinctly clavate (fig. 2, *a*); the three or four apical segments of the funicle are slightly darkened. Genitalia (fig. 4, *b*).

Length : ♂♀, .47 mm. approx.

MALAYA (Ulu Sali Road), *G. H. Corbett* : series bred, 16. v. 1935, from eggs of a Lepidopteron.

This little species is largely characterized by having the head strongly transverse and conspicuously wider

Fig. 2.



Telenomus (Aholcus) ulusalus, sp. n. : (a) antenna of ♂ ; (b) head of ♀ (from behind).

Telenomus (Aholcus) adenyus, sp. n. : (c) antenna of ♂ ; (d) antenna of ♀.

than the thorax and by the absence of the occipital margin. The pale legs, pale antennæ, and brownish abdomen are also characteristic.

The species is interesting, further, on account of the 10-segmented antennæ of the male. *Telenomus* (*Neotelenomus*) *fiskei* Brues, from the U.S.A., is the only other known species of *Telenomus* in which the male shows a similar reduction in the number of antennal segments.

Telenomus (*Aholcus*) *turbata*, sp. n.

♂♀.—Legs pale yellow throughout. First five segments of the antennæ of ♀ much the same colour as the legs.

♀.—*Head* seen from above, along a line perpendicular to a line between the posterior ocelli, somewhat long, less than twice as wide as its greatest length, 5 : 3; seen from the same angle, the eyes occupy the entire lateral surface of the head; further, the eyes are rather large, the shortest distance between them only slightly greater than their width as seen from above, 17 : 14. Vertex in the region of the anterior ocellus somewhat depressed. Occipital margin weak but distinct; when the head is seen from behind, this margin is situated slightly above the mid-point between the occipital foramen and the top of the vertex. Vertex falling very sharply away to the occipital margin. Antennæ: segment 4 of the funicle shorter and narrower than 5, so that the club is not clearly differentiated (fig. 5, *b*). Frons in greater part entirely smooth and shining, towards the eye-margin with some very vague sculpture and some very ill-defined punctures.

Thorax a little narrower than the head, 13 : 15. Mesonotum only feebly convex, its sculpture indefinite, but somewhat close and dull. Scutellum almost smooth and shining everywhere. Fore wings somewhat yellowish; venation yellowish and indistinct, stigmalis somewhat long; hind wing not at all parallel-sided beyond the nervature, the fringe at widest part of wing only slightly more than half the width of the wing at the same point.

Abdomen nearly twice as long as its greatest width, 20 : 11; tergite 2 distinctly longer than its greatest width, 14 : 11, with a well-marked costate furrow at its base.

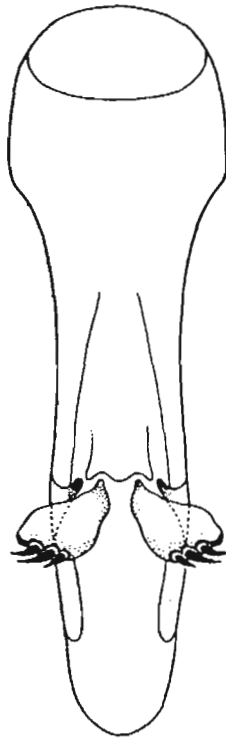
♂.—Antennæ pale yellow throughout; funicle hardly thickened towards the apex (fig. 5, *a*); segments 4-9 of the funicle bead-like. Genitalia (fig. 4, *c*).

Length: ♂♀, .75 mm. approx.

MALAYA (Kuala Lumpur), *G. H. Corbett*, series bred, 5. ii. 1926, from eggs of *Orgyia turbata* Butler.

This species is characterized to some extent by the feebly convex, almost flattened thorax.

Fig. 3.



Male genitalia of *Telenomus (Aholcus) adenyus*, sp. n.

Telenomus (Aholcus) adenyus, sp. n.

This species is evidently closely related to *turbatae*, from which it differs as follows:—

♀.—Basal segments of the funicle on the whole darker than in *turbatae*, but legs (except for coxæ, which are blackened) similarly pale yellowish.

Head distinctly more transverse. Vertex behind the

posterior ocelli sharply declivous; occipital margin, as in *turbatæ*, weak but distinct, and when the head is seen from behind, this margin is situated almost exactly at mid-point between the occipital margin and the top of the vertex. Antenna (fig. 2, *d*).

Thorax, in lateral aspect, distinctly higher. Mesonotum more feebly sculptured, more shining, and *strongly convex*. Fore wings similarly yellowish; stigmalis very slightly shorter.

Abdomen almost exactly twice as long as its greatest width, when the segments are not retracted, and slightly more pointed apically than in *turbatæ*.

♂.—Antennæ pale brownish, very slightly thickened towards the apex, of ordinary form (fig. 2, *c*); segments 4–9 of the funicle bead-like. Genitalia markedly different from *turbatæ* (fig. 3, *e*).

Length: ♂♀, .75 mm. approx.

CEYLON (Peradenya), J. C. Hutson: series bred, 12. vii. 1928, from lepidopterous eggs on Lima beans.

Telenomus (Aholcus) incommodus, sp. n.

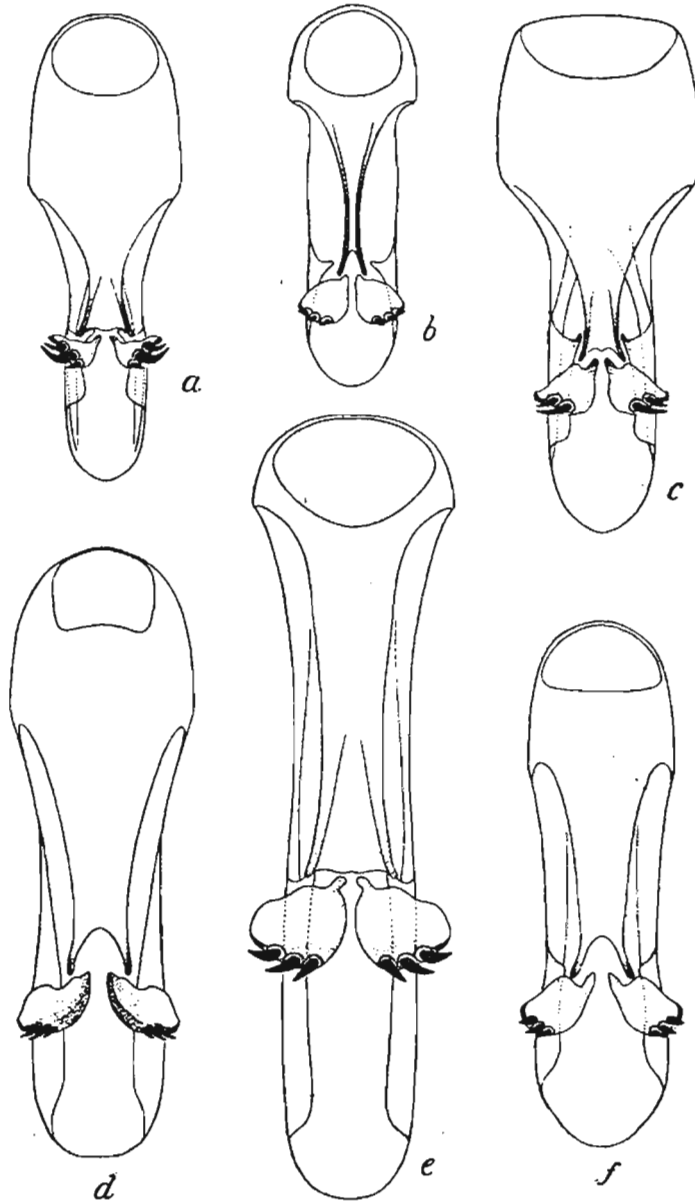
This is another species with the hind wings not at all parallel-sided beyond the nervature. In general facies it resembles *adenyus* very closely, having the same strongly convex mesonotum, with this part showing a similar degree of sculpturation. The genitalia of the males of the two species show them to be quite distinct from one another.

A. incommodus may be compared with *adenyus* as follows:—

♀.—Legs darker in colour, that is, more or less brownish-yellow; first five segments of the antennæ likewise darker; the scape yellowish basally.

Head slightly more transverse, and wider in proportion to the width of the thorax. Shortest distance between the eyes almost equal to the width of an eye, as seen from above. Vertex to the side of the anterior ocellus, as in *adenyus*, with rather large punctures, which are, as usual, not sharply defined; the surface sculpture between the punctures tends to be very weak, almost absent. Vertex as in *turbatæ* and *adenyus*, falling away very sharply behind the posterior ocelli. Occipital margin distinct but

Fig. 4.



Male genitalia of (a) *Telenomus (Aholcus) incommodus*, sp. n.;
(b) *T. (A.) ulusalus*, sp. n.; (c) *T. (A.) turbatæ*, sp. n.; (d) *T. (A.)
stigma*, sp. n.; (e) *T. (A.) molorchus*, sp. n.; (f) *T. (A.) talaus*, sp. n.
All drawn to same scale.

weak, situated exactly midway between the occipital foramen and the top of the vertex.

Thorax: Fore wings with a slight smoky tinge, absent in *adenyus*; fringe of hind wings at widest part of wing, clearly more than half the width of the wing at the same point.

Abdomen, when the segments are not retracted, almost twice as long as its greatest width. Tergite 2 with a conspicuous costate furrow at base; this tergite is distinctly longer than in *adenyus*, about 28 : 23.

♂.—Antennæ yellowish-brown; funicle 1 only slightly longer than wide; 4-9 bead-like. Genitalia (fig. 4, a).

Length: ♂♀, .7 mm. approx.

MALAYA (Batu Gajah), G. H. Corbett: series of 7 ♀♀, 4 ♂♂, bred, 30. iii. 1929, from eggs of a lepidopteron, the larva of which feeds on banana-leaves.

Telenomus (Aholcus) stigis, sp. n.

♂♀.—Legs predominately yellowish, with a brownish tinge on the femora. Antennæ of ♀ yellowish-brown, with the scape and funicle paler beneath, to predominantly brown throughout.

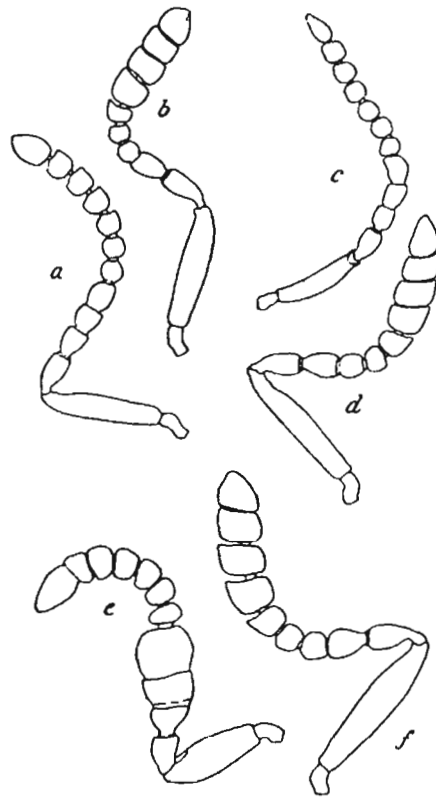
♀.—*Head* not quite twice as wide as long, seen along a line perpendicular to a line between the posterior ocelli, 17 : 9. Eyes rather large, the shortest distance between them to width of eye, as seen from above, as 9 : 7. Frons over its greater part entirely smooth and shining, but towards the eye-margin with some very weak scaly-reticulation. Vertex between the ocelli feebly scaly-reticulate, with a very few ill-defined punctures; similar punctures occur at the sides of the anterior ocellus; further, the vertex falls away rather sharply from the posterior ocelli so that a posterior, declivous surface is sharply delimited. Circumference of occiput small. Antennæ: funicle 4 more or less intermediate in size between 3 and 5 so that the club is not sharply 5-segmented (fig. 5, f).

Thorax slightly narrower (greatest width) than the head, 14 : 17. Mesonotum with the usual vague scaly-reticulate sculpture, which, however, is strong enough for the surface to be described as almost matt. Scutellum predominately smooth and unsculptured. Fore wings:

stigmatis rather long; hind wing narrow, its fringe at widest part of wing more than half the width of the wing at that point.

Abdomen about $1\frac{1}{2}$ times as long as wide, about 23 : 15. Segment 1 strongly transverse and deeply costate right

Fig. 5.



Antennæ of (a) *Telenomus (Aholcus) turbatæ*, sp. n., ♂; (b) *T. (A.) turbatæ*, sp. n., ♀; (c) *T. (A.) talaus*, sp. n., ♂; (d) *T. (A.) talaus* sp. n., ♀; (e) *T. (A.) stigis*, sp. n., ♂; (f) *T. (A.) stigis*, sp. n., ♀.

across; 2 as long as wide, its basal costæ extending medially as delicate striations over nearly basal third; 3-6 hairy and with some microscopic sculpturation.

♂.—Segments 1-3 of the funicle extraordinarily dilated, 3 being fully twice as wide as the following segments (fig. 5, e). Genitalia (fig. 4, d).

Length: ♂♀, .95 mm. approx.

MALAYA (Kuala Lumpur), G. H. Corbett: two series, comprising both sexes, bred, ix. 1924 and x. 1926, from eggs of *Acherontia styx* West.

The male of this species is unmistakable on account of the striking development of certain of the antennal segments.

Telenomus (Aholcus) talaus, sp. n.

A species very like *stigis*, especially in the ♀, but less robust. The ♂, however, is without the dilated funicular segments of *stigis*, but the genitalia of the two species are very similar.

♀.—Eyes less large, the shortest distance between them to the width of an eye, as seen from above, as 3:2. Vertex similarly sharply angled, but the occipital margin, above, forming almost a right angle, not very feebly angled as in *stigis*. Mesonotum more convex than in *stigis*. Tergite 2 striate on basal quarter at most. Antenna (fig. 5, d).

In all other respects I can detect no other differences between the females of the two species.

♂.—Only segment 3 of the funicle is very slightly dilated (fig. 5, c). Genitalia (fig. 4, f); teeth of the apical articulated appendages shorter and blunter than in *stigis*; there are also minor differences in the shape of the various structures.

Length: ♂♀, .75 mm. approx.

MALAYA (Kuala Lumpur), G. H. Corbett: 6 ♀♀, 1 ♂, from eggs of *Papilio agamemnon* L., iii. 1925.