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A systematic study of the parasite complex of the
Karoo Caterpillar, *Loxostege frustalis* Zeller:
Perilampidae and Ichneumonidae (Hym.).

by

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Considerable biological study has been made in South Africa of the Karoo Caterpillar, *Loxostege frustalis* Zell. and its parasite complex by Dr. S. J. S. Marais, and it was especially desired that the identity of the parasites should be firmly founded. The Braconidae are being described by my colleague Mr. G. E. J. Nixon in a companion paper. Some Chalcididae were received, and most were determined as a probably new species of *Peltochalcidia* Steffan 1948: Monsieur J. R. Steffan kindly consented to study them, and his paper should appear in the *Bulletin du Museum d'histoire naturelle* in early 1956. There remained the Perilampidae and Ichneumonidae, which are treated below.

Some specimens of the species here treated, including the holotypes of the two described as new, are deposited in the British Museum (Natural History), and others are being returned to the Department of Agriculture, Pretoria. It is the intention of Dr. H. K. Munro to present some of the latter to the Transvaal Museum.

Family PERILAMPIDAE

Perilampus rostratus sp.n.

Head from above (fig. 1) rather strongly transverse and narrowed behind eyes, having ocelli further apart than their own diameters, the lateral one and a half times their own diameter from eye margin; in frontal view (fig. 2) rather elongate, the eyes not nearly reaching level of base of clypeus: shining and finely piliferous-punctate in front, rugose-punctate on a finely reticulate background on vertical region, merging to strongly striate behind; without distinct frontal folds. Clypeus quite strongly transverse, basally and laterally not deeply delimited, with the slightly reflexed apex almost truncate. Maxillae and labium produced to form a rostrum much more elongate than in any other species seen (fig. 3: cf. fig. 4 of *tristis* Mayr).

Antennal scape of female almost parallel-sided, very slightly expanded to base and apex, almost smooth beneath; of male in apical half a little more

expanded and closely punctate beneath. Postannellus about quadrate in female, distinctly transverse in male.

Pronotum behind collar, mesoscutum and scutellum above loosely reticulate and with finely reticulate microsculpture, giving these parts a matt appearance: scutum with the usual smooth bands beside the notaulices: axillae distinctly longitudinally striolate: scutellum with a slightly raised median ridge that makes its way between the reticulations, its overhang with an almost smooth band that usually is somewhat broader than either of the two rows of alveoli it separates. Upper triangular part of prepectus completely fused with pronotum; lower part, as in *tristis* Mayr, not distinctly marked off from the pectus, but running almost straight down to hind margin, which is strongly raised and shallowly emarginate. Propodeum (fig. 5) having median keel broadened into a narrow diamond-shaped, smooth area; having a row of coarse punctures beside this and anteriorly, and of finer ones on other sides of the large, mirror-like areas; strongly and closely reticulate at sides: metapleura smooth, traversed by a row of coarse punctures.

Petiole segment short, its hind margin raised sharply, but not nearly so steeply as in *tristis* Mayr.

Fore wings with postmarginal vein about or more than three-quarters length of marginal: stigma without uncus, but distinctly angled in that position.

Legs with femora and tibiae scaly-reticulate, on outer side of about equal fineness to microsculpture of mesoscutum.

Length about $2\frac{1}{2}$ mm.

Coloration as follows: head on top and some way down orbits, and thorax above, dull green with bright, brassy reflection, the punctures darker; the whole sometimes overlaid in greater or lesser part with bronzy, or sometimes in small part with bluish: femora except at apex, and tibiae in part similar: scape and pedicellus, coxae and trochanters darker brassy-green to blue-black: remainder of head and thorax, propodeum and gaster blue-black, sometimes giving way to brassy green, the diamond-shaped middle part of the propodeum brassy to bronzy: antennal flagellum and remainder of legs testaceous, the flagellum darkened above: mandibles metallic at base, merging to testaceous with dark tips.

This species has been reared in large numbers as a secondary parasite of *Loxostege frustalis* Zell.: it has been noted as reared from the *Macrocentrus* species described by my colleague G. E. J. Nixon in a companion paper, but it seems possible that the primary Ichneumonidae and Tachinidae might also be compatible primary hosts if they are available at the right time of year. Holotype and paratypes: Cape Province, Middelburg, ii-iv. 1951, xii. 1951, S. J. S. Marais; additional paratype: Orange Free State, Boshof, 1 ♀ 1.x.1926, R. Nel.

It is very different from the large, black species *maurus* Walker 1852, which has sharp frontal carinae; and it does not agree with the descriptions of the more recently described African species. I have been able to make direct comparisons with the types of *brevicornis* Risbec 1951, which belongs in another genus, and *braconiphaga* Risbec 1951. It was hoped to make a direct

comparison also with *laticeps* Masi 1940; but Professor Russo informs me that the unique type of that species cannot be traced in his institute, and was evidently among material lost on account of wartime conditions.

In the key to French species of Steffan (1952), it would run to *tristis* Mayr. Steffan observed that in that species the sides of the pronotum and prepectus are almost fused, though a line of division is apparent at least in the upper part. This fusion has been carried further in the species now under description, as it has also in the Asiatic *microgastris* Ferrière 1932, the North American *similis* Crawford 1914 (which is represented in the British Museum collection by specimens determined by C. F. W. Muesebeck) and the West Indian *politifrons* Howard (one specimen in British Museum), a species apparently very closely related to *tristis* Mayr. *P. tristis* Mayr differs from it most notably in having the frontal folds quite distinct though not sharp, the male antennal scape more than a little expanded, the pronotum, mesoscutum and scutellum above closely reticulate, and the propodeum with median keel sharp or rather sharp. *P. microgastris* has the head in facial view much shorter, with eyes almost or quite reaching level of base of clypeus, the male antennal scape more than a little expanded, the pronotum, mesoscutum and scutellum above closely reticulate, the lower part of prepectus more sharply marked off from the pectus, and the propodeum with a sharp median keel. *P. similis* has the head less broad, and in male very strongly swollen in place of the frontal folds, the pronotum, mesoscutum and scutellum above somewhat loosely reticulate, shining between the punctures near mid line, and the propodeum with a sharp median keel and a strong nucha.

In the key to N. American species of Smulyan (1936), *P. rostratus* sp.n. would run not to *similis* Crawford but to *granulosus* Crawford 1914, on account of the very short petiole. From the description of *granulosus* it differs most notably in having the interspaces on mesoscutum not in large part smooth, and the scutellum shining and almost smooth and not with dense granular sculpture laterally; also in the head shape in various aspects, and in having the hind tibiae in greater part metallic coloured.

Perilampus maurus Walker

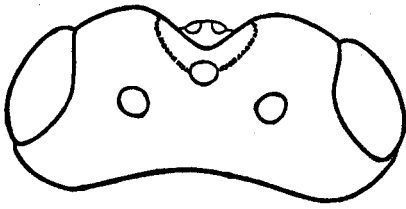
1852 *Perilampus maurus* Walker, *Ann. Mag. nat. Hist.*, (2) 10: 45.

1911 *Perilampus testaceitarsis* Cameron, *Ann. Transvaal Mus.*, 2 (4): 214, syn.n.

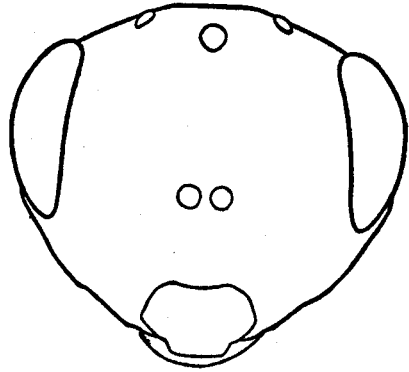
Two original Walker specimens, both males, stand in the British Museum

LEGEND

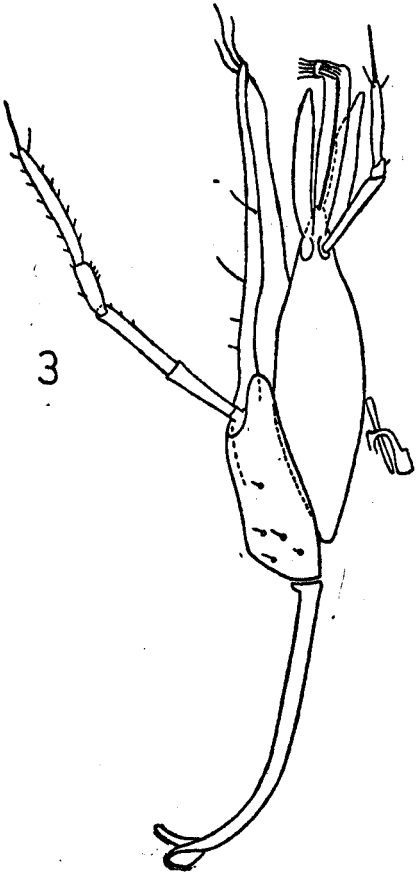
Figs. 1-4. (1) *Perilampus rostratus* sp.n., head of ♀ viewed from above; (2) the same in facial view; (3) labium and right maxilla; (4) *P. tristis* Mayr, labium and left maxilla, for comparison with last.
In fig. 4, the labium was drawn from a second, slightly smaller, (female) specimen which had not been squashed out of shape by a coverslip.



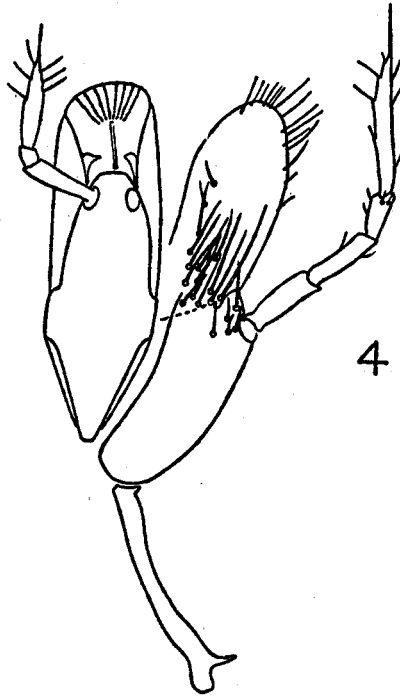
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4

collection. One bears Walker's original label, but the other has one antenna unbroken and is in other respects a better specimen, and I select it as lectotype.

The unique type of *testaceitarsis* Cameron from Pretoria is male. I have compared it carefully with Walker's cotypes and with modern specimens determined by Ch. Ferrière as *maurus* Walk., including some reared from Dipterous puparia, and I consider them as specifically identical. The clypeo-frontal suture is less deeply emarginate above in Cameron's type. The British Museum series examined shows variation in the shape of the scutellum, some specimens having it more pointed apically than others.

***Aperilampus brevicornis* (Risbec), comb. n.**

1951 *Perilampus brevicornis* Risbec, *Mém. Inst. franc. Afr. noire*, 13: 371-3.

I have examined the unique type of this species and consider it to be congeneric with *Perilampus discolor* Walker 1862, type species of *Aperilampus* Walker 1871.

In the tables of Ashmead (1904) and Schmiedeknecht (1909), *Aperilampus* is separated from *Perilampus* by having the gaster distinctly petiolate. This is misleading, for both genera are short-petiolate.

Family ICHNEUMONIDAE

Tribe CAMPOPLEGINI

Fourteen specimens of this tribe have been submitted to the Commonwealth Institute of Entomology, five females and seven males of a species of *Horogenes* Först. (= *Angitia* Hlgr.), and two females of a species that cannot be placed in any known European genus. Both have the tergites of the gaster largely rufous.

The species have been reared only in quite small numbers, and therefore are not considered to be of significant economic importance. It is not proposed to give them valid species names nor to describe them fully, but only to mention some few characters that may give indications to future workers on the parasite complex or on the taxonomy of the group.

The *Horogenes* species may be placed in the section C a of Thomson (1887), and seems to be related to the European species *fenestralis* Hlgr. and *chrysostricta* Gmel.

The other species may be distinguished superficially by having the hind tibiae broadly pale rufous, not white-banded. It resembles *Campoplex* Grav. (= *Omorgus* Först.) in having the postpetiole rounded and without glymma or scrobs lateralis; but the postpetiole has a fine lateral carina, the propodeum is hardly excavate in middle, the nervellus is not intercepted or angled, and the seventh tergite (female) is sharply and rather deeply incised, as in many *Horogenes* species. The ovipositor is relatively short: its sheaths project beyond the dorsal apex of the gaster by a little more than the dorsal length of tergite 5.

Tribe CREMASTINI

Cremastus pictus Holmgren 1868

1868 *Cremastus pictus* Holmgren, K. Svenska Fregatten *Eugenies Resa omkring Jordan* 2. Zoologi (1) *Insecta. Hymenoptera*: 419.

The reared series of specimens has been determined by comparison with the type and a second specimen, kindly sent from Stockholm by Dr. R. Malaise. The original description is perhaps misleading on the thoracic colouring: the propleura and mesosternum are mostly black, but the mesopleura are broadly yellow in lower half. The mesoscutum appears „subnitidus” on account of the close punctation, but the interspaces are mostly shining.

The species would come in section „c” in Thomson's treatment of the European species (1890, p. 1444-5): however, the area superomedia is distinctly closed behind in many specimens, though in the type the transverse costa closing it is hardly stronger than the transverse rugae on the area posteromedia. The reared specimens are rather larger than those described by Holmgren, and have the median black band on the lower face less developed.

I have examined the descriptions of types of the other African species described as *Cremastus*, and have not discovered any possible synonym.

Tribe MESOCHORINI

Genera *Mesochorus* Gravenhorst 1829 and *Stictopisthus* Thomson 1885.

C. G. Thomson (1885) in his study of the European Mesochorini, from which he specifically excluded *Cidaphus* Förster 1868 (= *Plesiophthalmus* Förster 1868), grouped the species within a single genus, which he divided into three subgenera namely *Mesochorus s.str.*, *Astiphromma* Förster 1868 and *Stictopisthus* Thomson. It has frequently happened that Thomson's subgenera have subsequently been considered as full genera, and these three were so treated by Schmiedeknecht (1910) and Morley (1914). There seems to be no doubt that *Astiphromma* is a valid genus; but *Stictopisthus* was replaced in synonymy with *Mesochorus* by Townes (1945 and 1951).

The following characters have been adduced to separate *Stictopisthus* — small, stout species, notably with legs stout, and with ovipositor sheaths stout, only about half length of petiolar segment: head, notably lower face, decidedly broad, with toruli much further apart than the distance between one of them and the eye: scutellar fovea narrow: postpetiole punctate-rugose (given incorrectly by Morley as punctate); fore wings with nervus parallelus emitted below middle of brachial cell and nervulus intercepting far beyond basal. It appears to me that the species included form a good, natural species-group of less than generic rank, and that the African species to be described below undoubtedly belongs to it. I would add that, in the three European species seen and in the African species the lower face and clypeus are coarsely rugose-punctate to punctate; but the African species has the postpetiole nothing like so strongly

longitudinally rugose as the European. The narrow scutellar fovea has very brief lateral margins, which are not continuous with the sharp, postero-lateral margins of the mesoscutum. The point of emission of the nervus parallelus in the group is variable, being frequently more or less median.

The African species treated by Wilkinson (1927) all belong to *Mesochorus* in the narrower sense, and it may be presumed that *M. nox* Morley does also.

***Mesochorus (Stictopisthus) breviscapus* sp.n.**

Head from above of normal proportions; moderately narrowed and very little rounded behind eyes in female, though more rounded in male; moderately and roundedly emarginate behind; in facial view broad, with cheeks rather short and very little rounded. Upper face with scrobes broad and deep, bounded on inner side by a pair of keels which run toward the outer sides of the lateral ocelli; very finely sculptured together with vertical region, which is obscurely punctate: temples and hinder genae more shining, the latter rather coarsely punctate: lower face rather strongly protuberant, coarsely transversely punctate-rugose, and with an ill-defined, blunt median keel; bounded above by a sharp keel which runs almost straight between and then below the toruli:

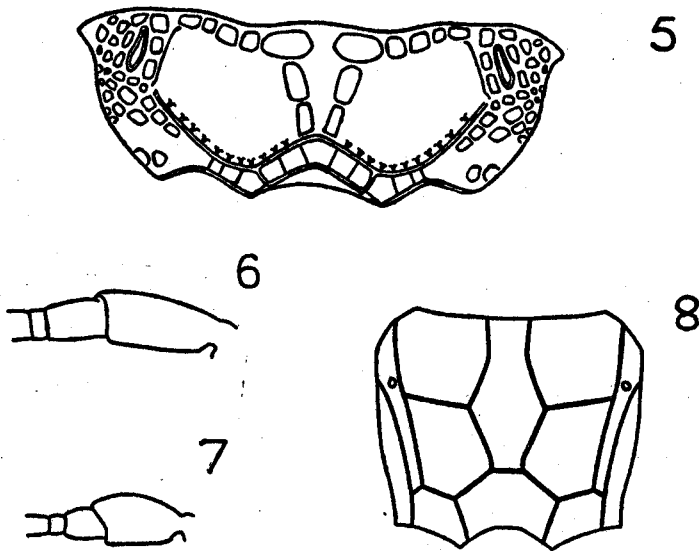


Fig. 5 *Perilampus rostratus* sp.n. ♀, propodeum.

Figs. 6-7: Antenna etc. in sinistro-lateral view of (6) *Mesochorus subniger* Wilkn. ♀; (7) *M. breviscapus* sp.n. ♀.

Fig. 8. *Mesochorus breviscapus* sp.n. ♀, propodeum.

clypeus coarsely punctate, reflected just before the sharply margined, almost truncate apex. Occipital costa strongly developed and uninterrupted; curving regularly round to meet, as genal costa, the hypostomal costa at rather more than half a right angle. Mandibles very little convex or twisted, and not at all sharply narrowed.

Antennae, as in European *Stictopisthus*, relatively short and stout, with scape (fig. 7) particularly short for the genus: flagellum 21- to 24-segmented.

Pronotum with a small, median semicircular area and, as in European *Stictopisthus*, having the dorsal transverse impression sharp and the femoral furrows broad and deep, without epomiae: laterally more or less finely punctate. Mesoscutum rather coarsely and densely punctate discally, much more finely so in front and at sides. Scutellum moderately and rather sparsely punctate, almost flat above. Mesopleura in greater part rather coarsely punctate, though much more finely so behind: sternaulices broad, moderately impressed: mesosternum almost flat, moderately and shallowly punctate: epicnemial carina complete: mesolcus rather sharply impressed and narrow, running into a broad pit before the sharp transverse costa which closes it behind. Propodeum above (fig. 8) shining and obscurely punctate, with costae weak and irregular; having areae spiracularis and lateralis obscurely rugose, and pleuralis rather strongly and densely punctate: area basalis almost parallel-sided, usually not closed apically: area superomedia not twice length of its greatest width, where it emits the costulae about in middle.

Petiole segment 2.2 to 3.0 times length of its greatest breadth; laterally distinctly margined to spiracle, and weakly so some way beyond it; with a curved, transverse keel before the small glymma; of female without distinct dorsal keels, but weakly longitudinally coriaceous-rugose beyond spiracles; of male more strongly coriaceous-rugose above, and with dorsal keels distinct though not strong. Remainder of gaster, as in most species, shining, sparsely and inconspicuously piliferous-punctate above: ovipositor sheaths projecting by less than length of tergite 2.

Fore wings with basal and disco-cubital veins not strongly divergent; with areolet quadrangular, just sessile or very shortly petiolate. Legs, as in European *Stictopisthus*, relatively short and stout.

Length, excluding ovipositor sheaths or claspers, about 4 mm.

Head in greater part behind, and on upper face except for the broad orbits, testaceous; with stemmaticum, occiput and mandibular apices blackish; elsewhere flavous. Antennae testaceous, darkened above and in apical half below. Prothorax mainly a similar testaceous. Mesothorax, metapleura and areae pleuralis a darker testaceous: sub-alar callus flavous: arising from region of notaulices are flavous lateral margins of mesoscutum, and also a pair of dorsal lines which extend back to sides of scutellar fovea and around scutellar shield: sides of scutellum, metathorax and propodeum above, blackish: tegulae stramineous. Legs mainly more or less pale testaceous; with hind tibiae paler, darkened at base and apex; and hind tarsi darkened. Wings with veins and stigma fuscous; the veins merging to stramineous at wing base, and the stigma with a very broad, paler middle streak. Petiole segment mainly

blackish, with broad apical margin pale testaceous: remainder of gaster mainly pale testaceous above, almost stramineous below, with darker marks laterally, apically and on sternites: third valvulae blackish.

Described from 8 ♀ ♀, 9 ♂ ♂, Cape Province, Middelburg, reared xi. 1950 — ii. 1951 as hyperparasites of *Loxostege frustalis* Zell. by S. J. S. Marais. It is suspected that the Tachinidae serve as primary hosts, but this has not been precisely determined.

This species would run in the key of Wilkinson (1927) to *subniger* Wilkn. or possibly to *nigellus* Wilkn. Those species differ from it in not having the characters of the *Stictopisthus* group or the pair of keels on the upper face, in having the occipital costa broadly interrupted in middle, the mandibles strongly narrowed in basal and slender in apical half, the antennal scapes very elongate (fig. 6 of *subniger* Wilkn.), the scutellum moderately convex, and in other characters that may be deduced by comparing the descriptions.

Very closely related to the European *M. (Stictopisthus) bilineatus* Thoms., which differs from it most clearly as follows: antennal scapes decidedly more elongate, sternaulices narrow and weakly impressed, postpetiole strongly longitudinally striate in female, rugose in male, general colour of head behind, and of pro- and mesothorax, black instead of testaceous.

Additional characters for other African *Mesochorus* species.

Since it seems likely that the African species of *Mesochorus* are very numerous, it may be well to add some head characters, not mentioned by Wilkinson (1927, 1929) for the species he described.

The occipital costa is broadly interrupted in middle in *nigellus* Wilkn., *nigrans* Wilkn. and *subniger* Wilkn.; uninterrupted in *melanothorax* Wilkn., *decoratus* Wilkn., *expolitus* Wilkn., *ornatus* Wilkn., *concinatus* Wilkn., *excultus* Wilkn., *herero* End. and *incertus* Wilkn.: it is weakly angled in middle in *melanothorax*, narrowly emarginate in middle in *excultus* and broadly so in *incertus*. It curves almost regularly round to meet the hypostomal costa in *nigrans*, *subniger*, *melanothorax*, *expolitus*, *ornatus* and *excultus*: it is very weakly emarginate below middle in *nigellus* and *herero*, and rather more strongly so in *incertus* [it is more strongly so in some European species]: it is somewhat curved in before meeting the hypostomal at an acuter angle in *concinatus* and *decoratus*.

The mandibles are very little convex or twisted and not sharply narrowed in *herero* and *incertus*; moderately or rather strongly narrowed and twisted in *decoratus*, *expolitus*, *ornatus* and *excultus*; sharply narrowed in upper basal half, and impressed in middle above in *melanothorax*; of similar form, but in basal half very sharply narrowed and strongly convex, though not especially slender in apical half, in *concinatus*; strongly narrowed in basal and slender in apical half in *nigellus*, *nigrans* and *subniger*.

The antennal scapes are of moderate proportion, very little longer relatively than in *breviscapus* sp.n. (fig. 7) in *incertus*; rather elongate in *nigrans*, *decoratus*, *expolitus*, *ornatus*, *excultus* and *herero*; elongate in *concinatus*;

elongate and rather strongly convex above in *melanothorax*; very elongate in *nigellus* and in *subniger* (fig. 6).

It will be seen that the second couplet in the key of Wilkinson (1927), which separates out the species *nigellus*, *nigrans* and *subniger*, may be supported by the characters of the occipital costa and mandibles.

SUMMARY

Taxonomic treatment is given to part of the parasite complex of the Karroo Caterpillar, *Loxostege frustalis* Zell. A new species of the Chalcidoid genus *Perilampus* is described, and is compared with several known species. In this connection, one new synonymy and one new combination are given and briefly discussed.

The Ichneumonid *Cremastus pictus* Hlgr., rediscovered after almost a century, and two undetermined Campoplegini are briefly discussed. A new species of the hyperparasitic genus *Mesochorus*, belonging to the subgenus *Stictopisthus* is described and is compared with several known species, after discussion of the status of *Stictopisthus*. Finally, the systematic study of African species of *Mesochorus* by Wilkinson (1927) is supplemented by further characterization of the species on certain head structures not mentioned by that author.

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