

SERPHTIDAE IN BALTIC AMBER, WITH THE DESCRIPTION OF A
NEW LIVING GENUS

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Received: June 6, 1939

Presented: May 10, 1939

1. FOSSIL SPECIES

In 1923 the present writer published a description of a single species of this family from the Baltic Amber.¹

Later, I received as a loan from the Geological Museum of the University of Königsberg an additional series of specimens and the Haren Collection of amber insects recently acquired by the Museum of Comparative Zoology contains also several species of this family. A study of all this material has enabled me to distinguish six clearly defined species, in addition to several others of dubious status that cannot be completely examined on account of unsatisfactory preservation.

In the living fauna the family Serphidae is nearly cosmopolitan, represented by a rather small number of species in a series of genera which are in the main very closely similar to one another. Two Australian genera depart from this general type in possessing a much less reduced wing venation which demonstrates very clearly their more primitive character and a third one from Formosa described in the present paper is also an aberrant form.

It might be expected that the amber fauna would include some primitive types, but this is not the case as all the species are of very ordinary form. Several of the genera as at present recognized are separable on only very slight characters and all of the amber species fall quite readily into one of these. This is *Cryptoserphus* Kieffer, characterized mainly by the extremely short abdominal petiole, and I have referred all of those described in the present paper to this genus. *Serphus cellularis* Brues, known only from the male has a much longer stigma and may not be congeneric. The females may be distinguished by the following key.

KEY TO THE AMBER SPECIES OF CRYPTOSERPHTUS

1. Penultimate joint of antennae one and one-half to two times as long as thick 2.
Penultimate joint of antenna quadrate or slightly transverse 3.
2. Body, legs, and antennae extremely long and slender; penultimate joint of antennae fully twice as long as wide *gracilis* sp. nov.
Body, legs, and antennae not extremely slender; penultimate joint of antennae shorter, not more than one-half longer than wide; radial cell large *pinorum* sp. nov.
3. Radial cell very small, elongate oval *obsolescens* sp. nov.
Radial cell larger, triangular, with a well developed upper side along the costa 4.
4. Cauda straight at base, the apical third curved, sharply so at the apex *hamiferus* sp. nov.
Cauda quite evenly curved throughout its entire length 5.
5. Propleura striate; cauda more than three times as long as wide at base *tertiarius* sp. nov.
Propleura smooth; cauda less than three times as long as wide at base *succinalis* sp. nov.

Cryptoserphus gracilis sp. nov.

(Fig. 1, a)

♀. Length 4.3 mm., the abdomen greatly extended, so that the length in life was nearer 3.8 mm.; cauda long and slender, about 0.5 mm. in length; antenna 1.7 mm. Color apparently black or very dark with the four anterior legs paler apically. Head small, very strongly narrowed below the eyes so that it appears transversely oval when seen from the front; malar space long, apparently without a furrow; eyes strongly protuberant, bare, about half as high as the head. Antennae very long and slender, not thickened apically; first three flagellar joints subequal; if anything, the first is slightly shorter; second joint almost four times as long as thick and very slightly thickened toward the apex;

¹ Proc. American Acad. Arts & Sci., vol. 58, p. 344.

penultimate joint twice as long as thick. Ocelli large, in a small triangle. Surface of head smooth, impunctate throughout. Thorax long and slender, almost three times as long as wide at the tegulae (56 : 20); propodeum long, gradually attenuated apically. Legs long, very thin, especially the hind pair and all of the tarsi; apical joint of the four anterior tarsi very slightly swollen, their claws simple, without basal tooth. Abdomen long and

forms by its remarkably slender body, legs, antennae and cauda.

Cryptoserphus pinorum sp. nov.

(Fig. 2)

♀. Length 2.5 mm. in normal position; with cauda extending backward, 3.5 mm.; antennae 1.2 mm. Apparently black, the tibiae and tarsi piceous; wings hyaline, the stigma and radial vein pale brown. Head large, fully twice as wide as thick, its surface smooth, impunctate; malar space half the width of the eye, with a very distinct furrow; ocelli prominent, in a small triangle. Antennae rather stout; scape scarcely as long as the first flagellar joint which is about twice as long as thick and slightly, but not conspicuously narrower at the base than at the apex; second flagellar joint very slightly longer than the first, following imperceptibly shorter, the penultimate joint one-half longer than thick. Mesonotum rather narrow, the parapsidal furrows quite distinctly impressed on the anterior half. Propleurae not entirely smooth; with several striations along the anterior border, and also some shallow punctate impressions, more noticeable below; mesopleura with a crenate posterior margin. Sides of propodeum rugose-reticulate, without any smooth polished central area; upper surface apparently without any longitudinal carinae. Abdominal petiole extremely short, scarcely visible from above; base of the second segment coarsely striate on the sides, both above and below. Cauda long, only faintly curved, its sides nearly parallel, about seven times as long as wide near the base (44 : 6). Stigma more elongate than usual, the radial cell large; postmarginal vein three-fifths as long as the stigma; first section of

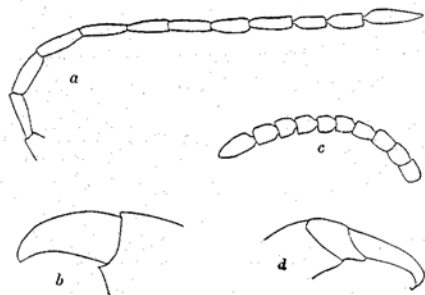


FIGURE 1. a, *Cryptoserphus gracilis* sp. nov., antenna; b, *Cryptoserphus tertiarus* sp. nov., cauda; c, *Cryptoserphus hamiferus* sp. nov., antenna; d, *Cryptoserphus hamiferus* sp. nov., cauda.

narrow; the cauda slender, of even width throughout its length, one and one-quarter times as thick as the basal joints of the antennal flagellum and apparently gently curved, although not visible in direct lateral view. Wings preserved only in part, the venation not visible in the type.

Type: No. 11,024. Collection of the Königsberg Museum.

Although not completely preserved, this species is readily distinguishable from the other amber

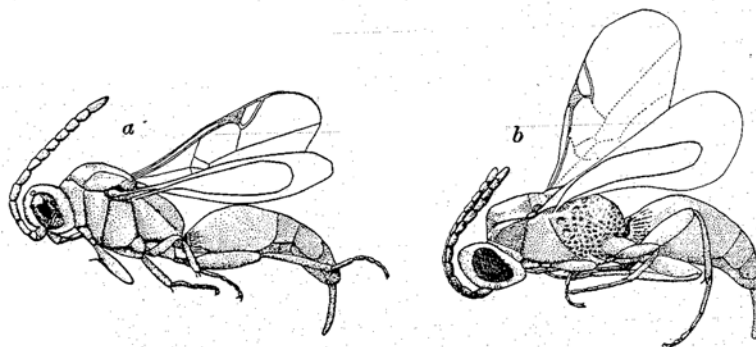


FIGURE 2. a, *Cryptoserphus pinorum* sp. nov., b, probably *C. pinorum*.

radius much thickened, half as long as the width of the stigma; second section not thickened, slightly curved on basal half and slightly divergent from the margin of the stigma. Legs long and slender; last joint of all the tarsi widened apically, but not strongly thickened; tarsal claws simple, without basal tooth.

Type: M. C. Z. No. 8257. Also two females in the collection of the Königsberg Museum, not so completely preserved, but almost certainly the same species, and further, another (No. 7841) most probably the same. Two other specimens are also included with considerable question as these are at least nearest to this species among those described.

***Cryptoserphus hamiferus* sp. nov.**

(Fig. 1, c and d)

♀. Length 2.1 mm; cauda 0.45 mm. Black, the abdomen apparently rufous or reddish at the base and the legs brownish, especially the four anterior ones; wings hyaline, the stigma and veins reddish brown. Head broad, two and one-half times as wide as thick in vertical view; ocelli in a wide, low triangle, the posterior pair much further from one another than from the eye-margin. Surface smooth and impunctate above; face and clypeus with distinct small punctures, sparse medially and denser at the sides. Malar space shorter than the basal width of the mandible, with a sharp furrow. Antennae short, stout, distinctly thickened apically; scape scarcely longer than broad; first flagellar joint one-half longer than wide at the tip, considerably narrowed toward the base; joints beyond imperceptibly shorter, the penultimate one quadrate, slightly narrower basally, but no longer than the apical width. Thorax rather broad, the mesonotum no longer than its greatest width; parapsidal furrows sharply impressed on their anterior fourth. Pronotum above transversely striate; propleurae smooth, except for a few striae at the extreme lower corner. Propodeum rather finely and evenly rugosely reticulate on the sides, the upper surface not visible in the type specimen. Legs stout, all the femora and tibiae noticeably thickened; last joint of all tarsi not wider than the others, all the claws slender and without a basal tooth. Abdomen short, stout; without striae at the base, except for some very short ones at extreme base below; first segment extremely short, not at all visible from above. Cauda rather long and slender; basal two-thirds straight and

only slightly narrowed; apical third sharply narrowed and arcuately curved downward to the tip. Radial cell with its costal margin about half as long as the stigma; first section of radius swollen, punctiform, the second section straight, strongly divergent from the apical margin of the stigma.

Type: M. C. Z. No. 8265.

This species may be recognized by the form of the cauda which is almost hooked at the tip.

***Cryptoserphus tertiaris* sp. nov.**

(Fig. 1, b)

♀. Length 3.9 mm.; cauda 0.4 mm. Apparently entirely black; wings hyaline with dark brown stigma and venation. Head rather wide, the cheeks as wide as the eyes; malar space about as long as the width of the mandible at base, with a well developed furrow. Antennae slightly, but distinctly thickened apically; penultimate joint of flagellum quadrate, its length equal to its width; scape short, slightly longer than thick; first flagellar joint about one-half longer than thick, the following joints growing gradually shorter. Face and clypeus apparently not punctate, although not very clearly visible. Mesonotum with no clear indications of parapsidal furrows. Pronotum transversely striate above; propleura striate, except anteriorly near the middle. Propodeum long, not very sharply declivous behind; rather coarsely reticulate above; the sides obliquely striate, except for a large smooth area below the spiracle; a heavy crenate line on each side of the anterior propodeal suture above the middle coxa. Abdomen elongate, the second segment one-third longer than high in lateral view; petiole very short, not visible from above; cauda curved throughout its length, about three times as long as thick near the base. Legs rather stout; front tarsi with the apical joint not at all widened, its claws simple. Radial cell about half as long as the stigma along the costal margin; first section of radius rather short and thick; second section thin, straight.

Type: M. C. Z. No. 8272.

This species is similar to the preceding one, but differs clearly in the shape of the cauda and the conspicuous striation of the propleura. It is also very much larger.

***Cryptoserphus obsolescens* sp. nov.**

♀. Length 3.2 mm.; cauda 0.43 mm. Entirely black, shining, except the tegulae which are

light brown, wings hyaline or slightly infuscated, the stigma and veins reddish brown. Head rather wide and thin when seen from above; the ocelli in a small triangle, the posterior pair at least as far from the eye as from one another; surface of head above and on the face and clypeus finely, sparsely punctate, the cheeks smooth. Malar space slightly shorter than the width of the mandible at base, with a sharply defined furrow. Antennae short, very little thickened apically; scape short and stout, scarcely as long as the first flagellar joint which is almost twice as long as wide at tip and very much narrowed toward the base; following joints gradually shorter, the penultimate one as long as wide. Pronotum medially rough, not clearly visible, but apparently not transversely striate. Mesonotum elongate, smooth, anteriorly with only shallow, weak indications of parapsidal furrows. Propleura smooth and shining, very strongly, obliquely concave; mesopleura smooth, except for some shallow longitudinal wrinkles near the upper edge; its posterior margin with a crenate line. Propodeum coarsely reticulate on the posterior slope and the sides; upper surface apparently smooth. In the type this appears as though it might be due to a layer of occluded air, but the paratype shows the same absence of reticulation on this surface. Sides of propodeum with a large smooth area anterior to and below the spiracle. Petiole of abdomen extremely short, not visible from above; base of second segment with a few very short striae at the base above. Cauda short, a little less than twice as long as high at the base (30 : 17); curved downwards, more noticeably so toward the apex, especially on the dorsal side. Radial cell very short, forming an elongate area that does not extend all the way to the lower corner of the stigma. Legs rather stout, the femora and tibiae noticeably clavate; tarsal claws simple, the last tarsal joint not noticeably enlarged.

Type: No. XXB967; paratype Z128, both in the Königsberg Collection.

This species is most distinct on account of the extremely small radial cell as well as by the sculpture of the propodeum.

***Cryptoserphus succinalis* sp. nov.**

(Fig. 3)

♀. Length 4.5 mm.; cauda 0.7 mm. Apparently entirely black, with the wings distinctly infuscated, especially in front. Head short, sur-

face smooth or nearly impunctate; transverse ocelli large, in a small triangle, the posterior pair considerably farther from the eye than from one another. Malar space short, with a sharply defined furrow. Antennae short, but not noticeably thickened; scape as long as the first flagellar joint, swollen apically; first flagellar joint much narrowed toward the base, more than twice as long as thick at apex (7 : 17); following joint much shorter; those beyond very gradually shorter, the penultimate one quadrate, or imperceptibly longer than thick. Thorax quite long and narrow in dorsal view, with shallow, poorly defined parapsidal furrows that extend nearly halfway to the scutellum and set off a narrow median lobe that is highly convex in front. Propodeum



FIGURE 3. *Cryptoserphus succinalis* sp. nov., type specimen.

long above, the posterior slope sharply declivous; coarsely reticulate, with a smooth area below and anterior to the spiracle; propleura smooth, without striate sculpture. Legs stout, especially the front pair and the femora of the hind pair; last joint of front tarsi fully as long as the preceding two joints together; all tarsal claws simple. Abdomen with the petiole very short, not visible from above, second segment with poorly developed striae at the base, its ventral surface clothed with rather long sparse hairs, repeated as a tuft on the venter just before the cauda. Cauda rather stout at the base, evenly curved and narrowed to the apex. Radial cell triangular, its costal edge about half as long as the stigma.

Type: M. C. Z. No. 8274. Also six other specimens, none of them quite so well preserved, that are probably the same species. No. XXB372 in

the Königsberg collection is the best of these and I believe without question conspecific. Of the others, three belonging to the Königsberg series and two to the M. C. Z. are probably this species. Most remarkable of all is a block of amber about 33 mm. long, 9 mm. wide and 8 mm. thick which contains a swarm of serphids that seem to belong to this species. These are massed together and so tangled and overlain that it is possible only to estimate the number of specimens in the group.



FIGURE 4. Amber block containing aggregation of some 50 specimens, probably *Cryptoserphus succinialis*.

All seem to be females and there are certainly more than fifty altogether. As the crowding is greatest along one side and at one end the number originally must have been much greater. In spite of the large series, it is impossible to view any of them clearly enough to make sure of the specific determination.

I have never seen any comparable swarm of serphids, nor have I seen any accounts of similar aggregations among living species of this group. What may have been the cause of this occurrence in the Oligocene pine forest must remain for the present uncertain.

2. A NEW LIVING GENUS OF SERPHIDAE FROM FORMOSA

I have had in my collection of Serphidae for a number of years a remarkable undescribed genus from Formosa. It is represented by only two male specimens, in neither of which are the antennae complete and I have delayed any attempt to describe it in hopes that better material might fall into the hands of some interested entomologist. Meanwhile, Dodd has described two genera from Australia, *Acanthoserphus* and *Austroserphus*, even more unusual than the Formosan genus. Both of Dodd's genera are more generalized than other Serphidae in possessing a much more complete wing venation, but both are highly modified, especially *Acanthoserphus* which has the prothorax and postscutellum spined and the mandibles greatly reduced or absent. In *Austroserphus* the antennal scape and vertex are peculiarly modified and the abdomen has a long petiole in the male. Both, however, possess 13-jointed antennae and in the general structure of the body are without the slightest question true Serphidae. The present genus is close to the very uniform series of other genera known from widespread points throughout the world, although the head and thorax are greatly modified and the antennae have more than thirteen joints which is the number always present in all the other known genera of the family.

Nothoserphus gen. nov.

♂. Head wide, and very thin antero-posteriorly, three times as wide as long in dorsal view; at the sides, between the eyes and occipital foramen; fully four times as wide as long; in facial view the head is slightly wider than long, much narrowed below the eyes. Clypeus transverse, with deeply impressed lateral foveae, convex, its lower margin with reflexed margin that extends as a marginal carina along the posterior edge of the malar space almost to the eye; mandibles concealed beneath the clypeus, but the palpi are long and projecting. Antennae with more than 13 joints (all lack the tips, but I suspect from the form of one with 13 joints that the complete antenna may probably be 14 or 15-jointed), inserted well above the clypeus, just above the lower margin of the eyes; scape small, pedicel very short; flagellum filiform, slender, joints of approximately equal length, but thinner toward the apex of the antenna. Vertex sharp above, forming a straight transverse edge which bears a rounded, blade-like

elevation on each side external to which the posterior ocelli lie; between these elevations is a deep semicircular excavation; ocelli large, in a triangle. Occipital margin narrowly reflexed. Thorax short; pronotum with the humeri angularly elevated; mesonotum with parapsidal furrows meeting before the scutellum and with similar furrows near the sides; scutellum raised, but not spined, with a deep basal impression. Propodeum much narrowed behind, reticulate, but without any longitudinal carinae. Petiole of abdomen short, scarcely visible above as in *Cryptoserphus*; second segment long, almost entirely covering the abdomen; tip of abdomen bispinose as usual. Wings ample; venation as in *Serphus*, with a large triangular stigma and short radial cell, but without discal venation. Legs slender; claws of front tarsi with a fleshy lobe at the base.

Type: *N. mirabilis* sp. nov.

In spite of the unusual form of the antennae I think that *Nothoserphus* must be placed in the Serphidae, particularly on account of the wing venation and the form of the abdomen which do not depart in the least from the typical members of the family.

***Nothoserphus mirabilis* sp. nov.**

♂. Length 3.5-4 mm. Body entirely black and shining; antennae pale brownish at the base, third and fourth joints darker, remainder black; tegulae dark brown; legs beyond the coxae pale honey yellow, the tips of the hind tibiae infuscated; wings tinged with brownish, below the stigma with a diffuse brown cloud, the stigma and veins deep brown. Head very highly polished, especially on the front and the posterior surface. Ocelli in a curved line or low triangle, the posterior ones lying just external to the elevated lobe on the vertex close to its sharp upper edge. The elevated lobes are so thin that their edges are broken in one specimen. Front nearly flat, the

orbits vertical, clypeus highly convex medially. First flagellar joint slightly more than three times as long as thick; following very little shorter and thinner, retaining about the same proportions. Head bare above, sparsely hairy below the antennae. Pronotum vertical, with a large fovea on each side of the median line and some smaller crenate sculpture, its upper angles elevated in blunt tooth, behind which the pleura is sparsely hairy. Mesonotum smooth, slightly wider than long, parapsidal furrows deep, transversely striate, entering two approximated shallow depressions well in front of the scutellum; lateral grooves coarsely crenate, extending just to the tegulae; median lobe very convex, tapering to a point behind, as wide as long. Scutellar groove wide and deep, enclosing three pits, disc sharply convex. Metanotum irregularly, coarsely striate. Propodeum elongate, evenly narrowed, coarsely reticulated, the posterior dorsal face small, slightly concave, but not separated by distinct carinae; basally above with a broad, shallow median impression. Propleura vertically excavated, its surface shallowly, very irregularly, confluent wrinkled or pitted; mesopleura smooth with a large shallow impression near the middle and a crenate submarginal line behind. Petiole of abdomen as long as high, but shorter above so that it appears much shorter than wide in dorsal view, coarsely and irregularly sculptured; second tergite with a single groove or broad stria medially at the base that extends to the basal fourth; otherwise polished and entirely smooth except for a broad apical band of very small, sparse punctures; sides of the compressed third segment similarly punctate. Stigma large, triangular, radial cell small, its costal edge less than half the length of the stigma; first section of radius practically wanting, the straight second section enlarged at the base which is contiguous with the stigma.

Type and paratype from Taihorin, Formosa; July 7, 1911 (H. Sauter).