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NEW OLIGOCENE BRACONIDAE AND BETHYLIDAE FROM BALTIC AMBER

CHARLES T. BRUES,
Biological Laboratories, Harvard University,
Cambridge, Massachusetts

The present paper is based on material contained in the large Haren Collection of Baltic amber insects recently acquired by the Musuem of Comparative Zoology. It supplements the much more lengthy account dealing with these two families which was prepared some years ago by the writer, from a study of specimens belonging to these families in the collections of the Amber Museum of the University of Konigsberg, and published in 1933.[1]

In the present series a number of the previously described species are represented but it contains also some interesting ones not previously known. Several of these are so unusual that they have been made the types of new genera. The discovery of such a surprisingly large number of peculiar forms only serves to emphasize again the fact that these families were already very highly diversified in Lower Oligocene times.

I am deeply indebted to Mrs. A. S. O'Connor who has drawn the figures that accompany the descriptive matter.

Family **Braconidae**

Subfamily **Doryctinae**

Anacanthobracon Gen. nov.

♂. Head more or less cubical, about as long as wide in dorsal view. Eyes round, slightly protuberant. Head devoid of any spines or projections, except for the rather prominent upper margin of the

[1]The Parasitic Hymenoptera of the Baltic Amber. Bernstein-Forschungen, Heft 3, pp. 4–178, 13 pls., 87 figs.

mouth opening. Antennae thin, long and tapering, exceeding the body in length. Maxillary palpi long, 4-jointed; labials 3-jointed. Thorax short, nearly cylindrical; mesonotum elevated medially in front, the notauli present; mesopleura long, the front and middle coxae very

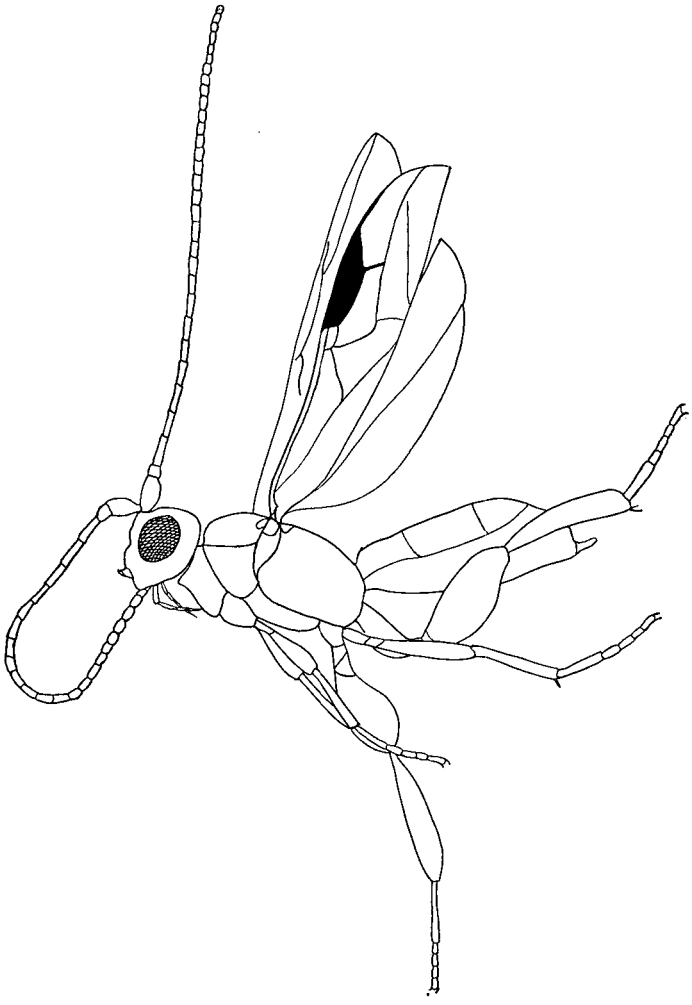

FIG. 1. *Anacanthobracon femorator* sp. nov.

widely separated from one another; propodeum short, rounded behind, not areolated. Abdomen short, consisting of only three tergites, the apical part and venter membranous; the three tergites are subequal and together shorter than the thorax and the membranous extruded apical portion, bearing the claspers at apex is half as long as the sclero-

tized tergites. Four anterior legs slender, their femora feebly clavate; hind legs greatly thickened; their coxae large, elongate, simple; femora less than three times as long as thick, more sharply narrowed at base than at apex; tibiae stout, strongly thickened apically and noticeably curved, their apical spurs short. Nervulus postfurcal; radial cell moderately long, the third section of the radius almost parallel to the first intercubitus which is fully twice as long as the second intercubitus; second cubital cell nearly four times as long below as above; recurrent nervure entering the base of the second cubital cell.

Type. A. femorator sp. nov.

This is undoubtedly referable to the Doryctinae, but is widely different from any described living genus. The peculiar shape of the second cubital cell is a gross exaggeration of the tendency seen in several genera for the second section of the radius to be much shortened and the thickening of the hind legs is likewise surprisingly pronounced, particularly on account of the strongly arcuate tibiae. The reduction of the abdominal tergites to form a three parted dorsal shield renders it quite unique in this subfamily. Although it shows some similarity to Digastrotheca Brues from the Baltic Amber in the form of the abdomen, I believe the resemblance does not indicate any relationship, as Digastrotheca, known only in the female sex, seems unquestionably to belong to the Rhogadinae.

Anacanthobracon femorator sp. nov.

(Fig. 1)

♂. Length 3 mm.; to tip of last abdominal plate, 2.7 mm. Apparently black, with the legs lighter beyond the femora; wings quite distinctly infuscated. Antennae 31-jointed; scape oval, twice as long as the quadrate pedicel; flagellum very thin, the basal joints about three times as long as thick, thence shorter until those near apex are minute, but still cylindrical and clearly longer than wide.

Type, M. C. Z., No. 6710.

Subfamily **Triaspidinae**

Heretofore no member of this group has been found in the Baltic, although it has been recognized in other Tertiary deposits. From the Miocene Shales of Florissant[2] the present writer described as *Urosigalphus aeternus* an undoubted triaspidine, although the generic reference is somewhat doubtful. From the Oligocene of the Isle of Wight Cockerell described

[2]Bull. Mus. Comp. Zool., vol. 54, p. 96, 1910.

Sigalphus (?) *cervicalis*,[3] but his figure represents a braconid that is certainly not a member of this subfamily.

In the present collection there is a single female which is very clearly a member of the Triaspidinae, but does not seem to be referable to any described genus. In habitus it agrees with Triaspis and others, but the neuration is distinctive in that the recurrent nervure is practically interstitial with the first transverse cubitus and the discoidal cell is petiolate above. However, the thoracic and abdominal details are not visible with sufficient clarity to permit of a complete diagnosis. It is therefore referred to for the present as a Triaspis *s. lat.*

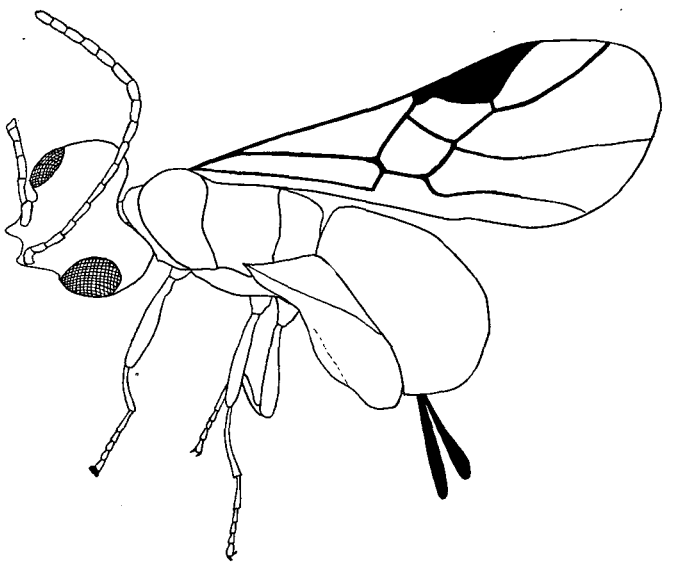

FIG. 2. *Triaspis anomala* sp. nov.

Triaspis anomala sp. nov.

(Fig. 2)

♀. Length 1.8 mm. Entirely black, but this may not be the original color; wings hyaline, stigma dark brown, venation pale brown. Head large, more or less cubical with the temples swollen behind and the occiput deeply, roundly emarginate when seen from above. Face produced just below the insertion of the antennae as two conical projections on the upper side of which the antennae are inserted; seen from above the projections are triangular, slightly rounded at tip,

[3]Ann. Mag. Nat. Hist. (9), vol. 7, p. 14 (1921).

closely approximate and rise above the surface to about half the thickness of the head. Eyes bulging, about as long as the width of the temples. Antennae with more than 14 joints (tips not preserved); scape short, stout; inserted in the concave upper surface of the facial tooth on each side; pedicel oval, much thicker than the long, slender first flagellar joint; second flagellar joint shorter and thicker, following ones growing shorter, of the same thickness. Surface of head and of thorax above smooth; propodeum finely and shallowly reticulate. Parapsidal furrows present; propodeum short, slightly concave on its posterior face. Abdomen only slightly longer than the thorax, oval and larger behind, its surface shining at the base, but the apical part is obscured by an opaque whitish coating; suture between the first and second tergites distinct, but not deep; first segment medially with a pair of carinae that converge behind. Posterior margin of carapace smooth with a finely raised margin. Ovipositor projecting, fully two-thirds as long as the abdomen. Stigma broad, triangular, the radius arising at the middle; anal cell without any trace of a cross-vein; nervulus postfurcal by three-fourths its length; first discoidal cell petiolate, the cubitus arising at the upper fourth of the basal vein; first section of radius very short, second section curved, ending halfway between the stigma and wing tip; first section of cubitus weaker than the other veins, but complete; second section obsolete, except at the extreme base; recurrent nervure interstitial with the transverse cubitus.

Type, No. 9292, M. C. Z.

This is a peculiar species, particularly in the presence of the horns below the insertion of the antennae. It may possibly represent a new genus.

Subfamily **Diospilinae**

Microtypus grandis sp. nov.

(Fig. 3)

♀. Length 5 mm.; ovipositor 3.3 mm., its sheaths 3 mm. Black; the wings presumably hyaline with brown venation although much stained in the type specimen. Eyes approaching close to the base of the mandibles, one-half wider than the temples; surface of head behind the eyes sparsely and finely punctate. Antennae long and slender, with 29 joints, tapering on the apical portion; scape large, half as long as the eye; pedicel, small, oval; first, second and third joints of flagellum subequal, each about three times as long as thick; following rapidly, then slowly growing shorter, all of them at least slightly longer than wide. Maxillary palpi with the second joint greatly swollen below. Mesonotum with the median lobe raised; the notauli deep, but apparently not crenulate, convergent behind. Propodeum deeply reticulate over its upper surface and on the sides at base and apex. First tergite more or less longitudinally roughened above, as long as the second and third tergites together; remainder of abdomen smooth, the second

tergite slightly longer than the third, separated from it by a fine suture; following tergites very much shorter. Stigma not very wide, the radius arising just beyond the middle. First section of radius barely longer than the second, third section faintly recurved apically and extending nearly to the tip of the wing; basal vein curved, the cubitus arising from its upper end; first intercubitus about as long as the first section of the cubitus; second section of radius about half as long as the second section of the cubitus; nervulus slightly postfurcal; recurrent nervure entering the first cubital cell about one-fourth its own length before the intercubitus. Legs slender, the hind coxae very large. Sheaths of ovipositor very minutely hairy.

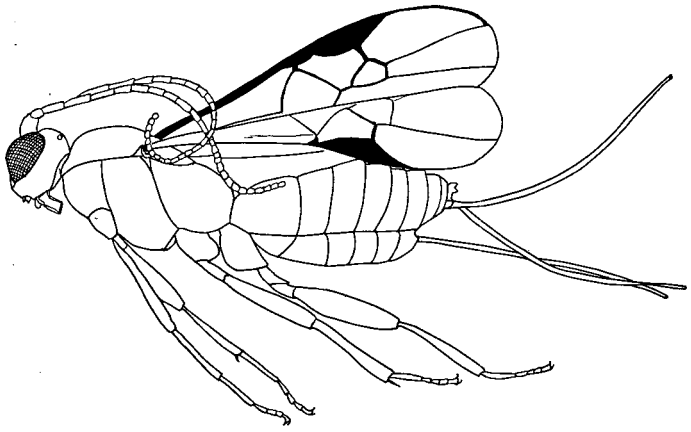

FIG. 3. *Microtypus grandis* sp. nov.

Type, No. 7842, M. C. Z.

This species is similar to *M. latipennis* Brues to which it will run in the key to Baltic amber species (Bernstein-Forschungen, p. 80). It differs by its much larger size, 5 mm. instead of 2.75 mm. and in having the recurrent nervure much nearer to the intercubitus.

Subfamily **Blacinae**

Blacus Nees

There are a number of specimens of this genus in the collection, including one species that appears to be undescribed. This increases the known number of Baltic amber species of Blacus to six.

Blacus gracilicornis sp. nov.

(Fig. 4)

♀. Length 2.3 mm.; ovipositor 1.7 mm., or about as long as the head and thorax together. Similar to *B. crassicornis* Brues, but differing by the much longer basal flageller joints. Black, the abdomen and legs appearing brownish. Head smooth and shining. Eyes large, the malar space hardly as wide as the base of the mandible. Ocelli large, separated by about their own diameter. Antennae 17-jointed; scape short, one-half longer than wide; pedicel narrower, nearly quadrate; first and second flagellar joints each fully four times as long as

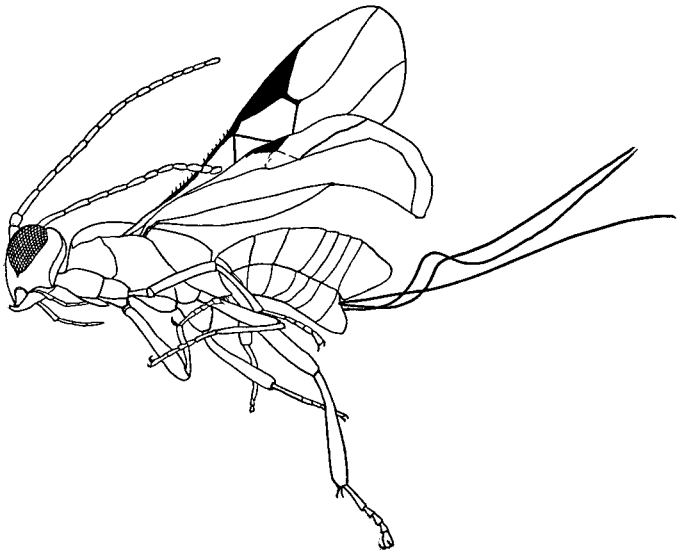

FIG. 4. *Blacus gracilicornis* sp. nov.

thick, of about equal length; next two joints three times as long as thick; succeeding ones gradually shorter, but elongate, the penultimate one one-third longer than wide. Notauli meeting before the base of the scutellum, deep and coarsely crenulate. Propodeum areolated, the carinae not very high although very clearly marked. First three abdominal tergites of about equal length, the basal one slightly longer; second suture fine, linear. Ovipositor and sheaths slender. Legs moderately slender. Stigma elongate triangular, the radius arising beyond the middle; first section of radius slightly oblique; two-thirds as long as the width of the stigma; second section noticeably curved near its basal third, ending slightly before the wing-tip. First discoidal cell not petiolate, the cubitus arising at the upper end of the basal vein; nervulus postfurcal by half its length, vertical; recurrent nervure entering the cubital cell just before its tip, parallel with the transverse cubitus and very nearly in line with it, first section of cubitus and transverse cubitus

of equal length, each about three times as long as the first section of the radius.

Type, No. 9400, M. C. Z.

This species will run to *B. crassicornis* Brues in my key to species (Bernstein-Forschungen, p. 82) on account of the small number of antennal joints and aside from the more slender antennae it is very similar.

Subfamily **Meteorinae**

There is a peculiar species in the present collection which is very similar to the large, more or less polymorphic genus Meteorus, but it lacks entirely the second transverse cubitus as in the subfamily Euphorinae. It does not have the habitus of the latter group however and in spite of the lack of this vein is undoubtedly more closely allied to living Meteorinae although it will not run there in current keys. Whether it represents a transition between the two groups seems doubtful as it shows little resemblance to any genus of Euphorinae known to me.

Meteorites Gen. nov.

♀. Body slender, the abdomen with a long, narrow, evenly curved petiole. Head wide, with large eyes; antennae 13 or 14-jointed, with elongate cylindrical joints. Thorax about as long as high, the propodeum gradually rounded off behind, with a lateral carina; notauli complete; mesopleura large. Abdomen elongate, more or less compressed apically, longer than the head and thorax together; seen from the side it is nearly truncate at tip with a short ovipositor which is thick at the base, tapering and strongly arcuate. Legs slender. Wings with a broad triangular stigma and long, narrow marginal cell; first discoidal cell petiolate above; first cubital cell complete, but the cubitus obsolete beyond it; nervulus nearly interstitial as is also the recurrent nervure.

Type, *M. inopinata* sp. nov.

Meteorites inopinata sp. nov.

(Fig. 5)

♀. Length 2.6 mm.; ovipositor 0.28 mm. Color probably black, with the abdomen and legs brown and the wings slightly infuscated with dark brown venation. Head shining, the surface shagreened quite uniformly throughout; eyes large, bulging, extending nearly to the base of the mandibles; ocelli in a small triangle, of good size, but much smaller than in Meteorus; posterior marginal line of head delicate, but complete; neither face nor clypeus noticeably protuberant. Scape and pedicel of antennae of about equal length; first five joints of flagellum subequal, the first narrow, nearly cylindrical, the second

widened apically; third of even width, about twice as long as thick; following joints imperceptibly smaller. Mesonotum weakly trilobed anteriorly, the notauli very shallow; behind with a depression before the scutellum. Mesonotum smooth and polished, with a punctate area above; propodeum punctate-reticulate, impressed medially behind

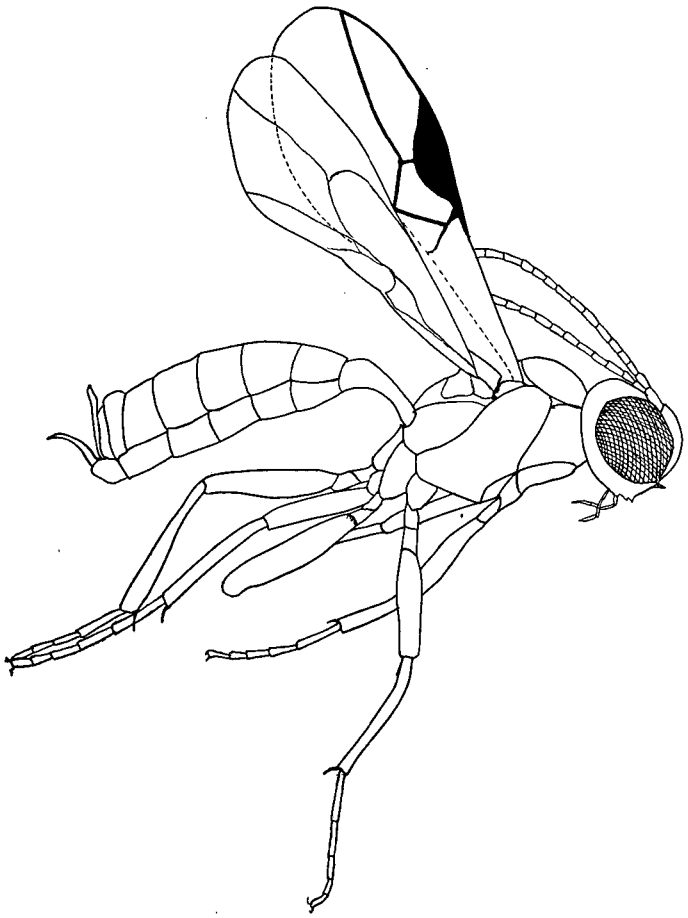

FIG. 5. *Meteorites inopinata* sp. nov.

above the insertion of the abdominal petiole. First abdominal tergite evenly curved, the spiracles apparently beyond the middle; surface punctulate, but no striae are visible in the type; second and third tergites about equal in length, together a little longer than the first, separated by a fine, weakly impressed suture; fourth, fifth and sixth tergites gradually shorter; seventh much shorter, its ventral surface vertical so that in side view the short sheaths and ovipositor arise at the lower corner and project upwards. Stigma oval at base, triangular apically, nearly

half as wide as long, the radius arising at the middle. First section of radius nearly vertical, extremely short, less than one-fourth the width of the stigma; second section a little less than twice the length of the stigma, reaching nearly to the tip of the wing; nervulus very slightly postfurcal; first discoidal cell petiolate above, the cubitus arising near the upper third of the basal vein; recurrent nervure almost exactly interstitial; second transverse cubitus entirely absent.

Type, No. 9395 M. C. Z.

Family **Bethylidae**

Misepyris Kieffer

Two species of this genus have already been described from the Baltic Amber and the present collection contains another.

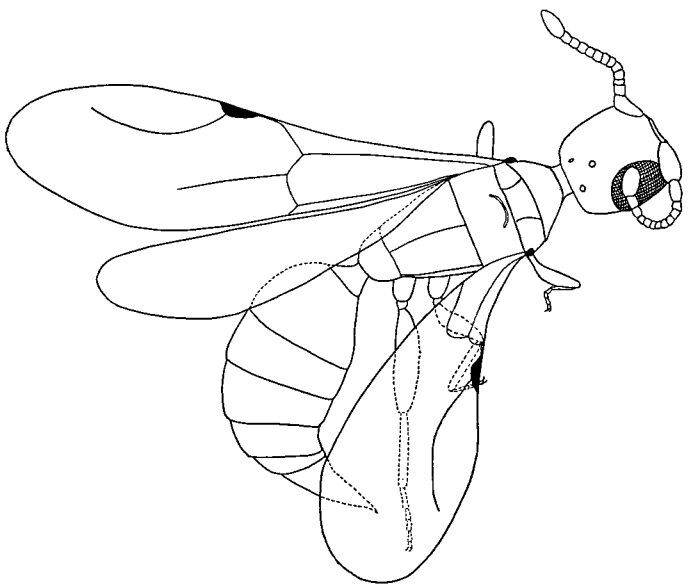

FIG. 6. *Misepyris minor* sp. nov.

Misepyris minor sp. nov.

(Fig. 6)

♀. Length 1.8 mm. Black, or very dark colored, the thorax with a strong aëneous reflection; antennae and legs brown; wings hyaline, the stigma black and the veins rather pale brown. Head about as wide as long; shining above with the surface confluently punctulate or rugulose. Ocelli in an equilateral triangle, closer to one another than to the eye-margin. Antennae 13-jointed, their tips reaching nearly to the tegula; scape stout, but little more than twice as long as

thick; pedicel more than half as long as the scape and two-thirds as thick as the scape; flagellar joints about quadrate, flagellum much narrower than the pedicel basally, but strongly thickened apically; last joint fully twice as long as the penultimate one. Prothorax long; exclusive of the neck, fully twice the length of the short, transverse mesonotum. Parapsidal furrows strongly convergent behind. Scutellum with a deeply curved groove at the base, but without foveae. Propodeum almost as long as the mesonotum and scutellum together, finely reticulately rugose; its dorsal surface with lateral carinae as well as a basal, apical and median longitudinal one. Abdomen smooth, polished, about as long as the head and thorax together. Legs rather short, the femora stout, especially the front pair. Wings typical for the genus, with two fully enclosed basal cells, the second discoidal cell practically obsolete, the radius arising near the tip of the stigma, gently curved and complete for three-fourths of its length; costa with extremely minute bristles.

Type, No. 6634, M. C. Z.

The present species differs from the Oligocene *M. robustus* Brues by its smaller size, longer antennae, longer pronotum and less widely separated ocelli. Like the latter it resembles *M. longiceps* Kieffer more closely than any other described living species.

Ctenobethylus Gen. nov. = Iridomyrmex

♀. Wingless, but with the thorax not very greatly modified. Head considerably longer than wide, the occipital margin strongly emarginate; eyes small, placed well up on the sides of the head, not very far from the clypeus. Mandibles expanded apically, with broad tips, with two well developed apical teeth and a series of at least seven denticles of decreasing size forming an inner blade. Antennae 13-jointed, the flagellum distinctly thickened at apex. Ocelli absent. Thorax elongate, widest at the middle of the pronotum and much narrowed posteriorly, the pronotum fully one half wider than long, its posterior margin arcuately emarginate for its entire length; mesonotum about as wide as long, but only about half the width of the pronotum, without parapsidal furrows, its sides nearly straight, but converging apically with the apex truncate or slightly concave. Scutellum apparently not developed. Propodeum sloping gradually, without any distinct carinae so far as can be seen. Abdomen as long as the head and thorax together; second, third and fourth segments occupying most of its upper surface. Legs unusually slender, except the front pair; none of the tibiae spinose.

12. / see fig. 7

Type, Ctenobethylus succinalis sp. nov.

This is the second species of Bethylidae with an apterous female to be discovered in the amber. Structurally it is similar to Apenesia, but the dentition of the mandibles is very unusual as there are rarely more than four teeth present. Glenosema Kieffer has the mandible armed with six or seven large teeth and

is similar in many respects, but the propodeum is margined and the ocelli are present. Cephalonomia Westwood is likewise quite similar, but the antennae are 12-jointed. The tibiae are simple, not bristly as in Apenesia. In mandibular structure the present genus resembles the South African Paralaelius Cameron which has one long apical tooth and numerous smaller denticles. The propodeum of the latter is however of the Epyris type, with several longitudinal keels. From Neoscleroderma Kieffer the new genus differs by the long antennal scape, slender legs and peculiar dentition of the mandibles.

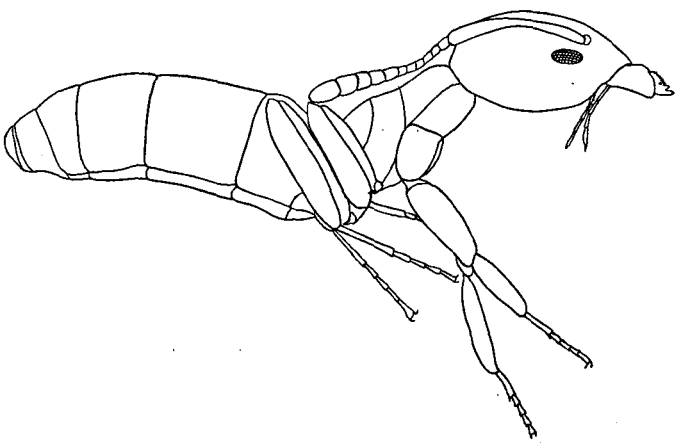

FIG. 7. *Ctenobethylus succinalis* sp. nov.

Ctenobethylus succinalis sp. nov. = *I. goepperti*

(Fig. 7)

♀. Length 2.8 mm. Color as preserved, dull ferruginous, the head darker brown and also to some extent the upper surface of the thorax and abdomen; flagellum of antennae very light brown. Head very minutely punctulate, almost smooth at the sides and apparently above also. Eyes small oval, one-third longer than wide, removed from the base of the mandibles by slightly more than their own length. Mandibles large, at least twice as broad at tip as at the base, the apical tooth long, triangular, acute; second tooth much shorter and narrower; the minute denticles that follow gradually decreasing in size, forming a serrate edge. Antennae long, the scape slender, extending to the vertex; pedicel larger than the basal flagellar joints, decidedly longer than wide; joints of flagellum gradually increasing in length, the first wider than long; following more or less quadrate, the antepenultimate decidedly longer than wide and fully one-half thicker than the first, the last two joints subequal and together as long as the antepenultimate although the suture between them is not very clearly visible; tip of

antenna reaching to the tip of the propodeum. Thorax, as nearly as can be discerned, smooth, impunctate and shining, although it is slightly obscured by imperfections in the amber. Abdomen smooth, about as wide as the head.

Type, No. 7666, M. C. Z.

Homoglenus Kieffer

There is a single species which runs directly to this genus in Kieffer's key to the Bethylidae in Das Tierreich. It differs from the described living species in having the parapsidal furrows lacking, although the lateral furrows are well developed. Such discrepancies are admitted in certain other genera, *e. g.*, Pristocera and it seems unwise to propose another generic name for the fossil species.

Homoglenus bifossatus sp. nov.

♂. Length 2.75 mm. Apparently black or very dark, the legs and antennae more brownish and the wings slightly infuscated. Head short oval, the eyes large, nearly round, bare, extending from close to the mandibles more than halfway to the vertex; sides of head behind the eyes not as wide as the eye. Antennae 13-jointed; scape very short, curved, not much thicker than the flagellum; pedicel very short, transverse, narrower than and only one-third the length of the first flagellar joint; all joints of flagellum of subequal length, but growing more slender apically, the basal ones about three times as long as thick. Mandible with five apical teeth, the lowest one longer than the others. Ocelli large, in a small triangle, separated by about their own diameter. Surface of head shining, minutely punctulate. Pronotum more or less evenly narrowed anteriorly, its posterior margin simple, strongly concave. Mesonotum as long as the pronotum, without parapsidal furrows, but with the lateral furrows deeply impressed on their posterior two-thirds and absent in front. Scutellum large, triangular, as long as wide and nearly as long as the mesonotum; basal groove of scutellum narrow, deep, coalescing with a small fovea at each side. Surface of pronotum, mesonotum and scutellum shining, sparsely punctulate. Propodeum coarsely irregularly reticulate above and behind, smooth or minutely reticulate on the pleurae, margined at base and apex and with three longitudinal carinae above which are more highly elevated than the reticulations. Abdomen short, convex, the second tergite longest. Legs stout; all the femora thickened. Wings with the radial vein long, very nearly closing the cell, arising from near the apex of the rather small stigma; basal vein short, straight, entering the costal vein about half its own length before the stigma; both basal cells enclosed by heavy veins, the median vein continuing beyond the cell for a considerable distance.

Type, No. 7679, M. C. Z.