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NEW EOICHNEUMONIDAE FROM EARLY CRETACEOUS OF SIBERIA AND MONGOLIA (HYMENOPTERA: ICHNEUMONOIDEA)

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ABSTRACT. Fourteen new species of Eoichneumonidae (Hymenoptera: Ichneumonoidea) in three new genera are described and figured from Early Cretaceous of Siberia and Mongolia. The phylogenetic relationships of the family within the Ichneumonoidea are discussed.

Introduction

The superfamily Ichneumonoidea includes two major extant clades, viz., the Ichneumonidae (including Agriotypinae and Paxylommatinae) and the clade Apozygidae + Braconidae (including Aphidiinae). Two extinct families have recently been added, Praeichneumonidae (Rasnitsyn, 1983) and Eoichneumonidae (Jell & Duncan, 1986). These are both recognizable as ichneumonids by the following character states: narrow costal space in the fore wing, ovipositor external, antenna with more than 13 flagellomeres, and flagellomeres with elongate placoids. The last character state is unknown for the Praeichneumonidae.

Within the superfamily the easiest way to distinguish the extant Ichneumonidae is by the characteristic shape of the complex fore wing cell 1r+2r+1m-cu (=discocubital = 1R1+1M). This cell is formed by the loss of vein 1RS+M, and although it is also lost convergently in some Braconidae, the cell thus formed never has the same shape except in some Aphidiinae. The loss of vein 1Rs+M is a synapomorphy for the Ichneumonidae exclusive of the Early Cretaceous genus *Tanychora*. Secondary modifications make the cell somewhat difficult to recognize in a few other Ichneumonidae, such as members of the Paxylommatinae.

Differences in hind wing venation are also important in distinguishing Ichneumonidae from members of the clade Braconidae + Apozygidae. Ichneumonidae have the r-m crossvein of the hind wing meeting RS well beyond its base (at least as much as in Fig. 2A). Braconidae and Apozygidae have r-m meeting R or rarely the extreme base of RS, such that the length of the first abscissa of RS is no greater than its width. Additionally, most extant braconids have lost the free portion of Cu.

A universally appreciated criterion for distinguishing Braconidae and Apozygidae from Ichneumonidae is the type of connection between metasomal terga two and three. In the Braconidae and Apozygidae the two terga are fused margin to margin; this also occurs independently in members of the Agriotypinae and several other ichneumonid taxa. In the vast majority of Ichneumonidae these

terga are hinged sublaterally but are otherwise overlapping at rest. It is noteworthy that the ichneumonid type of connection is loose enough to become rather free during decomposition, resulting in the overlapping or spacing of the terga in fossils. This is apparent in many of the figures presented in this article.

Concerning the fossil families, the Praeichneumonidae have several symplesiomorphies that are lost in all other Ichneumonoidea, i.e., distinct though narrow costal space, rudiments of 1r-rs and 3r-m crossveins in the fore wing, and cell r (=R1) of the hind wing closed.

The Eoichneumonidae have venational characteristics that are intermediate between those of the Braconidae and the Ichneumonidae. The family was described on the basis of a sole specimen from the Early Cretaceous of Australia (Jell & Duncan, 1986). Family status was proposed because of the plesiomorphic appearance of the hind wing, particularly the presence of a second r-m crossvein. However, this seems to be due to misinterpretation since the hind wing is not figured in the original publication nor is it traceable on good photographs studied by the senior author (courtesy Dr. Jell). The photographs mentioned permitted us to identify *Eoichneumon* Jell & Duncan as a close relative of better preserved Asiatic fossils of similar age. These fossils were initially believed to be members of the Braconidae (c.f. Rasnitsyn, 1988) and later understood as belonging to this distinct family.

The material studied is kept in Paleontological Institute, Academy of Sciences of the USSR, Moscow (hereafter referred to as PIN).

Family EOICHNEUMONIDAE

Eoichneumonidae Jell & Duncan, 1986: 184.

Diagnosis: Typical member of Ichneumonoidea, as confirmed by flagellomeres more than 13 in number and with elongate placoids, pronotum narrow medially, mesonotum lacking mesoscutal sulcus, fore wing with costal space virtually lost, hind wing with vein M not arching into basal cell (R), and ovipositor external. Unlike Praeichneumonidae and Ichneumonidae in that r-m of the hind wing meets either R or RS near its base, as well the fore wing cells 1+2r and 1m-cu (1R1 and 1M) not confluent. Unlike Braconidae in that metasomal terga 2 and 3 hinged. Unlike Braconidae but like Apozygidae in that 2m-cu of the fore wing present.

Genera included: Eoichneumon Jell & Duncan, 1986, and three genera described below, all of Early Cretaceous age.

Phylogeny: The Eoichneumonidae share no definitive synapomorphies with the Braconidae though 1r-m of the hind wing meets RS very near the junction of RS and R1 thereby approaching the apomorphic condition of the Braconidae + Apozygidae. If this is indicative of a true transformation series then Eoichneumonidae may be the stem-group or sister group of this clade.

Eoichneumonidae share plesiomorphic character states with Praeichneumonidae and Ichneumonidae (in fore wing venation and in junction of metasomal terga 2 and 3) and apomorphies with Ichneumonidae and Braconidae + Apozygidae (further reduction of costal space and loss of 2r-m in fore wing). No plesiomorphic characters are shared by the Eoichneumonidae that are not part of

the ground plan of the Ichneumonoidea as exemplified by *Tanychora* and Praeichneumonidae. (Rasnitsyn, 1980: 81 wrongly stated that RS+M is weak in *Tanychora*). Relative to the Braconidae groundplan, no synapomorphic character states have been found for the Eoichneumonidae.

Paleoecological speculation: Insect and plant assemblages collected in the Baissa section of Lower Cretaceous deposits in Transbaicalian show that definite climatic changes occurred during the time interval. Both the lower and upper parts of the section (beds 38-31 and 11-1, respectively) yielded similar and less thermophilous assemblages than those from the middle part of the section (Sukatsheva, 1968; Rasnitsyn, 1969; Kuzmina, 1985; Krassilov, personal communication, 1979). Not quite half of the Hymenoptera (46%) were found in "warm" parts of the section, while significantly more than half of the Eoichneumonidae were found there (12 of 18 specimens or 67%). Thus the Eoichneumonidae are hypothesized to be more thermophilous insects than the average Early Cretaceous Hymenopteran.

1. Genus **Eoichneumon** Jell & Duncan (Fig. 1)

Eoichneumon Jell & Duncan, 1986: 186.

Type and only species: E. duncanae Jell & Duncan, 1986; Early Cretaceous, ?Aptian, Korrumburra Group, Koonwarra Fossil Bed; South Gippsland, Victoria, Australia.

Diagnosis (based on photographs of the only known specimens, Fig. 1): Unlike all genera described below as follows: fore wing with 1st abscissa of RS short (RS+M issuing near R), 3r-m spectral while 2m-cu pigmented (possibly tubular) metasomal tergum 1 elongate but robust, hardly narrowed cephalad, subequal in length to terga 2+3 combined. Additionally, unlike *Baissobracon*, gen. nov. in that cu-a of the fore wing is postfurcal, propodeum clearly areolated, metasomal terga 1 and 2 not strongly, longitudinally striate.

2. Genus **Baissobracon** Rasnitsyn & Sharkey, nov. (Figs. 2, 3)

Type and only species: B. striatus, sp. nov.

Gender: Masculine.

Description: Fore wing with 1st abscissa of RS long, 3r-m and 2m-cu both spectral, cu-a antefurcal. Hind wing with 1st abscissa of RS (between R and r-m) long, about half r-m length and proclival. Propodeum with coarse reticulation obscuring primary areolation. Metasomal tergum 1 short, transverse, tergum 1 shorter than terga 2+3 combined. Terga 1 and 2 closely, longitudinally striate.

Diagnosis: Unlike all other genera in that cu-a of fore wing antefurcal, 1st abscissa of RS of hind wing long, proclival, terga 1 and 2 striate.

Species included: One new species.

Baissobracon striatus Rasnitsyn & Sharkey, sp. nov. (Figs. 2, 3)

Holotype (sex?): PIN, no 4210/1150; Early Cretaceous, Neocomian, Zaza formation; Transbaicalian, upper stream of Vitim Riv., Baissa locality, bed 22. Paratype (sex?): PIN, no. 1989/2523, same data, bed 19.

Description: Fore wing with cell 3r (2R1) short and wide, cell 2+3m (1RS) sessile on cell 1m-cu (1M) and extending considerably beyond 2m-cu crossvein. Hind femur long and thick. Metasomal tergum 1 striate laterad dorsal carinae, with single median stria between carinae. Tergum 2 postero-laterally and terga 3-7 entirely lacking striation. Ground color dark, hind leg beyond coxa pale. Length of holotype as preserved 4 mm, fore wing ca. 3.5 mm.

3. Genus **Cretobraconus** Rasnitsyn & Sharkey, nov. (Figs. 4-11)

Type species: C. pusillus, sp. nov.

Gender: Masculine.

Description: Fore wing with 1st abscissa of RS long, 3r-m and 2m-cu both spectral, cu-a postfurcal. Hind wing with 1st abscissa of RS reclival, short, but distinct. Mesonotum with notauli converging, meeting before scutellar base. Propodeal areolation evident. Metasomal terga not strongly striated, tergum 1 wider than long or of subequal dimensions. Ovipositor short, with sheath shorter than metasoma.

Diagnosis: Unlike *Eoichneumon* in that 1st abscissa of RS of fore wing long, 2m-cu of fore wing spectral and metasomal tergum 1 short. Unlike *Baissobracon* in that cu-a of fore wing postfurcal, 1st abscissa of hind wing RS short, reclival, propodeum and metasomal base free of dense, coarse sculpture. Unlike *Archobraconus* in that hind wing RS with distinct 1st abscissa, and both metasomal tergum 1 and ovipositor short.

Species included: Seven new species in two species-groups.

The **pusillus** species-group (Figs. 4-7)

Four species included, with ovipositor long (sheath at least 0.4 wing length), antenna narrow, bristle-shaped, flagellomeres long, hind femora usually (not always) dark.

3a. **Cretobraconus pusillus** Rasnitsyn & Sharkey, sp. nov. (Fig. 4)

Holotype: Female, PIN, no. 3064/1991; Early Cretaceous, Neocomian, Zaza formation; Transbaicalian, upper stream of Vitim Riv., Baissa locality, bed 31.

Description: Head elongate, eyes large, not bulging. Antenna with ca. 20 flagellomeres. Fore wing with cell 2+3rm (1RS) short, reaching neither cell 1m-cu (1M) nor crossvein 2m-cu. Legs short, weak. Metasomal terga short. Ovipositor sheath ca. 0.6 wing length. Ground color dark, antennal base, tibiae, tarsi (except tarsomere 5) and, partly, fore and mid femora pale. Length of body 2.5 mm, fore wing 1.8 mm, ovipositor sheath 1.0 mm.

Diagnosis: Unlike other species in species-group due to very small size. Unlike known Eoichneumonidae in that fore wing cell 2+3rm (1RS) reaches neither cell 1mcu (1M) nor cross-vein 2m-cu.

3b. **Cretobraconus robustus** Rasnitsyn & Sharkey, sp. nov. (Fig. 5)

Holotype: (sex?), PIN, no. 3064/1989; Early Cretaceous, Neocomian, Zaza formation; Transbaicalian, upper stream of Vitim Riv., Baissa locality, bed 15.

Description: Eyes moderately small. Antenna with more than 20 flagellomeres. Fore wing with cell 2+3rm (1RS) shorter than cell 1+2r (1R1), not reaching cell 1m-cu (1M), extending a little beyond crossvein 2m-cu. Metasomal terga short, tergum 1 with dorsal carinae subparallel (unknown anteriorly). Ground color dark, flagellar base (ca. 5 basal flagellomeres preserved) paler, legs including coxae pale. Length of body as preserved 3.6 mm, fore wing ca. 4.3 mm.

Diagnosis: Similar to the above species and unlike following ones in that cell 2+3rm (1RS) not reaching cell 1m-cu (1M). Unlike *C. pusillus* in that 3r-m distad 2m-cu and body size is large.

3c. **Cretobraconus maculatus** Rasnitsyn & Sharkey, sp. nov. (Fig. 6)

Holotype: Female, PIN, no. 4288/261; earliest Early Cretaceous, Ulugey formation; Mongolia, Southern Gobi Aimak, 25 km S of Mandal-Obo village. Khutuliin-Khira locality, bed 391/3.

Description: Fore wing with cell 2+3rm (1RS) shorter than cell 1+2r (1R1), sessile on cell 1m-cu (1M), extending a little beyond 2m-cu crossvein. Metasoma with terga relatively long, tergum 1 with dorsal carinae well spaced and weakly converging cephalad, and with median longitudinal line. Ovipositor sheath 0.45 wing length. Body, hind coxa and ovipositor sheath dark, lateral spots on metasomal tergum 2 and, possibly, postero-lateral corners of tergum 1 pale. Length of thorax and metasomal terga 1-4 combined 4.0 mm, fore wing 3.0 mm, ovipositor sheath 1.6 mm.

Diagnosis: Unlike other species in species-group in that metasomal terga long and unlike all known species of Eoichneumonidae in that metasoma with pale spots.

3d. **Cretobraconus mongolensis** Rasnitsyn & Sharkey, sp. nov. (Fig. 7)

Holotype: Female, PIN, no. 4307; earliest Early Cretaceous; Mongolia, Ara-Khangai Aimak, 6 km N of Khotont village, Khotont locality.

Description: Eyes at least moderately large. Fore wing with cell 2+3rm (1RS) longer than cell 1+2r (1R1), sessile on cell 1m-cu (1M), extending considerably beyond 2m-cu crossvein. Legs short, weak. Metasomal terga short, tergum 1 with dorsal carinae converging cephalad. Ovipositor sheath 0.4 wing length. Ground color dark, tibiae, tarsi and fore and mid coxae pale. Length of body 3.2 mm, fore wing 3.2 mm, sheath 1.3 mm.

Diagnosis: Unlike other *Cretobraconus* in that cell 2+3rm (1RS) very long.

The **micron** species-group (Figs. 8, 9, 10, 11)

Three species included, with ovipositor sheath at most 0.3 times wing length, antenna thick or thickening apically, at least subapical flagellomeres thick, all legs pale.

3e. **Cretobraconus micron** Rasnitsyn & Sharkey, sp. nov. (Figs. 8, 9)

Holotype: Female, PIN, no. 4210/1149; Early Cretaceous, Neocomian, Zaza formation; Transbaicalian, upper stream of Vitim Riv., Baissa locality, bed 22. Another specimen possibly conspecific with holotype, though not included in type series: PIN, no. 3064/1985, same data, bed 31.

Description: Head rounded, eyes very large, bulging. Flagellum thick throughout. fore wing with cell 2+3rm (1RS) shorter than cell 1+2r (1R1), sessile on cell 1m-cu (1M), extending a little beyond crossvein 2m-cu. Metasomal tergum 1 short, with dorsal carinae probably well spaced and converging cephalad (not seen in holotype), following terga relatively long. Ovipositor sheath 0.25 wing length. Ground color dark, legs (probably including coxae) and metasomal terga 1, 2 and base of 3 pale. Length of body 2.4 mm, fore wing 1.9 mm, sheath 0.45 mm.

Diagnosis: Size small and ovipositor sheath short compared to any other known *Cretobraconus*. Eyes bulging unlike other species of *micron* group.

3f. **Cretobraconus brachyurus** Rasnitsyn & Sharkey, sp. nov. (Fig. 10)

Holotype: Female, PIN, no. 4210/1148; Early Cretaceous, Neocomian, Zaza formation; Transbaicalian, upper stream of Vitim Riv., Baissa locality, bed 15.

Description: Body stout, head big. Flagellum thick throughout, with more than 13 flagellomeres, middle flagellomeres with length ca. 1.5 times width. Fore wing with cell 2+3rm (1RS) subequal in length to cell 1+2r (1R1), sessile on cell 1m-cu (1M), extending considerably beyond 2m-cu crossvein. Ovipositor sheath less than 0.3 wing length. Ground color dark, metasoma increasingly pale basally, legs pale. Length of body 3.3 mm, fore wing 2.3 mm, ovipositor sheath 0.6 mm.

Diagnosis: Flagellum thick throughout as in preceding species, but unlike it in that cell 2+3rm (1RS) long.

3g. **Cretobraconus antennatus** Rasnitsyn & Sharkey, sp. nov. (Fig. 11)

Holotype: Female, PIN, no. 4210/1151; Early Cretaceous, Neocomian, Zaza formation; Transbaicalian, upper stream of Vitim Riv., Baissa locality, bed 22.

Description: Eyes moderately small. Flagellum thin, thicker subapically, flagellomeres more than 15 in number, with length 3-4 times width except shorter subapical ones. Fore wing with cell 2+3rm (1RS) shorter than cell 1+2r (1R1), sessile on cell 1m-cu (1M), extending considerably beyond crossvein 2m-cu. Metasomal tergum 1 scarcely longer than tergum 2, with dorsal carinae well spaced, strongly con-

verging cephalad. Ovipositor sheath less than 0.3 wing length. Ground color dark, metasoma increasingly pale basally, legs pale. Length of body 3.0 mm, fore wing 2.5 mm, ovipositor sheath 0.7 mm.

Diagnosis: Flagellum thickest subapically unlike all other Eoichneumonidae.

4. Genus **Archobraconus** Rasnitsyn & Sharkey, nov. (Figs. 12-19)

Type species: A. caudatus, sp. nov.

Gender: Masculine.

Description: Fore wing with 1st abscissa of RS long, 3r-m and 2m-cu both spectral, cu-a postfurcal. Hind wing with r-m meeting R (instead of RS). Mesonotum with notauli straight, meeting before scutellar base. Propodeal areolation evident. Metasomal terga not strongly striated, tergum 1 elongate. Ovipositor long, with sheath longer than metasoma.

Diagnosis: First abscissa of RS of fore wing long and cu-a crossvein of fore wing postfurcal as in *Cretobraconus*, but unlike it in that both the ovipositor and metasomal tergum 1 long, hind wing r-m meeting R.

Species included: Six new species.

4a. **Archobraconus caudatus** Rasnitsyn & Sharkey, sp. nov. (Fig. 12)

Holotype: Female, PIN, no. 3064/1993; Early Cretaceous, Neocomian, Zaza formation; Transbaicalian, upper stream of Vitim Riv., Baissa locality, bed 31.

Description: Eyes not preserved. Flagellum long, bristle-shaped, flagellomeres more than 29 in number, subbasal ones with length ca. 4 times width, subapical ones ca. 2 times width. Fore wing with cell 2+3rm (1RS) shorter than cell 1+2r (1R1), distant from cell 1m-cu (1M) and extending beyond 2m-cu crossvein. Metasomal tergum 1 ca. 1.3 times length of tergum 2, with dorsal carinae moderately spaced at midlength, moderately converging both cephalad and caudad. Ovipositor sheath almost twice wing length. Ground color moderately dark, flagellum more pale, legs pale. Length of body 4.5 mm, fore wing ca. 3 mm, sheath 5.4 mm.

Diagnosis: Ovipositor longer than those of other Eoichneumonidae.

4b. **Archobraconus imperfectus** Rasnitsyn & Sharkey, sp. nov. (Fig. 13)

Holotype: Female, PIN, no 3064/1990; Early Cretaceous, Neocomian, Zaza formation; Transbaicalian, upper stream of Vitim Riv., Baissa locality, bed 15.

Description: Fore wing with cell 2+3rm (1RS) shorter than cell 1+2r (1R1), distant from cell 1m-cu (1M), extending a little beyond 2m-cu crossvein. Metasomal tergum 1 ca. 1.5 length of tergum 2, with dorsal carinae diverging cephalad. Ovipositor sheath 1.1 times fore wing length. Ground color moderately dark, legs pale. Length of body as preserved 3.9 mm, fore wing 3.5 mm, sheath 4.0 mm.

Diagnosis: Cells 1m-cu (1M) and 2+3rm (1RS) distant as in above species but size larger, ovipositor shorter and metasomal tergum 1 longer.

4c. **Archobraconus oculatus** Rasnitsyn & Sharkey, sp. nov. (Fig. 14)

Holotype: Male, PIN, no. 3064/1992; Early Cretaceous, Neocomian, Zaza formation; Transbaicalian, upper stream of Vitim Riv., Baissa locality, bed 31.

Description: Eyes very large. Fore wing with cell 2+3rm (1RS) much longer than cell 1+2r (1R1), extending far beyond 2m-cu crossvein. Prescutellar fovea long, trans-striate. First metasomal tergum 1.3 times length of tergum 2, with dorsal carinae close to each other, weakly converging cephalad. Ground color moderately pale, metasomal tergum 2 and legs except hind coxa pale. Length of body 2.8 mm, fore wing ca. 2.2 mm.

Diagnosis: Size small and cell 2+3rm (1RS) long compared to other species of *Archobraconus*.

4d. **Archobraconus pallidus** Rasnitsyn & Sharkey, sp. nov. (Fig. 15)

Holotype: (sex?): PIN, no. 4210/1157; Early Cretaceous, Neocomian, Zaza formation; Transbaicalian, upper stream of Vitim Riv., Baissa locality, bed 31.

Description: Eyes moderately small. Fore wing with cell 2+3rm (1RS) subequal cell 1+2r (1R1) in length, sessile on cell 1m-cu (1M), extending considerably beyond 2m-cu crossvein. Metasomal tergum 1 with dorsal carinae diverging cephalad. All preserved parts pale except dark hind femur. Length of fore wing 3.1 mm.

Diagnosis: Though based on very incomplete specimen, species readily distinguishable from other species in having pale thorax and dark hind femora.

4e. **Archobraconus parvus** Rasnitsyn & Sharkey, sp. nov. (Fig. 16)

Holotype: Female, PIN, no. 3064/1986; Early Cretaceous, Neocomian, Zaza Formation; Transbaicalian, upper stream of Vitim Riv., Baissa locality, bed 13.

Description: Flagellum bristle-shaped, flagellomeres minimum 17 in number, with length 2-3 times width. Metasomal tergum 1 narrow, length 1.3 times tergum 2 length, with dorsal carinae converging cephalad. Ovipositor sheath ca. 0.9-1.0 times wing length. Ground color dark, tibiae and tarsi pale. Length of body 3.0 mm, fore wing probably 2.0-2.2 mm, ovipositor sheath 2.0 mm.

Diagnosis: Size small as in *A. oculatus* but metasomal tergum 1 with dorsal carinae converging cephalad and hind femur black.

4f. **Archobraconus microphthalmus** Rasnitsyn & Sharkey, sp. nov. (Fig. 17)

Holotype: Female, PIN, no. 3064/1194; Early Cretaceous, Neocomian, Zaza Formation; Transbaicalian, upper stream of Vitim Riv., Baissa locality, bed 31.

Description: Eyes small. Flagellomeres more than 15 in number, with length several times width, subapical flagellomeres with length 1.5 times width. Ovipositor sheath probably 0.9-1.9 wing length. Ground color moderately dark, flagellum and probably legs pale. Length of body 3.7 mm, fore wing ca. 2.8-3.0 mm, ovipositor sheath 2.8 mm.

Diagnosis: Unlike other species in small eye size. Ovipositor shorter than in *A. caudatus* and *A. imperfectus*, body size larger than in *A. oculatus* and *A. parvus*, unlike *A. pallidus* in that thorax dark while hind femur pale.

4g-h. **Archobraconus** spp. indet. (Figs. 38, 19)

There are two more specimens assignable to the genus based on long metasomal tergum 1 and, in one case, on long ovipositor (Figs. 18, 19). Both come from the Baissa locality where most described species have been collected (see above), no. 3064/1988 from bed 15, while no. 4210/1153 from bed 22. The first specimen (Fig. 18) is similar to *A. caudatus* in color and long ovipositor, though body size is much larger (body length 5.8 mm, ovipositor sheath length 6.8 mm). Another specimen (Fig. 19) matches in size (body length 3.5 mm, fore wing length ca. 3 mm) only with *A. pallidus* and *A. microphthalmus* but differs from the former in color (body black, legs pale) and in metasomal tergum 1 with dorsal carinae subparallel, and it differs from the latter in large eye size. It is the second male known for the genus.

5. **Cretobraconus** vel **Archobraconus** spp. indet. (Figs. 20, 21)

There are two isolated fore wings (Figs. 20, 21) from Baissa locality (bed 15), both sharing long 1st abscissa of RS of fore wing, spectral 3r-m and 2m-cu and postfurcal cu-a with the above genera. One of them (Fig. 20) differs from all other Eoichneumonidae in its huge size (Probably near 15 mm). Another wing (Fig. 21) has cell 2+3rm (1RS) sessile on cell 1mcu (1M) and scarcely or not at all extending beyond 2m-cu, a combination unknown for other Eoichneumonidae.

Acknowledgments

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References

JELL, A. P. & DUNCAN, P. M., 1986. Invertebrates, mainly insects, from the freshwater, Lower Cretaceous, Koonwarra Fossil Bed (Korrumburra Group), South Gippsland, Victoria. Mem. Ass. Australas. Palaeontols., 3: 111-205.

KUZMINA, S. A., 1985. New Phasmomimidae (Orthoptera) from the Lower Cretaceous in Transbaicalian. Paleontol. Zhurn., 3: 59-65 (in Russian; English translation in Paleontol. J., 1985, 19(3): 56-63.

RASNITSYN, A. P., 1969. Origin and evolution of the Lower Hymenoptera. Trans. Paleont. Inst. Acad. Sci. USSR, 123: 1-196 (in Russian; translated into English by Amerind Publ. Co., New Delhi, 1979).

RASNITSYN, A. P., 1980. Origin and evolution of Hymenoptera. Trans. Paleont. Inst. Acad. Sci. USSR, 174: 7-192 (in Russian).

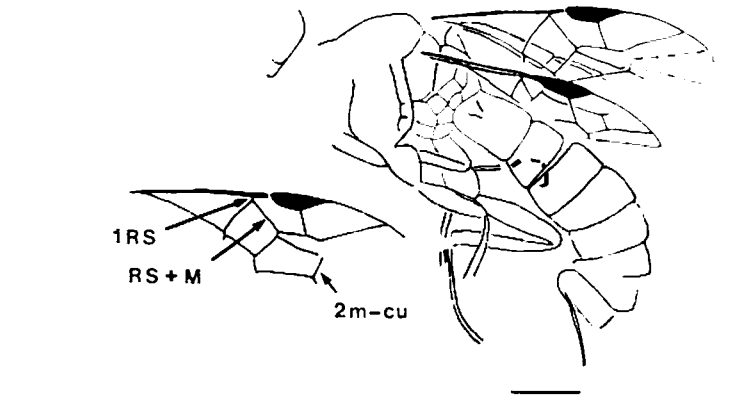
RASNITSYN, A. P., 1983. Ichneumonoidea from the Lower Cretaceous of Mongolia. Contrib. Amer. Entomol. Inst., 20: 259-265.

RASNITSYN, A. P., 1988. An outline of evolution of the Hymenopterous insects (Order Vespida). Oriental Ins., 22: 115-145.

SUKATSHEVA, I. D., 1968. New Mesozoic caddis-flies from Transbaicalian. Paleontol. Zhurn., 2: 94-105 (in Russian).

Figures 1-21

All scale bars = 1 mm.



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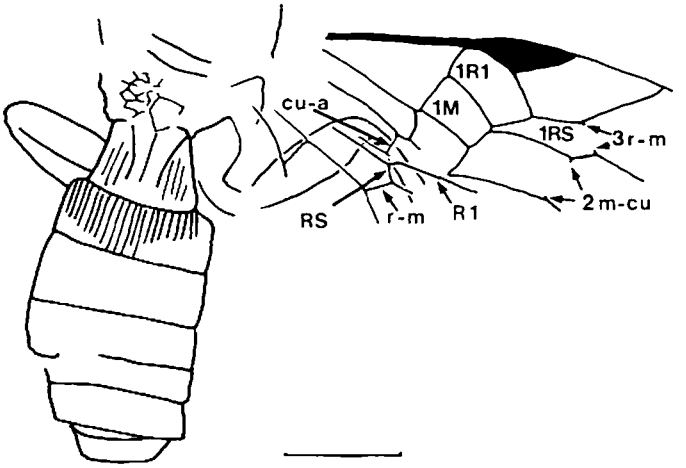


2a

2b

Fig. 1. *Eoichneumon duncanae*, holotype
Fig. 2. *Baissobracon striatus*, holotype

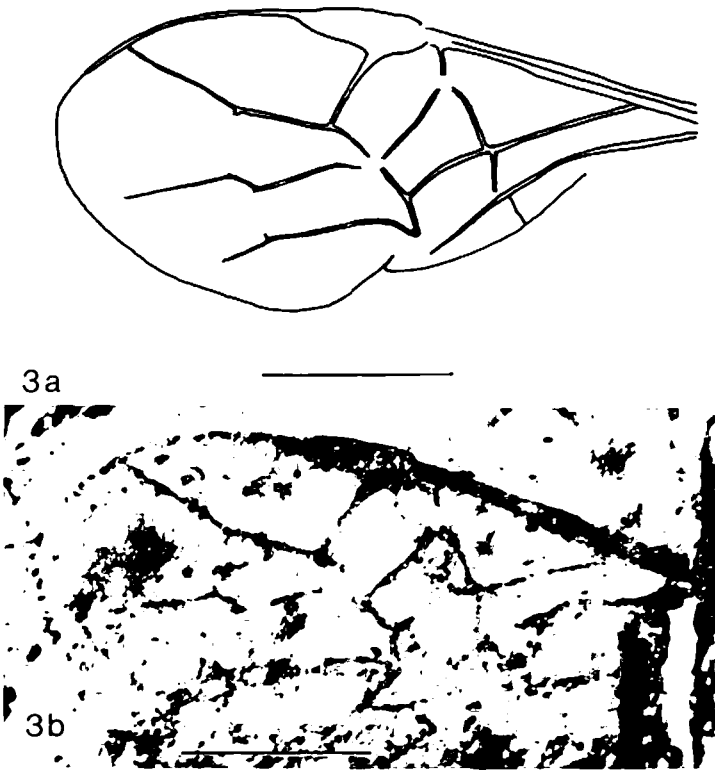
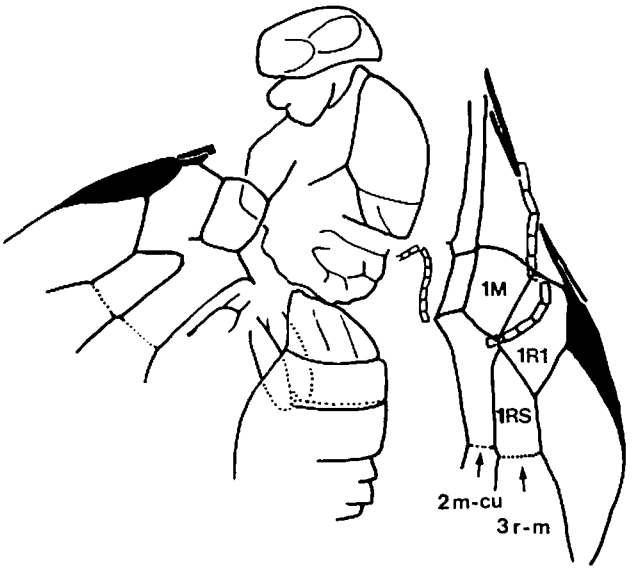
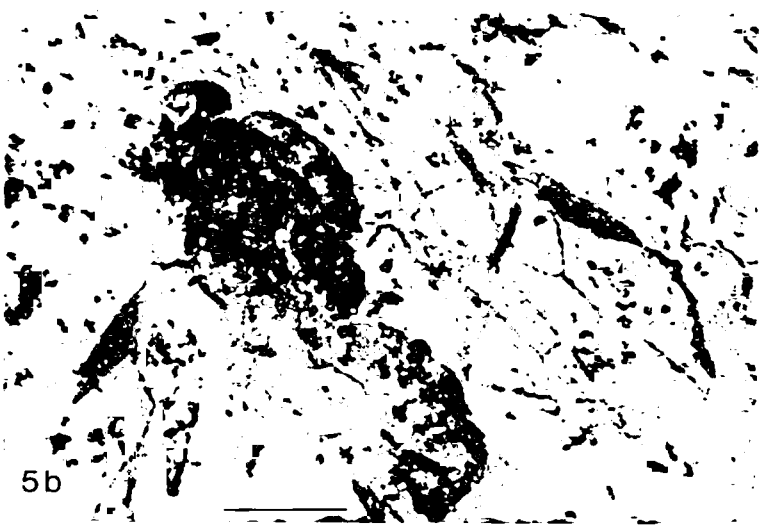


Fig. 3. *Baissobracon striatus*, paratype

Fig. 4. *Cretobraconus pusillus*, holotype

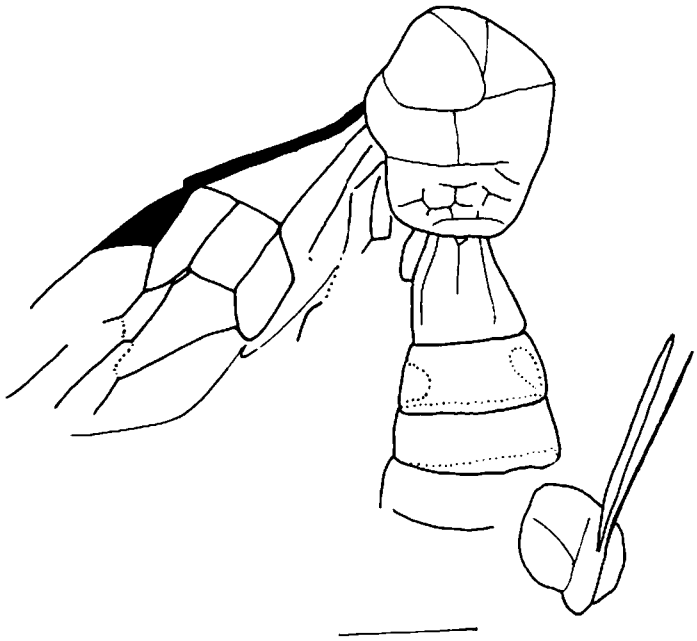


5a



5b

Fig. 5. *Cretobraconus robustus*, holotype



6a

6b

Fig. 6. *Cretobraconus maculatus*, holotype

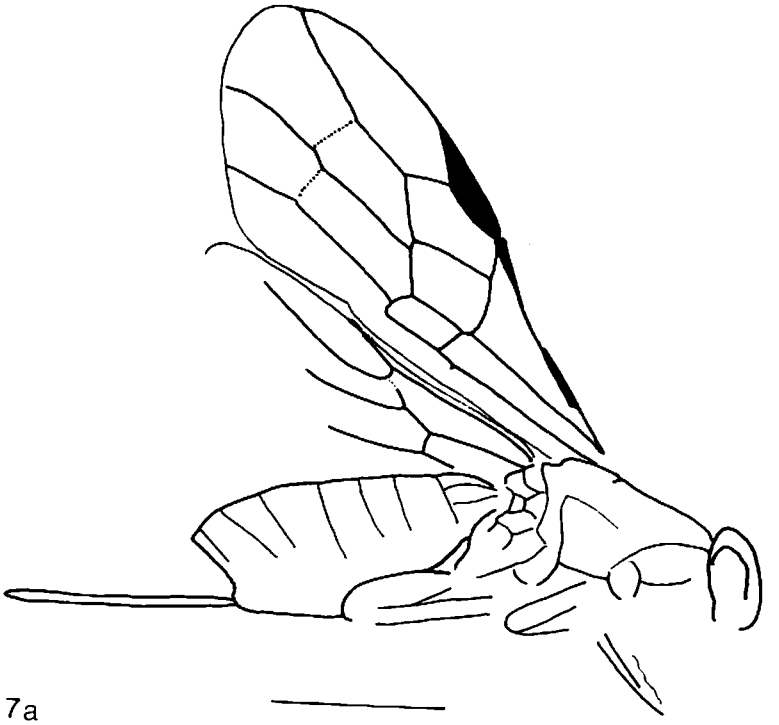
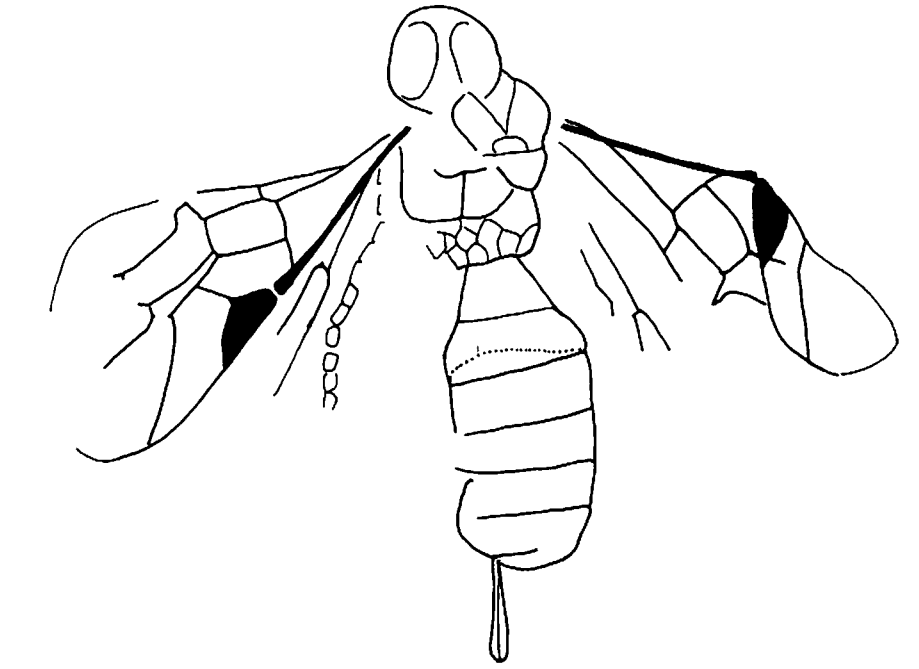
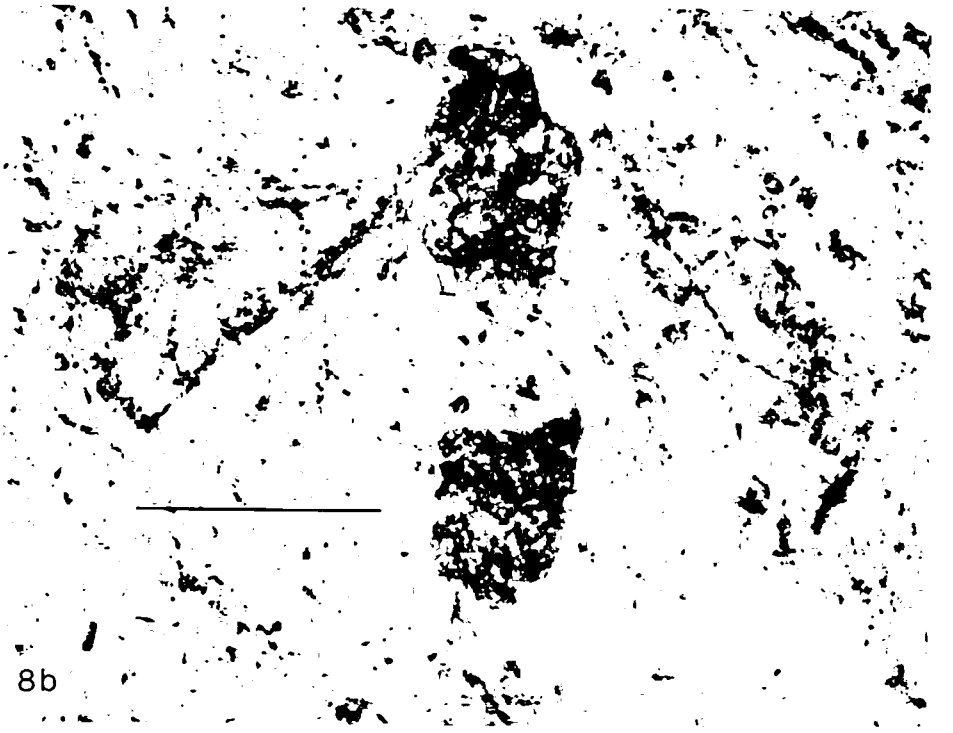


Fig. 7. *Cretobraconus mongolensis*, holotype



8a



8b

Fig. 8. *Cretobraconus micron*, holotype

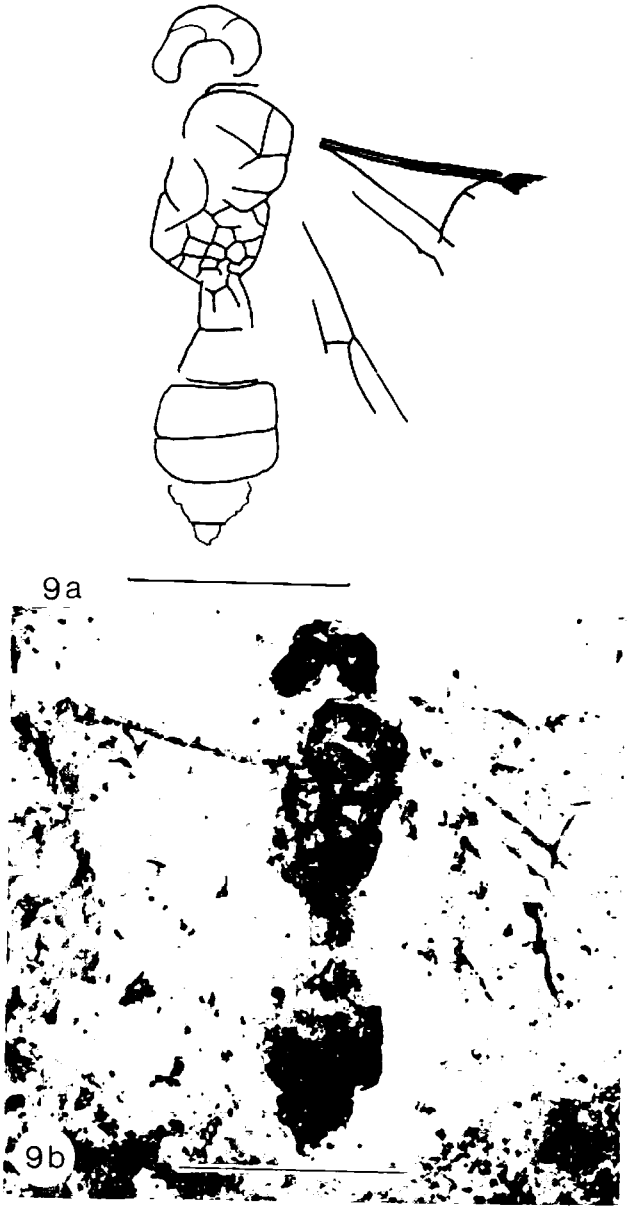


Fig. 9. *Cretobraconus micron*

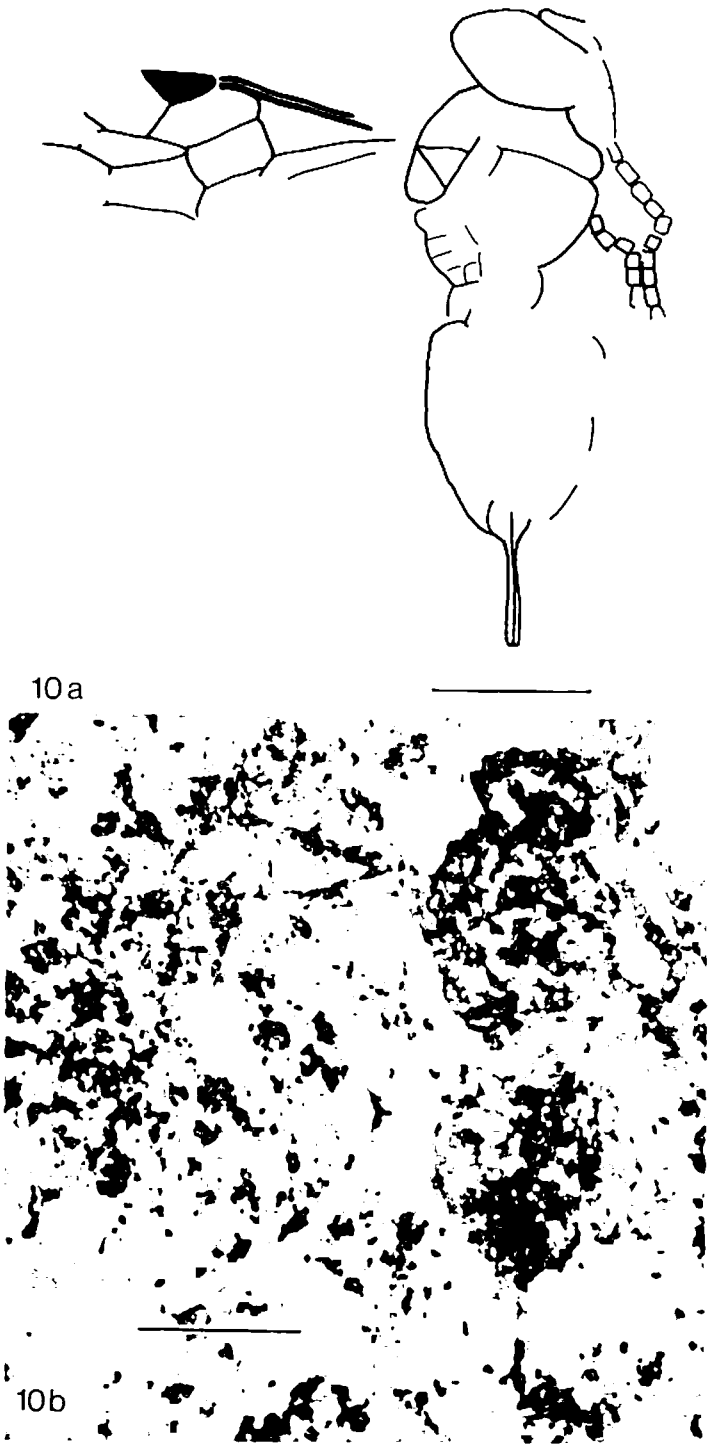


Fig. 10. *Cretobraconus brachyurus*, holotype

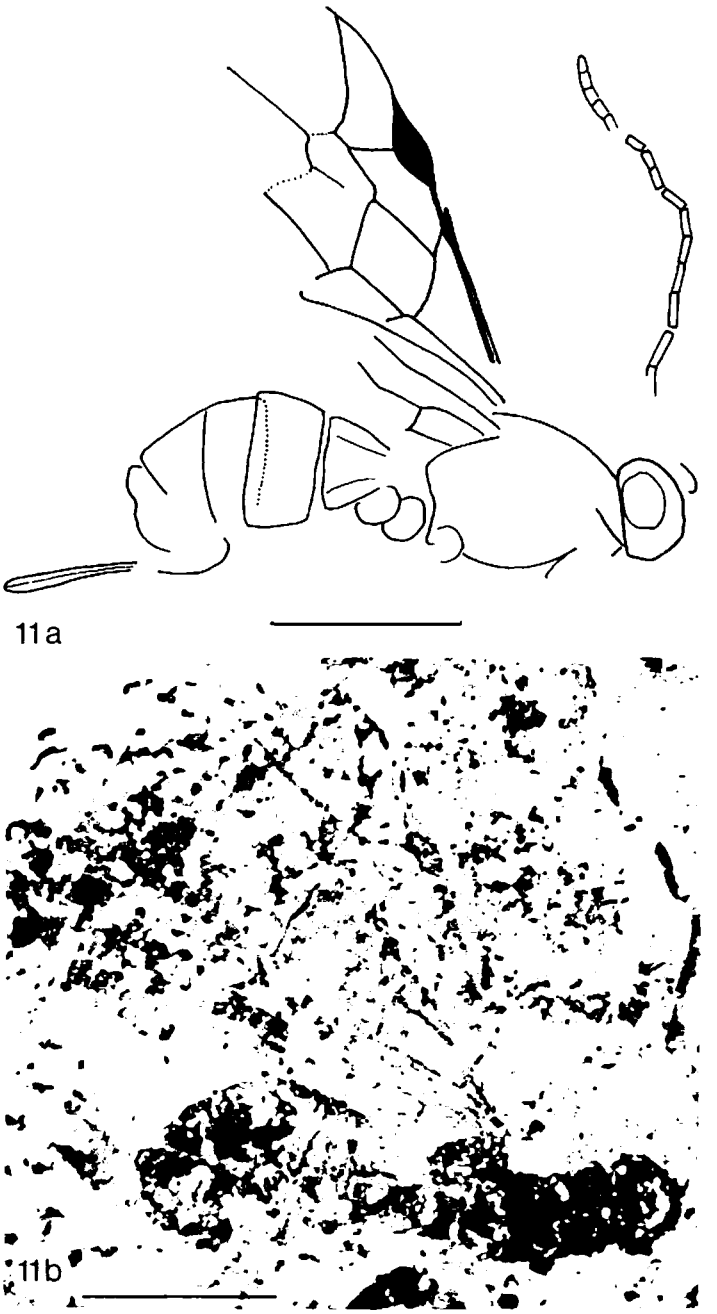
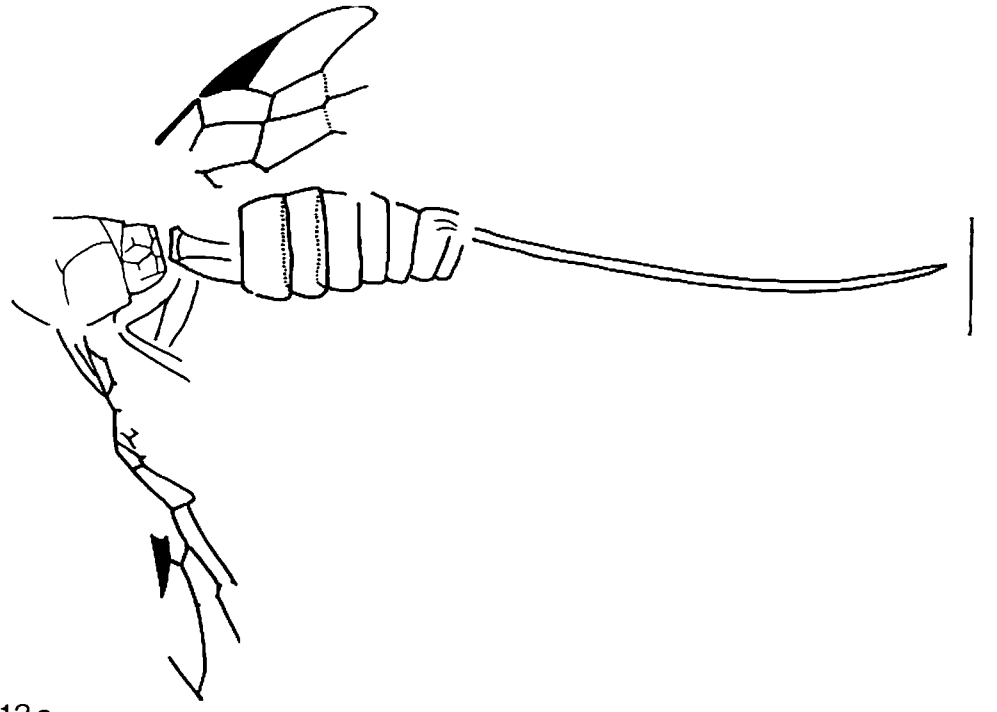


Fig. 11. *Cretobraconus atennatus*, holotype

Fig. 12. *Archobraconus caudatus*, holotype



13a

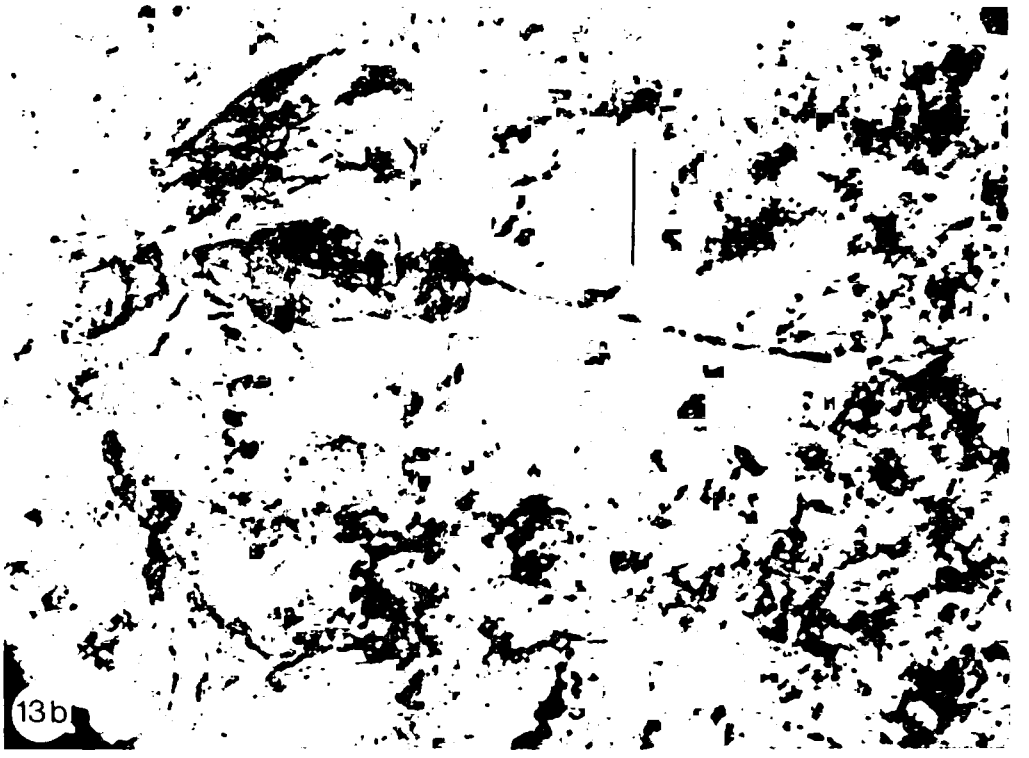
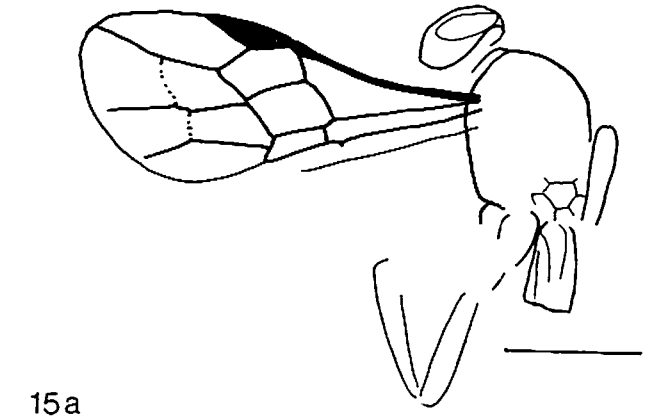


Fig. 13. *Archobraconus imperfectus*, holotype

Fig. 14. *Archobraconus oculatus*, holotype

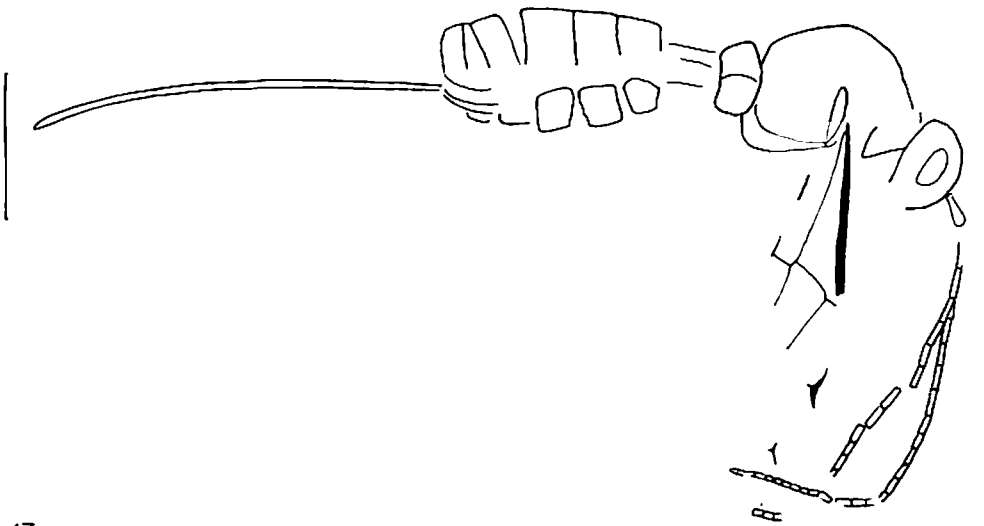


15a

15b

Fig. 15. *Archobraconus pallidus*, holotype

Fig. 16. *Archobraconus parvus*, holotype



17a

17b

Fig. 17. *Archobraconus microphthalmus*, holotype

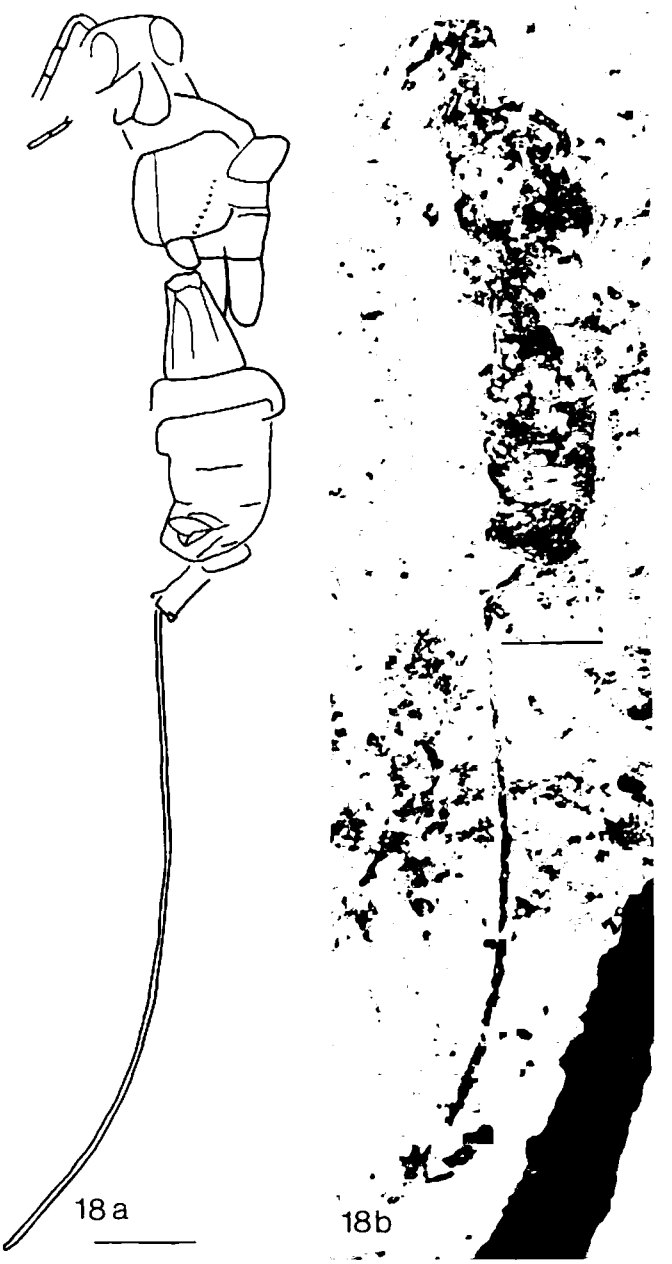


Fig. 18. *Archobraconus* sp.

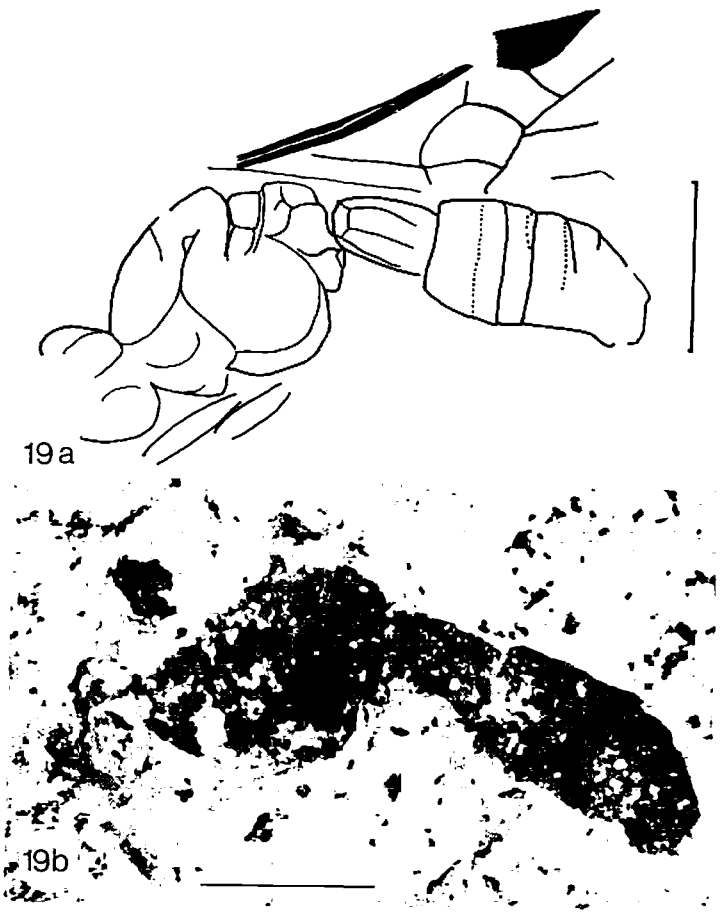
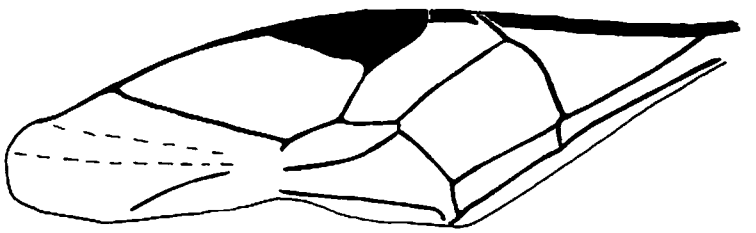


Fig. 19. *Archobraconus* sp.



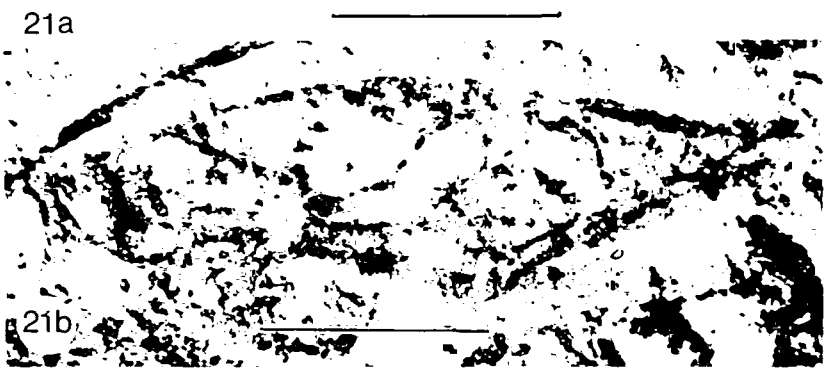


Fig. 20. *Cretobraconus* sp. vel *Archobraconus* sp.
Fig. 21. *Cretobraconus* sp. vel *Archobraconus* sp.