

Hymenopterous insects (Insecta: Vespida) in the Upper Jurassic deposits of Shar Teg, SW Mongolia

Перепончатокрылые насекомые (Insecta: Vespida) из верхнеюрских отложений Шар Тега в ЮЗ Монголии

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KEY WORDS: Fossil hymenopterans, Upper Jurassic, Mongolia, Xyelidae, Ephialtitidae, Praeaulacidae, Megalyridae, Peleciniidae, new genera, new species.

КЛЮЧЕВЫЕ СЛОВА: Перепончатокрылые, верхняя юра, Монголия, Xyelidae, Ephialtitidae, Praeaulacidae, Megalyridae, Peleciniidae, новые роды, новые виды.

ABSTRACT. Described from the Upper Jurassic of Shar Teg, SW Mongolia, are *Shartexyela mongolica* **gen. sp.n.** (Xyelidae: Gigantoxyelini), *Altephialtites altaicus* **gen. sp.n.** (Ephialtitidae: Ephialtitinae), *Praeaulacus patiens* **sp.n.**, *P. sharteg* **sp.n.** (Praeaulacidae: Praeaulacinae), *Anomopterella gobi* **sp.n.** (Praeaulacidae: Anomopterellinae), *Cleistogaster gobialtaica* **sp.n.**, *Mesaulacinus mongolicus* **sp.n.** (Megalyridae: Cleistogastrinae), *Praescopinus excellens* **gen. sp.n.** (Peleciniidae: Iscopininae). Composition of the fossil assemblage is expectable for the Upper Jurassic and more similar to that of the Upper Jurassic of Karatau (S. Kazakhstan) than to Daohugou (NE China).

РЕЗЮМЕ. Из верхней юры Шар Тега (ЮЗ Монголия) описаны *Shartexyela mongolica* **gen. et sp.n.** (Xyelidae: Gigantoxyelini), *Altephialtites altaicus* **gen. et sp.n.** (Ephialtitidae: Ephialtitinae), *Praeaulacus patiens* **sp.n.**, *P. sharteg* **sp.n.** (Praeaulacidae: Praeaulacinae), *Anomopterella gobi* **sp.n.** (Praeaulacidae: Anomopterellinae), *Cleistogaster gobialtaica* **sp.n.**, *Mesaulacinus mongolicus* **sp.n.** (Megalyridae: Cleistogastrinae), *Praescopinus excellens* **gen. et sp.n.** (Peleciniidae: Iscopininae). Этот состав ископаемых ожидаем для верхней юры и более сходен с таковым в верхней юре Казахстана (Каратау), чем в средней юре СВ Китая (Даохугоу).

Ten hymenopterous fossils have been collected in the Upper Jurassic lacustrine deposits of Shar Teg Beds outcropped at Ulan Malgait Mt. 4–5 km west of Shar Teg Mt., 100 km ESE Altai Somon (former Bajjan-Obo), Altai Gobi Aimag, SW Mongolia [Gubin & Sinitsa, 1996]. One of them, *Sepulca mongolica* Rasnitsyn, 1993 (Sepulcidae) has been described earlier [Rasnitsyn, 1993a]. Scarce information about insects of the end of Jurassic (later than famous Karatau assemblage in Kazakhstan) is

justifying description of the rest material which is interesting even though of limited diversity.

The fossils under description are kept at the Paleontological Institute, RAS, Moscow. The photographs are made using Leica MZ 9.5 microscope and Nikon D70 camera further corrected using Adobe Photoshop CS 9.0 software, line drawings are made using CorelDraw 12 software.

Order Vespida Laicharting, 1781
(= Hymenoptera Linné, 1758)

Family Xyelidae Newmann, 1834

Subfamily Macroxyelinae Ashmead, 1898

Tribe Gigantoxyelini Rasnitsyn, 1969

Genus *Shartexyela* Rasnitsyn, **gen.n.**

Type species *Sh. mongolica* **sp.n.**

SPECIES INCLUDED. Type only.

DIAGNOSIS. Wing membrane naked. Pterostigma dark, sclerotized throughout. SC with one extra fore branch, with hind branch meeting R at RS base, with apical branch meeting C well beyond RS base. R gently arching making preradial space widest basal of RS base. 1RS slightly longer than 1M. 1r-rs shorter than 2r-rs. Cell 2r long (distance between 1r-rs and 2r-rs twice as long as 2r-rs). RS₂ meeting R much more close to apex of RS₂ than to apex of pterostigma. 1m-cu more than half as long as 3Cu. 2m-cu angular toward wing base, at midlength with short stub there.

REMARKS. Naked wing membrane, pterostigma sclerotized throughout, and moderately short 1m-cu indicate position of the fossil at hand in the subfamily Macroxyelinae and tribe Gigantoxyelini (for further discussion see [Rasnitsyn, 1993b]). Within the tribe, presence of a single extra SC branch is unique for the genus (two are found in *Gigantoxyela* Rasnitsyn, 1966 and none in *Chaetoxyela* Rasnitsyn, 1966, *Chionoxyela* Rasnitsyn, 1993, and *Heteroxyela* Zhang et Zhang, 2000), as well as long cells 2r and 3r. SC meeting R just at base of RS and 1r-rs shorter than 2r-rs are similar to



Fig. 2. *Altephtaltites altaicus* gen. sp.n., holotyp, PIN 4270/1546; the fossil (A) and its interpretation (B); venational symbols as Fig. 1, other morphological symbols: f_2 , f_3 — mid and hind femur; pl_1 — propleurae; oc — eye; ta_1 — fore tarsus; 1, 2, 3, etc. — metasomal segments.

Рис. 2. *Altephtaltites altaicus* gen. sp.n., голотип, PIN 4270/1546; отпечаток (A) и его интерпретация (B). f_2 , f_3 — среднее и заднее бедро; pl_1 — проплевра; oc — глаз; ta_1 — передняя лапка; 1, 2, 3 и т.п. — сегменты мезосомы; остальные обозначения как на Рис. 1.

viz., Praeaulacidae and Bethylonymidae are found as well.

Within the genera of Ephialtitidae [as listed by Zhang et al., 2002 and Rasnitsyn et al., 2003] the fossil in question is unique in 1RS meeting M at striking angle and yet directed posterobasal: other genera have it either (majority) more or less aligned with 1M, or directed vertical or posterodistal. Another unique feature of the new genus is cells 2rm and 3rm both short being combined only slightly longer than 1mcu. Taking other available characters into consideration, and particularly the hind wing venation, the most similar to the present genus is *Asiephialtites* Rasnitsyn, 1975. Position of cu-a close to the base of cell 1mcu implies the new genus to belong to subfamily Ephialtitinae and hence a possession of long ovipositor.

ETYMOLOGY. Genus is named after the source area of the fossil (Gobi-Altai Aimag of Mongolia) and genus *Ephialtites*. Gender masculine.

Altephialtites altaicus Rasnitsyn, sp.n.

Fig. 2

MATERIAL. Holotype: PIN 4270/1546, almost complete insect with head and mesosoma much damaged and almost impossible to interpret, most of legs and metasomal apex lost; SW Mongolia, Shar Teg; Late Jurassic, Shar Teg Beds.

DESCRIPTION. Ground color dark, mesosoma and possibly head less so. Antenna thin, slightly widened apically, mid flagellomeres some three times as long as wide, subapical ones slightly longer than wide (antennal base lost). Fore wing pterostigma long, narrow, with 2r-rs at its midlength, 1RS about as long as its distance from pterostigma, almost half as long as 1M, RS+M gently sinuate, 2r-rs slightly shorter than 2RS and about twice as long as 3RS; 4RS and 5RS forming

almost straight line, 4RS slightly shorter than 5RS, 2M short but distinct, subvertical, 1m-cu almost aligned with 3M, 2m-cu slightly before midlength of cell 3rm, 1Cu short (roughly as long as 2M). Hind wing 1RS as long as 1M, r cell closed at wing fore margin before wing apex, r-m almost 2/3 as long as 1RS, 2M+Cu distinctly longer than 1M and than cu-a. Mid(?) tibia about as long as 3r cell, mid(?) tarsomere 1 0.3 times as long as tibia. Metasomal tergum 1 apparently somewhat longer than wide, terga 2–3 distinctly transverse. Fore wing length as preserved 4.8 mm.

ETYMOLOGY. After Altai Mts.

Family Praeaulacidae Rasnitsyn, 1972

Subfamily Praeaulacinae Rasnitsyn, 1972

Genus *Praeaulacus* Rasnitsyn, 1972

Praeaulacus patiens Rasnitsyn, sp.n.

Fig. 3

MATERIAL. Holotype: PIN 4270/1545, much damaged fossil with only head back side, damaged pro- and mesonotum, propodeum, incomplete hind legs, and three wings (one damaged) preserved; SW Mongolia, Shar Teg; Late Jurassic, Shar Teg Beds.

DESCRIPTION. Head and preserved fragments of mesosoma including hind coxae dark, hind legs beyond

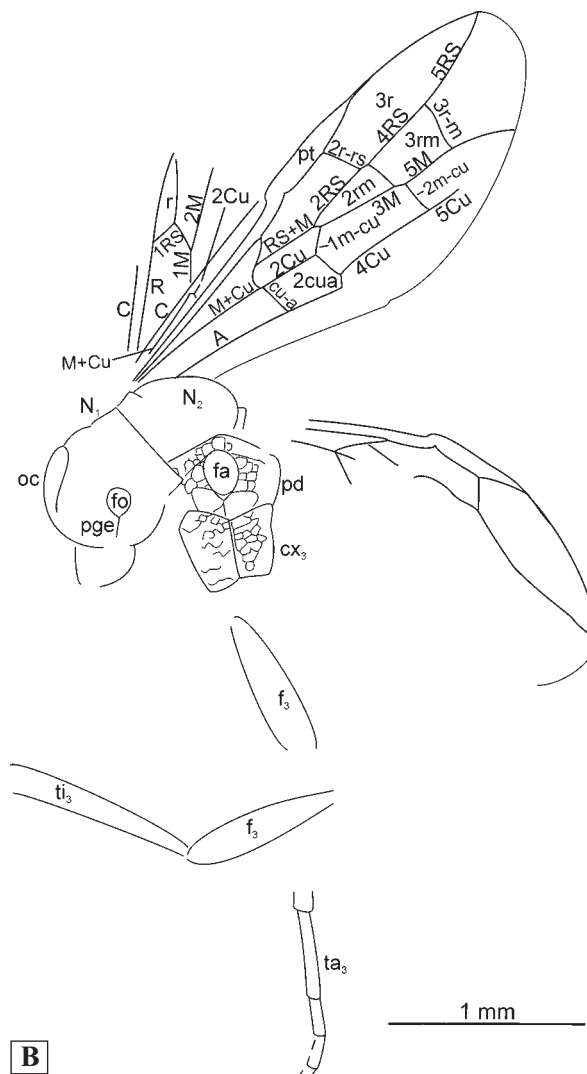
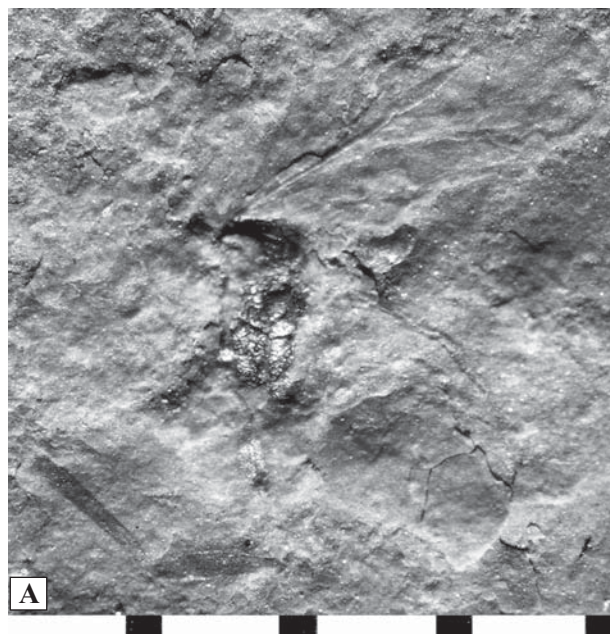


Fig. 3. *Praeaulacus patiens* sp.n., holotype, PIN 4270/1545; the fossil (A) and its interpretation (B); morphological symbols other than explained at Figs 1–2: cx₃ — hind coxa; fa — articulatory foramen of metasoma; fo — foramen occipitalis; N₁, N₂ — pro- and mesonotum; pd — propodeum; pge — postgena.

Рис. 3. *Praeaulacus patiens* sp.n., голотип, PIN 4270/1545; отпечаток (A) и его интерпретация (B). cx₃ — задний тазик; fa — сочленовное отверстие метасомы; fo — затылочное отверстие; N₁, N₂ — передне- и среднеспинка; pd — пропододеум; pge — постгена; остальные обозначения как на Рис. 1–2.

coxae and pterostigma less so. Propodeum and hind coxae areolated rugose, other body fragments as preserved without rough sculpture. Head large, round, with eyes small, rather flat, and postgenae meeting for a distance below occipital foramen. Propodeum with large, oval articular foramen closed below with bridge half as wide as foramen high and reaching above boundary between upper and hind propodeal surface. Hind coxa about as high as propodeum, some twice as long as wide in hind view, femur subclavate, 4–4.5 times as long as wide, tibia slightly longer than femur, rather thin, tarsus shorter, with tarsomere 1 as long as 2–4 combined. Fore wing with pterostigma long, narrow, meeting 2r-rs slightly beyond midlength, 1RS and 1M subequal in length, meeting smooth, distant from pterostigma for less than their combined length, RS+M straight, parallel to 2+3Cu, 2RS almost straight, with no indication of 1r-rs, 2r-rs much longer than pterostigma wide, very slightly longer than 2r-m, meeting RS short before 2r-m, RS almost straight between RS+M and 3r-m and only beyond slightly bending toward wing fore margin, 3r-m slightly more close to 2r-rs than to 3r apex, 2m cell slightly longer than 3m. 2M short but distinct, 2m-cu near base of 3m, cu-a at the very base of 1m-cu. Hind wing 3r cell closed or almost closed at wing fore margin, r-m scarcely longer than 1RS, distinctly shorter than 1M and almost aligned with it, cu-a slightly beyond branching point of M+Cu. Fore wing length 2.6 mm.

REMARKS. Upper position of the propodeal foramen indicates that the new species belongs to superfamily Evanioidea and, because of plesiomorphic wing venation, family Praeaulacidae and subfamily Praeaulacinae. Within that subfamily, absence of metasoma does not permit generic identification using existing keys [Rasnitsyn, 1972; Zhang & Rasnitsyn, 2008 in press]. Nevertheless, the selection is limited with the only genus *Praeaulacus* Rasnitsyn, 1972, because all other genera demonstrate essentially different venation. Again, the above keys to species of *Praeaulacus* are of limited use because of badly incomplete fossil, and yet its species level distinctness is apparent because of its unusually low cell 1m-cu. The only species similar in that respect, *P. exquisitus* Zhang et Rasnitsyn from the Middle Jurassic of Daohugou, China, has much larger fore wing (6 mm instead of 2.6), sinuate 3r-m and short hind wing r-m. All known Praeaulacinae are restricted to the Middle and Upper Jurassic of Kazakhstan, Mongolia (undescribed) and China.

ETYMOLOGY. Species name is Latin for patient.

Praeaulacus sharteg Rasnitsyn, **sp.n.**

Fig. 4

MATERIAL. Holotype: Female, PIN 4270/1544, partially preserved insect with metasoma almost entirely, and much of appendages other than wings lost; SW Mongolia, Shar Teg; Late Jurassic, Shar Teg Beds.

DESCRIPTION. Ground color dark, legs and preserved fragment of metasoma less so. Mesosoma rugose and areolate rugose except that mesonotum transversely striate. Head transverse with large, convex eyes, temples wide above and rather narrow below. Scape small, pedicel elongate, as wide as basal flagellomeres, about twice as long as wide, three basal flagellomeres subequal, some 3 times as long as wide, more distal flagellomeres preserved shorter and slightly wider. Pronotum with hind margin scarcely concave. Notauli straight, diverging, deeply impressed and trans-ridged, mesoscutal suture line-like, prescutellar impression long. Propodeum very short. Hind coxa apparently short. Fore wing with pterostigma rather short and thick, with 2r-rs near its midlength, 1RS and 1M meet almost smooth, distant from

pterostigma for about their combined length, RS+M straight, parallel to 1Cu, 2RS desclerotized, angled with straight 3RS but with no real remnant of 1r-rs, 2r-rs very slightly longer than 2r-m, distant from that for slightly less than 2r-m length, 3r-m distinctly more close to 2r-rs than to apex of 3r, 2M very short. Cell 2m slightly longer than 1m-cu and much longer than 3m, 1m-cu not very low. 2m-cu at about basal third of 3m, cu-a coincides with branching point of 1M and 1Cu. Hind wing as in preceding species except that 1R longer than r-m; short A stub present distal of cu-a. Fore wing length 4.1 mm.

REMARKS. The new species is generally similar to the previous one and equally deserves attribution to *Praeaulacus*, and particularly to the same group of species with characteristically straight hind wing 1M almost aligned with r-m. Of these, only *P. sculptus* Zhang et Rasnitsyn from the Middle Jurassic of Daohugou, China, is similar in clear distinction of 2RS and 3RS and in most other venational features: it clearly differs, however, in 3r-m placed much closer to the wing margin.

ETYMOLOGY. After locality (noun in apposition).

Subfamily Anomopterellinae Rasnitsyn, 1975

Genus *Anomopterella* Rasnitsyn, 1975

Anomopterella gobi Rasnitsyn, **sp.n.**

Fig. 5.

MATERIAL. Holotype: PIN 4270/1549, damaged fore wing; SW Mongolia, Shar Teg; Late Jurassic, Shar Teg Beds.

DESCRIPTION. Pterostigma long, narrow, with 2r-rs just before apex. RS leaving R just before pterostigma. 2r-m 2/3 as long as pterostigma, meeting RS shortly before 3r-m, last section RS (5RS) straight, 3r cell slightly more than twice as long as wide, 2+3rm and 2m-cu cells very narrow, (M+)CuA almost straight throughout, very slightly indented at apex of 2cua cell, cu-a coinciding with 1M base, cua cells very wide (high), 2cua truncate distally. Fore wing length 3.5 mm.

REMARKS. Very characteristic venation, and particularly form of pterostigma and cells 2–3r, 2+3rm, 2m-cu and 2cua, leave no doubts in taxonomic position of the present fossil in the subfamily Anomopterellinae and its sole genus *Anomopterella*. The new species differs clearly from all three congeners from the Middle and Upper Jurassic of Kazakhstan and China [Rasnitsyn, 1975; Zhang, Rasnitsyn, 2008 in press] in having 2r-rs particularly long and 4RS particularly short, and in interstitial cu-a.

ETYMOLOGY. Species name is the Mongolian for desert (noun in opposition).

Family Megalyridae Schletterer, 1889

Subfamily Cleistogastrinae Rasnitsyn, 1975

Genus *Cleistogaster* Rasnitsyn, 1975

Cleistogaster gobialtaica Rasnitsyn, **sp.n.**

Fig. 6

MATERIAL. Holotype: female, 4270/1548, damaged fossil with legs and ovipositor incomplete, wings and metasoma distorted and mesosoma particularly damaged; SW Mongolia, Shar Teg; Late Jurassic, Shar Teg Beds.

DESCRIPTION. Ground color dark, legs as preserved and metasomal apex less so. Mesosoma possibly rugose, otherwise body surface with no rough sculpture. Head medium-sized, ovoid, with eyes large, elongate, not particularly convex, temples not inflated. Antenna 18-

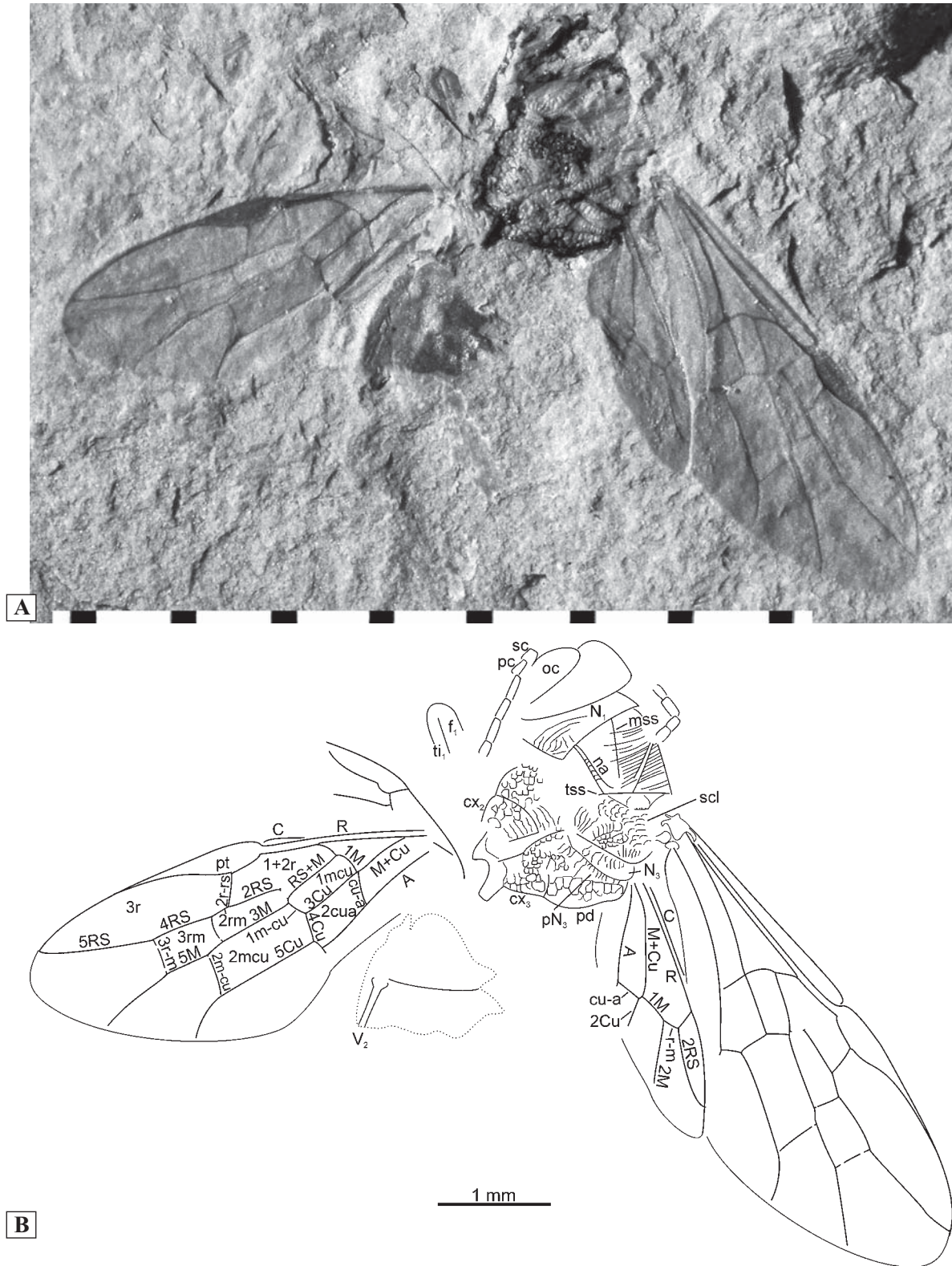
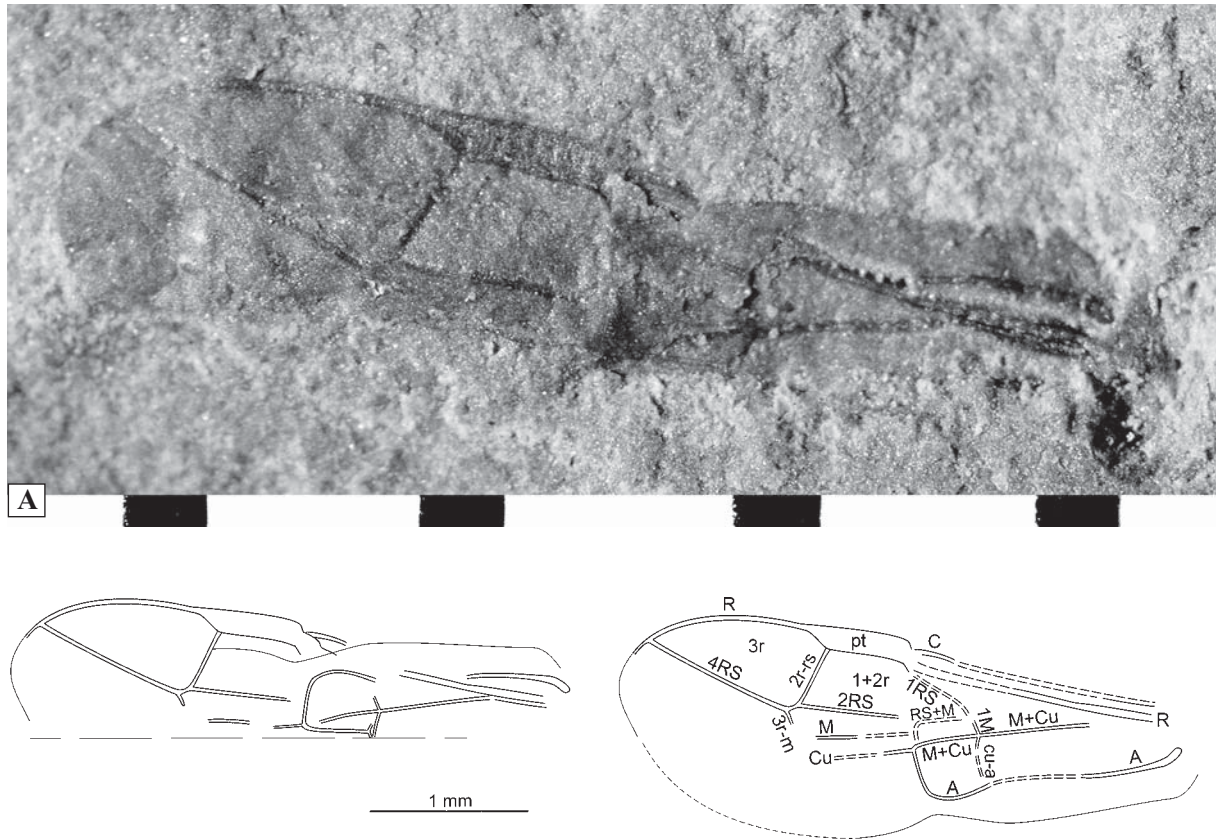


Fig. 4. *Praeaulacus sharteg* sp.n., holotype, PIN 4270/1544; the fossil (A) and its interpretation (B); morphological symbols other than explained at Figs 1–3: mss — mesoscutal suture; N₃ — metanotum; na — notaulus; pc — pedicel; pN₃ — metapostnotum; sc — scape; scl — scutellum (mesoscutellum); tss — transscutal suture; V₂ — fused dorsal (2nd) valvulae of ovipositor.

Рис. 4. *Praeaulacus sharteg* sp.n., голотип, PIN 4270/1544; отпечаток (A) и его интерпретация (B). mss — продольный шов среднеспинки; N₃ — заднеспинка; na — нотаула; pc — педицел; pN₃ — метапостнотум; sc — скапус; scl — щитик; tss — поперечный шов среднеспинки; V₂ — дорзальная створка яйцеклада; остальные обозначения как на Рис. 1–3.



B Fig. 5. *Anomopterella gobi* sp.n., holotype, PIN 4270/1549; the fossil (A) and its interpretations (B); venational symbols as Fig. 1.

Рис. 5. *Anomopterella gobi* sp.n., голотип, PIN 4270/1549; отпечаток (A) и его интерпретация (B); условные обозначения как на Рис. 1.

segmented, with scape funnel-shaped as preserved, pedicel longer than wide, slightly wider than basal flagellomeres, first four flagellomeres almost isometric, some 3–3.5 times as long as wide, eight apical ones almost equal length, slightly longer than wide. Fore wing with pterostigma moderately short and narrow, parallel-sided, with 2r-m at midlength. Venation complete (2–3r-m and 2m-cu present). RS+M reaching 1m-cu, 2RS and 3RS meeting at rounded angle, 2r-rs and 2r-m practically co-incide at RS, 3r-m subvertical, straight, almost twice as long as 2r-m, placed near midpoint between 2r-m and apex of 3r cell, 2m-cu beyond midlength of cell 3rm, cu-a very slightly beyond base of 1M. Hind wing with r-m and 1M not perfectly aligned, with M stub preserved, otherwise ordinary as preserved. Body length as preserved 4.3 mm, fore wing length 3.3 mm.

REMARKS. Complete venation with 3r-m and 2m-cu crossveins well developed implies unequivocally position of the new species in the genus *Cleistogaster*, and very large cell 3rm indicates its distinctness at species level. Among congeners, *C. obscurus* Rasnitsyn, 1975, from the Upper Jurassic of Kazakhstan is most similar in co-inciding 2r-rs and 2r-m as well as cu-a and 1M but differs in all short flagellomeres. *Cleistogaster* is known from the Jurassic of Kazakhstan and East Siberia [Rasnitsyn, 1975] (attribution of source deposits of *C. dahurica* Rasnitsyn, 1975 to the Lower Cretaceous is now considered incorrect).

ETYMOLOGY. The species name is after Gobi-Altai Aimag of Mongolia.

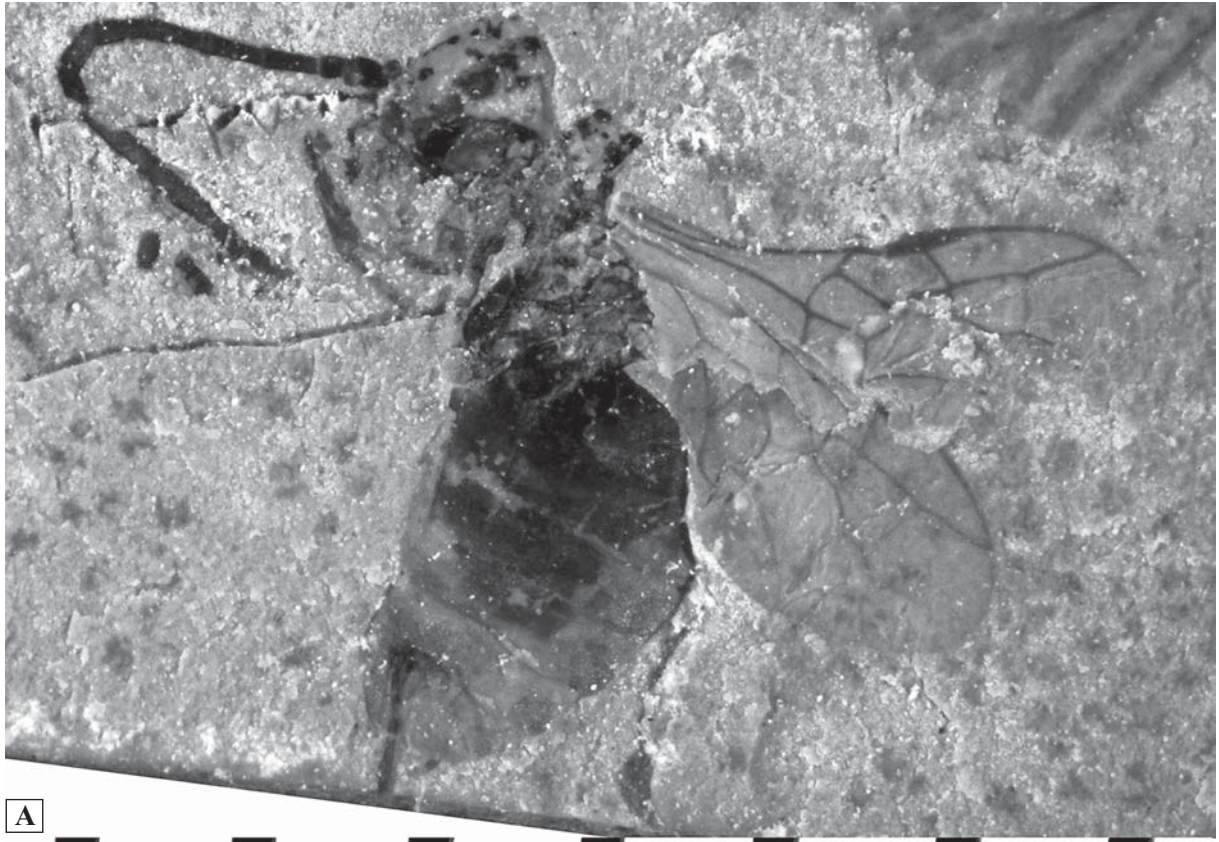
Genus *Mesaulacinus* Martynov, 1925

Mesaulacinus mongolicus Rasnitsyn, sp.n.

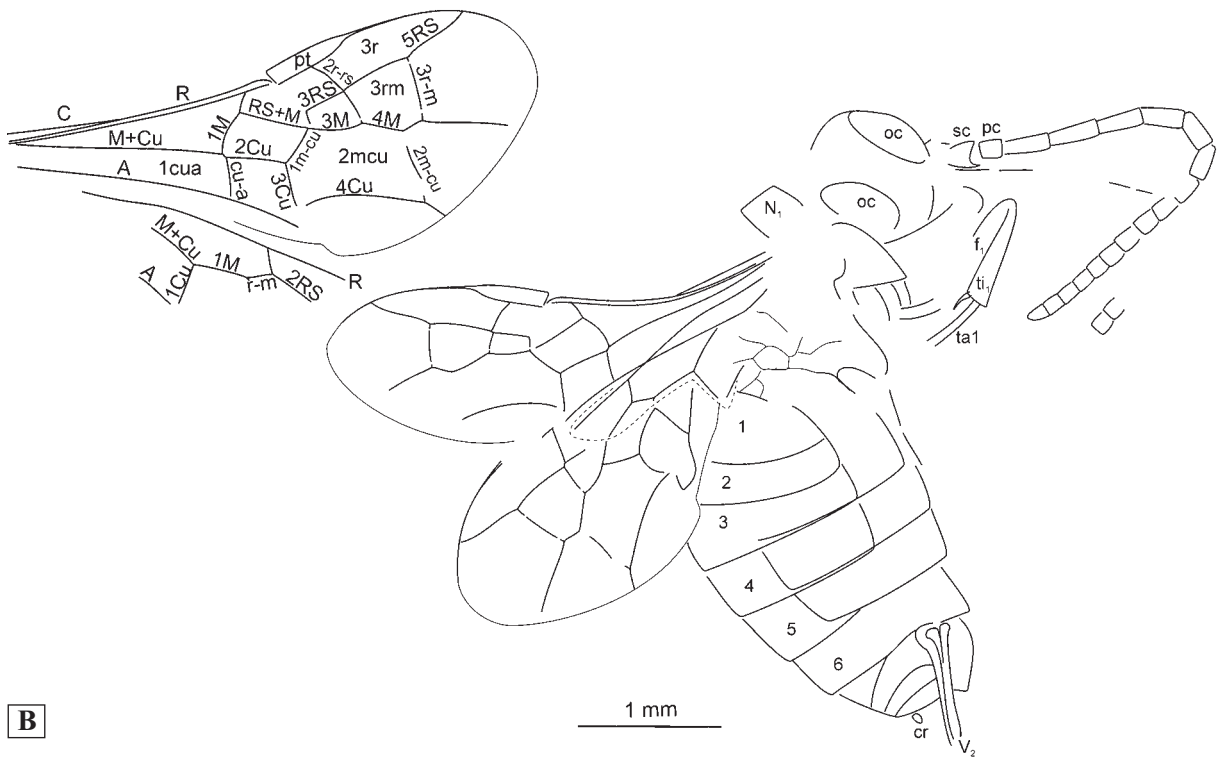
Fig. 7.

MATERIAL. Holotype, PIN 4270/1547; partial body lacking head, most of metasoma and of appendages except one wing pair and parts of one hind leg; SW Mongolia, Shar Teg; Late Jurassic, Shar Teg Beds.

DESCRIPTION. Mesosoma, pterostigma, R, M+Cu, and 1st metasomal tergum somewhat darkened, rest of fossil pale as preserved. Pronotum and mesopleural venter in part transversely rugose, propodeum closely areolated, otherwise surface without rough sculpture as preserved. Notauli and mesoscutal suture diverging from one point. Hind femur and tibia narrow, moderately long. Fore wing with pterostigma moderately narrow, with 2r-rs at midlength. 1RS and 1M meeting at angle, 1RS half as long as 1M, distant from pterostigma for about length of 1M, 2r-m present, 3r-m lost except short stubs on RS and M, 2m-cu lost but M still distinctly bent at place of its former attachment. RS+M not quite parallel to 3Cu, 2+3RS almost straight, with no sign of 1r-rs, 2r-rs and 2r-m of subequal length, distant for less than their length. 3r cell with stub of 3r-m closer to its apex than to 2r-m. 2M short but distinct, 2rm cell about as long as 3rm, 3rm cell with trace of former 2m-cu at its basal 1/3. 2Cu very short but distinct. Hind wing with r cell closed at wing fore margin close to wing apex, 1RS and 1M subequal in length, r-m shorter than them, almost perfectly aligned with 1M, 2M and 2Cu long, cu-a well before apex of M+Cu. Fore wing length 4.0 mm.



A



B

Fig. 6. *Cleistogaster gobialtaica* sp.n., holotype, PIN 4270/1548; the fossil (A) and its interpretation (B); cr — cercus; other morphological symbols as before.

Рис. 6. *Cleistogaster gobialtaica* sp.n., голотип, PIN 4270/1548; отпечаток (A) и его интерпретация (B); cr — церк; остальные обозначения как на Рис. 1–4.

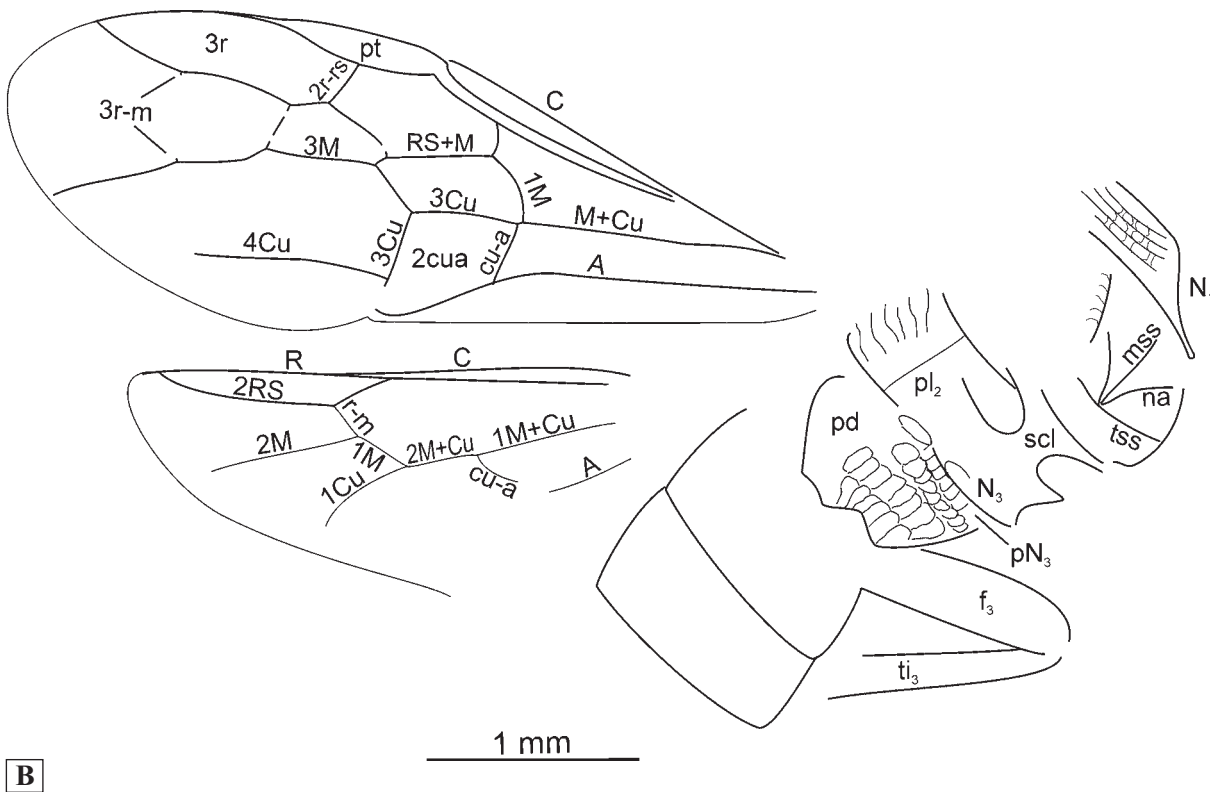


Fig. 7. *Mesaulacinus mongolicus* sp.n., holotype, PIN 4270/1547; the fossil (A) and its interpretation (B); pl_2 — mesopleuron (ventropleuron); other morphological symbols as before.

Рис. 7. *Mesaulacinus mongolicus* sp.n., голотип, PIN 4270/1547; отпечаток (A) и его интерпретация (B); pl_2 — среднегрудка (мезоплевры) остальные обозначения как на Рис. 1–6.

REMARKS. General arrangement of the fore and hind wing venation agrees with Megalyridae: Cleistogastrinae, and lost 3r-m, except stubs on RS and M, and 2m-cu, — with *Mesaulacinus*. Differs from congeners in having 2r-rs and 2r-m widely spaced combined with 1mcu and 2rm cells distinctly overlapping each other, and cu-a almost coinciding with 1M.

Previously described *Mesaulacinus* spp. all come from the Late Jurassic of Kazakhstan, [Rasnitsyn, 1975] (“*Mesaulacinus*” *rasnitsyni* Ren, Lu, Guo et Ji, 1995 [Ren et al., 1995] as described cannot belong to Megalyridae and until re-study of the type is to be considered *Apocrita incertae sedis*).

ETYMOLOGY. After Mongolia.

Family Pelecinidae Haliday, 1840

Subfamily Iscopininae Rasnitsyn, 1980

Genus *Praescopinus* Rasnitsyn, **gen.n.**

Type species. *P. excellens* **sp.n.**

SPECIES INCLUDED. Type only.

DIAGNOSIS. Antenna 14-segmented. Fore wing with pterostigma and cell 3r wide, 2r-rs long, straight (articulatory with hind wing) section of hind margin extending for about 1/3 wing length. Hind wing lacking tubular veins other than R. Male metasoma long, narrow, smooth narrowing caudad.

REMARKS. Fore wing venation most plesiomorphic for Proctotrupoidea indicates Mesoserphidae, but hind wing free of tubular veins other than R is a synapomorphy of Proctotrupoidea other than Mesoserphidae. Additionally, long, narrow male metasoma is unusual for Mesoserphidae and characteristic of many male Pelecinidae, particularly of *Iscopinus* Kozlov, 1974. Also, short articulatory hind margin of fore wing is indicative of short length of hind wing, a striking feature of living *Pelecinus* Latreille and generally characteristic to an extent of many extinct pelecinids. The family is not described from the Jurassic yet. However, several characteristic pelecinid fossils (of general appearance of some female Iscopininae) have been collected in the Upper Jurassic of Karatau and prepared for description by M.V. Kozlov (St.-Peterburg) whose untimely death stopped that project. Pelecinidae did occur in Jurassic time making attribution of the fossil at hand to that family quite logic. Within Pelecinidae, the new genus is most similar to *Iscopinus* except that pterostigma and 3r cell are wide, antenna markedly less than 18-segmented, and metasoma more regularly narrowing from base to apex.

ETYMOLOGY. Genus name is modified from *Iscopinus* (prae- is the Greek for before). Gender masculine.

Praescopinus excellens Rasnitsyn, **sp.n.**

Fig. 8

MATERIAL. Holotype: male, PIN 4270/1550; almost complete fossil with one antenna and part of legs lost; SW Mongolia, Shar Teg; Late Jurassic, Shar Teg Beds.

DESCRIPTION. Ground color dark, particularly antenna, metasoma except 1st segment, and hind tarsus apically. Mesopleurae, propodeum and, partially, mesoscutum closely rugose, 1st metasomal segment with long, spaced, longitudinal folds basally, otherwise surface sculpture weak or lost. Head with large, ovate eyes reaching mandibular base, and narrow temples (if any). Antenna with scape short, pedicel transverse, as wide as scape, flagellum slightly narrower throughout, flagellomeres gradually changing from (the first) almost three times as long as wide to (penultimate) quadrate, ultimate one and a half times as long as wide. Mid and hind legs narrow, moderately short, 1st tarsomere slightly shorter than three

following ones combined. 1RS distant from pterostigma for combined length of 1RS and 1M, 1M slightly longer than 1m-cu, 2RS+M + 2RS + 3RS form almost straight line, cu-a distinctly distal of 1M, 2cu-a scarcely distal of 1m-cu. Metasoma as preserved somewhat inflated due to postmortem decomposition, difficult to conclude if more or less normal in width of two basal segments or stick-like narrow throughout, segments 1 through 5 very gradually changing shorter backward, following three visible markedly shorter but not apparently modified, terminalia not seen in detail. Body length as preserved (somewhat distended) 6.0 mm, fore wing length 3.0 mm.

ETYMOLOGY. Species name is the Latin for excellent.

Apocrita incertae sedis

Fig. 9.

MATERIAL. PIN 4270/1550; detached ovipositor; SW Mongolia, Shar Teg; Late Jurassic, Shar Teg Beds.

DESCRIPTION. Detached ovipositor 2.5 mm long with attached sclerites (one sheath, all four valvifers, and halves of metasomal tergum 8) as well as with detached, crescent-like metasomal sterna 5 and 6 of plesiomorphic apocritan structure. Ovipositor (fused dorsal valves) dark, other structures preserved pale.

REMARKS. The structures preserved are indicative of any apocritan family of small body size (some 3–6 mm) and with ovipositor extending for half to full length of metasoma. For the Late Jurassic, these could be Paroryssidae, Ephialtidae, Praeaulacidae, Megalyridae, or Mesoserphidae, the second through fourth of the listed being present in the assemblage at hand. However no one of the above described fossils shows special similarity with the present fragment so it has to be left unidentified.

Discussion

The fossil assemblage at hand from the Jurassic of Shar Teg in SW Mongolia, even though small (nine identifiable specimens), shows distinct features at least in respect to its age. Indeed, the vast majority of taxa recorded (genera *Sepulca*, *Praeaulacus*, *Anomopterella*, *Cleistogaster*, and *Mesaulacinus*, as well as *Asi-ephialtites*, the closest relative of *Altephialtites*) are of strictly Jurassic (mainly of Late or Middle and Late Jurassic) recorded distribution. Only Gigantoxylini and Iscopininae are known described only from the Early Cretaceous. However, both are recorded in the Jurassic, even if not described from there yet. That is why the new material can be taken as confirmation of the Jurassic age of the Shar Teg Beds.

Concerning more precise identification of the age (Late vs. Middle Jurassic) and of geographic appearance of the fossil assemblage, this question cannot be replied at present because of scarcity of relevant reference assemblages. This is because we possess only two minimally rich hymenopteran assemblages of necessary age: one most probably Middle Jurassic in the NE China — Daohugou assemblage [Rasnitsyn & Zhang, 2004], another most probably earlier Late Jurassic (or maybe latest Middle Jurassic) in S. Kazakhstan — Karatau assemblage [Rasnitsyn, 1980], all others being too limited in their known diversity. Shar Teg assemblage reveals five of nine identifiable fossils as representing Praeaulacidae and Megalyridae. This is unquestionably more similar to

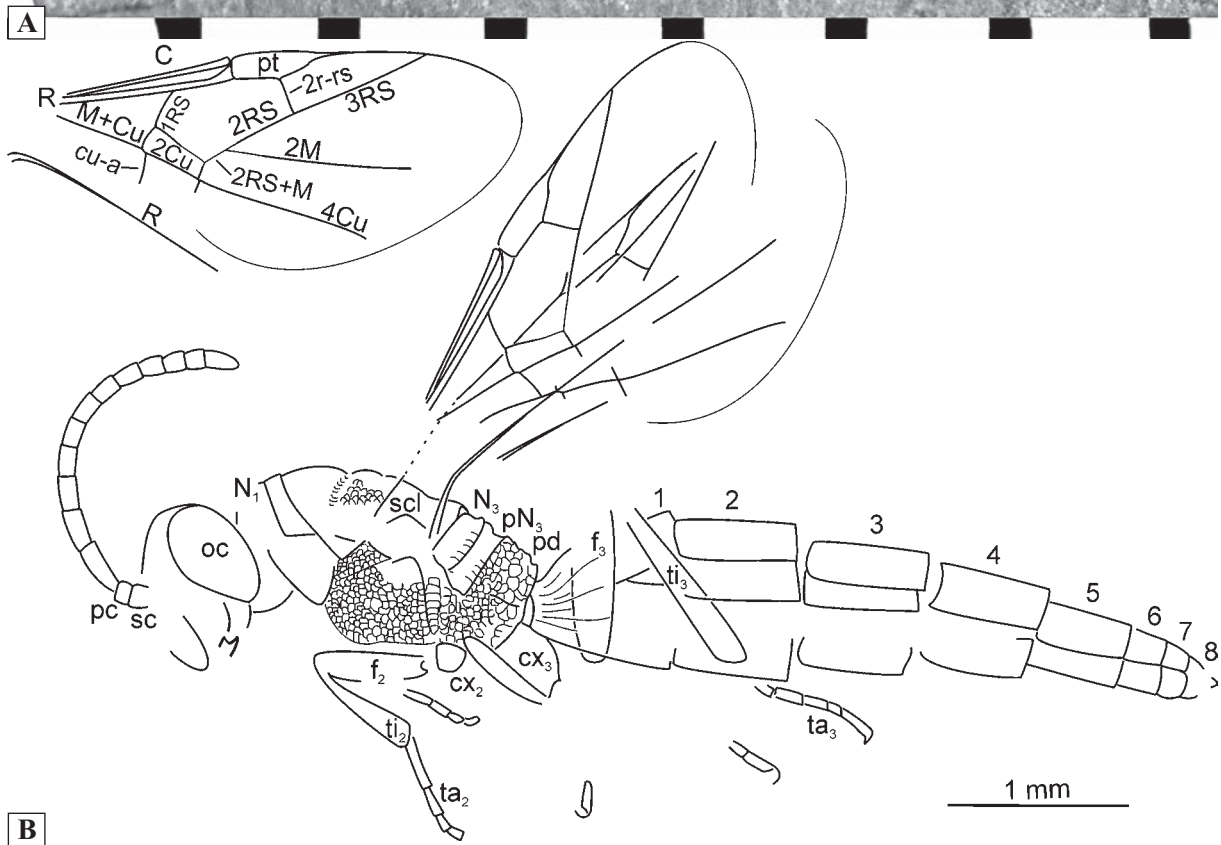


Fig. 8. *Praescopinus excellens* gen. sp.n., holotype, PIN 4270/1550; the fossil (A) and its interpretations (B); morphological symbols as before.

Рис. 8. *Praescopinus excellens* gen. sp.n., голотип, PIN 4270/1550; отпечаток (A) и его интерпретация (B). Условные обозначения как на Рис. 1–6.

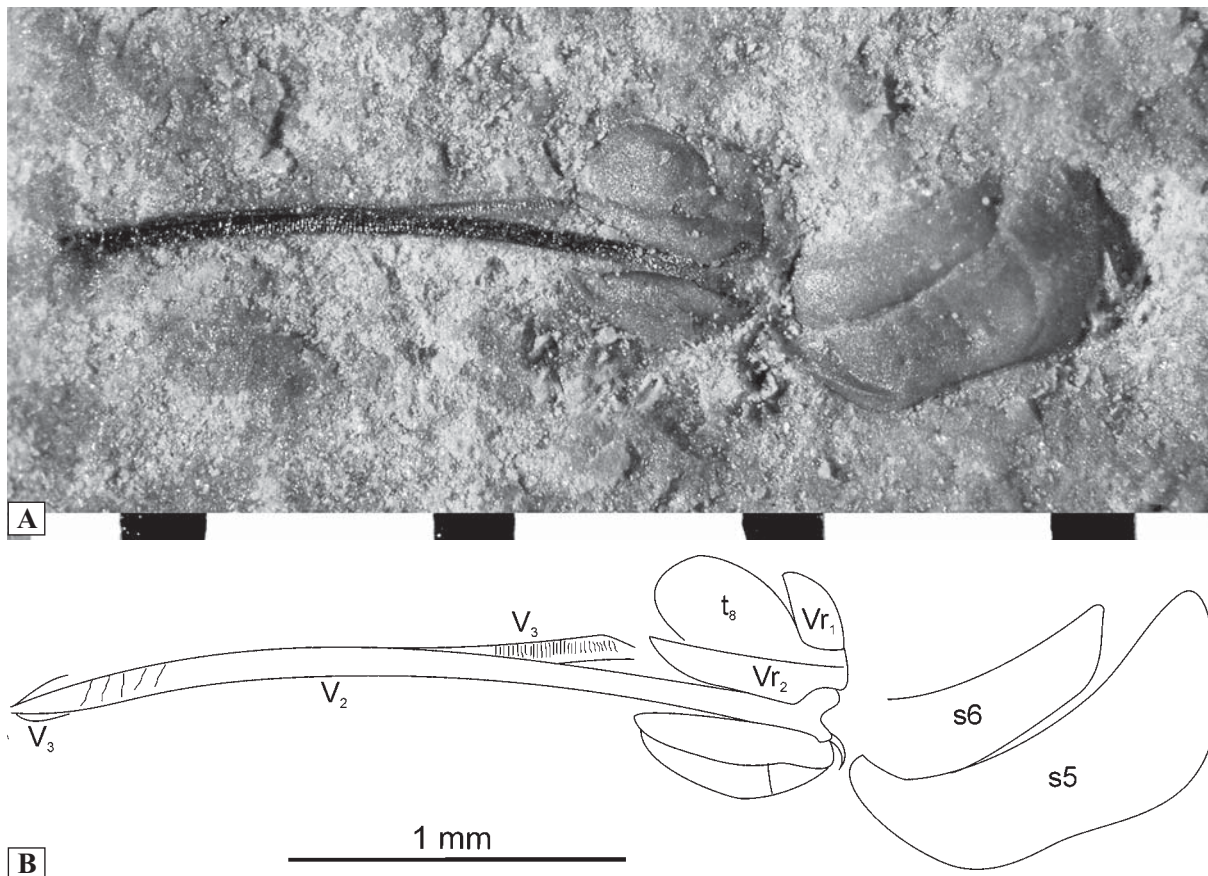


Fig. 9. *Apocrita* indet. PIN 4270/1550; detached ovipositor, the fossil (A) and its interpretation (B); s5, s6 — metasomal sternite 5 and 6; t_8 — metasomal half-tergum 8; V_2 — fused dorsal (2nd) valvulae of ovipositor; V_3 — 3rd valvula (ovipositor sheath); Vr_1 , Vr_2 — 1st and 2nd valvifers.

Рис. 9. *Апоскрита* индет. PIN 4270/1550; изолированный яйцеклад, отпечаток (А) и его интерпретация (В); s5, s6 — стерниты 5–6 метасомы; t_8 — полутергит 8 метасомы; V_2 — дорзальная створка яйцеклада; V_3 — ножны яйцеклада; Vr_1 , Vr_2 — 1-й и 2-й вальвиферы.

figures of Karatau where Praeaulacidae and Megalyridae dominate taking jointly 34% of hymenopterans. Unlike this, the Daohugou assemblage is dominated by Ephialtitidae and Xyelidae, with Praeaulacidae and Megalyridae yielding jointly only 6%. However, this similarity to Karatau might be equally because of more close age, or more close geographic position, or because of any other reason unknown as yet.

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