

A new coleopterous family Mesocinetidae fam. nov. (Coleoptera: Scirtoidea) from Late Mesozoic and notes on fossil remains from Shar-Teg (Upper Jurassic, South-Western Mongolia)

Новое семейство жуков Mesocinetidae fam. nov. (Coleoptera: Scirtoidea) из позднего мезозоя и замечания об ископаемых остатках из Шар-Тег (верхняя юра, юго-западная Монголия)

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The paper deals with the description of the new family, Mesocinetidae **fam. nov.**, four new genera (*Manoelodes gen. nov.*, *Manopsis gen. nov.*, *Parashartegus gen. nov.* and *Shartegus gen. nov.*) and eight new species (*Manoelodes gratiozus sp. nov.*, *Manopsis concavicolis sp. nov.*, *Mesocinetus aequalis sp. nov.*, *M. angustitarsis sp. nov.*, *M. elumbis sp. nov.*, *M. subjectus sp. nov.*, *Parashartegus distinctus sp. nov.* and *Shartegus transversus sp. nov.*) originated from site Shar-Teg (South-Western Mongolia; Gobi-Altai aimag) with the Upper Jurassic age. Other species of this new family (*Mesocinetus mongolicus* Ponomarenko, 1986 (Myangad, Hovd aimag, West Mongolia) and *M. ovatus* Ponomarenko, 1990 (Undurga, Chitinskaya Region, Transbaikalia, Russia)) are known from the Lower Neocomian, Lower Cretaceous, although *M. ovatus* is temporally excluded from the genus *Mesocinetus* Ponomarenko, 1986. The key to the genera of this family is elaborated. Specimens of the new family found also in other places (Karatau (Upper Jurassic), Baissa (Lower Cretaceous), Khutel-Khara and Liaoning (both at the boundary between Jurassic and Cretaceous)) and can be expected in many Asian Late Mesozoic sites. This new family is rather similar to both families Scirtidae and Eucinetidae, sharing different characters with each of them. The structure of the superfamily Scirtoidea and placement of the new family are discussed. The composition of fossil animals and plants in the Shar-Teg sediments is reviewed and time of its formation is estimated.

Статья включает описание нового семейства Mesocinetidae **fam. nov.**, четырех новых родов (*Manoelodes gen. nov.*, *Manopsis gen. nov.*, *Parashartegus gen. nov.* и *Shartegus gen. nov.*) и восьми новых видов (*Manoelodes gratiozus sp. nov.*, *Manopsis concavicolis sp. nov.*, *Mesocinetus aequalis sp. nov.*, *M. angustitarsis sp. nov.*, *M. elumbis sp. nov.*, *M. subjectus sp. nov.*, *Parashartegus distinctus sp. nov.* и *Shartegus transversus sp. nov.*) из местонахождения Шар-Тег (Юго-Западная Монголия, Гоби-Алтайский аймак) верхнеюрского возраста. Другие виды этого нового семейства (*Mesocinetus mongolicus* Ponomarenko, 1986 (Мянгад, Ховдский аймак, Западная Моголия) и *M. ovatus* Ponomarenko, 1990 (Ундурга, Читинская область, Забайкалье, Россия)) известны из нижнего неокома (нижний мел), хотя *M. ovatus* временно выведен из рода *Mesocinetus* Ponomarenko, 1986. Составлена определительная таблица для родов этого семейства. Экземпляры нового семейства найдены также в других местонахождениях (Каратау (верхняя юра), Байса (нижний мел), Хутель-Хара и Ляонин (оба у границы юры и мела)) и могут ожидать в других позднемезозойских местонахождениях Азии. Это новое семейство довольно сходно с семействами Scirtidae и Eucinetidae, имея общие признаки с каждым из них. Обсуждаются структура надсемейства Scirtoidea и положение в нем нового семейства. Сделан обзор

состава ископаемых животных и растений в шар-тегских толщах, а также оценивается время их формирования.

Key words: Upper Jurassic, Shar-Teg, fossil animals and plants, insects, Coleoptera, Scirtoidea, Mesocinetidae, *Manoelodes*, *Manopsis*, *Parashartegus*, *Shartegus*, new family, new genera, new species

Ключевые слова: верхняя юра, Шар-Тег, ископаемые животные и растения, насекомые, Coleoptera, Scirtoidea, Mesocinetidae, *Manoelodes*, *Manopsis*, *Parashartegus*, *Shartegus*, новое семейство, новые роды, новые виды

INTRODUCTION

The superfamily Scirtoidea includes usual but not dominant forms in the Late Mesozoic deposits, whose remains are more numerous in sites of the end of Jurassic and beginning of Cretaceous (130–150 millions). Because of lack of the characters in compression fossils, which are light for diagnostics, these beetles are still poorly known. The first indication on the Scirtoidea in the Mesozoic was the assumption of Crowson (1981) that *Ooperiglyphus contractus* Bode, 1953 from the Lower Jurassic of Germany can be a member of Eucinetidae Lacordaire, 1857. The holotype of this species needs to be retested to check the attribution of this species and for now it should be regarded without family membership. The genus *Mesocinetus* was described by Ponomarenko (1986) from the Lower Cretaceous of West Mongolia (Lower Neocomian, Gurban-Eren Formation) and later the second species of this genus was described from the Lower Cretaceous of Transbaikalia (Russia; Lower Neocomian, Turginskaya Formation) (Ponomarenko, 1990). Both were put in the original descriptions to the family Eucinetidae. Most Scirtoid fossils are known from epy Cainozoic mostly beginning from the Lowermost Eocene and Oligocene (Kirejtshuk & Nel, 2008; Kirejtshuk et al., in press). However, at least three Scirtoid families were recorded from the Mesozoic (Scirtidae Fleming, 1821; Clambidae Fischer, 1821; Elodophthalmidae Kirejtshuk & Azar, 2008) (Kirejtshuk & Azar, 2008, Kirejtshuk et al., 2010). More detailed informa-

tion on representation of these coleopterous families in the fossil record can be got in the catalogue by Ponomarenko & Kirejtshuk (2009–2010).

All remains under description originated from the locality Shar-Teg, where Scirtoidea are rather abundant. It represents the Lagerstätte-site unusually diverse in fossils. Here are found water and terrestrial plants, molluscs, Crustacea, insects, fishes, amphibians, reptiles and mammals. The last findings of Mongolian-Japanese expedition demonstrated that the diversity of this oryctocenosis does not exhaust and brought in addition some new theromorph reptiles. Despite of this the current data make possible some preliminary conclusions on the biota of this area in the Upper Jurassic.

The site is located in the large erosive depression at the south-eastern end of Adzh-Bogdo Mountain Ridge of the south-western part of the Gobi-Altai Aimak. In the section of this site the Shar-Teg and Ulaan Malgaitian sediments are divided by the lime residual soil (kaliche). The lower Shar-Teg sediments include grey, green and yellow sandstone and siltstone. The kaliche permeates all outcrops of the Shar-Teg sediments. The Ulaan Malgaitian sediments consist of red and brightly colored sandstone and siltstone. Remains of insects were found only in the Shar-Teg sediments. The site was formed by the deposits of two lakes having existed in a series in the same basin, although the deep centers of these lakes seemed to be not coincided and the younger one had a much larger area of water and shallower. Taking

into consideration the thickness of kaliche the existence of these lakes was intermitted by a rather long time. The remains of insects were recovered only in the Shar-Teg Formation and Elstiinian deposits, but in the Ulaan Malgaitian sediments they were not preserved because of the roughness of sediments and oxyphilous conditions of sedimentation.

The Shar-Teg deposits are characterised by numerous plant remains, which are scant of species. Among them the horsetails (*Equisetopsida*) are dominant, but liverworts (*Hepaticae*), ferns, gingopsids and coniferes are rare. The lower plants are represented by *Charophyta*. Animals include molluscs (both bivalves and gastropods), fishes, turtles, labyrinthodons etc. Fresh water and terrestrial insects are here more diverse, although there are present also chelicerates (one small xiphosuran and several spiders), crustaceans (seed shrimps, ostracods and conchostracans). Some plants and vertebrates are rather similar to the Middle Jurassic and another to Upper Jurassic or Cretaceous forms. Insects show some inconsistency in the stratigraphic characteristics: stoneflies (*Plecoptera*) are mostly close to the Lower and Middle Jurassic ones, mayflies (*Ephemeroptera*) to the Upper Jurassic ones, orthopterans and cockroaches to the Upper Jurassic – Lower Cretaceous ones. The insect remains in general are evidence of the first half of the Upper Jurassic for the Shar-Teg sediments. Only the multiplicity and diversity of protective cases of caddisflies are more characteristic of the Lower Cretaceous, however some of the Upper Jurassic sites (e.g. Bahar in Central Mongolia) demonstrate also many protective cases of them in some facies. A great number of the true bug family *Corixidae* is characteristic of the lakes of the Uppermost Jurassic and Lower Cretaceous.

Insects comprise the most diverse component of the oryctocenosis of Shar-Teg and represent at least 22 orders, 95 families, some hundreds of genera and species. The general diversity of insects is somewhat

higher than in the most Lower and Middle Jurassic oryctocenoses and lower than in the most Upper Jurassic and Lower Cretaceous ones. In Shar-Teg all orders recorded in the Mesozoic in general, including *Lepidoptera*, *Megaloptera*, *Thysanoptera*, *Miomoptera* and *Lophioneurida*, have been found.

The remains of *Coleoptera* are more frequent in the site and include about 700 specimens. The suborder *Archostemata* consists about 2.5% of beetles and is represented by *Cupedidae* Laporte, 1836 and *Schizophoridae* Ponomarenko, 1968. The remains of *Adephaga* have more than 10% of beetles in the site and among them there are less than ten ground beetles. The infraorder *Staphyliniformia* are also few in number, the family *Hydrophilidae* Latreille, 1802 is more usual than *Staphylinidae* Latreille, 1802. Many representatives of *Scirtoidea* belong to one family here described. *Scarabaeoidea* and *Elateridae* Leach, 1815, even taking into account isolated elytra, are rather small in number. *Lasiosynidae* Kirejtshuk et al., 2010 are dominant among the remaining *Polyphaga*. The *Cucujiformia* and *Rhynchophora* comprise only a few percent of coleopterous remains. The composition of the fresh water insects bear the Jurassic character in general (stoneflies and their larvae, and also small mayflies, plenty of specimens from the genus *Memptus* Handlirsch, 1906 (*Dytiscomorpha incertae sedis*) and small coptoclavids).

During the Jurassic there were two climatic regions: (1) warm moderate Siberian and (2) hot and seasonally arid Euro-Sinian Regions. At the end of the Jurassic the boundary between these regions was moving from Huáng Hé River to the North in Siberia. The fresh water insects in the former region are characterised by the plenty of species and some predominance of stoneflies, and also a great number of *Corixidae*, as a rule, attributed to the same species. The fresh water insects of Shar-Teg have somehow an intermediate character. On the one hand, there are many diverse stoneflies and, on the other one, there are many, but not

dominant Corixidae. Besides stoneflies, the mayflies, beetles of the family Liadytidae Ponomarenko, 1977 and genus *Memptus* can be put to the 'Siberian' groups, while the beetles of the families Gyrinidae Latreille, 1810, Coptoclavidae Ponomarenko, 1961, megalopterous family Corydalidae Leach, 1815, caddisflies making protective cases, nematoceran Chaobaridae Edwards, 1912 and most dragon-flies (Odonata) in addition to numerous Corixidae could be regarded as 'Euro-Sinian' ones. Such a composition of the insect fossils in Shar-Teg deposits is evidence of the ecotone position of Shar-Teg, i. e. this site was formed, while the boundary between the regions was placed there. Having compared composition of the Shar-Teg, Elstiin and Ulaan Malgait sediments some features of climatic warming can be traced.

MATERIALS AND METHODS

The fossils of Scirtoidea are known to the authors in collections of USA, United Kingdom, France, Spain, Germany, Russia, Ukraine, Lebanon and China, including about 250 specimens from the Mesozoic. About 200 Mesozoic specimens are deposited in the collection of the Paleontological Institute of Russian Academy of Sciences (Moscow), including more than 50 specimens from Shar-Teg and half of them are rather complete to be studied before preparation of this paper. In contrast to these specimens, the fresh water groups of Coleoptera, particularly Coptoclavidae in this locality are represented by the isolated elytra. All Scirtoid specimens from Shar-Teg belong to the same family here described and most of them are here regarded as conspecific. Except materials from Shar-Teg, the new family has been found at least among specimens from Karatau (Upper Jurassic), Baissa (Lower Cretaceous), Khutel-Khara and Liaoning (both at the boundary between Jurassic and Cretaceous). For this study of these usual optic equipment was used, in particular the microscopes Leica MZ 12 in

the Moscow institute and Leica MZ 16.0 in St. Petersburg institute provided with CCD cameras. All specimens described in this paper are deposited in the collection of the Paleontological Institute of Russian Academy of Sciences, Moscow (PIN).

Type strata. Upper Jurassic, Shar-Teg Formation.

Type locality. Shar-Teg, south-eastern end of Adzh-Bogdo Mountain Ridge of the south-western part of Gobi-Altai Aimak.

RESULTS

Ordo COLEOPTERA

Subordo POLYPHAGA

Superfamily SCIRTOIDEA Fleming, 1821

Familly MESOCINETIDAE fam. nov.

Type genus: *Mesocinetus* Ponomarenko, 1986.

Composition. *Mesocinetus*, *Parashartegus* gen. nov., *Shartegus* gen. nov., *Manopsis* gen. nov., *Manoelodes* gen. nov.

Diagnosis. Body moderately small; integument finely and diffusely punctured with smooth microsculpture; dorsum with dense and subuniform fine hairs; eyes rather large and with large facets; antennal insertions disposed in situation of frons at anterior edge of eye; labrum well isolated; 11-segmented antennae without distinct club; prosternum very short with strongly transverse and widely open coxal cavities which are (sub)contiguous; procoxae somewhat oblique and with exposed trochantin; mesocoxae very large and subtriangular oval, with exposed trochantin; moderately to rather wide metepisterna; metaventricle without or with parametacoxal lines (metakatepisternal suture) before metacoxae and without median suture (discrimen); metacoxae contiguous, transverse or oblique, becoming longer mediad, with femoral plate looking like a stripe turning at the middle towards abdomen; epipleura moderately wide and sometimes sharply narrowing at the elytral midlength, elevated laterally; trochanters of normal type and

comparatively large; tibiae with long separate setae spread mostly along their outer edge; their apices subtruncate, densely and finely crenulate and with well developed spurs; tarsi with 5 simple and rather narrow tarsomeres or protarsi with slightly lobed tarsomeres 1–4; apices 1–4 with truncate, densely and finely crenulate apices.

Comparison. This new family has an expressed peculiarity consisting in the clear contradiction in characters of subcylindrical tarsomeres with apical fine crenulation (as in Eucinetidae) and slightly raised short femoral plates of metacoxae (as in Scirtidae). By these contradictory characters this new family is somewhat similar to the Cretaceous Elodophthalmidae, however differs from the latter in the much shorter and scarcely modified antennae, somewhat smaller eyes, much wider and subparallel-sided metepisterna, contiguous (not separated) metacoxae with distinct femoral plates, 5-segmented metatarsi (non-heteromeroid tarsal formula) and characteristic crenulation on apices of tibiae and all tarsomeres which are preceding the ultimate ones. Besides, this new family differs from:

- Clambidae in the somewhat larger body; larger eyes with large facets; only small sinuation of frons at antennal insertions; distinctly projecting frons; larger labrum; 11-segmented antennae without club; larger and subtriangular oval mesocoxae; plane of metaventricle not transversely divided; femoral plates of metacoxae short, looking like a stripe turning at the middle towards abdomen; epipleura moderately wide and elevated laterally; tibiae with long and separate setae spread mostly along their outer edge, their apices subtruncate, densely and finely crenulate; tarsi with 5 simple and rather narrow subcylindrical tarsomeres or protarsi with slightly lobed tarsomeres 1–4; apices tarsomeres 1–4 with truncate, densely and finely crenulate apices;

- Decliniidae Nikitski, Lawrence, Kirejtshuk & Gratshev, 1994 in the diffuse and fine elytral puncturation; larger facets of eyes; (sub)contiguous procoxal cavities;

- much larger mesocoxae; moderately wide metepisterna; metaventricle shorter and without median suture (discrimen); femoral plates of metacoxae becoming obsolete laterally; metepisterna comparatively wider; tibiae with long separate setae spread mostly along their outer edge, their apices subtruncate, densely and finely crenulate; tarsi with 5 simple and rather narrow tarsomeres or protarsi with slightly lobed tarsomeres 1–4; apices tarsomeres 1–4 with truncate, densely and finely crenulate apices;

- Eucinetidae in the integument finely and diffusely punctured with rather smooth microculture; dense and subuniform fine hairs on dorsum; rather large eyes with large facets; larger mesocoxae; much longer metaventricle and much shorter femoral plates of metacoxae (not covering completely metacoxae); much shorter metepisterna; more or less narrower and longer tibiae and tarsi;

- Scirtidae in the eyes rather large and with large facets; prosternum without intercoxal process and (sub)contiguous coxal cavities; metaventricle without elongate median suture (discrimen); tibiae and tarsomeres 1–4 with apices subtruncate, densely and finely crenulate; longer abdominal ventrite 1; narrow and subcylindrical tarsomeres or protarsi with slightly lobed tarsomeres 1–4.

This group is represented in the deposits of Sar-Teg by rather uniform members which can be splitted into some genera according to the characters listed in the below key to genera. It makes possible to reduce the formal description of both genera and species here described. However, members of this group in other outcrops are quite variable. Integument of body of most specimens is apparently soft, although in *Parashartegus distinctus* **gen. et sp. nov.** it is heavily sclerotised.

Notes. Additional specimens of Elodophthalmidae (waiting for description) show that this group, in contrast to other families of Scirtoidea and the infraorder Elateriformia in general, is characterised by heteromeran tarsal formula (5–5–4).

Discussion on position of Mesocinetidae fam. nov.

At this level of our knowledge it is difficult to estimate the similarities and differences listed above as an evidence of correlative relationship between families of Scirtoidea. Some important fossils from different late Mesozoic outcrops are still waiting for further study and comparison with the known forms. Probably recent Scirtidae and Eucinetidae represent the groups maintaining more archaic characters than Clambidae and Decliniidae, although the latter seems to combine a mixture of many plesiotypic features and some secondary simplification. Recent Scirtidae are characterised by comparatively archaic structure of imagines and very specialised structure of larvae (particularly filtrating mouthparts), while the recent Eucinetidae, which seem to have a mode of life may be more similar to initial one, show less specialised larvae but rather modified structure of adults (particularly mouthparts and metathorax). Some members of the new family under description look somewhat like rather Scirtidae, particularly in shape of pronotum and position of the head (*Manopsis* **gen. nov.** and *Manoelodes* **gen. nov.**), while the others rather like Eucinetidae (*Mesocinetus*, *Shartegus* **gen. nov.** and *Parashartegus* **gen. nov.**). Larvae of the new fossil family are unknown, however its adults with simple tarsi seemed to be associated with habitats inside substrate rather than on surface of substrate. It is thought that they could have a mode of life more similar to that of the recent Eucinetidae. The finding of slightly lobed protarsomers in *Mesocinetus elumbis* **sp. nov.** can be regarded as a predisposition for further development of lobed tarsomers of Scirtidae. Wider and lobed protarsi in species with simple meso- and metatarsi occur also in some recent Eucinetidae and some undescribed Scirtoid forms from the Upper Jurassic Karatau and Upper Jurassic – Lower Cretaceous Yixian.

The superfamily Scirtoidea in general is usually referred to as a rather archaic

group similar to those which were at base of the Polyphagan diversifications in general (Forbes 1926; Crowson 1955; Kukulova-Peck & Lawrence 1993; Fedorenko 2009). Although these conclusions somewhat contradict the fossil record. On the other hand, it could be admitted that the family Chelonariidae Blanchard, 1845 from Byrrhoidea maintained a tendency in transformations of the head and thorax, which appeared in ancestors, probably is rather similar and closely related to some groups of Scirtidae (Kirejtshuk & Azar, 2008). This tendency was found also in other families of the superfamily Byrrhoidea (Lawrence et al. 1995), what could suppose their plesiotypic character. The posterior wing venation of Scirtoidea is looking like derivative from the basal Archostematan type (or rather Cupedid type after recent members of the family), but in contrast to the remainder of the suborder Polyphaga, the wing folding of Scirtoidea maintains somewhat Archostematan character (excluding rolling of the wing apex). Therefore some coleopterists consider the wing venation and folding of this superfamily as a separate type opposing the type in rest Polyphaga (Fedorenko, 2009). Lawrence & Yoshitomi (2007) inclined to consider Scirtoidea and Derodontidae LeConte, 1861 as occupying a more basal position within Polyphaga. They argued this opinion with morphological (Lawrence, 2001) and molecular (Caterino et al., 2002) data. Nevertheless, such a conclusion should be tested by information from the historical development which could be obtained after description of the available Mesozoic fossils.

Key to the genera of Mesocinetidae

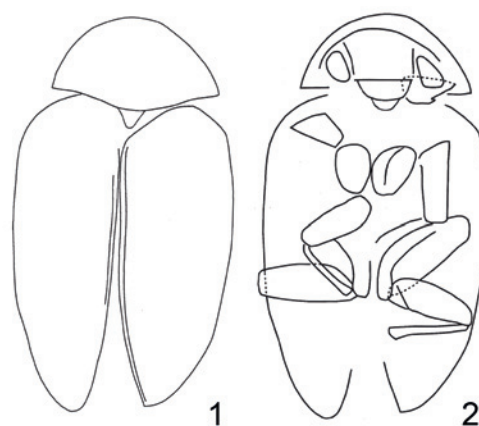
- 1a. Pronotum with anterior edge more or less convex and anterior angles not projecting and with posterior edge gently rounded and arcuate posterior angles 2
- 1b. Pronotum with anterior edge more or less emarginate and anterior angles distinctly projecting and with posterior edge more or less bisinuate and projecting posterior angles 4

- 2(1)a. Mesocoxae widely separated; metacoxae clearly transverse and with wide median process, apex of which rather far from posterior edge of abdominal ventrite 1 **Parashartegus gen. nov.**
- 2(1)b. Mesocoxae narrowly separated or (sub) contiguous 3
- 3(2)a. Metacoxae clearly oblique and with comparatively narrow median process almost reaching the posterior edge of abdominal ventrite 1 **Mesocinetus**
- 3(2)b. Metacoxae clearly transverse and with wide median process, apex of which rather far from posterior edge of abdominal ventrite 1 **Shartegus gen. nov.**
- 4(1)a. Metacoxae subtransverse with femoral plates widely expanded medially, apex of which rather far from posterior edge of abdominal ventrite 1; mesocoxae narrowly separated **Manopsis gen. nov.**
- 4(1)b. Metacoxae oblique with femoral plates narrowly expanded medially almost reaching posterior edge of abdominal ventrite 1; mesocoxae (sub) conjoined **Manoelodes gen. nov.**

Genus **Mesocinetus** Ponomarenko, 1986

Type species: *Mesocinetus mongolicus* Ponomarenko, 1986

Composition. The genus includes the type species and species here described. The authors reexamined the holotype of *Mesocinetus mongolicus* (PIN No. 3149–1028) and some additional specimens (including paratypes). The latter could be regarded as another species and, therefore, in this publication the characters of the holotype which is repictured and redrawn (Figs 1–2, 11–12) were used exclusively. *Mesocinetus mongolicus* differs from all new species in the much larger head with comparatively smaller eyes and also from *M. aequalis* sp. nov., *M. angustitarsis* sp. nov. and *M. elumbis* sp. nov. in the traced submetacoxal lines. In the addition to the original description *Mesocinetus mongolicus* is characterised by the uniform dense and shallow small punctures on dorsum, raised adsutural lines on elytra, narrow and long metafemoral plates, subquadrangular metepisterna, more oblique metacoxae, larger and subcontiguous mesocoxae.



Figs 1–2. *Mesocinetus mongolicus*, holotype, PIN No. 3049–1029. Body. Dorsall view (1) and ventral view (2). Length of body 2.4 mm.

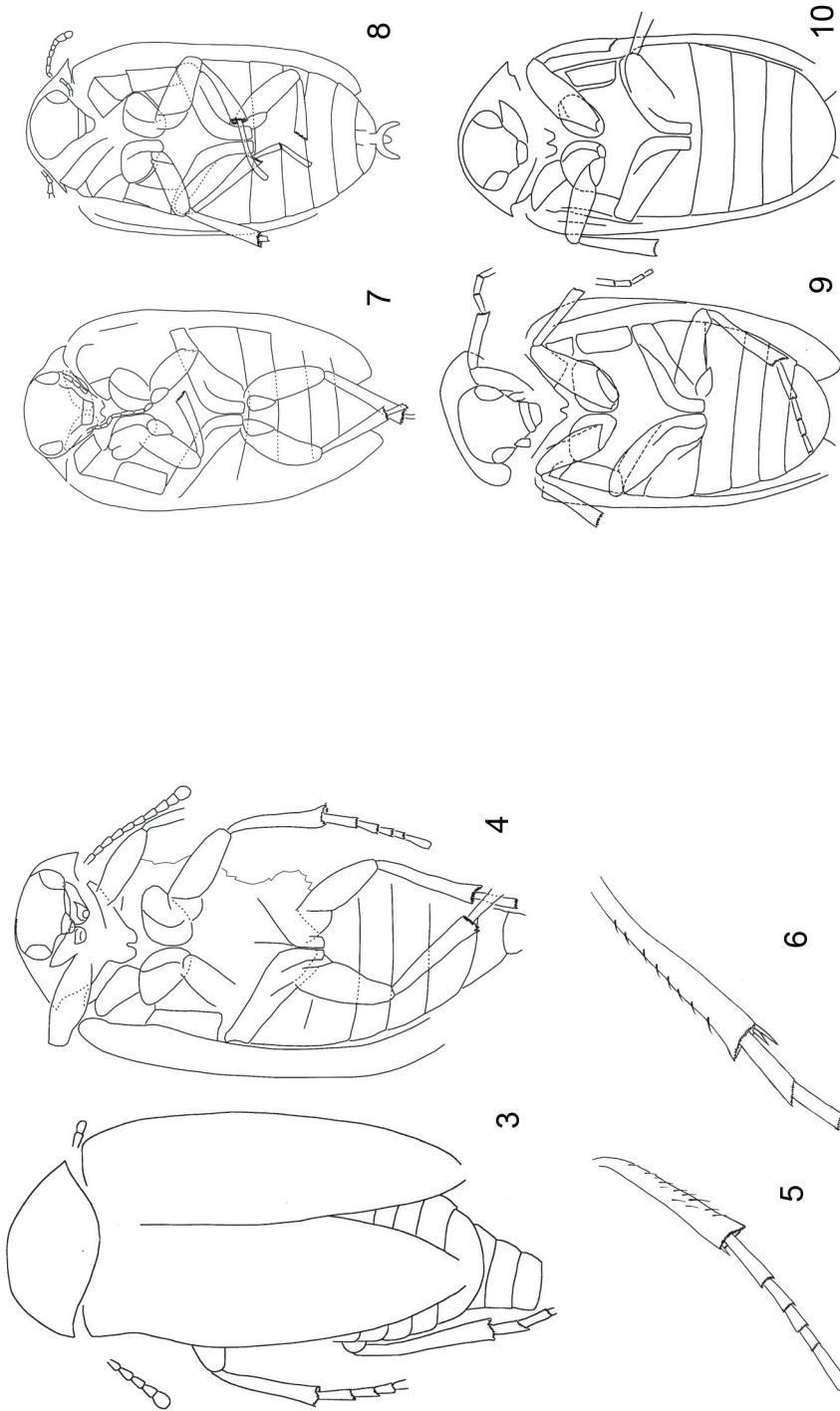
Mesocinetus ovatus Ponomarenko, 1990 could be temporally excluded from members of this taxon and regarded as *Mesocinetidae incertae sedis* because the characters important for diagnostics do not have clear outlines, although it seems to be distinct from all species here described in having a larger head. Besides, the specimens put in the type series of this ‘species’ look like members of some species.

Diagnosis. This genus is characterised by the pronotum with more or less convex anterior edge, mesocoxae conjoining or very narrowly separated, metepisterna not widened or slightly widened anteriorly, metacoxae short and rather oblique almost reaching the posterior edge of abdominal ventrite 1 and metacoxal femoral plates narrowly expanded medially. It could be diagnosed after the above key to genera.

***Mesocinetus aequalis* sp. nov.**

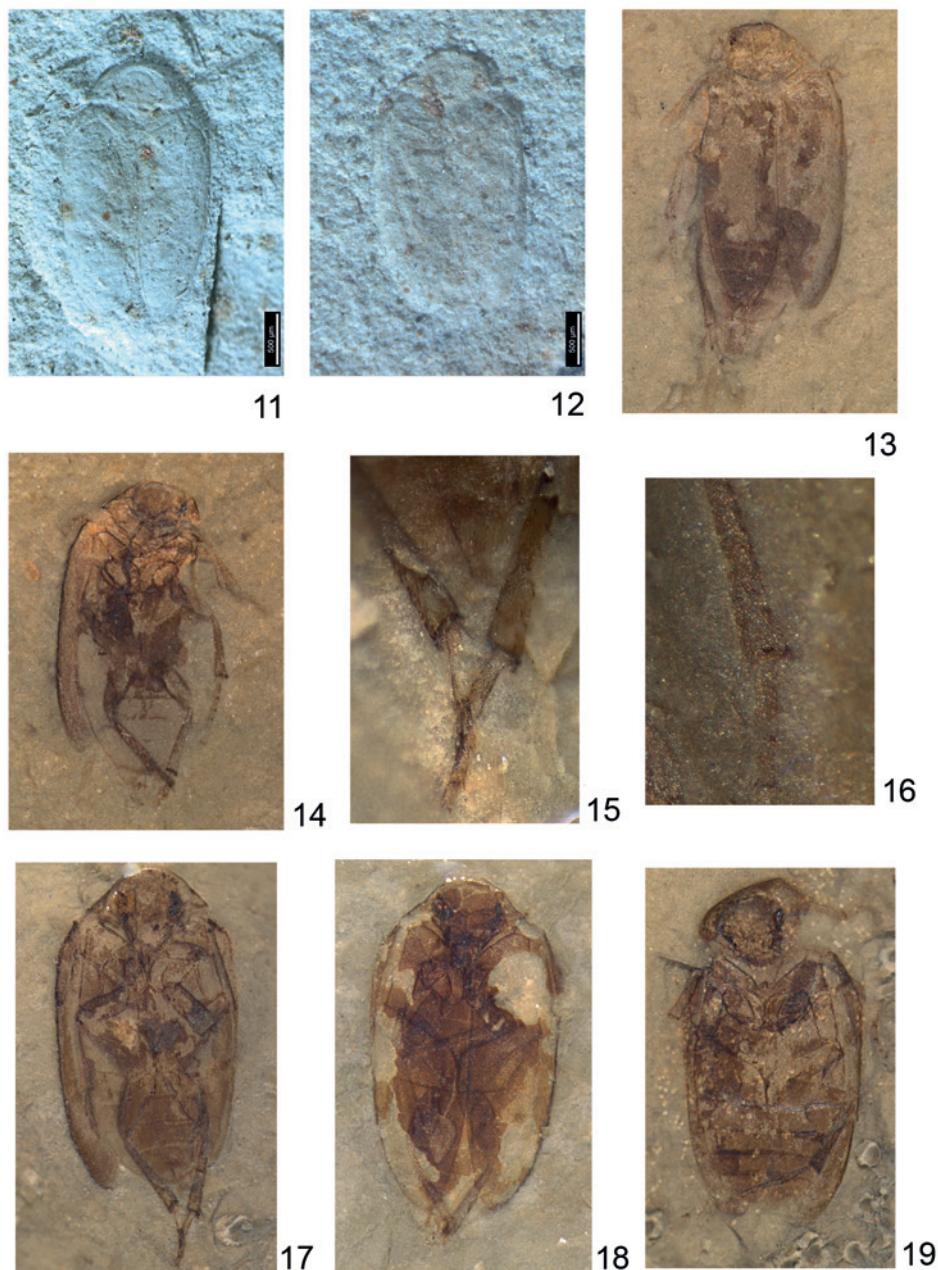
(Figs 3–10, 13–20, 24)

Material examined. *Holotype.* PIN No. 4270–48 (part and counterpart), nearly complete beetle with broken right side of body, missing antennae, left protibia, protarsi, left distal part of mesofemur, mesotibia, distal metatarsomeres; two segments of abdomen extruded beyond pygidium and hypopygidium (true sternite VII).



Figs 3–6. *Mesocinetus aequalis* sp. nov., holotype, PIN No. 4270–48. **3**, body, dorsal view; **4**, body, ventral view; **5**, mesotibia and mesotarsus; **6**, metatibia and metatarsus. Length of body 2.9 mm. Length of mesotibia 0.8 mm. Length of metatibia 0.9 mm.

Figs 7–10. *Mesocinetus aequalis* sp. nov., body, ventral view – paratype (9) and additional specimens (7, 8, 10). **7**, PIN No. 4270–1094, length of body 3.0 mm; **8**, PIN No. 4270–1100, length of body 3.2 mm; **9**, PIN No. 4270–1071, length of body 2.8 mm; **10**, PIN No. 4270–1070, length of body 2.9 mm.



Figs 11–19. *Mesocinetus*: *M. mongolicus* (11, 12) and *M. aequalis* sp. nov. (13–19). **11**, holotype, PIN No. 3049–1028; **12**, holotype, PIN No. 3049–1029, length of body 2.4 mm; **13–14**, **16**, holotype, PIN No. 4270–48, length of body 2.9 mm; **15**, **17**, additional specimen, PIN No. 4270–1065, length of body 2.7 mm; **18**, additional specimen, PIN No. 4270–1094, length of body 3.0 mm; **19**, paratypes, PIN No. 4270–1071, length of body 2.8 mm. Body (11–14, 17–19), body, part (11, 13) and counter-part (12, 14), metatibia and metatarsus (15, 16).



Figs 20–29. *Mesocinetus*: *M. aequalis* (20, 24), *M. angustitibialis* sp. nov. (21, 22), *M. elumbis* sp. nov. (23, 25) and *M. subjectus* sp. nov. (26–29). **20, 24**, additional specimen, PIN No. 3049–1100, length of body 3.2 mm. **21, 22**, holotype, PIN No. 4270–1067, length of body 2.8 mm; **23, 25**, holotype, PIN No. 4270–1088, length of body 2.6 mm; **26**, holotype, PIN No. 4270–1075, length of body 3.0 mm; **27, 28**, paratype, PIN No. 4270–1074, length of body 2.8 mm; **29**, paratype, PIN No. 4270–1068, length of body 2.8 mm. Dry body (20–23, 26, 28, 29), body in alcohol (27), head (24, 25), body, part (21) and counterpart (22).

Paratypes. PIN No. 4270–1079 (part and counterpart), nearly complete beetle with broken left side of distal part of body, missing antennae (except right scape), pro- and mesotarsi, distal metatarsomeres. PIN No. 4270–1071, nearly complete beetle with missing antennae (except right scape), right anterior and posterior legs, right mesotarsus. PIN No. 4270–1078, pterothorax and abdomen without left posterior leg, abdominal apex and elytral apices.

Additional specimens. PIN No. 4270–1065, part and counterpart, probably female, nearly complete beetle without left anterior leg, right protibia and protarsus, right mesotibia. PIN No. 4270–1066 (part and counterpart), nearly complete beetle with missing antennae, anterior legs, right posterior leg. PIN No. 4270–1100, probably female, nearly complete beetle with missing right antennomeres, left anterior legs, right mesotarsus. PIN No. 4270–1090, female, left part of metathorax and abdomen, without legs, but both metafemora are present. PIN No. 4270–1092, probably female, nearly complete beetle with missing antennae, left anterior leg. PIN No. 4270–1094 (part and counterpart), probably female, nearly complete beetle with missing anterior legs, left mesotibia and tarsi (except metatarsomere 1). PIN No. 4270–1097, probably female, nearly complete beetle with missing antennae, left anterior leg, right posterior leg, left metatibia and metatarsus. PIN No. 4270–1103, female, nearly complete beetle with missing antennae, right anterior and intermediate legs, left posterior leg. PIN No. 4270–1077, pterothorax and abdomen with present legs. PIN No. 4270–1089, probably female, nearly complete beetle with broken and missing right part of head, prothorax and pterothorax and also right anterior and intermediate legs, and also with missing pro- and mesotarsi. PIN No. 4270–1070 (part and counterpart), probably female, nearly complete beetle with missing anterior legs, mesotarsi, right posterior leg and left posterior tarsus. PIN No. 4270–1099, nearly complete beetle with missing antennae, left protibia and protarsus, right anterior leg and posterior legs. PIN No. 4270–1084, nearly complete beetle with missing antennae and anterior legs.

Diagnosis. This new species can be diagnosed after the following characters: body much more than twice as long as wide; metepisterna about 2.5 times as long as wide; lack of parametacoxal lines; inner process of metacoxae 2.0–2.5 times as long as wide and

not abrupt or widened at apex; metacoxa about three times as wide as long, posterior edge of metacoxae nearly straight; tibiae somewhat widening apically. It has also markedly wider legs (particularly tibiae) than in *Mesocinetus angustitibialis* **sp. nov.** and *M. elumbis* **sp. nov.** Besides, in contrast to *M. mongolicus* and *M. subjectus* **sp. nov.**, this new species has not parametacoxal line on metaventrete, and, in contrast to *M. mongolicus* and *M. ovatus*, the head of this new species is much smaller. Finally, the aedeagus of *M. aequalis* **sp. nov.**, in contrast to that in *M. elumbis* **sp. nov.**, is with widely separated lateral lobes. See also the diagnoses of the following new species described below.

Some additional specimens are with the subparallel-sided metepisterna and larger metacoxae, which have the convex posterior edge, inner process of their femoral plate about three times as long as wide and abrupt (not widened) at apex.

Description of holotype (female). Body length (with deflected head) 2.9 mm, width about 1.3 mm, elytra length at least 2.1 mm. Integument of dorsal and ventral sclerites slightly sclerotised, apparently with uniform, rather small and dense, quite shallow punctures, interspaces between them apparently less than a puncture diameter, more or less alutaceous; densely covered with very short and dense hairs; elytra without a trace of longitudinal rows of small punctures.

Head rather transverse (nearly twice as wide as long); with moderately large oval eyes. Mandibles and palpi not visible. Labrum well exposed, more than twice as wide as long. Antennae presented by 9 distal antennomeres; antennomeres 3–8 subequal, more than twice as long as wide, subconical and somewhat widened apically; antennomeres 9 and 10 somewhat wider at apex and shorter, ultimate antennomere suboval, as long as each of antennomeres 3–8 and with arcuate apex. Prothorax markedly more than 2.5 times as wide as long; pronotum apparently gently convex, its anterior edge very broadly rounded; anterior angles not expressed; posterior edge rather convex and shallowly

sinuate at each posterior angle, which is distinctly pointed and moderately projecting posteriorly; prosternum traced only because of visible strongly transverse and very narrowly separated procoxae. Mesocoxae sub-oval to subtriangular, rather large and (sub) contiguous, almost three times as long as procoxae. Metacoxae strongly oblique, becoming longer mediad and conjoining along their inner edges; their femoral plates short at outer edge, slightly enlarging mediad and going into moderately wide process rounded at apex. Mesoventrite apparently somewhat shorter than metaventrite, in the middle with a heavily sclerotised trident oriented anteriorly. Metepisterna moderately wide and narrowing anteriorly, somewhat more than twice as long as wide at posterior edge. Metaventrite with a median line (discrimen) expressed in distal third. Elytra much wider than prothorax and broadly arcuate at sides, about 1.7 times as long as wide combined, longest at suture, apparently rather convex, sides not explanate, apices acuminate, leaving apex of abdomen exposed. Abdominal ventrite 1 long apparently longest, although median part of strongly oblique metacoxae nearly reaching posterior edge of ventrite 1; ventrite 2 slightly shorter than ventrite 1 and as long as hypopygidium, ventrites 3 and 4 shortest and comparable in length; hypopygidium and pygidium widely rounded at apex; two following abdominal segments exposed from under pygidium and somewhat sclerotised (two last extruded abdominal segments nearly as well sclerotised as other body sclerites).

Trochanters moderately large, although mesotrochanter comparatively large. Femora nearly comparably wide (metafemur somewhat wider), about 1.7–2.5 times as thick as procoxae long. Tibiae slightly longer than femora and rather thin (about half as thick as femora), evenly covered with setae, apices of meso- and metatibiae somewhat widened and with dense fine crenulation along posterior edges. Mesotarsus about as long as tibiae with subcylindrical tarsomeres, tarsomere 1 longest, tarsomere

5 slightly shorter and tarsomeres 2–4 progressively shortened, apices of tarsomeres 1–4 with fine and dense crenulation along posterior edges. Metatarsomeres 1 and 2 subcylindrical and comparatively long, their apices with fine and dense crenulation along posterior edges. Apices of meso- and metatarsomeres 1 more or less oblique.

Notes. The most paratypes seem to have more deflected head which look like more elongate than transverse. The specimens with the more deflected head demonstrate their anterior part of frons somewhat more projecting than other specimens here regarded conspecific with the holotype.

Variations. Paratypes: PIN No. 4270–1079 – body length 2.8 and width 1.3 mm; metepisterna very slightly narrowing anteriorly; epipleura at the middle of metepisterna sharply narrowing; elytra with clear adsutural lines and apices rounded rather than acuminate; scape rather large and subcylindrical; PIN No. 4270–1071 – body length 2.8 and width 1.3 mm; metepisterna subparallel-sided; elytra with apices rounded rather than acuminate; PIN No. 4270–1078 – body length 2.2 and width 1.5 mm; metepisterna subparallel-sided; elytra with apices rounded rather than acuminate.

Additional specimens: PIN No. 4270–1065 – length 2.7, width 1.5 mm, metepisterna with convex inner edge; PIN No. 4270–1066 – body length 2.7 and width 1.5 mm, metepisterna subparallel-sided; PIN No. 4270–1090 – largest specimen: length of metathorax and abdomen 2.8 and width 1.9 mm, metepisterna subparallel-sided; PIN No. 4270–1094 – body length 3.0 and width 1.7 mm, antennae rather narrow, metepisterna subparallel-sided; PIN No. 4270–1092 – length 3.0 mm, apices of mesotibiae with rather projecting outer angles; PIN No. 4270–1097 – body length 2.7 and width 1.6 mm, metepisterna subparallel-sided; PIN No. 4270–1080 – large specimen, length without head and prothorax 2.7, width 1.6 mm; PIN No. 4270–1103 – body length 2.9 and width 1.7 mm; PIN No. 4270–1077 – length of pterothorax and ab-

domen 2.2 mm; PIN No. 4270–1100 – body length 3.2 and width 1.7 mm; elytra with longitudinal sparse punctured rows, metepisterna subparallel-sided; hypopygidium feebly and widely emarginate to truncate at apex; pygidium widely rounded at apex; aedeagus moderately sclerotised and with lateral lobes of tegmen widely separated; PIN No. 4270–1089 – body length 2.9 and width 1.5 mm; metepisterna subparallel-sided; PIN No. 4270–1070 – body length 2.9 and width 1.7 mm; metepisterna subparallel-sided; PIN No. 4270–1099 – body length 2.8 and width 1.6 mm; metepisterna subparallel-sided; PIN No. 4270–1099 – body length 2.4 and width 1.3 mm.

Etymology. The epithet of this new species means even, regular, steady, equal, exact.

***Mesocinetus angustitibialis* sp. nov.**

(Figs 21–22, 30–31)

Material examined. Holotype. PIN No. 4270–1067 (part and counterpart), probably female, nearly complete beetle with missing antennae, anterior legs, right mesotarsus and left metatarsus.

Diagnosis. This new species can be diagnosed due to the comparatively robust body, very narrow tibiae and lack of a sclerotised trident in the middle of mesoventrite. Besides, it is characterised by the body less than twice as long as wide, metepisterna about twice as long as wide, lack of parametacoxal lines, inner process of metacoxae about three times as long as wide, abrupt and widened at apex, metacoxa about three times as wide as long, posterior edge of metacoxae clearly convex and tibiae scarcely widening apically. The lack of fork sclerotised on mesoventrite is also a peculiar feature of this new species. This new species has very narrow tibiae (as in *Mesocinetus elumbis* sp. nov.), however it differs from the latter in the more robust body, much longer inner process of metacoxal femoral plates with transversely abrupt and widened apex, somewhat wider tibiae, longer tarsi and particularly tarsomere 1.

Notes. Because this species is rather similar to the previous one, most characters are omitted in the below description.

Description of holotype (female). Body length (with deflected head) 2.8 mm, width about 1.8 mm, elytra length at least 2.3 mm. Integument of dorsal and ventral sclerites slightly sclerotised, apparently with uniform, rather small and dense, quite shallow punctures, interspaces between them apparently less than a puncture diameter, more or less alutaceous.

Head rather transverse (exposed part of head nearly 1.5 times as wide as long), with moderately large oval eyes. Mandibles and palpi not visible. Labrum well exposed, more than twice as wide as long. Prothorax markedly more than 3 times as wide as long. Procoxae nearly contiguous. Metacoxae strongly oblique, becoming longer mediad and conjoining along their inner edges; their posterior edge convex; their femoral plates short at outer edge, slightly enlarging mediad and going into moderately wide process (about 3 times as long as wide) with transversely abrupt and widened at apex. Mesoventrite apparently somewhat shorter than metaventrite, without a clear sclerotised trident oriented anteriorly. Metepisterna moderately wide and narrowing anteriorly, slightly more than twice as long as wide at posterior edge. Metaventrite without a clear median line (discrimen). Elytra much wider than prothorax and broadly arcuate at sides, about 1.5 times as long as wide combined, longest at suture, covering apex of abdomen. Abdominal ventrite 1 long apparently longest, although median part of strongly oblique metacoxae nearly reaching posterior edge of ventrite 1; ventrite 2 about 1.5 times as long as ventrite 1 and slightly shorter than ventrite 4 and hypopygidium, ventrite 3 shortest; hypopygidium and pygidium widely rounded at apex.

Tibiae slightly longer than femora and very thin (almost a third as thick as femora), evenly covered with setae, apices of meso- and metatibiae somewhat widened and with dense fine crenulation along pos-

terior edges. Mesotarsus about three-fourth as long as tibiae with subcylindrical and subequal in length tarsomeres, although mesotarsomere apparently longer. Metatarsomeres 1 somewhat longer than each of metatarsomeres 2–4, their apices with fine and dense crenulation along posterior edge.

Etymology. The epithet of this new species is formed from the Latin ‘angustus’ (narrow, tight) and ‘tibialis’ (tibial).

***Mesocinetus elumbis* sp. nov.**

(Figs 23, 25, 32)

Material examined. *Holotype.* PIN No. 4270–1088, male, nearly complete beetle with missing antennae, right anterior leg, left intermediate leg, right mesotibia and mesotarsus, right posterior leg.

Diagnosis. This new species is characterised by the extremely narrow tibiae, narrower than in *Mesocinetus angustitibialis* sp. nov., however differing from it in the characters mentioned in the diagnosis of the latter (more slender body, much shorter inner process of metacoxal femoral plates with rounded apex, somewhat narrower tibiae, shorter tarsi and particularly tarsomere 1). Aedeagus, in contrast to that in *M. aequalis* sp. nov., shows the lateral lobes moderately separated. Besides, this new species can be diagnosed due to the body less than twice as long as wide, metepisterna about three times as long as wide, lack of parametacoxal lines, inner process of metacoxae about three times as long as wide and not abrupt or widened at apex, metacoxa about three times as wide as long, posterior edge of metacoxae nearly straight and tibiae scarcely widening apically.

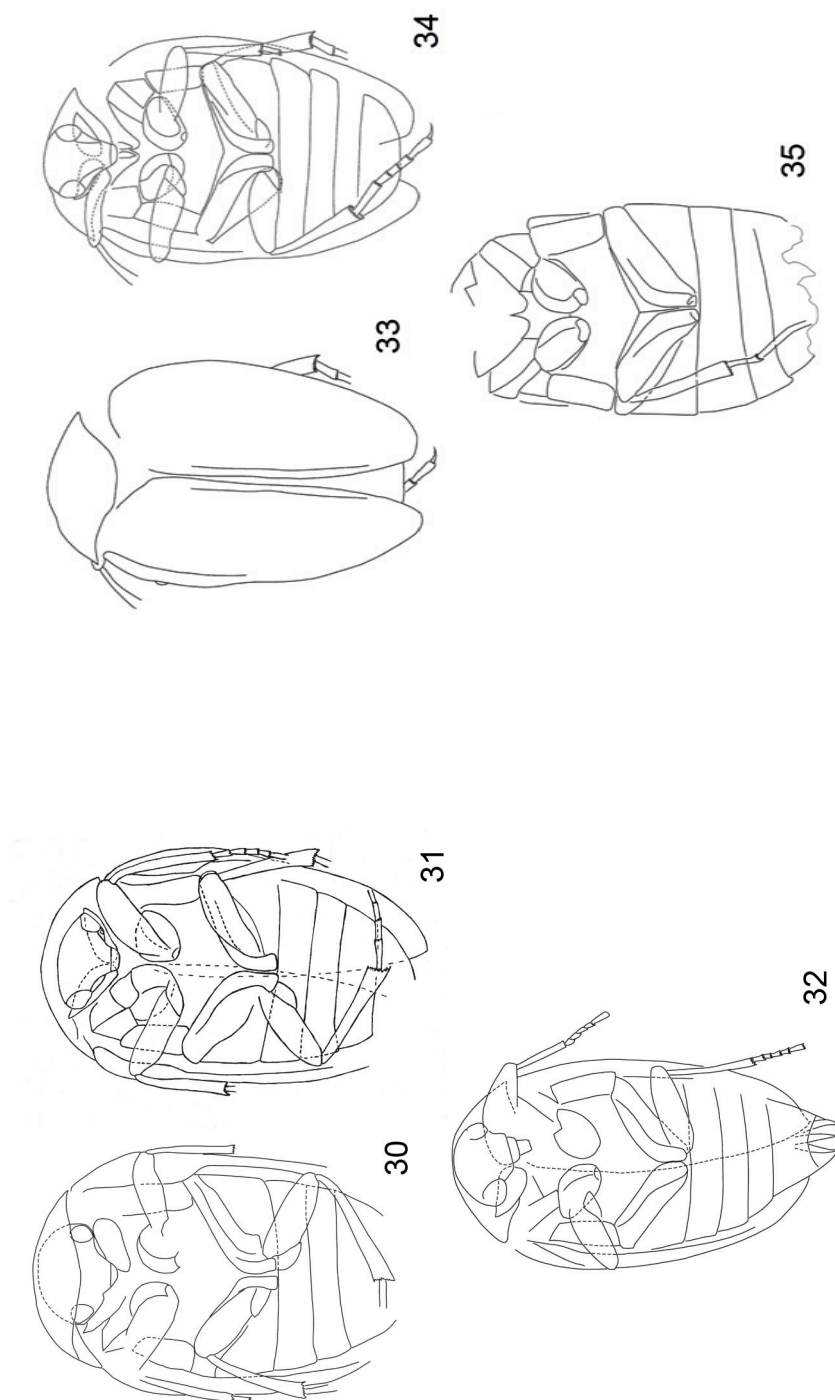
Notes. Because this species is rather similar to *M. aequalis* sp. nov., most characters are omitted in the below description.

Description of holotype (male). Body length (with deflected head) 2.6 mm, width about 1.3 mm, elytra length at least 2.1 mm. Integument of dorsal and ventral sclerites slightly sclerotised, apparently with uniform, rather small and dense, quite shallow punctures, interspaces between them appar-

ently less than a puncture diameter, more or less alutaceous.

Head rather transverse (nearly 1.5 times as wide as long); with moderately large oval eyes. Labrum well exposed, more than twice as wide as long. Prothorax about three times as wide as long; with very narrowly separated procoxae. Mesocoxae suboval to subtriangular, rather large and very narrowly separated, about twice as long as procoxae. Metacoxae strongly oblique, becoming longer medially and conjoining along their inner edges; their femoral plates short at outer edge, slightly enlarging medially and going into moderately wide process rounded at apex. Mesoventrite apparently somewhat shorter than metaventrite, without clear heavily sclerotised trident in the middle oriented anteriorly. Metepisterna moderately wide and slightly narrowing anteriorly, somewhat about 2.5 times as long as wide at posterior edge. Metaventrite without visible median line (discrimen). Elytra about 1.5 times as long as wide combined, longest at suture, leaving exposed apex of abdomen. Abdominal ventrite 1 long longest, although median part of strongly oblique metacoxae nearly reaching posterior edge of ventrite 1; ventrite 2 about half as long as ventrite 1, ventrites 3 and 4 shortest and comparable in length; hypopygidium about 1.5 times as long as ventrite 2 and with deeply concave apex; pygidium apparently rounded at apex.

Tibiae slightly longer than femora and extremely thin (about one-fourth as thick as femora), apices of pro- and metatibiae somewhat widened and with dense fine crenulation along posterior edges. Protarsus much shorter than tibiae with subcylindrical tarsomeres 2–4, protarsomere 1 shortest and narrowly bilobed, protarsomere 5 longest, apices of protarsomeres 1–4 with fine and dense crenulation along posterior edges. Metatarsomeres 1 slightly shorter than metatarsomere 5, metatarsomeres 2–4 somewhat shorter than metatarsomere 1 and their apices with fine and dense crenulation along posterior edges.



Figs 33–35. *Mesocinetus subjectus* sp. nov., body. **33, 34**, holotype, PIN No. 4270–1075, length of body 3.0 mm; **35**, paratype, PIN No. 4270–1068, length of body 2.8 mm. Dorsal view (33, 35) and ventral view (34).

Figs 30–32. *Mesocinetus*: *M. angustitibialis* sp. nov. (30, 31) and *M. elumbis* sp. nov. (32). **30**, holotype, PIN No. 4270–1067, length of body 2.8 mm; **31**, holotype, PIN No. 4270–1066, length of body 2.6 mm. Body (32), body part (30) and counterpart (31).

Aedeagus partly transparent inside ultimate abdominal segment and heavily sclerotised.

Etymology. The epithet of this new species is formed from the Latin 'ex' (of, from, out of) and 'lumbus' (thigh, haunch, waist; loins) meaning weak in thighs (hips), feeble, subtle, weak.

***Mesocinetus subjectus* sp. nov.**

(Figs 26–29, 33–35)

Material examined. *Holotype.* PIN No. 4270–1075 (part and counterpart), sex unknown, part, nearly complete beetle with missing antennae, left anterior leg, right protarsus, right mesotibia and mesotarsus, right mesotibia and mesotarsus, right posterior leg and counterpart represented by metathorax and abdomen.

Paratypes. PIN No. 4270–1074 (part and counterpart), probably female, pterothorax and abdomen, without left intermediate leg, both posterior tibiae and tarsi. PIN No. 4270–1068 (part and counterpart), part and counterpart, pterothorax and abdomen with missing left elytron, intermediate legs, left metatibia and tarsus, right metatarsus.

Diagnosis. This new species is distinct from all the congeners from Shar-Teg in the presence of parametacoxal lines, separately rounded elytral apices forming a small sutural angle, rather wide tarsi, comparatively short elytra with very widely rounded apices. From *Mesocinetus mongolicus* and *M. ovatus* this new species differs in smaller head, and from the first also in the lack of parametacoxal line on metaventricle. Besides, it is characterised by the body about 2.5 as long as wide, antennae about as long as pronotum wide, metepisterna about 2.5 as long as wide, lack of parametacoxal lines, inner process of metacoxae 2.0–2.5 times as long as wide and not abrupt or widened at apex, metacoxa about 3 times as wide as long, posterior edge of metacoxae nearly straight, and tibiae somewhat widening apically.

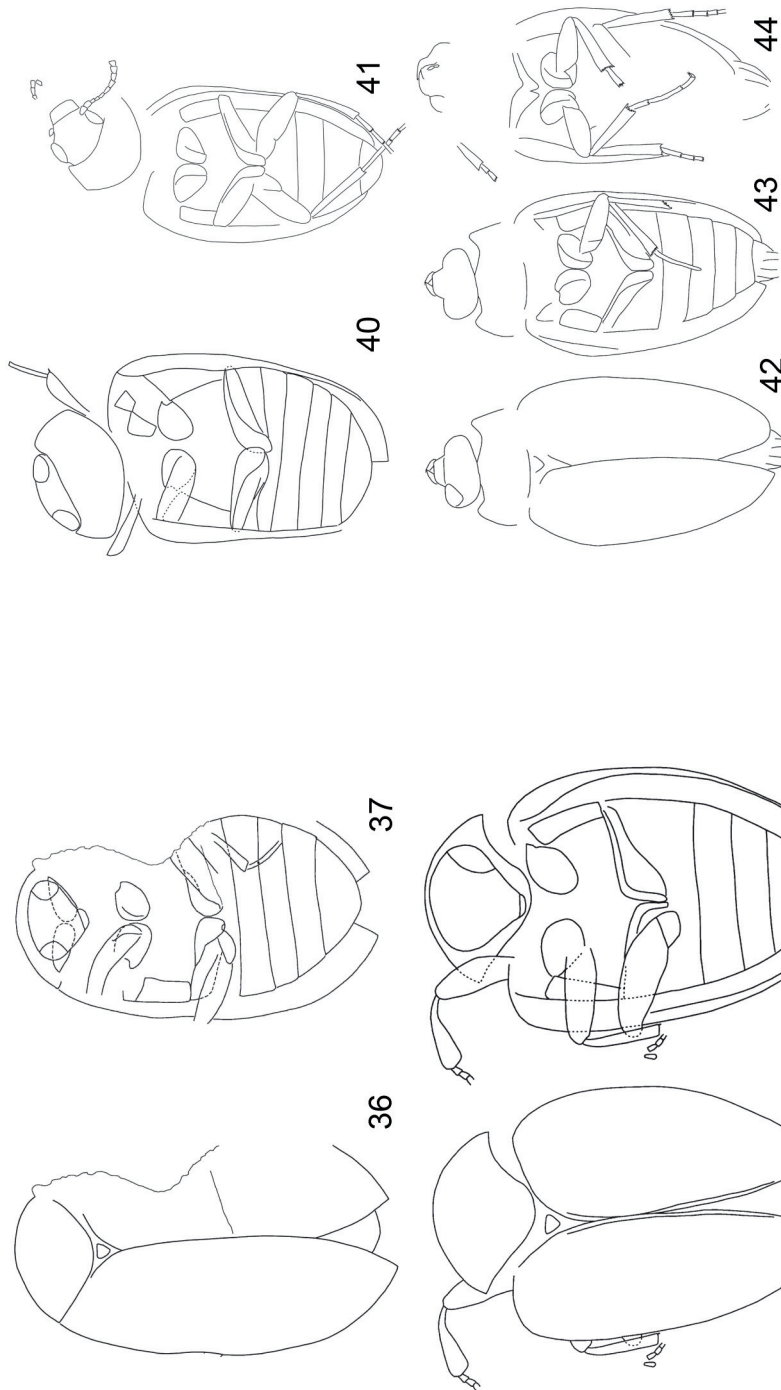
Notes. Because this species is rather similar to *M. aequalis* sp. nov., most characters are omitted in the below description.

Description of holotype (sex unknown). Body length (with deflected head) 3.0 mm,

width about 1.7 mm, elytra length at least 2.6 mm. Integument of dorsal and ventral sclerites slightly sclerotised, apparently with uniform, rather small and dense, quite shallow punctures, interspaces between them apparently less than a puncture diameter, more or less alutaceous.

Head slightly transverse with somewhat projecting frons. Labrum well exposed, more than twice as wide as long. Prothorax markedly more than three times as wide as long. Mesocoxae suboval to subtriangular, rather large and very narrowly separated. Metacoxae strongly oblique, becoming longer mediad and conjoining along their inner edges; their femoral plates short at outer edge, slightly enlarging mediad and going into moderately wide process (about three times as long as wide) subtruncate at apex. Mesoventricle apparently somewhat shorter than metaventricle, in the middle with a heavily sclerotised trident oriented anteriorly. Metepisterna moderately wide and subparallel-sided, somewhat more than twice as long as wide at posterior edge. Metaventricle with parametacoxal line and short median line (discrimen). Elytra much wider than prothorax and broadly arcuate at sides, less than 1.5 times as long as wide combined, longest at suture, apices rounded and forming a sutural angle, adsutural lines distinct, covering abdomen. Abdominal ventricle 1 apparently longest, although median part of strongly oblique metacoxae nearly reaching posterior edge of ventricle 1; ventricle 2 somewhat shorter than ventricle 1 and hypopygidium taken separately, ventricles 3 and 4 shortest and comparable in length; hypopygidium and pygidium apparently widely rounded at apex.

Tibiae slightly longer than femora and rather thin (about half as thick as femora), apices of meso- and metatibiae somewhat widened and with dense fine crenulation along posterior edges. Mesotarsomere 1 apparently longer than mesotarsomeres 2–4 with fine and dense crenulation along posterior edge. Metatarsomeres 1 longest, metatarsomeres 2–4 combined slightly longer



Figs 40–44. Mesocinetidae. *Manopsis concaevicollis* gen. et sp. nov. (40) and *Manoelodes gratiosus* gen. et sp. nov. (41–44). 40, holotype, PIN No. 4270–1110, length of body 4.6 mm; 41, holotype, PIN No. 4270–1082, length of body 3.2 mm; 42, 43, paratype PIN No. 4270–1087, length of body 3.2 mm; 44, paratype PIN No. 4270–1083, length of body 2.8 mm. Body, dorsal view (40–42) and ventral view (43).

Figs 36–39. Mesocinetidae. 36, 37, *Shartegus transversus* gen. et sp. nov., holotype, PIN No. 4270–1069, length of body 2.1 mm. 38, 39, *Parashartegus distinctus* gen. et sp. nov., holotype, PIN No. 4270–1313, length of body 3.0 mm. Dorsal view (36, 38) and ventral view (37, 39).

than metatarsomere 1, their apices with fine and dense crenulation along posterior edges.

Variations. Paratypes: PIN No. 4270–1068 – length of pterothorax and abdomen 2.8 and width 1.9 mm. PIN No. 4270–1074 – length of pterothorax and abdomen 2.8 and width 1.8 mm.

Etymology. The epithet of this new species means close-fitting, tight-fitting, adjacent (to), contiguous (to), bordering (to).

***Shartegus* gen. nov.**

Type species: *Shartegus transversus* sp. nov.

Diagnosis. This new genus is characterised by the pronotum with convex anterior edge, mesocoxae narrowly separated, metepisterna slightly widened apically, metacoxae short and subtransverse, apex of which rather far from posterior edge of abdominal ventrite 1 and metacoxal femoral plates widely expanded medially. The mesoventrite of the type species of this new species in the middle has no a trident oriented anteriorly (as in most species of *Mesocinetus*), but only a median short projection. On the other hand, the abdominal ventrite 1 of it is much shorter than hypopygidium. This new genus can be diagnosed after the above key to genera.

Etymology. The name of this new genus is formed from the name of the locality where the type specimens were collected. The gender is masculine.

***Shartegus transversus* sp. nov.**

(Figs 36–37, 45–47)

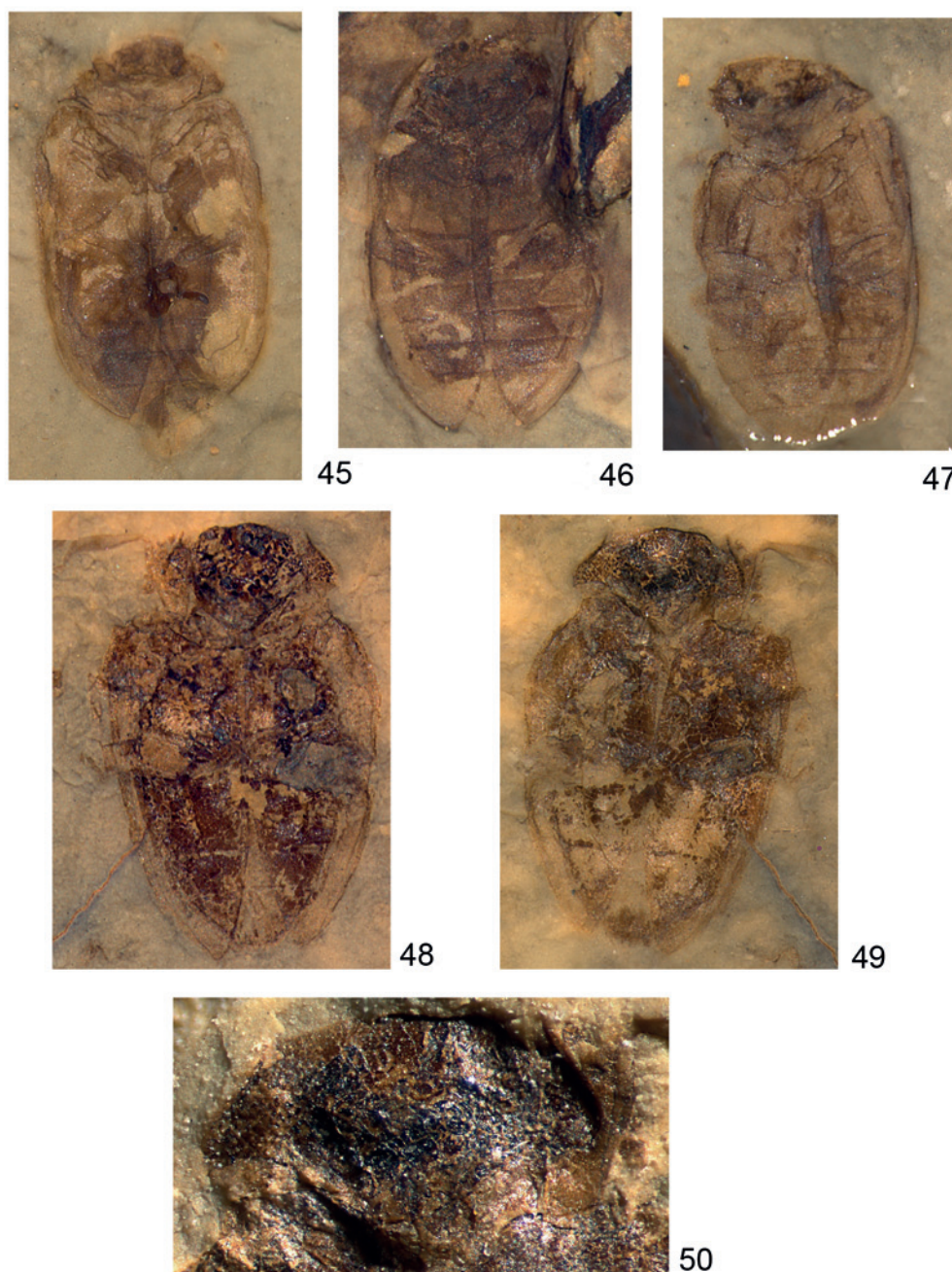
Material examined. *Holotype.* PIN No. 4270–1069 (part and counterpart), probably female, part, nearly complete beetle with broken left part of thorax and also with missing antennae, anterior legs, left intermediate leg, right mesotibia and mesotarsus, right mesotibia and mesotarsus, right metatibia and metatarsus. The beetle is a part of coprolite including many remains of insects.

Paratypes. PIN No. 4270–4270–1086, probably female, pterothorax and abdomen, without left intermediate leg, both posterior tibiae and tarsi. PIN No. 4270–1091, probably female, part and counterpart, pterothorax and abdomen

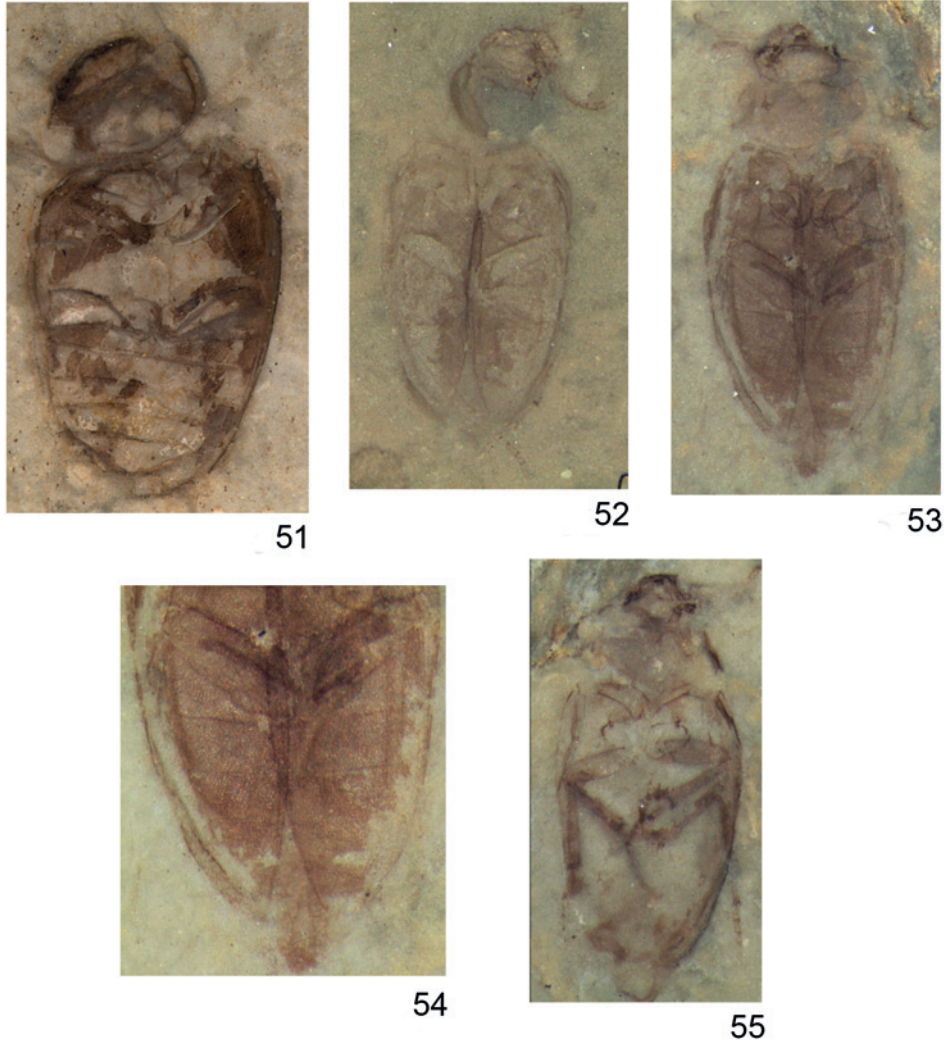
with missing left elytron, intermediate legs, left metatibia and tarsus, right metatarsus.

Description of holotype (female). Body length (with deflected head) 2.1 mm, width about 1.2 mm, elytra length at least 1.7 mm. Integument of dorsal and ventral sclerites slightly sclerotised, apparently with uniform, rather small and dense, quite shallow punctures, interspaces between them apparently less than a puncture diameter, more or less alutaceous; densely covered with very short and dense hairs; elytra without a trace of longitudinal rows of small punctures.

Head rather transverse (nearly twice as wide as long); with moderately large oval eyes. Mandibles and palpi not visible. Labrum well exposed, about three times as wide as long. Antennae missing. Prothorax somewhat more than 2.5 times as wide as long; pronotum apparently gently convex, its anterior edge very broadly rounded; anterior angles not expressed; posterior edge rather convex and shallowly sinuate at each posterior angle, which is distinctly pointed and moderately projecting posteriorly; prosternum traced only because of visible strongly transverse and very narrowly separated procoxae. Mesocoxae suboval to subtriangular, rather large and narrowly separated, almost twice as long as procoxae. Metacoxae (sub)transverse, slightly longer mediad and conjoining along their inner edges; their femoral plates obsolete at outer edge, slightly enlarging mediad and going into moderately wide process rounded at apex. Mesoventrite in the middle without a trident oriented anteriorly, but only with a median short projection. Metaventrite about twice as long as mesoventrite and without clear median line (discrimen). Metepisterna moderately wide and widening anteriorly, somewhat more than twice as long as wide at posterior edge. Elytra much wider than prothorax and broadly arcuate at sides, about 1.7 times as long as wide combined, longest at suture, apparently rather convex, sides not explanate, apices acuminate, completely covered apex of abdomen and with expressed adsutural lines.



Figs 45–50. Mesocinetidae. *Shartegus transversus* gen. et sp. nov. (45–47) and *Parashartegus distinctus* gen. et sp. nov. (48–50). **45**, paratype, PIN No. 4270–1086, length of body 2.2 mm; **46**, holotype, PIN No. 4270–1069, length of body 2.1 mm; **47**, paratype, PIN No. 4270–1091, length of body 2.1 mm; **48–50**, holotype, PIN No. 4270–1313, length of body 3.0 mm. Body (45–47), body, part (48) and counterpart (49), pronotum (50).



Figs 51–55. Mesocinetidae. *Manopsis concavicornis* gen. et sp. nov. (51) and *Manoelodes gratiosus* gen. et sp. nov. (52–55). **51**, holotype, PIN No. 4270–1110, length of body 4.6 mm; **52**, holotype, PIN No. 4270–1082, length of body 3.2 mm; **53–55**, paratype, PIN No. 4270–1087, length of body 3.2 mm; **56**, paratype, PIN No. 4270–1083, length of body 2.8 mm. Body (51–53, 55) and abdomen with aedeagus (54).

Abdominal ventrite 1 significantly shorter than hypopygidium and markedly longer each of ventrites 2–4 (which are comparable in length); hypopygidium and pygidium widely rounded at apex.

Metatrochanters moderately large. Metafemur about three times as long as wide and somewhat wider than procoxae long. Metatibia rather thin (about a third as thick as femora) and only slightly dilated apically. Metatarsomeres 1 and 2 subcylindrical and rather long.

Variations. Paratypes: PIN No. 4270–1086 – length of body 2.2 and width 1.2 mm; PIN No. 4270–1091 – length of body 1.1 and width 1.2 mm; ovipositor is weakly sclerotised, moderately short and with well developed styli.

Etymology. The epithet of this new species means transverse referring to the transverse metacoxae.

***Parashartegus* gen. nov.**

Type species: *Parashartegus distinctus* sp. nov.

Diagnosis. This new genus is characterised by the pronotum with convex anterior edge, mesocoxae widely separated, metepisterna narrowly widened apically, metacoxae long and subtransverse, apex of which rather far from posterior edge of abdominal ventrite 1 and metacoxal femoral plates narrowly expanded medially. The eyes of the type species of this new genus seem to be comparatively large, but somewhat smaller than those in *Manopsis concavicornis* gen. et sp. nov. The protibiae of *Parashartegus distinctus* gen. et sp. nov. are most dilated among the members of this new family. The large eyes and dilated protibiae make this new species similar to *M. concavicornis* gen. et sp. nov., but it differs from the latter in the more robust body, wider pronotum with anterior edge not distinctly concave and much longer abdominal ventrite 1. The new genus under consideration can be diagnosed after the above key to genera. Tibiae and tarsomeres of this new species do not show clear crenulation at their apices.

Etymology. The name of this new genus is formed from the generic name '*Shartegus*' and Greek/Latin prefix 'para' (beside, around, near). The gender is masculine.

***Parashartegus distinctus* sp. nov.**

(Figs 38–39, 48–50)

Material examined. Holotype. PIN No. 4270–1313 (part and counterpart), male, nearly complete beetle with missing antennae, right legs, and also left metatibia and metatarsus.

Description of holotype (male). Body length (with deflected head) 3.0 mm, width about 2.1 mm, elytra length at least 2.3 mm. Integument of dorsal and ventral sclerites heavily sclerotised, apparently with uniform, rather small and dense, quite shallow punctures, interspaces between more or less alutaceous; elytra without a trace of longitudinal rows of small punctures.

Head transverse (slightly wider than long); with rather large oval eyes. Mandibles and palpi not visible. Labrum well exposed, rather short. Antennae missing. Prothorax nearly twice as wide as long; pronotum apparently gently convex, its anterior edge very broadly rounded; anterior angles not expressed; posterior edge rather convex and shallowly sinuate at each posterior angle, which is distinctly pointed; procoxae not visible. Mesocoxae suboval, rather large and widely separated. Metacoxae transverse, becoming longer medially and conjoining along their inner edges; their femoral plates short at outer edge, slightly enlarging medially and going into moderately wide process rounded at apex, which is rather far from posterior edge of abdominal ventrite 1. Metepisterna comparatively narrow and widening anteriorly, about four times as long as wide at posterior edge. Metaventrite without clear median line (discrimen). Elytra much wider than prothorax and broadly arcuate at sides, about 1.3 times as long as wide combined, longest at suture, sides apparently not explanate, apices acuminate, covering apex of abdomen. Abdominal ventrite 1 longest, nearly twice as long as hypopygidium, ven-

trites 2–4 comparable in length and each of slightly shorter than hypopygidium; hypopygidium and pygidium widely rounded at apex.

Metatrochanter rather large. Femora moderately wide (metafemur somewhat wider), about 3.5 times as thick as long. Protibia rather wide at apex (about two thirds as wide as femora), without clear fine crenulation along posterior edges. Mesotibia narrow and slightly dilated apically. Pro-tarsomeres 1–3 short, thick (slightly longer than thick) and subcylindrical, their apices without clear crenulation along posterior edges. Mesotarsomeres moderately long and thin, each at least twice as long as thick.

Etymology. The epithet of this new species means distinct, different, detached, separated, dividual.

***Manopsis* gen. nov.**

Type species: *Manopsis concavicollis* sp. nov.

Diagnosis. This new genus is characterised by the pronotum with concave anterior edge, mesocoxae narrowly separated, metepisterna strongly widened apically, metacoxae long and subtransverse and metacoxal femoral plates widely expanded medially. The eyes of the type species of this new genus seem to be largest among the members of this new family. The anterior legs of it are rather dilated. The most outstanding character of this new genus is gently rounded posterior edge of pronotum. Besides, mesocoxae of it are comparatively smaller than in other members of the new family. See also the diagnosis of *Parashartegus* gen. nov. and the above key to genera.

Etymology. The name of this new genus is formed from Greek ‘manos’ (sparse, rare) and ‘opsis’ (occurrences or structure resembling a (specified) thing). The gender is masculine.

***Manopsis concavicollis* sp. nov.** (Figs 40, 51)

Material examined. Holotype. PIN No. 4270–1110 – probably female, nearly complete beetle

with missing antennae and legs, only protibiae are traced.

Description of holotype (male). Body length (with deflected head) 4.6 mm, width about 2.7 mm, elytra length at least 3.5 mm. Integument of dorsal and ventral sclerites slightly sclerotised, apparently with uniform, rather small and dense, quite shallow punctures, interspaces between them apparently more or less alutaceous.

Head apparently strongly transverse; with rather large oval eyes. Mandibles, palpi, frons and labrum not visible. Prothorax about twice as wide as long; pronotum apparently gently convex, its anterior edge very broadly emarginate; anterior angles widely rounded; posterior edge rather convex and gently outlined at each posterior angle, which is somewhat arcuate and not projecting posteriorly; procoxae not visible. Mesocoxae suboval, moderately large and moderately separated. Metacoxae (sub) transverse, becoming longer mediad and conjoining along their inner edges; their femoral plates short at outer edge, slightly enlarging mediad and going into moderately wide process rounded at apex. Mesoventrite apparently somewhat shorter than metaventrite. Metepisterna moderately wide and widening anteriorly, about 3.5 times as long as wide at posterior edge. Metaventrite without clear median line (discrimen). Elytra much wider than prothorax and broadly arcuate at sides to rectilinear at anterior two thirds, about 1.5 times as long as wide combined, longest at suture, apparently rather convex, apices pointed, covering apex of abdomen. Abdominal ventrite 1 longest, median part of strongly oblique metacoxae far not reaching posterior edge of ventrite 1; ventrites 2–5 comparable in length, hypopygidium and pygidium widely rounded at apex. Protibiae rather dilated to oblique apex.

Etymology. The epithet of this new species is formed from the Latin ‘concavus’ (concave, hollow, sunken) and ‘collis’ (hill, knoll, hillock) referring to the concave anterior margin of pronotum.

***Manoelodes* gen. nov.**

Type species: *Manoelodes graciosus* sp. nov.

Diagnosis. This new genus is characterised by the pronotum with concave anterior edge and apparently with posterior angles not pointed, mesocoxae conjoined, metepisterna subparallel-side, metacoxae long and oblique and metacoxal femoral plates narrowly expanded medially. This new genus, in contrast to other members of the new family, has rather short frons and very large labrum. Besides, it has the rather short antennae and comparatively small mesocoxae. Its pronotum of this new family seems to be most similar to that in most recent Scirtidae in comparison with other members of the new family. The new genus under consideration can be diagnosed after the above key to genera.

Etymology. The name of this new genus is formed from Greek 'manos' (sparse, rare) and generic name 'Elodes'. The gender is masculine.

***Manoelodes graciosus* sp. nov.**

(Figs 41–44, 52–56)

Material examined. *Holotype.* PIN No. 4270–1082, sex unknown, nearly complete beetle with missing most part of right antenna, anterior and intermediate legs; outline of pronotum very incomplete.

Paratypes. PIN No. 4270–1087, male with well preserved aedeagus, nearly complete beetle with missing antennae (although trace of the right antenna somewhat visible), anterior and posterior legs, and also without right intermediate leg. PIN No. 4270–1083 (part and counterpart), probably male, outline of anterior part of head, trace of mesoventrite, mesocoxae with intermediate legs, and also with left antenna, metatibiae and metatarsi.

Description of holotype (sex unknown). Body length 3.2 mm, width about 1.3 mm, elytra length at least 2.2 mm. Integument of dorsal and ventral sclerites slightly sclerotised, apparently with uniform, rather small and dense, apparently shallow punctures, interspaces between them apparently less than a puncture diameter, more or less alutaceous.

Head about as wide as long; with moderately large oval eyes, rather short frons. Mandibles and palpi not visible. Labrum well exposed, very large (larger than eyes), somewhat more than twice as wide as long. Left antenna presented by 10 antennomeres; scape rather small and not thick; antennomere 2 about as large as scape; antennomere 3 shortest and apparently thinnest; antennomeres 8–10 widened apically.

Prothorax markedly more than 2.5 times as wide as long; pronotum apparently gently convex, its anterior edge very broadly excised; anterior angles distinctly projecting; posterior edge rather and regularly convex; posterior angles apparently not pointed; prosternum not visible. Mesocoxae suboval to subtriangular, moderately large and (sub) contiguous. Metacoxae strongly oblique, becoming longer mediad and conjoining along their inner edges; their femoral plates short to obsolete at outer edge, slightly enlarging mediad and going into moderately wide process rounded at apex. Mesoventrite markedly shorter than metaventrite. Metepisterna moderately wide and subparallel-sided, about 2.5 times as long as wide at posterior edge. Metaventrite without clear median line (discrimen). Elytra much wider than prothorax and broadly arcuate at sides, about 1.5 times as long as wide combined, longest at suture, apparently rather convex, sides not explanate, apices subacuminate, leaving exposed apex of abdomen. Abdominal ventrite 1 long longest, median part of strongly oblique metacoxae far not reaching posterior edge of ventrite 1; ventrite 2 slightly shorter than ventrite 1 and somewhat longer than hypopygidium, ventrites 3 and 4 shortest and apparently comparable in length; hypopygidium and pygidium widely rounded at apex.

Metatrochanters moderately large. Metafemur nearly 3 times as long as wide. Metatibia slightly longer than femur and rather thin (about third as thick as femur), evenly covered with setae, apex of metatibia with dense and fine crenulation along posterior edges. Metatarsus somewhat longer

than metatibia; metatarsomeres subcylindrical and becoming shorter distally, their apices with fine and dense crenulation along posterior edges.

Variations. Paratypes: PIN No. 4270–1087 – length of body 3.2, width 1.3 and length of elytra 2.2 mm; clearly transverse head with large labrum and exposed acute apices of mandibles; distinct pronotal anterior edge (bisinuate) and gently arcuate sides; mesotibia slightly widened apically; hypopygidium shallowly and broadly emarginate at apex; aedeagus heavily sclerotised, with narrow penis trunk and rather narrow parameres. PIN No. 4270–1083 – length of body 2.8, width 1.3 and length of elytra 2.0 mm; mandibular apices rather acute; protibia as wide as meso- and metatibiae; mesoventrite with a narrow sclerotised process oriented anteriorly.

Etymology. The epithet of this new species is formed from the Latin ‘gratia’ (grace or graceful) and ‘-osus’ (having the quality of).

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