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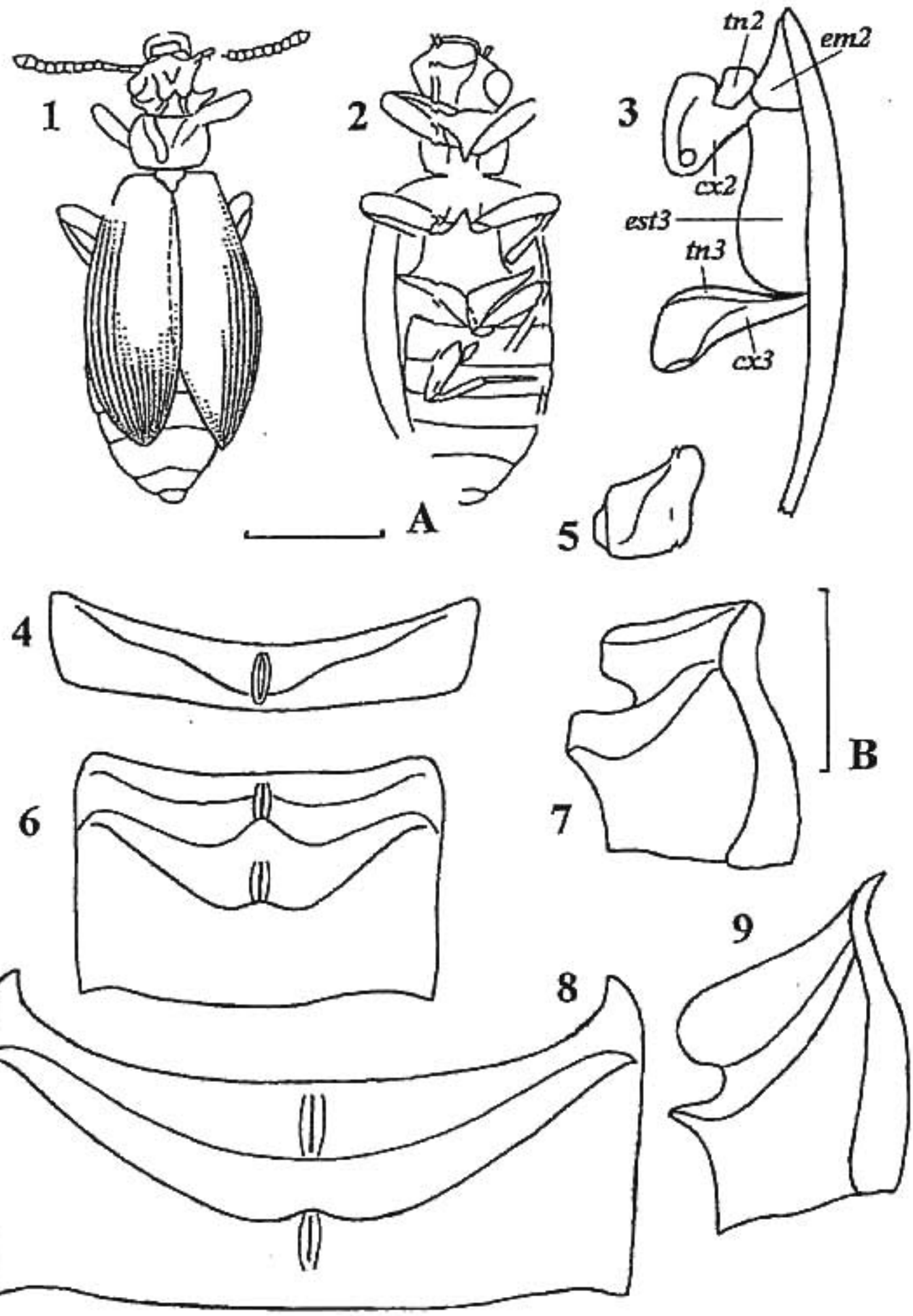
# *SIKHOTEALINIA ZHILTZOVAE* (LAFER, 1996) - RECENT REPRESENTATIVE OF THE JURASSIC COLEOPTEROUS FAUNA (COLEOPTERA, ARCHOSTEMATA, JURODIDAE)

This paper is aimed to light up some problems appeared in connection with preparation of the CD "Beetles of the World" (C.S.I.R.O., Canberra, 1999) and to clarify a situation with the species (*Sikhotealinia zhiltzovae)* from the Russian Far East, for which the new genus and family (Sikhotealiniidae) were erected (Lafer, 1996). The only known specimen was captured by L.A. Zhiltzova in the very early spring (April 1974); now it is deposited in the Zoological Institute of the Russian Academy of Sciences.

Characters mentioned in the description of *Sikhotealinia* show the features of different suborders (Archostemata, Adephaga and Polyphaga). The description is illustrated by drawings of head with 3 ocelli and pronotum, elytra with seriate true punctation (i.e. without trace of primary membrane and venation), peculiar abdomen, metepisternum widened posteriorly, conical pro- and mesocoxae, metacoxae rather extending posteriorly, hind wing in folded and unfolded position. The author of this paper was informed by A.G. Ponomarenko that this recent form looks very similar to Jurodidae, a palaeoendemic family described from the Lower Mid Jurassic deposits of Transbaikalia (Ponomarenko, 1985) and stratigraphically spread along the Jurassic and Cretaceous. A comparison of the types of *Jurodes ignoramus* Ponomarenko, 1985 (Figs. 1 & 2) and the fossils allied to it with the holotype of *Sikhotealinia zhiltzovae* has led to the opinion that the Mesozoic and recent species seem to be "related" species. Differences between them concern mostly the length and thickness of antennae, length of pronotum, number and density of punctured rows on elytra, proportions of tarsomeres. The only character which can be used to distinguish *Sikhotealinia* from extinct genera is the number of punctured rows: 11 in *Sikhotealinia* and more than 15 in Mesozoic groups (although some of extinct forms remained undescribed have certainly diffuse punctation on elytra).




Figs. 1-9. Jurodidae & Cupedidae

*1* - body of holotype of *Jurodes ignoramus*, dorsal; *2* - idem, ventral; *3* - metepisternum of *Sikhotealinia zhiltzovae* comb.n., ventral (*em2* - mesepimeron, *tn2* - mesotrochantin, *cx2* - mesocoxae, *est3* - metepisternum, *tn3* - metatrochantin, *cx3* - metacoxa); *4* - ventrite 1 of the same species, ventral; *5* - ventrite 1 and laterosternite 1 of the same species, lateral; *6* - ventrite 1 of *Priacma serrata*, ventral; *7* - ventrite 1 and laterosternite 1 of the same species, lateral; *8* - ventrite 1 of *Temnomerga mucida*, ventral; *9* - ventrite 1 and laterosternite 1 of the same species, lateral

Scale bars: *A* - to figs 1-2; *B* - to figs. 3-9

The both described representatives of Jurodidae (*Jurodes ignoramus* and *Sikhotealinia zhiltzovae*) possess some almost unique features among Coleoptera. One of them is the shape of metepisternum distinctly widened posteriorly (Fig. 3): anterior part of it participates in formation of the mesocoxal cavities. The last peculiarity is rather characteristic to the extinct Palaeozoic Protocoleoptera and Meso-Caenozoic Archostemata than to other subordera. In comparison with the Cupedid *Temnomerga mucida* (Chevrolat, 1829), the recent and Jurassic forms under consideration have different head, elytra, hind wing venation and tarsi, but general configuration of thoracic sclerites and abdominal ventrites of all these species is evidently similar. Ventrite 1 of Cupedidae is characterized by the presence of a short and sharp ridge between metacoxae (Figs. 4-9). *Priacma serrata* (Leconte, 1861) resembles the considered forms in configuration of thoracic sclerites and head appendages. Epicranium is similar in all 3 species, although *Priacma* has a smooth central plate and a pair of postocular tubercles in the same places, where *Sikhotealinia* has ocelli. Main differences of these forms, in addition to the structure of metepisterna, number of ventrites and hind wing venation, consist in the presence of remnants of true elytral cells and squamose subrecumbent dorsal pubescence in *Priacma*, while the recent *Sikhotealinia* has true punctation on elytra and is covered with suberect hairs.

Anal sclerite of *Jurodes* and *Sikhotealinia* as in males of many Cupedidae is exposed dorsally. The holotypes of *Sikhotealinia zhiltzovae* and *Jurodes ignoramus* are certainly males, because both have this sclerite. The abdomen of both forms have 6 visible ventrites (ventrite 6 is exposed behind the transverse apex of preceding ventrite), while representatives of almost all archostematan families have not more than 5 ventrites, except for *Micromalthus debilis* Leconte, 1878 which has 6 or 7 ventrites.

Ponomarenko (1985) has justified his placement of *Jurodes* in Adephaga by the presence of "*oblongum*" in hind wing and visible second (primary) abdominal sternite. Actually he had seen a loose space between the thorax and detached abdomen (Fig. 2). It was a reason of this unexpectable mistake of the greatest expert among coleopterists who ever studied Archostemata. The "*oblongum*" is more or less characteristic for Archostemata and Adephaga, but has not been revealed on fossils with Jurodidae examined by the author.

The holotype of *Sikhotealinia* was dissected by G.Sh. Lafer. The venation in his drawing is not quite archostematan and rather reduced in distal half (Lafer, 1996), while folding of this wing is not rolled as usually in Archostemata. Both the venation and folding in *Sikhotealinia* are nearly polyphagan.

If the similarity between *Priacma* and Jurodidae reflects also to some extent similar mode of life, we can suppose it with some care also to the extinct forms. Species of the latter could apparently be wood or root borers in larval stages like most modern Archostemata, but the imagines having very long and simple tarsi with

strong claws were and are associated rather with open mode of life on tree trunks and branches at fresh water basins than with other habits.

Ponomarenko (1969) included in Archostemata also the Palaeozoic Protocoleoptera and Mesozoic Myxophaga (represented by Schizophoriformia) and other Coleoptera described from the layers earlier than the Triassic. The family Cupedidae in his interpretation is correspondent to the whole suborder in other versions. He regarded Micromalthidae as a separate family related to the "Schizophoroid-lineage" (Myxophaga) but not to "Cupedoid-lineage". Ponomarenko recognized only 3 subfamilies of Cupedidae: the extinct Triadocupedinae as well as Cupedinae and Ommatinae, which are known from the Mesozoic and Caenozoic eras. In more popular concept Archostemata is thought (Lawrence & Newton, 1995) to include 4 families of recent beetles: Cupedidae, Ommatidae, Crowsoniellidae and Micromalthidae. The two former families are distinct from two others in much larger body size, presence of primary membrane and trace of primary venation in their elytra, as well as in the comparatively less reduced venation of hind wings. Jurodidae show an intermediate state in the both thoracic organs and even in body size between the pairs of Cupedidae-Ommatidae and Crowsoniellidae-Micromalthidae.

The Meso-Caenozoic Jurodidae have a position close to Cupedidae and Ommatidae, but in contrast to the latter with completely dislodged primary membrane and disappeared trace of venation in elytra. Jurodidae shares a character of distribution in time with *Omma* Newman, 1839 and *Tetraphalerus* Waterhouse, 1901 having a more representation in the past (Mesozoic era) and recent remnants of ancient diversity.

## Diagnosis of Jurodidae Ponomarenko, 1985 (=Sikhotealiniidae Lafer, 1996, syn. n.)

Type genera: *Jurodes* Ponomarenko, 1985 and *Sikhotealinia* Lafer, 1996, both by monotypy.

This family is very different from the Palaeozoic Protocoleoptera, as it is characterized by the 11-segmented antennae, moderately long elytra without trace of primary membrane and rather reduced hind wing venation. It should be regarded as a member of Archostemata because of the following characters: complete ventrite 1 with a sharp median ridge between joint metacoxae, participation of metepisternum in formation of mesocoxal cavities, characteristic convexities on head and pronotum, movable metacoxae with visible trochantin.

Jurodidae can be identified with the following key to families of Archostemata:

1 **a.** Body elongate and narrow with shortened elytra, leaving 5-6 tergites uncovered; prothorax without lateral edges, distinct notopleural and sternopleural sutures; abdomen with 6-7 ventrites; elytra with diffuse true punctation; maxillary lobes reduced . . . . . Micromalthidae Barber, 1913

1 **b.** Body more or less oval with complete elytra, completely covering abdominal tergites; prothorax with distinct lateral edges, notopleural and sternopleural sutures; abdomen with 5 ventrites or also with a small ventrite 6; elytra as a rule with seriate remnants of primary cell or rows of punctures (only *Crowsoniella* Pace, 1976 with indistinct rows of punctures); maxillary lobes raised or reduced . . . . . 2

2 (1) **a.** Elytra with trace of primary membrane between thickened veins . . . . . 3

2 (1) **b.** Elytra with true punctation, i.e. without trace of primary membrane between heavily sclerotized veins . . . . . 5

3 (2) **a.** Procoxal cavities contiguous; abdominal ventrites rather flattened; antennal insertions lateral; tarsomere 4 simple; thoracic underside without grooves for reception of legs; maxillary lobes reduced . . . . . .Ommatidae Sharp et Muir, 1912

3 (2) **b.** Procoxal cavities separated; abdominal ventrites more or less convex . . . . . 4

4 (3) **a.** Prosternum with raised intercoxal processus which is narrower than procoxae; antennal insertions dorsal; tarsomere 4 lobed beneath; thoracic underside with distinct grooves for reception of legs; maxillary lobes well raised. . . . . Cupedidae Laporte, 1836

4 (3) **b.** Prosternum without distinct intercoxal processus and distance between procoxae not narrower than procoxae; antennal insertions lateral; tarsomere 4 simple; thoracic underside without traced grooves for reception of legs . . . . . Triadocupedidae Ponomarenko, 1966

5 (2) **a.** Prosternum with distinct processus between coxae; metepisternum narrowed posteriorly; abdomen with 5 visible ventrites; antennae with 7 segments; labrum fused with frons; elytra with indistinct rows of punctures; maxillary lobes reduced . . . . . .Crowsonielliidae Iablokoff-Khnzoryan, 1983

5 (2) **b.** Prosternum without processus between contiguous coxae; metepisternum widened posteriorly; abdomen with 6 visible ventrites; antennae with 11 segments; large and free labrum clearly exposed from under frons; elytra with regular rows of dense punctures; maxillary lobes well raised . . . . . .Jurodidae Ponomarenko, 1985

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