Paleontological Journal, Vol. 39, No. 2, 2005, pp. 173–177. Translated from Paleontologicheskii Zhurnal, No. 2, 2005, pp. 64–67.

New Grylloblattids (Insecta: Grylloblattida) from the Triassic of Eastern Europe, Eastern Kazakhstan and Mongolia

D. S. Aristov

Paleontological Institute, Russian Academy of Sciences, Profsoyuznaya ul. 123, Moscow, 117997 Russia
e-mail: danil_aristov@mail.ru

Received November 24, 2003

Abstract—Four new representatives of the order Grylloblattida are described: *Chauliodites mongolicus* sp. nov. (Chaulioditidae) from the Lower Triassic (?) of Mongolia, *Yontala camura* gen. et sp. nov. (?Chaulioditidae) from the Lower Triassic of the Vologda Region, *Ideliopsina kenderlykensis* sp. nov. (Ideliidae) from the Upper Triassic of eastern Kazakhstan, and *Triassoprobnis humilis* gen. et sp. nov. (Probnidae) from the Upper Triassic of the Kharkiv Region.

Key words: Insecta, Grylloblattida, Triassic, eastern Europe, Asia, new taxa.

INTRODUCTION

The order Grylloblattida appeared in the Late Carboniferous and flourished in the Permian. Although the diversity of grylloblattids decreased somewhat in the Triassic, it was still considerable. However, most of this diversity is recorded from the Madygen and Dzhailoucho localities (Middle or Upper Triassic, Madygen Formation, Kyrgyzstan), which have yielded large collections of grylloblattids of 48 species, 26 genera, and 9 families: the widespread Ideliidae, Tunguskapteridae, Geinitziidae, Megakhosaridae, Blattogryllidae, and Mesorthopteridae and the endemic Mesojabloniidae, Madygenophlebiidae, and Gorochoviidae (Storozhenko, 1998). Grylloblattids from the remaining Triassic localities are not nearly as diverse.

Undoubted or presumed Lower Triassic localities such as Anakit and Tura (Bugarikta Formation, Tunguska Basin), Nedubrovo (base of the Vokhma Formation, Vologda Region), Yamaan-Us (upper Yamaan-Us Formation, southern Mongolia), and Tikhvinskoe (Rybinsk Formation, Yaroslavl' Region) have only yielded several specimens of *Chauliodites* (Chaulioditidae). The only grylloblattid specimen from the Yontala locality (Vetluga Group, Vologda Region) possibly also belongs to Chaulioditidae. Grylloblattids collected from the Babii Kamen' locality (Maltseva Formation, Kemerovo Region) are somewhat more diverse and abundant, consisting of several dozen specimens of five species and three genera of the families Chaulioditidae and Geinitziidae (Aristov, 2003, 2004). Some authors date the Bugarikta and Maltseva formations as terminal Permian; the Yamaan-Us Formation is considered to be entirely Upper Permian, but its upper member has yielded an insect assemblage resembling those of the Triassic.

The Middle Triassic grylloblattids were likewise not especially diverse. Chaulioditidae were described from the Middle Triassic of China (Lin, 1978; Aristov, 2003) and the Goedewitz locality (Lower or Middle Buntensandstein, Germany; Aristov, 2004, 2004b). Undescribed Chaulioditidae and Blattogryllidae were recorded from the Vosges (Anisian of France), and Grylloblattida incertae sedis were recorded from the Potrerillos Formation of Argentina (Cacheuta).

The grylloblattid fauna of the Upper Triassic is more diverse. Mesorthopteridae and Geinitziidae were recorded from the Beacon Hill (Hawksbury Sandstone Series) and Mount Crosby localities (base of the Ipswich Group) in Australia and from the Fletcher locality (Molteno) in South Africa. Mesorthopteridae were described from the Kyzyl-Tam (=Ketmen') locality (Kol'dzhat Formation, Kazakhstan, Almaty Region, Uigur District, northern slopes of the Ketmen' Range, Kyzyl-Tam; Storozhenko, 1998). Ideliidae and fragmentary Mesorthopteridae were collected from the Kenderlyk locality (Tologoi Formation, eastern Kazakhstan). The localities of Kalacha-Mazar (Tadjikistan, Leninabad Region, Isfara District, env. Isfara), Tyul'kino (Donetsk Region, Slavyansk District, Nikolaevka, Dubovaya Ravine), and Garazhovka (Protopivka Formation, Kharkiv Region) yielded Mesorthopteridae, Blattogryllidae, and Probnidae, respectively. The presence of grylloblattids in the latter four localities is reported here for the first time. No representatives of the families Ideliidae, Blattogryllidae, and Probnidae were previously known from undoubted Upper Triassic localities.

MATERIAL

The material studied is deposited in the collection of the Paleontological Institute of the Russian Academy of Sciences (PIN).

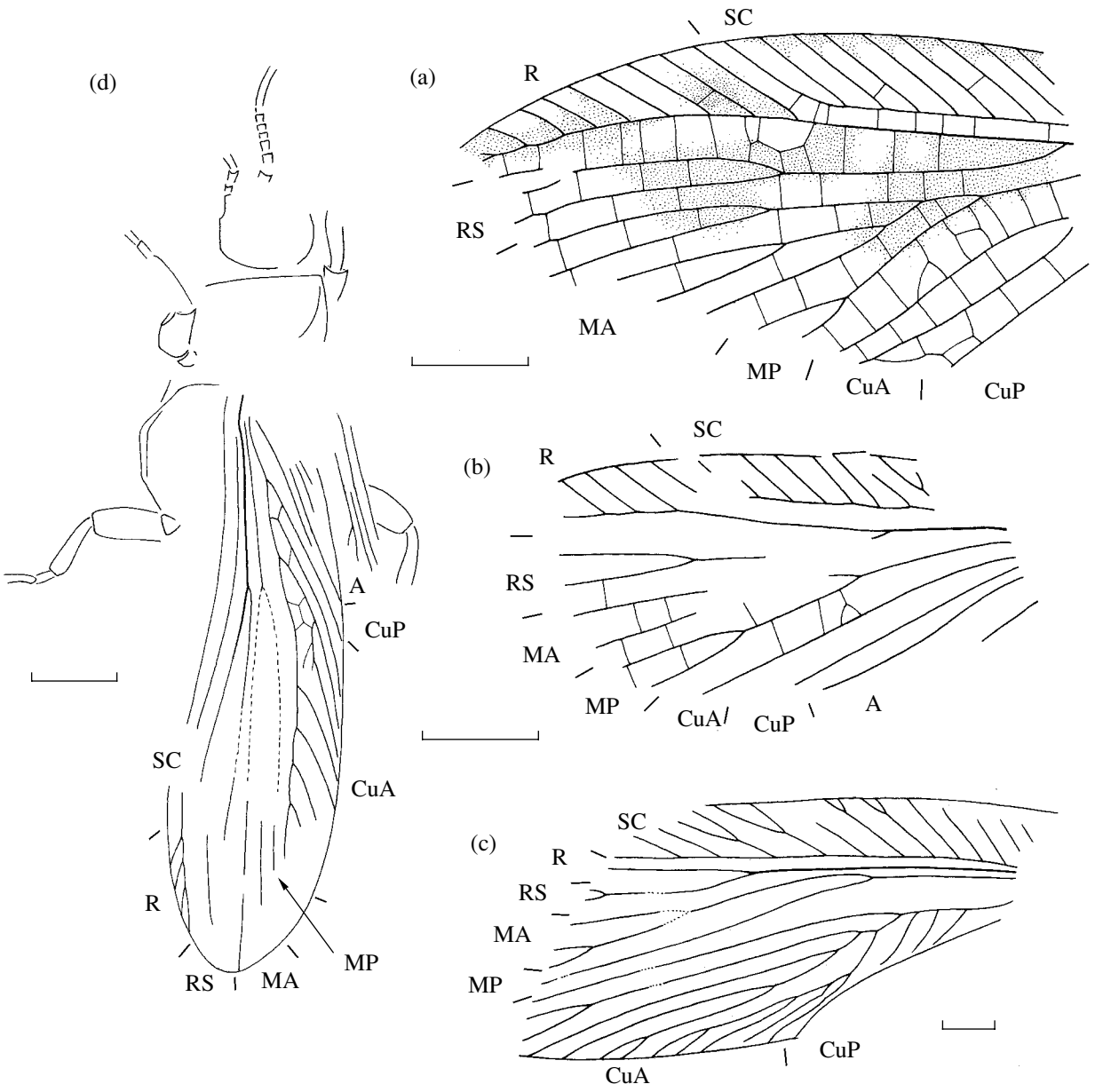


Fig. 1. Representatives of the order Grylloblattida: (a) *Chauliodites mongolicus* sp. nov., holotype PIN, no. 5006/1; (b) *Yontala camura* sp. nov., holotype PIN, no.4891/2; (c) *Ideliopsina kenderlykensis* sp. nov., holotype PIN, no. 2496/24; places where veins change position are marked with dots; (d) *Triassoprobnis humilis* sp. nov., holotype PIN, no. 3320/10. Scale bar 2 mm for Figs. 1a–1c and 3 mm for Fig. 1d.

SYSTEMATIC PALEONTOLOGY

Order Grylloblattida

Suborder Grylloblattina

Family Chaulioditidae Handlirsch, 1908

Genus *Chauliodites* Heer, 1864

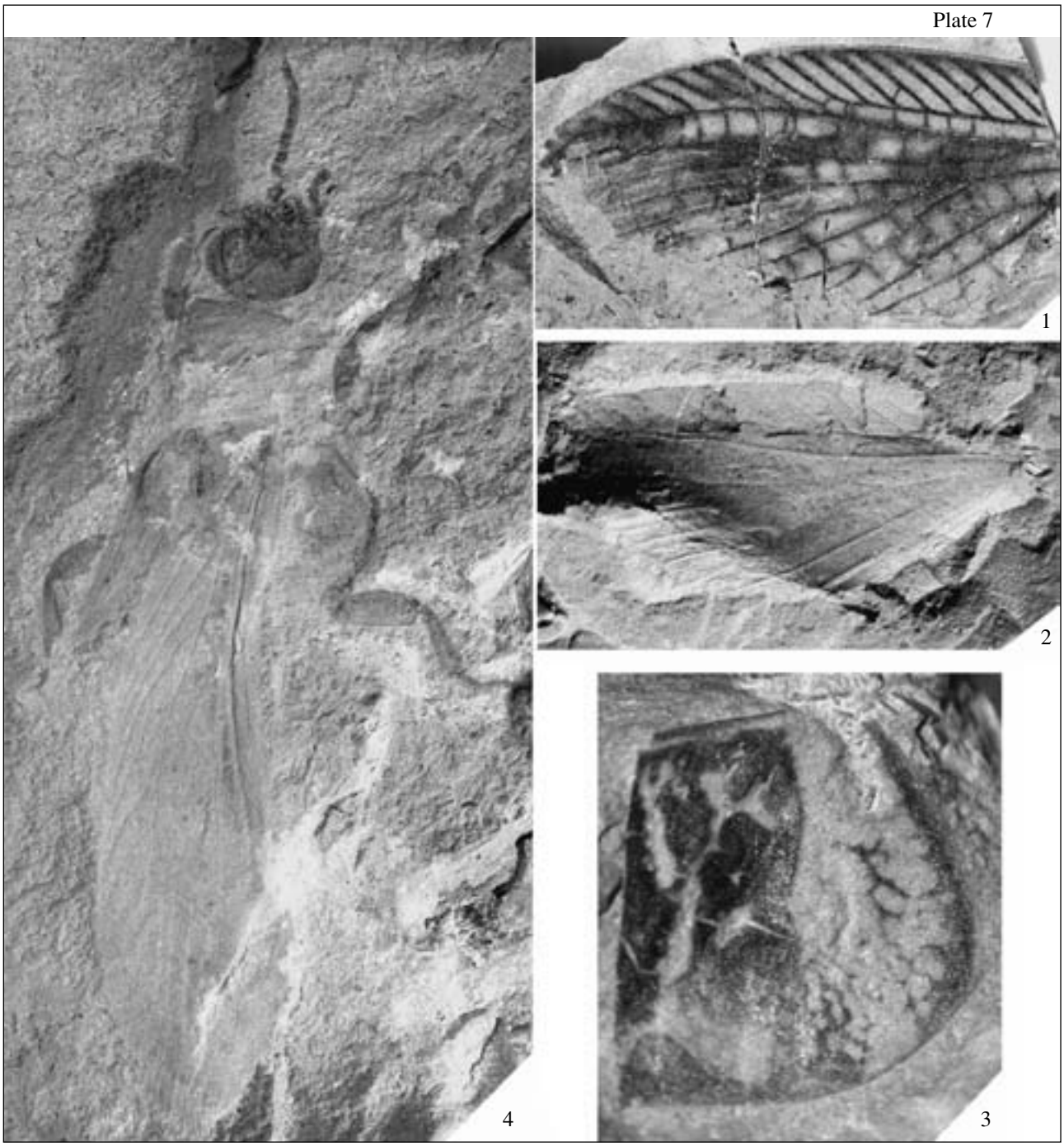
***Chauliodites mongolicus* Aristov, sp. nov.**

Plate 7, fig. 1

Etymology. From Mongolia.

Holotype. PIN, no. 5006/1, well preserved forewing (part and counterpart); Mongolia, Omnogovi Aymag, 25 km east of Nomgon Sum, Yamaan-Us locality; ?Lower Triassic, Yamaan-Us Formation, upper (sandstone) member.

Description (Fig. 1a). Small insects. The anterior margin of the forewing is convex; the costal area is about three times as wide as the subcostal one. The anterior branches of SC and R are simple, straight, and connected by sparse crossveins. RS is three-branched and originates in the basal wing quarter. MA bears five or six branches; MP is two-branched; the CuA branches



Explanation of Plate 7

Fig. 1. *Chauliodites mongolicus* sp. nov., holotype PIN, no. 5006/1, ×10.
Fig. 2. *Yontala camura* sp. nov., holotype PIN, no. 4891/2, ×12.
Fig. 3. Pronotum ?Chaulioditidae specimen PIN, no. 5006/3, ×20.
Fig. 4. *Triassoprobnis humilis* sp. nov., holotype PIN, no. 3320/10, ×6.

are curved; CuP is straight. The crossveins are mostly simple and form a double row of cells in the interradial, medial, and intercubital areas. The dark pattern consists of large, irregularly shaped spots.

Measurements (mm): forewing length, about 12.

Comparison. The new species is most similar to *C. sennikovi* Aristov, 2003 from the Lower Triassic localities Tichvinskoe (Yaroslavl' Region) and Nedubrovo (Vologda Region) but differs from this species in the broader costal area, the greater number of branches

on MA, and the presence of a double row of cells in the interradial and medial areas.

Remarks. In addition to the wings, an isolated pronotum (Pl. 7, fig. 3) was collected in the Yamaan-Us locality that resembles those of chaulioditids from the Lower Triassic locality Babii Kamen' in shape and dark pattern (Aristov, 2004c) and probably also belongs to that family.

Material. In addition to the holotype, paratype PIN, no. 5006/2 from the same locality.

Family Ideliidae M. Zalessky, 1928

Genus *Ideliopsina* Storozhenko, 1996

Ideliopsina kenderlykensis Aristov, sp. nov.

Etymology. From the Kenderlyk locality.

Holotype. PIN, no. 2496/24, well preserved forewing fragment (positive impression); eastern Kazakhstan, Saur Range, southern slopes of the Saikan mountains, right bank of the Akkolka River, Kenderlyk locality; Upper Triassic, Tologoi Formation.

Description (Fig. 1c). Medium-sized insects. The anterior margin of the forewing is weakly convex; the costal area is much broader than the subcostal area and is crossed by simple and dichotomizing anterior branches of SC. RS originates in the basal wing third and has two branches about the midwing; MA has three branches; MP is simple. CuA bears four posterior branches, the most proximal of them being five-branched and reaching the posterior wing margin. The remaining CuA branches form a regular comb of seven or eight branches. The stems of RS, MA, and MP and two CuA branches become concave about the midlength of the wing. CuP is arched forwards.

Measurements (mm): forewing length, about 30.

Comparison. The new species is most similar to *I. ruginosa* Storozhenko, 1996 from the Middle or Upper Triassic Madygen locality (Storozhenko, 1998) but differs in the larger size, early bifurcation of MA, long posterior branch of CuA, and arched CuP.

Material. Holotype.

Family ?Chaulioditidae Handlirsch, 1908

Genus *Yontala* Aristov, gen. nov.

Etymology. From the Yontala locality.

Type species. *Y. camura* sp. nov.

Diagnosis. Small insects. Anterior margin of forewing weakly convex; costal area twice as wide as subcostal area; anterior branches of SC and R straight, simple or dichotomizing. SC terminating in the distal wing third. M bifurcating distad of the RS origin; CuA simple.

Composition. Type species.

Remarks. In the broad costal area, course of the anterior branches of SC and RS, and M bifurcating beyond the RS origin, the new genus is similar to the type genus of the family Chaulioditidae, being distinct from it only in the absence of the CuA fork. In grylloblattids, CuA becomes simple with simplification of the venation pattern (all members of the Sheimiidae and Visheriferidae); in the other families, CuA is branched. A trend toward diminishing CuA forks has been recorded in some chaulioditids (*Paratomia* Aristov, 2003); therefore, the possibility that *Yontala* gen. nov. is an aberrant chaulioditid cannot be excluded.

Yontala camura Aristov sp. nov.

Plate 7, fig. 2

Etymology. From the Latin *camura* (concave).

Holotype. PIN, no. 4891/2, moderately well preserved forewing (part and counterpart); Russia, Vologda Region, Kichmengskii Gorodok Region, right bank of the Yug River 2 km downstream of the Yontala River mouth, Yontala locality; Lower Triassic, Vetluga Group.

Description (Fig. 1b). RS originates in the basal wing third. RS, MA, and MP bear two branches each. CuA and CuP are straight; the anal veins are simple. Crossveins are simple or Y-shaped.

Measurements (mm): forewing length, about 11.

Material. Holotype.

Suborder Protoperlina

Family Probnidae Sellards, 1909

Genus *Triassoprobnis* Aristov, gen. nov.

Etymology. From the Triassic and the genus *Probnis*.

Type species. *T. humilis* sp. nov.

Diagnosis. Medium-sized insects with robust body. Head large, antennomeres about as long as wide. Pronotum trapezoidal, paranota widened backwards. Legs short, trochanters small; femora powerful, fore femora shortened; tibiae widened distally, unarmed; tarsi as long as tibiae. Forewing elongate with anterior margin concave. CuA_1 branched early, forming a dense comb of branches almost reaching the wing apex.

Comparison. The new genus differs from the Lower Permian genera *Probnis* Sellards, 1909 from the Elmo locality (Storozhenko, 1998) and *Sylvafossor* Aristov, 2004 from the Chekarda locality (Aristov, 2004a) in the combination of shortened fore femora, unarmed tibiae, concave anterior margin of the forewing, and the early branching of CuA_1.

Composition. Type species.

Triassoprobnis humilis Aristov, sp. nov.

Plate 7, fig. 4

Etymology. From the Latin *humilis* (low).

Holotype. PIN, no. 3320/10, moderately well preserved incomplete body and forewing (positive impression); Ukraine, Kharkiv Region, Izyum District,

mouth of the Beren' River, village of Garazhovka, Garazhovka locality; Upper Triassic, Protopivka Formation.

Description (Fig. 1d). The forewing is acutely rounded apically, with a convex posterior margin. The costal area is broader than the subcostal area in the basal wing third, and as broad as the latter about the midwing. SC reaches the distal wing third; R bears anterior branches; RS is simple, originating at 1/3 wing length; MA is two-branched; MP is simple; CuA_1 bears 10 branches; crossveins are simple or form a double row of cells.

Measurements (mm): forewing length, 21; length of head, pro- and mesothorax combined, 11.

Material. Holotype.

ACKNOWLEDGMENTS

The author is grateful to A.P. Rasnitsyn and D.E. Shcherbakov (PIN) for valuable comments on the manuscript.

The study was supported by the Russian Foundation for Basic Research (project no. 01-04-48925) and the Federal Program "Coevolution of Ecosystems and Global Change in the Past."

REFERENCES

1. D. S. Aristov, "Revision of the Family Tomiidae (Insecta: Grylloblattida)," Paleontol. Zh., No. 1, 32–39 (2003) [Paleontol. J. **37** (1), 31–38 (2003)].
2. D. S. Aristov, "The Fauna of Grylloblattid Insects (Grylloblattida) of the Lower Permian Locality of Tshekarda," Paleontol. Zh. (Suppl. 2) (2004a) [Paleontol. J. **38** (Suppl. 2), S80–S145 (2004a)].
3. D. S. Aristov, "Grylloblattids of the Family Chaulioditidae (= Tomiidae syn. nov.) (Insecta: Grylloblattida) from the Upper Permian of the Orenburg Region," Paleontol. Zh. (Suppl. 2) (2004b) [Paleontol. J. **38** (Suppl. 2), S146–S149 (2004b)].
4. D. S. Aristov, "The Fauna of Grylloblattid Insects (Grylloblattida) from the End of the Late Permian to the First Half of the Triassic," Paleontol. Zh., No. 5, 45–52 (2004c) [Paleontol. J. **38** (5), 514–521 (2004c)].
5. Q.-b. Lin, "Upper Permian and Triassic Fossil Insect of Guizhou," Acta Palaeontol. Sin. **17** (3), 313–317 (1978).
6. S. Yu. Storozhenko, *Systematics, Phylogeny, and Evolution of Grylloblattid Insects (Insecta: Grylloblattida)* (Dal'nauka, Vladivostok, 1998) [in Russian].