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Grylloblattids of the Family Ideliidae (Insecta: Grylloblattida) from the Lower Permian of the Ural Mountains

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Abstract—A new genus of the family Ideliidae, *Tshekardelia media* gen. et sp. nov., is described from the locality of Chekarda, the Lower Permian of the Ural Mountains. The species *Sylvidelia latipennis* Martynov, 1940, is redescribed.

INTRODUCTION

For the first time, the family Ideliidae appeared in the paleontological record in the Lower Permian. Its last representatives disappeared in the Upper or Middle Triassic. To date, this family includes 32 species of 13 genera (Storozhenko, 1998). In spite of the large number of species described, the structure of the body has been insufficiently studied. Such data are known only for two representatives of the family, *Rachimentomon reticulatum* G. Zalessky, 1935 and *Sojanidelia florea* A. Rasnitsyn, 1996; both come from the locality of Chekarda in the central Ural Mountains (Perm region, Suksun district, left bank of the Sylva River, near the mouth of the Chekarda River, Kungurian, Koshelevka Formation). Two more species of ideliids from Chekarda are described below. One of them, *Sylvidelia latipennis*, was described from the impression of the forewing (Martynov, 1940). Later, a nearly complete specimen of *S. latipennis* has been discovered in the collection of fossil insects from Chekarda that was collected by Sharov (PIN) during 1959–1961. Below, a description of this impression and redescription of the holotype are given. In addition, the paper describes a previously unknown ideliid found in 1989 by Novokshonov in the locality of Chekarda.

MATERIAL

The holotype is housed in the Paleontological Institute of the Russian Academy of Sciences (PIN).

SYSTEMATIC PALEONTOLOGY

Family Ideliidae M. Zalessky, 1929

Genus *Sylvidelia* Martynov, 1940

Sylvidelia latipennis Martynov, 1940

Holotype. PIN, no. 99/27, forewing; Chekarda locality; Kungurian, Koshelevka Formation.

Description (Figs. 1, 2, 4a–4c). The insect is large. The head is small. The antennae are filiform and thin. The pronotum is large with a shallow excavation on the anterior margin and broad paranota. The mesonotum is longitudinal, with a distinct short prescutum; the lobes of the scutum are distinct and not

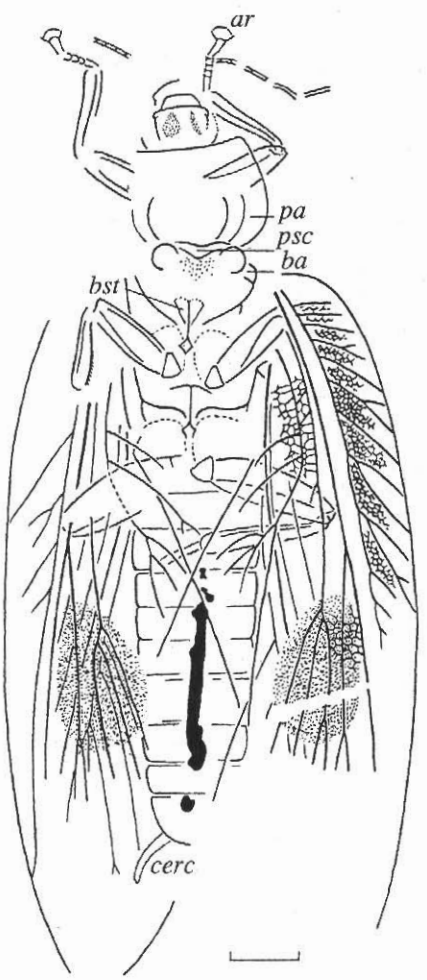

Fig. 1. *Sylvidelia latipennis* Martynov, 1940, specimen PIN, no. 1700/617, general appearance. Abbreviations: (*ar*) arolium, (*pa*) paranota, (*psc*) prescutum, (*ba*) basalare, (*bst*) basisternum, and (*cerc*) cerci. Scale bars in Figs. 1–3, 5 mm.

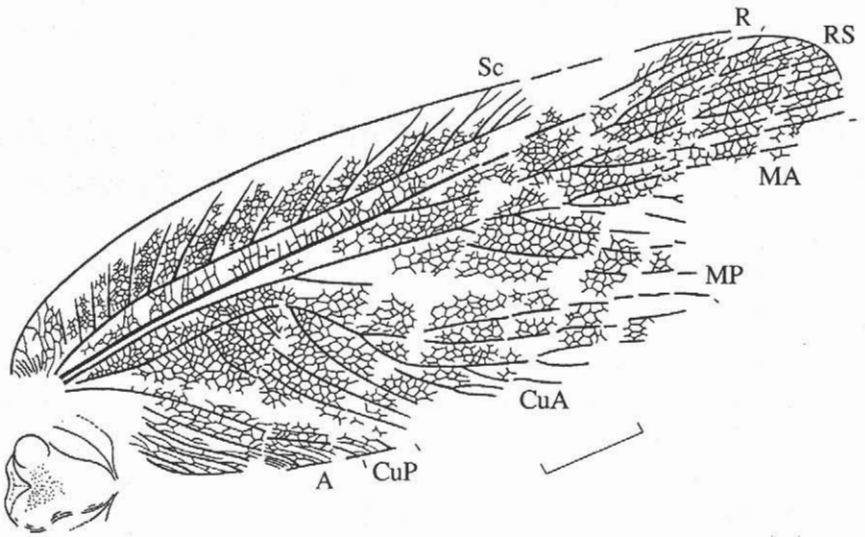

Fig. 2. *Sylvidelia latipennis* Martynov, 1940, holotype PIN, no. 99/27, forewing and mesonotum.

touching; the scutellum is weakly convex. The surface of the mesonotum is irregularly punctured. The longitudinal suture on the ventral surface of the thorax is distinct; the furcasternum is small and rhomboid. The legs are stout, the femora and tibiae have longitudinal ridges, and the tibiae are slightly bent and expanded apically and have a longitudinal row of small dents along the inner margin. The tarsi are 5-segmented and distinctly shorter than the tibiae in the anterior legs; the first and the last tarsomeres are the longest; the three middle tarsomeres are very short; their length does not exceed their width; the claws are paired; the arolium is large and semicircularly extends beyond the tip of the claws. The coxae of the fore and mid legs are large, cone-shaped, in close proximity, but not touching. The hind legs are strongest.

In the forewing, the costal margin is strongly convex and the apex of the wing is somewhat tapered. The costal area is two to three times as wide as the subcostal area. SC has 14 to 16 branches; they are simple or, occasionally, rarely branching. R is straight. RS deviates from R at the midlength of the wing as a long stem, which subsequently randomly dichotomizes to form seven or eight branches. The median vein branches far before RS. The vein MA forms four branches; MP is apparently simple. CuA is first parallel to M in its basal portion, then bent sinusoidally, and has a row of peculiar posterior branches. CuP is greatly desclerotized. The anal area is small and includes five tightly arranged veins. The archedyction is dense, mainly regular, being finer in the costal area and form a double row of cells near the tip. The cells of the archedyction are strongly elongated in the anal area. There are two large conspicuous pigmented spots near the center of the forewings. In the hindwings, the anterior margin is straight, the costal area is 1.5–2 times as broad as the subcostal area, RS has at least five terminate branches, CuA is simple, with a distinct bent near its base.

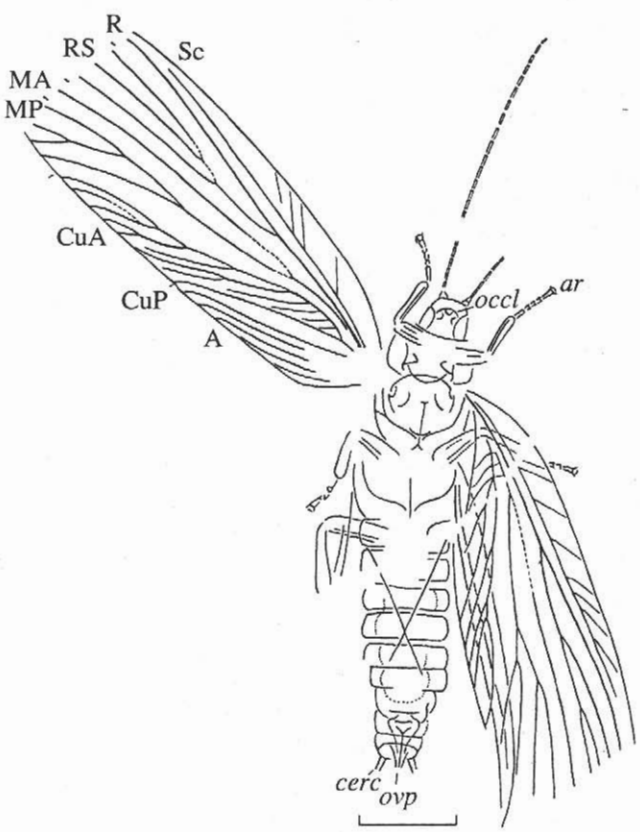

Fig. 3. *Tshekardelia media* sp. nov., holotype PGU, no. 1/38, general appearance. Abbreviations: (*occl*) ocelli and (*ovp*) ovipositor; for other abbreviations, see Fig. 1.

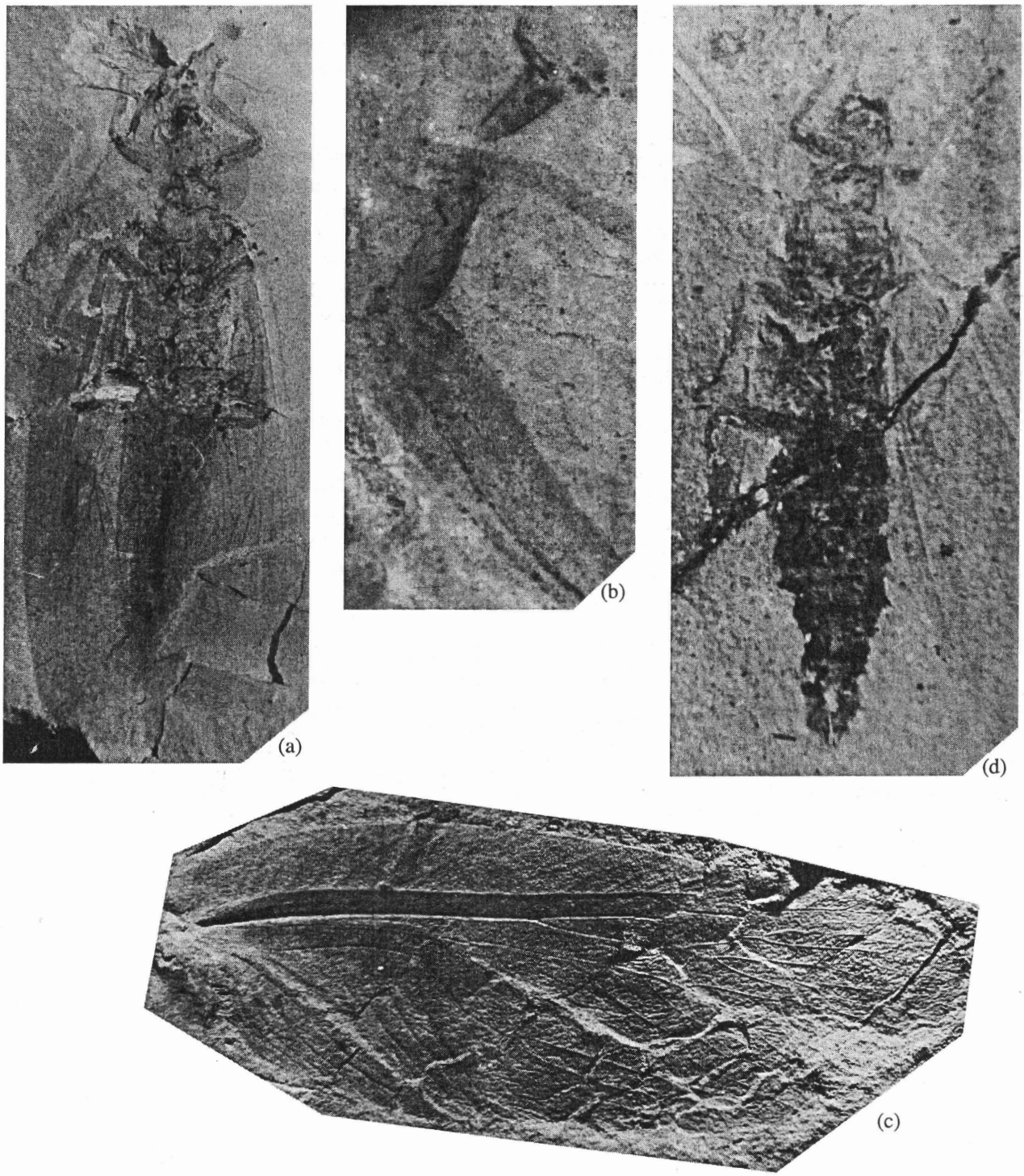

Fig. 4. Grylloblattids from the Lower Permian of the Ural Mountains: (a)–(c) *Sylvidelia latipennis* Martynov, 1940: (a) and (b) specimen PIN, no. 1700/617 (×1.9), (a) general appearance and (b) anterior tarsus; and (c) holotype PIN, no. 99/27 (×3.3); and (d) *Tshekardelia media* sp. nov., holotype PGU, no. 1/38 (×4.3), general appearance.

The abdomen, which does not even approach the apex of the folded wings, is slender, with short cerci.

Measurements, mm. Body length 48 (specimen PIN, no. 1700/617), forewing length 42 (holotype) to 46 (specimen PIN, no. 1700/617).

Remark. The narrow dark strip on the background of the abdomen of the specimen no. 1700/617, is an alimentary lump of supposedly plant origin.

Material. Holotype and specimen PIN, no. 1700/617.

Genus *Tshekardelia* Aristov, gen. nov.

Etymology. From the locality of Chekarda and the genus *Idelia*.

Type species. *T. media* sp. nov.

Diagnosis. Head prognatous, with a length just slightly greater than the width. Antennae filiform, their length comparable with that of body, two first antennomeres enlarged, other antennomeres thin. Eyes rather large, three ocelli placed near anterior margin of eyes. Pronotum rounded with broad ring of paranota. Femora and tibiae of the fore legs with longitudinal ridge of the same length. Tarsus equal to tibia, five tarsomeres, first and last tarsomeres largest, arolium small. Mesonotum rounded-triangular, with distinct tergal incisions. Lobes of scutum small and not touching, scutellar portion weakly convex. Postnotum transverse and wider than mesonotum. Middle and hind legs similar in structure to fore legs but markedly stouter (especially hind legs). In forewings, the costal area is twice as broad as the subcostal one; SC with unforked anterior branches. R nearly straight; RS deviates from R in basal half of wing, with three branches. M bifurcates before RS origin, MA simple, MP with four branches. CuA evenly S-shaped, with peculiar posterior branches in basal half. Forks of CuA closed, with seven or eight branches. Area between CuA and CuP narrow. CuP simple. Anal area small with five simple slightly curved anal veins. In hindwings, costal area not so large, RS-shaped, CuA simple. Abdomen not reaching wing apex, tapering, ovipositor base broad, angle between cerci less than 90°.

Species composition. Type species.

Comparison. This genus differs from other genera in the family in having a simple MA, complex MP, narrow area between CuA and CuP, and numerous branches of CuA in the forewing.

***Tshekardelia media* Aristov, sp. nov.**

Etymology. Latin *media* (medial).

Holotype. PGU, no. 1/38, part of complete and satisfactory preserved insect; Chekarda locality; Kungurian, Koshelevka Formation.

Description (Figs. 3, 4d). The insect is relatively large, with massive body. The ovipositor is broad and short.

Measurements, mm. Body length 25, wing length about 26.

Material. Holotype.

ACKNOWLEDGMENTS

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