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RESEARCH ARTICLE

New subtribes of Arachnocephalini (Orthoptera: Mogoplistidae) and a new genus and species of this tribe from South Africa

Новые подтрибы Arachnocephalini (Orthoptera: Mogoplistidae) и новые род и вид этой трибы из Южной Африки

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Abstract. The tribe Arachnocephalini is divided into three subtribes: [1] Pseudomogoplistina **subtrib. nov.** with one genus lacking ventrolateral lobes on the tarsi and having a massive Y-shaped sclerite in the male genitalia; [2] Bothromogoplistina **subtrib. nov.** including two genera with similar tarsi but with a different structure of the male genitalia (lacking a Y-shaped sclerite and having a long and thin virga-like sclerotised rachis inside a membranous invagination of the ventral fold); [3] Arachnocephalina Gorochov, 1984 possibly including all the other genera of this tribe (these genera are with a pair of ventrolateral lobes on the second tarsal segment and/or with the male genitalia more or less similar to those of Bothromogoplistina **subtrib. nov.**). One new genus with one new species (*Bothromogoplistes paraproctalis* **gen.** et **sp. nov.**) are described from a burrow in the arid territory of South Africa. This cricket is probably related to the genera *Cycloptiloides* Sjöstedt, 1910 and *Eucycloptilum* Chopard, 1936, but their males differ from each other in the pronotal length, the presence or absence of wings and tympana, and the shape of the paraprocts and genital plate. One species, *Cycloptiloides parvum* (Chopard, 1961), **comb. nov.**, is transferred from *Eucycloptilum* to *Cycloptiloides*.

Резюме. Триба Arachnocephalini подразделена на три подтрибы: [1] Pseudomogoplistina **subtrib. nov.** с одним родом, лишенным вентролатеральных лопастей на лапках и имеющим массивный Y-образный склерит в гениталиях самца; [2] Bothromogoplistina **subtrib. nov.**, включающая два рода с похожими лапками, но с иным строением гениталий самца, которые лишены Y-образного склерита и снабжены очень длинным и тонким склеротизованным рахисом внутри трубчатого впячивания вентральной складки; [3] Arachnocephalina Gorochov, 1984, возможно, включающая все другие роды этой трибы (эти роды с одной парой вентролатеральных лопастей на втором членике лапок и/или с гениталиями самца, более или менее похожими на таковые Bothromogoplistina **subtrib. nov.**). Один новый род с одним новым видом (*Bothromogoplistes paraproctalis* **gen.** et **sp. nov.**) описаны из норы в аридной зоне Южной Африки. Этот сверчок, вероятно, близок к родам *Cycloptiloides* Sjöstedt, 1910 и *Eucycloptilum* Chopard, 1936, но их самцы хорошо различаются длиной переднеспинки, наличием или отсутствием крыльев и тимпанумов, а также формой парапроктов и генитальной пластинки. Один вид – *Cycloptiloides parvum* (Chopard, 1961), **comb. nov.** – перенесен из *Eucycloptilum* в *Cycloptiloides*.

Key words: scale crickets, taxonomy, Orthoptera, Mogoplistidae, Mogoplistinae, Arachnocephalini, new taxa

Ключевые слова: чешуйники, систематика, Orthoptera, Mogoplistidae, Mogoplistinae, Arachnocephalini, новые таксоны

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Introduction

The tribe Arachnocephalini was described by Gorochov (1984) for the Mogoplistinae genera having a narrow or moderately wide clypeus and the male genitalia with sclerotised structures. Most of these genera have also a pair of ventrolateral lobes on the second tarsal segment (adaptation to life on leaves of plants), but some of them lack such tarsal lobes; one of the latter genera (*Cycloptiloides* Sjöstedt, 1910) is with the male genitalia more or less similar to those of most genera of this tribe, but the male genitalia in *Pseudomogoplistes* Gorochov, 1984 are very different from all the other members of Arachnocephalini. Another genus without tarsal lobes and with the male genitalia similar to those of *Cycloptioloides* is described here for a new species from South Africa; these genera are probably related to each other and must be included in the same subtribe. *Pseudomogoplistes* with a unique type of the male genitalia must be also included in a separate subtribe of Arachnocephalini; moreover, the sclerotisation of its male genitalia could arise independently from Arachnocephalini (Gorochov, 2015), and in this case, this subtribe may be considered as a separate tribe.

It is necessary to add that at present, the family Mogoplistidae is divided into three subfamilies: Malgasiinae Gorochov, 1984 including one apterous and very morphologically isolated Recent genus from Madagascar, Comores and Seychelles (Gorochov, 1984); Protomogoplistinae Gorochov, 2010 with one primitive fossil genus from Burmese Cretaceous amber (Gorochov, 2010); Mogoplistinae Costa, 1855 with two widely distributed Recent tribes (Mogoplistini with a few similar genera and Arachnocephalini with more numerous and diverse genera; they are possible ancestor and descendant, respectively). Here the Arachnocephalini is divided into three subtribes which are described in a key to subtribes of this tribe.

The holotype of a new species described in this paper is deposited at the Zoological Institute, Russian Academy of Sciences, St Petersburg. It is dry and pinned. The photographs of this specimen and its morphological structures were made with a Leica M216 stereomicroscope equipped with a digital camera.

Systematics

A key to the subtribes of the tribe Arachnocephalini

1. Clypeus narrow or moderately narrow, 1–2 times as wide as scape. Legs usually with distinct ventrolateral lobes on second segment of all tarsi, but in one genus (*Discophallus* Gorochov, 2009), these lobes evidently lost. In latter case as well as in most of genera, male genitalia with thin and long sclerotised (virga-like) rachis located inside of long but more or less widened and partly sclerotised invagination of ventral surface of dorsal fold (this invagination forming almost lamellar and usually semicircularly curved structure, or it partly twisted into small or large spiral with similarly twisted rachis); however these invagination and rachis in one genus (*Arachnocephalus* Costa, 1855) probably lost, but in this case, second segment of all tarsi with ventrolateral lobes. In all tropical and subtropical regions . . . . . **subtribe Arachnocephalina s. str.**
[Composition: *Arachnocephalus* (type genus); *Ornebius* Guérin-Méneville, 1844; *Ectatoderus* Guérin-Méneville, 1847; *Cycloptilum* Scudder, 1869; *Discophallus* (*Arachnocephalus steini* Saussure, 1877 and *Ectatoderus samui* Ingrisch, 2006, having ventrolateral lobes on second tarsal segment and disc-like spiral structure in male genitalia, probably also from this genus; Gorochov 2009); possibly *Oligacanthopus* Rehn et Hebard, 1912, *Apterornebius* Ingrisch, 2006 as well as fossil *Archornebius* Gorochov, 2010 (Eocene) and *Pseudarachnocephalus* Gorochov, 2010 (Miocene).]
- Clypeus moderately wide, 2.3–3.2 times as wide as scape. Legs with narrow tarsi, i.e. without distinct ventrolateral lobes on second segment. Male genitalia with thin and long sclerotised (virga-like) rachis located inside of membranous invagination of ventral surface of dorsal fold (this rachis forming one loop or a few irregular loops), or these genitalia with one massive Y-shaped sclerite only 2
2. Male genitalia with thin and long sclerotised rachis located inside of membranous invagination of ventral surface of dorsal fold. In tropical regions: Africa, Asia, America, Ryukyu and Canary Islands . . . . . **subtribe Bothromogoplistina subtrib. nov.**
[Composition: *Bothromogoplistes* **gen. nov.** (type genus, gender masculine); *Cycloptiloides*; possibly *Eucycloptilum* Chopard, 1935.]
- Male genitalia with one massive Y-shaped sclerite only. On sea coasts: Morocco, southern half of Europe, some nearest islands . . . . . **subtribe Pseudomogoplistina subtrib. nov.**

[Composition: only *Pseudomogoplistes* Gorochov, 1984 (type genus, gender masculine).]

Remark. The other genera of Mogoplistinae belong or possibly belong to the tribe Mogoplistini (*Mogoplistes* Audinet-Serville, 1838; *Gotwendia* Bolivar, 1927; *Paramogoplistes* Gorochov, 1984; possibly *Hoplosphyrum* Rehn et Hebard, 1912, *Micrornebius* Chopard, 1969, *Pachyornebius* Chopard, 1969, *Pongah* Otte et Alexander, 1983, *Terraplistes* Ingrisch, 2006 as well as fossil *Eomogoplistes* Gorochov, 2012 and *Pteromogoplistes* Gorochov, 2012 from Eocene), or they are insufficiently studied, i.e., with an unknown or unclear structure of the male genitalia and some other important characters: *Derectaotus* Chopard, 1936, a possible synonym of *Ectatoderus* or *Micrornebius* (Ingrisch, 2006: p. 138); *Tubarama* Yamasaki, 1985; *Collendina*, *Talia*, *Marinna*, *Biama*, *Kalyra* and *Kiah* described by Otte and Alexander (1983) as well as *Musgravia* Otte, 1994 and *Yarabina* Otte, 1994, possible relatives of *Ornebius* or its synonyms.

Genus *Bothromogoplistes* gen. nov.

Type species *Bothromogoplistes paraproctalis* **sp. nov.**

Diagnosis. Body very small, without tympana and apterous in male (Figs 1, 2). Head somewhat dorsoventrally depressed, with rather small and almost triangular eyes lacking facets only in small upper part, without ocelli, with large and very convex clypeus having space between antennal cavities approximately 3 times as wide as scape, and with moderately long and thin maxillary palpi (their subapical segment almost as long as clypeal width, and apical and third segments more or less equal in length but slightly shorter than subapical one; Figs 1, 3). Pronotum semitubular, somewhat longer than wide, with anterior edge slightly convex, with posterior edge barely concave, and with lateral lobes rather high as well as having very obtusely angular ventral edges and almost vertical anterior and posterior edges (Figs 1, 2). Legs moderately long and thin, with hind leg having femur distinctly longer than tibia (Fig. 4), and with long and narrow tarsi lacking any widened parts or lobules (Figs 1, 4). Abdominal apex slightly widened in dorsal view and with tergites lacking large lobes or projections; anal plate rather large, directed mainly downwards, and with a pair of longitudinal stripes consisting of short but strong setae (Figs 8, 9); paraprocts widely separated from each other, very large and in shape of characteristic hooks having large distal lamellar lobes directed medially (Figs 8–10); genital plate rather short but with distal part having narrow median lobule (Fig. 9–11); genitalia with membranous dorsal fold having very long and thin sclerotised rachis inside membranous invagination near apex of this fold (this rachis forming a few irregular loops; Figs 6, 7).

Included species. Only type species.

Comparison. The new genus is more or less similar to the other genera of this subtribe in its general appearance. However, it differs from the widely distributed genus *Cycloptiloides* (with several species in America, Africa, Asia and nearest islands, some of which are probably synanthropic) in an apterous male body, the male pronotum lacking a hind lobe covering the tegmina in *Cycloptoloides*, the absence of tympana, the male paraprocts with specialised hook-like processes widely separated from each other and having the distal parts lamellar and directed medially, the male genital plate with a narrower posteromedian lobule, and the male genitalia without sclerites on the dorsal fold but with a sclerotised rachis forming more than one loop. From the African genus *Eucycloptilum* lacking any hind pronotal lobe, wings and tympana as well as with unknown male genitalia, the new genus is distinguished by a smaller eye portion without facets and the same characters of the male abdominal apex (i.e., specialised paraprocts and genital plate). It should be added that *E. parvum* Chopard, 1961 described in *Eucycloptilum* from a single female (Angola) but having a small inner tympanum as well as a simple (normal) abdominal apex (Chopard, 1961: fig. 63) must be evidently transferred to the genus *Cycloptiloides* (*C. parvus* **comb. nov.**), because all the true females of *Eucycloptilum* lack tympana and have the seventh abdominal tergite with a pair of posterolateral lobules partly covering the base of the genital plate from below (Chopard, 1935: figs 6, 8).

Etymology. This new generic name originates from the old generic name *Mogoplistes* with the Latinised Greek prefix “bothro-“ (connected with

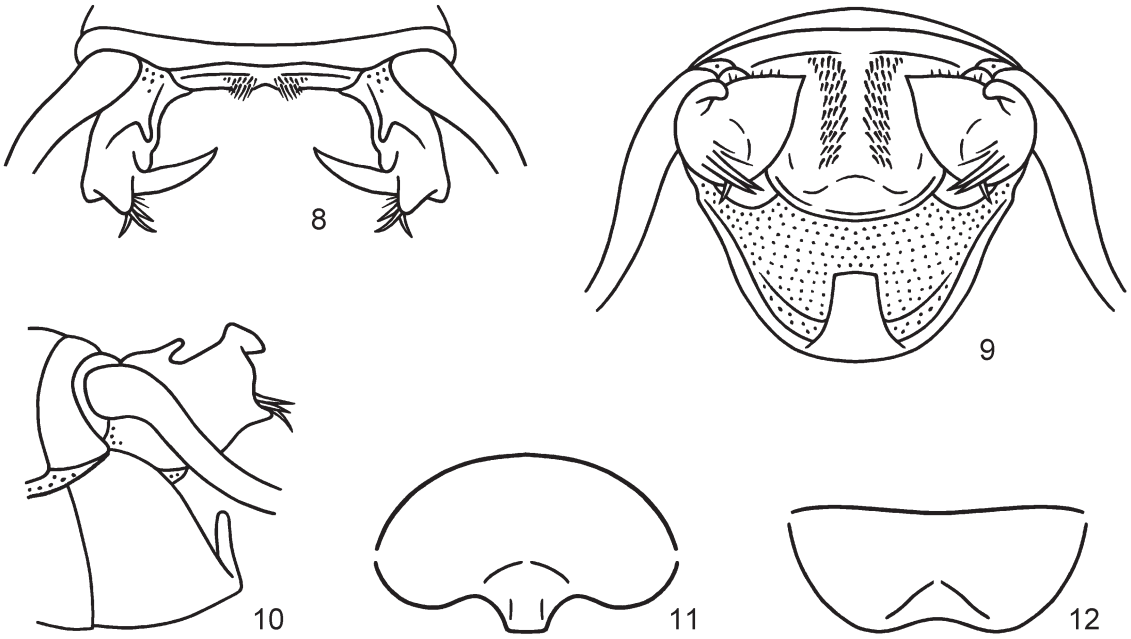
Figs 1–7. *Bothromogoplistes paraproctalis* **gen.** et **sp. nov.**, male: **1**, **2**, body from side (1) and from above (2); **3**, head in front; **4**, hind legs, outer view; **5**, dorsal denticles and setae on hind tibia, outer view; **6**, **7**, genitalia from above (6) and from side (7).

burrow) due to the discovery of the type species of this genus in a burrow.

Bothromogoplistes paraproctalis **sp. nov.**
(Figs 1–12)

Holotype. Male, **South Africa**, *Northern Cape Prov.*, ~50 km SW of Springbok Town, Namaqua National Park, 100–200 m, semi-desert with salt marsh, beer trap in large burrow of possibly porcupine (*Hystrix*), 11–14.I.2008, A. Gorochov, A. Sotshivko (ZIN).

Description. Male (holotype). Body uniformly yellowish with sparse and small whitish scales (many scales missing after beer trap), but eyes greyish brown and having light brown small upper (lacking facets) portions, and antennal flagellum as well as small scales on dorsolateral parts of two posterior tergites and on dorsal half of cerci slightly darkened (greyish-brownish) (Figs 1, 2).



Figs 8–12. *Bothromogoplistes paraproctalis* **gen.** et **sp. nov.**, male (schematically): **8**, abdominal apex without genital plate from above; **9**, **10**, abdominal apex with genital plate from behind (9) and from side (10); **11**, **12**, genital plate from below/behind (11) and from below (12).

Shape of head and pronotum as in Figs 1–3; fore and middle femora clearly longer than pronotum (Fig. 1); hind femur almost twice longer than previous femora; fore and middle tibiae with one short and thin ventroapical spur; hind tibia with six rather long apical spurs (middle inner spur reaching distal half of hind basitarsus, dorsal inner and middle outer spurs almost equal in length but distinctly shorter than previous one, dorsal outer and ventral inner spurs slightly shorter than latter spurs, and ventral outer spur shortest but somewhat longer than spurs of fore and middle tibiae), with two rows of sparse and very small dorsal denticles as well as with seta-like spinules between these denticles (Figs 4, 5); claws moderately long and thin (Fig. 4). Anal plate almost square but with roundly convex posterior edge, and with a pair of longitudinal stripes of setae located near each other and somewhat not reaching this edge (Figs 8, 9); each paraproctal hook with distal lamellar part leaf-like as well as having one small dorsolateral lobe and a few thin ventrolateral spinules (these spinules directed more or less backwards), and with one very small dorsal lobule between previous lobe and base of this hook (Figs 8–10); posteromedian lobule of genital plate very strongly curved upwards and with truncate apex (Figs 9–12); genitalia as in Figs 6, 7.

Female unknown.

Length in mm. Body 5; pronotum 1.7; fore femora 2.1; hind femora 4.3; hind tibiae 3.5; hind tarsi 2.6.

Remark. One species of *Cycloptiloides* from Guinea (*C. lamottei* Chopard, 1955) is with "genitalia" having a pair of spinose structures slightly similar to the lamellar distal parts of the male paraproctal hooks in *B. paraproctalis* **sp. nov.** (Chopard, 1955: fig. 40); if these structures are paraproctal hooks (but not genitalia), *C. lamottei* may be a primitive relative of this species that preserved the tympana and male tegmina.

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