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**ON THE TAXONOMIC POSITIONS OF THE GENERA *PARALUSANDA* SYNAVE,
PARAMANGOLA SYNAVE, *CHONDROPTERA* BERGROTH, AND *NEOLOLLIUS* MUIR
(HEMIPTERA: AUCHENORRHYNCHA: FULGOROIDEA: NOGODINIDAE)**

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ABSTRACT

Previously treated as members of the family Issidae and currently without clear status, four genera are transferred to the family Nogodinidae: genus *Paralusanda* Synave, 1956 is transferred to the tribe Mithymnini Fennah, genera *Chondroptera* Bergroth, 1910 and *Neolollius* Muir, 1921 – to the tribe Tongini Kirkaldy, and genus *Paramangola* Synave, 1956 – to the tribe Epacriini Fennah. Male and female genitalia of *Paralusanda sinuatipennis* Synave, 1956 and fore and hind wings of *Paramangola schmitti* Synave, 1956 are illustrated for the first time. Notes on ecology of *P. sinuatipennis* are made.

Key words: ecology, morphology, taxonomy, Nogodininae, Epacriini, Mithymnini, Tongini, Acanaloniidae

**О ТАКСОНОМИЧЕСКОМ ПОЛОЖЕНИИ РОДОВ *PARALUSANDA* SYNAVE,
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РЕЗЮМЕ

Четыре рода, первоначально установленные в семействе Issidae и не имеющие в данный момент определенного таксономического положения, перенесены в семейство Nogodinidae: род *Paralusanda* Synave, 1956 перенесен в трибу Mithymnini Fennah, роды *Chondroptera* Bergroth, 1910 и *Neolollius* Muir, 1921 – в трибу Tongini Kirkaldy, а род *Paramangola* Synave, 1956 – в трибу Epacriini Fennah. Впервые проиллюстрированы гениталии самца и самки *Paralusanda sinuatipennis* Synave, 1956, а также переднее и заднее крыло *Paramangola schmitti* Synave, 1956. Приведены данные по экологии *P. sinuatipennis*.

Ключевые слова: экология, морфология, систематика, Nogodininae, Epacriini, Mithymnini, Tongini, Acanaloniidae

INTRODUCTION

After publication of recent classification of the family Issidae Spinola, 1839 (Gnezdilov 2013) the genera *Paralusanda* Synave, 1956, *Paramangola* Synave, 1956, *Neolollius* Muir, 1921, and *Chondroptera*

Bergroth, 1910 originally described or listed in the Issidae (Bergroth 1910; Muir 1921; Synave 1956; Metcalf 1958) became taxa of uncertain position (Bourgoin 2016) being not clearly or formally assigned to any other fulgoroid families. Review of the original descriptions and examination the sampling

available for these taxa allow placing them in different tribes of the Nogodinidae, Nogodininae *sensu* Gnezdilov (2009, 2012a).

Thanks to Dr. Michael Stiller, I received for study long series of *Paralusanda sinuatipennis* Synave, 1956, including males and females giving opportunity to illustrate male and female genitalia of this peculiar species as well as providing a list of the plants on which this species occurs.

MATERIAL AND METHODS

The species discussed below including the type specimens are deposited in the following collections: ARC – Agricultural Research Council, Pretoria, Republic of South Africa; NHMW – Naturhistorisches Museum Wien, Austria; MNB – Museum für Naturkunde, Berlin, Germany; ZIN – Zoological Institute of the Russian Academy of Sciences, Saint Petersburg, Russia.

Morphological terminology follows Gnezdilov (2003) and Gnezdilov et al. (2014). The drawings of *Paralusanda sinuatipennis* Synave were made using Leica MZ95 light microscope and the photo of the species – using Leica MZ95 with video camera Leica DFC 290, image is produced with the software Helicon Focus and Adobe Photoshop. The drawings of wings and supplementary description of *Paramangola schmitti* Synave were made using photos of the holotype received from the Naturhistorisches Museum Wien.

SYSTEMATICS

Family Nogodinidae Melichar, 1898

Subfamily Nogodininae Melichar, 1898

Tribe Mithymnini Fennah, 1967

Genus *Paralusanda* Synave, 1956

Paralusanda Synave, 1956: 21.

Type species: *Paralusanda sinuatipennis* Synave, 1956.

Notes. The species and genus were described after a single female from Kamieskroon in Northern Cape of Republic of South Africa (Synave 1956). This genus is closely related to the genus *Bowesdorpia* Synave, 1956 which is already placed in the Mithymnini (Gnezdilov 2007) according to narrowed apices of fore wings (Fig. 1).

***Paralusanda sinuatipennis* Synave, 1956**
(Figs 1–9)

Paralusanda sinuatipennis Synave, 1956: 22.

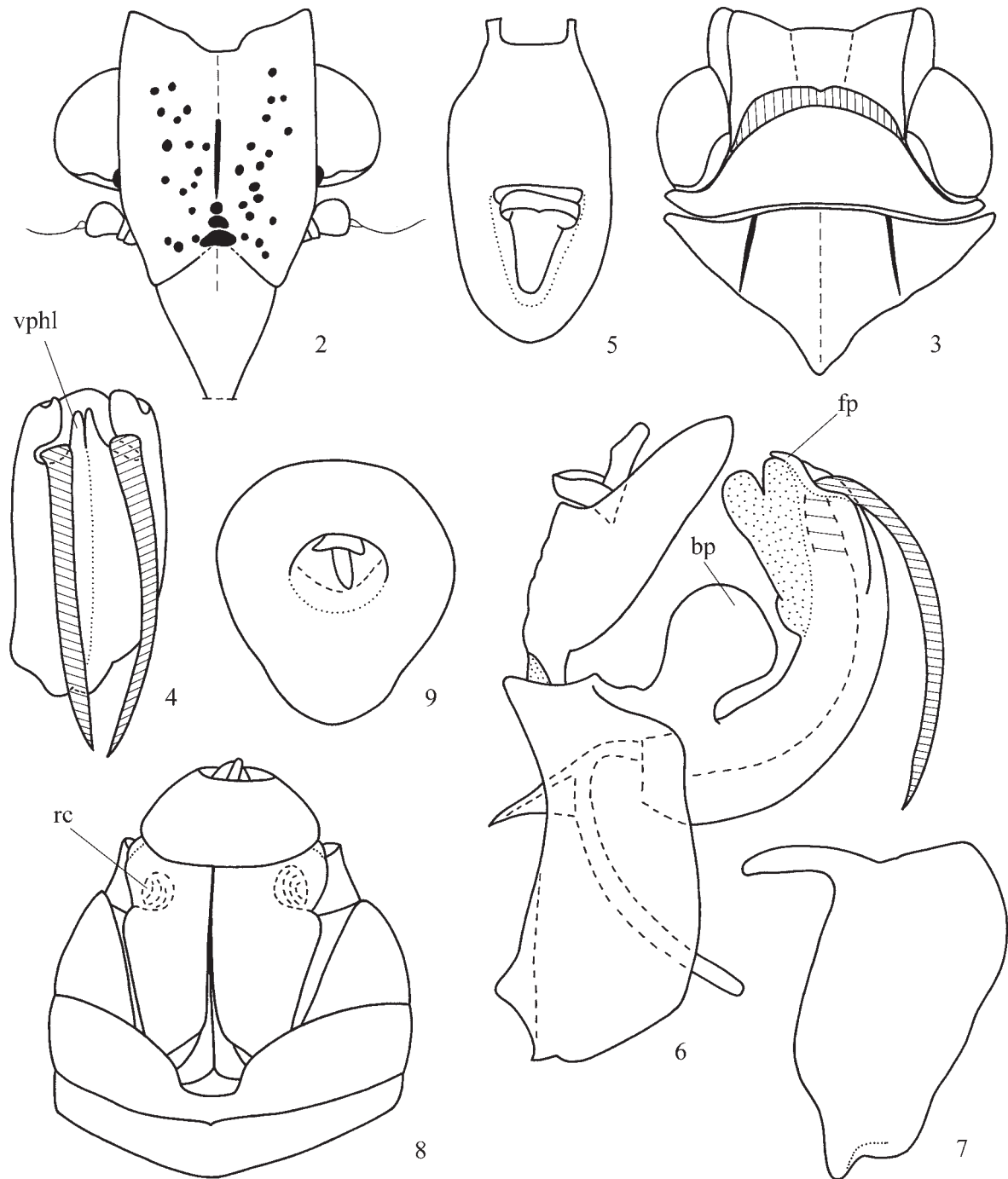
Material examined. REPUBLIC OF SOUTH AFRICA, Northern Cape Province: 1 male, 3 females, Anenous Pass, N Steinkopf, 29°13'S 17°37'E, 1 October 2002, 697 m, M. Stiller leg. (ARC and ZIN); 2 males, 4 females, Biesiesfontein Farm, S Springbok, 29°45'S 17°56'E, 29 September –3 October 2002, 710 m, M. Stiller leg. (ARC and ZIN); 1 male, Quaggafontein b.Soebatsfontein, 30°11'17''S 17°33'02''E, 30 September 2002, J. Deckert leg. (MNB); 1 female, Western Cape Province, Wiedouw Farm foot, Gilberg Pass, SE Vanrhynsdorp, 31°44'S 18°46'E, 3–10 October 2002, 120 m, M. Stiller leg. (ARC).

Supplementary description (Figs 2, 3). Metope wide, narrowing to clypeus, with only incomplete median carina and pustules (traces of larval sensory pits); upper margin trapezoidally concave medially (Fig. 2). Coryphe transverse, concave medially, without carinae (Fig. 3). Ocelli present. Pronotum without carinae, with rather wide paradiscal fields. Mesonotum with lateral carinae.

Male genitalia (Figs 4–7). Pygofer wide, with nearly straight hind margin (in lateral view) (Fig. 6). Anal tube elongate, twice as long as wide at midline, nearly oval (in dorsal view) (Fig. 5). Lower margins of anal tube straight (in lateral view). Paraproct wide and long, 0.3 times as long as anal tube. Phallobase enlarged apically (in lateral view), with pair of large



Fig. 1. *Paralusanda sinuatipennis* Synave, female, lateral view. Total length – 5.0–5.1 mm.



Figs 2–9. *Paralusanda sinuatipennis* Synave (Northern Cape, N Steinkopf). 2, 3 – head; 4–7 – male genitalia; 8, 9 – female genitalia. 2 – head, frontal view, 3 – head, pro-, and mesonotum, dorsal view, 4 – penis, ventral view, 5 – male anal tube, dorsal view, 6 – male genital block, lateral view, 7 – style, lateral view, 8 – female genital block, ventral view, 9 – female anal tube, dorsal view. Abbreviations: bp – basal process; fp – finger-shaped process; rc – rounded concavity, vphl – ventral phallobase lobe.

and wide processes (bp) arised basally (Fig. 6). Phallobase weakly sclerotized dorsally. Apices of dorso-lateral phallobase lobes with finger-shaped sclerotized processes (fp). Ventral phallobase lobe short, bilobed apically, with a median groove (Fig. 4, vphl). Aedeagus with pair of long ventral hooks arised on its apex, but not reaching the phallobase socle. Ventral aedeagal hooks narrow, with pointed apices. Connective with small coup. Style with long and narrow capitulum, without lateral tooth; caudo-dorsal angle obtuse (Fig. 7).

Female genitalia (Figs 8, 9). Hind margin of sternum VII with deep rectangular median concavity (Fig. 8). Anal tube wide, narrowing apically (in dorsal view) (Fig. 9). Paraproct short. Gonoplags elongated vertically, with pair of rounded concavities (rc) (Fig. 8).

Total length (from the apex of coryphe to the apices of fore wings). Males – 4.0–4.1 mm, females – 5.0–5.1 mm.

Ecology. In Anenous Pass (see the material examined) the species is swept off *Nylandtia spinosa* (Polygalaceae). In Biesiesfontein Farm the species is swept off the plants of 3 families – Aizoaceae (*Galenia africana* var. *africana*), Asteraceae (*Pretonia divaricata*), and Zygophyllaceae (*Zygophyllum retrofractum*, at night near to light). In Gilberg Pass the species swept off *Salvia lanceolata* (Lamiaceae).

Note. According to long arised apically ventral aedeagal hooks *Paralusanda sinuatipennis* is related to the members of the genera *Telmosias* Fennah, 1967 and *Stilpnochlaena* Fennah, 1967 (Fennah 1967a), but the presence of pair of large lobe-shaped rounded processes on the phallobase socle (bp) brings it close to the genus *Fovealvus* Gnezdilov et Wilson, 2007 (Gnezdilov and Wilson 2007).

Peculiar shape of the gonoplags with pair of rounded concavities (rc) (Fig. 8) or lateral invaginations as it was shown for *Fovealvus nama* Gnezdilov et Wilson, 2007 (Gnezdilov and Wilson 2007, fig. 6) is apparently a character of the tribe Mithymnini, except the genus *Bilbilis* Stål, 1861 provisionally placed in this tribe (Gnezdilov 2007) and the taxonomic position of which is still in need of revision.

Tribe Tongini Kirkaldy, 1907

Genus *Neolollius* Muir, 1921

Neolollius Muir, 1921: 584.

Type species: *Neolollius viridis* Muir, 1921.

Notes. The genus was erected originally (Muir 1921) for *Neolollius viridis* Muir, 1921, but later R.G. Fennah (1967b) added one more species, *Tonga samoensis* Melichar, 1906. According to F. Muir's (Muir 1921, figs 8, 8a) and R.G. Fennah's illustrations (Fennah 1967b, figs 172–178) both species and accordingly the genus may be placed in the tribe Tongini.

Genus *Chondroptera* Bergroth, 1910

Chondroptera Bergroth, 1910: 238.

Type species: *Chondroptera musiva* Bergroth, 1910.

Notes. In his original description E. Bergroth (1910) compared *Chondroptera* with the genus *Tonga* Kirkaldy, 1900 suggesting its placement in the tribe Tongini. Unfortunately the type specimen of *Chondroptera musiva* is not located and thus not available for study.

This genus was already transferred out from Issidae, Tonginae (Metcalfe 1958: 538) to Acanaloniidae, Tonginae by Emeljanov (1999: 61). Gnezdilov (2007: 296) transferred all Fennah's genera of Tonginae to Nogodinidae but without *Chondroptera*, which was not part of Fennah's list. Accordingly *Chondroptera* was left with an *incertae sedis* position in the Acanaloniidae (see Bourgoin 2016). However Gnezdilov (2012c, d) revising the composition of the family Acanaloniidae suggested to treat Acanaloniidae *sensu stricto* as an endemic group to New World comprising 5 genera: *Acanalonia* Spinola, 1839, *Batusa* Melichar, 1901, *Bulldolonia* Gnezdilov, 2012, *Chlorochara* Stål, 1869, and *Philatis* Stål, 1862. The genus *Notosimus* Fennah, 1965 have to be added to this group as well according to Fennah's original suggestion (Fennah 1965). Thus totally the family Acanaloniidae *sensu stricto* comprises just 6 New World genera.

Tribe Epacriini Fennah, 1978

Genus *Paramangola* Synave, 1956

Paramangola Synave, 1956: 14.

Type species: *Paramangola schmitti* Synave, 1956.

Notes. H. Synave (1956) in his original description mentioned that *Paramangola* is close to the genus *Mangola* Melichar, 1906 according to 4 lateral spines of hind tibia and by the morphology of head including the presence of median carina on metope.

The last genus was transferred already to the tribe Epacriini from the Issidae (Gnezdilov 2012b). Because Synave (1956) illustrated only male genitalia, the illustrations of fore and hind wings of the species which give characters for correct taxonomic placement of the genus are provided here.

***Paramangola schmitti* Synave, 1956**

(Figs 10–13)

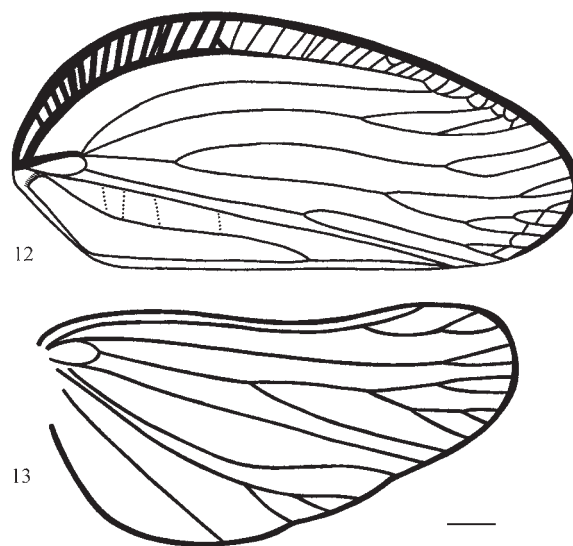
Paramangola schmitti Synave, 1956: 15.

Type material examined. Holotype (specimen without head and abdomen), “D. O. Africa / (Morogoro) / Nachl. Schmitt”, “Type”, “H. Synave det. 1956 / *Paramangola* g. n. / *Schmitti* sp. n.” (NHMW).

Supplementary description (Figs 11–13). Fore wing wide, narrowing apically, with many transverse veins in subcostal area (Figs 11, 12). Basal cell large, elongately oval. R and M start from basal cell in one point. R 4 (first furcation at basal cell; posterior branch furcating apically) M 8 (first furcation in proximal half of the wing before its middle; other furcations in distal half of the wing apically) CuA 3 (first furcation in



Figs 10–11. *Paramangola schmitti* Synave, holotype. 10 – labels, 11 – fore wing. Scale bar – 2 mm.



Figs 12–13. *Paramangola schmitti* Synave, holotype. 12 – fore wing, 13 – hind wing. Scale bar – 1 mm.

distal half of the wing, just after its middle; anterior branch furcates apically) CuP 1 Pcu 1 A₁ 1. Pcu fused with A₁ after clavus middle. Clavus open (Pcu + A₁ running into the apex of clavus).

Hind wing trilobed, with 2 weak marginal clefts – on the apices of Pcu and third branch of first anal vein (A_{1,3}), coupling lobe indistinct (Fig. 13). Basal cell large, elongately oval. R 3 (furcating apically) M 2 (furcating apically) CuA 5 (first furcation near to wing middle; other furcations of anterior branch – apically) CuP 1 Pcu 1 A₁ 3 (furcating apically) A₂ 1. Distal part of Pcu turned to CuP.

Hind tibia with 4 lateral spines and 9 apical spines. First metatarsomere with 2 latero-apical spines and entire row of intermediate spines. Second metatarsomere with only 2 latero-apical spines.

Note. Still now the species is known only after the holotype described from Morogoro in Tanzania (Fig. 10) (Synave 1956).

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