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**The Afrotropical species of the genus *Amphibulus*
(Hymenoptera, Ichneumonidae, Phygadeuontinae)**

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A b s t r a c t : A new species of the genus *Amphibulus* KRIECHBAUMER, 1893 from Tanzania is described, the female of *Amphibulus africanus* LUHMAN is redescribed and the male of this species is described for the first time. The species are figured and a key to the Afrotropical species is provided.

K e y w o r d s : *Amphibulus*, new species, key, Afrotropical region

Introduction

TOWNES 1(970) and LUHMAN (1991) provided a description of the genus *Amphibulus*. LUHMAN (1991) revised the world species of *Amphibulus*. He treated 25 species, of which only three were already known and so he described 22 species as new. Later, five more species were described from China (LI et al. 2023, SHENG & SUN 1999, ZONG et al. 2013). This genus is widespread with species known from the Palaearctic, Oriental, Nearctic, Neotropical and Afrotropical regions. Most of the described species occur in America and only one species (*Amphibulus africanus* LUHMAN) was known from southern Africa. The African species was described from one female specimen from South Africa; hitherto no more material has been published. Thus, the male is still unknown. In the Museum für Naturkunde in Berlin (ZMHB) I found four females and two males of this species, so the male is described here for the first time and a redescription of the female is made. In addition, in Biodiversitätszentrum Linz (OLML) there are three males from Tanzania representing a different species, which is described in this paper as new. A key for the two species is provided.

Material and Methods

Terminology used in the descriptions follows those of BROAD et al. (2018). For this paper, the Afrotropical material of *Amphibulus* found in ZMHB and OLML was used. No specimens of Afrotropical *Amphibulus* have been found in other museums consulted so far.

Taxonomy

***Amphibulus africanus* LUHMAN, 1991**

D e s c r i p t i o n (♀) (Fig. 1): Antenna stout, beyond its middle widened and flat-

tened below, distinctly narrowed distally, with 27-28 segments, third segment (without annellus) 1.5-1.6 times as long as wide and 0.9-1.0 times as long as fourth segment.

Head, mesosoma, first segment of metasoma laterally and legs with rather long setae.

Face short and wide, with a smooth background, punctures moderate or coarse (Fig. 2); lateral of central convexity with some rugosity; central convexity distinctly convex. Clypeus wide, 0.3 times as high as wide, in profile weakly convex, above ventral margin with a transverse furrow, median part of ventral margin somewhat upturned, without teeth, background lustrous, with moderate and somewhat scattered punctation except ventrally. Mandible with upper tooth longer than lower tooth. Malar space with a narrow furrow, 0.5-0.6 times as long as basal width of mandible. Temple lustrous with moderate and scattered punctation. Frons lustrous, with dense and coarse or moderately coarse punctation.

Shortest distance between eye and hind ocellus (OOL) 0.9-1.0 times as long as the distance between hind ocelli (POL). Head in dorsal view behind the eyes weakly narrowed, straight and distally convex (Fig. 3).

Upper part of pronotum laterally with coarse and moderately coarse punctation. Mesoscutum (Fig. 4) on a smooth background with coarse and fine scattered punctures, but in its centre punctures dense; notaulus only indicated. Posterior margin of mesoscutum with a transverse break. Scuto-scutellar groove without median longitudinal carina. Scutellum weakly convex, laterally without carina; scutellum on a smooth background with a few coarse punctures and some very fine punctures. Mesopleuron except speculum on a smooth background with coarse punctation, partly with longitudinal rugae; mesopleuron dorsally partly with fine punctation; speculum partly smooth, but dorsally with fine punctation; subtegular ridge sharp; sternalus distinct until about midlength of mesopleuron. Epinomial carina somewhat elevated ventrally, dorsally reaching lateral part of pronotum at about its midheight; transverse carina of the mesosternum somewhat elevated and not bilobed medially. Mesosternum medially with a moderately impressed longitudinal furrow with transverse ridges. Metapleuron with coarse punctures and partly with some rugae.

Propodeum of moderate length and with all carinae distinct, posterior transverse carina more robust than the other carinae, without apophysis; area superomedia 1.0 as long as wide, with costula anterior of its middle or about in its middle; dorsal part of propodeum lustrous and with fine and moderate punctures. Spiracle oval.

Hind femur 3.5-3.7 times as long as wide, with some long setae (mainly on fore and ventral sides), which are distinctly longer than the other rather long setae. Fore and mid tibiae with spines dorsally and anteriorly and some long setae on posterior side, spines about as long as short setae; hind tibia with some long setae dorsally, which are more than twice as long as the other setae, without spines.

Fore wing with sides of areolet strongly convergent upwards; 2m-cu joining areolet somewhat behind its middle; ramulus absent; 1cu-a interstitial or weakly postfurcal. Hind wing with nervellus distinctly inclivous; hind abscissa of CU distinct.

First segment of metasoma without latero-median carina. Postpetiole with scattered fine or moderate punctures on a smooth background, present mainly laterally and anteriorly. Second and third tergites with very fine and scattered punctation on a smooth background (Fig. 5). Ovipositor sheath ~0.6 times as long as hind tibia. Ovipositor with a very weak nodus, its tip 6.1-6.5 times as long as wide and with very fine and hardly recognizable teeth ventrally (Fig. 6).



Figs 1-6: *Amphibulus africanus* LUHMAN, ♀. (1) Habitus laterally; (2) head in facial view; (3) head dorsally; (4) mesoscutum; (5) second metasomal tergite; (6) ovipositor tip in lateral view.

Coloration: black, mesosoma mainly orange. White are antennal ring except ventrally, narrow hind margins of metasomal tergites 5 to 8, widest on seventh tergite. Sometimes clypeus ventrally and mandible medially orangish. Palpi brownish. Sometimes coxae partly, fore and mid femora partly, fore and mid tibiae partly orangish or orangish-brownish. Mesosoma partly ventrally and tegula black. Pterostigma blackish.

Body length: 5.8-6.9 mm.

♂ (Fig. 7): Antenna with 28 segments, segments 12-15 with linear tyloids widened beyond the middle or medially; third segment (without annellus) 2.0 times as long as wide and 1.0 times as long as fourth segment.

Head, mesosoma, first segment of metasoma laterally and legs with rather long setae, but longest setae on mesosoma shorter than longest setae in the female. Punctuation on average somewhat finer than in the female.



Figs 7-9: *Amphibulus africanus* LUHMAN, ♂. (7) Habitus laterally; (8) head facial view; (9) mesoscutum.



Face short and wide, with a smooth background, punctures moderate or coarse (Fig.8); lateral of central convexity in one specimen with some rugosity; central convexity weak.

Clypeus wide, 0.4 times as high as wide, in profile weakly convex, above ventral margin with a transverse furrow, median part of ventral margin upturned, without teeth, background lustrous, with moderate and somewhat scattered punctation except ventrally. Mandible with upper tooth longer than lower tooth. Malar space with a narrow furrow, 0.4-0.5 times as long as basal width of mandible. Temple lustrous with fine and moderate and scattered punctation. Frons lustrous, with dense and moderately coarse punctation. Shortest distance between eye and hind ocellus (OOL) 0.8 times as long as the distance between hind ocelli (POL). Head in dorsal view behind the eyes weakly narrowed, straight and distally convex.

Upper part of pronotum laterally with coarse and moderately coarse punctation. Mesoscutum (Fig. 9) on a smooth background with coarse or moderately coarse and fine punctures, punctation scattered but in its centre densely punctured; notaulus distinct, but shallow. Posterior margin of mesoscutum with a transverse break. Scuto-scutellar groove without median longitudinal carina. Scutellum weakly convex, laterally without carina; scutellum on a smooth background with few moderate or fine punctures and some very fine punctures. Mesopleuron except speculum on a smooth background with coarse punctation; mesopleuron dorsally partly with fine punctation, speculum mainly smooth, but dorsally with fine punctation; subtegular ridge sharp; sternaulus distinct until about midlength of mesopleuron. Epicnemial carina not or hardly elevated ventrally, dorsally

reaching lateral part of pronotum at about its midheight; transverse carina of the mesosternum weakly elevated and not bilobed medially. Mesosternum medially with a moderately impressed longitudinal furrow with transverse ridges. Metapleuron with moderate punctures.

Propodeum of moderate length and with all carinae distinct, but area basalis and area superomedia confluent; posterior transverse carina somewhat more robust than the other carinae, without apophysis; area superomedia 1.0-1.4 as long as wide, with costula anterior of its middle; dorsal part of propodeum lustrous and with fine punctures. Spiracle oval.

Femora mainly ventrally with some long setae; hind femur 4.2 times as long as wide, with a few long setae ventrally, which are distinctly longer than the other setae. Tibiae with rather indistinct spines dorsally and anteriorly and without long setae or with few long setae on fore and mid tibiae, spines about as long as normal setae.

Wing venation as in female.

First segment of metasoma without latero-median carina. Postpetiole on a smooth background with scattered moderate and with some fine punctures, present mainly laterally and anteriorly. Second and third tergites with very fine or fine and scattered punctation on a smooth background, but punctation somewhat denser than in female.

Coloration: black, thorax mainly orange. White are scape partly (varying from only dorsal spot to mainly), transverse patch on face (Fig. 8), mandible basally, narrow hind margin of metasomal tergite 6 and wide hind margin on tergite 7. Mandible close to teeth orangish. Palpi brownish. Fore femur partly, fore and mid tibiae partly orangish or orangish-brownish. Mesosoma ventrally mainly and tegula black. in one specimen propodeum dorsally partly dark orangish. Pterostigma blackish.

Body length: 7.2-8.3 mm.

Material examined: South Africa: Western Cape, Clanwilliam, Karukareb, 32°14'S, 19°00'E, 4-20.10.2008, leg. F. Koch (1♀, 1♂; ZMHB), 18.9-4.10.2000 (3♀♀, 1♂; ZMHB, OLML).

Amphibulus arushaensis nov.sp.

Type material: Holotype (♂): "Tanzania, prov. Arusha[,] 45 km E of Arusha, 930 m 03°23'22"S 37°00'01"E[,] J. Halada, 2.4.2018", "Holotypus", "Holotypus *Amphibulus arushaensis* SCHWARZ des. Mart. Schwarz '25", "OLML-0001-0610" (OLML). Paratypes (2♂♂): same data as holotype, except OLML-0001-0611 and OLML-0001-0612 (OLML).

Description (♂) (Fig. 10): Antenna with 31 segments, segments 12/13-15/16 with linear tyloids widened medially or beyond the middle (Fig. 14); third segment (without annellus) 1.8-1.9 times as long as wide and 1.0-1.1 times as long as fourth segment.

Head, mesosoma, first segment of metasoma laterally and legs with rather long setae.

Face and clypeus with a smooth background, punctation moderate or coarse, partly with rugosity (Fig. 11); central convexity of face weak. Clypeus wide, 0.3-0.4 times as high as wide, ventral margin smooth, in profile hardly convex, above ventral margin without a distinct transverse furrow, median part of ventral margin upturned, without teeth. Mandible with upper tooth distinctly longer than lower tooth (Fig. 13). Malar space with a weak furrow, 0.3 times as long as basal width of mandible. Temple lustrous with fine or moderate and scattered punctation. Frons lustrous, with coarse to fine punctation;

punctures somewhat scattered to dense, in the last case partly confluent. Shortest distance between eye and hind ocellus (OOL) 0.7-0.8 times as long as the distance between hind ocelli (POL). Head in dorsal view behind the eyes weakly narrowed and convex (Fig. 12).

Upper part of pronotum laterally with fine or very fine and scattered punctation. Mesoscutum with a smooth background, lateral lobe with very fine and scattered punctures; median lobe with fine or very fine and scattered punctures, but punctation somewhat denser than in lateral lobe; centre of the mesoscutum densely and coarsely punctured; notaulus indicated. Posterior margin of mesoscutum with a transverse break. Scuto-scutellar groove without median longitudinal carina, smooth. Scutellum weakly convex, laterally without carina; scutellum on a smooth background with few moderate or fine punctures. Mesopleuron except speculum with coarse, moderate or fine punctation on a smooth background; speculum mainly smooth, but dorsally with very fine punctation; subtegular ridge sharp; sternaulus distinct until about midlength of mesopleuron. Epicnemial carina ventrally not widened, dorsally reaching lateral part of pronotum at about its midheight; transverse carina of the mesosternum distinctly elevated and not bilobed medially. Mesosternum medially with a moderately impressed longitudinal furrow with rather robust transverse ridges. Metapleuron with moderate to very fine punctures.

Propodeum of moderate length and with all carinae distinct, but anterior transverse carina sometimes partly absent or indistinct, thus area basalis and area superomedia may be confluent; posterior transverse carina somewhat more robust than the other carinae, without apophysis; area superomedia 1.1-1.3 times as long as wide, with costula anterior of its middle; dorsal part of propodeum lustrous and with very fine punctures, mainly anteriorly. Spiracle oval.

Femora mainly ventrally with long setae; hind femur 4.0 times as long as wide. Fore and mid tibiae with rather indistinct spines dorsally and anteriorly; tibiae without or with only a few long setae.

Fore wing with sides of areolet strongly convergent upwards; 2m-cu joining areolet somewhat before or behind its middle; ramulus absent; 1cu-a interstitial or weakly postfurcal. Hind wing with nervellus distinctly inclivous; hind abscissa of CU distinct.

First segment of metasoma without latero-median carina. Postpetiole with scattered very fine punctures on a smooth background, present mainly laterally and anteriorly. Second and third tergites with very fine and scattered punctation on a smooth background, punctation more scattered than in *A. africanus* LUHMAN.

Coloration: black. Mandible basally, narrow distal margin of metasomal tergites 5-7 or 6-7 white. Fulvous are scape, sometimes pedicel partly, mandible anterior of teeth, palpi (sometimes whitish), sometimes tegula, most of legs, postpetiole, metasomal tergites 2-4. Hind tarsus blackish except proximally. Fore coxa entirely or partly, sometimes mid coxa entirely or partly, fore trochanter entirely or partly, sometimes mid trochanter partly, fore and mid trochantelli partly and sometimes hind trochantellus partly whitish. Pterostigma yellowish.

Body length: 6.3-8.6 mm.

E t y m o l o g y : Named after the type locality Arusha.



Figs 10-14: *Amphibulus arushaensis* nov.sp., holotype, ♂. (10) Habitus laterally; (11) head in facial view; (12) head dorsally; (13) mandibles; (14) antennal segments with tyloids.

Key to the Afrotropical species of *Amphibulus*

- 1 Mesosoma mainly orange. Metasomal tergites black (Figs 1, 7), except narrow hind margins of posterior tergites, which are white. Pterostigma blackish..... *A. africanus* LUHMAN
- Mesosoma black. Metasoma medially fulvous (Fig. 10). Pterostigma yellowish..... *A. arushaensis* nov.sp.

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