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A peculiar new genus and species of pollen beetles of the *Anthystrix*-complex of genera from South Africa (Coleoptera: Nitidulidae, Meligethinae)

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Abstract
A peculiar new species of pollen beetles of the *Anthystrix* complex of genera, *Austroborovecia anthystrixina* **gen. nov.**, **sp. nov**., is described from northern South Africa (Limpopo Province). This new species, although it appears very similar in external aspect to members of the genus *Anthystrix* Kirejtshuk, 1981 (including half a dozen species, all from South Africa), exhibits a series of peculiar morphological characters representing obvious autapomorphies (e.g., the male antennomeres III to V flatly depressed, larger and markedly wider than antennomeres II and VI, a large semi-circular tomentose and blackish area on the orange male last abdominal ventrite, more developed teeth on the outer edge of front tibiae, occipital sulci bordering the dorsal surface of the eyes indistinct, virtual absence of distinct hairs along the outer elytral borders, and peculiarly shaped male genitalia). This series of morphological traits is combined instead with the absence of several of the most important and diagnostic characters of all true *Anthystrix* species (such as the strongly modified and enlarged antennal club in males, the unique "violin-shaped" median lobe of the aedeagus, and the very deep and narrow longitudinal median incision of the proximal part of the tegmen). Despite the evident outer similarity with most species of *Anthystrix*, due to some other shared external characters (such as the long, dense and thick golden pubescence covering the whole body, the strongly sinuated and modified male hind tibiae, and the male metaventrite with a large and deep pentagonal impression), the new species cannot be placed in this clade, and requires the institution of a new genus, closely related to *Anthystrix*. The larval hostplant of the new species is thus far unknown, although almost certainly it is included among members of the tribe Tarchonantheae (Asteraceae), as for all other known members of the *Anthystrix*-complex of genera.

Key words: taxonomy, distribution, pollen beetles, new genus, new species, hostplants, Asteraceae, Tarchonantheae.

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Introduction

Audisio et al. (2008), describing from Northern South Africa and Namibia the new monotypic genus and species *Sebastiangethes anthystrixoides* Audisio, Kirk-Spriggs & Cline, 2008, first circumscribed a peculiar South African lineage of pollen beetles (Coleoptera: Nitidulidae, Meligethinae), informally defining a so-called "*Anthystrix*-complex of genera", and discussing its phylogenetic position.

The genus *Anthystrix* (Table 1) was established by Kirejtshuk (1981), to include the (at that time) single species *A. squamosa*, originally described by Grouvelle (1899) as *Pria squamosa* from the "Cape" (Republic of South Africa, approximately the present-day Western + Eastern Cape Provinces). Kirejtshuk & Easton (1988) a few years later added two new South African species (*A. longiclava* and *A. nigroclava*, both from the Eastern Cape), together with a third taxon from the Eastern Cape, *A. luculenta*, later transferred by Audisio et al. (2009a, b, 2015b) to the closely related genus *Tarchonanthogethes* Audisio & Cline, 2009. In the same paper (Kirejtshuk & Easton 1988) was also included in *Anthystrix*, as *A. martini*, another species originally described by Grouvelle (1899) under the unrelated genus *Pria* Stephens, 1830, from the present-day KwaZulu-Natal. Audisio et al. (2009a) finally revised the genus and described two other new species

from the eastern Western Cape (*A. megalocera* Audisio & Cline and *A. flabellicornis* Audisio & Cline). In this same paper, Audisio et al. (2009a) also redescribed under a new name (*A. endroedyi* Audisio & Cline) the above cited taxon first described and figured by Kirejtshuk & Easton (1988), but erroneously believed to represent the above cited *Pria martini* Grouvelle, 1899 [whose lectotype belongs to a species of the quite distinct genus *Tarchonanthogethes* Audisio & Cline, 2009; Audisio et al. 2009a, b, 2015b]. *Anthystrix* now therefore includes six species, as synthetized by Audisio et al. (2009a, b, 2015b), arranged in three species-groups, all distributed in the Republic of South Africa; Fig. 13). All species known so far (Table 1) are closely associated as both larvae and adults to male inflorescences of small trees of the genus *Tarchonanthus* L. (Asteraceae, Tarchonantheae), which grow mainly in scrub and shrublands in coastal and subcoastal areas, and more rarely in submontane xeric rocky areas, often at the edges of indigenous forest clearings (Herman 2002; Audisio et al. 2009a, b, 2015b; Herman et al. 2021).

As noted by Audisio et al. (2009a), *Anthystrix* (and related genera) are poorly represented in museum collections, probably due to their peculiar ecology and unusual, short, seasonal phenology. All species are, in fact, anthophagous on the above cited small trees that only flower for a couple of weeks, mostly during the Southern Hemisphere autumn and winter (especially in the months between March and July) (Audisio et al. 2008, 2009a, b, 2015b), when entomological research activities in southern Africa are normally much reduced, compared to spring and summer periods. The new species described herein, collected in December (see below), therefore represents a possible exception in the known phenology of members of the *Anthystrix* complex of genera.

In an Integrative Taxonomy perspective (Audisio et al. 2000, 2015a; Mancini et al. 2008; Sabatelli et al. 2020a, b; Liu et al. 2021, 2024a, b), some preliminary molecular results on a single studied member of the genus *Anthystrix* (*A. longiclava*) were also discussed by Trizzino et al. (2009), and by Audisio et al. (2011, 2014), to test some previous hypotheses (Audisio et al. 2009a, b) on the phylogenetic positioning of this peculiar genus. The preliminary results of these analyses (based on Mitochondrial COI, nuclear PEPCK gene sequences, and secondary structures of the rRNA internal transcribed spacer 2 - ITS2) have highlighted with some clarity how the genetic distances between the various genera of the *Anthystrix* complex see *Anthystrix* closer to the pair [*Sebastiangethes* + *Xenostrongylogethes*], than to *Tarchonanthogethes*. Further molecular investigations using CAD and a wider range of mitochondrial and nuclear markers are under way, to better define the phylogenetic positioning of *Anthystrix* and of the other (ca. 30) Meligethinae genera (out of a total of 47 currently recognized) for which we have material suitable for molecular studies (Liu et al. 2024a); the results of this research will be the subject of a forthcoming *ad hoc* contribution.

A first tentative cladistic analysis of all members of the *Anthystrix* complex of genera, based on a matrix of

Table 1. Genus *Anthystrix* Kirejtshuk, 1981 and its likely sister-genus *Austroborovecia* **gen. nov.**: list of the 7 included species (in alphabetical order), with data on their geographic distribution (Fig. 13) and habitat.

Genera and species	**Distribution *(habitat)*, phenology;** *hostplant*
Anthystrix endroedyi Audisio & Cline, 2009	**Northern and eastern South Africa (KwaZulu-Natal, North-West Province; Fig. 13)** *(forest edges with rocky areas and screes; ca. 1000-1600 m a.s.l.)* **III–IV**; probably on inflorescences of *Tarchonanthus parvicapitulatus* Herman
Anthystrix flabellicornis Audisio & Cline, 2009	**SE South Africa (southeastern Western Cape; Fig. 13)** *(coastal tickets and fynbos areas; ca. 10–100 m a.s.l.)* **III–V**; on inflorescences of *Tarchonanthus littoralis* Herman
Anthystrix longiclava Kirejtshuk & Easton, 1988	**SE South Africa (eastern Western Cape, Eastern Cape; Fig. 13)** *(subcoastal tickets and inland hills with fynbos; ca. 10–300 m a.s.l.)* **III–V**; on inflorescences of *Tarchonanthus littoralis* Herman
Anthystrix megalocera Audisio & Cline, 2009	**SE South Africa (southeastern Western Cape; Fig. 13)** *(coastal tickets and fynbos areas; ca. 10–100 m a.s.l.)* **III–V**; on inflorescences of *Tarchonanthus littoralis Herman*
Anthystrix nigroclava Kirejtshuk & Easton, 1988	**southern South Africa (southern portion of Western Cape; Fig. 13)** *(subcoastal tickets and inland hills and flatlands with fynbos; ca. 100–800 m a.s.l.)* **XI–V**; on inflorescences of *Tarchonanthus littoralis* Herman
Anthystrix squamosa (Grouvelle, 1899)	**southern South Africa (southwestern portion of Western Cape; Fig. 13)** *(coastal and subcoastal tickets and fynbos areas; ca. 0–600 m a.s.l.)* **I–V**; on inflorescences of *Tarchonanthus littoralis* Herman
Austroborovecia anthystrixina Audisio, Jelínek & Liu, **gen. nov., sp. nov.**	**Northern South Africa (Limpopo, Soutpansberg mountain range; Fig. 13)** *(indigenous Afromontane forest edges; ca. 1300 m a.s.l.);* **XI?–XII**; probably on inflorescences of Asteraceae Tarchonantheae, maybe of *Tarchonanthus trilobus* DC.

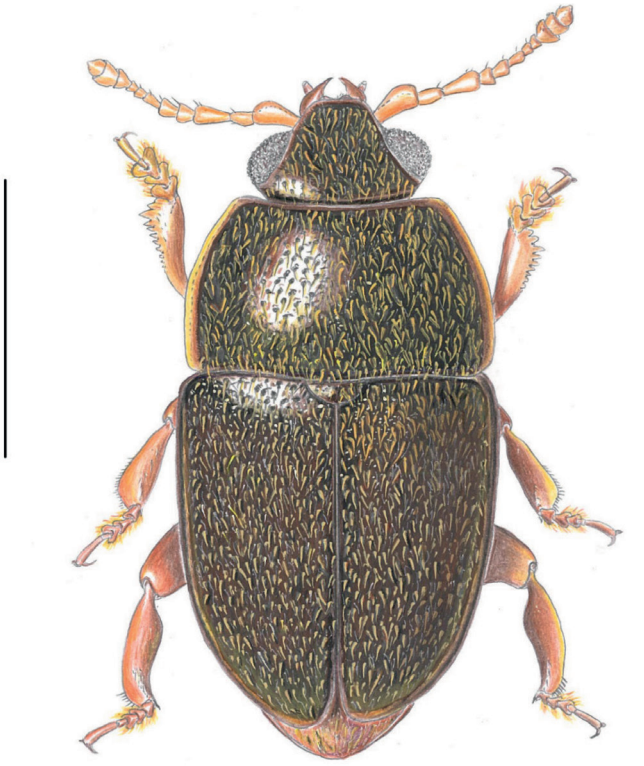


Fig. 1 – Habitus of the male holotype of *Austroborovecia anthystrixina* **gen. nov.**, **sp.nov.**, from South Africa, Limpopo. Scale bar: 1 mm. Tempera painting by P. Audisio [the only available specimen of this taxon would have been impossible to photograph with the usual stacking techniques, due to the unsuitable and not modifiable position of the legs at the time of death].

41 morphological characters, was presented by Audisio et. al. (2015b). From this merely exploratory analysis, not supported by new molecular data, *Anthystrix* resulted more closely related to *Tarchonanthogethes*, contrary to the rather meagre molecular evidence discussed above. *Anthystrix* resulted to be composed of three monophyletic species-groups: i) *squamosa*-group, composed of *A. squamosa* and *A. nigroclava*, ii) *endroedyi*-group (monotypic) and iii) *longiclava*-group, composed of *A. longiclava*, *A. flabellicornis* and *A. megalocera*. A possible sister-group relationship between "*endroedyi*-group" and "*longiclava*-group" resulted moderately supported.

Herein, we describe a new genus and species from northern South Africa (*Austroborovecia anthystrixina* **gen. nov.**, **sp. nov.**), based on a single male specimen recently collected by a Czech entomologist (Roman Borovec, Sloupno, Czech Republic) during a field trip to Limpopo (December, 2017); this new taxon, exhibiting a series of univocal and peculiar character states, also combines a few synapomorphies with some members of the genus *Anthystrix,* as defined by Audisio et al. (2009a, 2015b), but lacks several of the most important autapomorphic and diagnostic character states which distinguish members of the latter genus, as discussed below.

It is interesting to note that the new species was discovered in the extreme North of the South Africa (Limpopo, Soutpansberg mountain range), where (including other close middle-altitude mountain systems of the same area, immediately northwards of the much better known and explored Drakensberg Chain), a true hot spot of Meligethinae biodiversity is probably present (Audisio et al. 2011, 2015b), paralleling the well-recognized high biodiversity and rate of endemism of local vascular plants (Hahn 2019; Moraswi et al. 2019). An updated checklist of the currently known *Anthystrix*, including six described taxa, and its likely sister-genus *Austroborovecia* **gen. nov**., is also presented herein (Table 1), with an updated identification key to the included species, as well as to the five genera of the whole complex.

Materials and methods

Morphological analysis

The whole material used for morphological analyses is stored in the P. Audisio's collection (presently housed in the Zoological Museum of the Sapienza Rome University, Rome, Italy; CAR-MZUR), and in collections of the National Museum, Prague, Czech Republic (NMPC).

Examination, dissection, measurements and drawings (except those of male genitalia) were completed with the use of a LEICA MZ125 40-200× stereomicroscope with an ocular micrometer and a drawing system lens tube. Body length was measured from the anterior margin of the clypeus to the apex of the pygidium, and body width as the maximum width of the elytra combined.

The male genitalia were studied and illustrated in temporary Euparal mounts using an Olympus BX41 100-1000× transmitted light microscope, associated with a drawing system lens tube; they were subsequently cleaned in pure ethanol and mounted in Euparal on the same card as the beetle.

Morphometry Acronyms

DTIN/LETE = ratio length of distal excision of tegmen/tegmen length
ELLEL/WILE = ratio elytral length/combined elytral width
GONL/CGOW = ratio gonocoxites length/gonocoxites width
LEAE/WIAE = ratio length/width of median lobe of aedeagus
LELY/WELY = ratio length/combined width of elytra (LELY measured from posterior edge of scutellar shield to posterior edge of elytra)
LETE/WITE = ratio length/width of tegmen
MTLE/MTWI = ratio length/width of metatibiae
OVPL/GONL = ratio ovipositor length/gonocoxites length
PRWI/PRLE = ratio pronotal width/pronotal length
PTLE/PTWI = ratio length/width of protibiae
STLE/CGOW = ratio styli length/gonocoxites width

STLE/DSIA = ratio styli length/distance between the point of insertion of styli and the apex of the ovipositor.

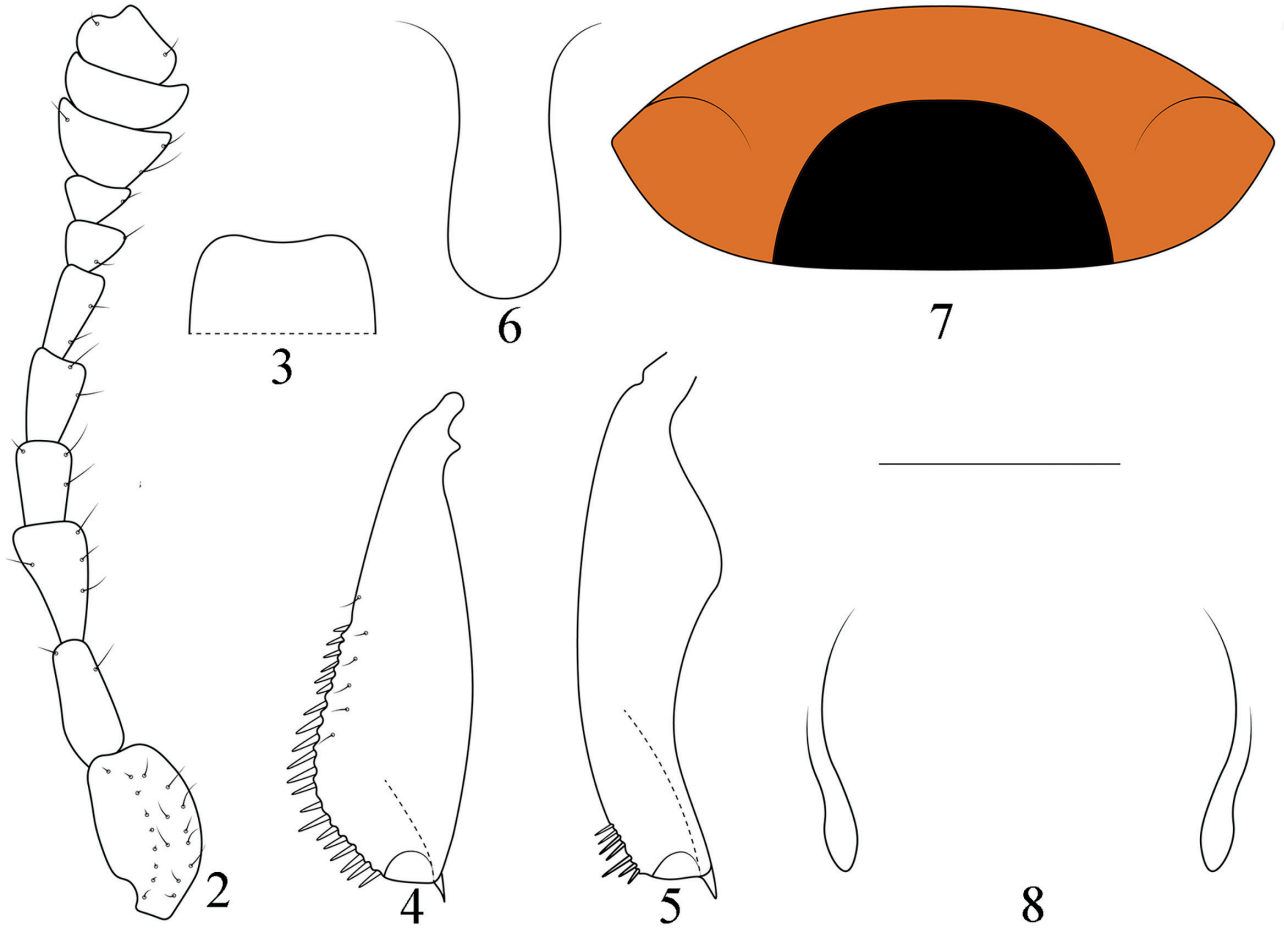
Taxonomy
Class Insecta Linnaeus, 1758
Order Coleoptera Linnaeus, 1758
Suborder Polyphaga Emery, 1886
Family Nitidulidae Latreille, 1802
Subfamily Meligethinae C.G. Thomson, 1859

Austroborovecia Audisio, Jelínek & Liu, **gen. nov.**
urn:lsid:zoobank.org:act:BF99A1DD-BD23-4EB0-838A-A125E4DB9EC9
(Figs 1-10)
Type species: *Austroborovecia anthystrixina* Audisio, Jelínek & Liu, **sp. nov.**

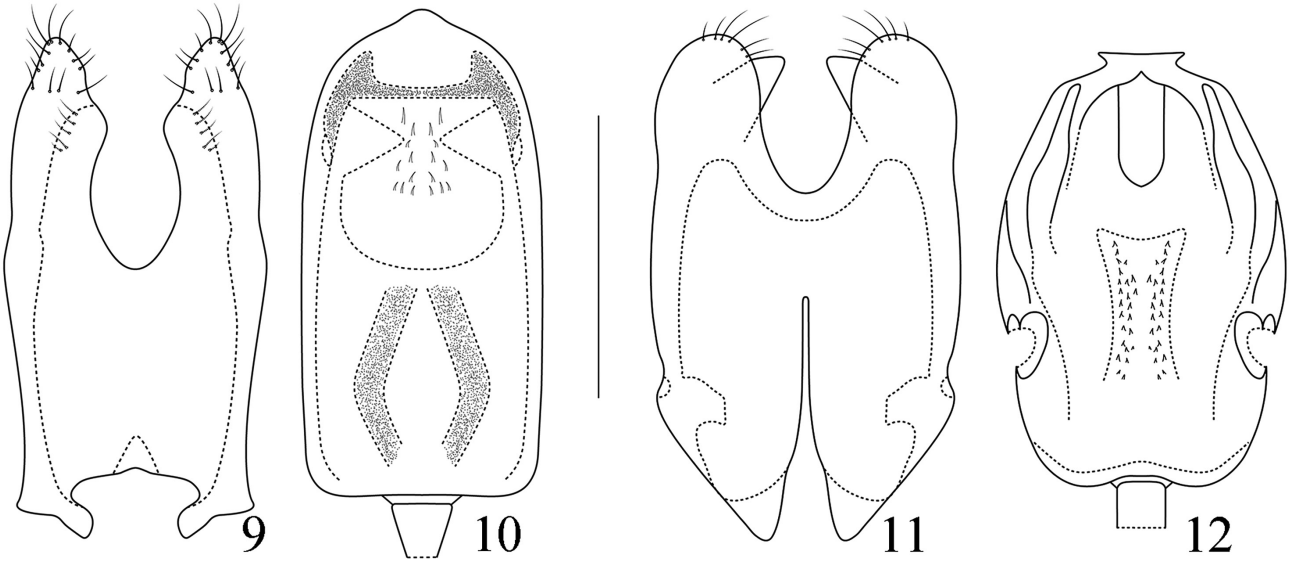
Diagnosis and Description

Middle-sized (length: 2.3 mm), narrowly elongate, moderately transversely convex (Fig. 1), densely and rather deeply punctuated, partially dark brown to blackish dorsally and ventrally (posterior 4/5 of elytra nut brown, and pygidium, abdominal ventrites, mentum and prosternal sides mostly orange), covered by a long, dense, golden-whitish pubescence; body shape and outer aspect markedly recalling that of members of the genus *Anthystrix*, but easily differentiated from all representatives of this genus by the simple (3-jointed) and small male antennal club, the flatly widened antennomeres III to V (Fig. 2), the male orange last ventrite bearing a large semi-circular and tomentose blackish spot in its distal half (Fig. 7), the virtually absent occipital sulci bordering the dorsal surface of the eyes, the presence of only hardly distinct, sparse and short hairs along the outer elytral borders, and the quite different shape of male genitalia (Figs 9-12).

Head. Occipital sulci bordering the dorsal surface of the eyes indistinct. Anterior margin of clypeus nearly obtusely truncate, only very slightly emarginate in the middle (Fig. 3). Antennal grooves on the ventral surface of the head very distinctly delimited and quite deep, arcuated anteriorly and convergent posteriorly, with a slightly divergent distal posterior portion (Fig. 8).



Figs 2-8 – 2, left antenna of *Austroborovecia anthystrixina* **gen. nov., sp.nov.**, male holotype from South Africa, Limpopo; **3**, *idem*, outline of the anterior edge of clypeus; **4**, *idem*, male left middle tibia; **5**, *idem*, male left hind tibia; **6**, *idem*, outline of the prosternal process; **7**, *idem*, colored outline of the male last abdominal ventrite; **8**, *idem*, outline of the shape of ventral antennal furrows on the head. Scale bar: 0.2 mm (Figs 2–8).



Figs 9-12 – 9, tegmen (dorsally) of the male holotype of *Austroborovecia anthystrixina* **gen. nov., sp. nov.**, from South Africa, Limpopo; **10**, *idem*, median lobe of the aedeagus (dorsally); **11**, tegmen (dorsally) of *Anthystrix endroedyi* Audisio & Cline, 2009; **12**, *idem*, median lobe of the aedeagus (dorsally). Scale bar: 0.2 mm (Figs 9–12). (Drawings 11 and 12 from Audisio et al. 2009a, re-inked and slightly modified).

Antennae. Antennae scarcely long, ratio ANLE/HEWI= ca. 1.20, antennal club in male peculiarly small-sized (Figs 1-2), probably without any sexual dimorphism (female unknown); but male antennomeres III to V flatly widened, enlarged, distinctly wider and larger than II and VI.

Prothorax. Pronotum normally shaped, maximum width at posterior two thirds (Fig. 1), ratio PRWI/PRLE = ca. 1.63. Scutellar shield rather large, semi-circular (Fig.1). Notosternal sutures on ventral surface quite distinct and raised, forming two parallel ridges nearly reaching posteriorly the anterior edge of the profemora. Prosternal process rather narrow, subparallel-sided, obtusely pointed distad (Fig. 6). Metaventrite in male with a large and deep pentagonal impression in posterior fourth fifths.

Elytra. Moderately elongate, obtusely and arcuately narrowed distad, ratio LELY/WELY= ca. 1.00 (Fig. 1). Lateral sides (tegumental borders) of elytra without any evident pubescence, only with sparse, minute, short, and hardly visible hairs.

Abdomen. Pubescence slightly reduced in the middle of ventrites I-IV, proximal base of the ventrite I dark brown, distal half of the ventrite I and ventrites II-V in male orange, with a large, semi-circular blackish and slightly tomentose area towards the apex of the last ventrite (Fig. 7).

Legs. Anterior tibiae moderately wide, with a series of well-developed teeth increasing in size along the anterior half of their outer edge (Fig. 1). Middle tibiae are nearly simple, not sinuated, with a series of small, fine pegs along the posterior half of their outer edge (Fig. 4). Hind tibiae narrow (ratio MTLE/MTWI= ca. 4.20) and markedly sinuated, with a series of few (5-6), small, fine pegs only close to the posterior apex of their outer edge (Fig. 5).

Male genitalia. About the same size as those of the other genera of the complex (Figs 9-12). Tegmen elongate, apex of paramera obtusely pointed, with a strong gibbosity along the distal third of the distal V-shaped tegminal excision (Fig. 9) and only with a very small and short proximal excision. Median lobe of the aedeagus normally shaped, parallel-sided and progressively narrowed in its distal fourth (Fig. 10).

Etymology. The generic name is derived from the surname of the collector, the entomologist Roman Borovec (Sloupno, Czech Republic), appreciated specialist of Coleoptera Curculionidae, combined with the prefix "*austro-*" [from the Latin *auster*, *austri* = southern (wind)], to underline the origin of the new genus from the Southern Hemisphere. It should be remembered that the generic name *Borovecia* is pre-occupied by *Borovecia* Pierotti & Belló, 2001 (Coleoptera: Curculionidae, Entiminae, Peritelini), a monotypic genus from the south-eastern Iberian Peninsula, based on the type species *B. gadorensis* Pierotti & Belló, 2001 (Pierotti & Belló 2001).

Taxonomic remarks

The new genus, currently monotypic, is easily differentiated from all the other taxa of the *Anthystrix* complex of genera (Audisio et al. 2008, 2009a, b, 2015b) by the peculiar shape of the male genitalia, which are markedly different from those of any other member of the complex (in particular the shape of the tegmen), although they vaguely recall the shape exhibited by some species of the nearby Oriental genus *Cyclogethes* Kirejtshuk, 1979 (Liu et al. 2024a); by the peculiar shape of the antennomeres from III to V in the

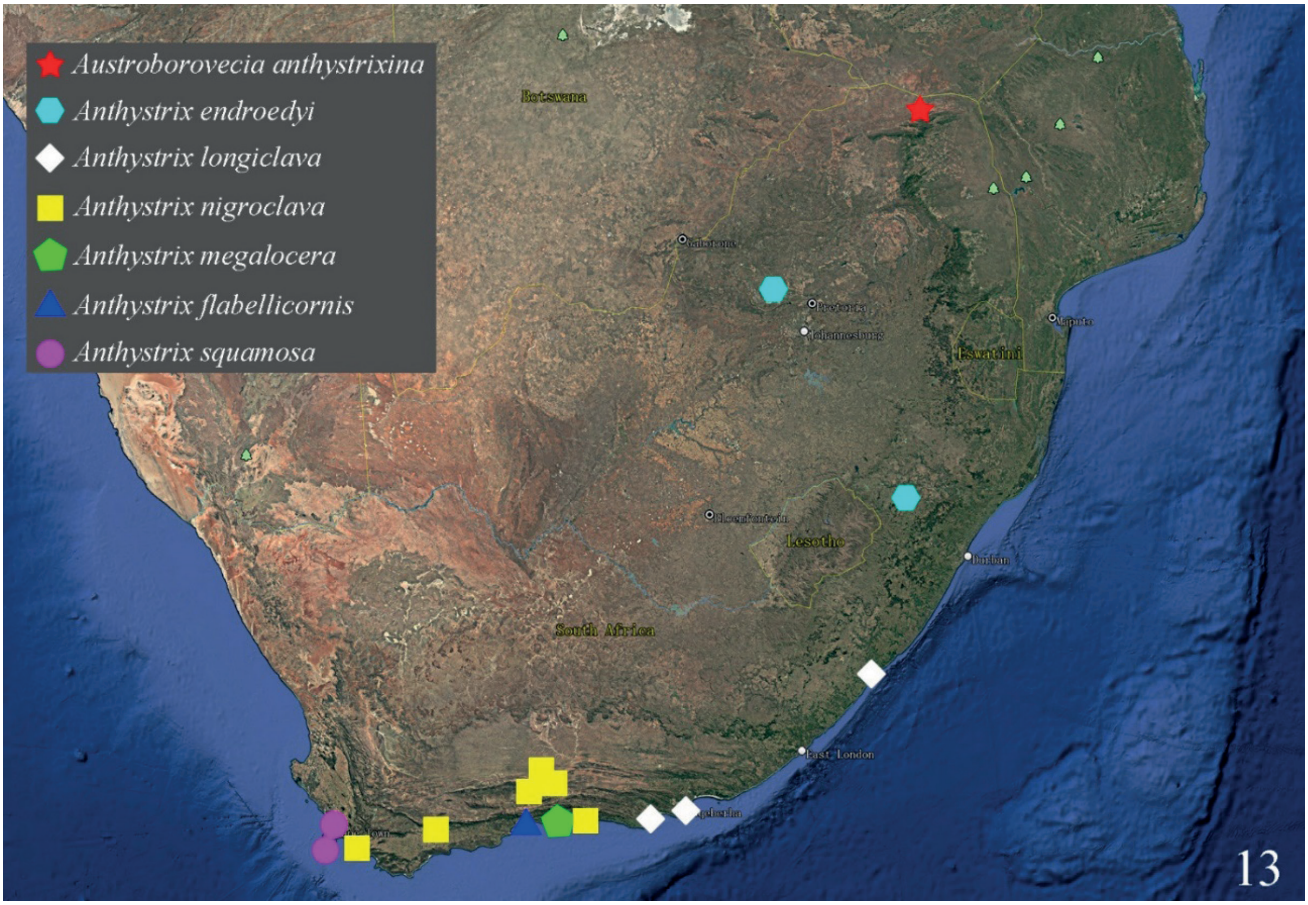


Fig. 13 – Distribution maps of the six known species of the genus *Anthystrix* Kirejtshuk, 1981, and location of the type locality of *Austroborovecia anthystrixina* **gen. nov.**, **sp. nov.** The maps report all records previously published by Kirejtshuk (1981), Kirejtshuk & Easton (1988), Audisio et al. (2009a), and the new record presented herein.

male (markedly flattened, larger and wider than II and VI); by the presence of a large, conspicuous blackish maculation, of semi-circular shape, arranged just before the apex of the last male abdominal ventrite; by the virtual absence of distinct hairs along the outer elytral borders (quite distinct and rather long in all known species of *Anthystrix* and *Xenostrongylogethes*, exceptionally developed in *Sebastiangethes anthystrixoides*, nearly absent only in some more derivate species of *Tarchonanthogethes*); and by the male antennal club which is not modified, and indeed of particularly small size. Some external character states of the type species however recall those present in some *Anthystrix* (e.g. the strongly haired body, the markedly sinuated male hind tibiae, and the deeply impressed male metaventrite); the above reported unusual combination of character states, pending molecular data, could probably suggest a phylogenetic position of *Austroborovecia* not far from *Anthystrix*, of which we could hypothesize it may represent the sister-taxon. The availability of new fresh material of the type species from Limpopo, with some specimens also preserved in pure ethanol, will certainly allow us to obtain molecular data capable of shedding light on the actual phylogenetic positioning of this new, peculiar and unexpected genus.

Austroborovecia anthystrixina Audisio, Jelínek & Liu, **sp. nov.**
urn:lsid:zoobank.org:act:79688DF9-D565-4998-8A45-9A1ACD055735
(Figs 1-10)

Diagnosis

Narrowly elongate, moderately transversely convex, densely and rather deeply punctuated, mostly dark brown dorsally, except the narrow yellowish orange pronotal sides and the orange pygidium; posterior 4/5 of the elytra and mouth parts except mentum nut brown, with markedly darker sutural border; abdominal ventrites, mentum and prosternal sides mostly orange, the rest of ventral surface dark brown to blackish. Antennae yellowish orange, as well as all legs (inner border of metatibiae markedly darker). Covered by a long, dense, conspicuous golden-whitish pubescence; body shape vaguely recalling that of *Anthystrix megalocera* Audisio & Cline, 2009 (from eastern Western Cape), but easily differentiated by the peculiarly shaped and markedly sinuated hind tibiae in males, the male orange last abdom-

inal ventrite bearing a large semi-circular and tomentose blackish spot distad, the simple (3-jointed) and small male antennal club, the flatly widened antennomeres III to V, and the quite different male genitalia.

Etymology. The specific epithet is derived from the marked (but only superficial) similarity of the new species with members of the however related genus *Anthystrix*.

Material examined

♂ Holotype; **REPUBLIC OF SOUTH AFRICA**: **Limpopo**, Soutpansberg Range, Thate-Vondo-Holy Forest, E of Louis Trichardt, 1331 m a.s.l., 22°52'.631" S, 30°20'.400" E, by sifting superficial soil (leaf litter) in indigenous forest, 10.xii.2017, R. Borovec lgt. (NMPC).

Description (male holotype)

Measurements. Body length 2.25 mm (measured from the anterior margin of the clypeus to the posterior apex of the pygidium), width 1.15 mm (measured as maximum combined elytral width).

Colour. Body partially blackish brown dorsally and ventrally, with posterior elytral 4/5 nut brown (elytral proximal first/fifth and circum-scutellar areas blackish) (Fig. 1), with orange pygidium and abdominal ventrites (except proximal base of the first ventrite and a large semi-circular distal maculation on the last ventrite, both blackish: Fig. 7); lateral pronotal borders (Fig. 1), prosternal sides, mentum, legs and antennae uniformly yellowish-orange, including antennal club (Fig. 1). Mouth parts brownish (except mentum).

Body shape. Body moderately elongate, scarcely transversely convex (Fig. 1).

Dorsal punctation. Surface moderately densely, coarsely, and deeply punctate (spaces between pronotal and elytral punctures ca. 1–1.5× their diameter: Fig. 1), with shining interspaces; elytra without traces of transverse strigose sculpturing.

Head. Transverse, ca. 0.63 mm (width), eyes moderately projecting outwards (Fig. 1).

Prothorax. Pronotum with trapezoidal shape and widely arcuated lateral sides, maximum width nearly at its posterior third (Fig. 1; ratio PRWI/PRLE = ca. 1.63). Pubescence is very dense, golden-whitish, long and distinct, each individual seta nearly as long as II antennomere. Notosternal sutures distinct, slightly darker than the remaining inner part of prosternum, markedly raised, and nearly approaching posteriorly the anterior edge of procoxae. Prosternal process narrowly rounded distad, rather parallel-sided, its maximum width nearly in the middle of its whole length, here nearly as wide as antennal club (Fig. 6).

Fig. 14 – Male inflorescences of *Tarchonanthus trilobus* DC. (Asteraceae, subfamily Tarchonantheae) on which the authors hypothetically believe *Austroborovecia anthystrixina* **gen. nov.**, **sp. nov.** could be associated with for its larval development. Photo: David Becking, https://treesa.org/

Fig. 15 – The indigenous forest habitat where *Austroborovecia anthystrixina* **gen. nov.**, **sp. nov.**, was collected at its type locality (South Africa, Limpopo, Thate-Vondo-Holy Forest). Photo: Roman Borovec, Sloupno, Czech Republic.

Elytra. Elytra rather parallel-sided, ratio LELY/WELY ≈ 1.00, and ca. 1.04× wider than pronotum (Fig. 1). Pubescence as on pronotum.

Pygidium. Proximal base of pygidium with normal, short "V" shaped carina in the middle, directed backwards. Pygidium rounded distad, without any apical projection directed backwards (Fig. 1).

Metathorax and ventrites. Metaventrite with a peculiarly deep, nearly pentagonal impression, occupying its posterior four fifths, deeper in its longitudinal middle, on the bottom of this impression with a subtle, shining, and barely raised longitudinal median ridge. Last abdominal ventrite (hipopygidium) orange-yellowish, bearing a rather large predistal semi-circular, blackish-brown and tomentose maculation (Fig. 7).

Legs. Front tibiae moderately wide, long, ratio PTLE/PTWI ≈ 3, with a series of small and short tegumental teeth, obtusely pointed, and slightly enlarged distad (Fig. 1); front tarsi slightly wider than the length of the II antennomere and of the width of the antennal club (Fig. 1); middle tibiae rather narrow, simple, not sinuated (Fig. 4), with a normal and distinct series of small dense spinules along the posterior half of their outer edge. Hind tibiae narrow (ratio MTLE/MTWI ≈ 3.75), peculiarly shaped, along their inner side dilated at proximal third and strongly modified and narrowed in their posterior half, markedly sinuated (Fig. 5), their outer edge nearly without a series of distinct spinules (only with a short series of very small and fine pegs distad).

Antennae. Antennae entirely orange-yellowish, club small, elongate, symmetrical, probably without any sexual differentiation, but with male antennomeres III, IV and V markedly flattened and widened if compared with antennomeres II and VI (Fig. 2). Antennae of normal length, ratio ANLE/HEWI ≈ 1,17 (Fig. 1).

Male genitalia. Distinctly shaped, medium-sized, with elongate and slightly undulate (at sides) tegmen (Fig. 9), and moderately pointed apex of each paramere; ratio DTIN/LETE ≈ 0.47–0.48, the distal excision's inner margins with a distinct pre-distal gibbosity at anterior

two-thirds; ratio LETE/WITE ≈ 1.88. Aedeagal median lobe not peculiarly shaped, long and narrow, regularly narrowed in its distal sixth, with obtusely and narrowly pointed apex, and maximum width near the middle (Fig. 10); ratio LEAE/WIAE ≈ 2.1.
Female unknown.

Phenology

The single available specimen of the new species was collected in middle December, which likely indicates adult local activity possibly in late Spring or early Summer (maybe from late October to December). On the other hand, its isolated presence in a forest litter sampling does not guarantee that the reproductive activity of the species on its host plant coincided with the capture period; in fact, some Meligethinae can occasionally be collected also in surface soils and forest litter, even one or two months before their actual reproductive period, waiting for the flowering time of their hostplants. However, it can be considered more likely that the specimen in question accidentally fell from the overlying forest vegetation during the sampling and sorting activities of the sifted litter material.

Hostplants and habitat

As above reported, the single known adult specimen of the new species was collected in Soutpansberg range near Louis Trichardt by sifting leaf litter material in an indigenous Afromontane forest habitat (Fig. 15); its unknown larval hostplant could be represented by a member of the family Asteraceae, the thus far known hostplants of all species of the related genus *Anthystrix* (Table 1) being represented by *Tarchonanthus* spp. (family Asteraceae, subfam. Carduoideae, tribe Tarchonantheae: Panero & Funk 2002; Herman 2002; Funk et al. 2009; Audisio et al. 2009a, 2009b, 2015b; Herman et al. 2021). On male inflorescences of these small trees and shrubs all *Anthystrix* species are, in fact, known to develop and reproduce (Audisio et al. 2009a, b; Herman et al. 2021). Considering the submontane area (ca. 1300 m a.s.l.) where the new species was collected in middle December, is it possible that the hostplant could be represented by *Tarchonanthus trilobus* DC., a small tree mostly occurring in submontane areas of NE South Africa and S Zimbabwe along wooded ravines, hillsides and margins of evergreen forests, locally known as broad-leaved wild camphor bush, and usually flowering (Fig. 14), depending on altitude, between August and February (Coates Palgrave 1983). Some species in the related genus *Brachylaena* R.Br. could be also considered; the best candidate with this hypothesis could be perhaps *Brachylaena huillensis* O. Hoffm. (locally known as lowveld silver-oak), usually flowering between October and December in mountain areas of NE North Africa and S Zimbabwe.

Distribution

N South Africa (Limpopo, Soutpansberg Range) (Fig. 13). If it is confirmed that the host plant of this species was indeed *Tarchonanthus trilobus* or *Brachylaena huillensis*, it could be hypothesized that *Austroborovecia anthystrixina* **gen. nov.**, **sp. nov.**, could also be more widely distributed in other submontane areas of KwaZulu-Natal, eastern Limpopo, and of southern Swaziland (Coates Palgrave 1983).

Taxonomic remarks

As reported above, this markedly distinct new species, pending molecular data, could be tentatively placed maybe not far from members of the genus *Anthystrix*, with vaguely closer affinities with *A. endroedyi* (Audisio et al. 2009a), sharing with this rare and markedly isolated central-northern South African species the simple, not modified middle tibiae in males, the markedly modified hind tibiae in males, and the reduced antennal sexual dimorphism. On the other hand, the shape of the male hind tibiae, combined with the mostly brown mouth parts, could lead to hypothesize some far phylogenetic relationships also with members of the *Anthystrix longiclava* group mentioned above. But the entirely different shape of the male genitalia, not exhibiting any similitude with the peculiar shape shared by all representatives of the genus *Anthystrix* (Figs 9-12 herein and Figs 14-25 in Audisio et al. 2009a), leaves no doubt as to its belonging to a distinct genus.

Conservation Issues

The new species here described certainly represents a particularly rare (and maybe localized) taxon, having so far escaped decades of specialized entomological research in South Africa. Fortunately, the type locality in the Soutpansberg Range is in or close to a series of protected submontane forest areas of Limpopo that should guarantee its presence and conservation. Based on the potentially restricted range and on similar experiences with other montane Meligethinae (Audisio et al. 2003; Liu et al. 2019), we believe that the species could still be provisionally considered as Nearly Threatened (NT), based on the IUCN criteria.

Updated identification key to African members of the *Anthystrix* complex of genera, and of species of the genera *Anthystrix* and *Austroborovecia* gen. nov.
[from Audisio et al. 2009a, 2015b, updated and modified].

1. Anterior portion of prosternum with distinct but partially obliterated notosternal sutures, not raised to form two distinct ridges.....**2**
- Anterior portion of prosternum with long, markedly raised notosternal sutures, which form two distinct ridges to receive the antennal flagellomeres when beetles are motionless (Fig. 35 in Audisio et al. 2009a, Fig.

27g in Audisio et al. 2009b, and Fig. 88 in Audisio et al. 2015b).....**3**

2. Anterior margin of clypeus strongly concave (Fig. 1 in Audisio et al. 2008). Prosternal process narrow, its maximum width little less than the length of second antennomere (Fig. 16 in Audisio et al. 2008). Male antennae *Pria*-like in shape (i.e., antennomeres III to V peculiarly elongate, with slender and loose antennal club), and exhibiting allometric development, i.e. club with markedly larger and slender articles in largest specimens (Figs 1, 13 in Audisio et al. 2008). Postocular furrows (occipital sulci) on the dorsal side of the head are almost obliterated. Ventral side in both sexes without dense tufts of dark brown hairs on first two visible ventrites. Male and female genitalia as figured (Figs 3–5, 11 in Audisio et al. 2008), ovipositor with outer proximal portion of gonocoxites distinctly indentate. Length: 1.9–2.9 mm. NW South Africa (North West Province) and S Namibia (very likely also in southern Botswana). Larvae on male inflorescences of *Tarchonanthus camphoratus* L. The reproductive period is between March and April..... ***Sebastiangethes anthystrixoides*** Audisio, Kirk-Spriggs & Cline, 2008

- Anterior margin of clypeus truncate to feebly concave (Figs 6, 57 in Audisio et al. 2015b). Prosternal process more obtusely rounded distad and wider, its maximum width little more than the length of second antennomere (Fig. 29d in Audisio et al. 2009b). Male antennae with compact club, never exhibiting allometric development (Figs 6, 65–66 in Audisio et al. 2015b). Postocular furrows (occipital sulci) on dorsal side of head distinct. Ventral side in males with a widely transverse dense tuft of dark brown hairs on first two visible ventrites (Fig. 95 in Audisio et al. 2015b). Ovipositors with outer proximal portion of gonocoxites simple, not indentate (Figs 58–59 in Audisio et al. 2015b). Eastern South Africa. .....**[**Genus ***Xenostrongylogethes*** Audisio & Cline, 2015**]**

3. Postocular furrows (occipital sulci) on dorsal side of head indistinct. Male antennomeres III to V distinctly flattened and widened (Figs 1 and 2 herein). Male genitalia as figured (Figs 9-10 herein). Males with metatibiae strongly sinuated along their inner margin (Figs 4 and 5 herein). Length: 2.3 mm. South Africa (N Limpopo: Fig. 13 herein). Larvae almost certainly on male flowers of some Asteraceae in the tribe Tarchonantheae, probably on *Tarchonanthus trilobus* DC. (or on *Brachylaena huillensis* O. Hoffm.). The local reproductive period is probably between November and January. ..... ***Austroborovecia anthystrixina*** Audisio, Jelínek & Liu, **gen. nov.**, **sp. nov.**

- Postocular furrows (occipital sulci) on dorsal side of head complete, rather deep, and quite distinct (Fig. 27i in Audisio et al. 2009b). Male antennomeres III to V of normal shape, not widened transversely, nor flattened (Fig. 27h in Audisio et al. 2009b), unless these antennomeres are also associated with an enormously developed male antennal club (Figs 8-10 in Audisio et al. 2009a. Male genitalia as figured (Figs 14-25 in Audisio et al. 2009a). **4**

4. Antennal furrows on ventral side of head arcuately convergent posteriorly (Fig. 35 in Audisio et al. 2009a). Male antennal club peculiarly large, flat, and foliaceous, composed by the antennomeres III-XI, V-XI, VI-XI or VII-XI combined (Figs 6–11 in Audisio et al. 2009a). Males exhibiting a peculiar violin-shaped aedeagus, with distinct pocket-shaped impressions on both sides, and T-shaped distal apex (Figs 15–25 in Audisio et al. 2009a); tegmen always with a peculiarly deep and narrow proximal excision (Figs 14–24 in Audisio et al. 2009a). Females with ovipositors possessing long styli and long distal setae (Figs 26–30 in Audisio et al. 2009a). Male hind tibiae markedly arcuately widened, or sinuated and markedly curved in most species (Figs 1, 3–5 in Audisio et al. 2009a), with the single exception of males of *Anthystrix megalocera* (Fig. 2 in Audisio et al. 2009a). .....**[**Genus ***Anthystrix*** Kirejtshuk, 1981**]**....**5**

- Antennal furrows on ventral side of head rather straight, or nearly parallel-sided at least in anterior two-thirds (Fig. 27g in Audisio et al. 2009b, and Fig. 88 in Audisio et al. 2015b), rarely slightly convergent posteriorly. Male antennal club smaller, more convex, never markedly flat and foliaceous, always 3-jointed in both sexes (Figs 2–5, 61–64, 67–69 in Audisio et al. 2015b), with the single exception of males of *Tarchonanthoges rotundiclava*, exhibiting a distinctly 4-jointed (Figs 1 and 60 in Audisio et al. 2015b) antennal club. Male genitalia on average larger (Figs 7–37 in Audisio et al. 2015b). Males exhibiting an aedeagus without any pocket-shaped impressions on lateral sides, and with simple (acute to narrowly truncate or obtusely rounded) distal apex (Figs 8–26 and 30–37 in Audisio et al. 2015b), with the single exception of *Tarchonanthoges hystrix*, exhibiting a quite peculiar aedeagal apex (Fig. 28 in Audisio et al. 2015b); tegmen without a peculiarly deep and narrow proximal excision (Figs 7–36 in Audisio et al. 2015b). Females with ovipositors possessing variably shaped apex, styli and distal setae (Figs 38–51 in Audisio et al. 2009a). Male hind tibiae usually arcuately widened, never sinuated and markedly curved (Figs 1-5, 79-82 in Audisio et al. 2015b). ....**[**Genus ***Tarchonanthogethes*** Audisio & Cline, 2009**]**

5. At least terminal two maxillary and labial palpomeres brown to blackish brown, distinctly darker than the rest of mouth parts. **6**

- Maxillary and labial palpomeres uniformly yellowish to orange, like other mouth parts. **8**

6. Antennal club in both sexes uniformly yellowish (Figs 3-4 in Audisio et al. 2009a). Male antennal club very

flat, fan-shaped, comprising last eight to nine antennomeres, ca. 2.9-3× longer than wide, terminal nine antennomeres greatly enlarged, IX one exceptionally large, nearly 2× longer as VIII (Figs 4, 10 in Audisio et al. 2009a). Males with both mesotibiae and metatibiae strongly sinuated along their inner margin (Fig. 4 in Audisio et al. 2009a), simple in females. Female antennal club comprising terminal three antennomeres, club antennomeres only moderately enlarged. Male and female genitalia as figured (Figs 24-25, 30 in Audisio et al. 2009a). Length: 2.1-2.7 mm. South Africa (eastern Western Cape: Fig. 13 herein). Larvae on male flowers of T*archonanthus littoralis* Herman. The reproductive period is likely between April and May. .....***A. flabellicornis*** Audisio & Cline, 2009

- Antennal club in both sexes at least partly blackish or piceous-brown, darker than rest of yellowish antenna (Figs 1-2, 5 in Audisio et al. 2009a). **7**

7. Antennal club in both sexes with entire terminal two antennomeres blackish (Figs 5, 9, and 13 in Audisio et al. 2009a). Male antennal club flat, comprising last seven to eight antennomeres, ca. 2.7-3.0× longer than wide, last seven antennomeres strongly enlarged, IX one moderately larger than VIII (Fig. 9 in Audisio et al. 2009a). Female antennal club comprising last three moderately enlarged antennomeres (Fig. 13 in Audisio et al. 2009a). Males with both metatibiae and mesotibiae strongly sinuated along inner margin (Fig. 5 in Audisio et al. 2009a). Male and female genitalia as figured (Figs 22-23, 29 in Audisio et al. 2009a). Length: 2.0-2.7 mm. South Africa (Eastern Cape: Fig. 13 herein). Larvae on male flowers of *Tarchonanthus littoralis* Herman. The reproductive period is usually between April and May. .....***A. longiclava*** Kirejtshuk & Easton, 1988

- Male antennal club with outer lateral two fifths of last six antennomeres piceous-brown (Figs 2 and 8 in Audisio et al. 2009a), female club with last two antennomeres and lateral portion of IX one piceous-brown. Male antennal club exceedingly large, flat, and comprising last seven antennomeres (Fig. 8 in Audisio et al. 2009a), ca. 2× longer than wide, with last five antennomeres strongly enlarged, especially IX one, which is subequal to length of VII and VIII combined. Female antennal club much smaller than male club and comprising last three antennomeres. Males with both metatibiae and mesotibiae simple, not sinuated along their inner margin (Fig. 2 in Audisio et al. 2009a), as in females. Male and female genitalia as figured (Figs 18-19, 27 in Audisio et al. 2009a). Length: 2.0-2.4 mm. South Africa (eastern portion of the Western Cape: Fig. 13 herein). Larvae on male flowers of *Tarchonanthus littoralis* Herman. The reproductive period is likely between April and May. .....***A. megalocera*** Audisio & Cline, 2009

8. Antennal club entirely yellowish in both sexes, males with metatibiae narrow and markedly sinuated along inner margin, with simple (not modified) middle tibiae, while protibiae characteristically wide and short (Figs 3 and 32 in Audisio et al. 2009a). Male antennal club comprising last five antennomeres, the IX one much larger than X (Figs 3 and 11 in Audisio et al. 2009a); club smaller and 3-jointed in females. Male and female genitalia as figured (Figs 20-21, 28 in Audisio et al. 2009a). Length: 2.0-2.5 mm. South Africa (North West Cape, KwaZulu-Natal: Fig. 13 herein). Larvae likely on male flowers of *Tarchonanthus parvicapitulatus* Herman. The reproductive period is probably between March and April. .....***A. endroedyi*** Audisio & Cline, 2009

- Antennal club entirely blackish in both sexes (Figs 6-7 and 12 in Audisio et al. 2009a), males with both mesotibiae and metatibiae nearly simple, the latter arcuately widened but not sinuated along their inner edge (Fig. 1 in Audisio et al. 2009a), and with not widened protibiae. Male antennal club comprising last five antennomeres; club smaller and 3-jointed in females. **9**

9. Male antennal club narrower and slightly longer (Fig. 6 in Audisio et al. 2009a), ca. 1.8-1.9× longer than wide, VIII antennomere ca. 1.6× wider than VII. Male and female genitalia as figured (Figs 14-15, 26 in Audisio et al. 2009a). Length: 2.3-2.7 mm. South Africa (southwestern portion of the Western Cape: Fig. 13 herein). Larvae on male flowers of *Tarchonanthus littoralis* Herman. The reproductive period is mostly between February and May. .....***A. squamosa*** (Grouvelle, 1899)

- Male antennal club wider and slightly shorter (Fig. 7 in Audisio et al. 2009a), ca. 1.5-1.6× longer than wide, VIII antennomere ca. 2.0× wider than VII. Male genitalia as figured (Figs 16-17 in Audisio et al. 2009a). Ovipositors like in *A. squamosa*. Length: 2.2-2.6 mm. South Africa (southern portion of the Western Cape: Fig. 13 herein). Larvae on male flowers of *Tarchonanthus littoralis* Herman. The reproductive period is mostly between February and April. .....***A. nigroclava*** Kirejtshuk & Easton, 1988

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