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Three new species in the genus *Antireicheia* Basilewsky, 1951 from South Africa (Coleoptera: Carabidae: Scaritinae: Clivinini)

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Abstract. Antireicheia verae sp. nov., A. geginati sp. nov. and A. ruthmuellerae sp. nov. from the Republic of South Africa (Western Cape Province) are described, illustrated including aedeagi and styli, and are compared with the most similar species. All South African taxa of this genus are included in a key.

INTRODUCTION

South African species of the anophthalmic, rarely microphthalmic genus *Antireicheia* Basilewsky, 1951 (subtribe Reicheina) described by Péringuey (1896), Basilewsky (1980) and Bulirsch & Magrini (2006, 2012, 2016, 2018, 2022) are reviewed and included in a key. To date 17 valid taxa of this genus are known from South Africa (exclusively from the southern part of the Western and Eastern Cape). Species of this genus are usually collected by sifting of litter in indigenous forests or in fynbos. Three species recently collected by the first and third authors in the Western Cape are described below.

MATERIAL AND METHODS

The study of dry-mounted specimens, including measurements and examination of microsculpture, was done at a magnification up to 98×. Aedeagi and female styli were fixed in Euparal or with water soluble glue on a label and placed on the same pin below the beetle. Measurements: length of body is measured from the anterior margin of the closed mandibles to the apex of the elytra along the suture; length of the pronotum along its midline; width of the pronotum at widest point; length of the elytra from its base to its apex along the suture; width of the elytra at its widest point. Length and width of body is given with 0.05 mm accuracy; other measurements including ratios and means are rounded to two decimal places. Label locality data are quoted verbatim except that standardized dates are provided.

Macrophotographs were taken by the second author using a Nikon D2X or D800 digital camera, with a Nikon Labophot II binocular optical microscope or a Nikon SM Z 1000 stereomicroscope, with diaphragmed lenses.

The new species of the genus *Antireicheia* were compared with the specimens including types of all South African taxa from the first author's collection as well as loaned from MRAC or TMSA. The articles by Bulirsch & Magrini (2006, 2012, 2016, 2018, 2022) are followed as closely as possible for taxonomy and methods.

The following abbreviations are used to indicate the depository of specimens:

MRAC Royal Museum of Central Africa, Tervuren, Belgium;

PBPC Petr Bulirsch, private collection, Praha, Czech Republic;

PMFI Paolo Magrini, private collection, Firenze, Italy;

TMSA Ditsong (= former Transvaal) Museum, Pretoria, South Africa. Other abbreviations:

SP: setiferous puncture(s); BSP: basal setiferous puncture(s); DSP: dorsal setiferous puncture(s); HT: holotype(s); PT: paratype(s); /, // by locality labels: end of line, label.

RESULTS

Genus Antireicheia Basilewsky, 1951

Type species: *Antireicheia promontorii* (Péringuey, 1896) originally described in the genus *Reicheia* Saulcy, 1862.

Antireicheia verae sp. nov. (Figs. 1-7, 22-23)

Type material. Holotype (\mathcal{S}): South Africa, Western Cape / Kogelberg NR, Louws river / fynbos with few trees, sifting / 34°17.3' S, 18°54.05'E / 20.xi.2022, P. Bulirsch lgt., (TMSA). Paratypes: (10 $\mathcal{S}\mathcal{S}$, 6 $\mathcal{Q}\mathcal{Q}$): with the same data as HT, (PBPC, PMFI); (1 \mathcal{Q}): South Africa, Western Cape / Kogelberg NR, Oudebos for. / 34°20.1' S, 18°56.7'E / 17.x.2017, P. Bulirsch lgt., (PBPC).

Description. Habitus as in Fig. 1. Body rusty red-brown, legs slightly, antennae distinctly lighter, mouthparts yellowish. Length 1.95-2.30 mm (mean 2.07 in \Im , 2.20 in \Im mm, HT 1.95 mm, n=18).

Head. Moderately broad, neck broad; anterior margin of clypeus between slightly protruding, very blunt lateral lobes slightly emarginated; impressions of clypeus oblique, broad and moderately deep, longitudinal carina short and broad. Genal posterior angles rather shortly rounded; moderately elevated supraantennal plates separated from genae by deep furrow; carina of prolonged supraantennal plates long and moderately sharp. Eyes absent, genae slightly drop-shaped. Vertex regularly, moderately deeply reticulated. Antennae with antennomere 2 almost as long as 3 and 4 combined, antennomeres 6-10 distinctly transverse.

Pronotum. In lateral view below its middle part indistinctly, very broadly concave, surface rather dull, with fine, more or less transverse wrinkles and with almost regular, moderately



Fig. 1. Antireicheia verae sp. nov. Habitus of HT.

rough reticulation; 1.06-1.13 (mean 1.10, HT 1.09) times as long as wide, 1.36-1.41 (mean 1.38, HT 1.41) times as wide as head, widest in posterior third; outline between lateral SP very slightly rounded, indistinctly to slightly attenuated anteriorly. Reflexed lateral margin entire, extended from very blunt, not protruded anterior angles to base, thin in latero-basal part, especially above flange; posterior angles very broadly rounded. Median line distinctly impressed, deepened posteriorly, abruptly diminished before basal furrow, anterior transverse impression superficial, weakened medially. Basal part (flange) very small, indistinctly produced posteriorly. Proepisterna very narrowly visible to almost invisible from above in apical third.

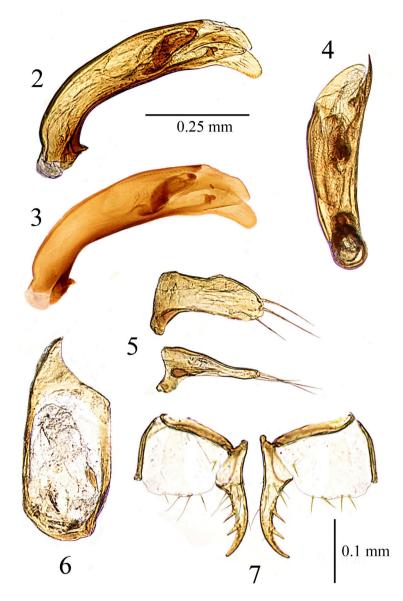
Elytra. Almost long oval, disc distinctly flattened in lateral view, 1.74-1.80 (mean 1.77, HT 1.74) times as long as wide, 1.23-1.34 (mean 1.28, HT 1.26) times as wide as pronotum, 1.98-2.12 (mean 2.06, HT 2.01) times as long as pronotum;

surface rather shiny, with irregular and very fine reticulation; base slightly to moderately sloping to rather broadly rounded, barely to moderately strongly protruded humeri; outline moderately broadened on sides, lateral channel moderately broad, its margin with variable number of (sub)humeral teeth: from 3-5 rather small and fine to mostly about 7-8 rather large and sharp teeth; in all specimens posterior half to two thirds of lateral margin without distinct teeth. Elytra broadest just above midlength; suture slightly depressed at base. Base without tubercle, with large BSP. Striae 1-4(5) moderately deep, with rather rough punctures, striae 5(6)-7 consisting of rows of rather rough punctures; outer striae disappearing latero-apically on apical inclination. Intervals 1-4 in basal part slightly vaulted, latero-apically intervals flattened. Third interval with three fine DSP.

Aedeagus (Figs. 2-6). Length in HT 0.58 mm; lower surface of median part of median lobe slightly concave (as in Figs. 2-3), apex moderately strongly bent down, slightly convergent to rather broadly rounded tip; median lobe in ventral view as in Fig. 4. Urite as in Fig. 6, with large and acute tooth; parameres as in Fig. 5, trisetose, upper outline of larger paramere distinctly and broadly concave.

Stylomeres (Fig. 7). Moderately long, apical spine rather long, regularly, distinctly curved.

Differential diagnosis. A. verae sp. nov. has the body moderately large, the head and the pronotum roughly, the elytra finely reticulated; the head without eye remnants and the



Figs. 2-7. Antireicheia verae sp. nov. 2-6 (HT), 7 (PT): 2- median lobe of aedeagus in lateral view (in euparal on vinyl acetate); 3- median lobe of aedeagus in lateral view (on perspex); 4- median lobe of aedeagus in ventral view (on acetate); 5- parameres; 6- urite IX; 7- stylomeres.

clypeus with the oblique impressions broad and moderately deep, prolonged by the short, rather blunt longitudinal keel; the narrow pronotum with the outline slightly convex; the long elytra with (3)5-8 mostly fine humero-lateral teeth, with three DSP and with rather deep and regular striae 1-7 punctation.

From the sympatric *A. kogelbergensis* Bulirsch & Magrini, 2012, the new species can be easily differentiated by the body being in average larger, by the head and the pronotum having distinct reticulation; by the elytra being distinctly longer and having more humeral teeth and deeper striae, and finally, by the very different shape of the median lobe of the aedeagus (Figs. 2-4 versus Figs. 3-4 in Bulirsch & Magrini (2012)). From other South African species it can be differentiated by using the key below and moreover by the concave upper outline of the larger paramere.

Name derivation. The new species is named in commemoration of late first author's mother Věra, who recently passed away during his latest trip to the Western Cape.

Distribution. This species is known only from two small localities in Kogelberg Nature Reserve. All specimens were collected by sifting of fynbos or indigenous forest litter (Figs. 22-23).

Antireicheia ruthmuellerae sp. nov. (Figs. 8-14, 24-25)

Type material. Holotype (\mathcal{C}): South Africa, W Cape; NW of / Riviersonderend: Ou(de)bos / ind. for.; 34°3.95'S, 19°49.35'E / 29.xi.2022, P. Bulirsch lgt., (TMSA). Paratypes: (23 $\mathcal{C}\mathcal{C}$, 27 $\mathcal{Q}\mathcal{Q}$): with the same data as HT, (PBPC, TMSA, PMFI).

Description. Habitus as in Fig. 8. Body rusty red-brown, legs slightly, antennae distinctly lighter, mouthparts yellowish. Length 2.00-2.20 mm (mean 2.09 mm, HT 2.10 mm, n=51).

Head. Relatively narrow, neck moderately broad; anterior margin of clypeus between slightly protruding, blunt lateral lobes rather slightly emarginated; impressions of clypeus oblique, moderately broad and deep, longitudinal carina short and broad. Genal posterior angles moderately broadly rounded; moderately elevated supraantennal plates separated from genae by distinct and rather narrow furrow; carina of prolonged supraantennal plates moderately long and blunt. Eyes absent, genae moderately strongly, regularly elevated. Vertex shiny, latero-basally with irregular rest of very fine reticulation. Antennae with antennomere 2 about as long as 3 and 4 combined, antennomeres 6-10 moniliform.

Pronotum. In lateral view below its middle part indistinctly, very broadly concave, surface shiny, with fine, more or less transverse wrinkles and latero-basally and apically with rests of fine reticulation; 0.96-1.03 (mean 1.00, HT 0.99) times as long as wide, 1.40-1.52 (mean 1.46, HT 1.52) times as wide as head, widest in about posterior third; outline between lateral SP slightly to very slightly rounded, very slightly attenuated anteriorly. Reflexed lateral margin entire, extended from blunt, barely protruded anterior angles to base, slightly thinner in latero-basal part, especially above flange; posterior angles broadly rounded. Median line narrowly impressed, abruptly diminished before basal furrow, anterior transverse impression superficial. Basal part (flange) very small, indistinctly produced posteriorly. Proepisterna very narrowly to just visible from above in apical half.

Elytra. Slightly ovate, disc slightly elevated in lateral view, 1.60-1.72 (mean 1.64, HT 1.62) times as long as wide, 1.16-1.30 (mean 1.24, HT 1.18) times as wide as pronotum, 1.95-2.11

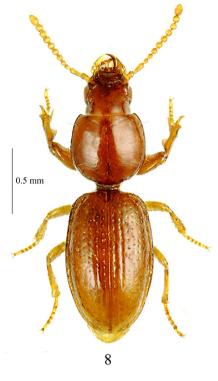


Fig. 8. Antireicheia ruthmuellerae sp. nov. Habitus of HT.

(mean 2.04, HT 1.98) times as long as pronotum; surface shiny, almost without reticulation; base slightly sloping to moderately broadly rounded, rather protruded humeri; outline rather slightly to moderately broadened on sides; lateral channel broad, in middle part slightly narrower, broadened apically, its margin with 1-(2) small and rather blunt humeral teeth, without lateral teeth; elytra broadest slightly above midlength; suture slightly depressed at base. Base without tubercle, with BSP. Striae 1-2(3) formed by rows of fine to moderately fine punctures, on disc irregularly connected by fine lines, striae 4-6 formed by fine to very fine punctures; diminished antero-basally and posterolaterally in apical fifth to third. Intervals flattened, intervals 1-(2) basally slightly elevated. Third interval with three DSP.

Aedeagus (Figs. 9-13). Length in HT 0.41 mm; apex of median lobe in lateral view (Figs. 9-10) short, regularly, slightly bent down, regularly narrowed to moderately narrowly rounded tip; in ventral view as in Fig. 11. Urite as in Fig.13, with moderately large,

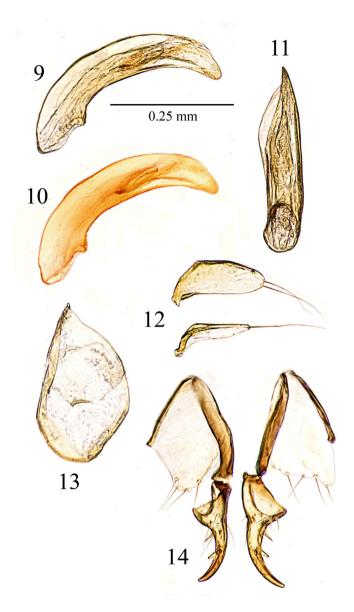
acute tooth; parameres as in Fig. 12, large paramere bisetose, smaller unisetose.

Stylomeres (Fig. 14). Moderately long, apical spine rather long, regularly, moderately strongly curved.

Differential diagnosis. *A. ruthmuellerae* sp. nov. has the body moderately large, shiny; the head without eye remnants and the clypeus with the oblique impressions deep, prolonged by the short and blunt longitudinal keel; the relatively broad pronotum with the outline slightly convex; the rather short elytra with only 1-2 fine humero-lateral teeth, with three DSP, with distinct BSP and with fine striae 4-6(7) punctation.

A. ruthmuellerae sp. nov. occurs very near to *A. caledonica* Basilewsky, 1980, known from Olifantbos near Riviersonderend. The new species can be differentiated from the latter species by the body being longer (the length in the latter species is about 1.8 mm); by the elytra being distinctly shorter and much more elevated laterally and by the median lobe of the aedeagus (Figs. 9-10 versus Fig. 1 in Basilewsky (1980)).

The new species differs from the most similar species, *A. leleupiana* Basilewsky 1980, described from Grootvaderbosch NR, by the body being slightly smaller, by the pronotal outline less rounded; by the elytra being in average longer, having the outline less rounded and especially by the very different shape of the median lobe of the aedeagus (Figs. 9-10 versus Fig. 7 in Basilewsky (1980)). From the other South African species it can be differentiated by using the key below.



Figs. 9-14. Antireicheia ruthmuellerae sp. nov. 9-13 (HT), 14 (PT): 9- median lobe of aedeagus in lateral view (in euparal on vinyl acetate); 10- median lobe of aedeagus in lateral view (on perspex); 11- median lobe of aedeagus in ventral view (on acetate); 12- parameres; 13- urite IX; 14stylomeres.

Name derivation. The species is named after Ruth Müller (Pretoria, RSA) who significantly helped the first and third authors with several collecting trips to South Africa.

Distribution. This species is known only from a small indigenous forest near Riviersonderend in Ou(de)bos in the Western Cape. All specimens were collected by sifting of indigenous forest litter (Figs. 24-25).

Antireicheia geginati sp. nov. (Figs. 15-21, 26-27)

Type material. Holotype (\Diamond): South Africa, Western Cape / Hottentots Holland NR, 3.5 km S Franschhoek / pass; 33°56.2'S; 19°9.8'E / 18.xi.2022; P. Bulirsch lgt., (TMSA). Paratypes: (1 \Diamond , 5 \Diamond \Diamond): with the same data as HT, (PBPC, PMFI).

Description. Habitus as in Fig. 15. Body rusty red-brown, legs slightly, antennae distinctly lighter, mouthparts yellowish. Length 2.15-2.25 mm (mean 2.20 mm, HT 2.20 mm, n=7).

Head. Moderately broad, neck broad; anterior margin of clypeus between slightly protruding, blunt lateral lobes very slightly emarginated; impressions of clypeus oblique, broad and moderately deep, longitudinal carina short to moderately long, distinct. Genal posterior angles rather shortly rounded; moderately elevated supraantennal plates separated from genae by distinct and moderately broad furrow; carina of prolonged supraantennal plates blunt. Eyes absent, genae moderately strongly, regularly elevated. Vertex regularly, moderately deeply reticulated. Antennae with antennomere 2 about as long as 3 and 4 combined, antennomeres 6-10 slightly transverse.

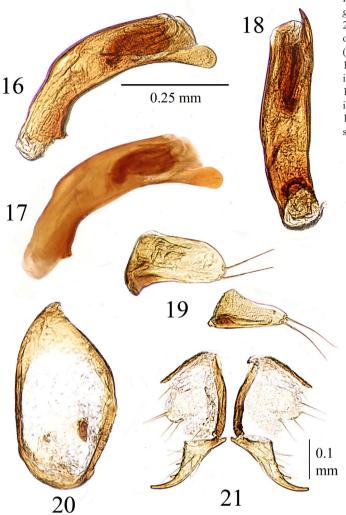
Pronotum. Slightly elevated in lateral view, shiny, surface with fine wrinkles, micropunctures and irregular, fine reticulation, less distinct on disc; 1.07-1.13 (mean 1.10, HT 1.07) times as long as wide, 1.35-1.43 (mean 1.38, HT 1.43) times as wide as



head, widest near posterior third; outline between lateral SP very slightly to slightly rounded, not to barely attenuated anteriorly. Reflexed lateral margin entire, extended from blunt, very slightly protruded anterior angles to base, thin in laterobasal part, especially above flange; posterior angles moderately broadly rounded. Median line distinctly impressed, abruptly diminished before basal furrow, anterior transverse impression very fine. Basal part (flange) small, indistinctly produced posteriorly. Proepisterna very narrowly visible from above in apical half.

Elytra. Convex, moderately long oval, disc slightly flattened in lateral view, 1.65-1.71 (mean 1.69, HT 1.65) times as long as wide, 1.28-1.36 (mean 1.32, HT 1.30) times as wide as pronotum, 2.00-2.08 (mean 2.03, HT 2.00) times as long as pronotum; base moderately strongly sloping to moderately protruded humeri; outline distinctly broadened on sides, lateral channel rather broad, its margin with 1-(2) very small and blunt humeral teeth; outline broadest just above midlength; suture slightly depressed at base. Base without tubercle,

Fig. 15. Antireicheia geginati sp. nov. Habitus of female PT.



Figs. 16-21. Antireicheia geginati sp. nov. 16-19 (HT), 20-21 (PT): 16- median lobe of aedeagus in lateral view (in euparal on vinyl acetate); 17- median lobe of aedeagus in lateral view (on perspex); 18- median lobe of aedeagus in ventral view (on acetate); 19- parameres; 20- urite IX; 21stylomeres.

with large BSP. Striae 1-2(3) fine, striae 3(4)-6(7) consisting of rows of rather fine punctures; outer striae disappearing latero-apically in apical sixth to third. Intervals 1-2(3) in basal part slightly elevated, latero-apical intervals flattened. Third interval with three fine DSP.

Aedeagus (Figs. 16-20). Length in HT 0.51 mm; apex of median lobe in lateral view (Figs. 16-17) short, rather slightly bent down, with subcircular, broadly rounded tip; apical part in ventral view as in Fig. 18. Urite as in Fig. 20, with rather blunt tooth; parameres as in Fig. 19, short and broad, bisetose.

Stylomeres (Fig. 21). Moderately long, apical spine moderately long, regularly, moderately strongly curved.

Differential diagnosis. *A. geginati* sp. nov. has the body relatively large; the head without eye remnants and the clypeus with the oblique impressions broad and deep, prolonged by the longitudinal keel; the narrow pronotum with the outline slightly convex; the moderately long, slightly ovate elytra with 1-(2) very fine humeral teeth and with the striae 3(4)-5 being fine in the basal half.

It can be distinguished from the most similar species *A. hottentota* Bulirsch & Magrini, 2018 and from almost sympatric *A. janaki* Bulirsch & Magrini, 2016; by the elytra being much shorter (ratio in both latter species is about 1.8) and by the different shape of the median lobe of the aedeagus (median lobe of *A. janaki* is figured in Bulirsch & Magrini (2016, Figs. 2-4) and *A. hottentota* in Bulirsch & Magrini (2018, Figs. 2-3)), and from *A. janaki* by having much deeper elytral striae.

Name derivation. The species is named after our colleague and friend Gernot Geginat (Magdeburg, Germany), well known specialist in African Trechodini.

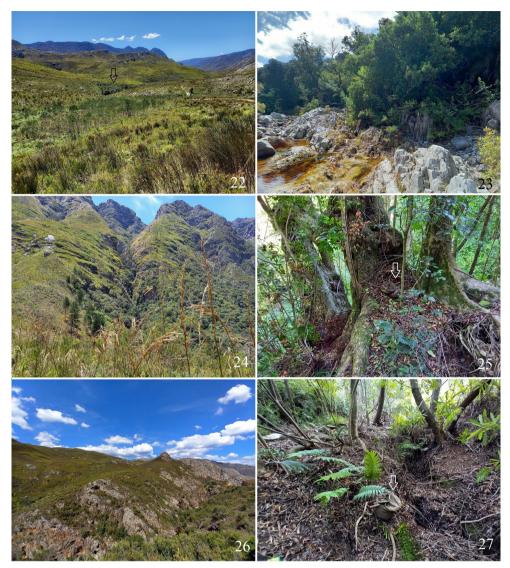
Distribution. This species is known only from an indigenous forest patch in Dutoitsrivier gorge in the Hottentots Holland Nature Reserve. All specimens were collected by sifting of indigenous forest litter (Figs. 26-27).

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KEY TO SOUTH AFRICAN SPECIES OF *ANTIREICHEIA* (refined and completed key in Bulirsch & Magrini (2016))

- 1(12) Eyes recognizable as small unfacetted fields at antero-lateral margin of genae.
- 2(7) Reflexed lateral margin of elytra with 1-3 small humeral teeth.
- 4(3) Pronotum 1.03-1.11 times longer than wide. Parameres bisetose, in one species unisetose.

- 7(2) Reflexed lateral margin of elytra with five or more (sub)humeral teeth.
- 8(11) Elytra shorter (ratio approximately 1.6), with broader lateral channel and with larger lateral teeth; apical part of median lobe of aedeagus small and almost straight. Length 1.70-2.30 mm. Amatola Mts.
- 10(9) Pronotum with outline below posterior SP broadly to very broadly rounded, above one more distinctly narrowed posteriorly, maximum of width at about midlength. Median lobe of aedeagus with narrower apex; parameres bisetose. *A. lindrothi* s.l.



Figs. 22-27. Type localities of described species. 22-23: Kogelberg NR, fynbos and forest at Louws river (black arrow indicates the position of the locality); 24-25: NW of Riviersonderend, Ou(de)bos; 26-27: Hottentots Holland NR, 3.5 km S Franschhoek pass. White arrows indicate a sifter which can be used as a scale.

- 10b(a) Pronotum with more convex outline, moderately broadly to broadly narrowed apically. Median lobe of aedeagus in lateral view with not reduced basal part.

- 11(8) Elytra longer (ratio approximately 1.7), with much narrower lateral channel, with finer lateral teeth; apical part of median lobe of aedeagus robust, evenly curved. Length 2.00-2.20 mm. Widespread in Knysna Region.
- 12(1) Eyes totally absent.
- 13(34) Reflexed lateral margin of elytra with 1-3 small humeral teeth.
- 14(29) Pronotum narrower, approximately 1.05-1.15 times as long as wide.
- 15(22) Larger species, length 2.10-2.40 mm.
- 16(21) Elytra elongate (ratio about 1.8).
- 17(18) Inner elytral striae fine, inner intervals almost flat basally. Median lobe of aedeagus as Bulirsch & Magrini
- (2016; Figs 2-4. Length 2.15-2.40 mm. Mt. Rochelle near Franschhoek pass. A. janaki Bulirsch & Magrini
- 18(17) Inner elytral striae much deeper, inner intervals distinctly elevated basally.
- 20(19) In average larger, length 2.20-2.40 mm; head and pronotum indistinctly reticulated; outer elytral striae finer. Median lobe of aedeagus as in Bulirsch & Magrini (2018, Figs. 2-3). Boegoekloof in Hottentots Holland NR.
- 22(15) Smaller species, length 1.70-2.05 mm.
- 23(26) Elytra shorter (ratio slightly below 1.7); outline more convex; median lobe of aedeagus short, with apical part slightly curved.

- 26(23) Elytra longer (ratio almost 1.8).

- 29(14) Pronotum wider, approximately as long as wide.
- 31(30) Smaller species; length 2.00-2.35 mm.
- 32(33) Pronotal outline more strongly rounded; elytra in average shorter (ratio about 1.57), with outline much more rounded; median lobe of aedeagus as in Basilewsky (1980, Fig. 7); in lateral view with apical part long, very broad and distinctly curved. Length 2.10-2.35 mm. Boosmansbos Wilderness Area and Grootvaderbosch NR.
- 34(13) Reflexed lateral margin of elytra with several subhumeral and often lateral teeth.

- 35(38) Smaller species, length below 2.0 mm. Reflexed lateral margin of elytra with several teeth almost up to apex. Elytra elongate (ratio mostly over 1.8).
- 37(36) Elytra rather dull, with two DSP (anterior missing) and rudimental BSP; length 1.75-1.95 mm. Potberg in De Hoop NR.

Remark. *A. verae* sp. nov. is a very distinct species, occurring exclusively in Kogelberg NR nevertheless it is placed in the key three times to be sure in its correct identification (most "typical" specimens belong to the item 38, while a few PT specimens with the less distinctly developed elytral posthumeral teeth belong to items 19 or 28).

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