

# THREE NEW SPECIES OF *ATROCRATES* KOCH, 1956 FROM SOUTH AFRICA (COLEOPTERA: TENEBRIONIDAE: PLATYNOTINI), WITH A NOTE ON THE OVOVIVIPARITY

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**Abstract.**— Three new species of the genus *Atrocrates* Koch, 1956 are described and illustrated: *A. gansbaaiensis*, *A. medvedevi* and *A. nudus*. The species belong to the generic group trigonopoid Platynotina from South Africa. Oviviparity has been recorded in *Atrocrates medvedevi* sp. nov.



**Key words.**— Coleoptera, Tenebrionidae, Platynotini, *Atrocrates*, new species, ovoviviparity, South Africa.

## INTRODUCTION

The genus *Atrocrates* was erected in 1956 by Koch (type species: *Trigonopus platyderus* Mulsant et Rey, 1953). This genus belongs to the generic group trigonopoid Platynotina from South Africa, where it is closely related to *Crypticanus* Fairmaire and *Atrocraticanus* Iwan (Iwan 1999a).

In his 1998 paper Iwan presented a revision of *Atrocrates*, with the following diagnose: mid part of mentum narrowed apically; lateral wings very wide; delicate, barely visible puncturation of pronotum and elytral intervals; lateral border of pronotum expanded and its inner ridge rounded anterior to posterior angles; the upper edge of elytral base obtuse (i.e. with no sharp edge), sometimes only slightly arched; widened fore and mid tarsi in male. A year later (1999b) the same author published descriptions of the 2 new species: *A. bellamyi* and *A. robertsonensis*.

In recent materials we found three species new to the sciences belonging to this genus. At present *Atrocrates* includes 30 species.

## METHODS AND ABBREVIATIONS

Means and ratios are based on all specimens listed under "Types" (measures of the genitalia – 1 or 2 specimens). Measurements were made as follows: width of lateral pronotal border – in the middle of lateral pronotal margin; width of anterior elytral margin – from humeral angle to scutellum; body length – from anterior margin of labrum to elytral apex; body width – maximum elytral width; pronotal length – in the middle of pronotum;

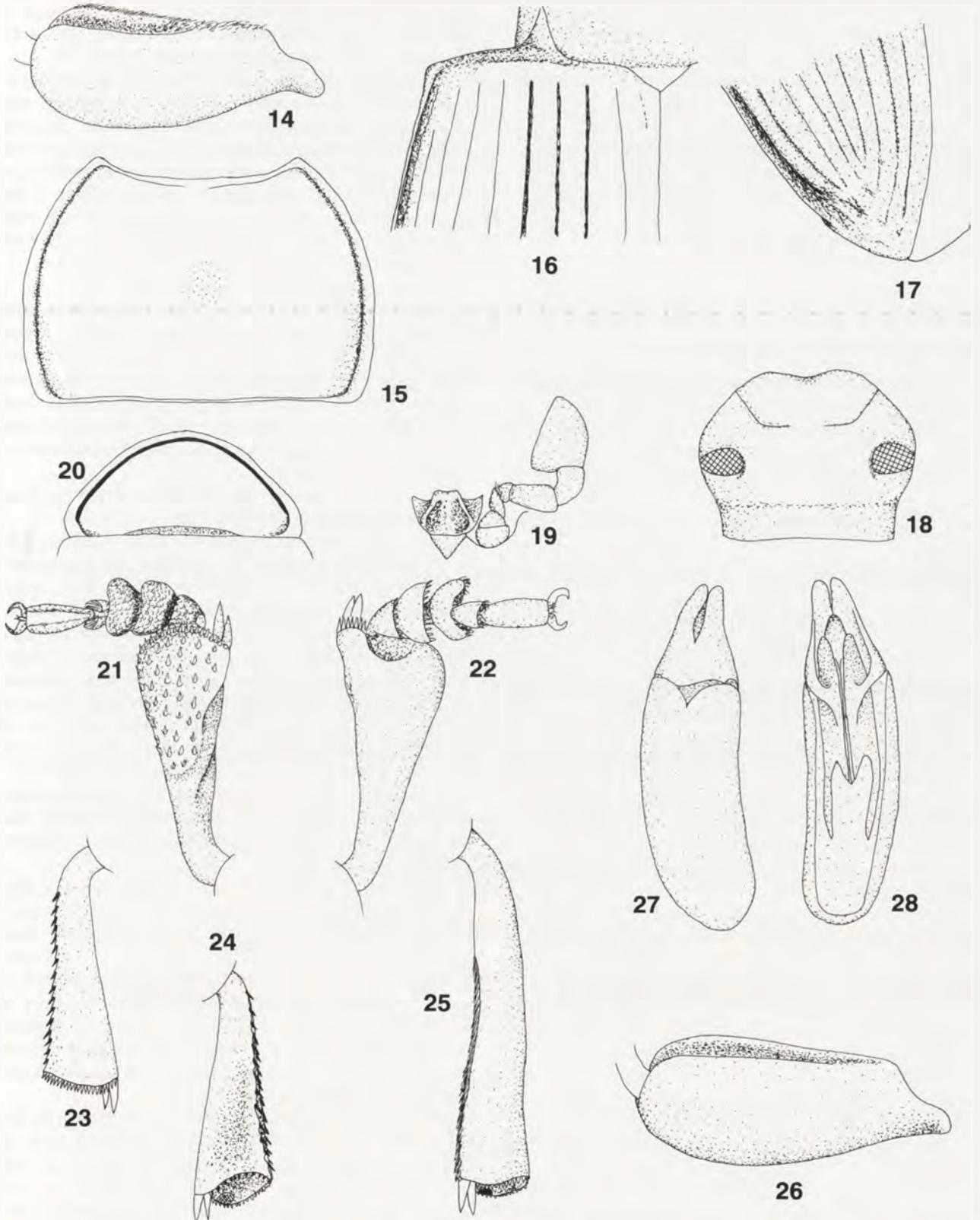
length of pronotum between angles – pronotal length from tip of anterior to tip of posterior angle.

### The following abbreviations have been used in the descriptions:

- ed/ew – clypeal emargination depth/width ratio;
- al/apl – length ratio antenna/pronotum;
- al/was3 – ratio length of antenna/ width of 3<sup>rd</sup> antennomere;
- as3/as2 – length ratio of antennomere 3/2;
- lpbor/was3 – breadth ratio lateral pronotal border/3<sup>rd</sup> antennomere;
- mp/as3 – ratio width of maxillary palp/length of antennomere 3<sup>rd</sup>;
- pl/lapa – length ratio pronotum/anterior pronotal angles;
- pkp/st – width ratio anterior margin of elytra/scutellum at base;
- ml/mw – metepisternum length/width ratio;
- metl/cavl – length ratio metasternum between the insertions of mid and hind coxae/cavity of hind coxa;
- ftibl/ftibw – fore tibia length/width ratio;
- tars1/2 – length ratio hind tarsomere 1/2;
- dtk/dod – length ratio posterior margin of hind tibia/inner spur of hind tibia;
- pav/pm – width ratio process of I abdominal ventrite/process of metasternum;
- tc/2bc1 – ratio total length of coxites/2 × breath of first plate of coxite;
- bc1/lc1 – first plate of coxite breath/length ratio;
- c1/c2 – length ratio first/second plates of coxite;



Figures 1-13. *Atrocates medvedevi* sp. nov. (1) pronotum; (2) head; (3) mentum, submentum, maxillary palp and antennomere 1-3; (4) anterior part of elytron; (5) pre- and last abdominal ventrites; (6) aedeagus; (7) ventral and (8) dorsal view of male fore tibia; (9) hind male tibia; (10) ventral and (11) dorsal view of male mid tibia; (12) ovipositor; (13) internal female genitalia (bc - bursa copulatrix, h - horion, l - larva, sag - spermathecal accessory gland, s - spermatheca, ov - oviduct).



Figures 14–28. 14. *Atrocrates medvedevi* sp. nov. 15–28. *A. nudus* sp. nov. (14) male fore femur; (15) pronotum; (16) anterior part of elytron; (17) apical part of elytron; (18) head; (19) submentum, mentum and maxillary palp; (20) last abdominal ventrite; (21) ventral and (22) dorsal view of male fore tibia and tarsus; (23) ventral and (24) dorsal view of male mid tibia; (25) male hind tibia; (26) male fore femur; (27) dorsal and (28) ventral view of aedeagus.

- c3/c3-c4 – length ratio third plate of coxite/distance between base of plates third and fourth;  
 c4-c3/c1 – length ratio distance between apices of plates fourth and third/first plate of coxite;  
 p/c – length ratio paraproct/coxites;  
 lmb/la – length ratio male body/aedeagus;  
 lfb/lo – length ratio female body/ovipositor;  
 lbp/lap – length ratio basal/apical parts of aedeagus;  
 pl/pb – pronotum length/breadth ratio;  
 el/eb – elytra length/breadth ratio;  
 el/pl – length ratio elytra/pronotum;  
 eb/pb – breadth ratio elytra/pronotum.

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- MNHN – Muséum National d'Histoire Naturelle, Paris, France (C. Girard);  
 ZMS/JFC – Naturhistoriska Riksmuseet, Stockholm, Sweden (B. Gustafsson)/Julio Ferrer Collection.

## SYSTEMATICS

### *Atrocates medvedevi* sp. nov. (Figs 1–14, 39)

**Name derivation.** In honour of an outstanding Russian coleopterist Prof. Gleb S. Medvedev from Sankt Petersburg (Russia).

**Terra typica.** "Caffrerie" (South Africa, Cape Province).

**Diagnosis.** *A. medvedevi* is close to *A. nudus*, *A. largus* and *A. endrodyi* due to the structure of male fore and mid tibia (simple, without denticles). The species (except *endrodyi*) have flat elytral intervals.

*A. medvedevi* differs from *largus* in the shape of pronotal border (wide, lpbor/was3 = 1.4 in *largus*; narrow, lpbor/was3 = 0.9 in *medvedevi*), from *nudus* in the shape of the elytral humeri (cf. Fig. 4 and Fig. 16), pubescens of the male fore femora (cf. Fig. 14 and Fig. 26) and structure of the male mid tibia (cf. Figs 10–11 and Figs 23–24).

*A. medvedevi* is easily separated from above mentioned species by the presence of the very deep circumocular depression (Fig. 2)

**Description.** Measurements. Body length 8.5–9.5 mm, pl/pb = 0.60–0.67, el/eb = 1.23–1.39, el/pl = 1.96–2.26, eb/pb = 1.05–1.07.

Head as in Fig. 2. Clypeus with shallow emargination (ed/ew ca. 12.0). Genal canthus equal to eyes. Eye between tempus and genal canthus very narrow (1–2 ommatidia visible), circumocular depression distinct (deep and groove-like near ventral margin). Antenna moderately long (al/apl ca. 0.95, al/was3 ca. 9.0), 3<sup>rd</sup> antennomere short (as3/as2 ca. 2.0), distal segments (antennomere 7–11) evenly widened, elongated.

Mentum and submentum as in Fig. 3. Last segment of maxillary palp moderately wide (mp/as3 ca. 1.4). Hipostoma near maxillary articulation simple.

Pronotum as in Fig. 1, sides rounded, subparallel at base; pronotal disc evenly convex, with extremely fine puncturation, depressed near lateral border; anterior angles moderately protruding anteriorly (pl/lapa ca. 8.0), posterior angles right, not protruding beyond the level of the middle of base; base almost straight; border of the anterior margin disappeared in the middle; lateral border slightly widened basally, in the middle moderately wide (lpbor/was3 = 0.9), basal border very narrow, entire.

Scutellum wide at base (pkp/st ca. 3.2).

Elytra composed of 9 rows, striae punctate-sulcate with small punctures; intervals smooth and flat; elytra slightly tucked in posteriorly (a part of interval IX visible from the underside); anterior margin (Fig. 4) almost straight, unbordered, upper edge forming gradual slope (slightly convex in the middle); elytral humeri rounded and very slightly protruding outwards, situated below at the level of scutellum.

Metasternum between the insertions of mid and hind coxae very short (metl/cavl ca. 5.0).

Metepisternum rectangle and very short (ml/mw ca. 2.3).

Legs, male fore and mid tarsi widened, hind tarsi moderately long (tars1/2 ca. 2.3); fore tibia in both sexes strongly triangularly widened towards apex (ftibl/ftibw ca. 2.3), male fore tibia with longitudinal depression on inner side (Figs 7–8); outer margin of mid tibia with 2 ridges (one of them is more convex), male mid tibia widened, with no apical denticle (Figs 10–11); male hind tibia as in Fig. 9, inner side with a longitudinal ridge and a row of dense setae, inner spur moderately long (dtk/dod ca. 1.3); male fore femur finely pubescent on inner side (Fig. 14).

Abdominal ventricities (in male) with delicate puncturation; bordering of the last abdominal ventrite distinct (Fig. 5); process of I abdominal ventrite narrow (pav/pm ca. 1.5).

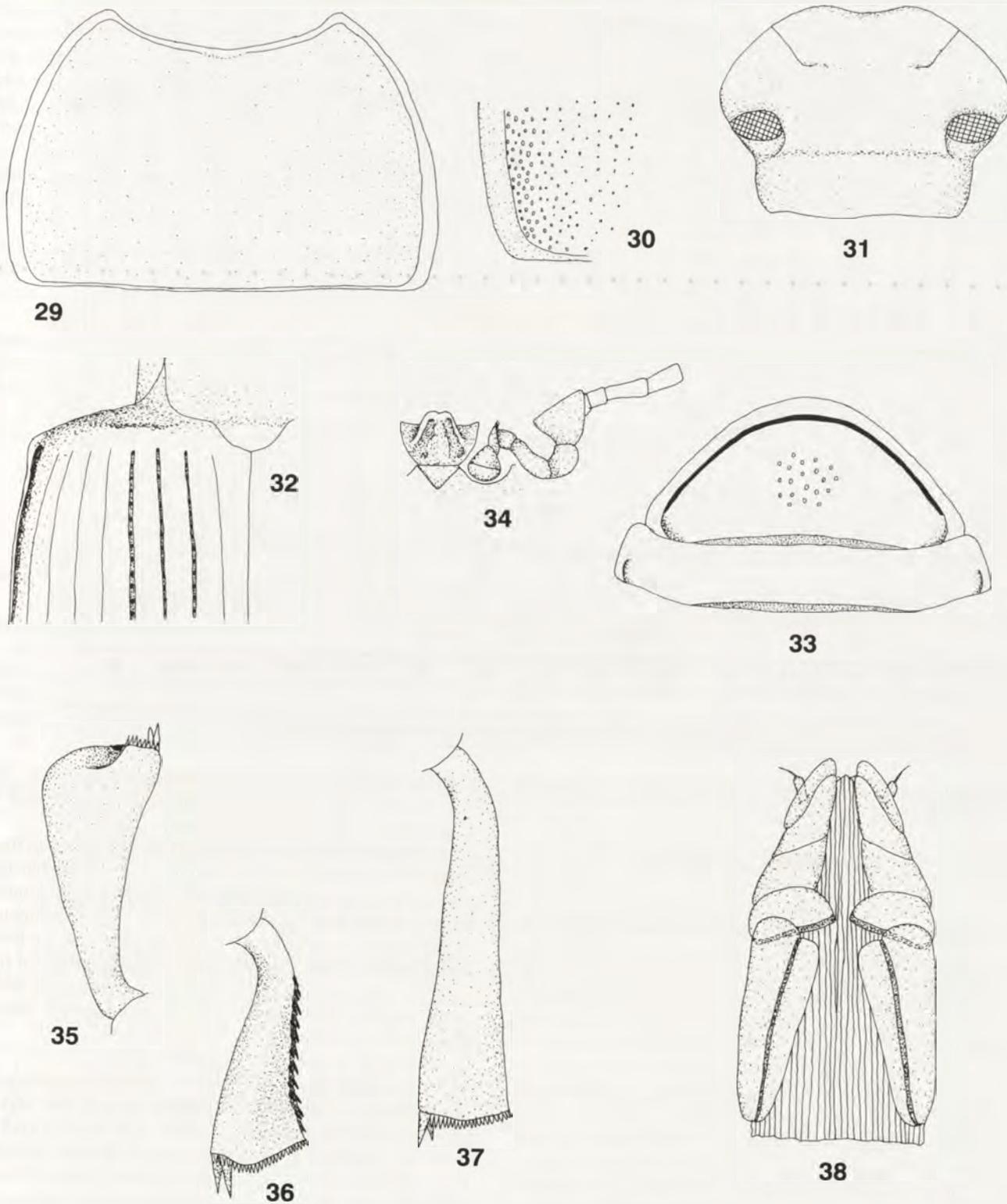
Female genitalia, lfb/lo = 5.6–6.2, ovipositor as in Fig. 12, paraproct shorter than coxites (p/c ca. 0.9); coxites triangle (tc/2bc1 ca. 0.9), first plate moderately wide (bc1/lc1 = 1.9–2.1) and long (c1/c2 ca. 0.9), distance between base of plates third and fourth long (c3/c3-c4 ca. 2.3), fourth plate longitudinal, apical free part of fourth plate long (c4-c3/c1 ca. 0.60), gonostylus present; bursa copulatrix with no sclerite (Fig. 13), spermatheca branched from the base, with narrow ducts, spermathecal accessory gland present.

Male genitalia as in Fig. 6, lmb/la ca. 5.5, lbp/lap ca. 2.3.

**Types.** Holotype (male), MNHN: "Caffrerie; coll. R. Oberthhr, ex coll. Deyrolle". Paratypes: Cap. b. sp.; coll. R. Oberthhr, ex coll. Deyrolle, (MNHN) 1 m, 2 f; Trigonopus, cape; Museum Paris, coll. de Marseul 1890, (MNHN) 2 f.

**Distribution.** South Africa (Cape Province) (Fig. 39).

**Notes.** Egg and first instar larva (Fig. 13) were dissected from bursa copulatrix (from two females sepa-



Figures 29–38. *Atocrates gansbaaiensis* sp. nov. (29) pronotum; (30) posterior angle of pronotum; (31) head; (32) anterior part of elytron; (33) pre- and last abdominal ventrites; (34) submentum, mentum, maxillary palp and antennomere 2–4; (35) fore tibia; (36) mid tibia; (37) hind tibia; (38) ovipositor.

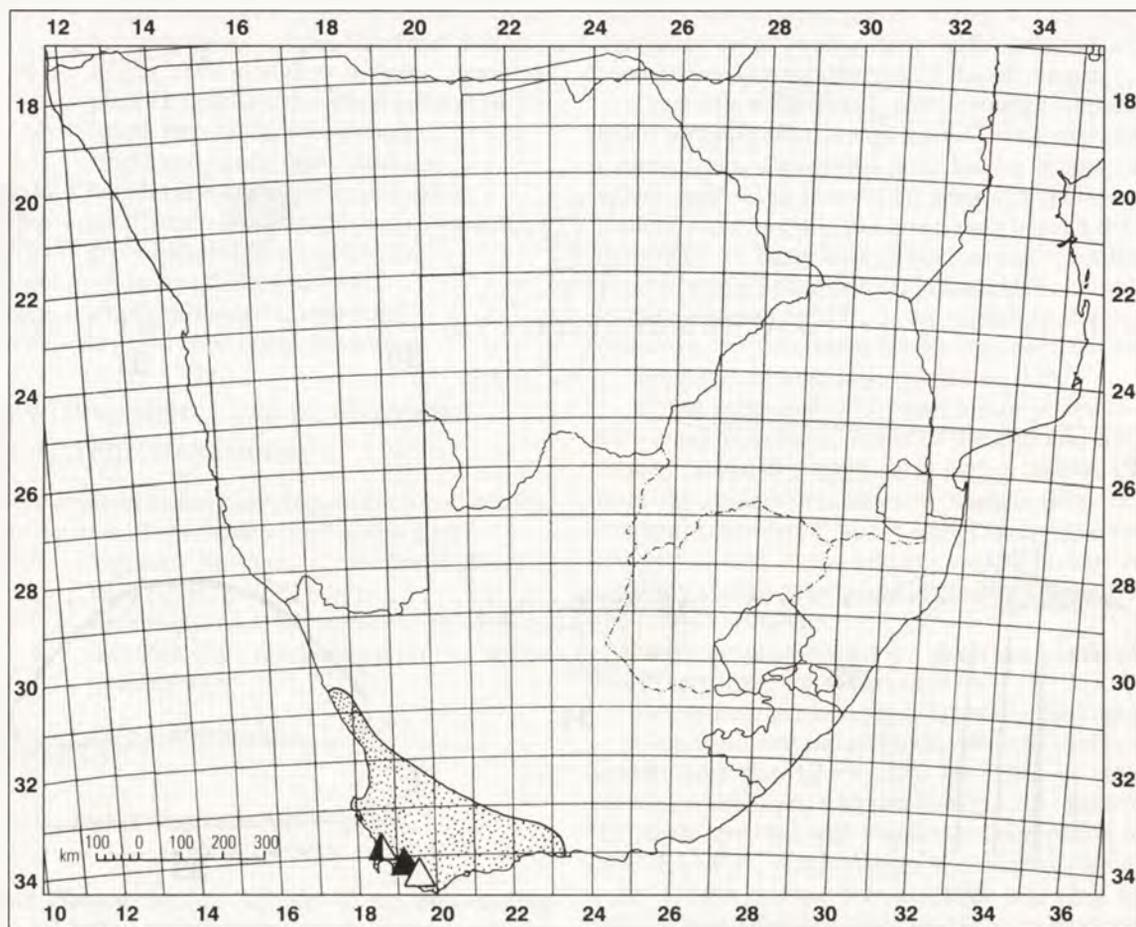


Figure 39. Distribution of *Atrocates nudus* sp. nov. (solid triangle), *A. gansbaaiensis* sp. nov. (open triangle) and *A. medvedevi* sp. nov. (solid/open triangle), genus *Atrocates* (dotted area).

rately). Egg elongate-ovate, whitish, 1.1 mm wide and 2.0 mm long; larva 3.2 mm long.

*Atrocates nudus* sp. nov.  
(Figs 15–28, 39)

**Name derivation.** Latin adjective, *nudus*: bare.

**Locus typicus.** Maanshijkop (South Africa, Cape Province).

**Diagnosis.** The species resembles *A. medvedevi* and *A. largus* in the structure of the male fore and mid tibia (simple, without denticles) and elytral intervals (flat).

Male fore femora (bare, Fig. 26) and structure of the elytral rows at apex (disappeared, Fig. 17) distinguish *nudus* from *medvedevi* and *largus*.

**Description.** Measurements. Body length 9.3 mm, pl/pb = 0.63, el/eb = 1.37, el/pl = 2.30, eb/pb = 1.03.

Head as in Fig. 18. Clypeus with shallow emargination (ed/ew = 5.0). Genal canthus equal to eyes. Eye between tempus and genal canthus very narrow (2 ommatidia visible), circumocular depression shallow. Antenna moderately long (al/apl = 0.80, al/was3 = 10.0), 3<sup>rd</sup> antennomere short (as3/as2 = 2.1), distal segments (antennomere 7–11) even-

ly widened (Fig. ). Mentum and submentum as in Fig. 19; last segment of maxillary palp moderately wide (mp/as3 = 1.2); hipostoma simple near maxillary articulation.

Pronotum with rounded sides (Fig. 15); pronotal disc evenly convex, without depression near lateral border; puncturation practically invisible; anterior angles moderately protruding anteriorly (pl/lapa = 9.1), posterior angles slightly rounded, not protruding beyond the level of the middle of base; base almost straight; border of the anterior margin entire; lateral border moderately wide in the middle (lpbor/was3 = 1.0), widened basally; basal border very narrow, entire.

Scutellum wide at base (pkp/st = 3.2).

Elytra with deep and regular striae (punctate-sulcate), disappeared on apex; intervals smooth, flat; elytra slightly tucked in posteriorly (a part of interval IX visible from the underside); anterior margin almost straight (Fig. 16), unbordered, upper edge forming gradual slope; elytral humeri rounded and slightly protruding outwards, situated at the level of scutellum; apical part as in Fig. 17.

Metasternum between the insertions of mid and hind coxae short (metl/cavl = 5.6).

Metepisternum rectangle and very short (ml/mw = 2.4).

Legs, male fore and mid tarsi widened, hind tarsi moderately long (tars1/2 = 2.1); fore tibia strongly triangularly widened towards apex (ftibl/ftibw = 2.4), with longitudinal ridge and concavity on inner side (Figs 21–22); mid tibia slightly widened, with no apical denticle, outer margin with 2 ridges (Figs 23–24); hind tibia as in Fig. 25, inner spur moderately long (dtk/dod = 1.8); fore femur widened and bare on inner side (Fig. 26).

Abdominal ventrities smooth; bordering of the last abdominal ventrite entire; process of I abdominal ventrite narrow (pav/pm ca. 1.6).

Male genitalia as in Figs 27–28, lmb/la = 5.5, lbp/lap = 2.6, apical part of aedeagus tapered, aedeagal lacinia not protruding beyond lateral margins of apical part, connection apical part of tegmen/lacinia oblique.

**Types.** Holotype (male), JFC: "S. Afr. Cape Prov., Maanshijkop, 7 miles E Hermanus, 21.XII.50, No 93; Swedish South Africa Expedition 1950–1951, Brinck – Rudebeck".

**Distribution.** South Africa (Cape Province: Maanshijkop) (Fig. 39).

*Atrocrates gansbaaiensis* sp. nov.  
(Figs 29–39)

**Name derivation.** The species is named after its locus typicus.

**Locus typicus.** "Gans Bay" [Gansbaai] (South Africa, Cape Province).

**Diagnosis.** The species is similar to *A. medvedevi*, *A. nudus* and *A. largus* in the structure of elytral intervals (flat) and rows (striae regular, nearly sulcate, with very small punctures)

*A. gansbaaiensis* differs from above mentioned species in the shape of the head (strongly widened genal canthus, Fig. 31) and pronotal puncturation (distinct, well visible near lateral border, Fig. 30).

**Description.** Measurements. Body length 10.0 mm, strongly widened – pl/pb = 0.58 and el/eb = 1.12, el/pl = 2.08, eb/pb = 1.07.

Head as in Fig. 31. Clypeus with shallow emargination (ed/ew = 9.0). Genal canthus distinctly wider than eyes. Eye between tempus and genal canthus very narrow (2 ommatidia visible), circumocular depression present and connected with narrow groove situated posteriorly. Mentum with short lateral wings, mid part short and narrowing anteriorly, median keel narrow; submentum triangle (Fig. 34). Last segment of maxillary palp narrow wide (mp/as3 = 1.0). Hipostoma near maxillary articulation simple.

Pronotum as in Fig. 32, with slightly rounded sides; pronotal disc flattened, puncturation dense and well visible near lateral border; anterior angles moderately pro-

truding anteriorly (pl/lapa = 8.0), posterior angles right, not protruding beyond the level of the middle of base; border of the anterior margin disappeared in the middle; lateral border moderately wide (lpbor/was3 = 0.9), slightly widened basally; base straight, with narrow border.

Scutellum wide at base (pkp/st = 3.3).

Elytra, anterior part as in Fig. 32; striae sulcate (deep and regular); intervals flat and smooth; elytra not tucked in posteriorly; anterior margin (base) almost straight, unbordered, upper edge forming gradual slope; elytral humeri rounded and slightly protruding outwards, situated below the level of scutellum.

Metasternum between the insertions of mid and hind coxae short (metl/cavl = 5.6).

Metepisternum rectangle and very short (ml/mw = 2.3).

Legs (female), hind tarsi moderately long (tars1/2 = 2.5); fore tibia strongly triangularly widened towards apex (ftibl/ftibw = 2.1) (Fig. 35); outer margin of mid tibia with 2 ridges (Fig. 36); hind tibia as in Fig. 37, inner spur moderately long (dtk/dod = 1.3); fore femur widened.

Abdominal ventrities with moderately dense and large puncturation; bordering of the last abdominal ventrite entire (Fig. 33); process of I abdominal ventrite narrow (pav/pm = 1.7).

Female genitalia, ovipositor as in Fig. 38, lfb/lo = 5.9, paraproct longer than coxites (p/c = 1.1); coxites triangle (tc/2bc1 = 1.0), first plate moderately narrow (bc1/lc1 = 1.3) and long (c1/c2 = 1.3), distance between base of plates third and fourth long (c3/c3-c4 = 2.0), fourth plate longitudinal, apical free part of fourth plate short (c1/c4-c3 = 0.21), gonostylus present; bursa copulatrix with no sclerite, spermatheca branched from the base, with narrow ducts, spermathecal accessory gland present.

**Types.** Holotype (female), ZMS: "Gans Bay, Cape Colony, H. Skoog; Naturhistoriska Riksmuseet Stockholm; Julio Ferrer".

**Distribution.** South Africa (Cape Province: Gansbaai) (Fig. 39).

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