

**Contribution to the knowledge of genus *Attagenus* (Coleoptera: Dermestidae)
from South Africa.**

The complex of *Attagenus capensis* with description of five new species

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Abstract. Five new species *Attagenus capronatus*, *A. constantini*, *A. muelleri*, *A. pseudocapensis* and *A. schawalleri* spp. nov. from Republic of South Africa, are described, illustrated and compared with related species. An identification key to the known South African species belonging to the “*capensis*” species complex is also provided.

INTRODUCTION

The South African species of the genus *Attagenus*, as well as most other genera of the family Dermestidae in this region, have been neglected by taxonomists for almost a century. There has been some research by Vladimír Kalík (Czech Republic), who worked on describing Afrotropical materials. Despite discovering many new species, he never published any description other than one for *Attagenus holmi*, which he co-authored with Jiří Háva in 2005. As a result, a lot of South African dermestids labelled by Kalík as type specimen have been deposited in the collections of several museums but because of their missing descriptions their names are not officially recognized (per International Code of Zoological Nomenclature - ICZN 1999). The authors of this paper have described several new species of the genus *Attagenus* since 2004 and are continuing Kalík's work (Háva, 2005, Kalík & Háva 2005, Kadej 2006, Herrmann & Háva 2007, Háva 2008, Háva & Kadej, 2008, Herrmann & Háva 2014).

The genus *Attagenus* Latreille, 1802 is one of the most numerous genera within the Dermestidae family and currently includes more than 200 species (Háva 2015), including 24 species that have been recorded in South Africa so far. The authors describe five new species of this genus in the present paper.

MATERIAL AND METHODS

Morphological structures were etherized and boiled for 3-10 minutes in 10% KOH, and placed in distilled water for ~1 hour to clean and soften the cuticle. All structures were placed on glycerol mounts. Morphological structures were examined with a Nikon Eclipse E 600 phase contrast microscope with a drawing tube, and a Nikon SMZ-800 binocular microscope.

The terminology used in this paper follows Lawrence and Ślipiński (2010) and Kadej & Háva (2014). The systematic classification follows Háva (2015). Separate labels are indicated by a slash (/). Author's remarks are shown in square brackets [].

Repositories:

AHEC private collection of Andreas Herrmann, Stade, Germany;

JHAC Private entomological laboratory and collection, Jiří Háva, Prague-west, Czech Republic;

SMNS Staatliches Museum für Naturkunde, Stuttgart, Germany;

TMSA Transvaal Museum, Pretoria, South Africa.

The size of the beetles and of their body parts can be useful in species recognition - the following abbreviations were used in this study:

total length (TL) - linear distance from anterior margin of pronotum to apex of elytra

pronotal length (PL) - maximal length measured from anterior margin to posterior margin

pronotal width (PW) - maximal linear transverse distance

elytral length (EL) - linear distance from shoulder to apex of elytron

elytral width (EW) - maximal linear transverse distance

The specimens of the described species are provided with red, printed labels showing the following text: „HOLOTYPUS [respectively PARATYPUS] *name of taxon* sp. n., A. Herrmann, M. Kadej & J. Háva det. 2015”.

RESULTS

Attagenus pseudocapensis sp. nov.

(Figs. 1-4)

Type material. Holotype (♂) labelled: „South Africa, West Cape, Botrivier 5 km West Houhoek pass 2 km W 34° 12' S, 19° 08' E, 250 m, 03.11.2003, R. Constantin”, (AHEC). Paratypes: (1 ♀), labelled with the same record data as the holotype, (AHEC); (14 spec.) labelled: “RSA Western Cape, Greyton env., 22.xi.202, M. Snižek lgt., (JHAC); (7 spec.) labelled: “S. Africa, Cape prov., Distr. Greyson, 1-8.xi.1994, C.A. v Nidek lgt., (JHAC).

Description. Body entirely black on dorsal and ventral surface; robust, oval (Fig. 1). Body measurements (in mm): TL 3.8, PL 1.2, PW 2.2, EL 3.1, EW 2.3. Head with dense and coarse punctation, sparsely covered with more or less recumbent dark hairs; palpi darkish brown. Eyes large with short and erect microsetae. Median ocellus distinctly present on front. Antennae entirely black, 11-segmented, the last three segments forming a distinct club covered by dense somewhat recumbent brown pubescence; the terminal segment roundabout twice as long as the two preceding combined (Fig. 2); shaft somewhat longer than the club,



Figs. 1-4. *Attagenus pseudocapensis* sp. nov.: 1- habitus; 2- antenna of male; 3- abdomen; 4- male genitalia.

sparsely provided with some strong, erected brown hairs. Pronotum sparsely and finely punctured on disk, covered with more or less recumbent darkish hairs, on the lateral parts several strong white hairs are intermixed; density of punctures and pubescence increases very much towards the lateral margins; lateral margins smooth, untoothed, not visible from above; apical margin with a distinct fringe of straight short brown hairs. Scutellum small, black and triangular, with the same kind of punctures and pubescence as in the elytra. Elytra black, covered quite densely by long, dark recumbent hairs, punctures coarse and dense, partly invisible because of the dense pubescence: lateral margins smooth, untoothed; humeri with a little distinct bump. Each elytra with spots of strong white hairs, which form roughly two interrupted transverse fasciae, one from the scutellum to the hind edge of the bump, the other at the beginning of the apical third of the elytra. Epipleura black, sparse and coarsely punctured, with a few recumbent dark long hairs. Legs robust, black to darkish brown, covered with recumbent, short brown hairs. All tibiae with several rows of strong black spines at their lateral margins, Tarsi quite long, nearly as long as the tibiae, darkish brown to black. Claws light brown. Mesosternum black, sparsely punctuate, densely covered with fine recumbent whitish hairs. Abdominal sternites black, very densely and finely punctuate, covered with recumbent brown hairs (Fig. 3). Male genitalia (Fig. 4).

Sexual dimorphism. Habitus of the female similar to male, but body somewhat bigger. The white spots on the elytra bigger and fasciae more distinct, antenna club smaller in relation to that of the male.

Variability. Variation in size: TL 3.8-4.5, EW 2.3-2.7.

Differential diagnosis. The new species differs from the similar *Attagenus capensis* mainly by the broad and robust form of its body and reduced spots respectively fasciae of intermixed white hairs. It differs from all known South African species of the capensis-group by the morphological characters mentioned in the key below.

Name derivation. The specific epithet „pseudocapensis“ refers to morphological similarity of new species to *Attagenus capensis*.

Attagenus constantini sp. nov.

(Figs. 5-7)

Type material. Holotype (♀) labelled: „ S.Africa, Western Cape, Cederberg, Oukraal se Kloof, Clanwilliam 20 km South, 32° 18' S, 19° 00' E, 240m, 21.10.2003, R.Constantin”, (AHEC). The specimen misses its left hind leg as well as the tarsus of the left middle leg. Paratypes: (1 ♀), labelled: “S.Africa, Western Cape, Seweweekspoort, 10 km E, 12 km W Gamkapoortdam, 33° 20' S, 21° 31' E, 656 m, 18.10.2002, R.Constantin”, (AHEC).

Description. Body entirely black on dorsal and ventral surfaces; elongate oval (Fig. 5). Body measurements (in mm): TL 3.2, PL 0.7, PW 1.7, EL 2.5, EW 1.8. Head shiny black with several coarse punctures, sparsely covered with more or less recumbent bright hairs, a few erect brown hairs are intermixed; palpi darkish brown. Eyes large with short and erect microsetae. Median ocellus distinctly present on front. Antennae entirely black, 11-segmented, the last three segments forming a distinct club covered densely by somewhat recumbent brown pubescence; the terminal segment notably longer than the two preceding ones (Fig. 6); shaft somewhat longer than the club, sparsely provided with some strong, erect brown hairs. Pronotum sparsely and finely punctured on disk, density of puncture increases towards the margins; covered with more or less suberect brown hairs, especially on the lateral parts several spots of recumbent strong white hairs are intermixed; lateral margins smooth, untoothed, not visible from above. Scutellum small, black and triangular, with the same kind of punctures and pubescence as in the elytra. Elytra black, covered sparsely by long, darkish-brown suberect hairs, punctures quite fine and not very dense, density of puncture increases towards the margins; lateral margins smooth, untoothed; humeri with a little indistinct bump. Elytra with spots of strong and more or less recumbent white hairs, which form roughly two interrupted transverse fasciae, one from the scutellum to the hind edge of the bump, the other at the beginning of the apical third of the elytra; some of such hairs are intermixed also at the anterior margin and the apex. Epipleura black, with the same kind of punctures



Figs. 5-7. *Attagenus constantini* sp. nov.: 5- habitus; 6- antenna of female; 7- abdomen.

and pubescence as in the elytra. Legs darkish brown, covered sparsely with recumbent, light brown hairs. All tibiae with rows of strong black spines at their lateral margins, Hind and middle tarsi quite long, roundabout as long as the tibiae, front tarsi distinctly shorter than the tibiae. Claws light brown. Mesosternum shiny black, sparsely punctuate, with a very few fine recumbent whitish hairs. Abdominal sternites black to darkish brown, dense and coarsely punctuate, covered quite densely with recumbent short brown hairs (Fig. 7).

Sexual dimorphism. Male unknown.

Differential diagnosis. The new species differs from the similar *Attagenus capensis* mainly by the elongate form of the body, the more erect pubescence and the reduced spots or fasciae of intermixed white hairs. It differs from all known South African species of the *capensis*-group by the morphological characters mentioned in the key below.

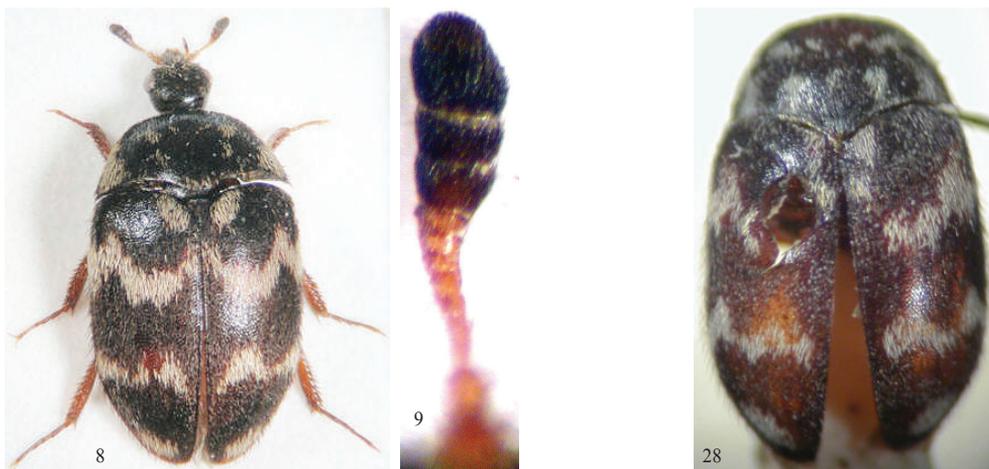
Name derivation. The epithet is a patronym honouring Robert Constantin (Saint-Lo, France) - the collector of the new species.

Attagenus schawalleri sp. nov.

(Figs. 8-9)

Type material. Holotype (♀) labelled: „S. Africa, J. Klapperich, Prov. Transvaal, Waterfal-Bo, 24.11.81” , (SMNS). The handwriting isn't readable very clearly on the labels.

Description. Body entirely black on dorsal and ventral surface, the cuticle in the elytral fasciae is somewhat brownish lightened; longish oval (Fig. 8). Body measurements (in mm): TL 3.7, PL 1.0, PW 2.1, EL 3.0, EW 2.3. Head shiny black, with dense and distinct punctation, sparsely covered with suberect brown hairs; palpi darkish brown. Eyes large with short and erect microsetae. Median ocellus distinctly present on front. Antennae 11-segmented, the last three segments forming a distinct club covered dense by recumbent short pubescence (Fig. 9); shaft nearly twice as long as the entirely black club, light brown to yellow, sparsely provided with some strong, erect brown hairs. Pronotum sparsely and finely punctured on disk, density of puncture increases towards the margins; covered with recumbent dark brown hairs and spots of recumbent light brown hairs, located beneath the disk and the apical margin; its lateral margins are covered by light brown hairs too, they are smooth, untoothed, and not visible from above. Scutellum small, black and triangular, with the same kind of punctures and pubescence as in the elytra. Elytra black, covered sparsely by long, darkish-brown recumbent hairs, puncture quite coarse and dense, density of punctures increases even more towards the margins; lateral margins smooth, untoothed; humeri with a little bump. Each elytron with two spots and two undulated transverse fasciae of recumbent light brown hairs. The anterior fascia starts laterally beyond the shoulder and ends at the first third of the suture, whilst the apical fascia separates the apical third of the elytra from the rest, this fascia doesn't reach the suture. The anterior spot surrounds the scutellum and the apical spot is located near the hind edge of the elytra, reaching neither the suture nor the apical margin. Epipleura black, with the same kind of punctures and pubescence as in the elytra. Legs brown, covered with slightly erect light brown hairs. All tibiae with rows



Figs. 8-9, 28. *Attagenus schawalleri* sp. nov.: 8- habitus; 9- antenna of female; 28- *Attagenus thunbergi* Mroczkowski, 1968, habitus.

of strong dark brown spines at their lateral margins, Tarsi long, roundabout as long as the tibiae. Claws light brown. Mesosternum black, covered quite densely with exactly the same recumbent light brown hairs as in the spots and fasciae of the elytra. Abdominal sternites darkish brown, densely and coarsely punctate, covered with recumbent brown hairs.

Sexual dimorphism. Male unknown.

Differential diagnosis. The new species differs from the similar *Attagenus thunbergi* mainly by the broader and flatter form of the pronotum as well as by the colour of the spots or fasciae which is light brown instead of white. It differs from all known South African species of the *capensis*-group by the morphological characters mentioned in the key below.

Name derivation. The epithet is a patronym honouring Wolfgang Schawaller (SMNS) - a specialist in Tenebrionidae (Coleoptera), who supported us by loaning the research material and providing other relevant information.

***Attagenus capronatus* sp. nov.**

(Figs. 10-12)

Type material. Holotype (♂) labelled: „S. Afr., Namaqualand, Gemsbock Vlake farm, 30.30 S - 17.25 E, 2.9.1977; E-Y:1371, singled, leg. Endrödy-Younga” (TMSA). The final segment of its left antenna is missing.

Paratypes: (1 ♂) labelled: “RSA, N Cape SE, Groenriviersmond coast, 15.x.1999, M. Snižek lgt., (JHAC).

Description. Body entirely black on dorsal and ventral surfaces; longish oval (Fig. 10). Body measurements (in mm): TL 3.3, PL 0.8, PW 1.6, EL 2.7, EW 1.7. Head shiny black, with dense and coarse punctation, sparsely covered with suberect dark hairs; palpi darkish brown. Eyes large with short and erect microsetae. Median ocellus distinctly present on front. Antennae 11-segmented, the last three segments forming a distinct club covered densely by recumbent short and brown pubescence; the terminal segment roundabout four times as long as the two preceding ones combined (Fig. 11); shaft as long as the entirely black club, dark brown, sparsely provided with some strong, erect brown hairs. Pronotum sparsely and finely punctured on disk, density of puncture increases towards the margins; covered with somewhat suberect brown hairs and spots of recumbent strong white hairs, four of those spots are quite big and located at the apical margin, six smaller spots are building an interrupted transverse fascia in the middle; lateral margins smooth, untoothed, not visible from above. Scutellum small, black and triangular, with the same kind of punctures and pubescence as in the elytra. Elytra black, covered sparsely by long, darkish-brown suberect hairs, punctures quite coarse and dense, density of punctures increases even more towards the margins; lateral margins smooth, untoothed; humeri with a little indistinct bump. Elytra with spots of strong and more or less recumbent white hairs, which form roughly two interrupted transverse fasciae, one from the scutellum to the hind edge of the bump, the other at the beginning of the apical third of the elytra. Epipleura black, with the same kind of punctures and pubescence as in the elytra. Legs darkish brown, covered sparsely with recumbent, light brown hairs. All tibiae with rows of strong black spines at their lateral margins. Tarsi long, roundabout as long as the tibiae. Claws light brown. Mesosternum black, covered quite densely with recumbent brown and whitish hairs. Abdominal sternites black to darkish brown, dense and coarsely punctuate, covered with recumbent brown hairs. Male genitalia (Fig. 12).

Sexual dimorphism. Female unknown.

Differential diagnosis. The new species differs from the similar *Attagenus capensis* mainly



Figs. 10-12. *Attagenus capronatus* sp. nov.: 10- habitus; 11- antenna of male; 12- male genitalia.

by the more elongate form of the body, the missing apical spot and the extremely enlarged last segment of the antenna club. It differs from all known South African species of the capensis-group by the morphological characters mentioned in the key below.

Name derivation. The specific epithet is a “capronotus” which is derived from (relatively seen) long and strong hairs of the white elytral spots. The word “capronatus“ is a Latin expression for scraggy or villous.

***Attagenus muelleri* sp. nov.**

(Figs. 13-16)

Type material. Holotype (♂) labelled: „S. Afr., S.W. Cape, Yzerfontein, 8km N, 33.15 S – 18.11 E, 25.8.1983; E-Y:1979, grassnetting, leg. Endrödy, Penrith”, (TMSA). Paratypes: (1 ♀) labelled: „S. Afr., S.W. Cape, Yzerfontein, 8km N, 33.15 S-18.11 E, 25.8.1983; E-Y:1979, grassnetting, leg. Endrödy, Penrith”, (TMSA); (1 ♀) labelled: „S. Afr., Namaqualand, Kleinzee, 50 km S, 30.10 S - 17.14 E, 10.9.1987; E - Y: 2487, shore and sandy coast, leg. Endrödy-Younga”, (TMSA); (1 ♀) labelled: „S. Afr., Namaqualand, Gemsbok Vlakte Farm, 30.30 S - 17.25 E, 2.9.1977; E - Y: 1371, singled, leg. Endrödy-Younga”, (TMSA); (53 spec.) labelled: “RSA W Cape, S of Barrydale, 16.xii.202, M. Snižek lgt., (JHAC); (1 ♂): RSA: Western Cape, West Coast Ntl. Pk., Duinepos, 33°11'40”S, 18°8'18”E, 0 m, 6-8 Sep 2013, S. A. Marshall, (AHEC).

Description. Body entirely black on dorsal and ventral surfaces; longish oval (Fig. 13). Body measurements (in mm): TL 3.0, PL 0.8, PW 1.5, EL 2.3, EW 1.7. Head black, with dense and coarse punctation, sparsely covered with suberect brown hairs; palpi darkish brown. Eyes large with short and erect microsetae. Median ocellus distinctly present on front. Antennae entirely black, 11-segmented, the last three segments forming a distinct club densely covered by recumbent short and brown pubescence; the terminal segment roundabout one and half times as long as the two preceding ones combined (Fig. 14); shaft a little bit longer than the club, sparsely provided with some strong, erect brown hairs. Pronotum sparsely and finely punctured on disk, density of punctures increases towards the margins; covered with somewhat recumbent brown hairs and spots of recumbent strong white hairs, four of those spots are quite big and located at the apical margin, six smaller spots are building an



13

14

15

16

Figs. 13-16. *Attagenus muelleri* sp. nov.: 13- habitus; 14- antenna of male; 15- andomen; 16- male genitalia.

interrupted transverse fascia in the middle; lateral margins smooth, untoothed, not visible from above. Scutellum small, black and triangular, with the same kind of punctures and pubescence as in the elytra. Elytra black, covered sparsely by long, darkish-brown suberect hairs, punctures quite coarse and dense, density of puncture increases even more towards the margins; lateral margins smooth, untoothed; humeri with a small indistinct bump. Elytra with spots of strong and recumbent white hairs, which form roughly two interrupted transverse fasciae, one from the scutellum to the hind edge of the bump, the other at the beginning of the apical third of the elytra; furthermore building an apical spot and some indistinct spots located at the anterior margin. Epipleura black, with the same kind of punctures and pubescence as in the elytra. Legs darkish brown, covered sparsely with recumbent, light brown hairs. All tibiae with rows of strong black spines at their lateral margins, Tarsi long, roundabout as long as the tibiae. Claws light brown. Mesosternum black, covered quite densely with recumbent bright hairs. Abdominal sternites black to darkish brown, dense and coarsely punctuate, covered with recumbent brown hairs (Fig. 15). Male genitalia (Fig. 16).

Sexual dimorphism. Female similar to male, but with smaller antenna club, last segment not as much enlarged.

Variability. Variation in size: TL 2.9-3.0, EW 1.6-1.7.

Differential diagnosis. The new species differs from the similar *Attagenus capensis* mainly by its narrower form of the body, broader pronotum in relation to its length, less erect pubescence of the surface and male genitalia, the aedeagus being nearly as long as the parameres; furthermore the whole genitalia is much smaller in size. It differs from all known South African species of the *capensis*-group by the morphological characters mentioned in the key below.

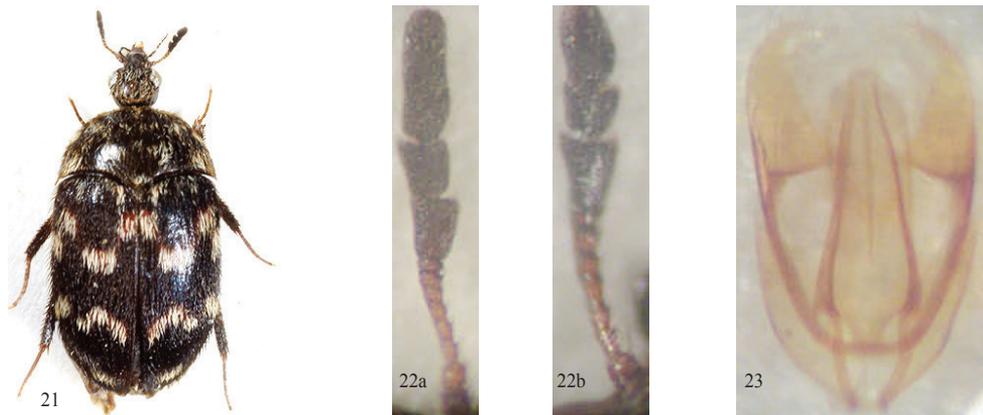
Name derivation. The name of the new species is dedicated to Ruth Müller (TMSA), who supported us by loaning the research material and providing other relevant information.

IDENTIFICATION KEY FOR THE *ATTAGENUS CAPENSIS* SPECIES GROUP

- 1 Intermixed white hairs on elytra build predominantly spots 4
- Intermixed white hairs on elytra build predominantly fasciae 2
- 2 Body narrow. Surface of the elytra with suberect long dark hairs 3
- Body broader, more robust. Surface of the elytra with short procumbent hairs 8
- 3 Averagely smaller; each elytra with two fasciae of suberect white hairs. Tibiae long and narrow, covered sparsely with thin and short thorns. Abdomen narrower, covered with greyish hairs (so far only females are known). 2.9-3.1 mm. *A. constantini* sp. nov.
- Averagely larger; each elytron with two fasciae of procumbent white hairs. Tibiae shorter and broader, covered more densely with strong and longer thorns. Abdomen broader, covered with brown hairs. 3.3 mm 7
- 4 Pubescence of the surface black, cuticle of the elytra also entirely black 5
- Pubescence of the surface dark brown, cuticle of the elytra directly underneath the white spots of hairs reddish brw 6
- 5 Body slightly elongate (Figs. 17-18). Male antenna as in (Fig. 19), genitalia as in (Fig. 20). 3.4-3.8 mm *A. capensis* Reitter, 1881
- Body robust, oval. White spots on the elytra reduced (Fig. 1). Male antenna as in (Fig. 2), genitalia as in (Fig. 4). 3.9-4.4 mm *A. pseudocapensis* sp. nov.
- 6 Hairs longer, stronger and denser, a little bit erect (Figs. 24-25). Male antenna shorter, shaft dark brown (Fig. 26), abdomen with dark pubescence, genitalia (Fig. 27). 3.4-4.2 mm *A. albonotatus* Pic, 1927



Figs. 17-20. *Attagenus capensis* Reitter, 1881: 17- habitus of male; 18- habitus of female; 19- antenna of male; 20- male genitalia.



Figs. 21-23. *Attagenus fasciatopunctatus* Reitter, 1881: 21- habitus; 22a- antenna of male; 22b- antenna of female; 23- male genitalia.



Figs. 24-27. *Attagenus albonotatus* Pic, 1927: 24- habitus of male; 25- habitus of female; 26a- antenna of male; 26b- antenna of female; 27- male genitalia.

- Hairs a little bit shorter, less strong and sparser (Fig. 21). Male antenna more elongate, shaft light brown (Fig. 22), abdomen with silver greyish pubescence, genitalia (Fig. 23). 3.0-3.6 mm..... *A. fasciatopunctatus* Reitter, 1881
- 7 Last antennal segment more elongate (width to length 1:3.3), four times as long as the two preceding ones combined; they are much broader in relation to their length. Hairs on pronotum and elytra are stronger and somewhat more erect. 3.3 mm..... *A. capronatus* sp. nov.
- Last antennal segment less elongate (width to length 1:1.9), only one and a half times as long as the two preceding ones combined; they are much larger and less broad in relation to their length. Hairs on pronotum and elytra more tender and recumbent. 3.0 mm..... *A. muelleri* sp. nov.
- 8 Body somewhat parallel or very slightly egg-shaped near the middle (Fig. 28). Pronotum bulged, anterior fascia not complete, more or less divided into spots. Fasciae consist of white hairs, both not reaching elytral suture. 4 mm..... *A. thunbergi* Mroczkowski, 1968
- Body more or less regularly oval (Fig. 8). Pronotum not bulged, anterior fascia complete, reaching the suture; hind fascia also not divided into spots, but interrupted at the suture. 3.8 mm. *A. schawalleri* sp. nov.

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