



### **A new species of the endemic South African spider genus *Austrachelas* (Araneae: Gallieniellidae) and first description of the male of *A. bergi***

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The Gallieniellidae is a small family of ground-dwelling gnaphosoid spiders with a Gondwanan distribution, currently including 10 genera and 55 species (World Spider Catalog 2017). The composition of the group remains unresolved, as different phylogenies have either supported (Platnick 2002; Haddad *et al.* 2009) or disputed (Ramírez 2014; Wheeler *et al.* in press) its monophyly.

Presently, *Austrachelas* Lawrence, 1938 is one of four genera recorded from the Afrotropical Region. *Austrachelas* and *Drassodella* Hewitt, 1916 are both endemic to South Africa (Tucker 1923; Haddad *et al.* 2009; Mbo 2017), while *Gallieniella* Millot, 1947 and *Legendrena* Platnick, 1984 are endemic to Madagascar (Platnick 1984, 1990, 1995). Amongst the Afrotropical genera, only *Austrachelas* has been revised to date (Haddad *et al.* 2009). In the current study, the unknown male of *A. bergi* Haddad, Lyle, Bosselaers & Ramírez, 2009 is described for the first time, new distribution records are presented for this species, and a new species, *A. entabeni* sp. nov., is described from the northern parts of the Limpopo Province of South Africa, representing the northern-most records of the genus.

The specimens examined in the current study are all deposited in the California Academy of Sciences in San Francisco, U.S.A. (CAS) and are preserved in 70% ethanol. The specimens were studied using a Nikon SMZ800 stereomicroscope. The female epigynes and male palps of individual specimens were dissected using insect pins and cleaned in a Labcon 5019U ultrasonic bath in 70% ethanol. Measurements of structures were taken from one specimen of each sex, as indicated, and are given in millimetres (mm). Leg spination follows the format of Bosselaers and Jocqué (2000).

Digital photographs of somatic and genitalic structures were taken using a Nikon D5-L3 camera system attached to a Nikon SMZ800 stereomicroscope. To increase depth of field, a series of images was taken and stacked using the CombineZM imaging software (<http://www.hadleyweb.pwp.blueyonder.co.uk>). CorelDraw X7 was used to trace the genitalic structures, which were used as a template for the line drawings.

The following abbreviations are used in the descriptions: AER—anterior eye row; AL—abdomen length; ALE—anterior lateral eye; AME—anterior median eye; AW—abdomen width; CH—clypeus height; CL—carapace length; CW—carapace width; do—dorsal; FL—fovea length; PER—posterior eye row; PERW—posterior eye row width; pl—prolateral; PLE—posterior lateral eye; plv—prolateral ventral; PME—posterior median eye; rl—retrolateral; rlv—retrolateral ventral; SL—sternum length; ST—spermatheca; SW—sternum width; TL—total length; vt—ventral terminal.

#### **Gallieniellidae Millot, 1947**

##### ***Austrachelas* Lawrence, 1938**

*Austrachelas* Lawrence, 1938: 504; Dippenaar-Schoeman & Jocqué, 1997: 128; Haddad, Lyle, Bosselaers & Ramírez, 2009: 16.

Type species: *Austrachelas incertus* Lawrence, 1938, by original designation.

**Diagnosis and description.** see Haddad *et al.* (2009).

##### ***Austrachelas entabeni* sp. nov. (Figs 1–3, 6, 7)**

**Diagnosis.** Females of *A. entabeni* sp. nov. are most closely related to *A. bergi*, sharing an elongate anterior epigynal hood (generally broader than long in other congeners). In *A. entabeni* sp. nov. the attachment of the anterior hood diverges anteriorly and the lateral hoods are small (arrows in Fig. 3), while in *A. bergi* the anterior hood is inserted at the

posterior end of a membranous pentagonal anterior concavity, and the lateral hoods are elongate (arrows in Fig. 4). Male unknown.

**Description. Female.** Measurements: CL 3.53, CW 2.55, FL 0.30, SL 1.94, SW 1.45, AL 4.90, AW 2.80, TL 8.35, AME–AME 0.02, AME–ALE 0.01, ALE–ALE 0.22, PME–PME 0.05, PME–PLE 0.08, PLE–PLE 0.46.

Length of leg segments (sequence from femur to tarsus, and total): I  $2.30 + 1.31 + 1.75 + 1.26 + 0.78 = 7.40$ ; II  $2.19 + 1.30 + 1.63 + 1.24 + 0.78 = 7.14$ ; III  $1.85 + 0.99 + 1.12 + 1.38 + 0.73 = 6.07$ ; IV  $2.50 + 1.29 + 1.79 + 2.15 + 0.85 = 8.58$ .

Carapace orange-brown with faint black mottling and radiating striae, slightly paler medially (Fig. 1); AER strongly procurved, laterals larger than medians; AME separated by distance equal to 1/5 their diameter, AME separated from ALE by distance equal to 1/10 AME diameter; clypeus height equal to 4/3 AME diameter at AME, equal to 3/5 ALE diameter at ALE; PER straight, laterals larger than medians; PME separated by distance equal slightly less than 1/2 their diameter, PME separated from PLE by distance slightly more than 1/2 PME diameter. Chelicerae deep red-brown, with coarse transverse ridges; promargin with four teeth, proximal tooth smallest, second tooth largest, third and fourth teeth progressively smaller; retromargin with one small denticle, positioned between second and third promarginal teeth. Sternum and mouthparts bright orange-brown. Legs all orange in colour. Leg spination: femora: I pl 1 do 1, II pl 1 do 1, III pl 2 do 2, IV do 2; patellae: spineless; tibiae: I & II spineless, III pl 2 rl 2 plv 2 rlv 1 vt 2, IV pl 1 rl 2 plv 2 rlv 2 vt 2; metatarsi: I & II spineless, strongly scopulate, III & IV scopulate in distal half, III pl 5 rl 4 plv 1 rlv 1 vt 2, IV pl 5 rl 5 plv 2 rlv 1 vt 2; palp: femora do 2, patellae pl 1, tibiae pl 2 do 2 plv 1, tarsus pl 1 do 2 rl 1 plv 2 rlv 2. Abdomen dark grey dorsally, with creamy-grey chevron markings (Fig. 1); paler grey laterally and ventrally, with dark grey mottled markings and V-shaped mediolateral marking ventrally (Fig. 2); dorsum and venter lacking scutum or other sclerites, except two small pairs of dorsal sigilla and small post-epigastric sclerites. Female epigyne diverging posteriorly, with long narrow tongue-like anterior hood and small lateral hoods (Figs 3, 6); copulatory openings situated medially, just posterior to anterior hood, entrance ducts curving laterally, entering ST 2 on their ventral surface; ST 2 positioned anterolaterally, with broad loop and globose end, connected broadly to adjacent oval posterior ST 1 (Fig. 7).

**Type material.** Holotype ♀: SOUTH AFRICA: *Limpopo*: Soutpansberg Mountains, ca. 20km N of Levubu, Entabeni Forest, 22°59'S, 30°17'E, 1360m a.s.l., leg. C. Griswold, 1–2.XII.1996 (CAS, CASENT 9072373).

**Distribution.** Presently known only from the type locality in the Soutpansberg Mountains in the northern Limpopo Province (Fig. 11). Together with the new distribution data for *A. bergi* presented below, *A. entabeni* sp. nov. extends the range of the genus approximately 300 km to the north of its previously known distribution (Haddad *et al.* 2009). The updated distribution of the genus presented here suggests a possibility that *Austrachelas* may be recorded from Zimbabwe, Swaziland and Mozambique in the future.

### ***Austrachelas bergi* Haddad, Lyle, Bosselaers & Ramírez, 2009 (Figs 4, 5, 8–10)**

*Austrachelas bergi* Haddad, Lyle, Bosselaers & Ramírez, 2009: 17, figs 1, 52, 53.

**Diagnosis.** Females of *A. bergi* share with *A. entabeni* sp. nov. an epigyne with a large tongue-shaped anterior hood, but can be recognized from the latter species by the anterior pentagonal membranous concavity into which the anterior hood is inserted (Fig. 4), which is absent in the latter species (Fig. 3). Males of *A. bergi* are unique in the genus by the presence of a large proximal apophysis and smaller distal dorsal apophysis on the male palpal tibia, in addition to the distal RTA found in all of the species (Figs 5, 8–10).

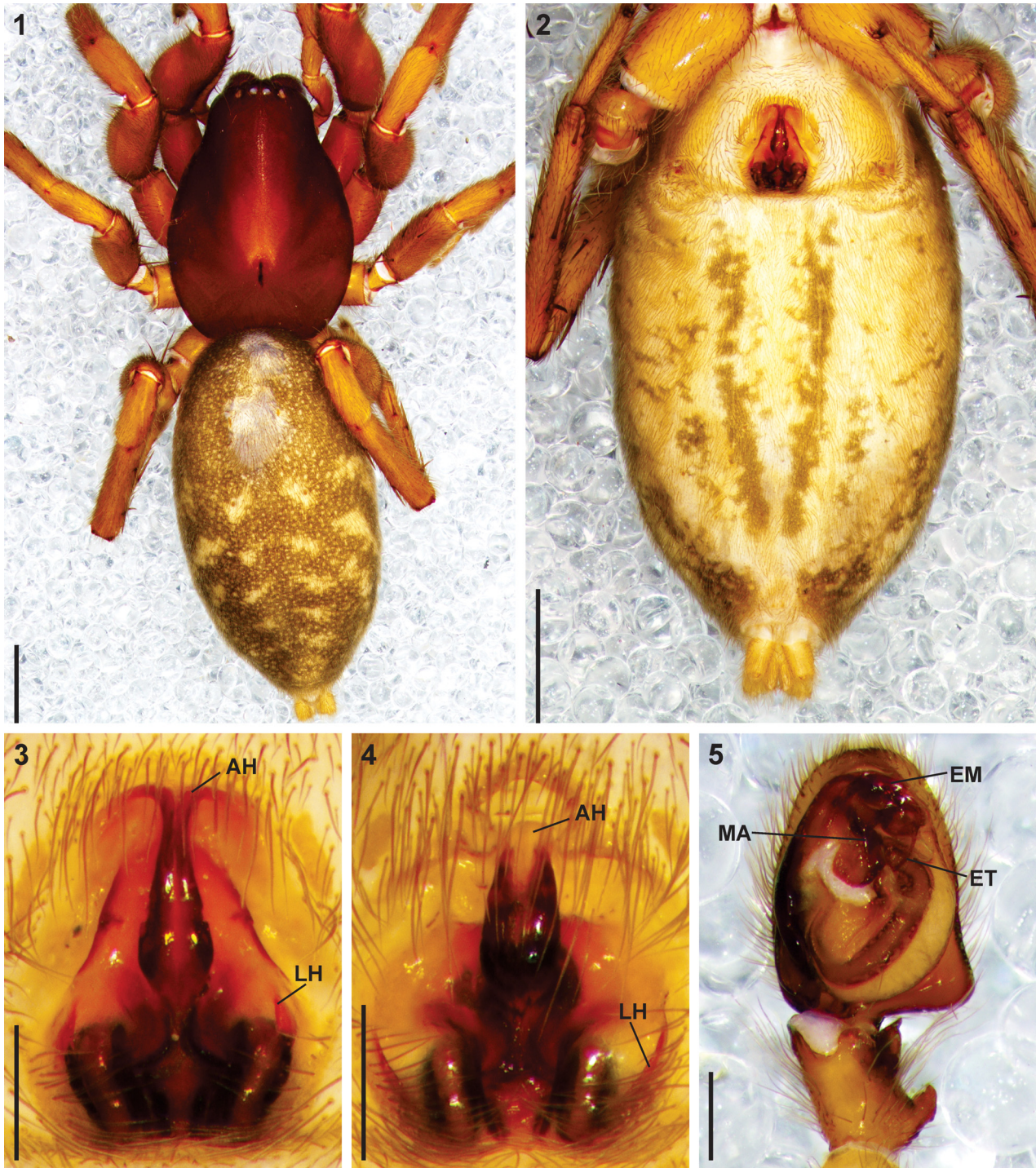
**Description. Female.** Described by Haddad *et al.* (2009).

**Male.** Measurements: CL 3.04, CW 2.20, FL 0.29, SL 1.65, SW 1.30, AL 3.45, AW 2.05, TL 6.50, AME–AME 0.03, AME–ALE 0.01, ALE–ALE 0.22, PME–PME 0.04, PME–PLE 0.07, PLE–PLE 0.38.

Length of leg segments (sequence from femur to tarsus, and total): I  $2.15 + 1.10 + 1.55 + 1.22 + 0.83 = 6.85$ ; II  $1.90 + 1.07 + 1.43 + 1.08 + 0.80 = 6.28$ ; III  $1.65 + 0.88 + 0.95 + 1.26 + 0.73 = 5.47$ ; IV  $2.25 + 1.08 + 1.70 + 2.02 + 0.85 = 7.90$ .

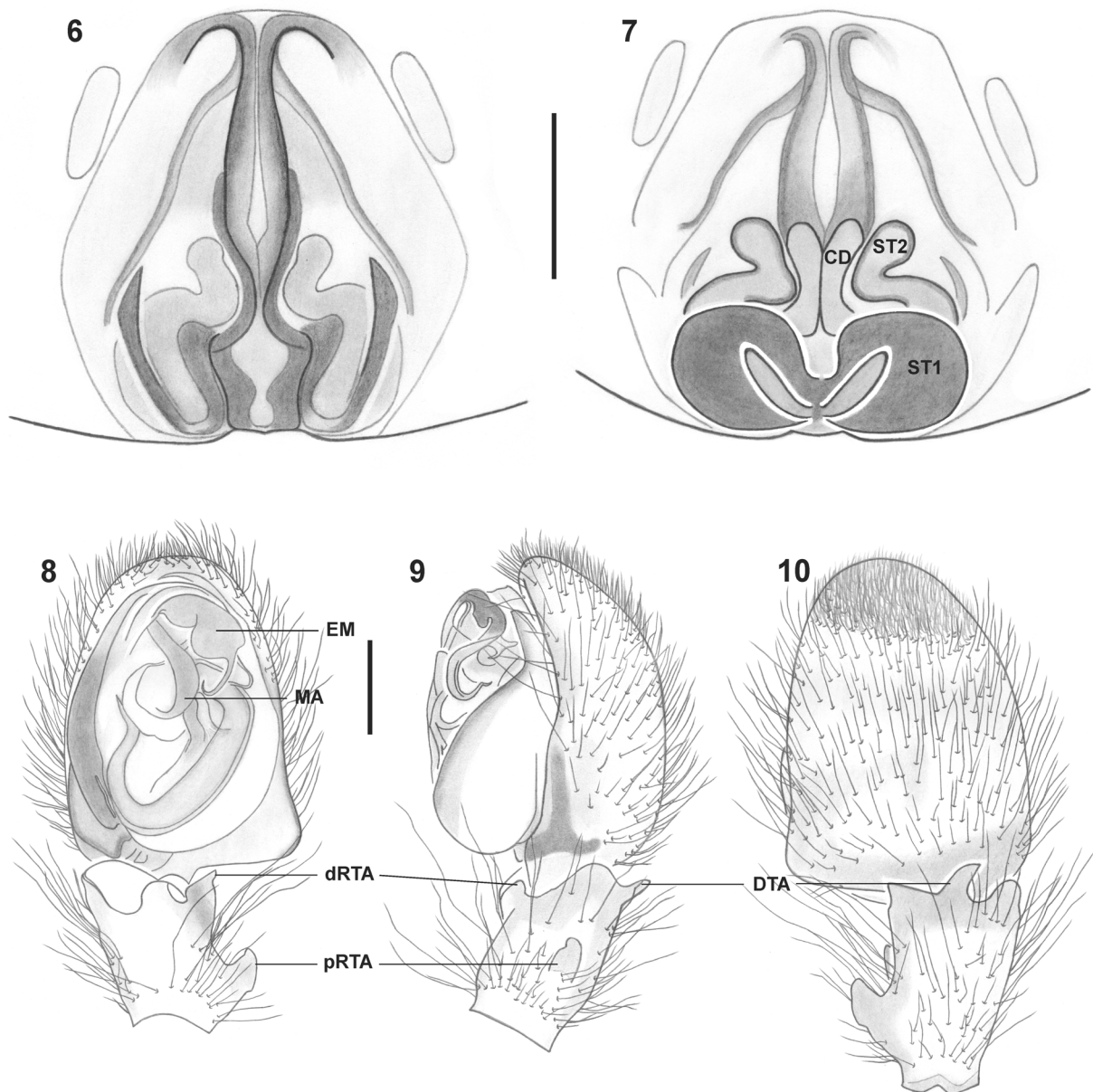
Carapace orange, slightly paler along midline, with series of 10–12 transverse ridges lateral to eye region, stronger anteriorly, progressively shallower posteriorly; AER strongly procurved, laterals larger than medians; AME separated by distance equal to 1/3 their diameter, AME separated from ALE by distance equal to 1/8 AME diameter; clypeus height equal to 6/5 AME diameter at AME, equal to 5/6 ALE diameter at ALE; PER straight, laterals larger than medians; PME separated by distance slightly less than 1/2 their diameter, PME separated from PLE by distance equal to 4/5 PME diameter. Chelicerae deep orange-brown, with eight coarse transverse ridges on anterior surface of paturon; promargin with four teeth, proximal tooth smallest, second tooth largest, third and fourth teeth progressively smaller; retromargin without teeth. Sternum and mouthparts bright yellow-brown. Legs all creamy-yellow, leg I with slightly brighter yellow

tinge. Leg spination: femora: I pl 1, II pl 1, III pl 2 do 2 rl 1, IV do 2; patellae: spineless; tibiae: I & II spineless, III pl 2 rl 2 plv 2 rlv 2 vt 2, IV pl 1 rl 2 plv 2 rlv 2 vt 2; metatarsi: I & II spineless, strongly scopulate, III & IV scopulate in distal half, III pl 5 rl 5 plv 1 rlv 1 vt 2, IV pl 5 rl 5 plv 2 rlv 1 vt 2; palp: femora do 2. Abdomen pale grey dorsally, with faint mottled creamy-grey chevron, pale grey laterally and ventrally, with grey ring around spinnerets; dorsum and venter lacking scutum or other sclerites, except two pairs of weak dorsal sigilla and small, oval post-epigastric sclerites. Male palpal tibia with proximal and distal retrolateral apophyses, and small triangular dorsal apophysis (Figs 5, 8–10); proximal retrolateral heel of cymbium strongly pronounced; median tegular apophysis broad, curved and elongate; embolus arc-shaped, with two lobes on inner margin, tip strongly curved (Figs 5, 8).



**FIGURES 1–5.** Digital microscope photographs of *Austrachelas entabeni* sp. nov. (1–3) and *A. bergi* Haddad, Lyle, Bosselaers & Ramírez, 2009 (4, 5): 1. Female holotype, dorsal habitus; 2. Same, ventral view of abdomen; 3, 4. Epigyne, ventral view; 5. Male palp, ventral view. Abbreviations: AH—anterior hood; EM—distal portion of embolus; ET—embolus tip; LH—lateral hoods; MA—median apophysis. Scale bars: 1, 2 = 1 mm, 3–5 = 0.25 mm.

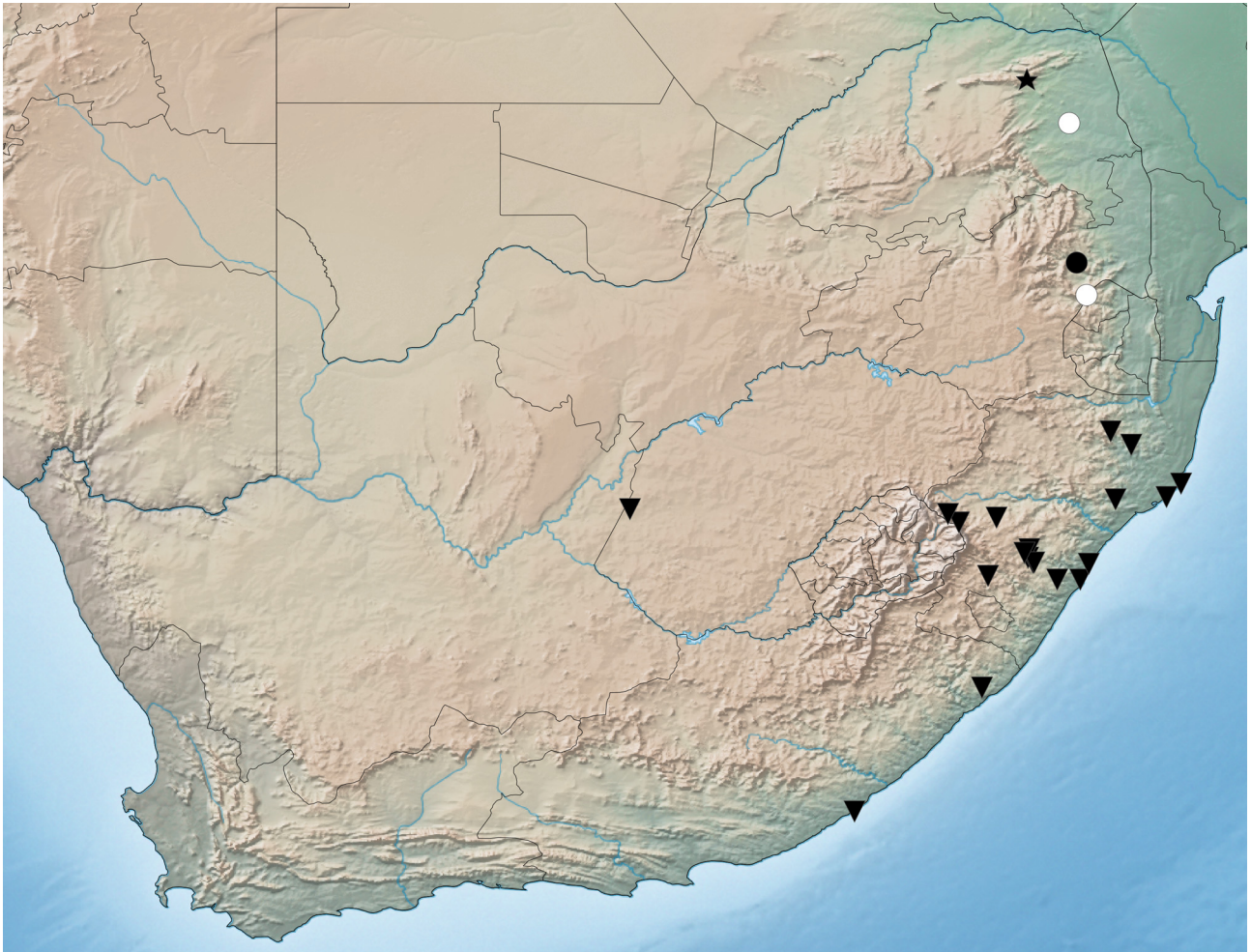




**FIGURES 6–10.** Genital morphology of *Austrachelas entabeni* sp. nov. (6, 7) and *A. bergi* Haddad, Lyle, Bosselaers & Ramírez, 2009 (8–10): 6. Female holotype, epigyne, ventral view; 7. Same, dorsal view; 8. Male palp, ventral view; 9. Same, retrolateral view; 10. Same, dorsal view. Abbreviations: CD—copulatory duct; dRTA—distal retrolateral tibial apophysis; DTA—dorsal tibial apophysis; EM—embolus; MA—median apophysis; pRTA—proximal retrolateral tibial apophysis; ST1—primary spermathecae; ST2—secondary spermathecae. Scale bars: 0.25 mm.

**Material examined.** SOUTH AFRICA: *Limpopo*: Mariepskop State Forest, Northern Drakensberg, 23°35.06'S, 30°51.81'E, 1350m a.s.l., leg. D. Ubick & S. Prinsloo, 13.X.1999, 1♀ (CAS, CASENT 9072380). *Mpumalanga*: Songimvelo Nature Reserve, Diepgezet, 25°56'41"S, 31°06'10"E, 1420m a.s.l., leg. D. & S. Ubick, 20–23.III.2001 (pitfalls, ravine with indigenous forest), 1♂ (CAS, CASENT 9072375).

**Distribution.** Previously known only from the type locality near Nelspruit [Mbombela], this species is recorded from an additional site in Mpumalanga Province near the Swaziland border, as well as from the Limpopo Province for the first time, extending its distribution range to approximately 275 km (Fig. 11).



**FIGURE 11.** Distribution of *Austrachelas* in South Africa, indicating type locality of *A. entabeni* sp. nov. (black star), type locality of *A. bergi* Haddad, Lyle, Bosselaers & Ramírez, 2009 (black circle), new localities of *A. bergi* (white circles), and distribution of other *Austrachelas* species (black triangles).

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