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## *Spinotrachelas montanus* sp. n., the first Afromontane representative in the genus (Araneae: Corinnidae)

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### ABSTRACT

A new species of the endemic South African sac spider genus *Spinotrachelas* Haddad, 2006 is described. *Spinotrachelas montanus* sp. n. is described based on material collected from four localities in the uKhahlamba-Drakensberg mountains, representing the first records of the genus from the east of the country and from the Grassland Biome.

KEY WORDS: Araneae, Trachelinae, spider, Afrotropical, South Africa, new species, distribution, ferns, grassland, montane.

### INTRODUCTION

The endemic South African dark sac spider genus *Spinotrachelas* Haddad, 2006 was described for a species of unique tracheline spiders, *S. capensis* Haddad, 2006, with heavily spined anterior legs and ventral leg cusps. Recently, Lyle (2011) added three more species from the western parts of the country. All of the distribution records of the genus are from the Fynbos, Succulent Karoo and Nama Karoo Biomes of South Africa, indicating a preference amongst these spiders for more arid habitats.

During recent field work in the Afromontane grasslands of the uKhahlamba-Drakensberg Mountains in KwaZulu-Natal and the Platberg Nature Reserve in the Free State Province of South Africa, a new species of *Spinotrachelas*, here described as *S. montanus* sp. n., was discovered by collecting at the base of grass tussocks and ferns. The discovery is significant for three reasons: (1) the collecting records expand the range of the genus by nearly 1100 km to the east, (2) the genus is recorded from the Grassland Biome for the first time, and (3) all of the records are from high altitudes above 1350 m; all previous locality records of the genus were from below 800 m.

### MATERIAL AND METHODS

All specimens were preserved and examined in 70% ethanol, and were observed for description using a light microscope. The left palp of a male paratype and epigyne of a female paratype were dissected with 0-size insect pins and cleared in a Labcon 5019U ultrasonic bath for 30 seconds, after which they were drawn in 70% ethanol.

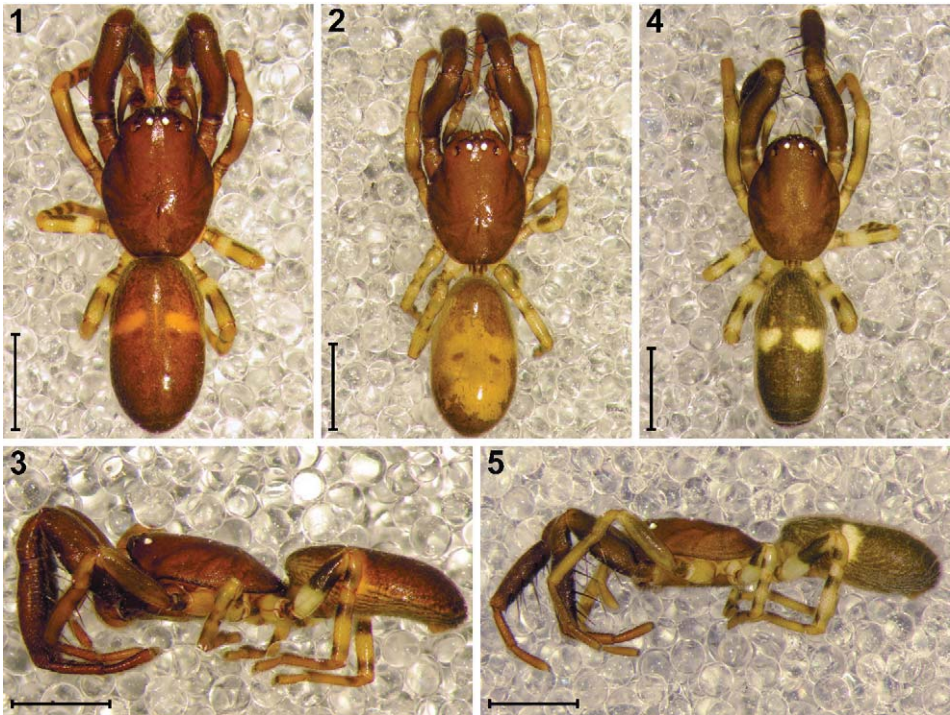
All measurements are given in millimetres and were taken using an ocular micrometer on a Nikon SMZ800 stereomicroscope. Body measurements were taken for the holotype male and a paratype female, and total body lengths were determined from the smallest and largest specimens of both sexes to provide a size range. Leg spination follows the format of Bosselaers and Jocqué (2000). Eye arrangements are described for the anterior view of the anterior eye row and dorsal view of the posterior eye row.

The following abbreviations are used in the descriptions:

AER – anterior eye row	ALE – anterior lateral eye
AL – abdomen length	AME – anterior median eye
AW – abdomen width	<i>plv</i> – prolateral ventral
CL – carapace length	PME – posterior median eye
CW – carapace width	<i>rl</i> – retrolateral
<i>do</i> – dorsal	<i>rlv</i> – retrolateral ventral
FL – fovea length	SL – sternum length
PER – posterior eye row	ST – spermatheca
<i>pl</i> – prolateral	SW – sternum width
PLE – posterior lateral eye	TL – total length

Digital photographs of the dorsal and lateral views of males and females were taken using a Nikon Coolpix 8400 camera mounted on a Nikon SMZ800 stereomicroscope. The extended focal range images were stacked using the software program CombineZM (<http://www.hadleyweb.pwp.blueyonder.co.uk>) to increase depth of field.

Material used in this study was deposited in the following South African collections (curators given in parentheses): NMBA – National Museum, Bloemfontein (L. Lotz); NMSA – KwaZulu-Natal Museum, Pietermaritzburg (A. Ndaba); TMSA – Ditsong National Museum of Natural History, Pretoria (formerly Transvaal Museum; R. Lyle).



Figs 1–5. Digital microscope photographs of *Spinotrachelas montanus* sp. n. in dorsal view (1, 2, 4) and lateral view (3, 5): (1, 3) holotype male, Platberg Nat. Res.; (2) paratype male, Royal Natal Nat. Park; (4, 5) paratype female, Champagne Castle. Scale bars = 1 mm.

## TAXONOMY

Genus *Spinotrachelas* Haddad, 2006***Spinotrachelas montanus* sp. n.**

Figs 1–10

**Etymology:** The species is named for the montane habitats that it occupies.

**Diagnosis:** This species is closely related to *S. capensis*, especially in the structure of the male palp, but can be distinguished by the following characters: abdomen narrower in males (>1.75 times longer than wide) and females (more than twice as long as wide) than in *S. capensis* (approximately 1.5 times longer than wide); male palpal patellar apophysis broader and more dorsally placed, and tibial apophysis more prolaterally placed than in *S. capensis*; female epigyne with copulatory openings V-shaped and directed posteriorly (straight and directed laterally in *S. capensis*) and copulatory ducts with a distinctive anterior loop leading to ST II, passing beneath the narrow ducts that lead to the posterior bilobed ST I, and female with ventral cusps on metatarsi I (absent in *S. capensis*) and with five cusps on tarsi I (only two in *S. capensis*).

**Description:**

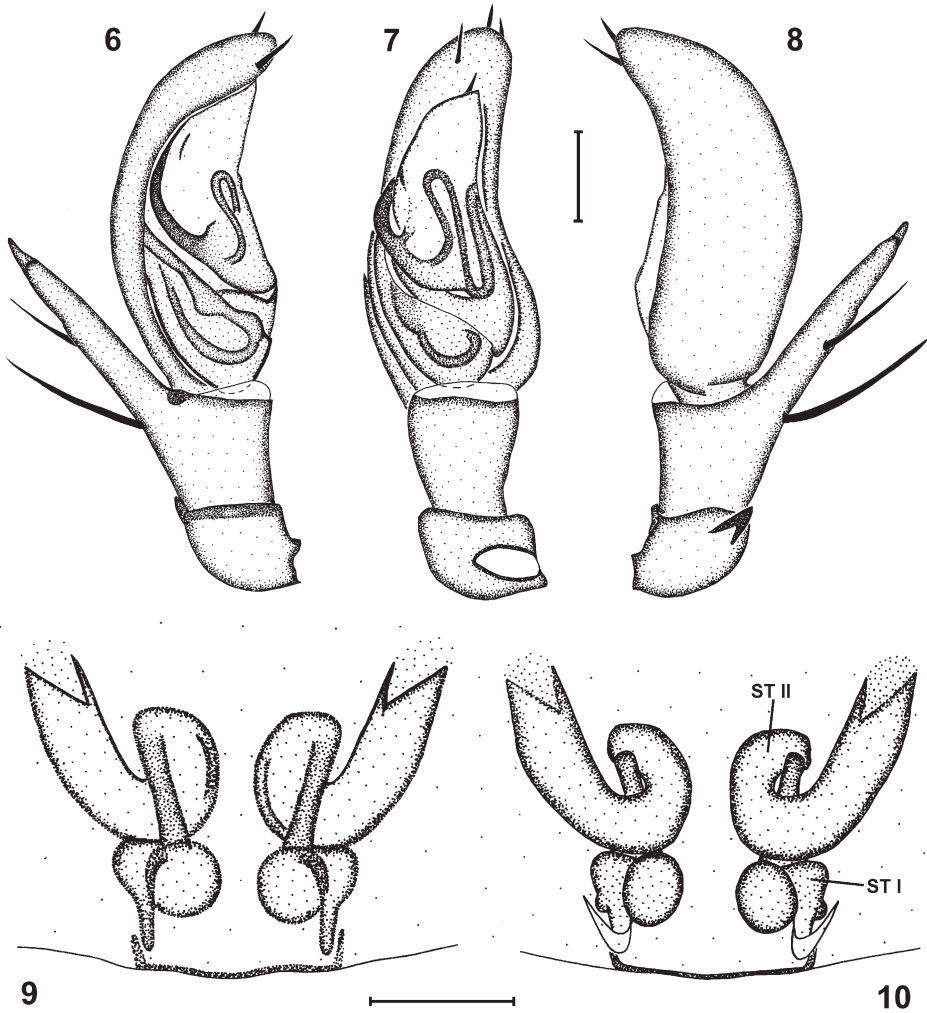
*Male* (holotype).

**Measurements:** CL 1.66, CW 1.26, AL 1.91, AW 1.03, TL 3.54 (3.30–3.92), FL 0.14, SL 0.93, SW 0.70, AME–AME 0.03, AME–ALE 0.03, ALE–ALE 0.24, PME–PME 0.11, PME–PLE 0.10, PLE–PLE 0.49.

Length of leg segments (sequence from femur to tarsus, and total): I  $1.17 + 0.56 + 1.05 + 0.59 + 0.53 = 3.90$ ; II  $0.92 + 0.44 + 0.80 + 0.56 + 0.48 = 3.20$ ; III  $0.65 + 0.39 + 0.50 + 0.53 + 0.29 = 2.36$ ; IV  $0.81 + 0.38 + 0.69 + 0.73 + 0.34 = 2.95$ .

General appearance of males in Figs 1–3. Carapace slightly flattened and convex, low in eye region, highest at half its length, slanting downwards sharply in its posterior third; broadest at anterior margin of second pair of legs; surface finely wrinkled, with small tubercles at setal bases and on striae; shallow oval depression anterior to fovea, just posterior to half carapace length (Figs 1–3); fovea short and narrow, slightly broader posteriorly; carapace uniform brown with black mottling; black striae radiating from fovea; ocular region not darker than rest of carapace, with two traversing thick black spines on clypeus beneath AME. All eyes with black rings, except on retrolateral margin; AER strongly procurved, laterals and medians subequal in size; clypeus height equal to ALE diameter; AME separated by approximately a third their diameter; AME separated from ALE by approximately a third AME diameter; PER strongly recurved, laterals and medians subequal in size; PME separated by distance slightly larger than their diameter; PME separated from PLE by distance equal to PME diameter. Chelicerae red-brown, with short white setae on anterior surface, surface granular; chelicera with single thick black seta on anterior surface of paturon, located just distal of cheliceral base; three evenly spaced teeth on promargin, median tooth largest, distal tooth smallest; two teeth on retromargin, close together and subequal in size; small cheliceral keel present; endites pale brown with scattered fine black setae, rounded on anterior margin, with well-developed serrula, straight on retrolateral and posterior margins; prolateral longitudinal ridge extending length of endites; labium brown, slightly wider than long. Sternum somewhat oval, rebordered, yellow-brown with grey

mottling, pale orange along borders; broadest between coxae II and III and narrowed anteriorly; pleural bars isolated; precoxal triangles present; intercoxal sclerites present between all coxa. Abdomen oval-elongate, widest at midpoint, with scutum covering entire dorsum; dorsum very dark brown with faint yellowish mottling, with lateral cream markings at half abdomen length; two pairs of sigilla present, first pair at a quarter abdomen length and second pair just behind cream markings; abdomen covered with short, straight white setae dorsally and fine black setae laterally; epigastric area sclerotised, ventral and inframamillary sclerites absent; venter with two paired lines of tiny sclerites running from epigastric fold to spinnerets. Leg I strongly built and long, coxae pale brown, remaining segments dark brown, patellae with black lateral mottling; leg II less strongly built and somewhat shorter, coxae pale brown,



Figs 6–10. *Spinotrachelus montanus* sp. n., paratype male (6–8) and female (9, 10): (6) palp, prolateral view; (7) palp, ventral view; (8) palp, retrolateral view; (9) epigyne, ventral view; (10) epigyne, dorsal view, indicating spermatheca I (ST I) and spermatheca II (ST II). Scale bars = 0.1 mm.

trochanters dark brown, femora pale brown proximally and distally, with broad faint grey band medially, tibiae pale brown with incomplete proximal and distal black bands laterally and ventrally; metatarsi and tarsi pale brown; legs III and IV weakly built and shorter, coxae yellow, trochanters dark brown, femora yellow proximally and dorsally with incomplete black band laterally and ventrally in distal two-thirds, tibiae yellow proximally with incomplete distal black band laterally and ventrally, metatarsi yellow-brown with incomplete distal black bands laterally and ventrally, and ventral preening brush, tarsi yellow. Leg spination: femora: I *pl* 1; patellae: I *plv* 1, all patellae with *do* 1 erect seta; tibiae: I *plv* 4 *rlv* 4, II *rlv* 3, all tibiae with *do* 1 erect seta; metatarsi: I *plv* 3–4 cusps, *rlv* 2–3 cusps, II *plv* 2–3 cusps; tarsi: I *plv* 6 cusps, *rlv* 4–5 cusps, II *plv* 2–3 cusps. Male palpal patella with small retrolateral apophysis; palpal tibia with long, curved sword-like dorsolateral apophysis, narrowed at the tip, with two spines on its dorsal surface; cymbium with pair of short stout black setae distally and *plv* spine; tegulum elongate-oval, with looping internal ducts; embolus long, wire-like, originating prolaterally, medially on tegulum; partly hidden beneath tegulum, emerging for short distance distally (Figs 6–8).

*Female* (paratype, Champagne Castle).

Measurements: CL 1.60, CW 1.28, FL 0.10, AL 2.37, AW 1.61, TL 3.95 (3.51–3.95), SL 0.87, SW 0.62, AME–AME 0.05, AME–ALE 0.02, ALE–ALE 0.22, PME–PME 0.10, PME–PLE 0.14, PLE–PLE 0.48.

Length of leg segments (sequence from femur to tarsus, and total): I  $0.99 + 0.47 + 0.79 + 0.60 + 0.52 = 3.37$ ; II  $0.93 + 0.44 + 0.73 + 0.54 + 0.43 = 3.07$ ; III  $0.67 + 0.39 + 0.47 + 0.53 + 0.28 = 2.34$ ; IV  $0.81 + 0.45 + 0.72 + 0.69 + 0.38 = 3.05$ .

General appearance of female in Figs 4, 5. Morphology similar to male except the following: carapace pale brown, slightly wrinkled with very faint striae. Endites and labium yellow, sternum yellow, covered in long black setae. Leg I with yellow coxae, trochanters pale brown with yellow band ventrally, remaining segments pale brown; leg II yellow throughout, with dark bands on lateral sides of femora; legs III and IV with coxae, trochanters, femora and patellae all yellow proximally and dark brown distally, tibiae yellow with dark brown medial and distal bands, metatarsi yellow with dark spot located distally on the ventral side, and tarsi yellow. Leg spination: femora: I *pl* 1; patellae: *plv* 1, all patellae with *do* 1 erect seta; tibiae: I *plv* 4 *rlv* 4–5, II *rlv* 3, all tibiae with *do* 1 erect seta; metatarsi: I *plv* 2 cusps; tarsi: I *plv* 3 *rlv* 2 cusps. Abdomen elongate-oval, longer and narrower than in male, dorsum dark brown with two cream markings at half abdomen length, dorsum covered in small white setae; dorsal and ventral scuta and inframamillary sclerites absent. Copulatory openings V-shaped, directed posteriorly, located anterolaterally in epigyne (Fig. 9); copulatory ducts curving posteromedially before entering narrow anterior ST II; small median ducts running beneath copulatory ducts to small bilobed lateral ST I (Fig. 10).

Holotype: ♂ SOUTH AFRICA: *Free State*: Platberg Nat. Res., Bottom of Donkey Pass, 28°16.843'S: 29°12.033'E, 2036 m, base of grass tussocks, 22.i.2011, C. Haddad (NMBA, 16178).

Paratypes: SOUTH AFRICA: *KwaZulu-Natal*: 1♂ 1♀ Champagne Castle, Mpojane R., 29°02.581'S: 29°23.898'E, 1395 m, base of grass tussocks, riverside, 20.i.2011, C. Haddad (NMSA, 24461); 2♂ 2♀ same locality, Hlathikuku Forest, 29°02.366'S: 29°23.421'E, 1560 m, base of grass tussocks, forest-grassland ecotone, 20.i.2011, C. Haddad (TMSA, 24009); 1♂ Royal Natal Nat. Park, riparian forest near offices, 28°41.185'S: 28°57.427'E, 1400 m, base of ferns and grasses, with ants, 21.i.2011, C. Haddad (NMSA, 24462).

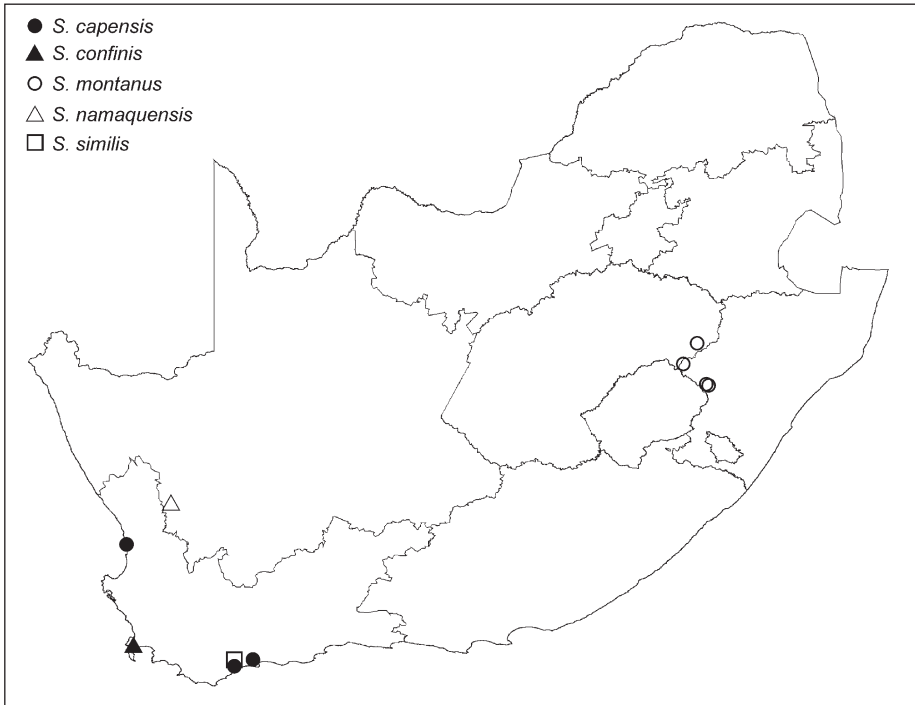


Fig. 11. Distribution of *Spinotrachelas* species in South Africa.

**Distribution:** Known only from the uKhahlamba-Drakensberg Mountains in KwaZulu-Natal and the Platberg Nature Reserve in the eastern Free State Province of South Africa. This is the easternmost distributed species in the genus, located approximately 1100 km east of congeners (Fig. 11). This distribution suggests that additional species may be discovered or new locality records reported in the eastern parts of the Western Cape, the Eastern Cape and southern KwaZulu-Natal provinces.

**Habitat and biology:** Specimens were collected from the bases of grass tussocks and ferns in Afromontane grassland-forest ecotone habitats (Fig. 12), grass patches in riparian forest (Fig. 13) and in open grassland along streams at altitudes approximately 1400–2050 m. One of the specimens (NMSA, 24462) was found in the close vicinity of foraging ants that it resembled in size, colouration and general body shape, suggesting that this species may be an inaccurate mimic of ants, as is *S. capensis* (Haddad 2006).

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Figs 12, 13. Habitats of *Spinotrachelas montanus* sp. n. in the uKhahlamba-Drakensberg Mountains in the KwaZulu-Natal, South Africa: (12) dense grasses and ferns in the grassland-forest ecotone near Hlathikulu Forest, Champagne Castle; (13) grassy patches in riparian forest, Royal Natal National Park.



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