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SIX NEW SPECIES OF THE GENUS *BISCIRUS* THOR (ACARI: BDELLIDAE) FROM SOUTH AFRICA

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ABSTRACT: Six new species of the genus *Biscirus* Thor, 1927 (Prostigmata: Bdellidae) from South Africa are described and illustrated: *B. lootsi* sp. n., *B. psammina* sp. n. , *B. kleinmondensis* sp. n. , *B. skuinsbaaiensis* sp. n. , *B. amplexus* sp. n., and *B. magdalenae* sp. n. . A key to the South African species is given.

KEY WORDS: Acari, Bdellidae, *Biscirus*, South Africa, new species, systematics

INTRODUCTION

Members of the Bdellidae (Acariformes: Eupodina) have high potential as biological control agents (Wallace 1974; Wallace and Mahon 1972; Wallace and Walters 1974; Wallace and Mahon 1976). In Africa this family was poorly known except for papers by Meyer and Ryke (1959) and J. den Heyer (1981). This study on the subfamily Spinibdellinae was carried out simultaneously with other studies on the subfamily Bdellinae (Van der Schyff et al. 2004, 2005), which considerably contributed to our knowledge of the African Bdellidae.

The genus *Biscuris* Thor, 1927 includes 8 species: *B. silvaticus* (Kramer, 1881), *B. thori* Womersley, 1933, *B. norvegicus* (Thor, 1905), *B. arenarius* Wallace et Mahon, 1972, *B. aquilonius* Wallace et Mahon, 1972, *B. obliquus* Wallace et Mahon, 1972, *B. simplexus* Soliman et Zaher, 1975 and *B. vulgaris* Kuznetzov et Barilo, 1984. The present study adds six new species from South Africa. Thus, the genus *Biscirus* seems to be more diverse than was first thought.

Nothing is known about the biology of the members of this genus except for an observation made by Wallace and Mahon (1972) on *B. thori* in Australia. It was found feeding on small Collembola belonging mostly to the family Entomobryidae.

MATERIALS AND METHODS

The material for this study was collected by means of plant beating and extraction from soil and litter samples in Berlese-Tullgren funnels. Specimens were preserved in 70–80% ethanol and mounted in Heinz's PVA on microscope slides. The body length was measured from the margin of the idiosoma to the apex of the hypostome, and the body width at the level of setae c_{1-2}. Setal lengths were recorded from the setal base to the tip. Legs were measured from their ventral insertion of the coxae up to the base of the pretarsi. Setal notations of idiosoma follow Kethley (1990). The following abbreviations are used: sts = simple tactile setae; bts = blunt tactile setae; dt = dorsoterminal setae on tarsi of legs; micro = minute spine; tr = trichobothrium; σ = solenidia on genua; φ = solenidia on tibiae; ω = solenidia on tarsi. Measurements of holotype are given first with those of paratypes in brackets, where available. All measurements are given in micrometers (μm). All holotypes are deposited at the National Collection of Arachnida (NCA), Plant Protection Research Institute, Pretoria, South Africa.

SYSTEMATICS

Family Bdellidae Dugés 1834

Subfamily Spinibdellinae Grandjean 1938

Type genus: *Spinibdella* Thor, 1930, by original designation.

Diagnosis. Both sexes. Two pairs of strong ventral hypostomal setae; with 2 (tarsi III and IV — *Tetrabdella* Hernandes and Feres) or 4 (tibiae I and IV and tarsi III and IV — *Biscirus* , *Spinibdella* Thor, 1930 and *Monotrichobdella* Baker et Balock, 1944) pairs of trichobothria on legs; well-developed genital tracheae and narrow chelicerae with reduced needlelike chelae distinguish this subfamily. Dorsal propodosoma with or without external vertical setae; secondary apodemes either absent or poorly developed; internal vertical setae simple; if present, unpaired setae on venter of opisthosoma between coxae I and II or III and IV not immediately anterior to genital opening. Palp with setae *ves* and *des* subequal, *des* longer than *ves*. Shape of palp tibiotarsus, number of end setae, presence or absence of external vertical setae (*ve*) and number of

trichobothria on legs mainly separates 4 genera in this subfamily.

Genus *Biscirus* Thor, 1913

Thor 1913: 28–30, 1928: 213, 1931: 74, Vitzthum 1931: 37, Womersley 1933: 104, Willmann 1939: 45, 1952: 165, Baker and Balock 1944: 177, Schweizer and Bader 1963: 235, Atyeo 1960: 435, 1963a: 174, Wallace and Mahon 1972: 552, Soliman and Zaher 1975: 77, Ghilarov 1978: 143.

Type species: *Bdella silvaticus* Kramer 1881, by original designation.

Diagnosis. Both sexes. *Biscirus* distinguished by palp tibiotarsus bearing 2 end setae plus 2 other setae; cheliceral setae short, not extending beyond tips of chelae; palp genu and basifemur with 2 setae each. Setae *ve* absent.

Biscirus lootsi Omukunda, Theron et Ueckermann, sp. n.

Figs. 1–9.

Description. Male (holotype). Dimensions: total length, including gnathosoma, 1252; length of gnathosoma 325, width 573; length of chelicerae 267; length of palpal segments II + III, 210; IV, 76; length of legs: I — 455; II — 384; III — 461 IV — 602; length of setae: *sce* 88; c_1 84; c_2 99; distance: *vi–vi* 63; first interspace (c_1–*d*) 101.

Gnathosoma. Chelicerae have faint rough longitudinal striations and one pair of strong setae. Fixed chela straight and half length of movable chela and slightly curved as shown in Fig. 1. Hypostome with 2 two pairs of strong ventral setae and longitudinally striated, its base with transverse striations as shown in Fig. 2. Two pairs of adoral setae present. Palpgenu relatively long. Palp extends beyond hypostome. Palp chaetotaxy from trochanter to tibiotarsus: 0–2–1–2–1 sts, 1 ω, *des, ves.*

Dorsum. Simple nosa, *vi* and *sci* trichobothria. Setae *sce* pilose and slightly curved. Centre of propodosoma with roughly broken longitudinal striations and with fine roughly broken transverse striations lateral to *sce*. Two pairs of well defined eyes separated by oblique striations (distance between anterior and posterior eyes equal to 0.6 times diameter of posterior eye). Idiosomal setae pilose. Striation pattern of idiosoma fine, roughly broken, transverse in median part and longitudinal in lateral parts. Sejugal groove not conspicuous. Two pairs of anal setae caudally.

Venter. Ventral setae both simple and pilose. Twenty-nine simple attenuate aggenitals, first pair between coxae IV. Nineteen pairs of simple attenuate genital setae arranged in 3 rows. Three pairs of genital discs. Amphioid sclerites with one anterior seta branched, 4 terminally forked, 2 simple and 2 solid branched as shown in Fig. 5. Striation pattern of venter roughly broken.

Legs (Figs. 6–9). Legs shorter than idiosoma, leg II shorter than I and IV longest. Legs with simple or simple and pilose setae. Genua I with 2 attenuate solenidia, II and III with one solenidion each. Tibiae I with 3 attenuate solenidia and 1 long attenuate blunt solenidion and 1 attenuate peg as shown in Fig. 6. Tarsi I with setae dt_1 hollow and nude with dt_{2-3} solid and nude. Tarsi II (Fig. 7) with all dorsoterminal setae solid and nude. Tarsi III with setae dt_{1-2} solid and nude and dt_3 hollow and nude. Tarsi IV with *dt* setae similar to those on tarsi III. Leg chaetotaxy: coxae I–IV, 3–3–6–4 bts; trochanters I–IV, 1–1–1–1 sts; basifemora I–IV, 10–7–7–3 sts; telofemora I–IV, 4–4–3–3 sts; genua I–IV, 4 sts, 2 σ – 4 sts, 1 σ – 4 sts, 1 σ – 4 sts; tibiae I–IV, 12 sts, 4 φ, 1 micro, 1 tr – 9 sts, 1 φ, 1 micro – 10 sts, 1 φ – 10 sts, 1 tr, tarsi I–IV, 26 sts, 4 ω, 1 micro – 24 sts, 2 ω – 28 sts, 1 tr – 27 sts, 1 tr.

Female. Unknown.

Type material. Male holotype, SOUTH AFRICA: Mkuze, from grass, Kwazulu-Natal, 27°37′S, 32°01′E, 25 January 1966, coll. L. Erasmus.

Type depositories. Holotype is deposited at NCA.

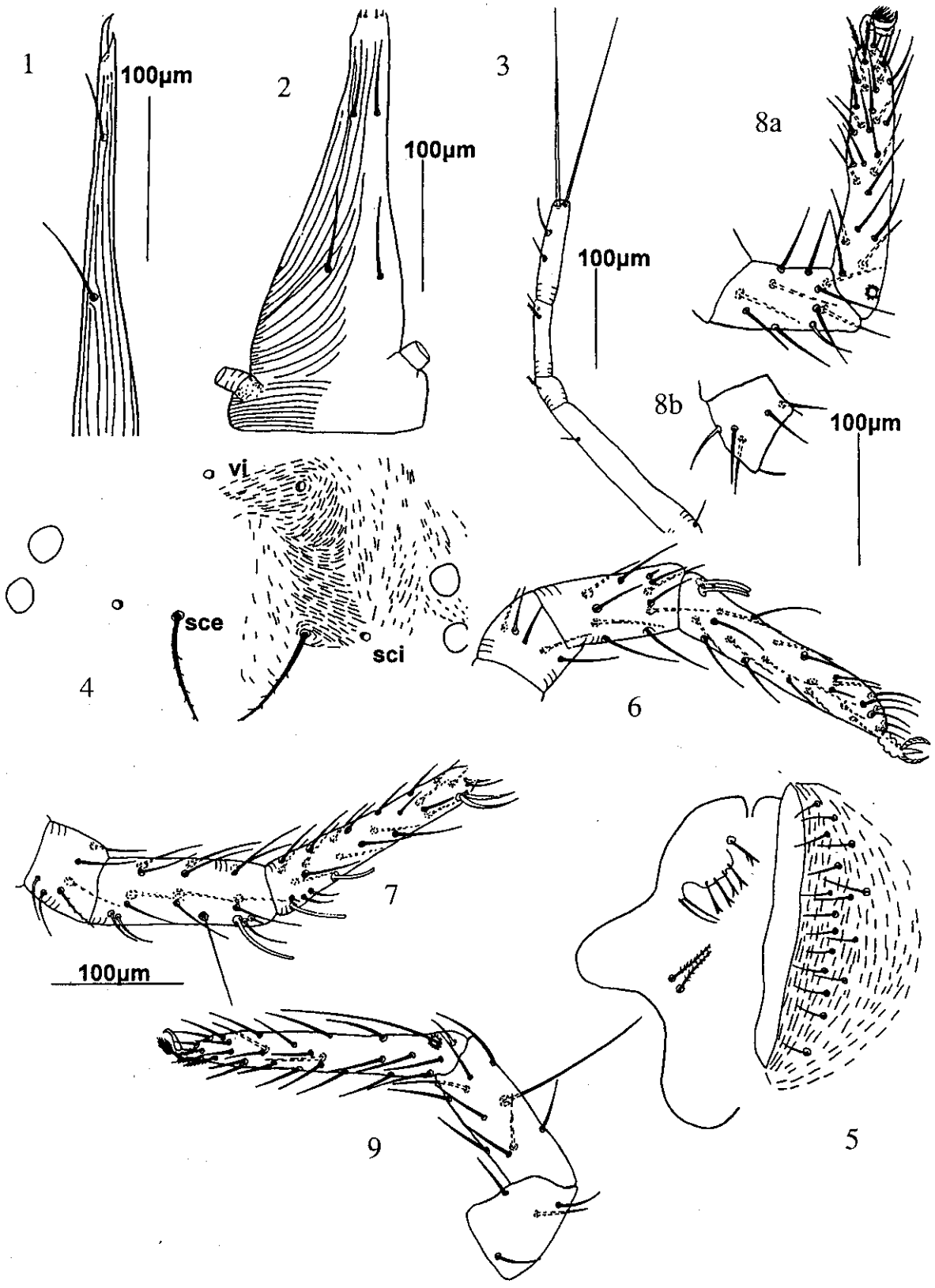
Etymology. This species was named for Prof. G.C. Loots of the School of Environmental Sciences and Development, University of the North-West, Potchefstroom, South Africa in recognition of his enormous contribution to Acarology.

Differential diagnosis. This species closely resembles *B. thori* from Australia in having a long palpgenu and dorsal seta of the palp telofemur and the palp genu pilose. It can, however, be distinguished by the roughly broken longitudinal striations at the centre of the propodosoma, whereas in the former it is transverse. Palp genu is about twice longer than telofemur instead of three times in *B. thori.* The amphiod sclerites have pilose setae, two simple and five terminally forked, opposed to all being terminally branched in *B. thori.*

Biscirus psammina Omukunda, Theron et Ueckermann, sp. n.

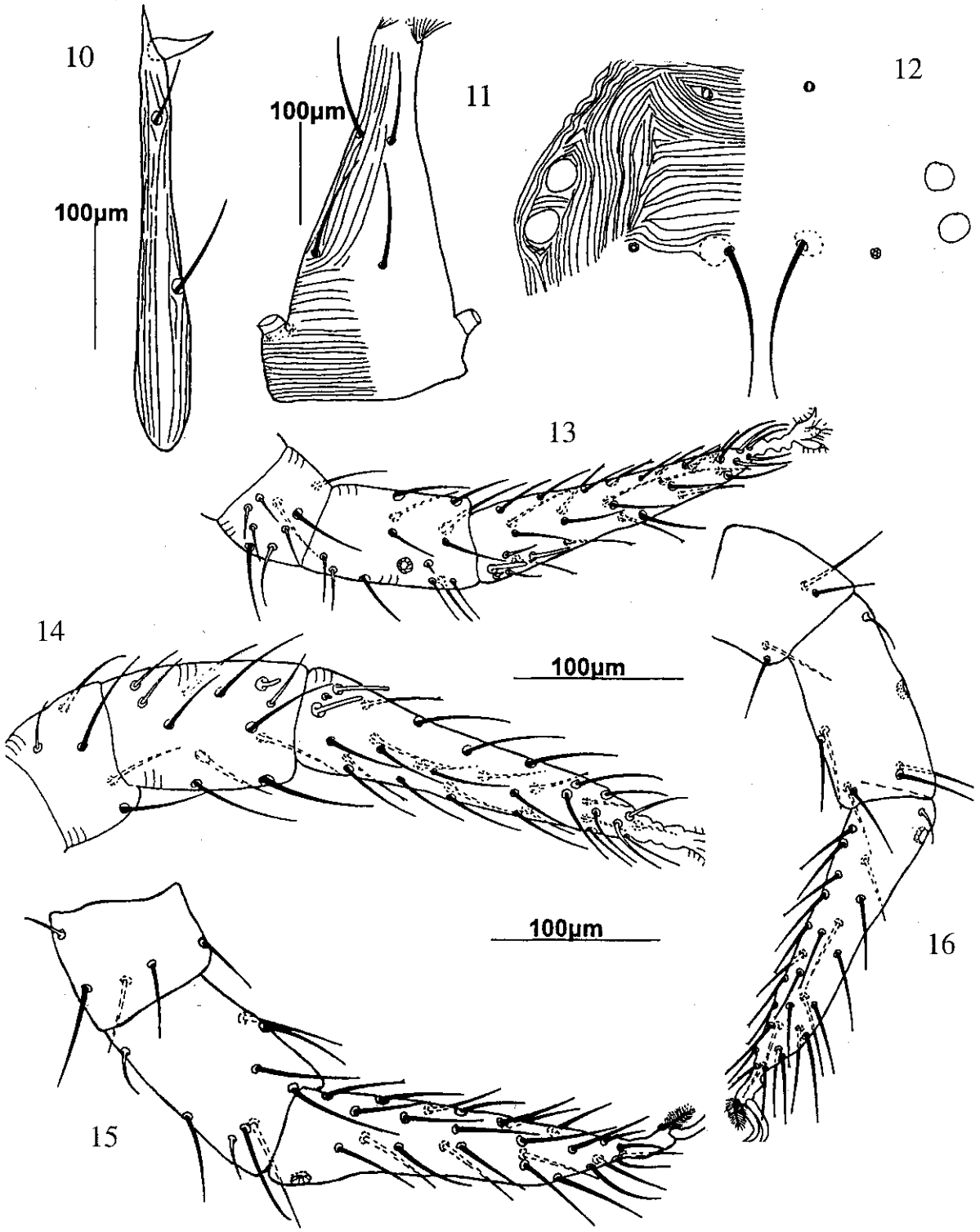
Figs. 10–16.

Description. Female (holotype). Dimensions: total length, including gnathosoma, 1257; length of gnathosoma 401, width 544; length of chelicerae 348; length of legs: I — 571; II — 495; III — 606; IV — 774; length of setae: *sce* 120; c_1 109, c_2 99; distance: *vi–vi* 71; first interspace (c_1–*d*) 86.



Figs. 1–9. *Biscirus lootsi* sp. n., male: 1 — chelicera, dorsal view; 2 — hypostome, ventral view; 3 — palp, lateral view; 4 — propodosomal striations; 5 — genital area ; 6 — leg I, lateral view; 7 — leg II, lateral view; 8a — tarsus and tibia III, lateral view; 8b — genu III, lateral view; 9 — leg IV, lateral view.

Gnathosoma. Chelicerae with sparsely broken longitudinal striations, 1 pair of strong setae each and not basely inflated (Fig. 10). Fixed digit of chelae straight and short, movable digit curved and long. Hypostome with 2 pairs of strong ventral setae, longitudinally striated anterior to proximal



Figs. 10–16. *Biscirus psammina* sp. n., female: 10 — chelicera, dorsal view; 11 —hypostome, ventral view; 12 — propodosomal striations; 13 — leg I, lateral view; 14 — leg II, lateral view; 15 — leg III, lateral view; 16 — leg IV, lateral view.

hypostomal setae but hypostomal base covered with fine transverse striations, as shown in Fig. 11. Lateral lips conspicuous, 2 pairs of adoral setae present. Palp chaetotaxy similar to that of *Biscirus lootsi* sp. n.

Dorsum. Simple naso present, *vi* and *sci* trichobothria, *sce* strong, simple and long. Propodosoma anteriorly with fine continuous transverse striations, posterior region with rough, sparsely broken striations, as shown in Fig. 12. Two pairs of well developed eyes separated by transverse striations (distance between anterior and posterior eyes equal to half of diameter of anterior eye). Mid-dorsum of idiosoma with fine continuous transverse striations,

dorso-laterally it is covered with fine continuous longitudinal striations. All idiosomal setae simple. Anal opening with postanal setae caudally.

Venter. Ventral setae simple, 50 blunt aggenital setae, first pair between coxae IV. Nineteen pairs of small attenuate genital setae arranged in 3 rows. Four pairs of anal and 2 pairs of paranal setae in anal region.

Legs. Legs shorter than idiosoma, leg II (Fig. 14) shorter than leg I (Fig. 13). Setae simple except laterals of tarsi branched terminally. Genua I with 5 attenuate solenidia, 2 proximal, 1 median, and 2 distal; genua II and III (Fig. 15) with 1 solenidion each (Figs. 11–12). Tibiae I with 4 attenuate solenidia, 2 proximal and 2 distal, tibiae II with 3 solenidia, 2 proximal and 1 distal; tibiae III with 2 attenuate solenidia, 1 proximal and 1 distal. Tarsi I and II with 2 long blunt solenidia. Hollow peg present on tarsi I; peg of tarsi II simple. Setae dt_1 solid and nude with dt_2 and dt_3 hollow and nude on tarsi I, dt_{1-2} solid and nude with dt_3 hollow and nude on tarsi II. Tarsi III and IV (Fig. 16) with *dt* setae as on tarsus II. Claws rayed and shorter than pretarsi.

Leg chaetotaxy: coxae I–IV, 4–3–4–3 bts; trochanters I–IV, 1–1–1–1; basifemora I–IV, 8–8–6–6 sts; telofemora I–IV, 5–5–5–4 sts; genua I–IV,4 sts – 5 σ – 4 sts, 1 σ – 4 sts, 1 σ – 4 sts; tibiae I–IV, 8 sts, 4 φ, 1 micro, 1 tr – 9 sts, 4 φ – 7 sts, 2 φ – 6 sts, 1 φ, 1 tr; tarsi I–IV, 29 sts, 4 ω, 1 micro – 30 sts, 2 ω, 1 micro – 27 sts, tr – 25 sts, 1 tr, 1 ω. Attenuate setae on tarsi IV lateral to trichobothrium.

Deutonymph (one paratype). Dimensions: length, including gnathosoma, 463; length of gnathosoma 157, width 254; length of chelicerae 138; length of palp segments: I — 8; II + III — 80; IV — 17; V — 54; *des* 105; *ves* 92. Length of legs: I — 206; II — 200; III — 229; IV — 240; length of setae: *sce* 48; c_1 38; c_2, 44; distance: *vi–vi* 33; first interspace (c_1–*d*) 50.

Two pairs of genital discs. Two pairs of genital setae and 10 aggenital setae, first pair between coxae IV. Palp chaetotaxy, trochanter to tibiotarsus as, 0–2–1–2–1 sts, 1 ω, *des, ves*. Leg chaetotaxy: coxae I–IV, 3–2–3–2 bts; trochanters I–IV, 1–1–1–1 sts; basifemora I–IV, 6–5–3–1 sts; telofemora I–IV, 3–4–3–3 sts; genua I–IV, 4 sts, 3 σ – 4 sts, 1 σ – 4 sts, 1 σ – 3 sts; tibiae I–IV, 4 sts, 3 φ, 1 micro – 5 sts, 3 φ – 5 sts, 2 φ – 4 sts, 1 tr; tarsi I–IV, 23 sts, 4 ω, 1 micro – 21 sts, 3 ω, 1 micro – 20 sts, 1 tr – 21 sts, 1 ω, 1 tr.

Protonymph (2 paratypes). Dimensions: length including gnathosoma 478–599; length of gnathosoma 152–162, width 220–239; length of chelicerae 134–149; length of palp segments: I — 10–12; II+III — 76–84; IV — 13–15; V — 52–54; *des* — 105; *ves* 90–92; length of legs: I — 172–210; II — 182–191; III — 229–239; IV — 230–240; length of setae; *vi* 96; *sce* 46–48; c_1 40–44; c_2 40–46; distance: *vi–vi* 33; first interspace (c_1–*d*) 46–59.

One pair of genital discs in vestibule, genital setae not developed, 5–6 aggenital setae. Palp chaetotaxy from trochanter to tibiotarsus: 0–1–1–2–1 sts, 1 ω, *des, ves*. Leg chaetotaxy: coxae I–IV, 3–1–2–0 bts; trochanters I–IV, 1–1–1–0 sts; basifemora I–IV, 2–2–1–0 sts; telofemora I–IV, 3–3–3–1 sts; genua I–IV, 4 sts, 3 σ – 4 sts, 1 σ – 4 sts, 1 σ – 2 sts; tibiae I–IV, 4 sts, 2 φ, 1 tr, 1 micro – 5 sts, 2 φ – 5 sts, 1 φ – 1 sts; tarsi I–IV, 19 sts, 3 ω, 1 micro – 17 sts, 1 ω, 1 micro – 16 sts, 1 tr – 8 sts.

Type material: Female holotype, 1 deutonymph and 2 protonymph paratypes, SOUTH AFRICA: Western Cape, Chapmans Peak, Cape Town, 33°55′S, 18°25′E, from eroded sand debris, 23 December 1998, coll. P.D. Theron.

Type depositories. Type material is deposited at NCA.

Etymology. The name of this species reflects its sandy habitat — sand (*psammos* Greek).

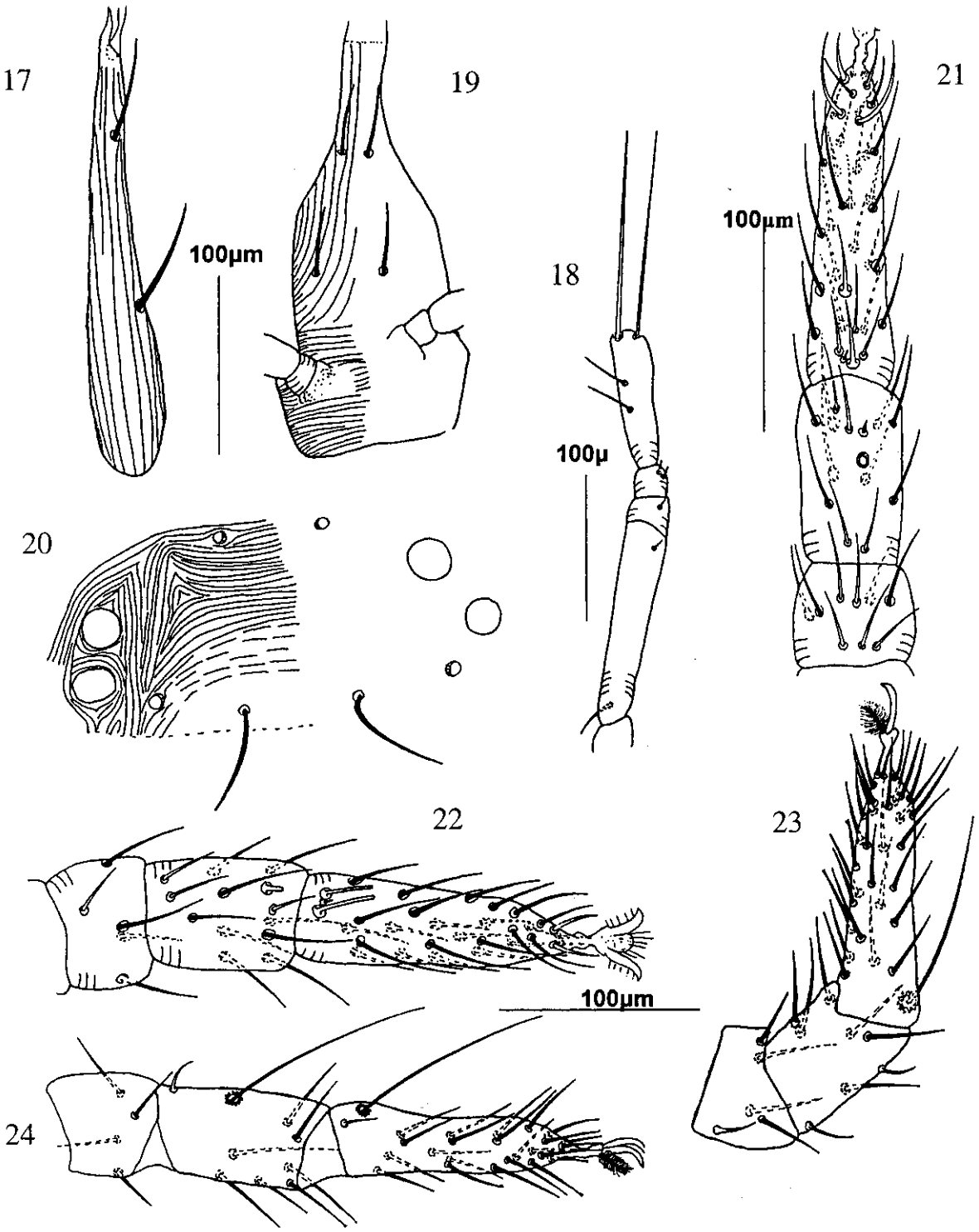
Differential diagnosis. This species closely resembles *B. kleinmondensis* sp. n. by having five attenuate solenidia on genu I, but can be distinguished by having the fine continuous transverse striations on the anterior part and rough continuous striations on the posterior part of the propodonotum, and by tarsus I having two solenidia. In *B. kleinmondensis*, the propodonotum is covered by the fine striations in its anterior third, the median third covered by the rough broken striations, and the posterior third is devoid of striations; tarsus I has three attenuate solenidia.

Biscuris kleinmondiensis Omukunda, Theron et Ueckermann, sp. n.

Figs. 17–24.

Description. Female (holotype). Dimensions: total length, including gnathosoma, 1005; length gnathosoma 294, width 497; length of chelicerae 264; length of palp segments: I — 15; II + III — 172; IV — 23; V — 101; *des*, 193; *ves*, 162; length of legs: I — 439; II — 378; III — 439 IV — 560; length of setae: *sce*, 76; c_1, 92; c_2, 84; distance: *vi–vi* 55; first interspace (c_1–*d*) 86.

Gnathosoma. Each chelicera with pair of strong setae inserted as shown in Fig. 17 and covered by strong, rough longitudinal striations. Both fixed



Figs. 17–24. *Biscirus kleinmondensis* sp. n., female: 17 — chelicera, dorsal view; 18 — palp dorsal view; 19 — hypostome, ventral view; 20 — propodosomal striations; 21 — leg I, dorsal view; 22 — leg II, dorsal view; 23 — leg III, lateral view; 24 — leg IV, lateral view.

and movable chelae straight, latter longer than former. Palp telofemur longer than palp genu (Fig. 18). Palp chaetotaxy from trochanter to tibiotarsus: 0–2–1–2–1 sts, 1 ω, 1 *des*, 1 *ves*. Base of gnathosoma with fine transverse striations and hypostome with strong, rough longitudinal striations (Fig. 19). Two pairs of adoral setae on lips.

Dorsum. Two pairs of trichobothria on propodosoma and *sce* long and smooth, anterior third of propodosoma with fine transverse striations, median third with rough broken transverse striations, and posterior third not striated (Fig. 20). Two pairs of detectable eyes separated by transverse striations (distance between anterior and posterior eyes

equal to ½ diameter of anterior eye). Sejugal groove conspicuous. Idiosomal setae slightly pilose. Internal humeral (c_1) longer than first interspace (c_1–d).

Venter. All ventral setae nude. Thirty four simple genital setae arranged in 2 rows. Three pairs of genital discs, first 2 pairs in anterior half of vestibule. Aggenital setae blunt.

Legs. Legs shorter than idiosoma, genua I (Fig. 21) with 5 attenuate solenidia, 3 in proximal part and 2 distal, II (Fig. 22) and III (Fig. 23) with 1 solenidion each. Tibiae I with 4 attenuate solenidia, 2 in distal half and 2 proximal; tibia II with 3 attenuate solenidia, 2 proximal and 1 distal, III with 2 solenidia, 1 distal and 1 proximal, and IV Fig. 24) with 1 solenidion. Tarsi I with 3 attenuate solenidia. Tarsi II with 2 blunt solenidia. Setae dt_{1-3} on tarsi I hollow and nude, dt_2 solid nude. Tarsi II with dt_{1-2}, solid nude and dt_3 hollow nude. Tarsi III with dt_{1-2} solid nude, dt_3 hollow nude. Tarsi IV with dt_1 solid nude and dt_{2-3} hollow nude. Leg chaetotaxy: coxae I–IV, 6–4–6–4 sts; trochanters I–IV, 1–1–1–1 sts; basifemora I–IV, 10–9–7–4 sts; telofemora I–IV, 5–5–4–4; genua I–IV, 4 sts, 5 σ – 4 sts, 1 σ – 4 sts, 1 σ – 4 sts; tibiae I–IV, 8 sts, 4 φ, 1 micro, 1 tr – 9 sts, 4 φ – 6 sts, 2 φ – 6 sts, 1 φ, 1 tr ; tarsi I–IV, 32 sts, 5 ω, 1 micro – 28 sts, 2 ω – 27 sts, 1 tr – 29 sts, 1 ω, 1 tr.

Type material. Female holotype, SOUTH AFRICA: Western Cape, Kleinmond, 34°21′S, 19°01′, from soil, 11 December 1976, coll. J. den Heyer.

Type depositories. Female holotype is deposited at NCA.

Etymology. This species is named after the type locality.

Differential diagnosis. This species closely resembles *B. psammina* sp. n. but can be distinguished by tarsus I having three attenuated solenidia and by the posterior third of the propodosoma without striae.

Biscirus skuinsbaaiensis Omukunda, Theron et Ueckermann, sp. n.

Figs. 25–32.

Description. Female (holotype and two paratypes). Dimensions: total length, including gnathosoma 1194 (1156–1194), width 573 (458–573); length of gnathosoma 363 (363–382); length of palp segments: I — 21; II + III — 191; IV — 31 (29–31); V — 132; *des* 193; *ves* 180; length of chelicerae 315 (302–315); length of legs: I — 455 (455–481); II — 437 (437–439; III — 455 (455–539); IV — 661 (573–661); length of setae: *sce*, 101 (101–117); c_1 , 86 (86–103); c_2 , 99 (99–105); distance: *vi–vi*, 84 (67–84); first interspace (c_1–d) 120 (118–120).

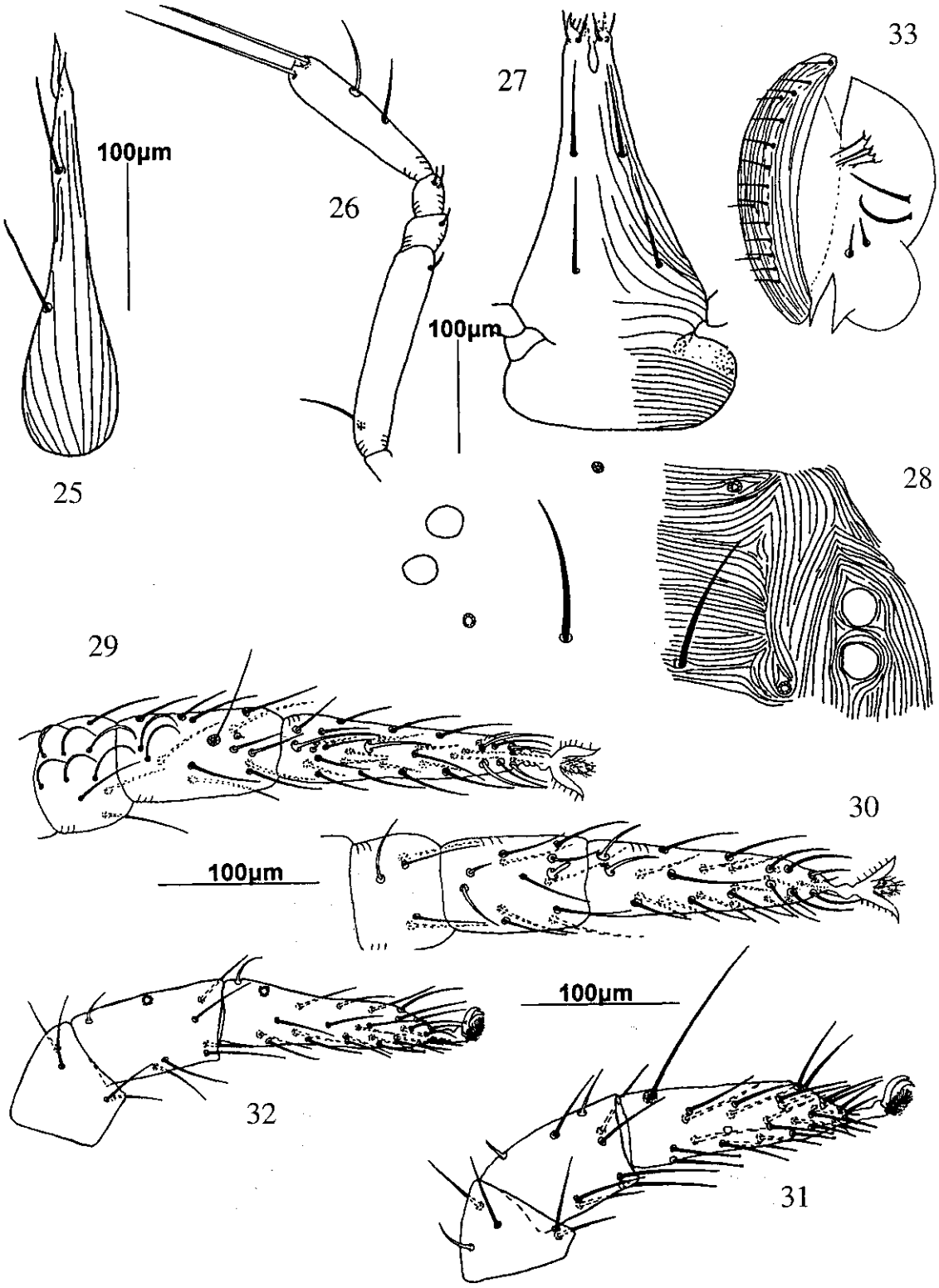
Gnathosoma. Chelicerae with 2 strong setae each, their base slightly inflated, as shown in Fig. 25. They covered by strong, rough longitudinal striations; both chelae straight, movable digit longer than fixed one. Palp genu subequal in length to telofemora, palp tibiotarsus cylindrical and elongated. Palp basifemora with 2 setae each, as shown in Fig. 26. Hypostome with 2 pairs of strong setae with weak, rough longitudinal striations, its base with fine transverse striations. Lateral lips conspicuous and with 2 pairs of adoral setae, as shown in Fig. 27.

Dorsum. Simple naso, *sce* sparsely pilose and slightly curved. Striation pattern of propodosoma with fine, sparsely broken, transverse striations in median part (Fig. 28). Two pairs of detectable eyes dorsolaterally. Eyes separated by transverse striations (distance between anterior and posterior eyes equal to half of diameter of posterior eye). Sejugal groove conspicuous. Idiosomal setae sparely pilose. Striations fine transverse in middle part of opisthosoma and fine longitudinal in dorsolateral parts. Setae c_1 about 1.4 times first interspace (c_1–d).

Venter. Ventral setae nude. Forty-six blunt aggenital setae, first pair between coxae IV. Sixteen pairs of attenuate genital setae arranged in 3 rows. Three pairs of small genital discs, first pair in proximal half of vestibule, rest in distal half. Three pairs of anal and 2 pairs of paranal setae.

Legs. Legs shorter than idiosoma. Attenuate solenidia present on leg segments as follows: genu I with 2 proximal, 2 median, and 2 distal solenidia; genua II and III with 1 solenidion in anterior half each; tibia I with 2 proximal and 2 distal solenidia (Figs. 29–31); tibia II with 1 or 2 proximal, and 1 distal solenidion; tibia III with 1 proximal and 1 distal solenidion, and tibia IV (Fig. 32) with 1 proximal solenidion. Tarsi I with dt_{1-3} hollow and nude, dt_2 solid and nude. Tarsi II with dt_{1-2} solid and nude, dt_3 hollow and nude, tarsi III with all *dt* setae solid and nude. Tarsi IV with *dt* similar to those of tarsi II. Claws longer than pretarsi and rayed.

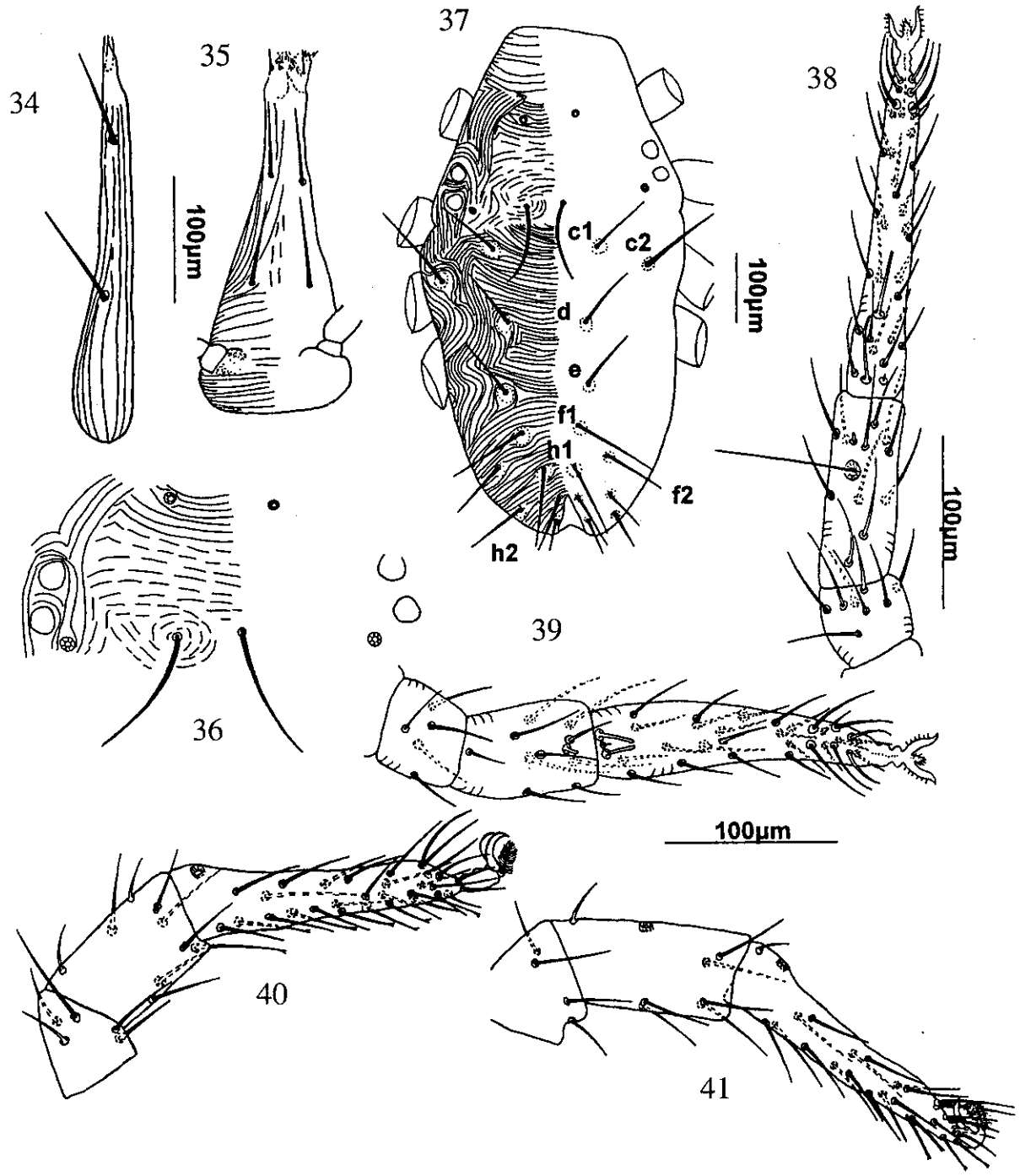
Leg chaetotaxy: coxae I–IV, 5–4–5–5 bts; trochanters IV, 1–1–1–1 sts; basifemora I–IV, 8–8–6–4 sts; telofemora I–IV, 4–5–4–4 sts; genua I–IV, 4 sts, 6 σ – 4 sts, 1 σ – 4 sts, 1 σ – 4 sts; tibiae I–IV, 9 sts, 4 φ, 1 micro, 1 tr – 9 sts, 3 to 4 φ – 7 sts, 2 φ – 6 sts, 1 φ, 1 tr; tarsi I–IV, 27 sts, 6 ω, 1 micro – 28 sts, 2 ω, 1 micro – 26 sts, 1 tr – 26 sts, 1 ω, 1 tr.



Figs. 25–33. *Biscirus skuinsbaaiensis* sp. n., female: 25 — chelicera, dorsal view; 26 — palp, lateral view; 27 — hypostome, ventral view; 28 — propodosomal striations; 29 — leg I, dorsal view; 30 — leg II, dorsal view; 31 — leg III, lateral view; 32 — leg IV, leg IV, lateral view; male: 33 — genital area.

Male (one paratype, Fig. 33). Dimensions: total length, including gnathosoma, 883; length of gnathosoma 293, width 325; length of palp segments: I — 15; II + III — 170; IV — 28; length of legs: I — 361; II — 353; III — 395; IV — 502; length of setae: c_2 78; distance: *vi–vi*, 55; first interspace (c_1–*d*) 94.

Male generally similar to female except for genital area. Amphioid sclerites as shown in Fig. 33.



Figs. 34–41. *Biscirus amplexus* sp. n., female: 34 — chelicera, dorsal view; 35 — hypostome, ventral view; 36 — propodosomal striations; 37 — idiosoma, dorsal view; 38 — leg I, dorsal view; 39 — leg II, dorsal view; 40 — leg III, lateral view; 41 — leg IV, lateral view.

coxae I–III, 3–1–2 bts; trochanters I–III, 0–0–0; femora I–III m 5–5–4 sts; genua I–III, 3 sts, 3 σ – 3 sts, 1 σ – 4 sts, 1 σ; tibiae I–III, 4 sts, 3 φ, 1 micro – 5 sts, 2 φ – 4 sts, 1 φ; tarsi I–III, 16 sts, 2 ω, 1 micro – 15 sts, 1 micro, 1 ω – 14 sts, 1 tr.

Type material. Female holotype, 1 tritonymph and 3 larva paratypes, SOUTH AFRICA: Western Cape, Groenvlei Pass near Kamieskroon, in debris under *Didelta spinosa* (Asteraceae) 30°11′S, 17°55′E, 28 August 1996, coll. H. Kruger.

Type depositories. Type material is deposited at NCA.

Etymology. *Amplexus* is the Latin word (*surrounding*) which refers to the striation pattern around the external scapulars (*sce*).

Differential diagnosis. This species closely resembles *B. skuinsbaaiensis* sp.n., but its propodosoma has the roughly broken striations, genua I with four attenuate solenidia, and tarsi I with three attenuate solenidia.

Biscirus magdalenae Omukunda, Theron et Ueckermann, sp. n.

Figs. 42–50.

Description. Female (holotype). Dimensions: length, including gnathosoma, 1089; length of gnathosoma 298, width 478; length of palp segments: I — 10; II+III — 157; IV — 19; V — 71; *des* 183; *ves* 159; length of legs: I — 367; II — 334; III — 438; IV — 533; length of setae: *sce* 86; c_1 82; c_2 80; distance: *vi–vi* 55; first interspace (c_1–*d*) 86.

Gnathosoma. Chelicerae with pairs of strong setae each and fine longitudinal striations. Movable chelae with 2 teeth, longer than fixed digit as shown in Fig. 42. Palp (Fig 43) equal in length to hypostome. Palp chaetotaxy from trochanter to tibiotarsus: 0–2–1–2 sts, 1 ω, 1 *des*, 1 *ves*. Gnathosomal base with fine transverse striations. Hypostome with rough transverse striations up to base of proximal hypostomal setae, covered by faint, rough longitudinal striations anterior to these setae, as shown in Fig. 44.

Dorsum. Simple naso. Propodosoma with 2 pairs of trichobothria, setae *sce* strong and slightly pilose. Anterior third of propodosoma with fine transverse striations, in posterior two-thirds of propodosoma non-striated (Fig. 45). Two pairs of well defined eyes separated by oblique striations (distance between anterior and posterior eyes equal to diameter of anterior eye). Idiosomal setae sparsely pilose, striation pattern fine, transverse in middorsal part and fine longitudinal in dorsolateral parts. Postanal setae arranged in line with posterior margin of anal opening and external clunal setae (h_2). Anal setae absent dorsally.

Venter. All ventral setae nude. Twenty-eight blunt aggenital setae, first pair between coxae IV. Fourteen pairs of equally long attenuate genital setae arranged in 2 rows. Three pairs of genital discs, 2 pairs situated in proximal half of vestibule and 1 pair in distal half of vestibule. Three pairs of anal and 2 pairs of paranal setae present. Striation pattern as shown in Fig. 46.

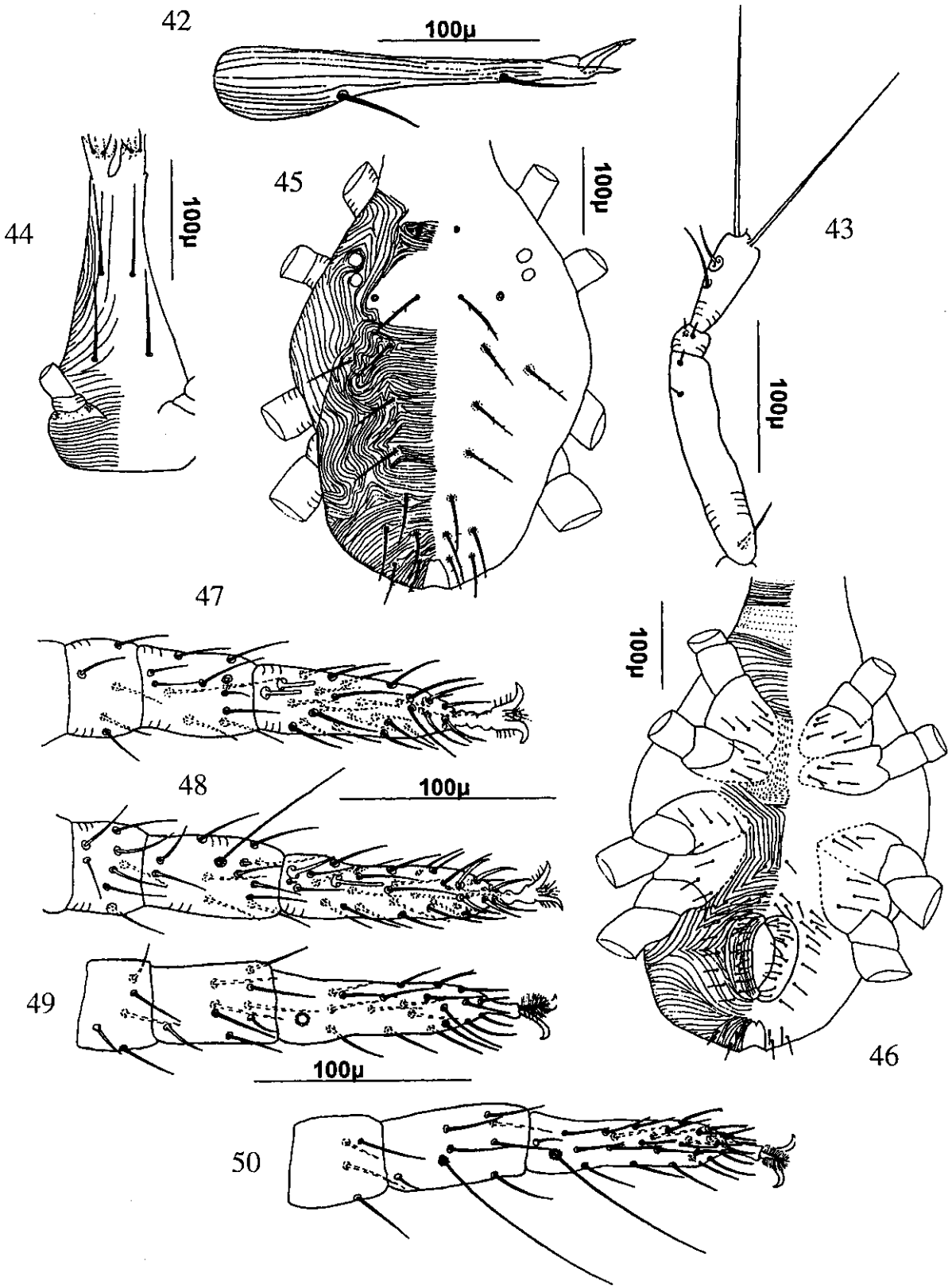
Legs (Figs. 37–38). Legs shorter than idiosoma. Coxae II with 1 or 2 terminally branched setae. Attenuate solenidia distributed as follows on leg segments: genu I with 2 in each half; genua II and III with 1 each; tibia I with 2 proximal and 2 distal, as shown in Fig. 47; tibia II with 2 proximal and 1 distal; tibia III with 1 solenidion in each half, tibia IV with 1 proximal; tarsus I with 2 and tarsi IV 1 lateral to trichobothrium. Dorsoterminal setae on tarsi I all hollow and nude. Tarsi II having dt_1, solid and nude, and dt_{2-3} hollow and nude (Fig. 48). Tarsi III having these setae solid and nude (Fig. 49). Tarsi IV (Fig. 50) with dt_{1-2} solid and nude, and dt_3 hollow and nude. Leg chaetotaxy: coxae I–IV, 5–5(5)–5(6)–3 bts; trochanters I–IV, 1–1–1–1 sts; basifemora I–IV, 9–7–6–4 sts; telofemora I–IV; 5–5–4–4 sts; genua I–IV, 4 sts, 4 σ – 4 sts, 1 σ – 4 sts, 1 σ – 4 sts; tibiae I–IV, 7 sts, 4 φ, 1micro, 1 tr – 8 sts, 4 φ – 7 sts, 2 φ – 6 sts, 1 φ, 1 tr; tarsi I–IV, 31 sts, 4 ω, 1 micro – 29 sts, 2 ω – 3 sts, 1 tr – 30 sts, 1 tr.

Tritonymph (one paratype). Dimensions: length, including gnathosoma, 880; width 401; length of gnathosoma 223, length of chelicerae 187; length of palp segments: I — 10; II + III — 101; IV — 13; V — 59; *des* 143; *ves* 118; length of setae: *sce* 61; c_1 6_2; c_2 57; distance: *vi–vi* 42; first interspace (c_1–*d*) 76. Length of legs: I — 267; II — 218; III — 296; IV — 342. Three pairs of genital discs; 8 pairs of genital setae; 9 pairs of aggenital setae, first pair between coxae IV. Two pairs of anal and paranal setae. Leg chaetotaxy: coxae I–IV, 4–3–4–3 bts; trochanters I–IV, 1–1–1–1 sts; basifemora I–IV, 7–7–5–3 sts; telofemora I–IV, 5–4–4–4 sts; genua I–IV, 4 sts, 4 σ – 5 sts, 1 σ – 4 sts, 1 σ – 4 sts; tibiae I–IV, 7 sts, 3 φ, 1 micro, 1 tr – 6 sts, 3 φ – 6 sts, 1 φ – 6 sts, la, 1 tr; tarsi I–IV, 22 sts, 4 ω, 1 micro – 21 sts, 2 ω – 22 sts, 1 tr – 20 sts, 1 tr, 1 ω.

Protonymph (one paratype). Dimensions: length, including gnathosoma, 607; width 296; length of gnathosoma 168, length of palp segments: I — 8; II+III — 80; IV — 13; V — 52; *des* 99; *ves* 82; length of legs: I — 214; II — 191; III — 224; IV — 239; length of setae: *vi* 99; *sci* 105; *sce* 34; c_1 29; c_2 31; distance: *vi–vi* 23; first interspace (c_1–*d*) 54.

One pair of genital discs; genital setae absent; 7 aggenital setae, first pair between coxae IV. Ventrally, 2 pairs of anal setae. Postanal setae transversely in line with external clunals (h_2) dorsally. Palp basifemora with 1 seta. Leg chaetotaxy: coxae I–IV, 3–2–2–(1)–0 bts; trochanters I–IV, 1–1–1–0 sts; basifemora I–IV, 2–2–1–0 sts; telofemora I–IV, 3–3–3–1; genua I–IV, 4 sts, 3 σ – 4 sts, 1 σ – 4 sts, 1 σ – 2 sts; tibiae I–IV, 4 sts, 2 φ, 1 micro, 1 tr – 5 sts, 2 φ – 5 sts, 1 φ – 1 sts; tarsi I–IV, 17 sts, 3 ω, 1 micro – 17 sts, 1 ω – 16 sts, 1 tr – 12 sts.

Larva (4 paratypes). Dimensions: length, including gnathosoma, 441–466; width 191–220; length of gnathosoma 122–136; length of chelicerae 105–109; length of palp segments: I — 10; II + III — 50–57; IV — 10; V — 36; *des* 82–86; *ves* 63–71; length of legs: I — 136–139; II — 141; III — 164–168; length of setae: *vi* 67–86; *sci* 99; *sce* 34–36; c_1 29–31; c_2 33; distance: *vi–vi* 34–36; first interspace (c_1–*d*) 38. Three pairs of legs; genital



Figs. 42–50. *Biscirus magdalenae* sp. n., female: 42 — chelicera, lateral view; 43 — palp, dorsolateral view; 44 — hypostome, ventral view; 45 — idiosoma, dorsal view; 46 — same, ventral view; 47 — leg I, dorsal view; 48 — leg II, dorsal view; 49 — leg III, dorsal view; 50 — leg IV, dorsal view.

region absent; femora not divided; leg chaetotaxy as follows: coxae I–III, 3–1–0 bts; trochanters I–III, 0–0–0; femora I–III, 5–5–2 sts; genua I–III, 4 sts, 2 σ – 4 sts, 1 σ – 4 sts, 1 σ; tibiae I–III, 4 sts, 2 φ, 1 micro – 5 sts, 2 φ – 4 sts, 1 φ; tarsi I–III, 14 sts, 2 ω, 1 micro – 8 sts, 1 ω – 6 sts, 1 tr.

Type material. Female holotype, SOUTH AFRICA: North West Province, Bodenstein, Ventersdorp-Coligny road, 26°19′S, 26°28′E, debris under weeping willow, 11 October 1970, coll. J. Den Heyer; 1 larva paratype, same locality, from soil, 20 January 1974, coll. J. den Heyer; 1 tritonymph and 1 larva paratypes, SOUTH AFRICA: North West Province, Potchefstroom, from soil, 26°43′S, 27°06′E, 15 January 1974, coll. J. Kruger; 1 deutonymph paratype, same locality, under *Eragrostis curvula* (Poaceae), 9 April 1963, coll. L.J. Erasmus; 1 protonymph paratype, same locality, from soil, 4 March 1963, coll. G.C. Loots; 1 larva paratype, same locality, from soil, 4 December 1969, coll. P.D. Theron; 1 larva paratype, same locality, Boskop Dam, from soil, 1 November 1996, coll. J van der Schyff.

Type depositories. Type material is deposited at NCA.

Etymology. This species was named after the late Dr. Magdalena K.P. Smith Meyer.

Differential diagnosis. This species closely resembles *B. kleinmondiensis* sp.n. but can be distinguished by genua I having four attenuate solenidia, tarsus I with two attenuate solenidia, the nonstriated centre of propodonotum, and by setae c_1 shorter than the first interspace (c_1–d).

KEY TO THE SOUTH AFRICAN SPECIES OF *BISCIRUS* THOR, 1927 (FEMALES)

1. Palp genu about twice palp telofemur, segments with at least one pilose seta each .... *B. lootsi* sp. n. (Figs. 1–9).
— Palp genu equal or slightly shorter than palp telofemur setae smooth 2
2. Genu I with 5 attenuate solenidia 3
— Genu I with 4 or 6 attenuate solenidia 4
3. Two attenuate solenidia on tarsus I, centre of propodosoma striated .... *B. psammina* sp. n. (Figs. 10–16).
— Three attenuate solenidia on tarsus I, distal half of centre of propodosoma not striated .... *B. kleinmondiensis* sp. n (Figs. 17–24).
4. Genu I with 6 attenuate solenidia .... *B. skuinsbaaiensis* sp. n. (Figs. 25–33).
— Genu I with 4 attenuate solenidia 5
5. Tarsus I with 3 attenuate solenidia, tibia II with 2 attenuate solenidia, entire propodosoma striated ..... *B. amplexus* sp. n. (Figs. 34–41).
— Tarsus I with 2 attenuate solenidia, tibia II with 3 attenuate solenidia, of propodosoma not striated ..... *B. magdalenae* sp. n. (Figs. 42–50).

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