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New species and new records of jumping spiders (Araneae: Salticidae) from central South Africa

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ABSTRACT

Examination of recently collected material of predominantly ground-dwelling jumping spiders (Araneae: Salticidae) mainly from the Free State and Northern Cape provinces, South Africa, lead to the discovery of 15 new species, which are described here: *Cembalea triloris* sp. n., *Evarcha brinki* sp. n., *E. flagellaris* sp. n., *E. vittula* sp. n., *Icius pulchellus* sp. n., *Langona hirsuta* sp. n., *L. lotzi* sp. n., *Microbianor globosus* sp. n., *Pseudicius dependens* sp. n., *P. gracilis* sp. n., *P. karinae* sp. n., *P. maculatus* sp. n., *P. solitarius* sp. n., *Rhene lingularis* sp. n. and *Tanzania meridionalis* sp. n. The unknown male of *Rhene konradi* Wesołowska, 2009, and the unknown females of *Pellenes bulawayoensis* Wesołowska, 1999, *P. modicus* Wesołowska & Russell-Smith, 2000, *Phlegra etosha* Logunov & Azarkina, 2006, *P. karoo* Wesołowska, 2006 and *Thyene thyenioides* (Lessert, 1925), are described for the first time. Nine species, *Dendryphantes hararensis* Wesołowska & Cumming, 2008, *Menemerus pilosus* Wesołowska, 2006, *Pellenes geniculatus* (Simon, 1868), *P. modicus*, *Phlegra bresnieri* (Lucas, 1846), *P. etosha*, *P. karoo*, *Tanzania mkomaziensis* (Wesołowska & Russell-Smith, 2000) and *T. thyenioides*, are recorded from South Africa for the first time. Apart from two records in the Northern Cape Province, *Cembalea triloris* sp. n. is also recorded from southern Namibia. Additionally, new provincial records for species previously recorded from elsewhere in South Africa are presented: 19 species are recorded from the Free State for the first time, five from the North West, and two from the Northern Cape. *Thyenula oranjensis* Wesołowska, 2001, described from the eastern Free State, is recorded from KwaZulu-Natal for the first time.

KEY WORDS: Araneae, Salticidae, Afrotropical, jumping spiders, new species, new records, Grassland, Nama Karoo, taxonomy.

INTRODUCTION

The spider fauna of the semi-arid and arid parts of central and western South Africa has long been neglected in terms of taxonomy and ecology. Only during the last two decades have the first ecological studies been undertaken in natural habitats and agro-ecosystems in the Grassland Biome (Lotz *et al.* 1991; Van den Berg & Dippenaar-Schoeman 1991; Haddad & Dippenaar-Schoeman 2002, 2006*a*, *b*; Haddad 2005; Fourie 2010) and Nama Karoo Biome (Haddad *et al*. 2004, 2005, 2006, 2008; Haddad & Dippenaar-Schoeman 2005) that dominate the Free State and Northern Cape provinces. Consequently, little is known about the association of spider species with these biomes, levels of endemism, conservation importance, and the factors affecting the distribution of the species occurring in each. A pattern that has emerged from these studies is that the Salticidae persist as one of the most species-rich spider families in most habitat strata in these biomes, a pattern that has been regularly observed in savannah (e.g. Whitmore *et al*. 2002; Haddad *et al.* 2006; Dippenaar *et al.* 2008; Foord *et al.* 2008; Dippenaar-Schoeman & Van den Berg 2010; Muelelwa *et al*. 2010), a structurally more complex vegetation type.

During sampling in these biomes over the last three decades, including studies forming part of the South African National Survey of Arachnida (SANSA), several species of

the Salticidae were sampled that were found to be new to science. This includes seven species of *Heliophanus* C. L. Koch, 1833, two *Thyenula* Simon, 1902, and one of each *Rhene* Thorell, 1869 and *Nigorella* Wesołowska & Tomasiewicz, 2008 that have already been described in previous papers (Wesołowska 2001, 2003, 2009*a*, *b*; Wesołowska & Haddad 2002). In the current contribution an additional 15 species are described, several species described from outside South Africa are recorded from the country for the first time, and new provincial records for the Free State, Northern Cape, North West and KwaZulu-Natal are presented. This includes range extensions for some of the species previously described in the papers listed above.

The Grassland Biome is presently considered to be one of the most seriously threatened vegetation types in South Africa, with 40% irreversibly transformed and only 2.8% formally conserved (O'Connor & Kuyler 2005). A large portion of the grassland habitat has been transformed by agriculture (cultivation and grazing), with additional threats coming from mining, urban expansion, industrialisation and associated pollution (Mentis & Huntley 1982). As such, the remaining untransformed grassland patches are highly irreplaceable (Egoh 2009). The absence of large protected areas within the Free State part of the Grassland Biome necessitates effective management and conservation of private land in order to protect the highly endemic fauna and flora of this biome (Wessels *et al.* 2003).

The Salticidae could serve as a potential surrogate taxon for environmental and conservation assessments in South Africa, as they are abundant, usually sampled throughout the year, show contrasting responses to climatic conditions, and are species rich (e.g. Wesołowska & Cumming 2008). Future consideration of their use in assessments and ecological studies requires that the species should be described, which would facilitate the identification of material and accurate presentation of their distribution and conservation importance. This paper thus aims to extend our knowledge of the Salticidae of the Grassland and Nama Karoo biomes and provide a platform for future biological and ecological research on the group.

MATERIAL & METHODS

Field work forming part of various student projects was undertaken between 2000 and 2009 at nine sites in central South Africa (Free State, Northern Cape and North West provinces), and several surveys as part of SANSA. Additionally, some accessioned museum material collected at various sites in the Free State, Northern Cape and KwaZulu-Natal provinces was also included in this study. The majority of specimens examined were collected by pitfall trapping, leaf litter sifting or active searching at the base of grass tussocks, thus accounting primarily for ground-dwelling jumping spiders. Plant-dwelling species collected by beating, sweeping and from under bark are considerably less prominently represented in these collections. A few depositories were sampled in and around human habitation.

In assessing the distribution of the species presented here, all records from South Africa published in taxonomic papers were included to indicate the historical distribution and coverage of the material examined in the current study. Records from ecological papers and unpublished records in museum databases were not included as they may require confirmation. A total of 1456 specimens were examined.

Collected spiders were preserved in 70% ethanol and examined in a dish with ethanol. Descriptions of colours and dorsal habitus photographs pertain to wet specimens. In some cases the male pedipalps and female epigynes were dissected from the specimens for study. Epigynes were macerated in 5% hot KOH for a few minutes, dehydrated with 100% ethanol, cleared in xylene and drawn in temporary mounts in eugenol. After examination, the genitalia were placed in micro-vials with ethanol and put into the vials containing the specimens from which they had been removed. Terminology is standard for spiders. All measurements are given in millimetres and were made with a binocular microscope (Nikon) equipped with an ocular micrometer scale.

Digital photos were taken of the dorsal habitus of each salticid species using a Nikon Coolpix 8400 camera mounted on a Nikon SMZ stereomicroscope. The extended focal range images were stacked using CombineZM image stacking software (http://www.hadleyweb.pwp.blueyonder.co.uk) to increase the depth of field. Measurements of each photographed specimen were taken using an ocular micrometer. Plates were prepared and scale bars added in CorelDraw X4.

Voucher material is deposited in the National Museum, Bloemfontein (NMBA), ARC–Plant Protection Research Institute, National Collection of Arachnida, Pretoria (NCA), KwaZulu-Natal Museum, Pietermaritzburg (NMSA) and Ditsong National Museum of Natural History, Pretoria (TMSA), all in South Africa, the Natural History Museum at Wrocław University in Poland (NHMWU), and the Royal Museum for Central Africa, Tervuren, Belgium (MRAC).

TAXONOMY

Genus *Baryphas* Simon, 1902

Type species: *Baryphas ahenus* Simon, 1902.

The genus contains a few, probably unrelated species. The type species is similar to members of the genus *Evarcha* Simon, 1902.

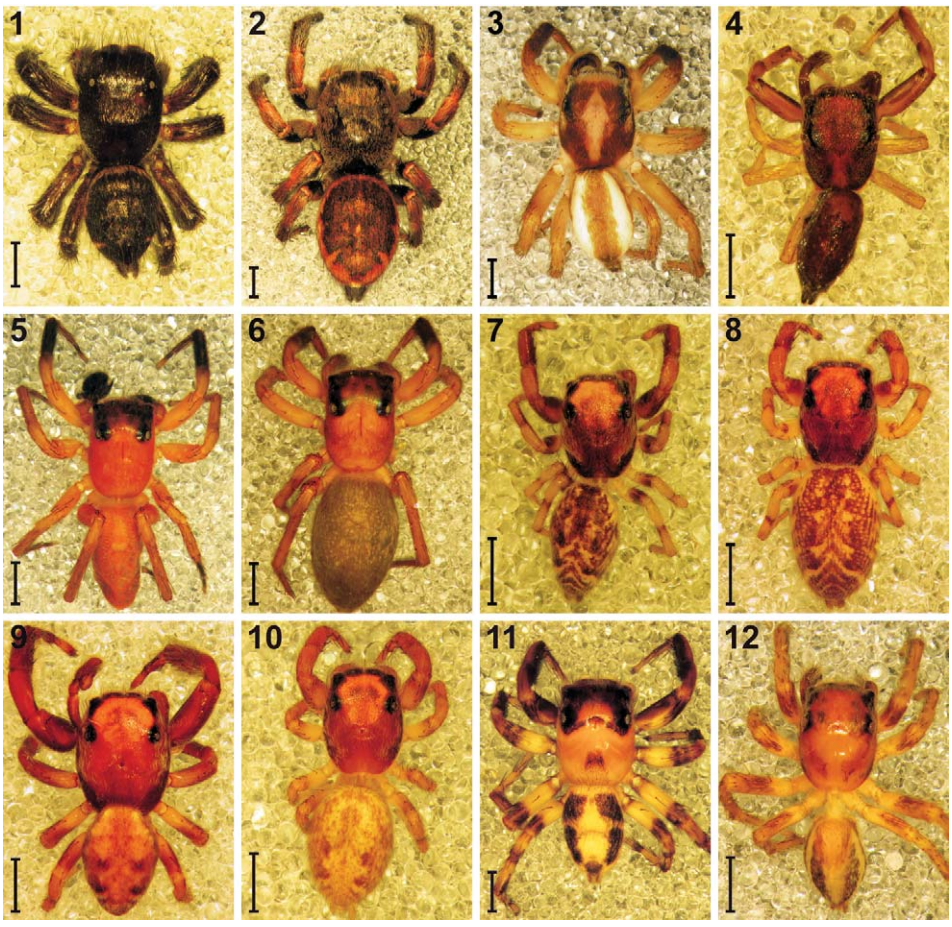
Baryphas ahenus Simon, 1902

Figs 1, 2

Baryphas ahenus: Simon 1902: 42; 1903: 681, figs 807–809; Peckham & Peckham 1903: 207, pl. 24, fig. 2; Lessert 1925*a*: 349, fig. 13; Prószyński 1987: 5; Wesołowska & Cumming 2008: 169, figs 2–8; Wesołowska & Haddad 2009: 23.

Wesołowska and Cumming (2008) described both sexes; general appearance of both sexes in Figs 1, 2.

Material examined: SOUTH AFRICA: *Free State*: 1♂ Bloemfontein, 29°08'S:26°10'E, in building, 12.iv.1989, L. Barkhuizen (NMBA, 2885); 2♀ Bloemfontein district, Deelhoek farm, 28°54'S:26°07'E, 5.iii.2000, C. Haddad (NHMWU); 1♂ Bloemfontein district, Hopefield farm, 28°54'S:26°14'E, 28.ix.2000, C. Haddad (NHMWU); 1♂ Boshoff district, Boesmansrus farm, 28°32.543'S:25°09.929'E, base of grass tussocks, 11.iii.2010, C. Haddad (NCA, 2010/300); 1♀ Brandfort district, Amanzi Private Game Reserve, 28°36.080'S:26°25.950'E, retreat in *Rhus ciliata* florescence, 3.iv.2010, C. Haddad (MRAC, 230324); 2♀ Clocolan district, Mpetsane Conservation Estate, 28°48.773'S:27°39.364'E, beating, 8.iii.2007, C. Haddad (NCA, 2007/1666); 4♂ Erfenis Dam Nat. Res., hilltop, 28°29.276'S:26°47.965'E, beats, *R. ciliata* shrubs, 24.ii.2006, R. Lyle (NCA, 2008/2791); 9 imm. 1♂ 3♀ same locality, rocky ridge, 28°29.888'S:26°48.488'E, beats, *R. ciliata* shrubs, 26.iv.2006, C. Haddad (NCA, 2007/3670); 1♂ 1♀ Harrismith, Wilger Park, 28°17.232'S:29°06.719'E, on walls of house, iv.2010, J. van As (TMSA, 23815); 1♀ Qwa Qwa National Park, Avondrust-Suid, 28°29'S:28°42'E, sweeping, 25.x.1994, L. Lotz (NMBA, 6665); 1♀ same locality, Eerstegeluk, 28°26'S:28°41'E, 3.iii.1994, L. Lotz (NMBA, 6375); 1 imm. 1♀ Tussen-die-Riviere Nat. Res.,



Figs 1–12. Digital microscope photographs of the dorsal habitus of South African jumping spiders: (1, 2) *Baryphas ahenus*, male (1) and female (2); (3) *Cembalea triloris* sp. n., male; (4) *Cosmophasis australis*, male; (5, 6) *Cyrba nigrimana*, male (5) and female (6); (7, 8) *Dendryphantes hararensis*, male (7) and female (8); (9, 10) *D. purcelli*, male (9) and female (10); (11) *Evarcha brinki* sp. n., male; (12) *E. flagellaris* sp. n., male. Scale bars = 1 mm.

30°28'S:26°13'E, beats, 23.x.2008, L. Lotz (NMBA, 12986); 6 imm. 1♀ same locality, 30°29'S:26°07'E, beats, rocky hillside, 16.x.2008, L. Lotz & C. Haddad (NMBA, 12907).

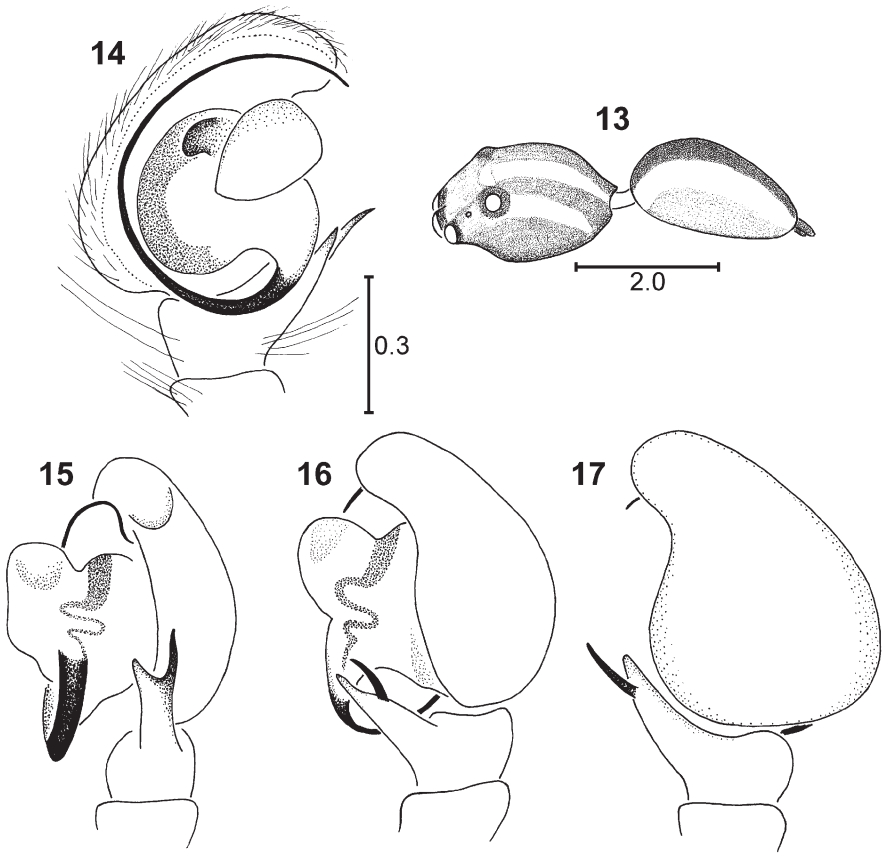
Distribution: Species common in southern Africa, recorded here from the Free State Province for the first time (Fig. 23).

Habitat and biology: This species was occasionally collected by beating foliage of shrubs.

Genus *Cembalea* Wesołowska, 1993

Type species: *Tularosa plumosa* Lessert, 1925.

A small genus consisting of only three species distributed in the Afrotropical Region. The members of the genus have a high carapace; a characteristic feature of males is the



Figs 13–17. *Cembalea triloris* sp. n., holotype male: (13) habitus, dorsolateral view; (14) palpal organ, ventral view; (15) palpal organ, lateral view; (16) palpal organ, dorsolateral view; (17) palpal organ, dorsal view.

long embolus and a ventral fringe of dark hairs on the first legs, which easily break off in preserved specimens and are sometimes missing as a result.

Cembalea triloris sp. n.

Figs 3, 14–17

Etymology: From Latin *tri-* (three-) and *lorum* (a thong, a strap), referring to the carapace markings of this species.

Diagnosis: This species is distinguished from congeners by the shape of the tibial apophysis, with an additional long spike on the terminal part dorsally.

Description:

Male.

Measurements: Carapace: length 2.0–2.3, width 1.6–1.8, height 0.9–1.0. Abdomen: length 1.9–2.5, width 1.4–1.7. Eye field: length 1.0–1.1, anterior width 1.3–1.4, posterior width 1.4–1.6.

General appearance as in Figs 3, 13. Carapace high and convex, sloping posteriorly, dark brown, vicinity of eyes black. White hairs forming three wide stripes on thoracic part (Figs 3, 13). Eyes of anterior row surrounded by white hairs. Clypeus clothed in pale hairs. Chelicerae unidentati, dark brown, endites dark yellow, external margins of endites with triangular lobes. Labium brown, sternum yellow, with dark ring around edge. Abdomen light, yellowish white, with wide median brown streak (Fig. 3), venter tinged with grey, this colour extending to sides of abdomen. Dorsum of abdomen covered with adpressed hairs. Spinnerets long, dark. Legs light brown, tibiae, patellae and lateral surfaces of femora slightly darker. Femora III and IV clearly longer than anterior femora. Spines numerous, yellow. Leg spination: I: femur dorsally 0-0-1-1-3, patella pro- and retrolaterally 1, tibia pro- and retrolaterally 1-1, ventrally 2-2 apically, metatarsus pro- and retrolaterally 1; II: femur dorsally 0-0-2-2-4, patella as I, tibia dorsally 1-0-0, pro- and retrolaterally 1-1, ventrally 0-2, metatarsus as I; III: femur dorsally 0-1-0-1-3, prolaterally 0-0-0-1-1, patella dorsally, pro- and retrolaterally 1, tibia dorsally 1-1-0, prolaterally 1-1-1-1, ventrally 1, metatarsus dorsally 1-1, pro- and retrolaterally 1-1, ventrally 2-2 apically; IV: femur dorsally 0-1-0-1-3, patella pro- and retrolaterally 1, tibia and metatarsus as III. Pedipalps pale. Palpal tibia short, single apophysis with long additional terminal spike (Figs 14–17). Bulb with convex anterior haematodocha, embolus long (Fig. 14). Cymbium with tip curved towards retrolateral side.

Female. Unknown.

Holotype: ♂ SOUTH AFRICA: *Northern Cape*: Prieska district, Green Valley Nuts, 29°35.495'S:22°57.308'E, Nama Karoo grassland, pitfall traps, 28.ii–26.iii.2002, C. Haddad (NCA, 2010/200).

Paratypes: NAMIBIA: 4♂ Wildheim Ost, 26°28'S:19°33'E, under calcrete stones, 6.vii.1986, C. Pieterse (NMBA, 1511); 2♂ Noachabeb, 27°23'S:18°30'E, under stones/red sand, 7–9.vii.1986, C. Pieterse (NMBA, 1554). SOUTH AFRICA: *Northern Cape*: 1♂, together with 1 imm. Namaqualand, Groenriviersmond, 30°51'S:17°35'E, 14.ix.1994, J. Irish (NMBA, 8119).

Distribution: Known from arid western South Africa and southern Namibia (Fig. 23).

Habitat and biology: Apparently an exclusively ground-dwelling species.

Remark: The holotype male was misidentified by Haddad and Dippenaar-Schoeman (2006*b*) as *Pellenes* sp.

Genus *Cosmophasis* Simon, 1901

Type species: *Plexippus thalassinus* C.L. Koch, 1846.

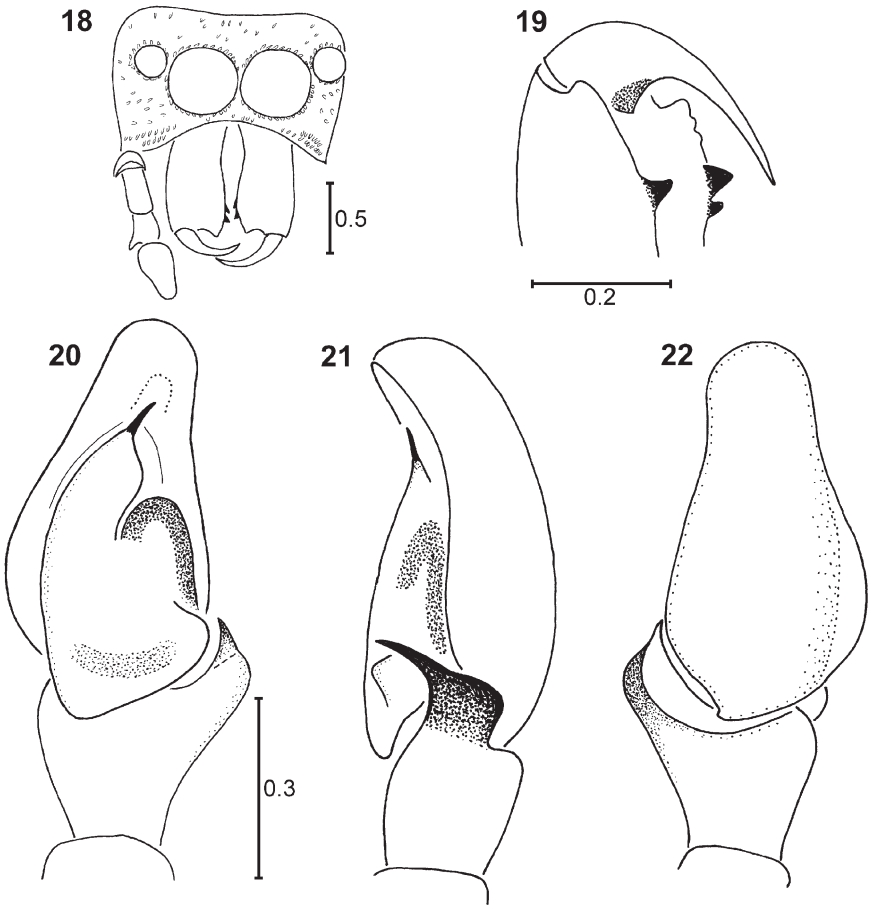
A moderately large genus with more than 40 species distributed mainly in tropical Asia, with 10 species known from the Afrotropical Region. Some of the Afrotropical species described in *Cosmophasis* were recently transferred to *Mexcala* Peckham & Peckham, 1902 (Wesołowska 2009), but the relationships of the remaining 10 species are unclear and the Afrotropical fauna urgently needs revision.

Cosmophasis australis Simon, 1902

Figs 4, 18–22

Cosmophasis australis: Simon 1902: 25; 1910: 419; Clark 1974: 14, figs 6–9.
Almota quinii: Peckham & Peckham 1903: 194, pl. 20, fig. 1.

See Clark (1974) for description of female.



Figs 18–22. *Cosmophasis australis*, male: (18) carapace, anterior view; (19) cheliceral dentition; (20) palpal organ, ventral view; (21) palpal organ, lateral view; (22) palpal organ, dorsal view.

Redescription:

Male.

Measurements: Carapace: length 1.8, width 1.3, height 0.7. Abdomen: length 1.9, width 1.0. Eye field: length 1.0, anterior width 1.2, posterior width 1.3.

General appearance as in Fig. 4. Small spider. Carapace high in cephalic part, with steep posterior slope beginning just behind eye field. Its colouration dark brown, near eyes blackish, covered with scarce small white scales, delicate brown bristles in vicinity of eyes. Anterior median eyes large (Fig. 18), all eyes of first row fringed with white scales, clypeus low, dark. Ocular area pitted. Labium, endites and sternum brown. Chelicerae unidentate, small additional lobe on prolateral edge between tooth and base of fang (Fig. 19). Abdomen thin, elongated, blackish with shine, delicate colourless hairs on its dorsum. Venter black. Spinnerets dark. Legs yellowish brown, first pair with dark lateral surfaces of femora and patellae. Tibia I with three pairs of spines ventrally, metatarsus

with two pairs. Pedipalps dark, a few white scales on dorsal surface. Tibial apophysis robust, with elongated spike-like end (Figs 20–22), bulb partially divided by fissure, embolus short (Fig. 20).

Holotype (examined): ♂ SOUTH AFRICA: Cape Colony (Museum of Comparative Zoology, Harvard University, USA).

Additional material examined: SOUTH AFRICA: *Free State*: 1♂ Tussen-die-Riviere Nat. Res., 30°29'S: 26°11'E, leaf litter sifting, riverine forest, 15.x.2008, L. Lotz & C. Haddad (NMBA, 12766).

Distribution: Described from the Cape Colony, most likely the present day Western Cape Province of South Africa. Recorded from the Free State Province for the first time (Fig. 23).

Habitat and biology: This species is apparently an ant mimic due to its elongate body and iridescent scales on the body. Only a single specimen was collected in leaf litter.

Remarks: The species is unrelated to the type species of the genus *Cosmophasis* and other members of the genus distributed in Australia and the Pacific Islands. Its inclusion in *Cosmophasis* is only tentative and will require revision after discovery of the female.

Genus *Cyrba* Simon, 1876

Type species: *Salticus algerinus* Lucas, 1846.

Cyrba is a small genus with 11 species distributed in the Afrotropical, Palaearctic and Australasian regions. The Afrotropical Region contains eight species, of which two have ranges extending into the Palaearctic. Species of this genus can be recognized by the posterior narrowing of the eye region, males by the large dark palpal cymbium,

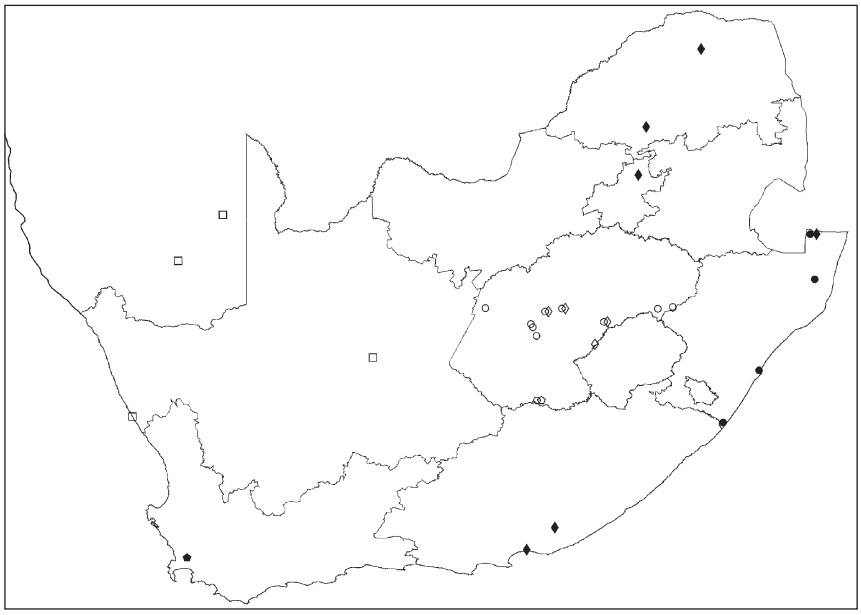


Fig. 23. Distribution of *Baryphas ahenus* (circles), *Cembalea triloris* sp. n. (squares), *Cosmophasis australis* (pentagons) and *Cyrba nigrimana* (diamonds) in South Africa. Solid icons indicate published records and open icons new records from central South Africa.

dorsal tibial apophysis with a row of elongate scales and elongate prolateral tegular process, and females by the epigyne with a paired posterior depression containing the copulatory openings, posterior margin of epigyne with paired lobes, and the simple internal structure of the spermathecae.

Cyrba nigrimana Simon, 1900

Figs 5, 6

Cyrba nigrimanus: Simon 1900: 389.
Cyrba nigrimana: Caporiacco 1947: 230; Wanless 1984: 465, figs 12a–g; Wesołowska & Haddad 2009: 27, figs 26–28; Azarkina & Logunov 2010: 168, figs 14–23.

Azarkina and Logunov (2010) described both sexes; general appearance of both sexes in Figs 5, 6.

Material examined: SOUTH AFRICA: *Free State*: 1 imm. 1♀ Brandfort district, Amanzi Private Game Reserve, 28°36.080'S:26°25.950'E, under rocks, 24.v.2009, C. Haddad (NMSA, 22665); 3 imm. 1♀ Clocolan district, Mpetsane Conservation Estate, 28°48'S:27°39'E, under rocks, 8.iii.2007, C. Haddad (NCA, 2007/1668); 1♂ 2♀ Erfenis Dam Nat. Res., 28°29.615'S:26°48.300'E, under rocks, hillside, 28.ii.2006, C. Haddad (NCA, 2008/2807); 2♂ 4♀ Ladybrand district, De Luc farm, 29°18'S:27°24'E, under rocks, 5.xii.2008, C. Haddad (NMBA, 13049).

Distribution: Widespread in the eastern half of South Africa, although known only from a few scattered localities. Recorded from Free State for the first time (Fig. 23).

Habitat and biology: A ground-dwelling species usually collected from under logs and rocks.

Genus *Dendryphantes* C.L. Koch, 1837

Type species: *Araneus hastatus* Clerck, 1757.

A widely distributed genus, with more than 50 species occurring on all continents except Australia. Nine species are known from the Afrotropical Region. Members of the genus are small with a flattened body, and all are similar coloured. The eye field characteristically has silver patches of translucent guanine crystals, and the abdomen has a herring-bone pattern. The males have a short palpal tibia with a single short apophysis, and a short embolus usually with an accompanying tegular apophysis. The structure of the female genitalia is simple, with short seminal ducts and single-chambered receptacles.

Dendryphantes hararensis Wesołowska & Cumming, 2008

Figs 7, 8

Dendryphantes hararensis: Wesołowska & Cumming 2008: 173, figs 16–21.

Wesołowska and Cumming (2008) described both sexes; general appearance of both sexes in Figs 7, 8.

Material examined: SOUTH AFRICA: *Free State*: 1♀ Golden Gate National Park, Mt Pierre, 28°32'S:28°39'E, beating, 20.iv.1994, L. Lotz (NMBA, 6529); 1♂ Qwa Qwa National Park, Zaphira, 28°29'S:28°40'E, beating, 27.x.1994, L. Lotz (NMBA, 6699); 1♀ same data but 6.vii.1994 (NMBA, 6601).

Distribution: Recently described from Harare, Zimbabwe, recorded for the first time from South Africa (Fig. 36).

Habitat and biology: Consistent with other members of the genus, this species was collected from the foliage of shrubs. Within the area under study, this species was only

collected in high altitude grasslands in the eastern Free State, but considering that the type locality is in the Savannah Biome in Zimbabwe this species may be very widespread.

Dendryphantes purcelli Peckham & Peckham, 1903

Figs 9, 10, 24–27

Dendryphantes purcellii: Peckham & Peckham 1903: 206, pl. 24, fig. 11.
Dendryphantes purcelli: Clark & Benoit 1977: 101, figs 44a–d.

Redescription:

Measurements (♂/♀): Carapace: length 1.9/1.9, width 1.4/1.4, height 0.7/0.6. Abdomen: length 2.1/2.5, width 1.4/1.6. Eye field: length 0.8/0.7, anterior width 1.0/1.0, posterior width 1.1/1.1.

Male.

General appearance as in Fig. 9. Carapace oval, flat, brown, eye field covered with silver spots of translucent guanine crystals and pair of dark patches in centre, eyes surrounded by black rings. Carapace covered in delicate colourless hairs, with some white hairs on slopes and brown bristles near eyes. Sternum and mouthparts brown, external margins of endites extended to triangular lobe. Abdomen greyish beige, with traces of a brown herring bone pattern and pair of rounded brown spots at midpoint, brown hairs on dorsum. Venter yellow, tinged with grey. Spinnerets yellow. Legs brownish with darker femora. Tibia I with 1-2-2 spines ventrally, metatarsus with two pairs ventral spines. Pedipalps brownish, tibia with single hooked apophysis, tegulum with short process near short embolus (Figs 24, 25).

Female.

Habitus and body setae similar to male, abdomen slightly paler (Fig. 10). Epigyne with small notch at posterior edge. Gonopores situated anteriorly in narrow furrow (Fig. 26). Seminal ducts straight, receptacles elongate and strongly sclerotized (Fig. 27).

Material examined: SOUTH AFRICA: *Free State*: 1♂ 1♀ Golden Gate National Park, 28°30'S:28°50'E, beating, 19.iii.1986, L. Lotz (NMBA, 1319); 1 imm. 1♀ Qwa Qwa National Park, Bos-en-Dal, 28°27'S:28°32'E, beating, 5.vii.1994, L. Lotz (NMBA, 6581); 2 imm. 1♂ 1♀ Vrede, Meulstroom, 27°48'S:29°38'E, beating, 6.xii.1992, L. Lotz (NMBA, 5886).

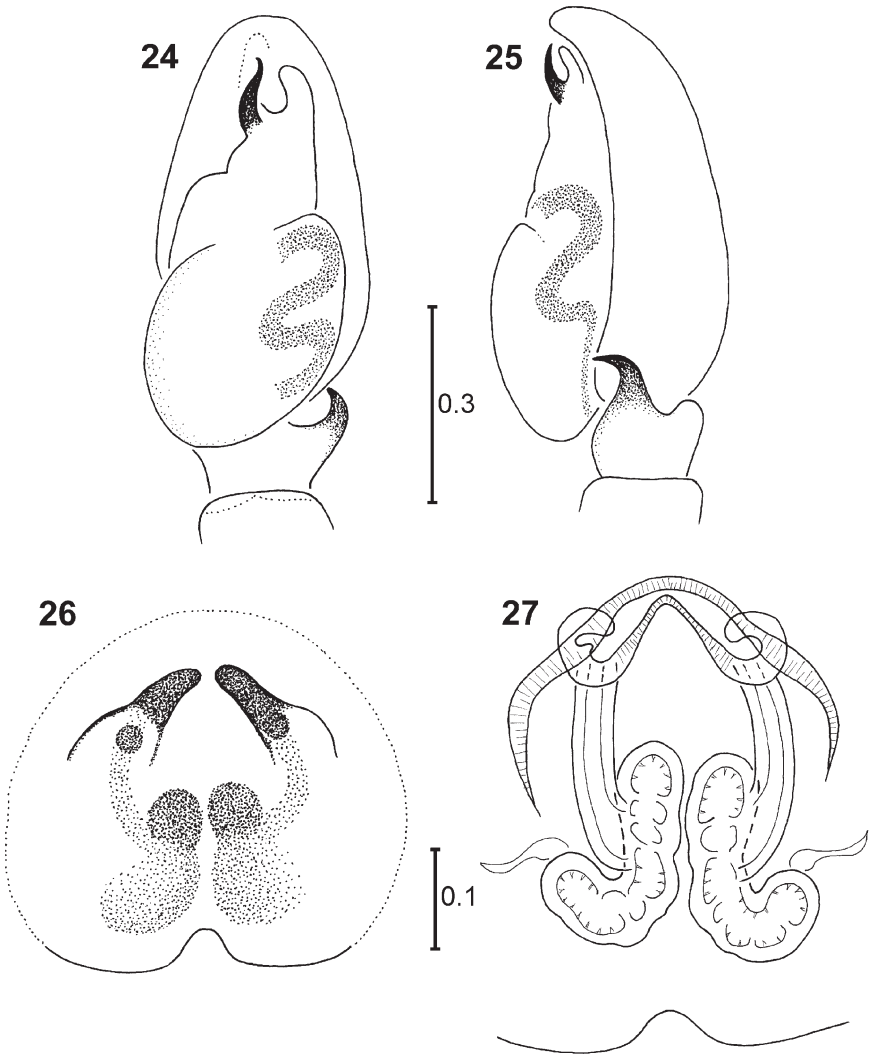
Distribution: Species known hitherto from the Western Cape Province (Cape Peninsula), also recorded from St Helena Island (Clark & Benoit 1977). Recorded here from the Free State Province for the first time (Fig. 36).

Habitat and biology: Collected from the foliage of shrubs. As for *D. hararensis*, this species was only collected in high altitude grasslands in the eastern Free State.

Genus *Evarcha* Simon, 1902

Type species: *Araneus falcatus* Clerck, 1757.

Evarcha is a very large genus comprising about 80 species distributed in the Old World, with the majority of them known from the Palaearctic Region, but also numerous species in the Afrotropical Region (Prószyński 2009; Platnick 2010). Members of this genus are primarily differentiated by morphological features. The males of most species have a palp with a single tibial apophysis, a rounded bulb with a small posterior lobe, and stiletto-like embolus bent towards the bulb. The females usually have strongly



Figs 24–27. *Dendryphantes purcelli*, male (24, 25) and female (26, 27): (24) palpal organ, ventral view; (25) palpal organ, lateral view; (26) epigyne; (27) internal structure of epigyne.

sclerotized multi-chambered receptacles. Despite reasonably stable morphology, genitalic structure suggests that the genus is paraphyletic, as demonstrated by the species presented below, and the relationships of the genus and its composite species need to be clarified on a global scale.

Evarcha brinki sp. n.

Figs 11, 28–32

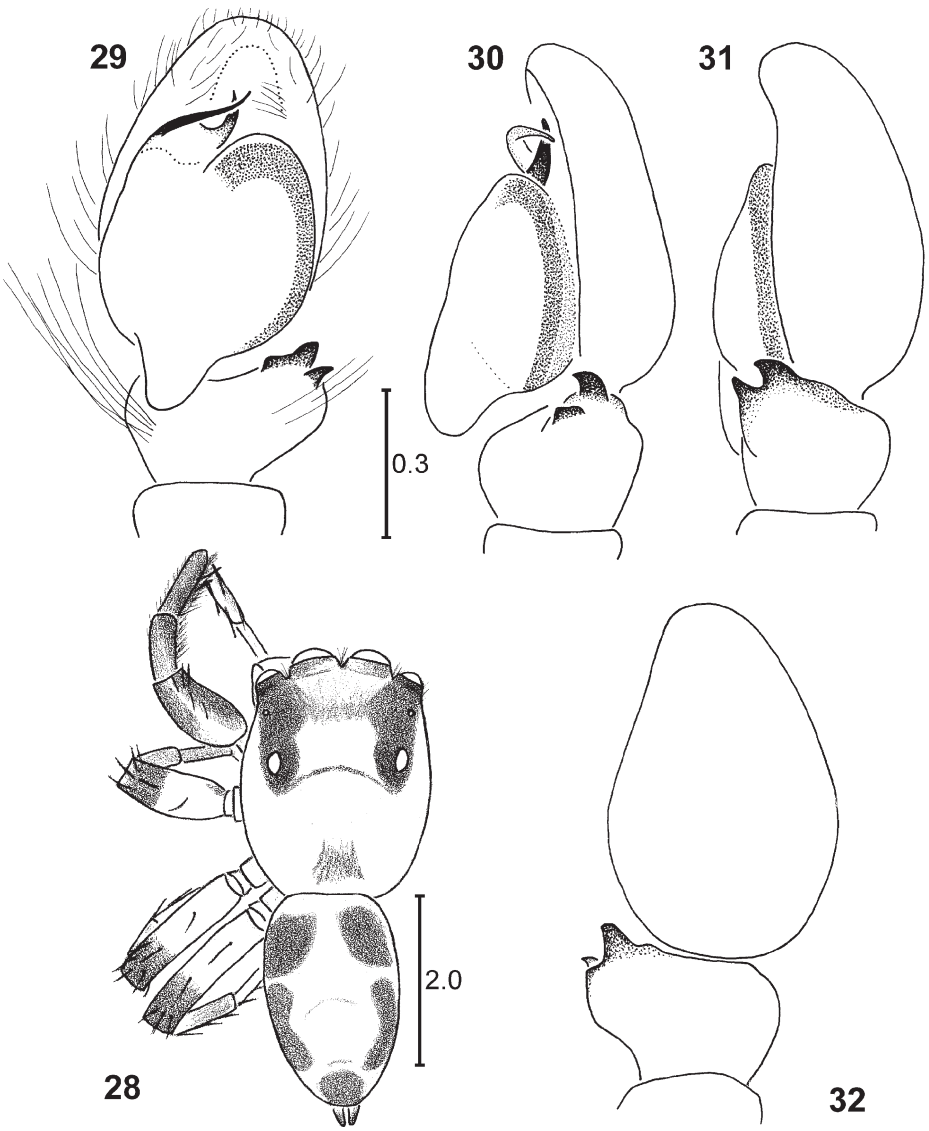
Etymology: The species is named in honour of André Brink, famous South African novelist.

Diagnosis: The species is distinguished by the unique embolus shape, with an additional terminal apophysis; the shape of tibial apophysis is also characteristic.

Description:

Male.

Measurements: Carapace: length 2.5, width 2.0, height 1.1. Abdomen: length 2.1, width 1.5. Eye field: length 1.1, anterior width 1.4, posterior width 1.5.



Figs 28–32. *Evarcha brinki* sp. n., holotype male: (28) habitus; (29) palpal organ, ventral view; (30) palpal organ, ventrolateral view; (31) palpal organ, lateral view; (32) palpal organ, dorsal view.

General appearance as in Figs 11, 28. Carapace high, sloping posteriorly, yellowish orange with darker patch composed of brown hairs on thoracic part. Eye field darker, vicinity of eyes almost black; white hairs forming pale area at posterior margin of eye field. Numerous long brown bristles near eyes; delicate short colourless hairs on thorax. Clypeus yellow with white hairs. Chelicerae unidentate, brown. Maxillae and labium brownish, sternum yellow. Abdomen ovoid, narrower than carapace; dorsum pale yellow with pattern composed of five large black spots (Figs 11, 28), clothed with hairs corresponding in colour with background; some longer brown bristles on dorsum. Venter pale with dark U-shaped patch. Anterior spinnerets yellowish, posterior spinnerets brown. Coxae and trochanters yellowish. Leg I dark brown, only base of femur and tarsus lighter; patellae and tibiae with long brown hairs. Legs II–IV yellow, only apical third of femora brown. Spines dark brown, leg hairs brown and whitish. Pedipalp yellow, but femur and bulb darker. Palpal tibia short and wide, tibial apophysis very strongly sclerotized, short and compact, bicuspidate (Figs 29–32). Embolus with accompanying terminal apophysis (Figs 29, 30).

Female. Unknown.

Holotype: ♂ SOUTH AFRICA: *Northern Cape*: Prieska district, Green Valley Nuts, 29°34.924'S:22°54.376'E, base of grass tussocks, 28.i.2009, C. Haddad (NMBA, 14102).

Distribution: Known only from the type locality (Fig. 36).

Habitat and biology: The holotype was collected from the base of grass tussocks on the banks of the Orange River.

Remarks: The affinities of the species are unclear. The habitus is typical for *Evarcha*, but the structure of embolus differs from that of other African members of the genus. It is slightly similar to the Chinese species *E. sichuanensis* Peng, Xie & Kim, 1993 and *E. orientalis* (Song & Chai, 1992).

Evarcha flagellaris sp. n.

Figs 12, 33–35

Etymology: From Latin *flagellum* (a whip), referring to the whip-like embolus of the species.

Diagnosis: The male of this species is closely related to *E. striolata* Wesołowska & Haddad, 2009 from the KwaZulu-Natal Province in South Africa, from which it can be distinguished by the less convex carapace and presence of a dorsal abdominal scutum in males. The male palp of *E. flagellaris* sp. n. differs from that of *E. striolata* by the clearly shorter embolus and bulb with a large bulged central lobe. The female epigyne is very similar to that of the female described as *E. elegans* Wesołowska & Russell-Smith, 2000 from Tanzania, Ethiopia and South Africa (sexes of the latter species are probably mismatched), which may in fact be the unknown female of *E. striolata*.

Description:

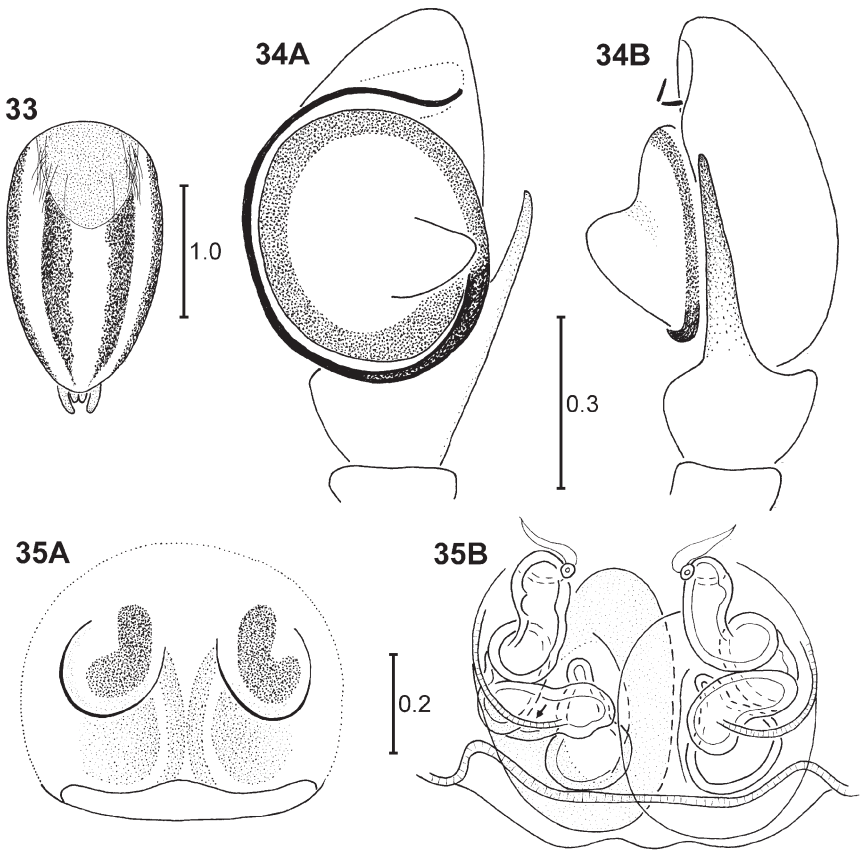
Male.

Measurements (♂/♀): Carapace: length 2.0–2.1/2.3–2.4, width 1.5–1.6/1.7–1.8, height 0.8/1.0–1.1. Abdomen: length 1.9–2.0/3.3–3.6, width 1.2/2.2–2.4. Eye field: length 0.8/0.9–1.0, anterior width 1.3/1.4–1.5, posterior width 1.4/1.5–1.6.

General appearance as in Figs 12, 33. Shape and colouration of carapace typical for *Evarcha* members, dorsum brown with traces of a light median streak on thoracic part, with dark patches composed of brown hairs lateral of this streak, vicinity of eyes black. Whitish hairs cover clypeus, anterior part of eye field and sloping sides. Chelicerae light brown, endites, labium and sternum yellow. Abdomen yellowish with four brown stripes, anterior third covered with orange scutum, with thick brown bristles laterally on this scutum (Fig. 33). Venter pale. Spinnerets grey. Legs yellow, brown hairs forming darker areas on dorsal surface of femora, except basal part. Dark stripe prolaterally along patellae, tibiae and metatarsi of legs I and II. Leg hairs brown. Spines numerous. Tibial apophysis of palp long and straight, bulb rounded with convex central lobe, embolus whip-like, thin and long, with curved end (Figs 34A, B).

Female.

Slightly larger than male. Carapace pale, thoracic part yellow, with black rings surrounding eyes, thoracic part light brown. Some brown bristles on carapace, whitish hairs near eyes. Clypeus low with few white hairs. Mouthparts and sternum dark yellow. Ab-



Figs 33–35. *Evarcha flagellaris* sp. n., holotype male (33, 34) and paratype female (35): (33) abdomen; (34A) palpal organ, ventral view; (34B) palpal organ, lateral view; (35A) epigyne; (35B) internal structure of epigyne, ventral view.

domen ovoid, its width equal to width of carapace, very light, yellowish white, with two longitudinal streaks composed of small beige patches, also with darker patches forming ill-defined streaks on sides; general pattern similar to colouration of male's abdomen, but less contrasted and scutum absent. Venter whitish with two lines of beige dots. Sparse brown bristles on abdomen. Spinnerets light, their tips grey. Legs yellowish to orange, with light brown spines and hairs. Epigyne with two rounded, widely separated grooves and very wide pocket at epigastric fold (Fig. 35A). Seminal ducts weakly sclerotized, very broad, forming broad loop medially; receptacles heavily sclerotized, composed of several lateral chambers (Fig. 35B).

Holotype: ♂ SOUTH AFRICA: *Free State*: Erfenis Dam Nat. Res., site 3, *Acacia karroo* trees, 28°30.272'S: 26°47.527'E, pitfall traps, woodland, 28.x–4.xii.2009, R. Fourie & A. Grobler (NMSA, 22703).

Paratypes: SOUTH AFRICA: *Free State*: 1♂ together with holotype; 1♂ Willem Pretorius Nat. Res., 28°16.696'S: 27°12.083'E, pitfall traps, grassland, 29.x–5.xii.2009, R. Fourie & A. Grobler (NMSA, 22676). *KwaZulu-Natal*: 1♂ Winterton, 28°47.669'S:29°34.635'E, sweep netting, grassland/weeds surrounding kenaf field, 13.ii.2007, V. Swart (TMSA, 23876). *North West*: 1♀ 5 km from Rustenburg, 25°41.904'S:27°14.925'E, long grass, 15.ii.1977, I.V. (NCA, 77/422); 1♀ Rustenburg Nat. Res., 25°42.785'S:27°11.086'E, sweep netting, 11.xii.1979, A.S. Dippenaar-Schoeman (NCA, 94/155); 1♂ same locality, sweep netting, 16.x.1980, M. Stiller (NCA, 94/98).

Distribution: Known from the central Free State Province, southern North West and western KwaZulu-Natal provinces (Fig. 36).

Habitat and biology: All known specimens were collected by pitfall trapping or sweep-netting in grassland and woodland.

Remarks: The structure of the male palp in *E. flagellaris* (and the closely related *E. striolata*) differs from the pattern found in the majority of African *Evarcha* species. It is related to the Asian *flavocincta* group of species. The shape of the epigyne and its structure are related to the Asian *E. flavocincta* (C.L. Koch, 1846) and *E. kochi* Simon, 1902, but also to the common African *E. dotata* (Peckham & Peckham, 1903).

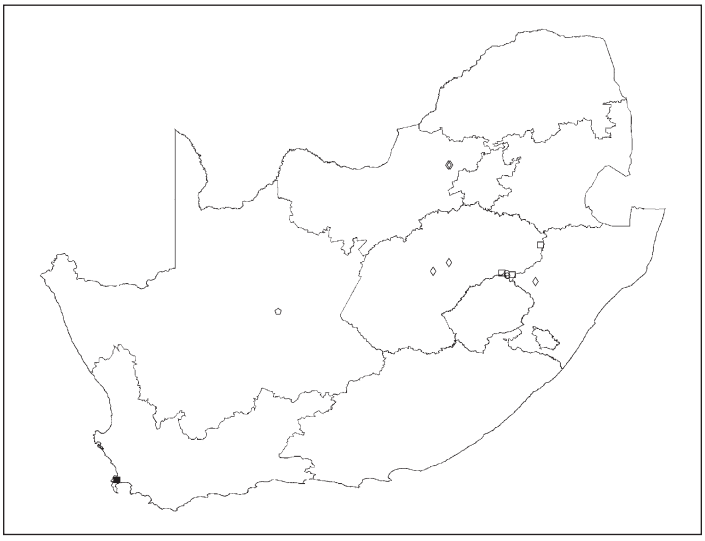


Fig. 36. Distribution of *Dendryphantes hararensis* (circles), *D. purcelli* (squares), *Evarcha brinki* sp. n. (pentagon) and *E. flagellaris* sp. n. (diamonds) in South Africa. Solid icon indicates a published record and open icons new records from central South Africa.

Evarcha prosimilis Wesołowska & Cumming, 2008

Figs 37, 38

Evarcha similis: Wesołowska & Russell-Smith 2000: 28, figs 45–48 (preocc. by Caporiacco 1941).
Evarcha prosimilis: Wesołowska & Cumming 2008: 179, figs 33–37 (replacement name); Wesołowska & Haddad 2009: 33, figs 42–46.

Wesołowska and Haddad (2009) described both sexes; general appearance of both sexes in Figs 37, 38.

Material examined: SOUTH AFRICA: *Free State*: 1♀ Bloemfontein, Naval Hill, Southern plateau, 29°06'S: 26°14'E, ix.1990, L. Lotz (NMBA, 6341); 1♂ Bloemfontein, National Botanical Gardens, 29°08'S:26°10'E, pitfall traps, top of koppie next to stone wall, N side, ix.2006, L. Lotz (NMBA, 10721); 3♂ same data but x.2006 (NMBA, 10894); 2♂ 1♀ same locality, pitfall traps, 8.xi.2006, R. Scholtz & S. Otto (NMBA, 11053); 2♀ same locality, 29°02'S:26°12'E, *Cussonia paniculata* litter, 14.iv.2009, V. Butler (NCA, 2009/3659); 1♂ same data but 22.vi.2009 (NCA, 2009/3658); 2♂ same locality, 29°02'S:26°12'E, *Rhus lancea* litter, 20.v.2009, V. Butler (NCA, 2009/3657); 1♂ same locality, 29°03.006'S:26°12.701'E, base of grass tussocks, 21.x.2009, C. Haddad (NMSA, 22632); 1♂ 1♀ Bloemfontein district, Hopefield farm, 28°54'S:26°14'E, 28.ix.2000, C. Haddad (NHMWU); 5♂ same locality, leaf litter, 14.iv.2002, C. Haddad (NHMWU); 1♂ Brandfort district, Florisbad, 28°46'S:26°05'E, preservation traps, 23.xi–8.xii.1987, L. Lotz (NMBA, 3236); 1♂ same data but 23.ix–6.x.1988 (NMBA, 4670); 1♀ Erfenis Dam Nat. Res., 28°29.276'S:26°47.965'E, beats, *Rhus ciliata*, 24.ii.2006, A. Grobler (NCA, 2007/3673); 1♀ Golden Gate National Park, Alma, 28°29'S:28°41'E, in grass, 11.i.1992, L. Lotz (NMBA, 5535); 1♂ Kroonstad district, Doornkloof farm, 27°43.376'S:27°42.042'E, pitfall traps, grassland, 1.ix–1.x.2009, R. Fourie & A. Grobler (NCA, 2009/3631); 10♂ 1♀ same data but 29.x–5.xii.2009 (NMSA, 22688); 1♀ Ladybrand district, De Luc farm, 29°18'S:27°24'E, base of grass tussocks, 5.xii.2008, C. Haddad (NMBA, 13051); 1♂ Sandveld Nat. Res., 27°41'S:25°41'E, 22.ix.2003, C. Haddad (NHMWU); 1♂ 2♀ Tussen-die-Riviere Nat. Res., 30°29'S:26°11'E, active searching under rocks, riverine forest edge, 15.x.2008, L. Lotz & C. Haddad (NMBA, 12745); 1♀ same locality, 30°28'S:26°13'E, leaf litter sifting, 21.x.2008, L. Lotz (NMBA, 12942); 3 imm. 1♂ same locality, 30°29'S:26°07'E, leaf litter sifting, rocky hill, 16.x.2008, L. Lotz & C. Haddad (NMBA, 12863); 2♂ same locality, 30°29'S:26°11'E, pitfalls, riverine bush, 13–16.x.2008, L. Lotz & C. Haddad (NMBA, 12578); 1♂ Willem Pretorius Nat. Res., 28°16.696'S:27°12.083'E, pitfall traps, grassland, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3519); 2♂ same locality, 28°16.660'S:27°12.207'E, pitfall traps, near water level, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3524). *North West*: 1♂ 1♀ Potchefstroom district, Thabela Thabeng Mountain Retreat, 26°51.825'S:27°17.819'E, pitfall traps, woodland grassland, 1.ix–1.x.2009, R. Fourie & A. Grobler (NCA, 2009/3618); 11♂ 3♀ same data but 1–29.x.2009 (NCA, 2009/3544); 3♂ 1♀ same data but 29.x–5.xii.2009 (MRAC, 230319); 4♂ same locality, 26°51.828'S:27°17.805'E, pitfalls, Vaal R. bank, 1.ix–1.x.2009, R. Fourie & A. Grobler (NCA, 2009/3617); 9♂ same data but 1–29.x.2009 (NCA, 2009/3554); 7♂ same data but 29.x–5.xii.2009 (MRAC, 230321).

Distribution: The species has been recorded from northern Tanzania, Zimbabwe and South Africa (KwaZulu-Natal), recorded here for the first time from the Free State and North West provinces. This is apparently a widespread species in semi-arid central and subtropical eastern and northern South Africa (Fig. 51).

Habitat and biology: This species was frequently collected at most sites in the Free State recently sampled by students and as part of SANSA surveys. It is one of the most common leaf litter dwelling salticids, was regularly collected in pitfalls, and occasionally sampled from the bases of grass tussocks and from under rocks. It has only been collected once by beating and appears to be closely associated with the soil surface and grasses.

Evarcha vittula sp. n.

Figs 39, 48–50

Etymology: From Latin *vitta* (a fillet, a band), referring to the presence of a stripe on the abdomen.

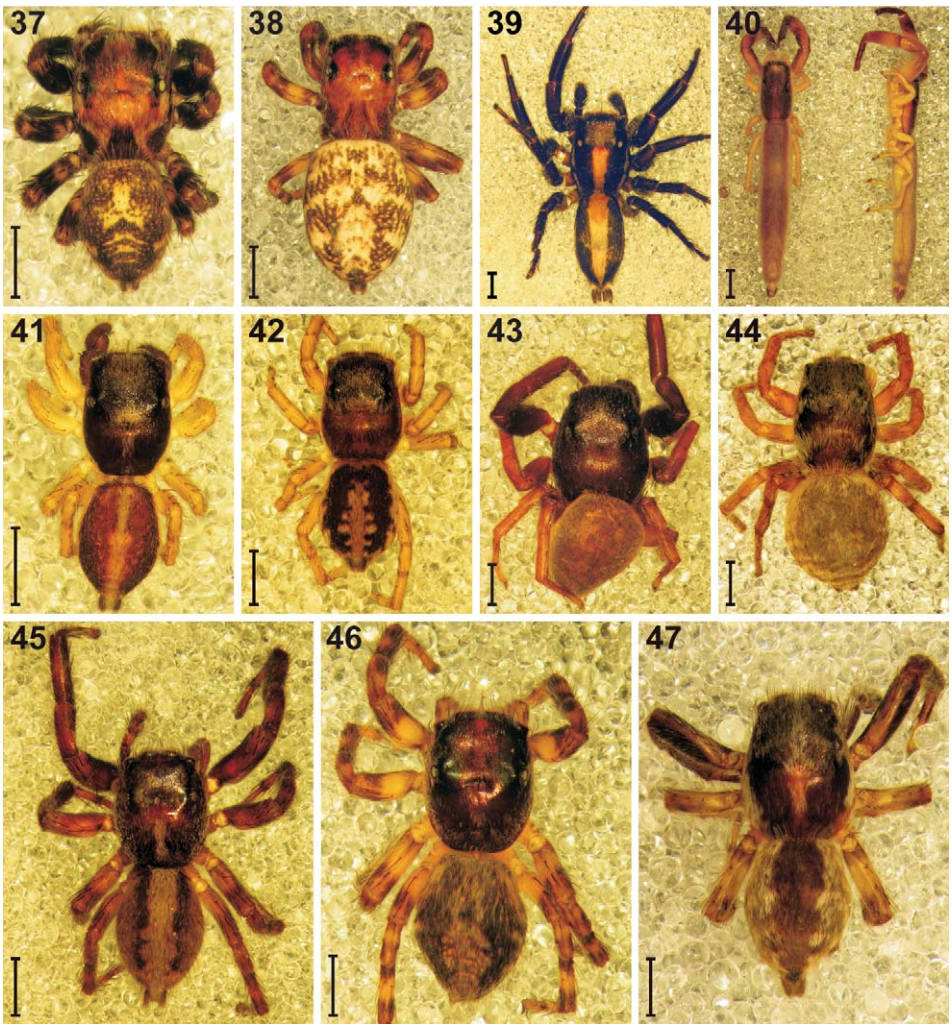
Diagnosis: The species is closely related to *E. maculata* Rollard & Wesołowska, 2002, known from Guinea and Ethiopia, but is distinguishable by the characteristic striped

pattern (*E. maculata* has a spotted pattern typical for the majority of *Evarcha* species) and by the straight embolus (slightly curved in *E. maculata*).

Description:

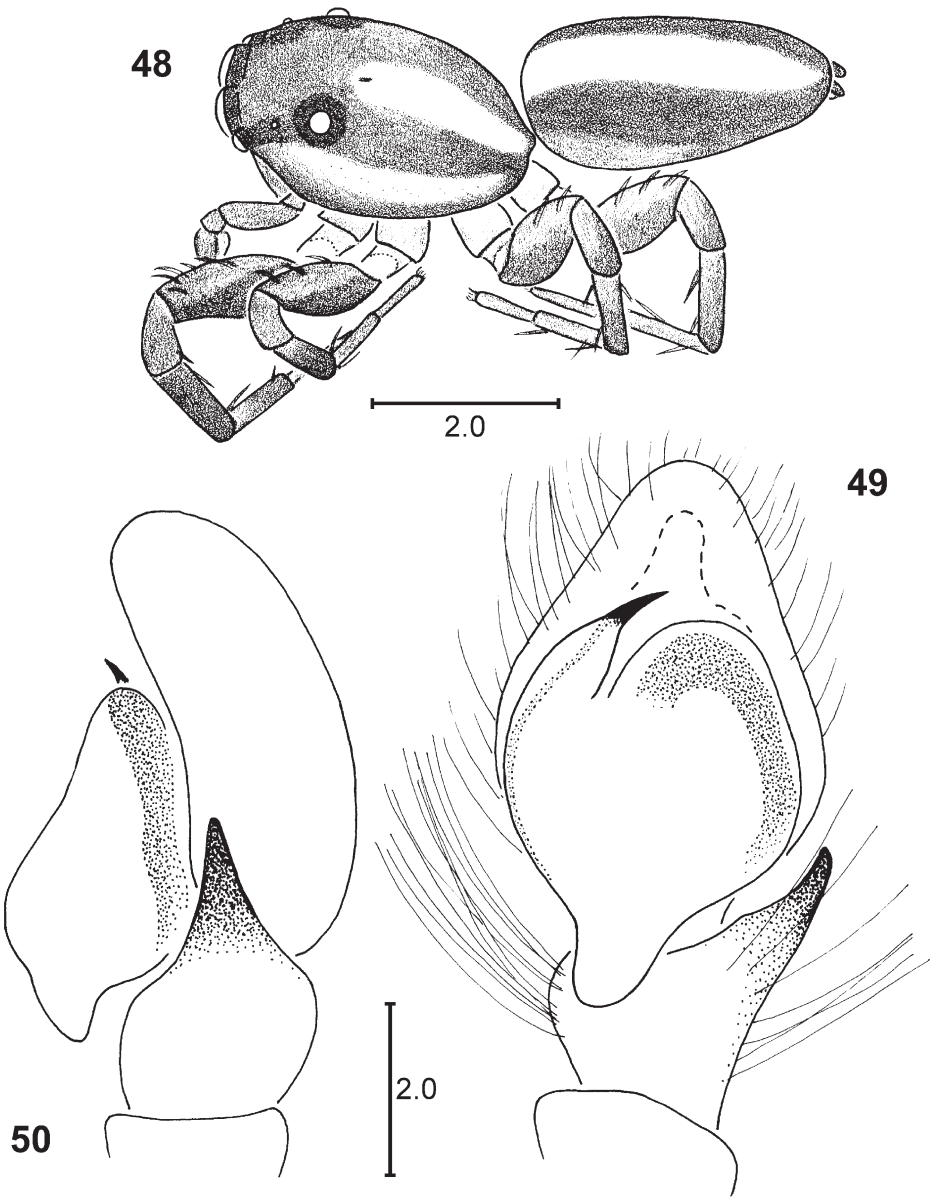
Male.

Measurements: Carapace: length 2.4–3.2, width 1.8–2.2, height 1.0–1.2. Abdomen: length 2.5–3.6, width 1.5–1.7. Eye field: length 1.0–1.3, anterior and posterior width 1.4–1.7. General appearance as in Figs 39, 48. Carapace oval, dark brown; orange median streak on thoracic part, covered with white hairs; white hairs forming stripes on lateral slopes



Figs 37–47. Digital microscope photographs of the dorsal habitus of South African jumping spiders: (37, 38) *Evarcha prosimilis*, male (37) and female (38); (39) *E. vittula* sp. n., male; (40) *Festucula lawrencei*, females, dorsal and lateral views; (41, 42) *Heliophanus modicus*, male (41) and female (42); (43, 44) *H. transvaalicus*, male (43) and female (44); (45, 46) *Icius insolidus*, male (45) and female (46); (47) *I. pulchellus* sp. n., male. Scale bars = 1 mm.

(Fig. 48). Vicinity of eyes black, anterior eyes encircled by fawn scales. Chelicerae blackish, labium brown, maxillae brown with light chewing margins, sternum light brown. Abdomen ovoid, slightly elongate, dark brown with wide median orange streak; hairs on the streak white, lateral hairs darker. Anterior third of dorsum covered by delicate scutum. Venter greyish with two narrow darker stripes. Spinnerets grey, posteriors



Figs 48–50. *Evarcha vittula* sp. n., paratype male: (48) habitus, dorsolateral view; (49) palpal organ, ventral view; (50) palpal organ, lateral view.

with darker bases. Legs dark brown, only coxae and tarsi paler. Spines numerous, long, first tibia with 3 pairs of ventral spines, metatarsus with 2 pairs; leg hairs dense, dark. Sparse white scales on femora I and II. Pedipalps brown. Palpal tibia with single straight apophysis, wide at base (Fig. 50). Bulb rounded with distinct posterior lobe; embolus short (Fig. 49).

Female. Unknown.

Holotype: ♂ SOUTH AFRICA: *Free State*: Erfenis Dam Nat. Res., 28°29.888'S:26°48.488'E, unburnt site 1, pitfall traps, 22.xi–23.xii.2005, C. Haddad (NMBA, 14103).

Paratypes: SOUTH AFRICA: *Free State*: 1♂ Bloemfontein, National Botanical Gardens, 29°02.892'S:26°12.662'E, 27.x–16.xi.2009, pitfall traps, *Rhus lancea* woodland, C. Haddad (NMSA, 22600); 1♂ Bloemfontein district, Mountain View farm, 29°01.845'S:26°13.599'E, walking on rocks, 28.ix.2002, C. Haddad (NMSA, 22666); 2♂ Erfenis Dam Nat. Res., 28°29.888'S:26°48.488'E, unburnt site 1, pitfall traps, 22.x–22.xi.2005, C. Haddad, S. Otto & R. Poller (NMBA, 14104); 12♂ same locality, site 1, near trench, 28°29.892'S:26°48.508'E, pitfall traps, grassland, 28.x–4.xii.2009, R. Fourie & A. Grobler (NMSA, 22693); 2♂ Oranjeville, Vaal Dam, 26°59.514'S:28°15.772'E, pitfall traps, overgrazed grassland, 1–29.x.2009, R. Fourie & A. Grobler (NCA, 2009/3537); 2♂ same locality, 26°59.523'S:28°15.737'E, pitfall traps, grassland, 1–29.x.2009, R. Fourie & A. Grobler (NCA, 2009/3540); 2♂ Tussen-die-Riviere Nat. Res., 30°28'S:26°07'E, active searching, grassland, 14.x.2008, L. Lotz & C. Haddad (NMBA, 12654).

Additional material examined: SOUTH AFRICA: *Free State*: 2♂ Willem Pretorius Nat. Res., 28°16.696'S: 27°12.083'E, pitfall traps, grassland, 29.x–5.xii.2009, R. Fourie & A. Grobler (NMSA, 22677).

Distribution: Widespread in the Free State Province (Fig. 51) and most likely occurs in adjacent grassland areas of the Gauteng, Northern Cape and North West provinces.

Habitat and biology: This species was rarely collected when compared to other similarly widespread species dealt with in this paper. Most of the specimens were sampled by pitfall traps, with single records from rocks and the base of grass tussocks in grassland.

Fig. 51. Distribution of *Evarcha prosimilis* (circles), *E. vittula* sp. n. (squares) and *Festucula lawrencei* (pentagons) in South Africa. Solid icons indicate published records and open icons new records from central South Africa.

Remarks: The species is provisionally placed in *Evarcha* based on the body shape and dimensions, and structure of the male palp, particularly the short curved embolus originating prolaterally and the posterior lobe of the bulb. The striped colour pattern of this species differs from what is typical for the genus. The palpal structure somewhat resembles that of *Plexippus* C.L. Koch, 1846 species, but *E. vitulla* sp. n. lacks the sclerotized serrated keel on the prolateral edge of the bulb, typical of *Plexippus*. Due to conflicting characters, the taxonomic position of this species should be confirmed after discovery of the female. One paratype (NMBA, 14104) is smaller and slightly paler in colour.

Genus *Festucula* Simon, 1901

Type species: *Festucula vermiformis* Simon, 1901.

A small genus consisting of only three species, of which two are distributed in the Afrotropical Region and the third in the Afrotropical Region, Egypt and Israel. Members of the genus have characteristic proportions: their body is very slender, its length exceeding its width by 4–6 times. Both sexes have a stridulatory apparatus of the leg-carapace type.

Festucula lawrencei Lessert, 1933

Fig. 40

Festucula lawrencei: Lessert 1933: 152, fig. 72; Wesołowska 1992: 50, figs 26–27; Wesołowska & Russell-Smith 2000: 28, figs 49–51; Wesołowska & Haddad 2009: 35, figs 50–52.

Wesołowska and Russell-Smith (2000) described both sexes; general appearance of females in Fig. 40.

Material examined: SOUTH AFRICA: *Free State Province*: 1 imm. 2♀ Koppies Dam Nat. Res., 27°13'S: 27°42'E, sweeps, 27.ix.1993, L. Lotz (NMBA, 6242).

Distribution: Species recorded from Angola, Tanzania and South Africa (KwaZulu-Natal), recorded from the Free State Province for the first time (Fig. 51).

Habitat and biology: The elongate body and cryptic colouration indicate adaptation to grass dwelling. Despite this, the species is apparently very rare in the Grassland Biome.

Genus *Heliophanus* C.L. Koch, 1833

Type species: *Aranea cuprea* Walckenaer, 1802.

This is a large genus that includes more than 100 species in the Palaearctic and Afrotropical regions, as well as a single Oriental species. Six of the seven species recorded below belong to the subgenus *Helafricanus*. Males in this subgenus are black with a metallic shine and white markings (Fig. 41), while females are often mottled brown and grey in colour, with a lighter median abdominal stripe (Fig. 42). The males in this subgenus have a large patellar apophysis and small femoral protuberance, while females have seminal ducts directed anteriorly and spermathecae that tend to be coiled (Wesołowska 1986). One of the seven species, *H. transvaalicus* Simon, 1901, belongs to the subgenus *Heliophanus*, males of which can be recognized by the large femoral apophysis and additional femoral protuberances, and females by the presence of a single large or two small copulatory openings (Wesołowska 1986). Members of this subgenus are not sexually dimorphic, and colouration is similar in both sexes (Figs 43, 44). A further

seven *Heliophanus* species have been recorded from central South Africa (within the present study area) in recent papers (Wesołowska 1986, 2003, 2009; Wesołowska & Haddad 2002), but are not dealt with further here as no additional localities have been noted: *H.* (*Heliocapensis*) *charlesi* Wesołowska, 2003, *H.* (*Heliocapensis*) *deserticola* Simon, 1901, *H.* (*Helafricanus*) *patellaris* Simon, 1901, *H.* (*Heliophanus*) *sororius* Wesołowska, 2003, *H.* (*Heliocapensis*) *termitophagus* Wesołowska & Haddad, 2002, *H.* (*Heliocapensis*) *thaleri* Wesołowska, 2009 and *H.* (*Helafricanus*) *trepidus* Simon, 1910.

Heliophanus (*Helafricanus*) *debilis* Simon, 1901

Heliophanus debilis: Simon 1901*a*: 59, fig. 12; Wesołowska 1986: 21, figs 148–162; Wesołowska & Cumming 2008: 182; Wesołowska & Haddad 2009: 43, figs 73–75.

Wesołowska (1986) described both sexes.

Material examined: SOUTH AFRICA: *Free State*: 4♂ Bloemfontein district, Deelhoek farm, 28°54'S:26°07'E, on grass, 19.xi.2001, C. Haddad (NHMWU); 3♂ 1♀ Bloemfontein district, Hopefield farm, 28°54'S:26°14'E, 28.ix.2000, C. Haddad (NHMWU); 1♂ Erfenis Dam Nat. Res., 28°29.276'S:26°47.965'E, beats, *Rhus ciliata*, 24.ii.2006, R. Lyle (NCA, 2008/2788); 1♂ Sandveld Nat. Res., 27°41'S:25°41'E, in chimney of *Odontotermes* termite mound, 25.x.2003, C. Haddad (NHMWU). *Northern Cape*: 1♀ Prieska district, Green Valley Nuts, pistachio orchard no. 19, 29°34.904'S:22°55.027'E, canopy fogging, 27.i.2001, C. Haddad (NHMWU).

Distribution: Widespread in central and southern Africa, recorded here from the Free State Province for the first time (Fig. 52).

Habitat and biology: This species occurs in all strata of the habitats it occupies but is generally rare.

Fig. 52. Distribution of *Heliophanus debilis* (circles), *H. hastatus* (squares) and *H. modicus* (pentagons) in South Africa. Solid icons indicate published records and open icons new records from central South Africa.

Heliophanus (*Helafricanus*) *hastatus* Wesołowska, 1986

Heliophanus hastatus: Wesołowska 1986: 24, figs 210–214; Wesołowska 2003: 263, figs 43–48.

Wesołowska (2003) described both sexes.

Material examined: SOUTH AFRICA: *Free State*: 1♂ Oranjeville, Vaal Dam, 26°59.523'S:28°15.737'E, pitfalls, grassland, 1.ix–1.x.2009, R. Fourie & A. Grobler (NCA, 2009/3624); 1♂ Platberg Nat. Res., Base of Donkey Pass, 28°16.836'S:29°11.992'E, base of grass tussocks, 27.v.2010, C. Haddad (TMSA, 23804). *North West*: 2♂ Potchefstroom district, Thabela Thabeng Mountain Retreat, 26°51.828'S:27°17.805'E, pitfalls, Vaal R. bank, 1–29.x.2009, R. Fourie & A. Grobler (NCA, 2009/3558); 1♂ same data but 29.x–5.xii.2009 (NMSA, 22681); 2♂ same data but 29.x–5.xii.2009 (MRAC, 230320); 6♂ same locality, 26°51.825'S:27°17.819'E, pitfalls, woodland grassland, 1–29.x.2009, R. Fourie & A. Grobler (NCA, 2009/3549).

Distribution: Widespread in the eastern half of South Africa, although only known from a few scattered localities. Recorded here from the Free State and North West provinces for the first time (Fig. 52).

Habitat and biology: Apparently closely associated with the ground layer in grassland and woodlands.

Heliophanus (*Helafricanus*) *modicus* Peckham & Peckham, 1903

Figs 41, 42

Heliophanus modicus: Peckham & Peckham 1903: 193, pl. 20, fig. 2; Wesołowska 1986: 25, figs 215–225.

Wesołowska (1986) described both sexes; general appearance of both sexes in Figs 41, 42.

Material examined: SOUTH AFRICA: *Free State*: 1♀ Tussen-die-Riviere Nat. Res., Camp, 30°30'S:26°08'E, active search, 15.x.2008, L. Lotz & C. Haddad (NMBA, 12824).

Distribution: Species known from Madagascar and the Eastern and Western Cape provinces of South Africa, recorded from the Free State Province for the first time (Fig. 52).

Habitat and biology: A rare species apparently associated with drier habitats in South Africa.

Heliophanus (*Helafricanus*) *nanus* Wesołowska, 2003

Heliophanus nanus: Wesołowska 2003: 274, figs 81–86.

Wesołowska (2003) described both sexes.

Material examined: SOUTH AFRICA: *Free State*: 3♂ 1♀ Bloemfontein, University of the Free State, West Campus, 29°06.240'S:26°10.307'E, sweeps, grassland, 9.viii.2002, C. Haddad (NCA, 2008/1957); 1 imm. 1♀ Erfenis Dam Nat. Res., Woodland grassland, 28°30.243'S:26°47.500'E, sweeps, grassland, 22.xi.2005, C. Haddad (NCA, 2007/3717); 1♀ same locality, 28°29.552'S:26°47.646'E, beats, *Rhus lancea* trees, 30.viii.2006, A. Grobler (NCA, 2007/3671); 1♀ Fauresmith district, Boschrand farm, 29°56'S:24°48'E, by hand, 21.iii.2005, L. Lotz (NMBA, 9995); 2♀ same data but 23.iii.2005 (NMBA, 10026); 1♂ Sandveld Nat. Res., 27°41'S:25°41'E, 22.ix.2003, C. Haddad (NHMWU); 2♀ Soetdoring Nat. Res., 28°49.831'S: 26°02.645'E, sweeps, grassland, 27.iv.2004, C. Haddad (NCA, 2008/480).

Distribution: Known only from the Free State Province, South Africa (Fig. 53).

Habitat and biology: A plant-dwelling species collected from grasses and shrubs in grassland.

Heliophanus (*Helafricanus*) *pistaciae* Wesołowska, 2003

Heliophanus pistaciae: Wesołowska 2003: 280, figs 101–107.

Wesołowska (2003) described both sexes.

Material examined: SOUTH AFRICA: *Free State*: 1♂ Benfontein Nat. Res., 28°50.003'S:24°48.756'E, pitfalls, dry thorny savannah, 14.x.2005–4.i.2006, R. Lyle (NCA, 2010/201); 1♂ Bloemfontein, National Botanical Gardens, 29°02.892'S:26°12.662'E, pitfalls, *Rhus lancea* woodland, 9.xii.2009–4.i.2010, C. Haddad (NCA, 2010/208); 1♀ Brandfort district, Amanzi Private Game Reserve, 28°36.080'S:26°25.950'E, base of grass tussocks, 3.iv.2010, C. Haddad (MRAC, 230325); 1♂ Erfenis Dam Nat. Res., site 3, *Acacia karroo* trees, 28°30.272'S:26°47.527'E, pitfall traps, woodland, 31.viii–30.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3643); 1♂ same data but 30.ix–28.x.2009 (NCA, 2009/3588); 1♂ same locality, site 7, rocky hillside, 28°29.629'S:26°48.323'E, 30.ix–28.x.2009, pitfall traps, R. Fourie & A. Grobler (NCA, 2009/3599); 2♀ same locality, Campsite, 28°30.243'S:26°47.500'E, beats, *A. karroo* trees, 28.v.2007, R. Fourie (NCA, 2007/3674); 4 imm. 2♀ same locality, uniform *Themeda triandra* grassland, 28°29.803'S:26°47.476'E, 22.xi.2005, sweeps, grassland, C. Haddad (NCA, 2007/3714); 1♂ Kroonstad district, Doornkloof farm, 27°43.393'S:27°42.066'E, pitfall traps, base of hill, 1–29.x.2009, R. Fourie & A. Grobler (NCA, 2009/3530); 1♂ same locality, 27°43.376'S:27°42.042'E, pitfall traps, grassland, 29.x–5.xii.2009, R. Fourie & A. Grobler (NMSA, 22691); 3 imm. 1♂ 2♀ Sandveld Nat. Res., 27°41'S:25°41'E, in chimney of *Odontotermes* termite mound, 25.x.2003, C. Haddad (NHMWU); 1♂ Willem Pretorius Nat. Res., 28°16.660'S:27°12.207'E, pitfall traps, near water level, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3521). *North West*: 2♂ Potchefstroom district, Thabela Thabeng Mountain Retreat, 26°51.828'S:27°17.805'E, pitfalls, Vaal R. bank, 1–29.x.2009, R. Fourie & A. Grobler (NCA, 2009/3555). *Northern Cape*: 1♀ Colesburg district, Vogelsfontein farm, 30°37'S:25°18'E, under stone, 23.iii.1995, L. Lotz (NMBA, 8135).

Distribution: Known from the Free State and Northern Cape provinces of South Africa, and Zimbabwe. Recorded from the North West Province for the first time (Fig. 53).

Habitat and biology: This species is an agrobiont spider in pistachio orchards at the type locality, Green Valley Nuts in the Prieska district, Northern Cape, dominating the arboreal fauna and common in ground covers (Haddad *et al.* 2004, 2005), but was rarely collected in pitfall traps (Haddad & Dippenaar-Schoeman 2006*b*). Most of the records presented here were collected by pitfall trapping or sweep-netting, suggesting fairly adaptable habits.

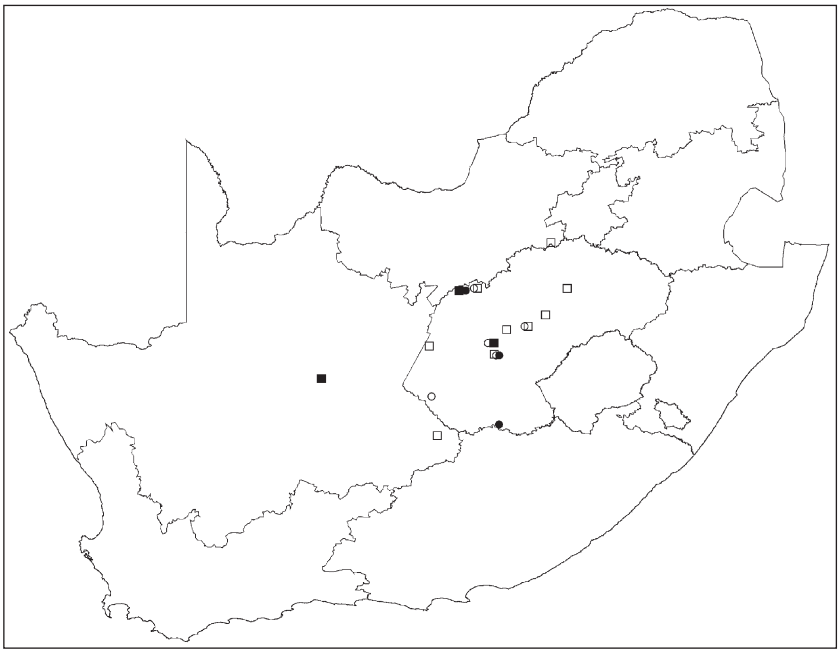


Fig. 53. Distribution of *Heliophanus nanus* (circles) and *H. pistaciae* (squares) in South Africa. Solid icons indicate published records and open icons new records from central South Africa.

Heliophanus (*Helafricanus*) *proszynskii* Wesołowska, 2003

Heliophanus proszynskii: Wesołowska 2003: 282, figs 108–113.

Wesołowska (2003) described both sexes.

Material examined: SOUTH AFRICA: *Free State*: 1♀ Clocolan district, Mpetsane Conservation Estate, 28°48.561'S:27°39.255'E, base of grass tussocks, 17.iii.2010, C. Haddad (NCA, 2010/342); 1♂ same locality, 28°48.773'S:27°39.364'E, under *Eucalyptus* bark, 17.iii.2010, C. Haddad (NCA, 2010/339); 7 imm. 3♀ Erfenis Dam Nat. Res., 28°29.722'S:26°48.439'E, sweeps, weedy grassland, 22.xi.2005, C. Haddad (NCA, 2007/3716); 1♂ same locality, site 2, eastern fence, 28°30.011'S:26°48.479'E, pitfalls, grassland, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3585); 3♂ 2♀ Kestell, 28º18.729'S:28º42.132'E, sweeps, grassland, 10.iii.2006, C. Haddad (NCA, 2006/681); 1♀ Vrede, Moreson, 27°31'S:29°06'E, under rocks, 9.iii.2006, L. Lotz (NMBA, 10126).

Distribution: Known from the Free State and Western Cape Provinces of South Africa (Fig. 54).

Habitat and biology: Apparently closely associated with grasses. Most of the specimens presented here and in the original description were collected by sweep-netting in grassland.

Heliophanus (*Heliophanus*) *transvaalicus* Simon, 1901

Figs 43, 44

Heliophanus transvaalicus: Simon 1901*a*: 55, fig. 7; 1901*b*: 541, 550, fig. 668; Wesołowska 1986: 33, figs 346–353.

Wesołowska (1986) described both sexes; general appearance of both sexes in Figs 43, 44.

Material examined: SOUTH AFRICA: *Free State*: 1♂ Boesmankop, 29°09'S:26°31'E, sweeping, 30.i.1986, Museum staff (NMBA, 1410); 2♂ Erfenis Dam Nat. Res., hilltop, 28°29.276'S:26°47.965'E, beats, *Rhus*

Fig. 54. Distribution of *Heliophanus proszynskii* (circles) and *H. transvaalicus* (squares) in South Africa. Solid icons indicate published records and open icons new records from central South Africa.

ciliata shrubs, 24.ii.2006, R. Lyle (NCA, 2008/2789); 1 imm. 5♂ 2♀ same locality, rocky ridge, 28°29.888'S: 26°48.488'E, beats, *R. ciliata* shrubs, 22.xi.2005, C. Haddad (NCA, 2007/3672); 1♂ Harrismith, Wilger Park, 28°17.232'S:29°06.719'E, on walls of house, iv.2010, J. van As (TMSA, 23813).

Distribution: Previously recorded from the Gauteng, Limpopo and Northern Cape provinces, here from the Free State Province for the first time (Fig. 54).

Habitat and biology: An uncommon species apparently associated with the foliage of shrubs.

Genus *Icius* Simon, 1876

Type species: *Marpissa hamata* C.L. Koch, 1846.

A moderately large genus with 31 species, with 10 of them occurring in the Afrotropical Region. The males have long chelicerae, a palp with a single tibial apophysis, an elongate bulb with a posterior lobe, and a short embolus. The females have an epigyne with straight seminal ducts and rounded receptacles.

Icius insolidus (Wesołowska, 1999)

Figs 45, 46, 55, 56

Menemerus insolidus: Wesołowska 1999*a*: 299, figs 158–167.
Icius insolidus: Wesołowska 2006: 234, figs 43–52; Wesołowska & Cumming 2008: 192.

Wesołowska (2006) described both sexes; general appearance of both sexes in Figs 45, 46.

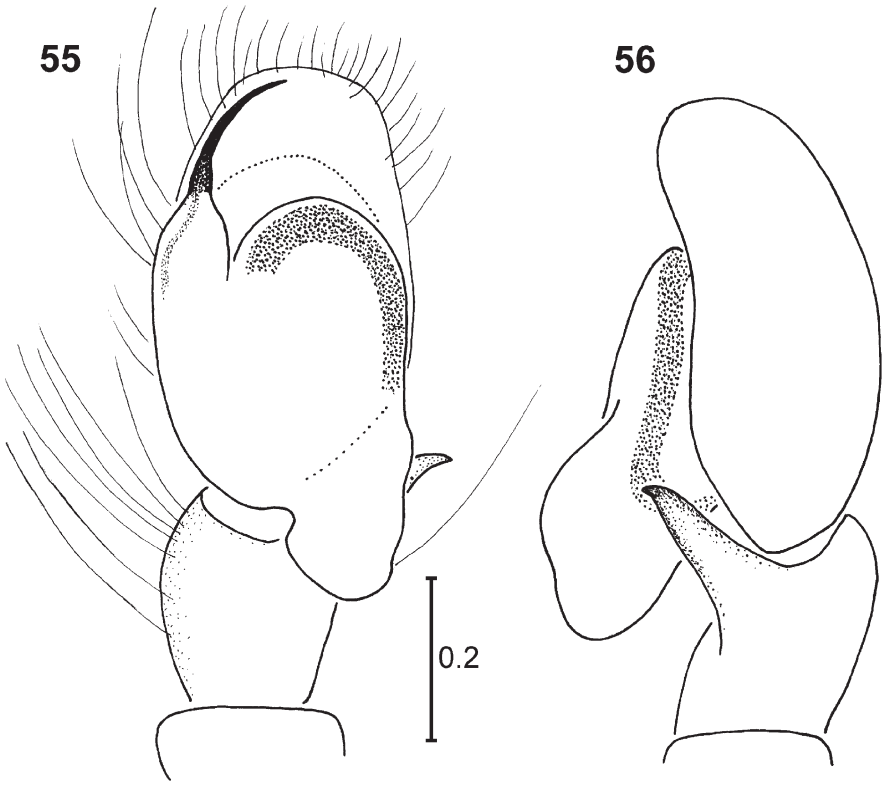
Redescription:

Male.

Measurements: Carapace: length 2.2–2.3, width 1.7–1.8, height 1.1–1.2. Abdomen: length 2.2–2.4, width 1.5–1.6. Eye field: length 0.9–1.0, anterior width 1.4, posterior width 1.5.

General appearance as in Fig. 45. Carapace oval, almost black; white hairs forming median streak running from one third of eye field length to posterior edge of carapace; lateral sides also with white streaks. Sparse thin long black hairs covering dorsum, many reddish brown hairs in vicinity of eyes. Clypeus and dorsal surface of chelicerae dark brown with some white scales. Chelicerae long, unidentate, with large additional tooth at base (see fig. 44 in Wesołowska 2006). Sternum blackish. Abdomen ovoid, black with broad white median stripe (Fig. 45); dorsum with sparse long dark bristles. Sides of abdomen with some reddish hairs. Venter dark with four paler lines. Spinnerets dark. Legs blackish, but dorsal surfaces paler. Spines long, legs covered with thin long black hairs. Pedipalps brown. Palpal tibia with single long apophysis directed ventrally (Fig. 56). Bulb elongate with large posterior lobe; embolus thin and curved (Fig. 55).

Material examined: SOUTH AFRICA: *Free State*: 2♂ Bloemfontein district, Deelhoek farm, 28°54'S:26°07'E, under rocks, 8.ix.2001, C. Haddad (NMSA, 22668); 1♂ Bloemfontein district, Mountain View farm, 29°01.845'S:26°13.599'E, walking on rocks, 28.ix.2002, C. Haddad (NMSA, 22667); 2♂ Brandfort district, Amanzi Private Game Reserve, 28°36.080'S:26°25.950'E, base of grass tussocks, 11.iv.2009, C. Haddad (NMBA, 14105); 1♂ 1♀ Fauresmith district, Boschrand farm, 29°56'S:24°48'E, by hand, 21.iii.2005, L. Lotz (NMBA, 9994); 1 imm. 1♀ same data but 23.iii.2005 (NMBA, 10027); 1♀ Fauresmith district, Kalkfontein Dam, 29°31'S:25°16'E, in webs and on ground, 9.iv.2008, L. Lotz (NMBA, 12096); 1♀ Jagersfontein district, Klein Preezfontein farm, 29°49'S:25°25'E, under stones, 15.viii.1989, students (NMBA, 2924); 1♀ Philippolis district, Driekop, 30°29'S:25°26'E, by hand, 1.iii.2005, L. Lotz (NMBA, 9950); 1♀ Tussen-die-Riviere Nat.



Figs 55, 56. *Icius insolidus*, male: (55) palpal organ, lateral view; (56) palpal organ, dorsal view.

Res., 30°29'S:26°14'E, under stacked rocks, 21.x.2008, L. Lotz & C. Haddad (NMBA, 12933); 1♂ same locality, 30°29'S:26°07'E, active search, rocky hill, 14.x.2008, C. Haddad (NMBA, 12722); 1♀ Zastron district, Opnek farm, 30°16'S:27°12'E, 1627 m, by hand, 1.iii.2007, L. Lotz (NMBA, 10386). *Northern Cape*: 1♂ Prieska district, Remhoogte farm, 29°32.016'S:23°00.182'E, active searching, experimental pistachio orchard, 27.iii.2002, C. Haddad (NCA, 2010/215).

Distribution: This species is known from Namibia, Zimbabwe and South Africa (Northern Cape). Recorded from the Free State Province for the first time (Fig. 63).

Habitat and biology: An uncommon ground-dwelling species that was sampled mainly by hand from rocks, from the base of grass tussocks and the soil surface.

Remark: The single female specimen from Remhoogte was misidentified by Haddad & Dippenaar-Schoeman (2006*b*) as *Phlegra* sp. (= *P. karoo* Wesołowska, 2006).

Icius pulchellus sp. n.

Figs 47, 57–62

Etymology: From Latin *pulchellus* (fair, neat, pretty).

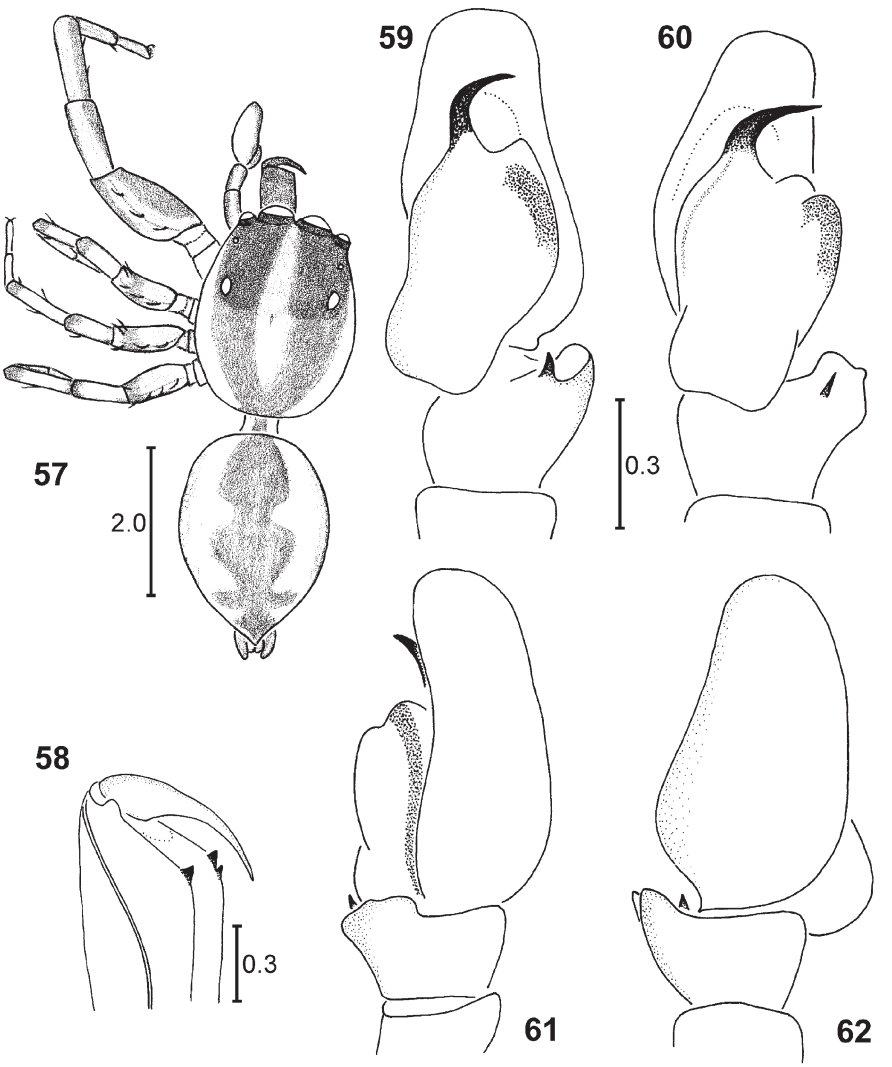
Diagnosis: The species is related to *I. minimus* Wesołowska & Tomasiewicz, 2008 from Ethiopia, but the male is easily distinguished by the pattern of the abdomen and by the shape of the tibial apophysis, which is very short.

Description:

Male.

Measurements: Carapace: length 2.0–2.5, width 1.5–2.0, height 0.8–0.9. Abdomen: length 2.0–2.4, width 1.4–1.8. Eye field: length 0.8–0.9, anterior width 1.1–1.4, posterior width 1.3–1.7.

General appearance as in Figs 47, 57. Carapace oval, medium high, dark brown, with black eye field. White hairs forming wide median streak on carapace and two streaks along sides. Eyes of anterior row framed by reddish fawn hairs, ocular area with some



Figs 57–62. *Icius pulchellus* sp. n., paratype male: (57) habitus; (58) cheliceral dentition; (59) palpal organ, ventral view; (60) palpal organ, ventroapical view; (61) palpal organ, lateral view; (62) palpal organ, dorsal view.

Fig. 63. Distribution of *Icius insolidus* (circles) and *I. pulchellus* sp. n. (square) in South Africa. Solid icon indicates a published record and open icons new records from central South Africa.

brown bristles. Chelicerae dark brown, large, unidentate, with long thin fissure on dorsal surface (Fig. 58). Labium orange, endites with pale tips, sternum yellow, with dark peripheral ring. Abdomen ovoid, with median dentate brown streak, sides densely covered with white hairs mixed with yellow and fawn hairs (Fig. 47). Some sparse brown bristles on abdomen. Venter yellow tinged with brown. Spinnerets dark. Legs yellow to light brown, distal ends of segments darker. First leg slightly longer and stouter than others, dark brown, only dorsal surface lighter. Leg hairs brown and whitish, spines dark. Tibia and metatarsus of leg I each with two pairs of short ventral spines. Pedipalps dark brown, but dorsal surface covered with dense white hairs, beginning from top of femur. Tibial apophysis very short and wide, with additional ventral spike (Figs 59–62), bulb of irregular shape, embolus falciform (Fig. 59).

Female. Unknown.

Holotype: ♂ SOUTH AFRICA: *Free State*: Sandveld Nat. Res., 27°44.219'S:25°45.893'E, pitfall traps, grassland and shrubs, 2–30.x.2009, R. Fourie & A. Grobler (NCA, 2009/3569).

Paratypes: 1♂ together with holotype; 1♂ same data as holotype but 2.ix–2.x.2009 (NCA, 2009/3610).

Distribution: Known only from the type locality (Fig. 63).

Habitat and biology: All known specimens were collected by pitfall traps in grassland.

Genus *Langona* Simon, 1901

Type species: *Attus redii* Audouin, 1826.

The genus contains about 40 species distributed in the Old World. Morphologically all *Langona* species are very similar, dark coloured with a characteristic striped pattern. The males have a single tibial apophysis, usually accompanied by a tuft of long black setae,

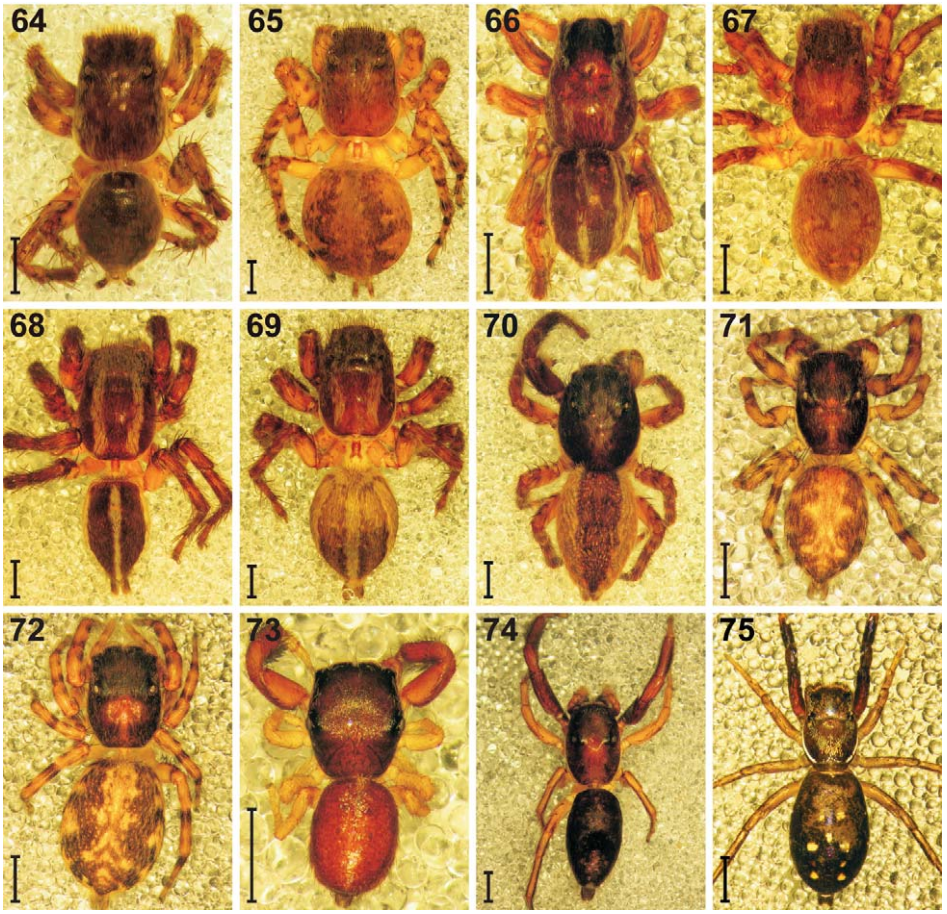
and embolus coiled on the tip of the tegulum. The females have an epigyne with a large central depression, the posterior edge of which is very strongly sclerotized. The internal structure of the epigyne is very complicated, with multi-chambered receptacles.

Langona hirsuta sp. n.

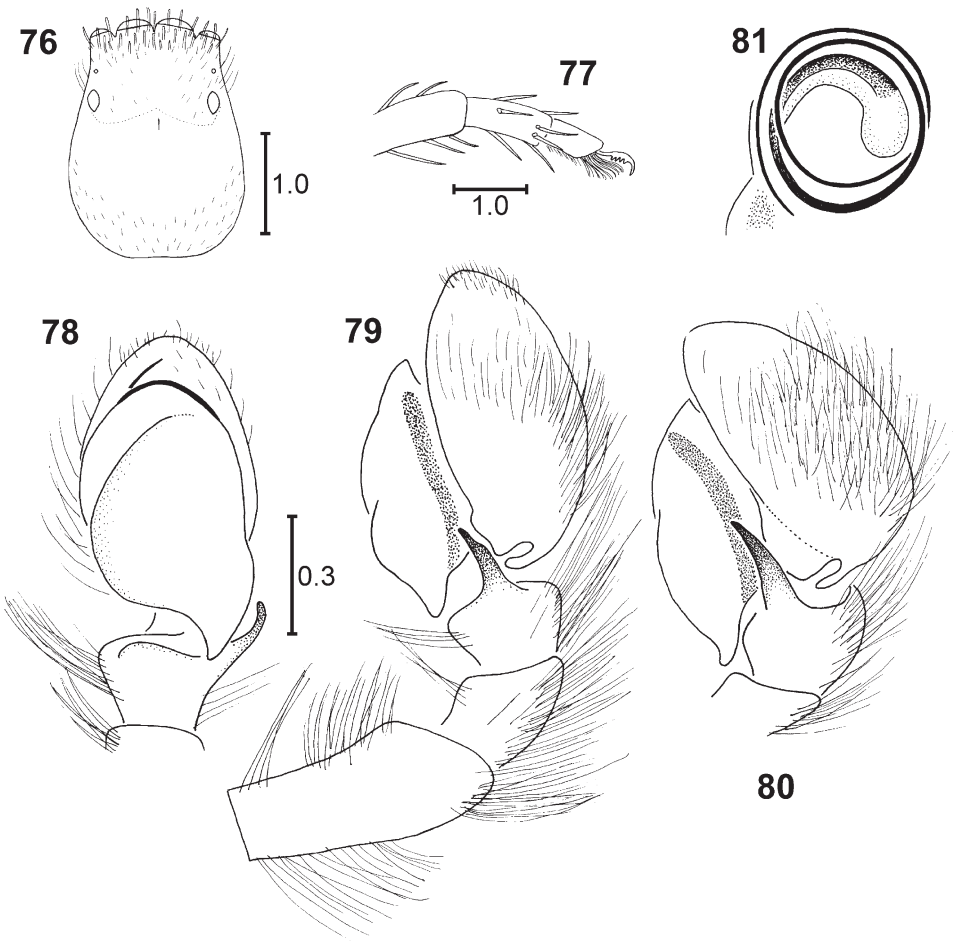
Figs 64, 65, 76–84

Etymology: From Latin *hirsuta* (hairy), referring to the very hairy pedipalps of the male.

Diagnosis: The male of this species is distinctive in having the pedipalps clothed in very dense long light hairs and by the presence of a single tibial apophysis. Slightly similar to *L. bitumorata* Próchniewicz & Hęciak, 1994 from Tanzania, but the palp lacks outgrowths on the tibia and femur. The female has an epigyne with characteristic narrow sickle-shaped hollows.



Figs 64–75. Digital microscope photographs of the dorsal habitus of South African jumping spiders: (64, 65) *Langona hirsuta* sp. n., male (64) and female (65); (66, 67) *L. lotzi* sp. n., male (66) and female (67); (68, 69) *L. warchalowskii*, male (68) and female (69); (70) *Memenerus pilosus*, male; (71, 72) *M. transvaalicus*, male (71) and female (72); (73) *Microbianor globosus* sp. n., male; (74, 75) *Natta chionogaster*, male (74) and female (75). Scale bars = 1 mm.



Figs 76–81. *Langona hirsuta* sp. n., paratype male: (76) carapace of male; (77) distal segments of first leg; (78) palpal organ, ventral view; (79) palpal organ, lateral view; (80) palpal organ, basolateral view; (81) embolus, apical view.

Description:

Measurements (♂/♀). Carapace: length 2.0–2.1/3.2–3.7, width 1.5–1.7/2.5–2.8, height 0.9–1.0/1.3–1.5. Abdomen: length 1.9–2.0/4.1–4.4, width 1.4–1.5/3.5–4.0. Eye field: length 0.7–0.9/1.2–1.3, anterior width 1.2–1.3/1.7–1.8, posterior width 1.3–1.4/1.6–1.7.

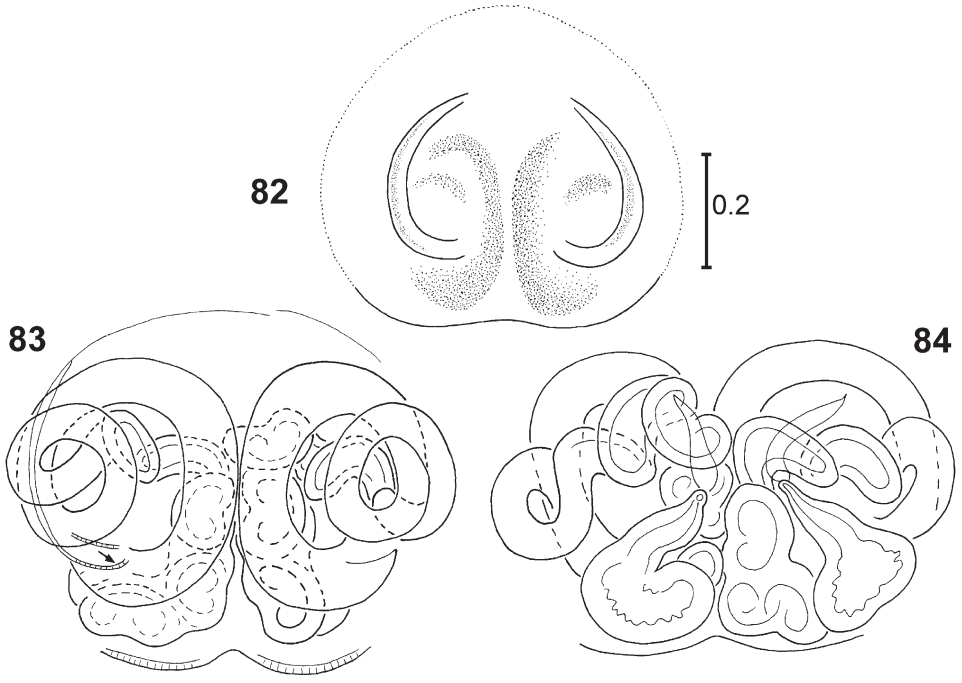
Male.

General appearance as in Fig. 64. Carapace oval, medium high; dark brown, clothed in dense greyish hairs. Eye field short; eyes surrounded by black rings, anterior median eyes encircled by white hairs; eye field with long brown bristles, among them some thicker rod-like bristles on anterior part (Fig. 76). Clypeus medium high, brown, with dark hairs. Chelicerae toothless, dorsal surface brown with dark hairs; ventral surface yellow. Labium and sternum brown, maxillae slightly paler. Abdomen oval; blackish

brown, covered with dense greyish hairs, among them longer brown bristles. Venter pale. Posterior spinnerets blackish, anterior ones pale. Leg formula 3412. Legs yellow to brown, distal parts of their segments darker, femur I tinged with black ventrally. Spines numerous, light brown; leg hairs fine, long, greyish and brown. Tarsi with dark scopulae (Fig. 77). Spination of leg I: femur dorsally 1-1-4, patella prolaterally and retrolaterally 1, tibia prolaterally and retrolaterally 1-1-1, metatarsus prolaterally and retrolaterally 1-1 apically, ventrally 2-2 apically. Pedipalps brown, very hairy. Femur ventrally and all segments dorsally clothed in dense long yellowish fawn hairs. Cymbium with narrow process proximally at retrolateral margin; tibia with single long and thin apophysis (Figs 78–80). Bulb oval with triangular posterior lobe; embolus hidden between bulb and cymbium, coiled in bulb tip, thin and very long (Figs 78, 81).

Female.

General appearance as in Fig. 65. Clearly larger than male. Carapace pear-shaped, high, widest at coxae III, dark brown; eye field short, eyes surrounded by black rings. Whole carapace covered with short dense white hairs. Chelicerae toothless. Abdomen swollen, brownish fawn, clothed in short brown and orange hairs, among them scarce longer brown bristles. In fresh specimens not poorly defined pattern on abdomen; irregular lighter median streak, three pairs of whitish small rounded spots cling to it, dark diagonal patches on sides. Venter light. Legs orange with brown rings, anterior pairs short. Epigyne with two sickle-shaped hollows (Fig. 82). Seminal ducts wide, spirally coiled, receptacles large, numerous-chambered (Figs 83, 84).



Figs 82–84. *Langona hirsuta* sp. n., paratype female; (82) epigyne; (83) internal structure of epigyne, ventral view; (84) internal structure of epigyne, dorsal view.

Holotype: ♂ SOUTH AFRICA: *Free State*: Erfenis Dam Nat. Res., site 4, gravel plain, 28°29.611'S:26°47.995'E, pitfall traps, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3593).

Paratypes: SOUTH AFRICA: *Free State*: 1♂ 1♀ Erfenis Dam Nat. Res., unburnt site 1, 28°29.888'S:26°48.488'E, pitfall trap, 22.xii.2005–23.i.2006, C. Haddad, S. Otto & R. Poller (NMBA, 14106); 1♂ same locality, unburnt site 3, 28°29.741'S:26°48.065'E, pitfall traps, 24.ii–27.iii.2006, S. Otto & R. Poller (NMSA, 22634); 2 imm. 3♂ 1♀ same locality, site 4, gravel plain, 28°29.611'S:26°47.995'E, pitfall traps, 31.viii–30.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3645); 6♂ same locality, site 5, overgrazed grassland, 28°29.605'S:26°47.974'E, pitfall traps, 31.viii–30.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3646); 4♂ same data but 30.ix–28.x.2009 (NCA, 2009/3595); 29♂ 3♀ same locality, site 7, rocky hillside, 28°29.629'S:26°48.323'E, pitfall traps, 31.viii–30.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3650); 3♂ 1♀ same data but 30.ix–28.x.2009 (NCA, 2009/3600); 1♂ Sandveld Nat. Res., 27°44.043'S:25°45.805'E, on ground, 22.ix.2003, C. Haddad (MRAC, 230339).

Additional material examined: SOUTH AFRICA: *Free State*: 1♂ Bloemfontein, National Botanical Gardens, 29°08'S:26°10'E, pitfall traps, 7.ix.2006, R. Scholtz & S. Otto (NMBA, 11057); 1♂ Bloemfontein, Naval Hill, Hangmanskloof North, 29°06'S:26°14'E, pitfall traps, ix.1990, L. Lotz (NMBA, 6314); 1 subad. ♀ 1♂ Bloemfontein district, Krugersdrift Dam, 28°42'S:25°55'E, in canal, 22.viii.1985, Museum staff (NMBA, 857); 1 imm. 5♂ same data but 28.viii.1985 (NMBA, 890); 1♂ 1♀ same data but 2.xii.1985 (NMBA, 1135); 1♀ Boshof district, Kromrant farm, 28°39'S:25°06'E, 21.xi.1985, Museum staff (NMBA, 1103); 3 subad. ♂ 3♂ Bothaville district, Deelfontein farm, 27°07'S:26°35'E, preservation traps, viii–x.1986, Museum staff (NMBA, 1678); 2 subad. ♂ 2 subad. ♀ 1♂ 1♀ Brandfort district, Florisbad, 28°46'S:25°43'E, preservation traps, ix.1982, Museum staff (NMBA, 243); 1♂ same data but x.1982 (NMBA, 226); 1♀ same data but x.1983 (NMBA, 570); 1♀ same data but ix.1984 (NMBA, 531); 3♀ same data but x.1984 (NMBA, 217); 2♀ same data but xi.1984 (NMBA, 567); 1♂ same data but ix.1985 (NMBA, 950); 2♀ same data but 21.x.1985 (NMBA, 1030); 1♀ same data but i.1985 (NMBA, 658); 1♂ same data but xi.1985 (NMBA, 1129); 1♀ same data but viii.1985 (NMBA, 874); 1♂ same locality, preservative traps, 9–23.xi.1987, L. Lotz (NMBA, 3080), 3♂ (NMBA, 3139), 1♂ (NMBA, 3160); 1♀ same data but 23.xi–8.xii.1987 (NMBA, 3183), 1♂ (NMBA, 3268); 1♂ same data but 23.ix–6.x.1988 (NMBA, 4630), 1♂ (NMBA, 4625); 1♂ 2♀ Jacobsdal district, Jacobsdal–Kimberley road, 29°11'S:24°46'E, under rocks next to canal, 20.viii.1987, Entomology staff (NMBA, 1890); 1♀ same data but 11.xi.1987, Museum staff (NMBA, 2490); 4 imm. 1♀ Sandveld Nat. Res., 27°40'S:25°43'E, pitfall traps, grassland, 10–13.iii.2008, L. Lotz (NMBA, 11825). *Northern Cape*: 1♀ Kimberley district, Langberg farm, 28°55'S:24°36'E, preservation traps, viii–xi.1987, Entomology staff (NMBA, 2611).

Distribution: Widespread throughout the semi-arid parts of the Free State Province, marginally entering the Northern Cape (Fig. 93).

Habitat and biology: A ground-dwelling species readily collected by pitfall traps.

Remarks: The inclusion of this species in the genus *Langona* is tentative and is based on the toothless chelicerae and the similarities of the male to members of this genus. However, the species differs in some details from all known Aelurillinae genera, and clarification of the species' relationships requires a revision of the subfamily.

Langona lotzi sp. n.

Figs 66, 67, 85–92

Etymology: The species is named in honour of Leon Lotz, collector of the species, specialist in Miturgidae spiders and curator of Arachnida at the NMBA.

Diagnosis: The male is distinguishable by the embolus that is shorter than in other species of the genus, and absence of thick setae usually accompanying the tibial apophysis. The female is distinctive in the unique shape of the epigyne, lacking a strongly sclerotized posterior edge of the epigynal depression.

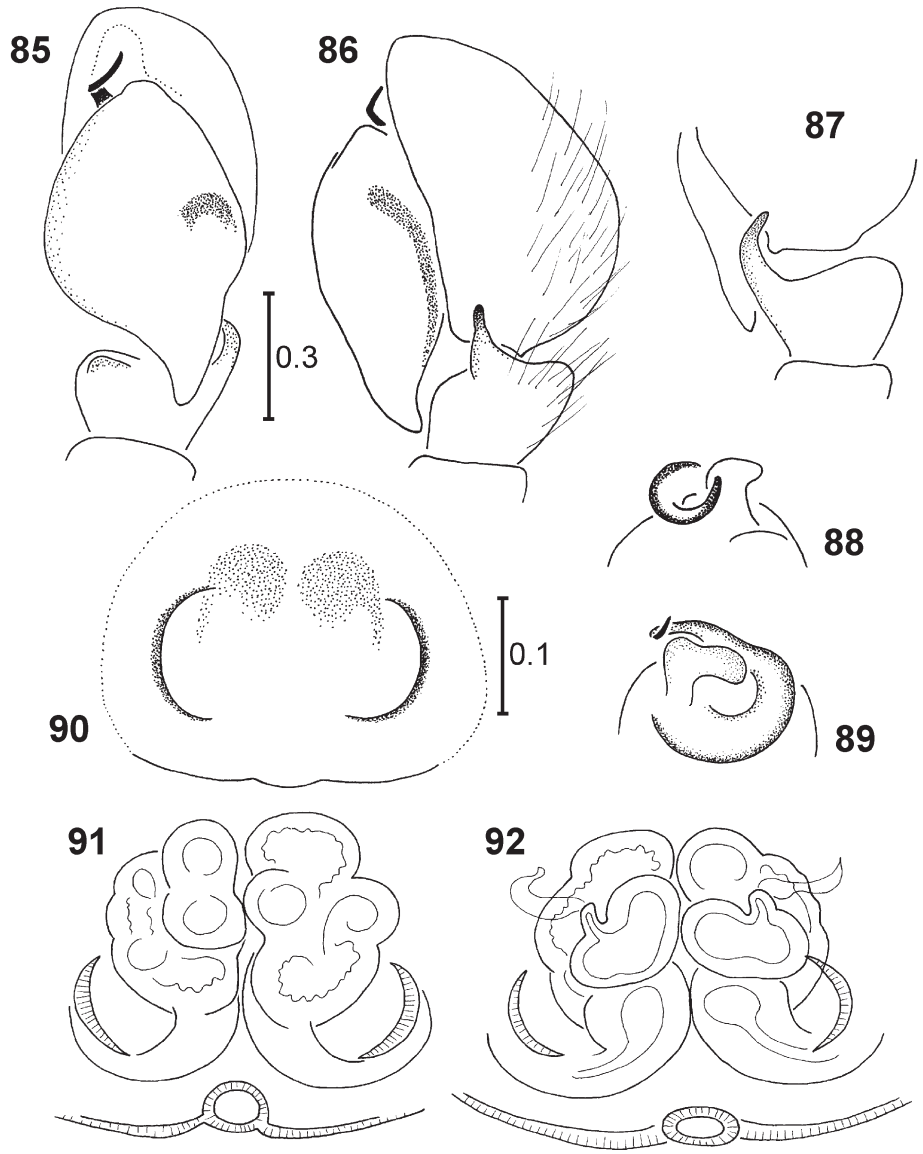
Description:

Measurements (♂/♀). Carapace: length 2.1–2.3/2.3–2.8, width 1.5–1.6/1.6–1.8, height 0.9–1.0/1.0–1.1. Abdomen: length 2.0–2.1/2.5–2.9, width 1.4–1.5/1.9–2.3. Eye

field: length 0.7–0.8/0.8–0.9, anterior width 1.1–1.2/1.2–1.3, posterior width 1.1–1.2/1.3–1.4.

Male.

General appearance as in Fig. 66. Medium sized spider, colouration typical for *Langona*. Carapace oval, low, with short eye field occupying third of carapace length. Eye field



Figs 85–92. *Langona lotzi* sp. n., paratype male (85–89) and paratype female (90–92): (85) palpal organ, ventral view; (86) palpal organ, lateral view; (87) tibial apophysis, dorsal view: (88) embolus, apical view; (89) embolus, apicolateral view; (90) epigyne; (91) internal structure of epigyne, ventral view; (92) internal structure of epigyne, dorsal view.

black, covered with long brown bristles, anterior eyes encircled by small fawn scales, thoracic part dark brown. White hairs form two thin stripes running from posterior median eyes to posterior edge of carapace. Clypeus dark, sternum brown, mouthparts light brown. Chelicerae unidentate, all teeth diminutive. Abdomen brownish black with three longitudinal white stripes. Anterior margin of abdomen with long dense dark bristles. Venter orange. Spinnerets dark. Legs light brown, sides of femora slightly darker, dark thin line along dorsal surface of femora. Leg hairs dark. Pedipalps brownish, femora with black ventral surface. Whitish long dense hairs on retrolateral surface of cymbium and palpal tibia. Tibial apophysis hooked (Figs 85–87). Embolus short, its basal part hidden in cymbial pocket (Figs 88, 89).

Female.

General appearance as in Fig. 67. Slightly larger than male, similarly coloured but slightly lighter, streaks on carapace indistinct. Abdomen greyish brown, without pattern. Legs yellowish with brown patches. Epigyne with shallow central depression, lateral margins of depression more strongly sclerotized, forming "wings" covering the gonopores (Fig. 90). Internal structure less complex than in congeners, receptacles with only few strongly sclerotized chambers (Figs 91, 92).

Holotype: ♂ SOUTH AFRICA: *Free State*: Golden Gate Highlands National Park, 28°30'S:28°50'E, preservation traps, viii.1985, L. Lotz (NMBA, 965).

Paratypes: 1♂ 1♀ together with holotype; 2♂ same data but 4.vi.1985 (NMBA, 882); 1♂ 1♀ same data but 16.ix.1985 (NMBA, 1028).

Distribution: Known only from the type locality in the eastern Free State Province, South Africa (Fig. 93).

Habitat and biology: This species was collected only by pitfall trapping in high altitude montane grassland at *ca* 1600–1800 m.

Fig. 93. Distribution of *Langona hirsuta* sp. n. (circles) and *L. lotzi* sp. n. (square).

Langona warchalowskii Wesołowska, 2007

Figs 68, 69, 94–97

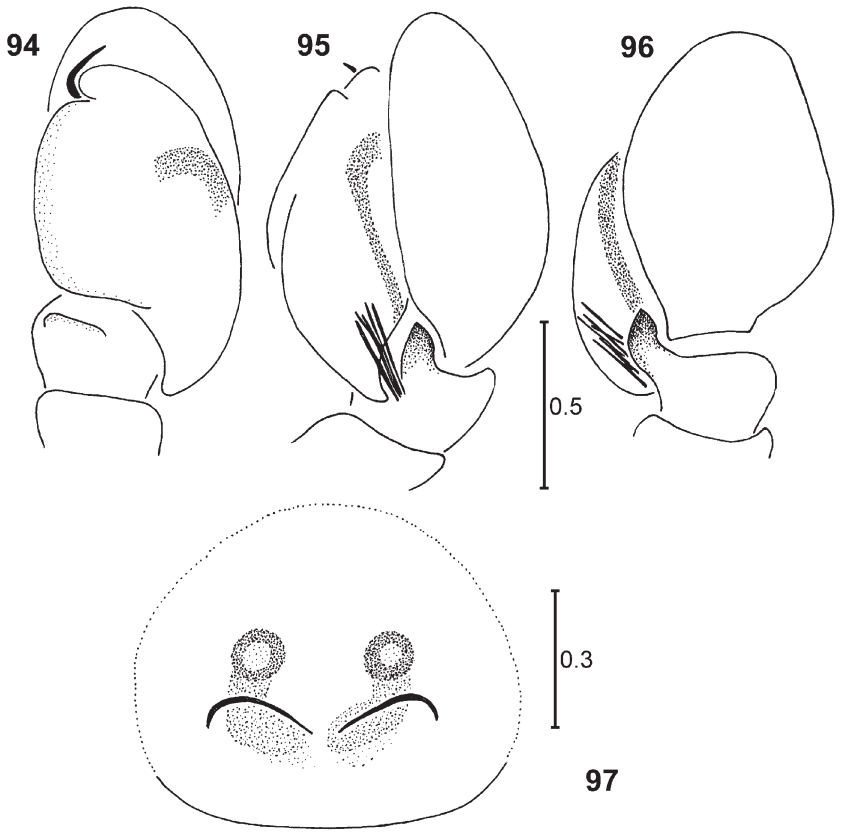
Langona warchalowskii: Wesołowska 2007: 783, figs 1–8.

Redescription:

Measurements (♂/♀). Carapace: length 3.3/4.0, width 2.5/2.9, height 1.1/1.1. Abdomen: length 3.2/5.8, width 2.5/4.0. Eye field: length 1.4/1.5, anterior width 1.6/2.0, posterior width 1.7/2.1.

Male.

General appearance as in Fig. 68. Shape of body and colouration typical for *Langona*. Carapace low, dark brown or blackish, with two longitudinal white stripes on dorsum, eye field black. White streaks along lateral edges extending to clypeus. Chelicerae toothless. Abdomen oval, black, with three narrow parallel white stripes. Spinnerets dark. Whole body clothed in dense dark hairs. Legs short, light brown, distal segments darker, with scopulae on tarsi. Pedipalps brown, with some white hairs on dorsal surface of femora, patellae and tibiae. Palpal organ as in Figs 94–96; tibial apophysis characteristically short, blunt, with accompanying tuft of long thick hard setae.



Figs 94–97. *Langona warchalowskii*, male (94–96) and female (97): (94) palpal organ, ventral view; (95) palpal organ, lateral view; (96) palpal organ, dorsal view; (97) epigyne.

Female.

General appearance as in Fig. 69. Clearly larger than male, colouration slightly lighter. Abdomen greyish brown with light longitudinal streak bordered with blackish lane. Distal segments of first leg very short. Epigyne unlike that of *Langona*, with two small procurved posterior depressions, their rims forming shields above the gonopores (Fig. 97). The internal structure of the epigyne as in other congeners, but copulatory ducts short (see fig. 8 in Wesołowska 2007).

Material examined: SOUTH AFRICA: *Free State*: 1♂ Benfontein Nat. Res., 28°50.003'S:24°48.756'E, pitfalls, dry thorny savannah, 14.x.2005–4.i.2006, R. Lyle (NCA, 2010/202); 1♂ Bloemfontein, National Botanical Gardens, 29°02.892'S:26°12.662'E, pitfalls, *Rhus lancea* woodland, 24.ix–8.x.2009, C. Haddad (NCA, 2009/3486); 1♂ 2♀ Brandfort district, Florisbad, 28°46'S:26°05'E, preservation traps, viii.1985, Museum staff (NMBA, 874); 10♂ 1♀ same data but ix.1982 (NMBA, 205); 1♂ same data but ix.1983 (NMBA, 428); 1♂ same data but x.1983 (NMBA, 571); 7♂ 1♀ same data but x.1985 (NMBA, 950); 1♀ same data but 23.xi–8.xii.1987 (NMBA, 3226); 1♂ same data but 30.viii–12.ix.1988 (NMBA, 4497); 1♂ same data but 30.viii–12.ix.1988 (NMBA, 4532); 1♂ same data but 23.ix–6.x.1988 (NMBA, 4653). *Northern Cape*: 1♂ Griquatown district, Bingap farm, 28°54'S:22°59'E, preservative traps, 4.x.1982, Museum staff (NMBA, 39).

Distribution: Species known only from the central karoo in South Africa. Apparently widespread in the arid and semi-arid parts of central and south-western South Africa. Recorded here from Free State and Northern Cape for the first time (Fig. 101).

Habitat and biology: An exclusively ground-dwelling spider collected primarily with pitfall traps, consistent with the habits of congeners.

Genus *Menemerus* Simon, 1868

Type species: *Attus semilimbatus* Hahn, 1829.

A large genus distributed worldwide, with over 40 species in Africa. The body is flattened and hairy and the carapace has pale lateral margins. The males have a characteristic very long tegular furrow and median protuberance on the palp. Females have strongly sclerotized entrance bowls in which the copulatory openings are hidden, and distinctive accessory glands.

Menemerus pilosus Wesołowska, 1999

Fig. 70

Menemerus pilosus: Wesołowska 1999*a*: 318, figs 225–231.

Wesołowska (1999*a*) described both sexes; general appearance of male in Fig. 70.

Material examined: SOUTH AFRICA: *Northern Cape*: 1 imm. 1♂ Prieska district, Green Valley Nuts, 29°34.904'S:22°55.027'E, canopy fogging, pistachio orchard no. 19, 25.vii.2001, C. Haddad (NCA, 2010/205).

Distribution: Previously known only from Namibia. Recorded from South Africa for the first time (Fig. 101).

Habitat and biology: This species is probably closely associated with bark due to its flat body and brown colour.

Menemerus transvaalicus Wesołowska, 1999

Figs 71, 72

Menemerus transvaalicus: Wesołowska 1999*a*: 339, figs 284–296.

Wesołowska (1999*a*) described both sexes; general appearance of both sexes in Figs 71, 72.

Material examined: SOUTH AFRICA: *Free State*: 1♀ Benfontein Nat. Res., 28°49.259'S:24°50.155'E, under *Eucalyptus* bark, 9.iii.2010, C. Haddad (NCA, 2010/299); 1♂ Bloemfontein, Bain's Vlei, 29°03.628'S: 26°09.280'E, on wall of house, 28.vii.2009, V. Butler (NCA, 2009/3497); 1♂ 1♀ Bloemfontein district, Maselspoort, 29°01.683'S:26°24.316'E, on wall of conference centre, 3.ii.2005, M. Cumming (NHMWU); 1♀ Brandfort district, Amanzi Private Game Reserve, 28°36.080'S:26°25.950'E, on wall of house, 3.iv.2010, C. Haddad (MRAC, 230322); 2♂ 7♀ Clocolan district, Mpetsane Conservation Estate, 28°48.773'S:27°39.364'E, under *Eucalyptus* bark, 17.iii.2010, C. Haddad (NCA, 2010/338); 1♂ Harrismith, 28°17.233'S:29°06.720'E, by hand, 13.xii.2005, C. Haddad (NCA, 2008/2564); 1♀ Koppies Dam Nat. Res., 27°13'S:27°42'E, in house, 20.ix.1993, L. Lotz (NMBA, 6239); 3♂ 2♀ Sandveld Nat. Res., 27°41'S:25°41'E, 22.ix.2003, C. Haddad (NHMWU); 1♀ same locality, in chimney of *Odontotermes* termite mound, 25.x.2003, C. Haddad (NHMWU).

Distribution: Hitherto known only from the Gauteng and Eastern Cape provinces in South Africa. Widespread in the Free State Province, where it is recorded for the first time (Fig. 101).

Habitat and biology: A species common under bark of trees, especially exotic *Eucalyptus*, and regularly seen on the walls on buildings.

Genus *Microbianor* Logunov, 2000

Type species: *Microbianor nigritarsis* Logunov, 2006.

The genus was described from the Seychelles (Logunov 2000), and subsequently found also on Réunion (Ledoux 2007) and Madagascar (Logunov 2009). These spiders are morphologically similar to the genus *Bianor* Peckham & Peckham, 1885, but can be distinguished by their very small size. The males have a diminutive process at the external margins of the maxillae, and a characteristically curved embolus tip. The females have distinctly shorter seminal ducts than in *Bianor*. *M. globosus* sp. n., described below, is the first species of the genus found in continental Africa.

Microbianor globosus sp. n.

Figs 73, 98–100

Etymology: From Latin *globosus* (globose), referring to the shape of the bulb.

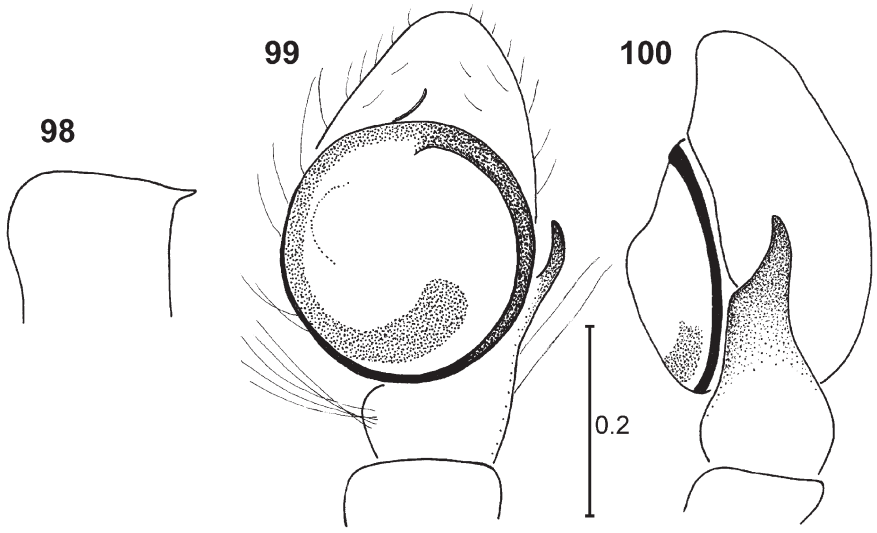
Diagnosis: This species differs from others in the genus in having a clearly larger tibial apophysis.

Description:

Male.

Measurements: Carapace: length 1.1, width 1.0, height 0.5. Abdomen: length 1.2, width 0.9. Eye field: length 0.7, anterior width 0.8, posterior width 1.0.

General appearance as in Fig. 73. Very diminutive, stout spider. Carapace high, broad and short, with large trapezoid eye field; posterior slope of carapace steep, just behind eye field. Carapace dark brown, slightly darker in vicinity of eyes. Delicate dark hairs cover carapace, with white hairs on lateral slopes anteriorly; some long bristles on eye field, with a few white scales near eyes. Chelicerae unidentate, light brown. Maxillae straight along anterior margin, with small process on external margin (Fig. 98). Sternum dark. Abdomen oval, slightly flattened, covered with large scutum; dorsum brown, with delicate pattern composed of white hairs: thin median line not reaching end of abdomen, and three pairs of small patches on lateral sides (last pair, placed at spinnerets, largest). Venter dark. Spinnerets brown. First legs slightly larger, brown, with lighter metatarsi



Figs 98–100. *Microbianor globosus* sp. n., holotype male: (98) endite; (99) palpal organ, ventral view; (100) palpal organ, lateral view.

and tarsi; tibiae only slightly swollen, covered with long black spatulate hairs, denser on dorsal surface. Legs II–IV dark yellow, with single distal spine on dorsal surface of femora. Palp brown. Palpal tibia short, with very large curved apophysis (Figs 99, 100). Bulb rounded, tegulum with prolateral protuberance. Embolus long, surrounding bulb, its tip thin and colourless, curved (Fig. 99).

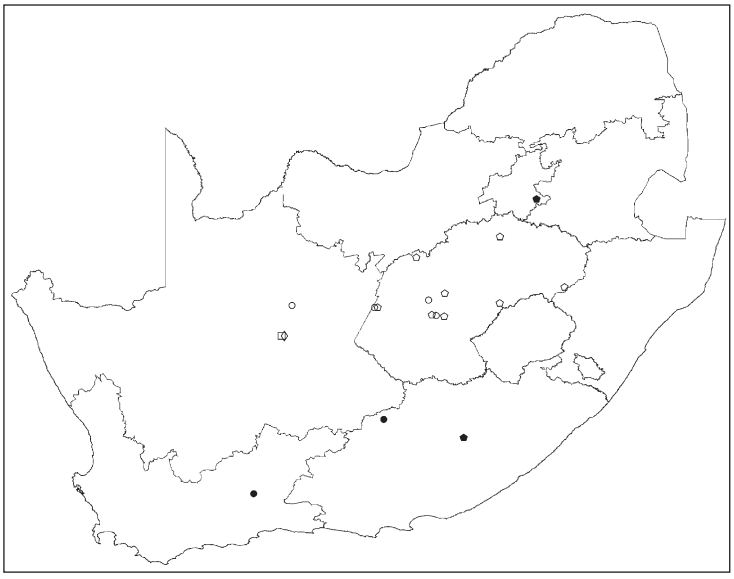


Fig. 101. Distribution of *Langona warchalowskii* (circles), *Menemerus pilosus* (square), *M. transvaalicus* (pentagons) and *Microbianor globosus* sp. n. (diamond) in South Africa. Solid icons indicate published records and open icons new records from central South Africa.

Female. Unknown.

Holotype: ♂ SOUTH AFRICA: *Northern Cape*: Prieska district, Green Valley Nuts, 29°34.924'S:22°54.376'E, base of grass tussocks, 28.i.2009, C. Haddad (NMBA, 14107).

Distribution: Only known from the type locality (Fig. 101).

Habitat and biology: Collected from the base of grass tussocks on the banks of the Orange River.

Remarks: This is the first species from the genus reported from continental Africa; all previously known species are distributed on Indian Ocean islands (Logunov 2000, 2009; Ledoux 2007). The description of the new species provides an alternative biogeographical hypothesis to that of Logunov (2009), who suggested that the distribution of the genus may reflect a faunal affinity with the Oriental Region. It could alternatively be proposed that the genus originated in Africa and speciated on the Indian Ocean islands following their geological separation from the African mainland. Further studies of the Oriental Harmochireae are necessary to more thoroughly assess the biogeography of *Microbianor*.

Genus *Natta* Karsch, 1879

Type species: *Natta horizontalis* Karsch, 1879.

This African genus includes only two species. The body is dark with a blue metallic shine and a few pairs of glaring orange patches on the abdomen. Copulatory organs of both sexes resemble those of *Phintella* species.

Natta chionogaster (Simon, 1901)

Figs 74, 75

Cyllobelus chionogaster: Simon 1901*c*: 151; 1901*b*: 541, 549, fig. 665; Peckham & Peckham 1903: 195, pl. 21, fig. 1.
Cyllobelus australis: Peckham & Peckham 1902: 334; 1903: 194, pl. 21, fig. 2.
Natta chionogastra: Prószyński 1984: 87; 1985: 80, figs 39–41, 45, 47; Wesołowska 1993: 18, figs 1–16.

Wesołowska (1993) described both sexes; general appearance of both sexes in Figs 74, 75.

Material examined: SOUTH AFRICA: *Free State*: 1♀ Krugersdrift Dam, 28°42'S:25°55'E, in canal, 18.i.1991, S. Louw & A. Wels (NMBA, 5364); 2♂ Sandveld Nat. Res., 27°41'S:25°41'E, 22.ix.2003, C. Haddad (NHMWU); 1♂ Tussen-die-Riviere Nat. Res., Camp, 30°30'S:26°08'E, active searching, 15.x.2008, L. Lotz & C. Haddad (NMBA, 12828). *Northern Cape*: 1♂ 1♀ Prieska district, Green Valley Nuts, 29°34.924'S: 22°54.376'E, leaf litter, Orange R. bank, 1.iii.2002, C. Haddad (NHMWU).

Distribution: Known from South Africa (Fig. 114), D.R. Congo and Namibia.

Habitat and biology: This species is usually found in the vicinity of foraging ants, especially *Anoplolepis custodiens* F. Smith, which it mimics in its movements and metallic scales on the body. In central South Africa it is clearly less common than *N. horizontalis* Karsch, 1879.

Natta horizontalis Karsch, 1879

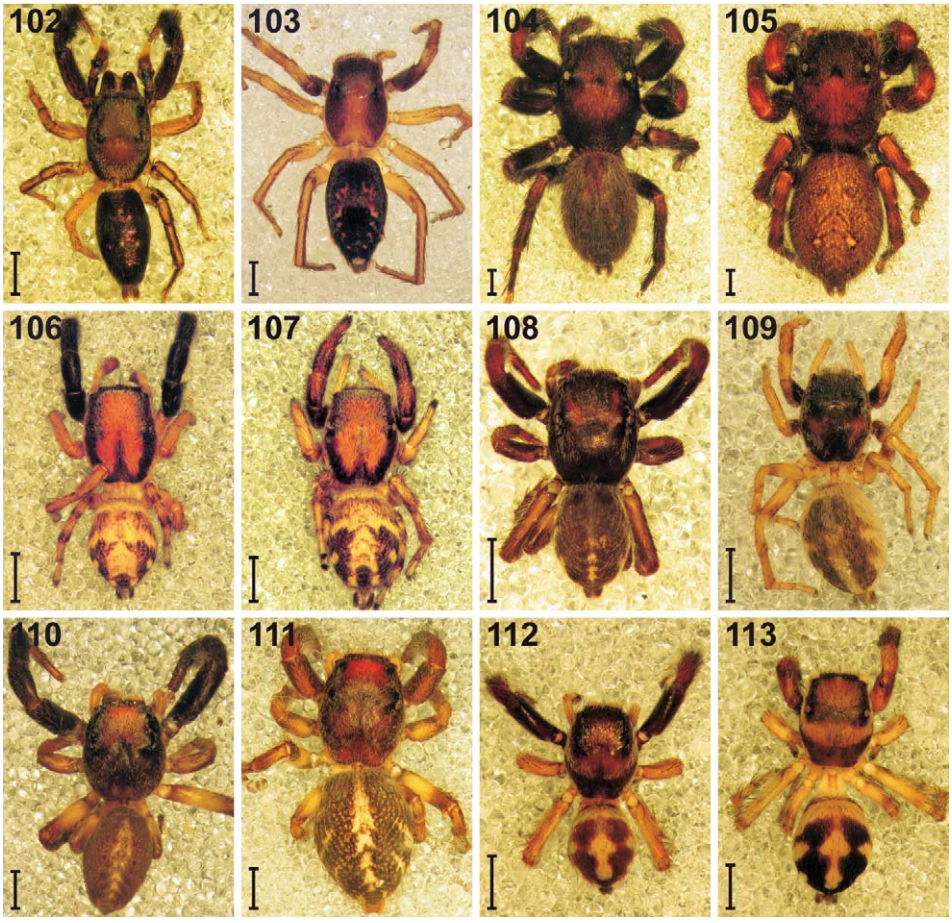
Figs 102, 103

Natta horizontalis: Karsch 1879: 362; Prószyński 1985: 78; figs 32–37; Próchniewicz 1989: 218, figs 33–38; Wesołowska 1993: 25, figs 17–41; Wesołowska & Cumming 2008: 201, figs 107–109; Wesołowska & Haddad 2009: 65.

Cyllobelus rufopictus: Simon 1901*b*: 549; 1910: 420; Berland & Millot 1941: 320, fig. 22; Lawrence 1942: 187, fig. 32.
Cyllobelus tristellatus: Simon 1906: 1171; Lessert 1936: 289, fig. 84.
Natta tristellata: Prószyński 1984: 87; 1985: 83, figs 42–44.
Natta rufopicta: Prószyński 1984: 88; 1985: 82, figs 46, 48.

Wesołowska (1993) described both sexes; general appearance as in Figs 102, 103.

Material examined: SOUTH AFRICA: *Free State*: 2♂ Bloemfontein district, Deelhoek farm, 28°54'S:26°07'E, 17.xi.2001, C. Haddad (NHMWU); 2♂ 1♀ Bloemfontein district, Hopefield farm, 28°54'S:26°14'E, under rocks, 28.ix.2000, C. Haddad (NCA, 2005/936); 1♂ Sandveld Nat. Res., 27°44.219'S:25°45.983'E, pitfalls, grassland and shrubs, 30.x–6.xii.2009, R. Fourie & A. Grobler (NMSA, 22683); 1♂ Tussen-die-Riviere Nat. Res., Camp, 30°30'S:26°08'E, night collecting, 13–17.x.2008, L. Lotz & C. Haddad (NMBA, 12594); 1 subad. ♀ 1♂ same locality, Brakfontein, 30°31'S:26°17'E, leaf litter sifting, 20.x.2008, L. Lotz (NMBA, 12926); 2 imm. 1♂ 1♀ same locality, 30°29'S:26°11'E, active searching under rocks, riverine forest edge, 15.x.2008, L. Lotz & C. Haddad (NMBA, 12744). *Northern Cape*: 2♂ Prieska district, Green Valley Nuts, 29°34.924'S:22°54.376'E, 1.iii.2002, leaf litter, Orange R. bank, C. Haddad (NHMWU); 1 imm. 2♂ 3♀ same



Figs 102–113. Digital microscope photographs of the dorsal habitus of South African jumping spiders: (102, 103) *Natta horizontalis*, male (102) and female (103); (104, 105) *Nigorella hirsuta*, male (104) and female (105); (106, 107) *Pellenes bulawayoensis*, male (106) and female (107); (108, 109) *P. geniculatus*, male (108) and female (109); (110, 111) *P. modicus*, male (110) and female (111); (112, 113) *P. tharinae*, male (112) and female (113). Scale bars = 1 mm.

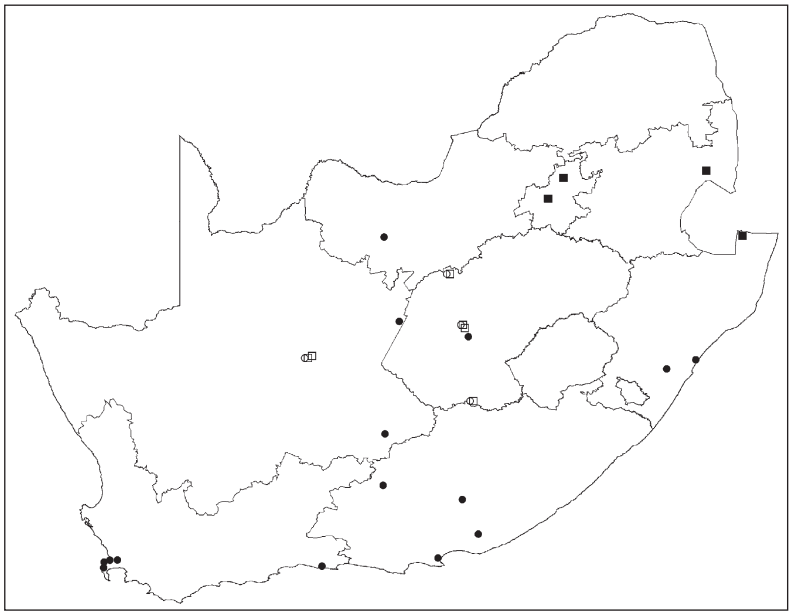


Fig. 114. Distribution of *Natta chionogaster* (circles) and *N. horizontalis* (squares) in South Africa. Solid icons indicate published records and open icons new records from central South Africa.

locality, 29°33.993'S:22°55.005'E, active searching, pistachio orchard no. 1, 28.ii.2002, C. Haddad (NCA, 2010/214); 2♂ Prieska district, Remhoogte farm, 29°32.016'S:23°00.182'E, active searching, experimental pistachio orchard, 22.xi.2001, C. Haddad (NCA, 2010/213).

Distribution: Widespread in the Afrotropical Region. In South Africa known from the Gauteng, Mpumulanga and KwaZulu-Natal provinces, recorded here from the Free State and Northern Cape provinces for the first time (Fig. 114).

Habitat and biology: As for *N. chionogaster* above.

Genus *Nigorella* Wesołowska & Tomasiewicz, 2008

Type species: *Nigorella aethiopica* Wesołowska & Tomasiewicz, 2008.

A small Afrotropical genus, only containing four poorly known species. Its members are medium to large in size, with dark colouration; the males have a characteristic embolus enveloped by a terminal apophysis; the gonopores in the female's epigyne are hidden in strongly sclerotized "cups".

Nigorella hirsuta Wesołowska, 2009

Figs 104, 105

Nigorella hirsuta: Wesołowska 2009*a*: 521, figs 16–25, 31, 33.

Wesołowska (2009*a*) described both sexes; general appearance as in Figs 104, 105.

Material examined: SOUTH AFRICA: *Free State*: 1♂ Bloemfontein, National Botanical Gardens, 29°08'S: 26°10'E, pitfall traps, 8.xi.2006, R. Scholtz & S. Otto (NMBA, 11052); 1♂ same locality, 29°02.892'S: 26°12.662'E, pitfall traps, *Rhus lancea* woodland, 16–21.xi.2009, C. Haddad (NMSA, 22605); 1♂ same locality, 29°03.006'S:26°12.701'E, pitfall traps, grassland, 16–21.xi.2009, C. Haddad (NMSA, 22619); 1♀

same locality, base of grass tussocks, 21.xi.2009, C. Haddad (NMSA, 22633); 2♂ Brandfort district, Florisbad, 28°46'S:26°05'E, preservative traps, 31.x–18.xi.1988, L. Lotz (NMBA, 4872); 1♂ Erfenis Dam Nat. Res., burnt site 1, 28°30.373'S:26°48.437'E, pitfall traps, 21.ix–22.x.2005, C. Haddad, S. Otto & R. Poller (NMSA, 22638); 1♂ same locality, burnt site 3, 28°29.990'S:26°48.486'E, pitfall traps, 21.ix–22.x.2005, C. Haddad, S. Otto & R. Poller (NMBA, 14108); 1♂ same locality, unburnt site 1, 28°29.888'S:26°48.488'E, pitfall traps, 22.x–22.xi.2005, C. Haddad, S. Otto & R. Poller (NMSA, 22639); 1♂ same locality, unburnt site 3, 28°29.741'S:26°48.065'E, pitfall traps, 24.ii–27.iii.2006, S. Otto & R. Poller (NMSA, 22640); 1♂ same locality, site 1, near trench, 28°28.892'S:26°48.508'E, pitfall traps, grassland, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3576); 1♂ same locality, site 2, eastern fence, 28°30.011'S:26°48.479'E, pitfall traps, grassland, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3582); 2♀ Ladybrand district, De Luc farm, 29°18'S:27°24'E, base of grass tussocks, 5.xii.2008, C. Haddad (NMBA, 13052); 1♂ Oranjeville, Vaal Dam, 26°59.523'S:28°15.737'E, pitfall traps, grassland, 1–29.x.2009, R. Fourie & A. Grobler (NCA, 2009/3541); 1♂ Sandveld Nat. Res., 27°41'S:25°41'E, 22.ix.2003, C. Haddad (NHMWU); 1♀ same locality, active search, ground and under rocks, 19.iii.2008, L. Lotz (NMBA, 11937); 2♂ same locality, 27°44.043'S: 25°45.805'E, pitfall traps, grassland, 2–30.x.2009, R. Fourie & A. Grobler (NCA, 2009/3568); 2♂ Willem Pretorius Nat. Res., 28°16.696'S:27°12.083'E, pitfall traps, grassland, 29.x–5.xii.2009, R. Fourie & A. Grobler (NMSA, 22678). *North West*: 1♂ Potchefstroom district, Thabela Thabeng Mountain Retreat, 26°51.825'S:27°17.819'E, pitfall traps, woodland grassland, 1–29.x.2009, R. Fourie & A. Grobler (NCA, 2009/3546); 2♂ same locality, 26°51.828'S:27°17.805'E, pitfalls, Vaal R. bank, 1–29.x.2009, R. Fourie & A. Grobler (NCA, 2009/3556).

Distribution: Known from South Africa and Zimbabwe. Recorded by Wesołowska (2009*a*) from Harrismith, Hopefield farm and Sandveld Nat. Res. in the Free State province, but clearly this species is very widespread in central and eastern South Africa. Recorded from the North West Province for the first time (Fig. 115).

Habitat and biology: A ground-dwelling species usually collected by pitfall trapping or searching at the base of grass tussocks. Although widespread, it was uncommon compared to other salticids in long-term pitfall trapping surveys.

Fig. 115. Distribution of *Nigorella hirsuta* in South Africa. Solid circles indicate published records and open circles new records from central South Africa.

Genus *Pellenes* Simon, 1900

Type species: *Aranea tripunctata* Walckenaer, 1802.

This large genus contains about eighty species distributed mainly in the Palaearctic and Afrotropical regions, with only a few species occurring in the Nearctic and a single species in Australia (Żabka 2006; Prószyński 2009; Platnick 2010). The Afrotropical species of the genus have been poorly studied and their distribution is poorly known. The species are difficult to identify: in some species the males can only be recognized by minute differences in the structure of the embolus tip; the females are often unrecognizable. Many species have white scales on the femora. All of the species treated in the present paper belong to the subgenus *Pelmutus* (Logunov *et al.* 1999).

Pellenes (*Pelmutus*) *bulawayoensis* Wesołowska, 1999

Figs 106, 107, 116–122

Pellenes bulawayoensis: Wesołowska 1999*b*: 163, figs 52–56; Wesołowska & Cumming 2008: 202, figs 110–112; Wesołowska & Haddad 2009: 68, figs 221, 222.

Redescription:

Measurements (♂/♀): Carapace: length 2.4–2.7/3.0, width 2.0–2.2/2.5, height 1.3/1.3. Abdomen: length 2.4–2.5/3.0, width 1.9/2.3. Eye field: length 1.1–1.2/1.5, anterior width 1.5–1.7/1.8, posterior width 1.7–1.9/2.3.

Male.

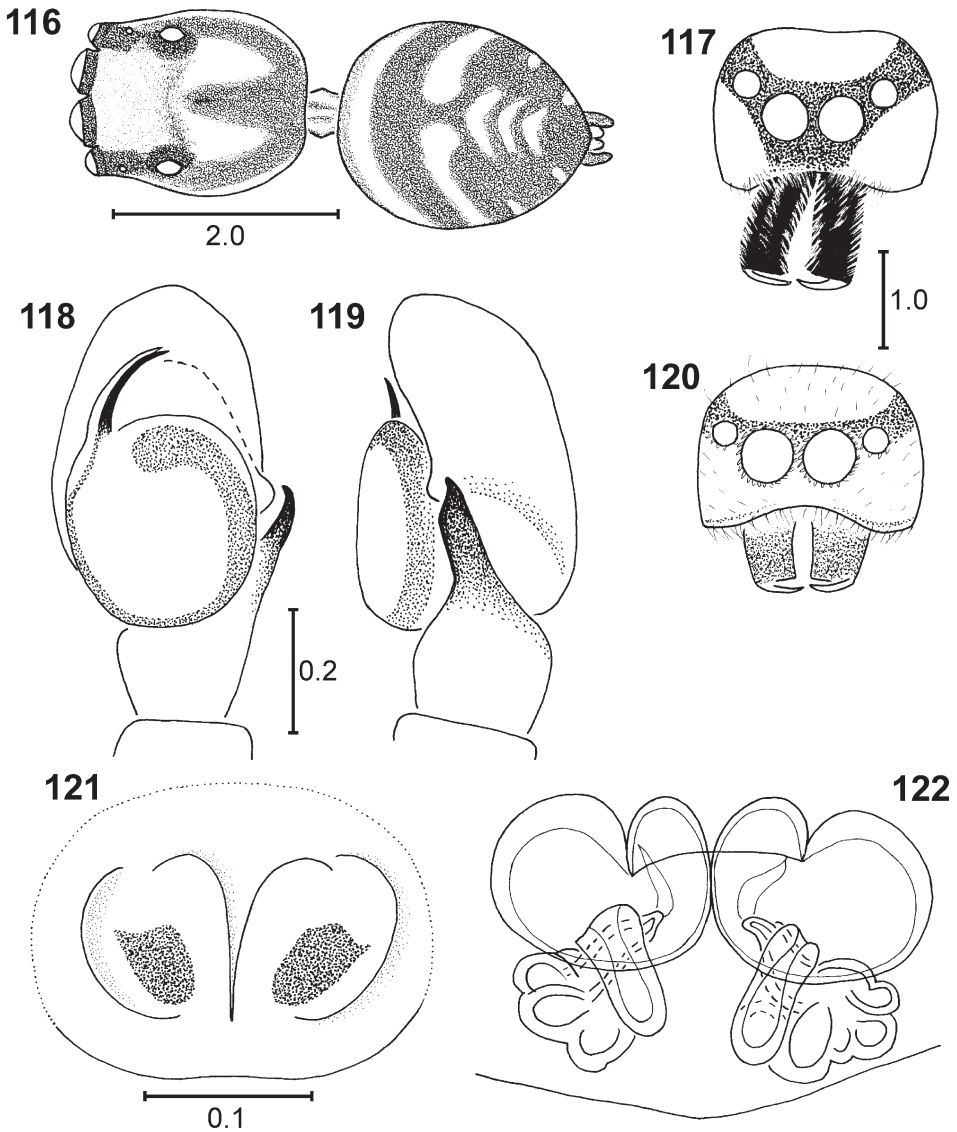
General appearance as in Figs 106, 116. Carapace oval, dark brown, vicinity of eyes black. Eye field dark, clothed in dense white hairs, with long brown bristles near eyes. Thoracic part brownish, darker medially; lateral slopes with pale stripes formed by white hairs. Clypeus high, with characteristic contrasting white-black pattern of "face" (Fig. 117). Chelicerae black with rows of white hairs. Mouthparts and sternum blackish. Abdomen brownish, with white pattern composed of two transverse streaks in anterior half (second of them interrupted in centre), chains of few median triangular spots, and two pairs of small lateral round patches in posterior part (Fig. 116). Venter pale with large grey patch. Posterior spinnerets dark, anterior spinnerets whitish. First legs longer and slightly thicker than others, black. Legs II–IV yellow. Pedipalps pale, cymbium slightly darker. Bulb rounded, embolus needle-shaped, with closely adherent accompanying terminal apophysis (Fig. 118). Tibial apophysis large, strongly sclerotized, adpressed in shallow groove along margin of cymbium (Fig. 119); cymbium with small retrolateral process (Fig. 118).

Female.

General appearance as in Fig. 107. Slightly larger than male. General colouration similar to male, abdominal pattern more distinct. Clypeus with white hairs; lateral sides of carapace and eye field clothed in very dense white hairs and scales, so spider's "face" is white; only surroundings of eyes blackish (Fig. 120). First leg shorter than in male, base of femur light brown, distal segments blackish. Femora of remaining pairs of legs brown; distal segments orange, with brown rings. Epigyne with narrow median septum (Fig. 121). Internal structure as in Fig. 122.

Material examined: SOUTH AFRICA: *Free State*: 1♂ Benfontein Nat. Res., 28°50.003'S:24°48.756'E, pitfalls, dry thorny savannah, 14.x.2005–4.i.2006, R. Lyle (NCA, 2010/203); 1♀ same locality, 28°49.259'S:

24°50.155'E, base of grass tussocks, 9.iii.2010, C. Haddad (NCA, 2010/294); 2♂ 1♀ Bloemfontein, National Botanical Gardens, 29°02.892'S:26°12.662'E, pitfalls, *Rhus lancea* woodland, 24.ix–8.x.2009, C. Haddad (NCA, 2009/3489); 10♂ 1♀ same data but 8–27.x.2009 (NCA, 2009/3507); 7♂ same data but 27.x–16.xi.2009 (NMSA, 22599); 4♂ 1♀ same data but 16–21.xi.2009 (NMSA, 22604); 4♂ 3♀ same data but 9.xii.2009–4.i.2010 (MRAC, 230331); 2♂ same locality, 29°03.006'S:26°12.701'E, pitfall traps, grassland, 16–21.xi.2009, C. Haddad (NMSA, 22620); 2♂ same data but 21.xi–9.xii.2009 (MRAC, 230330); 1♂ Erfenis Dam Nat. Res., burnt site 1, 28°30.373'S:26°48.437'E, pitfall traps, 21.ix–22.x.2005, C. Haddad, S. Otto & R. Poller (NMSA, 22646); 1♂ same data but 23.xii.2005–23.i.2006 (NMSA, 22647); 2♂ same locality, burnt site 2, 28°30.134'S:26°48.427'E, pitfall trap, 22.x–22.xi.2005, C. Haddad, S. Otto



Figs 116–122. *Pellenes bulawayoensis*, male (116–119) and female (120–122): (116) habitus of male; (117) carapace of male, frontal view; (118) palpal organ, ventral view; (119) palpal organ, lateral view; (120) carapace of female, frontal view; (121) epigyne; (122) internal structure of epigyne.

& R. Poller (NMBA, 14109); 1♂ same data but 23.xii.2005–23.i.2006 (NMSA, 22648); 1♂ 1♀ same locality, burnt site 3, 28°29.990'S:26°48.486'E, pitfall trap, 22.xii.2005–23.i.2006, C. Haddad, S. Otto & R. Poller (NMBA, 14110); 1♂ same locality, unburnt site 2, 28°29.706'S:26°48.281'E, pitfall traps, 23.xii.2005–23.i.2006, C. Haddad, S. Otto & R. Poller (NMSA, 22649); 1♂ same locality, unburnt site 3, 28°29.741'S:26°48.065'E, pitfall traps, 22.xi–23.xii.2005, C. Haddad (NMSA, 22650); 2♂ same locality, site 1, near trench, 28°28.892'S:26°48.508'E, pitfall traps, grassland, 31.viii–30.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3635); 3♂ same data but 30.ix–28.x.2009 (NCA, 2009/3577); 4♂ same locality, site 2, eastern fence, 28°30.011'S:26°48.479'E, pitfall traps, grassland, 31.viii–30.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3639); 4♂ same data but 30.ix–28.x.2009 (NCA, 2009/3581); 10♂ 1♀ same locality, site 3, *Acacia karroo* trees, 28°30.272'S:26°47.527'E, pitfall traps, woodland, 31.viii–30.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3641); 16♂ same data but 30.ix–28.x.2009 (NCA, 2009/3589); 1♂ same locality, site 4, gravel plain, 28°29.611'S:26°47.995'E, pitfall traps, 31.viii–30.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3644); 1♂ same locality, site 6, northern shore of dam, 28°29.738'S:26°48.272'E, pitfall traps, near water level, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3596); 1♂ same locality, site 7, rocky hillside, 28°29.629'S:26°48.323'E, pitfall traps, 31.viii–30.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3652); 1♂ same data but 30.ix–28.x.2009 (NCA, 2009/3601); 2♂ Kroonstad district, Doornkloof farm, 27°43.393'S:27°42.066'E, pitfall traps, base of hill, 1.ix–1.x.2009, R. Fourie & A. Grobler (NCA, 2009/3629); 3♂ same data but 1–29.x.2009 (NCA, 2009/3532); 13♂ 4♀ same data but 29.x–5.xii.2009 (MRAC, 230333); 1♂ same locality, 27°43.376'S:27°42.042'E, pitfall traps, grassland, 1.ix–1.x.2009, R. Fourie & A. Grobler (NCA, 2009/3633); 2♂ 1♀ same data but 1–29.x.2009 (NCA, 2009/3534); 10♂ same data but 29.x–5.xii.2009 (MRAC, 230332); 19♂ 5♀ Oranjeville, Vaal Dam, 26°59.514'S:28°15.772'E, pitfall traps, overgrazed grassland, 1.ix–1.x.2009, R. Fourie & A. Grobler (NCA, 2009/3627); 31♂ 2♀ same data but 1–29.x.2009 (NCA, 2009/3536); 31♂ 8♀ same locality, 26°59.523'S:28°15.737'E, pitfall traps, grassland, 1.ix–1.x.2009, R. Fourie & A. Grobler (NCA, 2009/3623); 51♂ 5♀ same data but 1–29.x.2009 (NCA, 2009/3543); 1♂ Sandveld Nat. Res., 27°41'S:25°41'E, active searching, by hand, 18–20.iii.2008, L. Lotz (NMBA, 11910); 21♂ 2♀ same locality, 27°44.043'S:25°45.805'E, pitfall traps, grassland, 2.ix–2.x.2009, R. Fourie & A. Grobler (NCA, 2009/3614); 12♂ same data but 2–30.x.2009 (NCA, 2009/3567); 3♂ 2♀ same data but 30.x–4.xii.2009 (MRAC, 230334); 27♂ 1♀ same locality, 27°44.219'S:25°45.893'E, pitfall traps, grassland and shrubs, 2.ix–2.x.2009, R. Fourie & A. Grobler (NCA, 2009/3608); 21♂ same data but 2–30.x.2009 (NCA, 2009/3574); 2♂ Willem Pretorius Nat. Res., 28°16.696'S:27°12.083'E, pitfall traps, grassland, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3517); 4♂ 1♀ same locality, 28°16.660'S:27°12.207'E, pitfall traps, near water level, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3522). *North West*: 4♂ Potchefstroom district, Thabela Thabeng Mountain Retreat, 26°51.825'S:27°17.819'E, pitfall traps, woodland grassland, 1.ix–1.x.2009, R. Fourie & A. Grobler (NCA, 2009/3621); 7♂ 1♀ same data but 1–29.x.2009 (NCA, 2009/3548); 1♂ same locality, 26°51.828'S:27°17.805'E, pitfalls, Vaal R. Bank, 29.x–5.xii.2009, R. Fourie & A. Grobler (MRAC, 230335).

Distribution: Species known from Zimbabwe and South Africa (KwaZulu-Natal). Recorded from the Free State and North-West provinces for the first time (Fig. 127).

Habitat and biology: This species is one of the most common and widespread ground-dwelling jumping spiders in central South Africa, and was very abundant in pitfall trapping surveys.

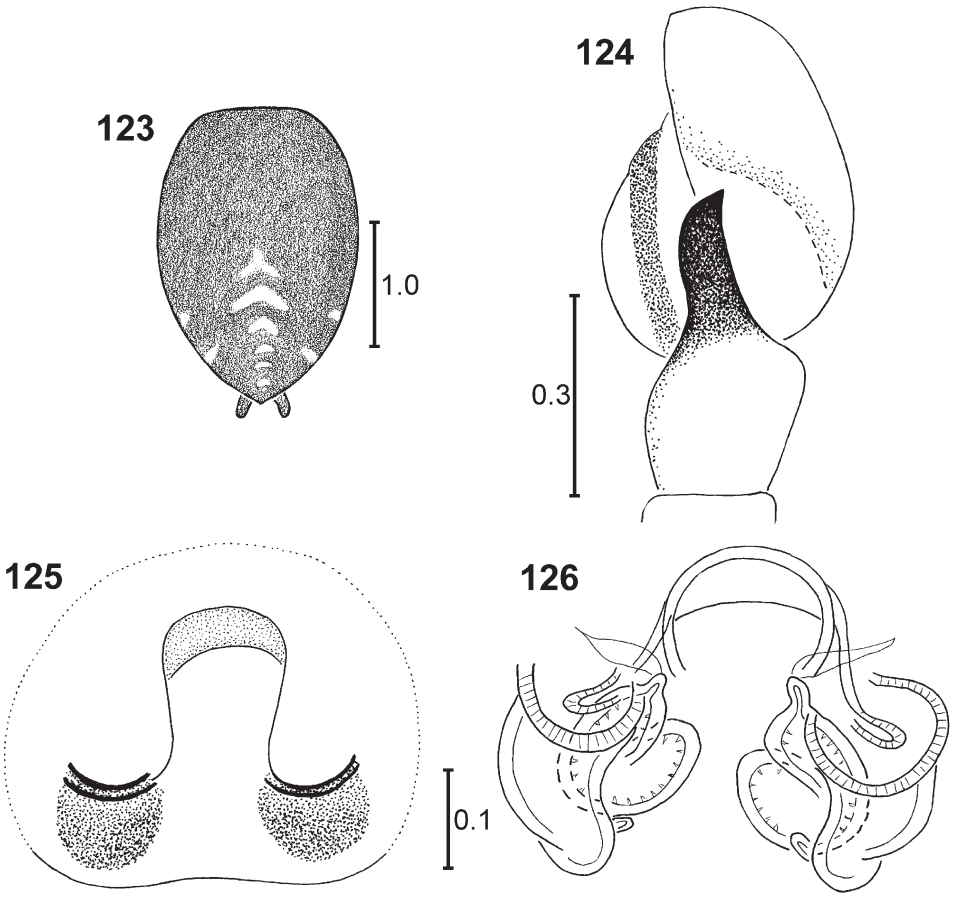
Remarks: The first description of the female of the species is given here.

Pellenes (*Pelmutus*) *geniculatus* (Simon, 1868)

Figs 108, 109, 123–126

Attus geniculatus: Simon 1868: 49.
Pellenes geniculatus: Simon 1876: 97; Logunov *et al.* 1999: 126, figs 5, 131–153; Metzner 1999: 128, fig. 94; Wesołowska & Russell-Smith 2000: 79, figs 210–213; Wesołowska & van Harten 2007: 239, figs 139–144; 2010: 43, pls 13–16, figs 44–51; Wesołowska & Tomasiewicz 2008: 37.
Salticus simoni: Pickard-Cambridge 1872: 329.
Pellenes simoni: Proszyński 2003: 119: figs 463–468, 487, 488, 492–494, 498–500.

Wesołowska and van Harten (2007) described both sexes; general appearance of both sexes in Figs 108, 109. Abdomen of male (Fig. 123) and male retrolateral tibial apophysis (Fig. 124) distinctly different to South African congeners. Epigyne typical for the genus, with shallow central pocket and sclerotized internal structures (Figs 125, 126).



Figs 123–126. *Pellenes geniculatus*, male (123, 124) and female (125, 126): (123) abdomen; (124) palpal organ, ventral view; (125) epigyne; (126) internal structure of epigyne.

Material examined: SOUTH AFRICA: *Free State*: 2♂ Bloemfontein, National Botanical Gardens, 29°03.006'S: 26°12.701'E, pitfalls, grassland, 21.xi–9.xii.2009, C. Haddad (MRAC, 230239); 1♂ Erfenis Dam Nat. Res., burnt site 1, 28°30.373'S:26°48.437'E, pitfall traps, 24.ii–27.iii.2006, S. Otto & R. Poller (NMSA, 22641); 2♂ same locality, burnt site 3, 28°29.990'S:26°48.486'E, pitfall traps 23.xii.2005–23.i.2006, C. Haddad, S. Otto & R. Poller (NMSA, 22642); 1♀ same locality, unburnt site 1, 28°29.888'S:26°48.488'E, pitfall traps, 24.ii–27.iii.2006, S. Otto & R. Poller (NMSA, 22643); 1♂ same data but 27.iii–28.iv.2006, C. Haddad & R. Lyle (NMSA, 22644); 1♂ same locality, unburnt site 3, 28°29.741'S:26°48.065'E, pitfall traps, 22.xi–23.xii.2005, C. Haddad (NMBA, 14112); 1♂ same data but 23.xii.2005–23.i.2006, C. Haddad, S. Otto & R. Poller (NMBA, 14113); 1♂ same data but 24.ii–27.iii.2006, S. Otto & R. Poller (NMSA, 22645); 1♂ same locality, site 3, *Acacia karroo* trees, 28°30.272'S:26°47.527'E, pitfall traps, woodland, 28.x–4.xii.2009, R. Fourie & A. Grobler (NMSA, 22694); 2♂ same locality, site 6, northern shore of dam, 28°29.738'S:26°48.272'E, pitfall traps, near water level, 31.viii–30.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3647); 5♂ same data but 30.ix–28.x.2009 (NCA, 2009/3598); 1♂ same locality, site 7, rocky hillside, 28°29.629'S:26°48.323'E, pitfall traps, 31.viii–1.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3651); 1♀ Fauresmith district, Kalkfontein Dam, 29°31'S:25°16'E, sweeping grass, L. Lotz, 8.iv.2008 (NMBA, 12054); 1♂ Kroonstad district, Doornkloof farm, 27°43.376'S:27°42.042'E, pitfall traps, grassland, 29.x–5.xii.2009, R. Fourie & A. Grobler (NMSA, 22687); 1♂ Sandveld Nat. Res., 27°40'S:25°43'E, pitfall traps, grassland, 10–13.iii.2008, L. Lotz (NMBA, 11824); 1♂ same locality, 27°44.043'S:25°45.805'E, pitfall traps, grassland, 2–30.x.2009, R. Fourie & A. Grobler (NCA, 2009/3564); 2♂ same locality, 27°44.219'S:25°45.893'E, pitfall

Fig. 127. Distribution of *Pellenes bulawayoensis* (circles) and *P. geniculatus* (squares) in South Africa. Solid icon indicates a published record and open icons new records from central South Africa.

traps, grassland and shrubs, 2–30.x.2009, R. Fourie & A. Grobler (NCA, 2009/3572); 2♂ same data but 30.x–6.xii.2009 (NMSA, 22686); 1♂ Tussen-die-Riviere Nat. Res., 30°29'S:26°11'E, pitfalls, riverine bush, 13–16.x.2008, L. Lotz & C. Haddad (NMBA, 12576); 1♂ same locality, Camp, 30°30'S:26°08'E, pitfalls, river floodplain, 13–17.x.2008, L. Lotz & C. Haddad (NMBA, 12527); 1♂ same locality, Camp, 30°30'S: 26°08'E, active search, 15.x.2008, L. Lotz & C. Haddad (NMBA, 12823); 1♀ Willem Pretorius Nat. Res., 28°16.660'S:27°12.207'E, pitfall traps, near water level, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3528).

Distribution: Species widely distributed in the southern part of the Palaearctic Region; also recorded from Yemen, and in continental Africa known from Tanzania and Ethiopia. Recorded from South Africa for the first time (Fig. 127).

Habitat and biology: This species was widespread and regularly collected in long-term pitfall surveys but was not abundant.

Remarks: The majority of specimens collected in South Africa are dark coloured, sometimes with only traces of the white chevrons posteriorly on abdomen.

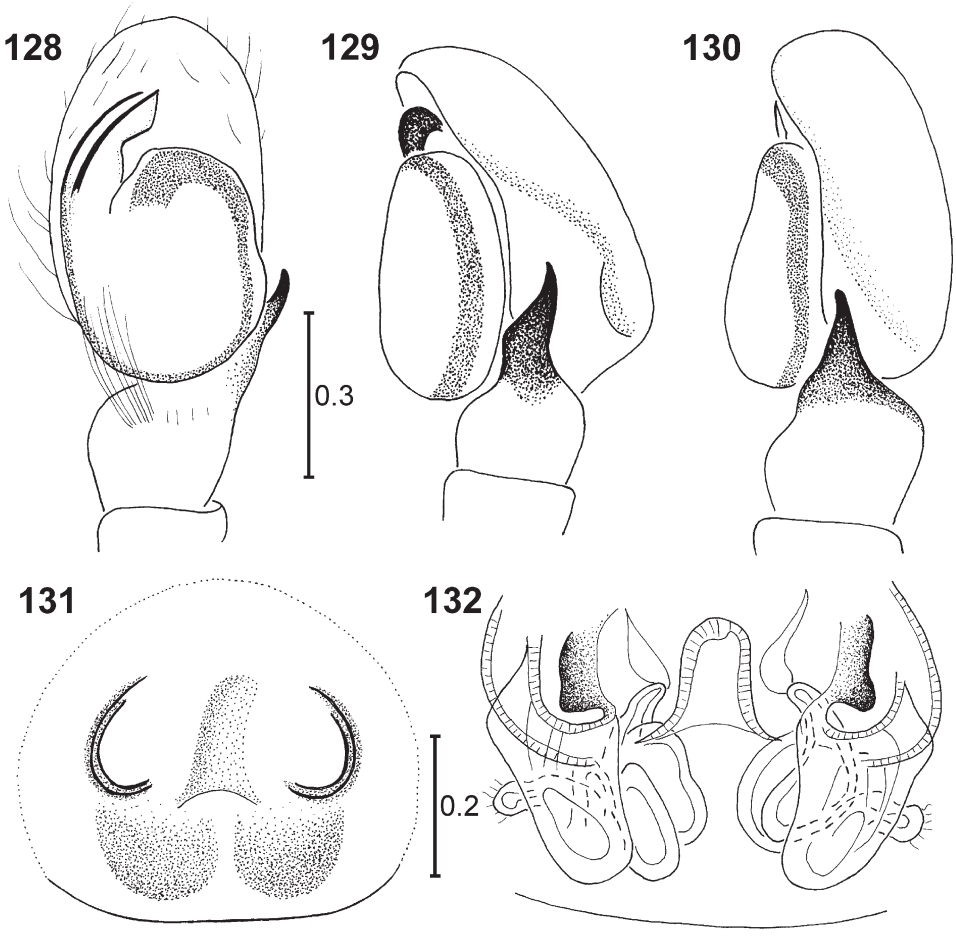
Pellenes (*Pelmutus*) *modicus* Wesołowska & Russell-Smith, 2000

Figs 110, 111, 128–132

Pellenes modicus: Wesołowska & Russell-Smith 2000: 81, figs 215, 216.

Redescription:

Measurements (♂/♀). Carapace: length 2.6–3.1/2.7, width 1.9–2.6/2.0, height 1.1–1.2/1.0. Abdomen: length 2.4–3.4/3.3, width 1.8–2.3/2.2. Eye field: length 1.3–1.6/1.3, anterior width 1.6–2.0/1.6, posterior width 1.7–2.1/1.9.



Figs 128–132. *Pellenes modicus*, male (128–130) and female (131, 132): (128) palpal organ, ventral view; (129) palpal organ, ventrolateral view; (130) palpal organ, lateral view; (131) epigyne; (132) internal structure of epigyne.

Male.

General appearance as in Fig. 110. Medium sized spider. Carapace oval, moderately high; brown, darker in vicinity of eyes, with black line along margins. Dense white hairs covering carapace, with long brown bristles near eyes; anterior eyes surrounded by fawn scales. Clypeus high, clothed in white hairs. Chelicerae long, dark brown, with three white lines on their dorsal surface. Labium dark brown, endites with paler mesial margins; sternum brown, with darker edges. Abdomen oval; dorsum brownish grey, with lighter longitudinal median streak composed of chevron patches. Abdomen covered with dense hairs. Sides of abdomen covered with small diagonal dark patches; venter dark. Spinnerets grey. Legs light brown with darker rings and patches. First pair of legs clearly longer and thicker than others; dark brown, bearing long brown and white hairs, especially dense ventrally on tibiae. Prolateral surface of femur I black. On first tibia 1-1-1-1 spines prolaterally; two pairs on metatarsus ventrally. All legs with sparse

white scales. Pedipalps light brown, only tegulum and base of femur darker. Tibial apophysis strongly sclerotized, long, adpressed in groove along posterolateral margin of the cymbium (Figs 128–130); depth of the groove variable. Bulb oval, embolus needle-shaped, with accompanying large truncate terminal apophysis (Fig. 128). Prolateral side of palpal tibia with row of long bristles (Fig. 128).

Female.

General appearance as in Fig. 111. Shape of body similar to male, anterior legs less robust than in male. Carapace almost black, clothed in light hairs, near eyes brown setae. Labium and endites brown with light tips, sternum brown. Abdomen very dark with median belt composed of yellowish chevrons. Dense colourless hairs cover abdomen. Abdominal sides mottled, venter yellowish with three darker stripes. Spinnerets dark. Legs greyish brown, only median part of femora II–IV light yellow and lateral sides of femora I black. Epigyne typical for the genus, with large central pocket (Fig. 131). Internal structure of epigyne characteristic, gonopores placed in narrow fissures, their vicinity strongly sclerotized, receptacles three-chambered, accessory glands clearly visible (Fig. 132).

Material examined: SOUTH AFRICA: *Free State*: 1♂ Bloemfontein, National Botanical Gardens, 29°02.892'S: 26°12.662'E, pitfalls, *Rhus lancea* woodland, 9.xii.2009–4.i.2010, C. Haddad (MRAC, 230241); 1♂ Erfenis Dam Nat. Res., unburnt site 3, 28°29.741'S:26°48.065'E, pitfall traps, 22.xi–23.xii.2005, C. Haddad (NMBA, 14111); 2♂ same locality, site 4, gravel plain, 28°29.611'S:26°47.995'E, pitfall traps, 28.x–4.xii.2009, R. Fourie & A. Grobler (NMSA, 22699); 1♂ same locality, site 5, overgrazed grassland, 28°29.605'S:26°47.974'E, pitfall traps, 28.x–4.xii.2009, R. Fourie & A. Grobler (NMSA, 22700); 1♀ Fauresmith district, Kalkfontein Dam, 29°31'S:25°16'E, sweeping grass, 8.iv.2008, L. Lotz (NMBA, 12054); 4 imm. 1♀ same data (NMBA, 12055); 1♂ Sandveld Nat. Res., 27°44.219'S:25°45.983'E, pitfalls, grassland and shrubs, 30.x–6.xii.2009, R. Fourie & A. Grobler (NMSA, 22684); 2 imm. 1♀ same locality, 27°41'S:25°41'E, by hand, active search, 18–20.iii.2008, L. Lotz (NMBA, 11905); 1♂ same locality, 27°44.219'S:25°45.893'E, pitfall traps, grassland and shrubs, 2–30.x.2009, R. Fourie & A. Grobler (NCA, 2009/3571); 2 imm. 1♀ Tussen-die-Riviere Nat. Res., 30°28'S:26°07'E, sweeps, grass, 14.x.2008, L. Lotz & C. Haddad (NMBA, 12681).

Distribution: Hitherto known only from Tanzania, recorded from South Africa for the first time, where it is widespread in the Free State Province (Fig. 133).

Habitat and biology: This species was the least common *Pellenes* species collected by pitfall traps in central South Africa.

Remarks: The female is described for the first time. The association of the female with the male is uncertain and the two sexes presented here have yet to be collected together, but their similarly large size and markings suggests they are conspecific.

Pellenes (*Pelmutus*) *tharinae* Wesołowska, 2006

Figs 112, 113

Pellenes tharinae: Wesołowska 2006: 248, figs 93–101; Wesołowska & Haddad 2009: 69.
Pellenes pulcher: Wesołowska 1999*b*: 165, figs 57–59 (*nec* Logunov 1995).

Wesołowska (2006) described both sexes; general appearance of both sexes in Figs 112, 113.

Material examined: SOUTH AFRICA: *Free State*: 1♀ Bloemfontein, National Botanical Gardens, 29°08'S: 26°10'E, pitfall traps, on top of koppie next to stone wall, SW side, xii.2006, L. Lotz (NMBA, 10964); 1♀ same data but xii.2006–i.2007 (NMBA, 10856); 1♂ same locality, 29°02.892'S:26°12.662'E, pitfalls, *Rhus lancea* woodland, 8–27.x.2009, C. Haddad (NCA, 2009/3505); 27♂ 3♀ same data but 9.xii–4.i.2010 (MRAC, 230242); 1♂ same locality, 29°03.006'S:26°12.701'E, pitfalls, grassland, 16–21.xi.2009, C. Haddad (NMSA, 22621); 1♀ Brandfort district, Florisbad, 28°46'S:26°05'E, preservative traps, 23.xi–8.xii.1987, L. Lotz (NMBA, 3242); 1♀ same data but 6–31.x.1988 (NMBA, 4802); 1♂ Erfenis Dam Nat. Res., burnt

site 1, 28°30.373'S:26°48.437'E, pitfall traps, 22.xi–23.xii.2005, C. Haddad (NMSA, 22651); 1♂ same locality, burnt site 2, 28°30.134'S:26°48.427'E, pitfall traps, 23.xii.2005–23.i.2006, C. Haddad, S. Otto & R. Poller (NMSA, 22652); 6♂ same data but 24.ii–27.iii.2006, S. Otto & R. Poller (NMSA, 22653); 2♂ same data but 27.iii–28.iv.2006, C. Haddad & R. Lyle (NMSA, 22654); 1♂ same locality, burnt site 3, 28°29.990'S:26°48.486'E, pitfall traps, 21.ix–22.x.2005, C. Haddad, S. Otto & R. Poller (NMSA, 22655); 1♂ same locality, unburnt site 1, 28°29.888'S:26°48.488'E, pitfall traps, 22.xi–23.xii.2005, C. Haddad (NMSA, 22656); 3♂ same data but 27.iii–28.iv.2006, C. Haddad & R. Lyle (NMSA, 22657); 2♂ same locality, unburnt site 2, 28°29.706'S:26°48.281'E, pitfall traps, 27.iii–28.iv.2006, C. Haddad & R. Lyle (NMSA, 22658); 3♂ same locality, unburnt site 3, 28°29.741'S:26°48.065'E, pitfall traps, 22.xi–23.xii.2005, C. Haddad (NMBA, 14114); 1♂ 1♀ same data but 23.xii.2005–23.i.2006, C. Haddad, S. Otto & R. Poller (NMBA, 14115); 1♂ same data but 23.i–24.ii.2006, C. Haddad & R. Lyle (NMSA, 22659); 2♂ same data but 24.ii–27.iii.2006, S. Otto & R. Poller (NMSA, 22660); 1♂ same locality, site 2, eastern fence, 28°30.011'S:26°48.479'E, pitfall traps, grassland, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3583); 1♂ same locality, site 3, *Acacia karroo* trees, 28°30.272'S:26°47.527'E, pitfall traps, woodland, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3587); 2♂ same locality, site 4, gravel plain, 28°29.611'S:26°47.995'E, pitfall traps, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3592); 2♂ same locality, site 7, rocky hillside, 28°29.629'S:26°48.323'E, pitfall traps, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3602); 1♂ Kroonstad district, Doornkloof farm, 27°43.393'S:27°42.066'E, pitfall traps, base of hill, 1–29.x.2009, R. Fourie & A. Grobler (NCA, 2009/3531); 1♂ same locality, 27°43.376'S:27°42.042'E, pitfall traps, grassland, 29.x–5.xii.2009, R. Fourie & A. Grobler (MRAC, 230316); 1♂ Sandveld Nat. Res., 27°40'S:25°43'E, pitfalls, grassland, 10–13.iii.2008, L. Lotz (NMBA, 11638), 1♂ (NMBA, 11823); 1♂ same locality, 27°44.219'S: 25°45.893'E, pitfall traps, grassland and shrubs, 2.ix–2.x.2009, R. Fourie & A. Grobler (NCA, 2009/3609); 11♂ same data but 2–30.x.2009 (NCA, 2009/3573); 1♂ same locality, 27°44.043'S:25°45.805'E, pitfall traps, grassland, 2.ix–2.x.2009, R. Fourie & A. Grobler (NCA, 2009/3615); 16♂ 2♀ same data but 2–30.x.2009 (NCA, 2009/3565); 16♂ 2♀ same data but 30.x–4.xii.2009 (MRAC, 230318); 1♀ same locality, 27°41'S:25°41'E, in chimney of *Odontotermes* termite mound, 25.x.2003, C. Haddad (NHMWU); 1♂ Willem Pretorius Nat. Res., 28°16.696'S:27°12.083'E, pitfall traps, grassland, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3516); 1♂ same locality, 28°16.660'S:27°12.207'E, pitfall traps, near water level, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3529).

Distribution: Species known from Namibia, Zimbabwe and South Africa (KwaZulu-Natal), recorded for the first time from the Free State Province (Fig. 133).

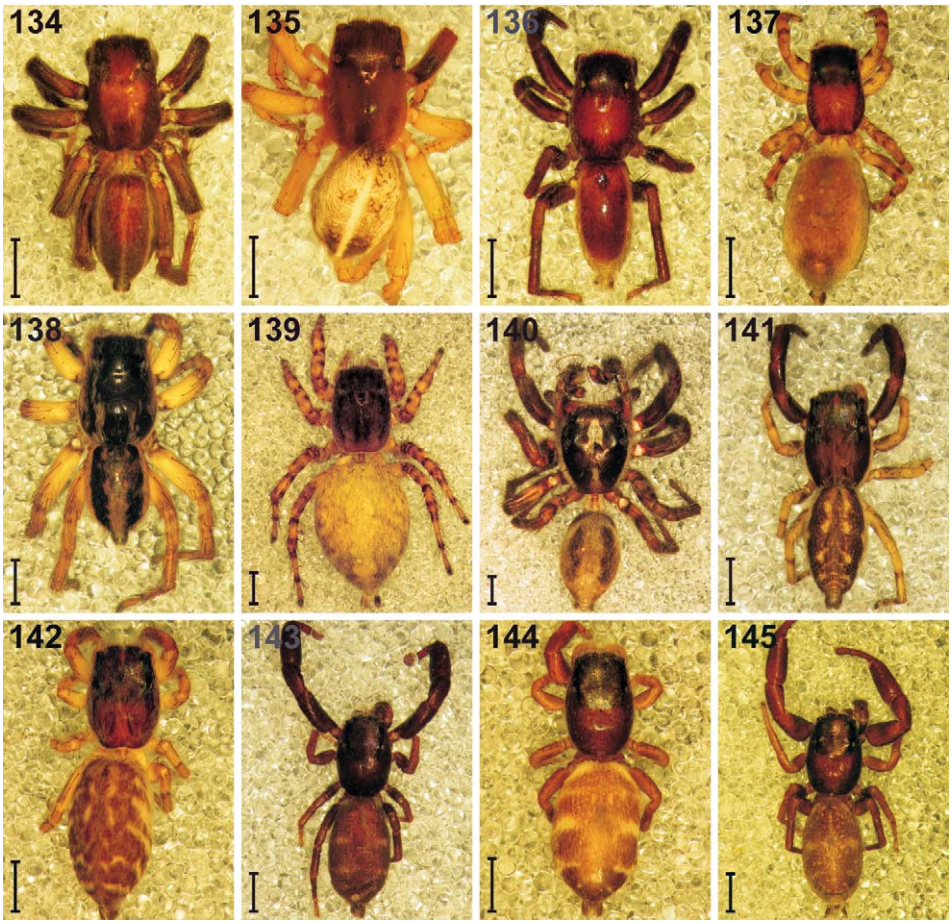
Fig. 133. Distribution of *Pellenes modicus* (circles) and *P. tharinae* (squares) in South Africa. Solid icon indicates a published record and open icons new records from central South Africa.

Habitat and biology: A widespread species in central South Africa. Often collected in pitfall trapping surveys but usually less abundant than *P. bulawayoensis*.

Genus *Phlegra* Simon, 1976

Type species: *Attus fasciatus* Hahn, 1826.

The genus includes nearly 80 species distributed in the Old World (except a single Nearctic species), almost half of which occur in the Afrotropics (Prószyński 2009; Platnick 2010). They are small or medium sized ground living spiders, the majority of whom have dark colouration with a characteristic striped pattern (two longitudinal white streaks on carapace and three streaks on abdomen); some males have the abdomen covered with a delicate dorsal scutum. The species are easily recognizable: as a rule the



Figs 134–145. Digital microscope photographs of the dorsal habitus of South African jumping spiders: (134, 135) *Phlegra bresnieri*, male (134) and female (135); (136, 137) *P. etosha*, male (136) and female (137); (138, 139) *P. karoo*, male (138) and female (139); (140) *Pignus simoni*, male; (141, 142) *Pseudicius dependens* sp. n., male (141) and female (142); (143, 144) *P. gracilis* sp. n., male (143) and female (144); (145) *P. karinae*, male. Scale bars = 1 mm.

males have two tibial apophyses and a compound embolus, which is partially hidden in the cymbial pocket behind the distal haematodocha; the females usually have a strongly sclerotized epigyne with the gonopores situated in large depressions, the seminal ducts forming many loops, and small rounded receptacles.

Phlegra bresnieri (Lucas, 1846)

Figs 134, 135

Salticus bresnieri: Lucas 1846: 154, pl. 7, fig. 8.
Phlegra bresnieri: Simon 1876: 124, pl. 11, fig. 11; Cantarella 1982: 248, fig. 23; Logunov 1996: 562, figs 4, 5, 74–79; Metzner 1999: 67, fig. 32; Prószyński 2003: 125; Logunov & Azarkina 2006: 728, figs 1–7; Wesołowska & van Harten 2007: 242, figs 149–156; Wesołowska & Tomasiewicz 2008: 40.

Wesołowska and van Harten (2007) described both sexes; general appearance of both sexes in Figs 134, 135.

Material examined: SOUTH AFRICA: *Free State*: 2♂ Erfenis Dam Nat. Res., burnt site 1, 28°30.373'S: 26°48.437'E, pitfall traps, 24.ii–27.iii.2006, S. Otto & R. Poller (NMSA, 22636); 1♀ same data but 27.iii–28.iv.2006, C. Haddad & R. Lyle (NMBA, 14116); 1♀ same locality, burnt site 2, 28°30.134'S:26°48.427'E, pitfall traps, 22.xi–23.xii.2005, C. Haddad (NMSA, 22635); 2♂ same locality, unburnt site 1, 28°29.888'S: 26°48.488'E, pitfall traps, 22.x–22.xi.2005, C. Haddad, S. Otto & R. Poller (NMSA, 22637); 1♂ same data but 24.ii–27.iii.2006, S. Otto & R. Poller (NMBA, 14117); 1♂ same locality, site 1, near trench, 28°28.892'S: 26°48.508'E, pitfall traps, grassland, 31.viii–1.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3637); 1♂ same locality, site 2, eastern fence, 28°30.011'S:26°48.479'E, pitfall traps, grassland, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3584); 2♂ same locality, site 8, *Themeda* grassland, 28°29.804'S:26°48.503'E, pitfall traps, 31.viii–1.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3654); 1♂ Willem Pretorius Nat. Res., 28°16.696'S:27°12.083'E, pitfall traps, grassland, 31.viii–1.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3634).

Distribution: Species widely distributed in the southern Palaearctic. In the Afrotropical Region known from Yemen, Tanzania and Ivory Coast, here for the first time recorded from South Africa (Fig. 160).

Habitat and biology: A generally rare ground-dwelling jumping spider collected mainly by pitfall trapping.

Remark: *Ph. albostriata* Simon, 1901, reported from South Africa and Mozambique, is possibly conspecific.

Phlegra etosha Logunov & Azarkina, 2006

Figs 136, 137, 146–150

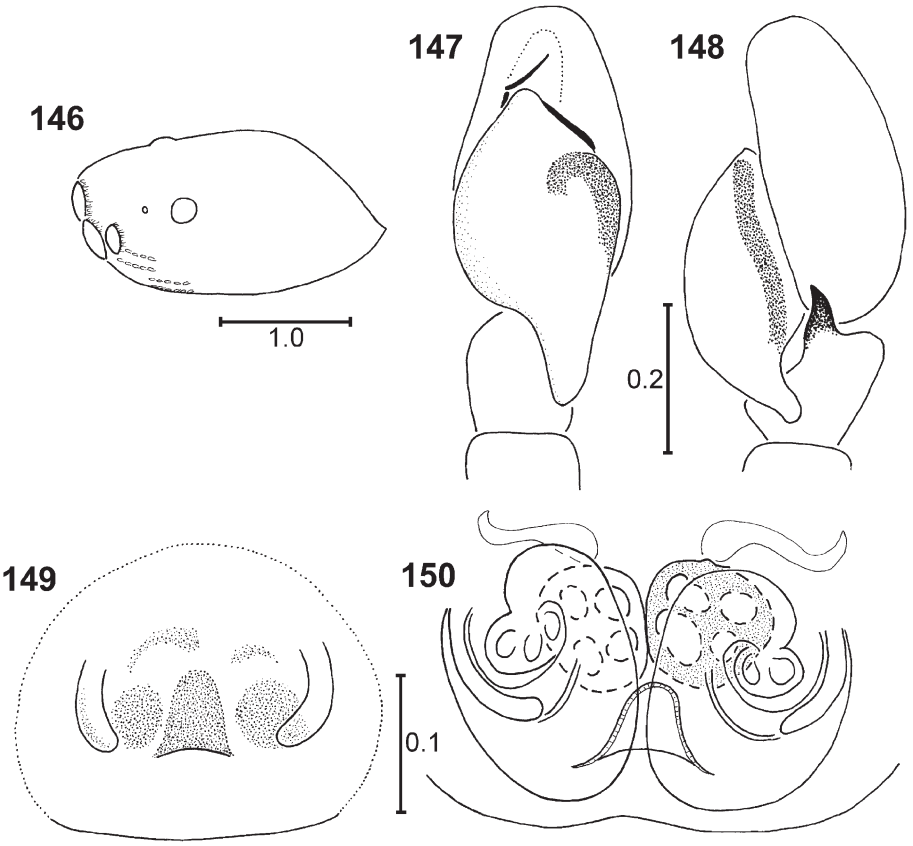
Phlegra etosha: Logunov & Azarkina 2006: 730, figs 8–15.

Redescription:

Measurements (♂/♀): Carapace: length 3.0/2.9, width 2.0/1.9, height 1.0/0.8. Abdomen: length 3.2/4.5, width 1.6/3.0. Eye field: length 1.1/1, anterior and posterior width 1.5/1.4.

Male.

General appearance as in Fig. 136. Small, slender, dark coloured spider. Carapace dark brown, darkening to margins. Eye field black, clothed in reddish hairs, anterior eyes surrounded with small scales that are reddish from above and white from below. White scales forming four lines on sides of carapace, below anterior lateral eyes (Fig. 146). Chelicerae and sternum dark, labium and endites with pale margins. Abdomen narrow, dark brown, with metallic shine, dorsum covered with delicate scutum (Fig. 136). Venter



Figs 146–150. *Phlegra etosha*, male (146–148) and female (149, 150): (146) caparace, dorsolateral view; (147) palpal organ, ventral view; (148) palpal organ, lateral view; (149) epigyne; (150) internal structure of epigyne.

dark, spinnerets yellowish grey, with dark tips. Legs dark brown, first pair blackish. Leg hairs brown, spines long and dark. Single tibial apophysis (Fig. 148), embolus coiled on tegulum tip (Fig. 147).

Female.

General appearance as in Fig. 137. Similar to male, carapace dark brown with black eye field, with some long brown bristles on ocular area, denser at anterior eyes (coloured scales absent). Mouthparts and sternum light brown. Abdomen larger than in male, without scutum, greyish beige, covered with colourless hairs, among them some brown bristles. Venter yellowish. Legs light brown with darker rings and spots. Palp with black spots on tibia and base of tarsus. Epigyne with large central pockets and gonopores situated laterally (Fig. 149). Seminal ducts wide, weakly sclerotized; receptacles compound, multi-chambered (Fig. 150). Internal structure of epigyne characteristic, unlike other *Phlegra*.

Material examined: SOUTH AFRICA: *Free State*: 1♂ Tussen-die-Riviere Nat. Res., 30°29'S:26°07'E, active search, rocky hill, 14.x.2008, L. Lotz & C. Haddad (NMBA, 12688); 1♂ same locality, 30°29'S:26°07'E,

pitfalls, rocky hill, 14–17.x.2008, L. Lotz & C. Haddad (NMBA, 12538); 1♂ same locality, Camp, 30°30'S: 26°08'E, active searching, 15.x.2008, L. Lotz & C. Haddad (NMBA, 12822); 1♂ same locality, rocky hill, 30°29'S:26°07'E, 14.x.2008, L. Lotz & C. Haddad (NMBA, 12686); 1♀ same data (NMBA, 12690).

Distribution: Hitherto known only from Namibia, recorded from South Africa for the first time (Fig. 160).

Habitat and biology: This ground-dwelling species was considerably less common than congeners from central South Africa.

Remark: The female of the species is described here for the first time.

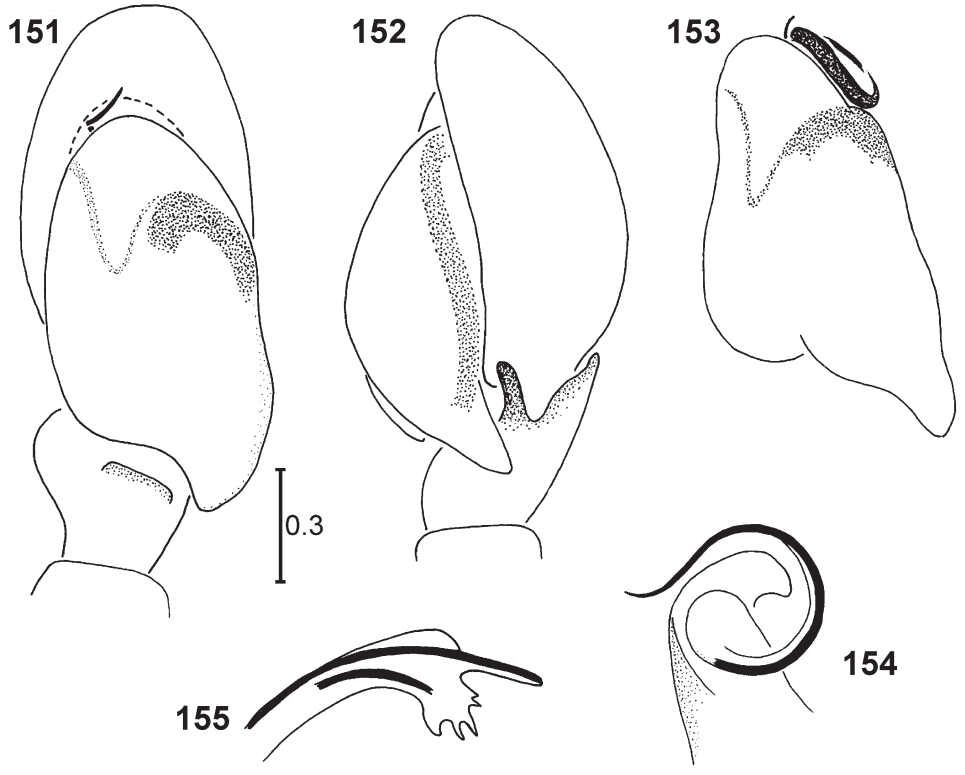
Phlegra karoo Wesołowska, 2006

Figs 138, 139, 151–159

Phlegra karoo: Wesołowska 2006: 250, figs 102–108.

Redescription:

Measurements (♂/♀): Carapace: length 2.4–2.6/2.8–3.1, width 1.8–1.9/2.1–2.2, height 1.0–1.1/1.1–1.2. Abdomen: length 2.4–2.5/2.8–5.4, width 1.5–1.6/2.3–3.5. Eye field: length 0.8–0.9/0.9–1.0, anterior width 1.2–1.4/1.4–1.5, posterior width 1.3–1.5/1.5–1.7.



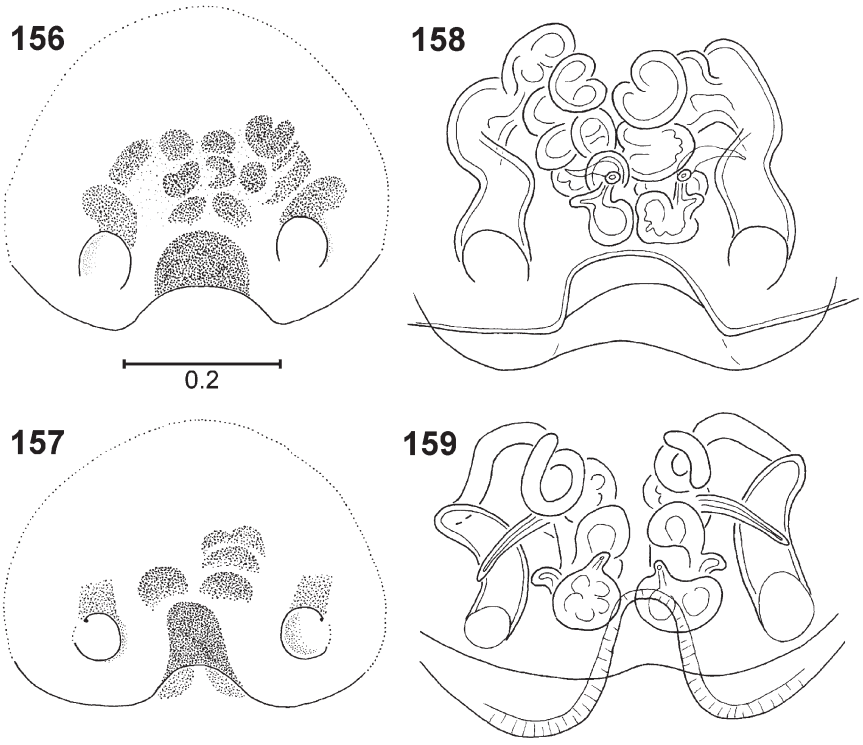
Figs 151–155. *Phlegra karoo*, male: (151) palpal organ, ventral view; (152) palpal organ, lateral view; (153) bulb, ventrolateral view; (154) embolus, apical view; (155) tip of embolus.

Male.

General appearance as in Fig. 138. Carapace medium high, slightly broadened posteriorly, with short eye field. Carapace dark, brownish black, clothed in whitish grey hairs, with brown bristles near eyes. In one specimen white hairs forming indistinct streaks on carapace. Sternum, clypeus and labium brown, maxillae with whitish margins. Chelicerae dark yellow, unidentate. Abdomen ovoid, narrower posteriorly; dark brown, with traces of lighter median streak; dorsum with large scutum. Greyish and brown hairs cover abdomen. Sides of abdomen pale, venter greyish. Spinnerets dark. Legs light brown; spines numerous, leg hairs brown. Pedipalps light brown. Palpal femur with two dark spots on ventral surface, one medially and second apically. Tibia with ventral transverse ridge and two retrolateral apophyses (Figs 151, 152). Embolus coiled on bulb tip (Figs 153, 154). Apical part of embolus in Fig. 155.

Female.

General appearance as in Fig. 139. Larger than male, similarly coloured. Chelicerae with two small teeth on promarginal edge and single tooth on retromarginal edge. Abdomen slightly swollen, without scutum, blackish brown, in some specimens with traces of lighter median streak, densely covered with different coloured long hairs (grey, fawn and brown). Legs brown with numerous dark patches. Epigyne with deep pocket at epigastric furrow and two rounded openings (Figs 156, 157). Initial part of seminal



Figs 156–159. *Phlegra karoo*, female: (156, 157) epigynes; (158, 159) internal structure of epigynes, dorsal view.

ducts tube-shaped, very weakly sclerotized, distal parts forming many loops, accessory glands long, receptacles small (Figs 158, 159).

Material examined: SOUTH AFRICA: *Free State*: Benfontein Nat. Res., 28°50.003'S:24°48.756'E, 14.x.2005–4.i.2006, pitfalls, dry thorny savannah, R. Lyle (NCA, 2010/204); 1♀ Bloemfontein, National Botanical Gardens, 29°08'S:26°10'E, pitfall traps, iii.2006, R. Poller & S. Otto (NMBA, 11125); 3♂ same locality, 29°02.892'S:26°12.662'E, pitfalls, *Rhus lancea* woodland, 24.ix–8.x.2009, C. Haddad (NCA, 2009/3487); 4♂ same data but 8–27.x.2009 (NCA, 2009/3506); 1♂ same data but 27.x–16.xi.2009 (NMSA, 22598); 2♂ same data but 16–21.xi.2009 (NMSA, 22606); 6♂ 2♀ same data but 9.xii.2009–4.i.2010 (MRAC, 230314); 1♀ same locality, 29°03.006'S:26°12.701'E, pitfall traps, grassland, 16–21.xi.2009, C. Haddad (NMSA, 22622); 3♂ 2♀ same data but 21.xi–9.xii.2009 (MRAC, 230240); 1♀ Bloemfontein district, Hopefield farm, 28°54'S:26°14'E, 28.ix.2000, C. Haddad (NHMWU); 1♂ Bloemfontein district, Krugersdrift Dam, 28°42'S:25°55'E, in canal, 22.viii.1985, Museum staff (NMBA, 857); 1♀ same data but 2.xii.1985 (NMBA, 1135); 1♂ Brandfort district, Amanzi Private Game Reserve, 28°36.080'S:26°25.950'E, under rocks, 3.iv.2010, C. Haddad (MRAC, 230323); 1♂ Brandfort district, Florisbad, 28°46'S:26°06'E, preservation traps, 23.xi–8.xii.1987, L. Lotz (NMBA, 3258); 1♂ same data but 23.xi–8.xii.1987 (NMBA, 3291); 1♂ same data but 8–21.xii.1987 (NMBA, 3410); 1♀ same data but 31.x–18.xi.1988 (NMBA, 4918); 1♂ same locality, preservation traps, xi.1983, Museum staff (NMBA, 423); 1♀ same data but xi.1985 (NMBA, 1129); 2♂ Erfenis Dam Nat. Res., unburnt site 1, 28°29.888'S:26°48.488'E, pitfall traps, 22.x–22.xi.2005, C. Haddad, S. Otto & R. Poller (MRAC, 230329); 1♀ same locality, site 1, near trench, 28°28.892'S:26°48.508'E, pitfall traps, grassland, 31.viii–30.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3638); 2♂ 1♀ same data but 30.ix–28.x.2009 (NCA, 2009/3575); 4♂ same locality, site 2, eastern fence, 28°30.011'S:26°48.479'E, pitfall traps, grassland, 31.viii–30.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3640); 2♂ same data but 30.ix–28.x.2009 (NCA, 2009/3586); 3♂ 1♀ same locality, site 3, *Acacia karroo* trees, 28°30.272'S:26°47.527'E, pitfall traps, woodland, 31.viii–30.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3642); 9♂ 6♀ same locality, site 6, northern shore of dam, 28°29.738'S:26°48.272'E, pitfall traps, near water level, 31.viii–30.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3649); 4♂ same data but 30.ix–28.x.2009 (NCA, 2009/3597); 1♂ same locality, site 8, *Themeda* grassland, 28°29.804'S:26°48.503'E, pitfall traps, 31.viii–30.ix.2009, R. Fourie & A. Grobler (NCA, 2009/3653); 4♂ same data but 30.ix–28.x.2009 (NCA, 2009/3607); 1♂

Fig. 160. Distribution of *Phlegra bresnieri* (circles), *P. etosha* (square) and *P. karoo* (diamonds) in South Africa.

Fauresmith district, Kalkfontein Dam, 29°31'S:25°16'E, pitfall traps, grassland, 7–10.iv.2008, L. Lotz (NMBA, 11984); 1♂ 2♀ Kroonstad district, Doornkloof farm, 27°43.393'S:27°42.066'E, pitfall traps, base of hill, 1.ix–1.x.2009, R. Fourie & A. Grobler (NCA, 2009/3630); 8♂ same data but 29.x–5.xii.2009 (MRAC, 230317); 1♂ 1♀ same locality, 27°43.376'S:27°42.042'E, pitfall traps, grassland, 1.ix–1.x.2009, R. Fourie & A. Grobler (NCA, 2009/3632); 3♂ 1♀ same data but 1–29.x.2009 (NCA, 2009/3533); 2♂ 1♀ same data but 29.x–5.xii.2009 (MRAC, 230315); 6♂ 3♀ Oranjeville, Vaal Dam, 26°59.514'S:28°15.772'E, pitfall traps, overgrazed grassland, 1.ix–1.x.2009, R. Fourie & A. Grobler (NCA, 2009/3626); 4♂ 1♀ same data but 1–29.x.2009 (NCA, 2009/3535); 15♂ 8♀ same locality, 26°59.523'S:28°15.737'E, pitfall traps, grassland, 1.ix–1.x.2009, R. Fourie & A. Grobler (NCA, 2009/3622); 5♂ 1♀ same data but 1–29.x.2009 (NCA, 2009/3542); 5♂ 1♀ Sandveld Nat. Res., 27°40'S:25°43'E, pitfall traps, grassland, 10–13.iii.2008, L. Lotz (NMBA, 11637); 4♂ same locality, 27°44.043'S:25°45.805'E, pitfall traps, grassland, 2–30.x.2009, R. Fourie & A. Grobler (NCA, 2009/3563); 1♂ 1♀ same data but 2.ix–2.x.2009 (NCA, 2009/3616); 2♂ 1♀ same locality, 27°44.219'S:25°45.893'E, pitfall traps, grassland and shrubs, 2–30.x.2009, R. Fourie & A. Grobler (NCA, 2009/3570); 4♂ 2♀ same data but 2.ix–2.x.2009 (NCA, 2009/3612); 2♀ Tussen-die-Riviere Nat. Res., Aasvoëlkop, 30°27'S:26°19'E, sweeping, 22.x.2008, L. Lotz (NMBA, 12953); 1♂ same locality, Camp, 30°30'S:26°08'E, pitfalls, river floodplain, 13–17.x.2008, L. Lotz & C. Haddad (NMBA, 12526); 3♂ 1♀ Willem Pretorius Nat. Res., 28°16.660'S:27°12.207'E, pitfall traps, near water level, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3525). *North West*: 1♂ Potchefstroom district, Thabela Thabeng Mountain Retreat, 26°51.825'S:27°17.819'E, pitfall traps, woodland grassland, 1.ix–1.x.2009, R. Fourie & A. Grobler (NCA, 2009/3620); 1♂ same data but 1–29.x.2009 (NCA, 2009/3547); 1♂ same locality, 26°51.828'S:27°17.805'E, pitfalls, Vaal River bank, 1–29.x.2009, R. Fourie & A. Grobler (NCA, 2009/3557). *Northern Cape*: 20♂ 3♀ Prieska district, Green Valley Nuts, 29°33.993'S:22°55.005'E, pitfall traps, pistachio orchard no. 1, 26.vii–19.ix.2001, C. Haddad (NCA, 2010/212); 2♂ 2♀ same locality, 29°34.904'S: 22°55.027'E, pitfall traps, pistachio orchard no. 19, 25.x–20.xi.2001, C. Haddad (NHMWU).

Distribution: Hitherto known from Namibia only, recorded for the first time from South Africa, where it is widespread in the drier parts of the Free State, Northern Cape and North West provinces (Fig. 160).

Habitat and biology: One of the most abundant and widespread ground-dwelling jumping spiders in central South Africa.

Remark: The female of the species is described here for the first time.

Genus *Pignus* Wesołowska, 1999

Type species: *Euophrys simoni* Peckham & Peckham, 1903.

This genus, related to the Palaearctic genus *Philaeus* Thorell, 1869, contains three species, all known only from males. The type species, *P. simoni* (Peckham & Peckham, 1903), is reported from South Africa and Zimbabwe; *P. lautissimum* Wesołowska & Russell-Smith, 2000 is known from Tanzania; and *P. pongola* Wesołowska & Haddad, 2009 was recently described from the KwaZulu-Natal Province, South Africa. The males of this genus are very similar in size, body shape and colouration, and have characteristically large diverging chelicerae with a long tooth on the retromarginal edge, near the base of fang.

Pignus simoni (Peckham & Peckham, 1903)

Figs 140, 161–165

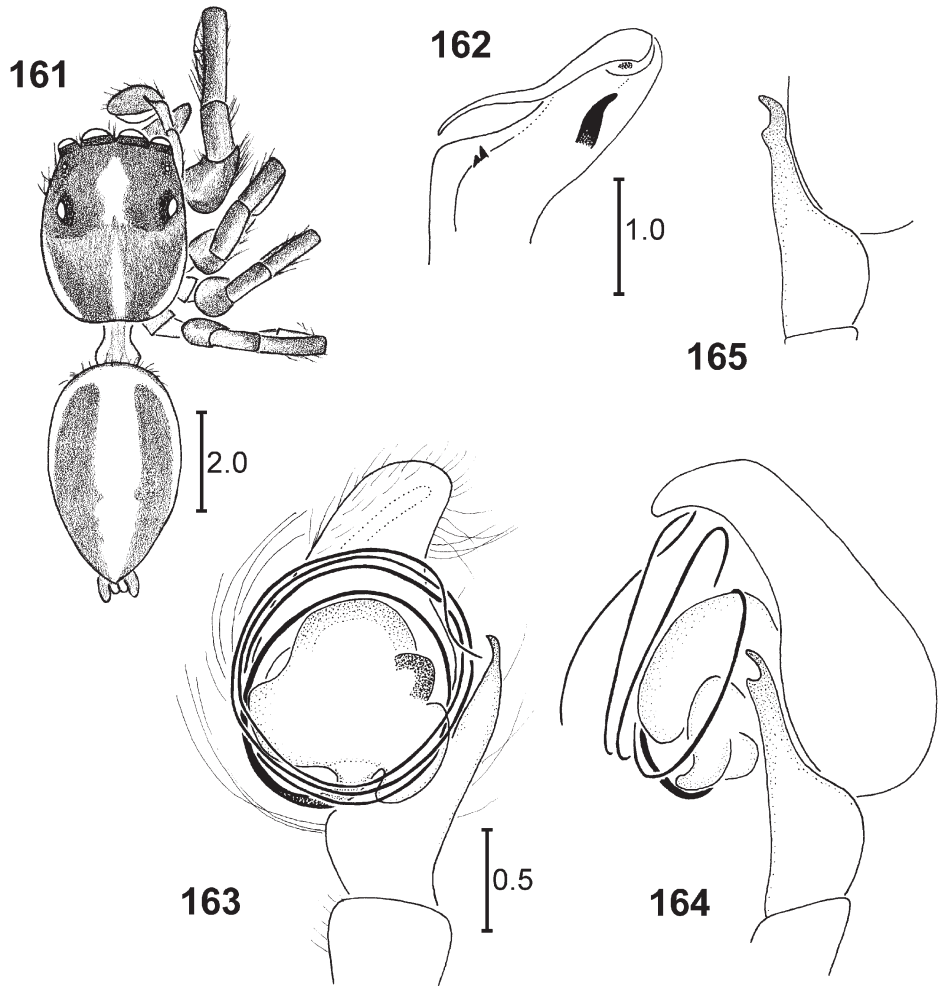
Euophrys simoni: Peckham & Peckham 1903: 202, pl. 22, figs 4, 4a, 4b.
Pignus simoni: Wesołowska 1999*b*: 166, figs 60–66; Wesołowska & Cumming 2011: 99, figs 61–69, 98.

Redescription:

Male.

Measurements: Carapace: length 3.3, width 2.5, height 1.3. Abdomen: length 3.7, width 2.5. Eye field: length 1.3, anterior width 1.9, posterior width 2.2.

General appearance as in Figs 140, 161. Medium sized spider. Carapace flat, oval; dark brown, with blackish eye field. Carapace clothed in dense dark hairs, with long brown bristles near eyes. White hairs forming light median streak on eye field, reaching the end of thoracic part; two white stripes running along lateral edges of carapace. Clypeus low, with mat of white hairs. Mouthparts and sternum brown; chelicerae large, with long fangs; two small teeth on promargin and additional large hooked tooth at base of fang (Fig. 162). Abdomen ovoid; greyish brown, with broad longitudinal median white stripe, also with whitish streak along anterior margin reaching to the sides. Brown and white hairs covering abdomen, hairs longer and denser at anterior edge. Venter dark. Spinnerets pale brown. Legs brown, distal parts of their segments darker. Leg hairs long, dense. First pair of legs longer and thicker than rest, with long dense black hairs on ventral surface of patellae, tibiae and metatarsi. Pedipalps brown, clothed in long



Figs 161–165. *Pignus simoni*, male: (161) habitus; (162) cheliceral dentition; (163) palpal organ, ventral view; (164) palpal organ, lateral view; (165) tibial apophysis, dorsolateral view.

dense brown hairs, mixed with white hairs on the tibia and base of cymbium. Tibial apophysis long, with notch at tip (Figs 163–165). Cymbium narrow; bulb rounded, with additional semicircular lobe at base of embolus; embolus thin, very long, encircling bulb four times (Fig. 163).

Material examined: SOUTH AFRICA: *Free State*: 1♂ Bloemfontein district, Glen, 28°58'S:26°20'E, caught by hand, 14.ix.1987, Entomology staff (NMBA, 1913); 4♂ Brandfort district, Florisbad, 28°46'S:26°05'E, preservative traps, x.1982, Museum Staff (NMBA, 261); 3♂ same data but x.1982 (NMBA, 729); 7♂ same data but xi.1982 (NMBA, 8826); 1♂ same data but ix.1983 (NMBA, 445); 1♂ same data but viii.1985 (NMBA, 874); 1♂ Clocolan district, Mpetsane Conservation Estate, 28°48.561'S:27°39.255'E, in garden and around house, 2010, A. Jones (NCA, 2010/327); 1♂ Erfenis Dam Nat. Res., burnt site 2, 28°30.134'S:26°48.427'E, pitfall traps, 22.x–22.xi.2005, C. Haddad, S. Otto & R. Poller (NMBA, 14118); 1♂ same locality, burnt site 3, 28°29.990'S:26°48.486'E, pitfall traps, 21.ix–22.x.2005, C. Haddad, S. Otto & R. Poller (NCA, 2010/216).

Distribution: Described from the Western Cape Province, South Africa, also recorded from Zimbabwe. Recorded from the Free State Province for the first time (Fig. 171). Apparently widespread in southern Africa.

Habitat and biology: A rare ground-dwelling species usually collected by pitfall trapping.

Remark: The first description of the female of this species is given in Wesołowska and Cumming (2011).

Genus *Pseudicius* Simon, 1885

Type species: *Aranea encarpata* Walckenaer, 1802.

This large genus contains over 80 species widely distributed on all continents of the Eastern hemisphere, with 25 species described from the Afrotropical Region. Its members are characterised by the slender flattened body and the first pair of legs with swollen tibiae, which are clearly stouter than the others. The presence of a stridulatory apparatus of the leg-carapace type in both sexes is also a distinctive feature of *Pseudicius*. The male palp has a large tibial apophysis in the majority of species.

Pseudicius dependens sp. n.

Figs 141, 142, 166–170

Etymology: From Latin *dependens* (hanging down), referring to the pendant shape of the male palpal cymbium.

Diagnosis: A distinctive species, the male is easily separable from congeners in having a large distal cymbial lobe on the retrolateral side, and a serrate tibial apophysis. The female has an epigyne similar to *P. africanus* Peckham & Peckham, 1903, but the seminal ducts are very thin, with large, spherical accessory glands.

Description:

Measurements (♂/♀): Carapace: length 2.0/1.8–1.9, width 1.4–1.6/1.3–1.5, height 0.6–0.7/0.6. Abdomen: length 2.1–2.3/2.5–2.9, width 1.2–1.4/1.5. Eye field: length 0.9/0.8–0.9, anterior width 1.1–1.3/0.9–1.2, posterior width 1.2–1.4/1.1–1.4.

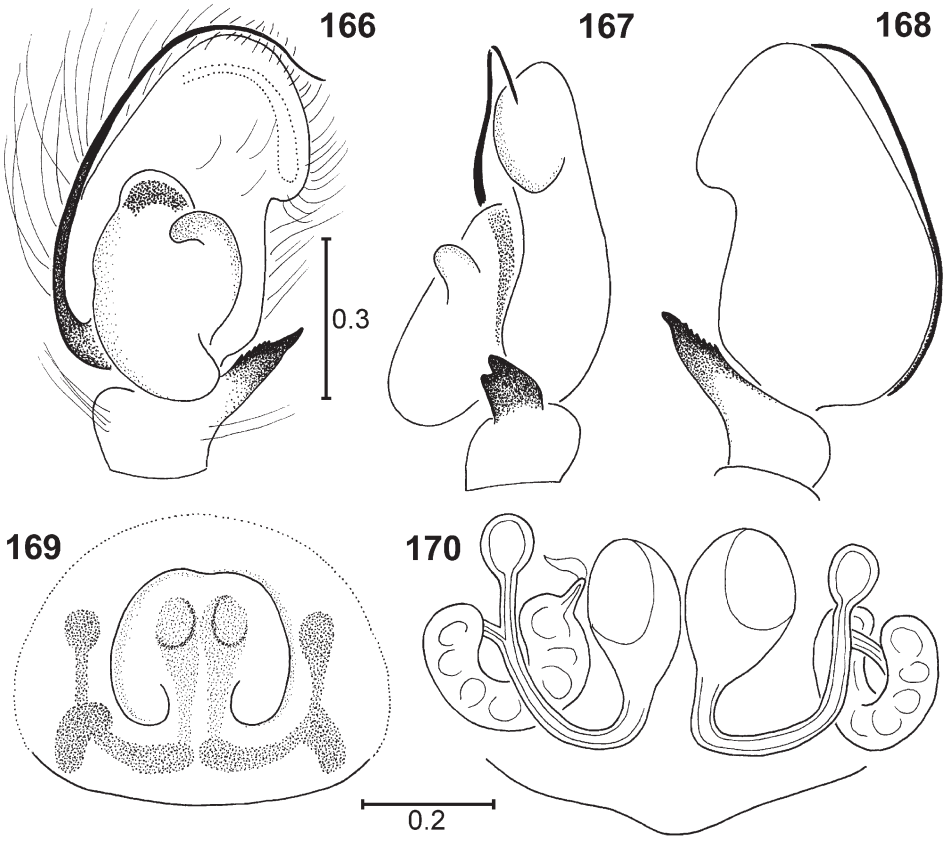
Male.

General appearance as in Fig. 141. Small spider with slender and flattened body. Carapace flat, oval, dark brown, with black eye field, covered with dense greyish hairs, and long brown bristles near eyes. Anterior median eyes encircled by small fawn scales. Stripe composed of white hairs extending along lateral margins of carapace, thin median

white line on thoracic part. Stridulatory apparatus present. Clypeus low, clothed in white hairs. Mouthparts and sternum brown. Abdomen ovoid, dark greyish brown, with pattern composed of five pairs of transverse patches placed marginally and four pairs of smaller rounded spots medially. Venter pale. Spinnerets grey. First pair of legs long and robust, with slightly swollen tibiae, and only single short stout tibial spine. Other legs yellow, only lateral surfaces of their femora tinged with brown. Leg hairs and spines brown. Pedipalp brown, densely clothed in long dark hairs. Palpal tibia short, with single apophysis, its margin serrate (Figs 166–168). Tegulum small, embolus very long, with whip-shaped end. Shape of cymbium unique, its tip curved to retrolateral side, forming a distal lobe (Figs 166–168).

Female.

General appearance as in Fig. 142. Shape of carapace as in male, eye field black, thoracic part brown. Whole carapace densely covered with whitish grey hairs, with brown bristles in vicinity of eyes. Labium and gnathocoxae brown, with lighter tips, sternum brown. Abdomen dark brownish grey, with indistinct lighter pattern composed of three diagonal



Figs 166–170. *Pseudicius dependens* sp. n., paratype male (166–168) and female (169, 170): (166) palpal organ, ventral view; (167) palpal organ, lateral view; (168) palpal organ, dorsal view; (169) epigyne; (170) internal structure of epigyne.

patches submarginally, three irregular patches placed medially and two chevrons in posterior part of abdomen. Venter pale. Legs yellow with brown rings and stains, lateral surfaces of first femora tinged with brown. Epigyne wider than long, with large shallow central depression (Fig. 169), sometimes plugged with waxy secretion. Internal structure as in Fig. 170, copulatory openings large; seminal ducts narrow, weakly sclerotized; accessory glands very large, spherical.

Holotype: ♂ SOUTH AFRICA: *Northern Cape*: Prieska district, Green Valley Nuts, pistachio orchard no. 1, 29°33.993'S:22°55.005'E, canopy fogging, 28.i.2001, C. Haddad (NMBA, 14119).

Paratypes: SOUTH AFRICA: *Free State*: 1♂ Bloemfontein, National Botanical Gardens, 29°02'S:26°12'E, *Olea europaea* leaf litter, 8.i.2010, V. Butler (NCA, 2010/397); 1♀ Bloemfontein, University of the Free State campus, 29°06.623'S:26°11.104'E, on *Celtis africana* bark, 15.ii.2010, C. Haddad (NMSA, 22702); 1♂ Boshof district, Kromrant farm, 28°39'S:25°06'E, 27.xi.1985, Museum staff (NMBA, 1105); 1♀ Hoopstad district, Swartsrus farm, 32°45'S:25°30'E, 18.xi.1985, Museum staff (NMBA, 8821). *Northern Cape*: 1♂ Lime Acres district, Klein Papkuil farm, 28°28.943'S:23°42.994'E, beats, vaalbos, 14.i.2008, R. Lyle, R. Fourie, D. Du Plessis & J. Adendorff (NCA, 2009/4119); 2♀ same data as holotype, 28.i.2001 (NMBA, 14120); 1♀ same data as holotype, 31.i.2002 (NCA, 2010/219); 1♀ same data as holotype, 26.xi.2002 (NMSA, 22669); 1♀ Prieska district, Green Valley Nuts, pistachio orchard no. 19, 29°34.904'S:22°55.027'E, 26.v.2001, canopy fogging, C. Haddad (NMSA, 22670); 1♂ Prieska district, Remhoogte farm, 29°32.016'S:23°00.182'E, canopy fogging, experimental pistachio orchard, 18.xii.2001, C. Haddad (NMSA, 22671); 1♀ same data but 1.xi.2002 (NMSA, 22672).

Additional material examined: SOUTH AFRICA: *Free State*: 1♀ Tussen-die-Riviere Nat. Res., 30°29'S: 26°07'E, beating, rocky hill, 16.x.2008, L. Lotz & C. Haddad (NMBA, 12905).

Distribution: Widespread in central South Africa (Fig. 171).

Habitat and biology: This species is uncommon and was primarily collected from foliage by beating shrubs, and in pistachio orchards specimens were collected by canopy fogging (Haddad *et al.* 2005).

Fig. 171. Distribution of *Pignus simoni* (circles) and *Pseudicius dependens* sp. n. (squares) in South Africa. Solid icon indicates a published record and open icons new records from central South Africa.

Pseudicius gracilis sp. n.

Figs 143, 144, 172–178

Etymology: From Latin *gracilis* (slender), referring to the shape of the spider's body.

Diagnosis: The species is closely related to *P. elegans* Wesołowska & Cumming, 2008 from Zimbabwe. The male is easy to recognize by the presence of two tibial apophyses (single in *P. elegans*). Also similar to *P. karinae* sp. n., but has a clearly longer dorsal tibial apophysis. The female may be distinguished by the position of the epigynal pockets, in front of the copulatory openings (at the lateral edges of the epigyne in *P. elegans*).

Description:

Measurements (♂/♀): Carapace: length 1.9/1.9–2.2, width 1.2/1.2, height 0.4/0.5. Abdomen: length 2.6/2.7–3.0, width 1.4/1.5–1.7. Eye field: length 0.8/0.8–1.0, anterior width 1.0/0.9, posterior width 1.1/1.1.

Male.

General appearance as in Fig. 143. Small, elongate spider with flattened body. Carapace oval, very flat, dark brown, eye field reticulated. Carapace covered in thin colourless hairs, with a few long bristles near anterior row of eyes. Stridulatory apparatus present, composed of row of stiff setae placed anteriorly on lateral surfaces of carapace and a few similar bristles on mesal surface of first femora. Mouthparts and sternum brown. Abdomen ovoid, brown, with three pairs of whitish transverse patches marginally and pair of small rounded spots posteriorly, pattern on abdomen formed by white hairs (Fig. 172). Venter brownish. Spinnerets dark. First leg brown, larger than others, stout, with swollen tibia; single short spine on prolateral surface of tibia, two pairs of very short ventral spines on metatarsus. Legs II–IV light brown. Leg hairs sparse, very long, thin, brown. Pedipalp brown. Palpal tibia short, with two apophyses, dorsal one short and straight, ventral apophysis long, bent dorsally at tip; bulb ovoid, with large posterior lobe and small process in centre (Figs 173–175).

Female.

General appearance as in Fig. 144. Shape of body as in male, but first leg of normal size. Carapace dark brown, eye field black. Carapace covered in greyish hairs, with a few brown setae on rims of anterior eyes. Stridulatory apparatus as in male. Abdomen brown, with pattern composed of white patches similar to male but more contrasted. Epigyne oval, wider than long, with two round gonopores and pockets placed in front of them (Fig. 176). Seminal ducts long, twisted; large accessory glands enter laterally into seminal ducts, receptacles narrow, long, medially placed (Figs 177, 178).

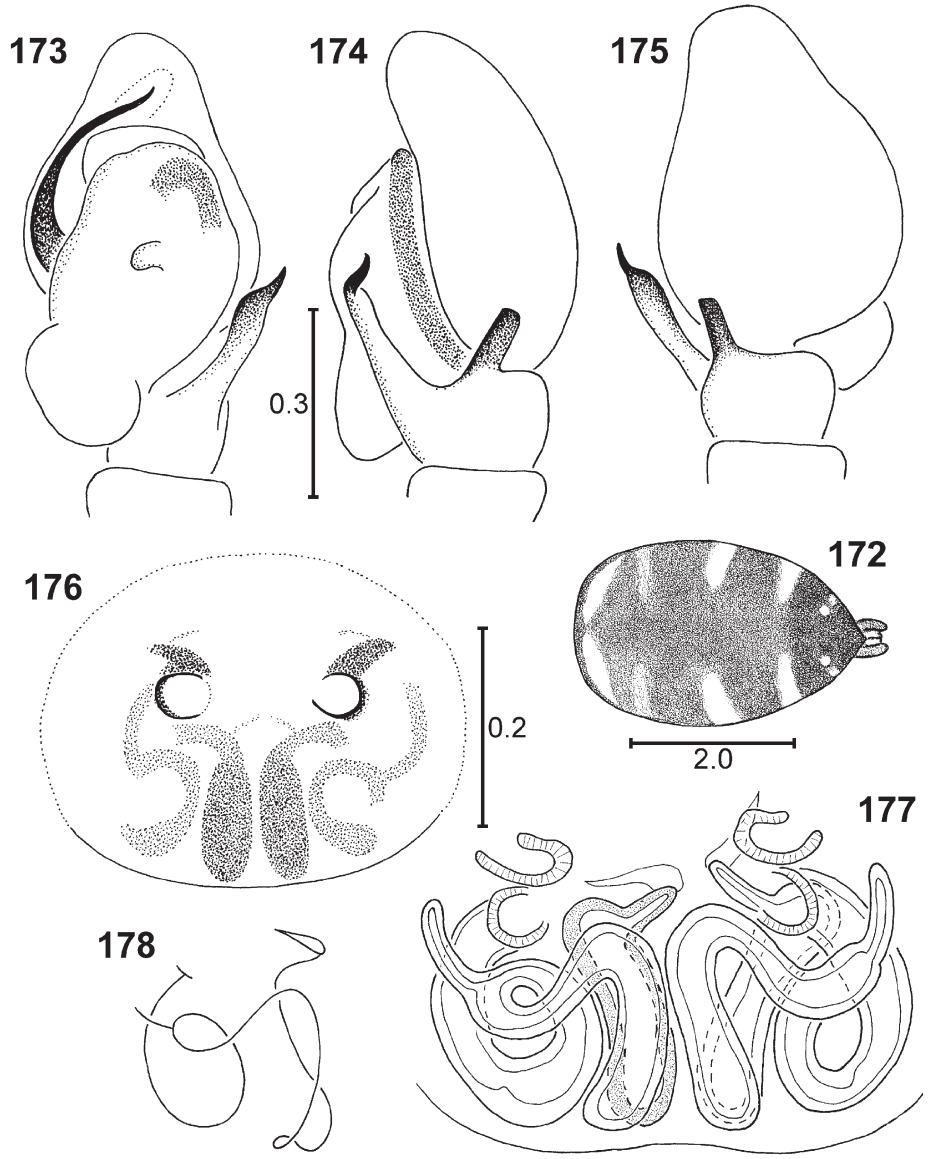
Holotype: ♂ SOUTH AFRICA: *Free State*: Sandveld Nat. Res., 27°44.043'S:25°45.805'E, 22.ix.2003, C. Haddad (NMBA, 14121).

Paratypes: SOUTH AFRICA: *Free State*: 3♀ same data as holotype (NMBA, 14122); 1♂ Erfenis Dam Nat. Res., 28°30.243'S:26°47.500'E, beats, *Acacia karroo*, 24.xi.2006, R. Fourie (NCA, 2007/3675); 1♀ Willem Pretorius Nat. Res., 28°16.660'S:27°12.207'E, pitfall traps, near water level, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3527).

Distribution: So far only known from three localities in the Free State Province (Fig. 202).

Habitat and biology: The holotype and corresponding paratypes were collected from silk retreats constructed in thorns of *Acacia erioloba*. The interaction between arthropods in these thorns is interesting. When branches of these trees die off then *Crematogaster*

ants establish nests in the branches and thorns, which are later hollowed out by ant foraging activity. The emergence holes of the ants in these dead thorns provide access points for other arthropods. Apart from the four *P. gracilis* sp. n. specimens, several *Thaumastochilus termitomimus* Jocqué, 1991 (Araneae: Zodariidae) were also collected from these thorns.



Figs 172–178. *Pseudicius gracilis* sp. n., holotype male (172–175) and paratype female (176–178): (172) abdomen; (173) palpal organ, ventral view; (174) palpal organ, lateral view; (175) palpal organ, dorsal view; (176) epigyne; (177) internal structure of epigyne; (178) diagrammatic course of seminal duct.

Pseudicius karinae sp. n.

Figs 145, 179–181

Etymology: The species is named after Karin Haddad, late mother of the first author, who lived for many years at the type locality.

Diagnosis: The species is most closely related to *P. elegans* Wesołowska & Cumming, 2008, but is easily separable from it by the presence of a dorsal tibial apophysis, which is short and blunt.

Description:

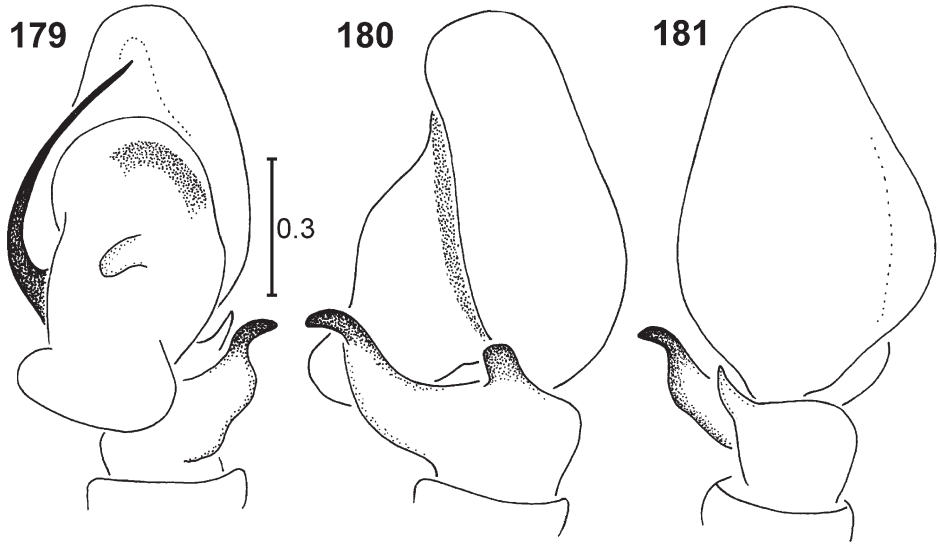
Male.

Measurements: Carapace: length 2.1, width 1.4, height 0.5. Abdomen: length 2.7, width 1.5. Eye field: length 0.8, anterior width 1.0, posterior width 1.2.

General appearance as in Fig. 145. Medium sized spider with flattened, elongate body. Carapace very flat, brown, darker towards edges, eye field almost black; delicate brown hairs cover carapace, with longer bristles at first row of eyes. Stridulatory apparatus present (the carapace-leg type, typical for the genus). Mouthparts and sternum brown. Abdomen elongate, blackish brown, with indistinct traces of four pairs of white spots. Venter yellowish grey. Spinnerets dark. First pair of legs thicker and longer than others, brown, tibia slightly swollen, with single short spine on prolateral side, metatarsus with two pairs of spines on ventral surface. Other legs slightly lighter. All legs bearing long thin hairs. Pedipalps pale brown. Retrolateral tibial apophysis very long, with curved tip, dorsal apophysis short, blunt (Figs 179–181), embolus long (Fig. 179).

Female. Unknown.

Holotype: ♂ SOUTH AFRICA: *Free State*: Bloemfontein district, Hopefield farm, 28°54'S:26°14'E, under *Eucalyptus* bark, 28.ix.2000, C. Haddad (NMBA, 14123).



Figs 179–181. *Pseudicius karinae* sp. n., holotype male: (179) palpal organ, ventral view; (180) palpal organ, lateral view; (181) palpal organ, dorsal view.

Distribution: Known only from the type locality (Fig. 202).

Habitat and biology: The only known specimen was collected from under bark of exotic *Eucalyptus* trees.

Remarks: The male of *P. karinae* is closely related to *P. alter* Wesołowska, 1999, *P. elegans* and *P. venustulus* Wesołowska & Haddad, 2009, so we anticipate that its female will have an epigyne similar to the females described for *P. alter* and *P. venustulus*. It was considered that *P. karinae* sp. n. could possibly have been the unknown male of *P. solitarius* sp. n., which is only known from the female, as the known localities of the two species fall within the same degree-square grid. However, the epigyne structure of *P. solitarius* sp. n. is very different to that of *P. alter* and *P. venustulus* and the species are therefore unlikely to be a match. Considering the relatively small distribution ranges of some of the *Pseudicius* described in this paper it would be considered safest to treat them as separate species until their matching sexes can be collected at the same locality and confirmed as conspecifics.

Pseudicius maculatus sp. n.

Figs 182, 183, 193–198

Etymology: From Latin *maculatus* (spotted, speckled), referring to the pattern of the abdomen.

Diagnosis: The species is closely related to *P. marshi* (Peckham & Peckham, 1903), but the male differs in the shape of the tibial apophysis, which is clearly wider in *P. maculatus* sp. n. The female has the epigyne with a deep oval central depression, similar to that of *P. africanus* Peckham & Peckham, 1903, but the internal structure of the epigyne of these two species differs, as well as their colouration.

Description:

Measurements (♂/♀): Carapace: length 2.7/2.5, width 2.0/1.7, height 0.8/0.6. Abdomen: length 2.7/2.5, width 1.9/1.6. Eye field: length 1.0, anterior and posterior width 1.4/1.3.

Male.

General appearance as in Fig. 182. Carapace slightly pear-shaped, flattened, chocolate brown, with black eye field. White hairs covering carapace, brown bristles near eyes and on eye field anteriorly. Small patches of fawn scales between anterior eyes. Clypeus clothed in white hairs. Chelicerae large. Endites, labium and sternum dark brown. Stridulatory apparatus present (carapace-leg type). Abdomen oval, greyish brown, with faint lighter patches. Brown and white hairs covering dorsum of abdomen. Venter and spinnerets dark. Legs brown, distal ends of their segments slightly paler. First pair considerably stouter and longer than others. Leg hairs long, brown and pale. Pedipalps pale brown. Tibial apophysis massive, very broad (Figs 193–195). Embolus curved towards retrolateral margin of cymbium (Fig. 193). Palpal femur with elevated dorsal surface.

Female.

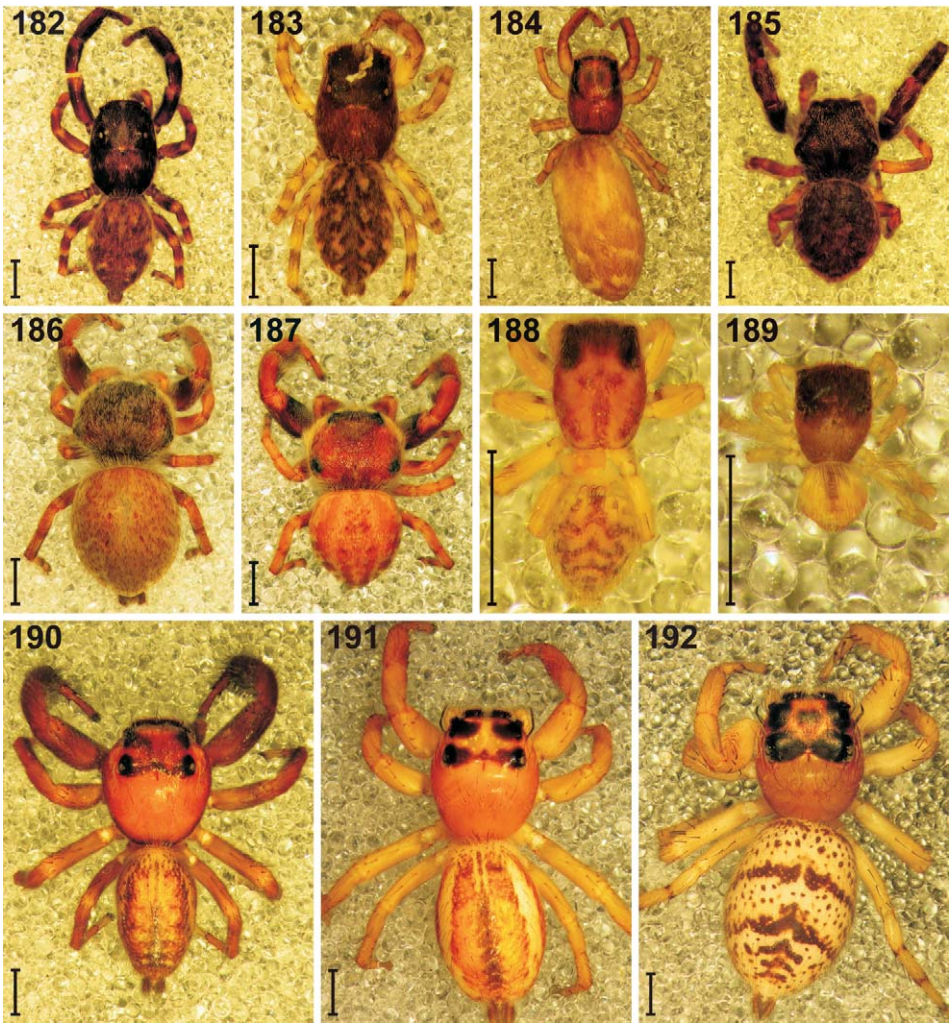
General appearance as in Figs 183, 196. Carapace similar to male, but white hairs less numerous. Small path composed of light hairs on eye field anteriorly. Sternum

and mouthparts brownish, only chewing margins of endites yellow. Abdomen black with yellow patches (Fig. 196), venter pale. Legs yellow with greyish basal part of segments. Epigyne with large oval depression in centre, leading to a deep pocket with gonopores along posterior margin (Figs 197, 198). Receptacles strongly sclerotized, single-chambered (Fig. 198).

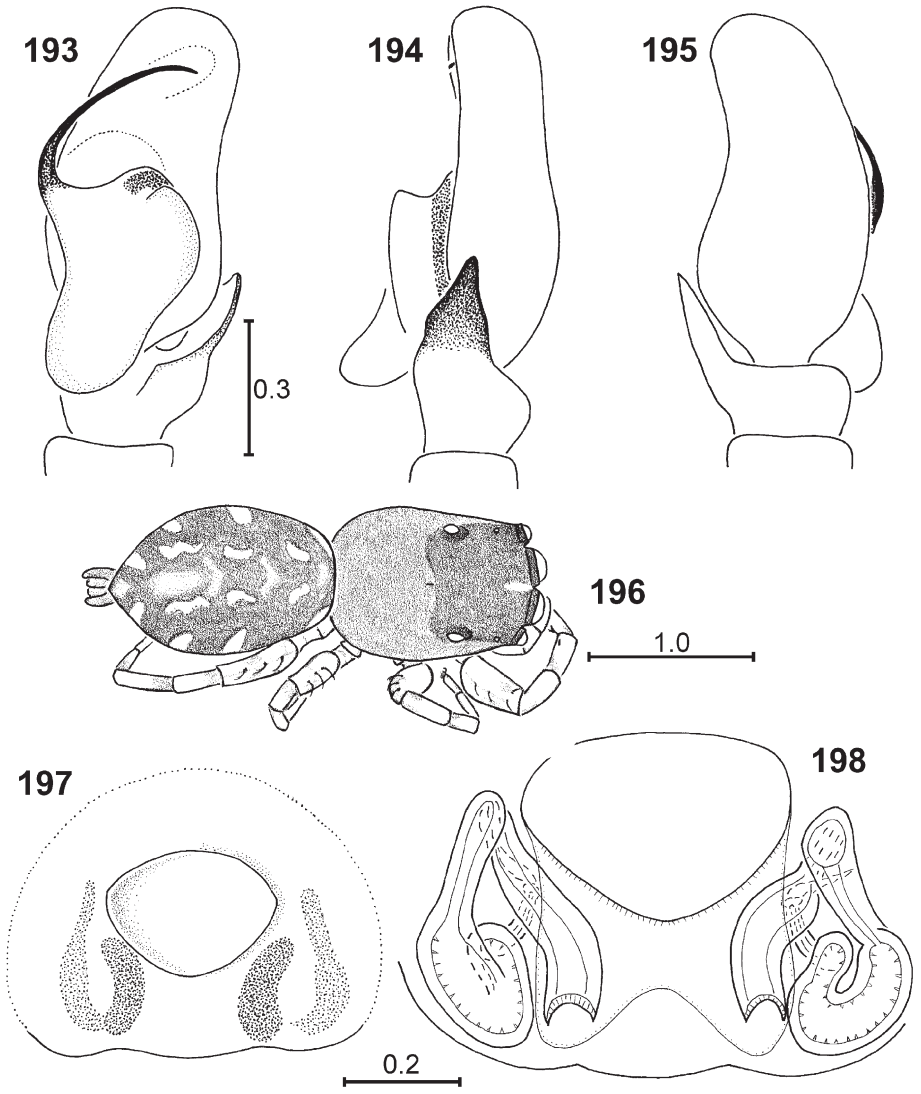
Holotype: ♂ SOUTH AFRICA: *Free State*: Bethlehem district, Zaphira, 28°29'S:28°40'E, 1.ii.1995, L. Lotz & J. Irish (NMBA, 6714). Paratype: 1♀ together with holotype.

Distribution: Known only from the type locality (Fig. 202).

Habitat and biology: Unknown, but presumably collected by beating shrubs.



Figs 182–192. Digital microscope photographs of the dorsal habitus of South African jumping spiders: (182, 183) *Pseudicius maculatus* sp. n., male (182) and female (183); (184) *P. solitarius* sp. n., female; (185, 186) *Rhene konradi*, male (185) and female (186); (187) *R. lingularis* sp. n., male; (188) *Tanzania meridionalis* sp. n., male; (189) *T. mkomaziensis*, male; (190, 191) *Thyene inflata*, male (190) and female (191); (192) *T. natalii*, female. Scale bars = 1 mm.



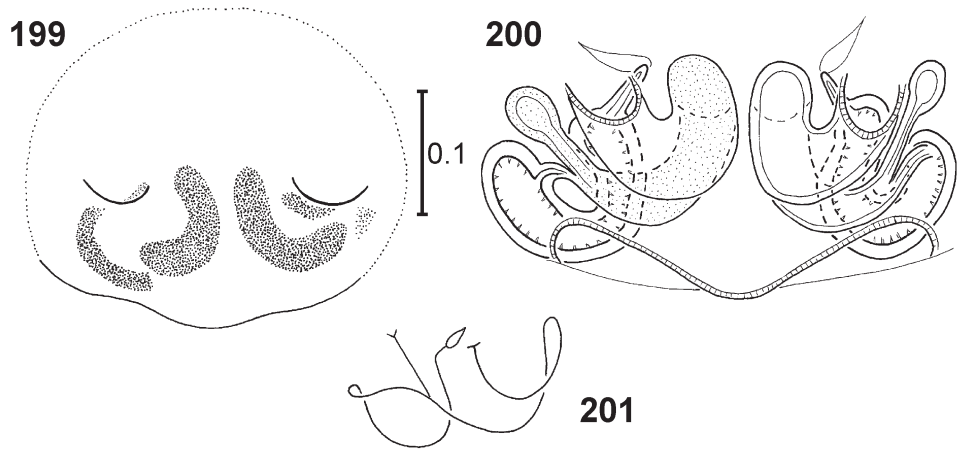
Figs 193–198. *Pseudicius maculatus* sp. n., holotype male (193–195) and paratype female (196–198): (193) palpal organ, ventral view; (194) palpal organ, lateral view; (195) palpal organ, dorsal view; (196) dorsal habitus; (197) epigyne; (198) internal structure of epigyne.

Pseudicius solitarius sp. n.

Figs 184, 199–201

Etymology: From Latin *solitarius* (alone, solitary), referring to the fact that the male of this species remains unknown.

Diagnosis: The female of this species has a similar epigyne to *P. adustus* Wesołowska, 2006, but its receptacles are clearly larger and the seminal ducts longer, with additional small spherical reservoirs.



Figs 199–201. *Pseudicius solitarius* sp. n., holotype female: (199) epigyne; (200) internal structure of epigyne; (201) diagrammatic course of seminal duct.

Description:

Female.

Measurements: Carapace: length 2.0, width 1.4, height 0.6. Abdomen: length 4.2, width 2.0. Eye field: length 0.7, anterior width 1.0, posterior width 1.2.

General appearance as in Fig. 184. Shape of body typical for the genus, elongate and flat. Carapace oval, strongly flattened, brown, with black rings around eyes. White scales surround anterior median eyes, dense whitish hairs cover whole carapace, brown bristles near eyes and on eye field anteriorly. Chelicerae and sternum brown, labium and endites with whitish tips. Abdomen elongate, greyish beige, with traces of three pairs of diagonal stripes in posterior half laterally. A few brown bristles on abdominal dorsum. Venter beige with two paler stripes. Spinnerets brown. First pair of legs brown, femora paler with lateral surfaces dark, with single short spine retrolaterally on tibia near base of the segment. Second pair of legs yellow, with lateral surfaces of femora, patellae and tibiae brown. Legs II–IV yellow, with darker rings. Epigyne oval with two openings situated laterally, further apart (Fig. 199). Internal structure of epigyne and course of seminal ducts in Figs 200, 201.

Male. Unknown.

Holotype: ♀ SOUTH AFRICA: *Free State*: Bloemfontein district, Glen, 28°58'S:26°20'E, beating, 3.xi.1987, Museum staff (NMBA, 2472).

Distribution: Known only from the type locality (Fig. 202).

Habitat and biology: Collected by beating foliage.

Genus *Rhene* Thorell, 1869

Type species: *Rhanis flavigera* C.L. Koch, 1846.

Rhene is a large genus with 54 described species, with 16 being known from the Afrotropical Region. These are small or medium sized spiders with a broad, robust, flattened body. The carapace is short with a large, clear trapezoid eye field. The males

Fig. 202. Distribution of *Pseudicius gracilis* sp. n. (circles), *P. karinae* sp. n. (square), *P. maculatus* sp. n. (pentagon) and *P. solitarius* sp. n. (diamond).

have a palp with a short tibial apophysis and a short embolus. The females have large accessory glands entering into the initial part of the seminal ducts.

Rhene konradi Wesołowska, 2009

Figs 185, 186, 203–206

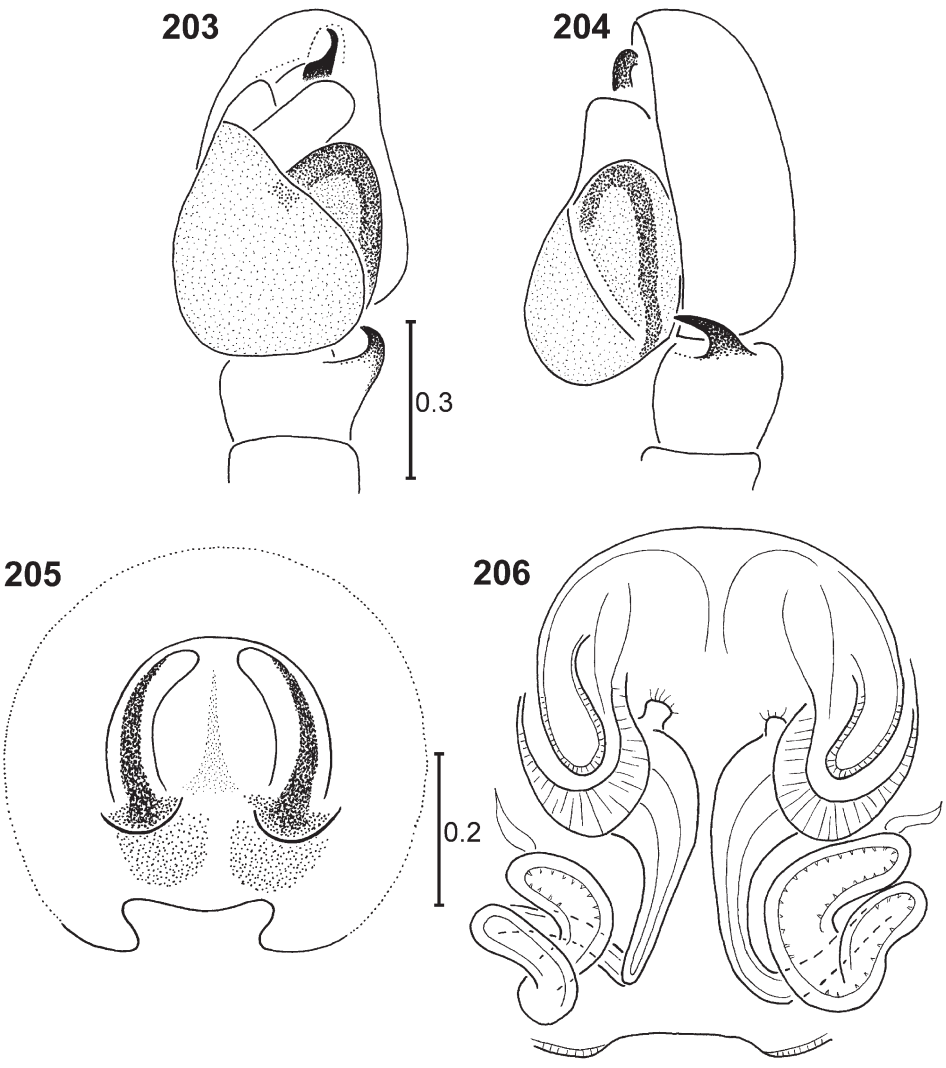
Rhene konradi: Wesołowska 2009*b*: 1411, figs 6–8.

Redescription:

Measurements (♂/♀). Carapace: length 2.1/2.2, width 2.0/2.4, height 1.0/0.9. Abdomen: length 2.8/3.1, width 2.0/2.7. Eye field: length 1.5/1.4 anterior width 1.2/1.3, posterior width 2.0/2.4.

Male.

General appearance as in Fig. 185. Robust, flattened spider, with trapezoid eye field, eyes of last row placed on protuberances. Carapace dark, almost black, eye field pitted, clothed in dense colourless hairs, anterior eyes surrounded with white scales, white hairs forming small patches in front of posterior lateral eyes and median stripe on thoracic part. Chelicerae dark brown, their bases covered with long dense white hairs. Sternum brownish, labium and endites with narrow pale line along tips. Abdomen brownish, lighter than carapace, with dense colourless hairs adpressed to surface, venter greyish beige. Spinnerets brown. First legs stouter and longer than others, dark brown, with dense hairs, ventral surface of femora with long white hairs. Other legs light brown. Pedipalps dark, tibial apophysis curved (Figs 203, 204), bulb dark brown, anterior haematodocha clearly separated, embolus short (Fig. 203).



Figs 203–206. *Rhene konradi*, male (203, 204) and female (205, 206): (203) palpal organ, ventral view; (204) palpal organ, lateral view; (205) epigyne; (206) internal structure of epigyne.

Female.

General appearance as in Fig. 186. Carapace dark brown, eye field pitted, its entire surface clothed in white hairs, especially dense lateral of eye field. Clypeus and base of chelicerae also covered with similar hairs. Mouthparts as in male. Abdomen light brown, with three pairs of sigilla, covered with short white hairs, longer and denser at anterior edge, brown bristles among hairs. Venter beige, booklung covers strongly sclerotized. Legs brownish, first pair slightly darker. Epigyne with large notch in posterior edge (Fig. 205). Depressions hiding gonopores plugged with waxy secretion. Internal structure as in Fig. 206, accessory glands enter into copulatory ducts in their initial parts.

Material examined: SOUTH AFRICA: *Free State*: 1♀ Bloemfontein district, Hopefield farm, 28°54'S:26°14'E, sweep-netting, *Eragrostis* grassland, 28.ix.2000, C. Haddad (NMSA, 22673); 1♂ Hoopstad district, Nooitgedacht farm, 27°41'S:25°29'E, by hand, 28.ix.1990, D. de Swart (NMBA, 5324); 1♀ Sandveld Nat. Res., 27°42'S:25°44'E, sweeping grass, 12.iii.2008, L. Lotz (NMBA, 11709); 1♂ same locality, 27°44.219'S: 25°45.893'E, pitfall traps, grassland and shrubs, 2.ix–2.x.2009, R. Fourie & A. Grobler (NCA, 2009/3611); 3 imm. 2♀ Tussen-die-Riviere Nat. Res., 30°28'S:26°07'E, sweeping grass, 14.x.2008, L. Lotz & C. Haddad (NMBA, 12682).

Distribution: Known only from the Free State Province in South Africa (Fig. 215).

Habitat and biology: Specimens were collected by sweep-netting and pitfall traps in grassland.

Remarks: The male of the species is described here for the first time.

Rhene lingularis sp. n.

Figs 187, 207–209

Etymology: From Latin *lingula* (tongue), referring to the tongue-shaped embolus.

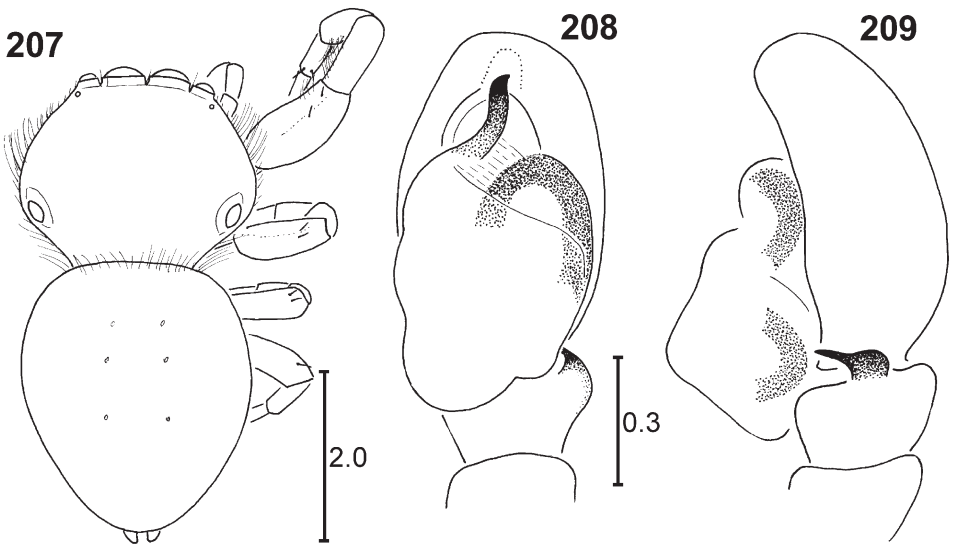
Diagnosis: The male of the species is easily distinguished by the tongue-shaped embolus.

Description:

Male.

Measurements: Carapace: length 1.9, width 2.2, height 1.1. Abdomen: length 2.6, width 2.2. Eye field: length 1.5 anterior width 1.2, posterior width 2.2.

General appearance as in Figs 187, 207. Shape of body typical for the genus. Eyes of second row very close to first row, eye field occupying most of carapace dorsum. Carapace brown, vicinity of eyes black, eye field pitted. Numerous light hairs on carapace, longer at sides, whitish hairs forming median belt in posterior part of carapace. Abdomen



Figs 207–209. *Rhene lingularis* sp. n., paratype male: (207) habitus; (208) palpal organ, ventral view; (209) palpal organ, lateral view.

covered with large scutum, dark brown, clothed in white hairs, which form ill defined pattern comprising two pairs of longitudinal lines and diagonal lines on abdominal sides. Spinnerets dark. First pair of legs robust, covered with long dense hairs, especially on ventral surfaces of patellae and tibiae; tibia with pair and metatarsus with two pairs of ventral spines. Other legs shorter, brown. Pedipalps dark, tibial apophysis wide at base, short, with pointed tip (Figs 208, 209). Bulb oval, distal haematodocha separated, embolus longer than in congeners, linguiform (Fig. 208).

Female. Unknown.

Holotype: ♂ SOUTH AFRICA: *Free State*: Brandfort district, Florisbad, 28°46'S:26°05'E, sweeping, 12.ii.1986, Museum staff (NMBA, 1280).

Paratype: 1♂ together with holotype; *Free State*: 1♂ Bloemfontein, 29°08'S:26°10'E, sweeping, 5.ii.1992, L. Lotz (NMBA, 5670).

Distribution: Known only from the central Free State Province (Fig. 215).

Habitat and biology: Collected by sweep-netting in grassland.

Genus *Tanzania* Koçak & Kemal, 2008

Type species: *Lilliput mkomaziensis* Wesołowska & Russell-Smith, 2000.

The genus *Lilliput* was described by Wesołowska and Russell-Smith (2000). It contains three species of very small ground-living jumping spiders from eastern Tanzania. As the generic name was preoccupied, Koçak and Kemal (2008) proposed a replacement name, *Tanzania*, for the genus. The genus, closely related to *Euophrys* C.L. Koch, 1834 and *Talavera* Peckham & Peckham, 1909, includes very small Euophryinae with a characteristic curved long bristle on the clypeus. All previously known species were reported only from the type localities. These species are probably more widely distributed, but due to their tiny size and inconspicuous colouration they could be overlooked in collected materials or treated as undeterminable immature specimens. Below we present the description of a new species of *Tanzania*, recorded far south from the previously known distribution of the genus, as well as the first record of the type species from South Africa.

Tanzania meridionalis sp. n.

Figs 188, 210–214

Etymology: From Latin *meridionalis* (southern), referring to the southern distribution of the species relative to that of the previously described congeners.

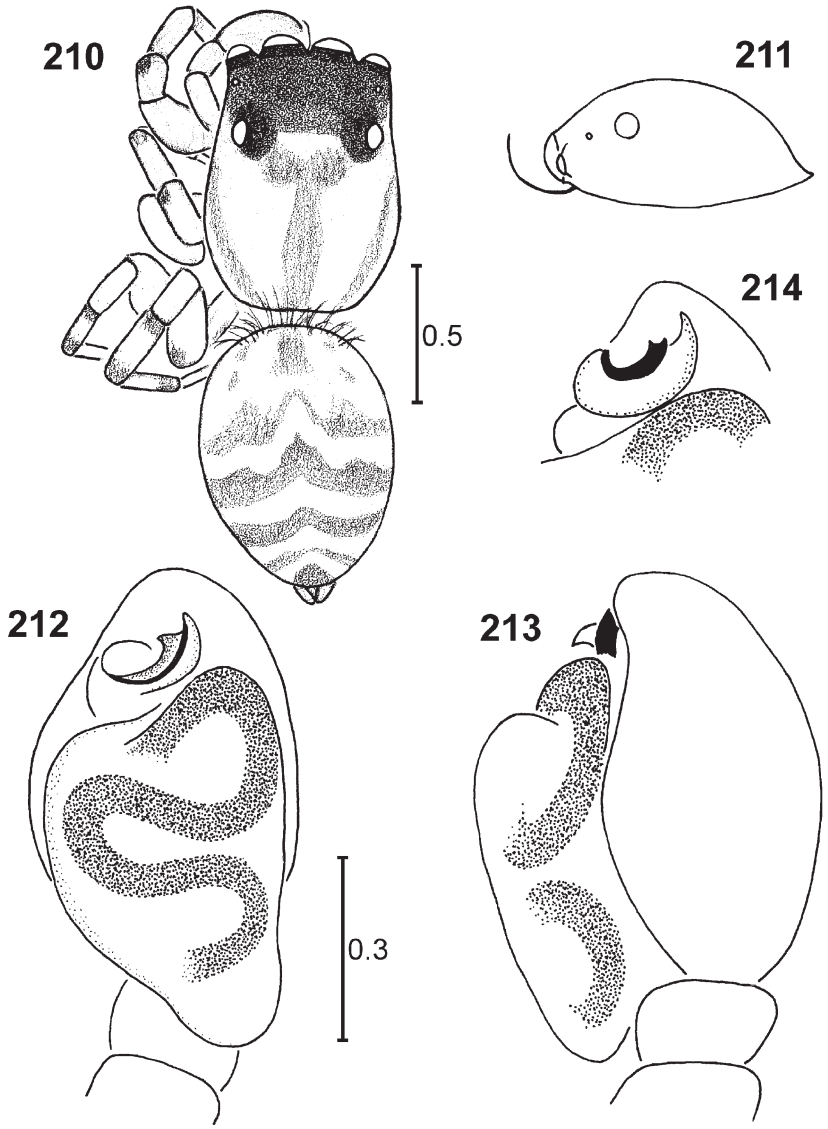
Diagnosis: This species is related to *T. mkomaziensis*, and may be distinguished from congeners by the embolus, which is the shortest in the genus.

Description:

Male.

Measurements: Carapace: length 0.8–0.9, width 0.6, height 0.2–0.3. Abdomen: length 0.8–0.9, width 0.6–0.7. Eye field: length 0.3, anterior width 0.5, posterior width 0.6.

General appearance as in Figs 188, 210. Very small spider, with medium high carapace (Fig. 211); eye field short, occupying one third of carapace length. Carapace light brown, with darker median stripe and two lateral streaks on thoracic part; dorsum covered with delicate colourless hairs. Eye field black, anteriorly with sparse white hairs. Clypeus very low, centrally with single long seta (Fig. 211). Mouthparts yellowish, sternum yellow



Figs 210–214. *Tanzania meridionalis* sp. n., paratype male: (210) habitus; (211) carapace, lateral view; (212) palpal organ, ventral view; (213) palpal organ, lateral view; (214) embolus, ventroapical view.

with slightly darker edges. Abdomen ovoid, with pattern composed of a few transverse brownish streaks (Fig. 210). Spinnerets yellowish. Dorsal surface of abdomen covered with fine long, brown and whitish hairs, longer and thicker at anterior edge. Venter pale. Legs dark yellow with brown rings, first pair slightly darker. Leg hairs long, brown. Pedipalps large in relation to body size, orange, without apophysis (Fig. 213). Bulb oval, with large posterior lobe, seminal duct meandering (Fig. 212). Anterior haematodocha clearly separated, embolus coiled, short (Figs 212, 214).

Female. Unknown.

Holotype: ♂ SOUTH AFRICA: *Free State*: Erfenis Dam Nat. Res., unburnt site 3, 28°29.741'S:26°48.065'E, pitfall traps, 22.xi–23.xii.2005, C. Haddad (NMBA, 13258).

Paratype: 1♂ *Free State*: Erfenis Dam Nat. Res., unburnt site 1, 28°29.888'S:26°48.488'E, pitfall traps, 22.xi–23.xii.2005, C. Haddad (NMBA, 14124).

Distribution: Known only from the type locality (Fig. 215). An immature specimen collected by pitfall trapping in the Qwa Qwa National Park in the eastern Free State (NMBA, 6588) has the same markings as the type specimens and is likely conspecific, but adults will need to be collected to confirm this.

Habitat and biology: The two specimens reported here were collected during spring by pitfall trapping in grassland.

Tanzania mkomaziensis (Wesołowska & Russell-Smith, 2000)

Fig. 189

Lilliput mkomaziensis: Wesołowska & Russell-Smith 2000: 63, figs 163–170; Wesołowska & Tomasiewicz 2008: 24, figs 92–94.

Tanzania mkomaziensis: Koçak & Kemal 2008: 3.

Wesołowska and Russell-Smith (2000) described both sexes; general appearance of male in Fig. 189.

Material examined: SOUTH AFRICA: *Free State*: 1♂ Sandveld Nat. Res., 27°44.043'S:25°45.805'E, pitfall traps, grassland, 2.ix–2.x.2009, R. Fourie & A. Grobler (NCA, 2009/3613).

Distribution: Species known from Tanzania and Ethiopia, recorded from South Africa for the first time (Fig. 215). Based on current knowledge, this is the most widespread species in the genus.

Habitat and biology: Collected by pitfalls in grassland.

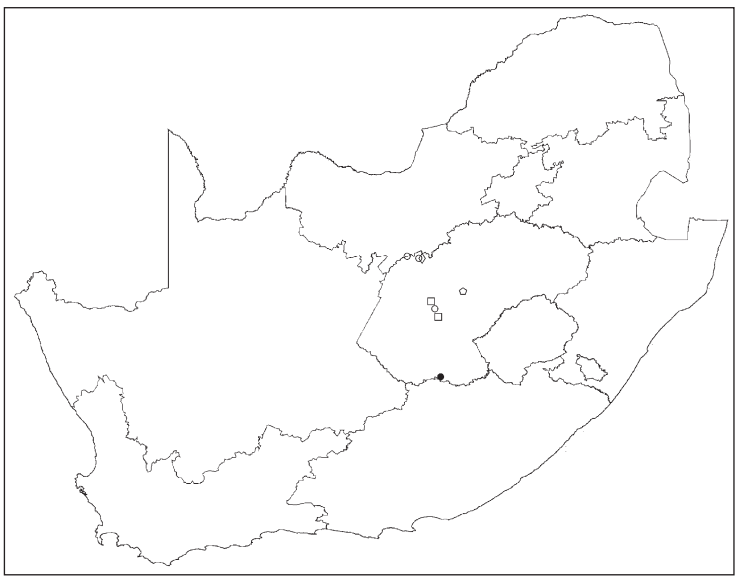


Fig. 215. Distribution of *Rhene konradi* (circles), *R. lingularis* sp. n. (squares), *Tanzania meridionalis* sp. n. (pentagon) and *T. mkomaziensis* (diamond) in South Africa. Solid icon indicates a published record and open icons new records from central South Africa.

Genus *Thyene* Simon, 1885

Type species: *Attus imperialis* Rossi, 1846.

This genus includes over 40 species, the majority of them being distributed in the Afrotropical Region. Members of *Thyene* are characterized by the presence of tufts of long black hairs near the posterior median eyes. The genital organs are very similar; the male palp has a rounded bulb and embolus encircling it few times; the epigyne is very weakly sclerotized, with a central window, seminal ducts forming a few loops, and very long accessory glands. *Thyene* species may be more easily distinguished by their colouration than by genitalic structures.

Thyene inflata (Gerstäcker, 1873)

Figs 190, 191

Phidippus inflatus: Gerstäcker 1873: 476.
Thyene squamulata: Simon 1886: 347.
Thyene inflata: Simon 1886: 348; Strand 1908: 197; Lessert 1925*b*: 480, figs 66, 67, 69, 71; Berland & Millot 1941: 374, figs 72c, 74; Próchniewicz 1989: 222, figs 45–47; Wesołowska & Russell-Smith 2000: 105, figs 293–299; Wesołowska & Tomasiewicz 2008: 188, figs 118–120; Wesołowska & Haddad 2009: 85, figs 228, 229.

Wesołowska and Russell-Smith (2000) described both sexes; general appearance of both sexes in Figs 190, 191.

Material examined: SOUTH AFRICA: *Free State*: 1♀ Boshoff district, Boesmansrus farm, 28°32.543'S: 25°09.929'E, base of grass tussocks, 11.iii.2010, C. Haddad (NCA, 2010/301); 2♀ Soetdoring Nat. Res., 28°49.831'S:26°02.645'E, sweeps, grass, 27.iv.2004, C. Haddad (NCA, 2005/1020); 1♀ same data (NCA, 2008/481); 1♂ Tussen-die-Riviere Nat. Res., 30°28'S:26°13'E, beats, 23.x.2008, L. Lotz (NMBA, 12985); 2♂ same locality, 30°28'S:26°13'E, beats, riverine bush, 15.x.2008, L. Lotz & C. Haddad (NMBA, 12796); 6 imm. 2♂ same locality, 30°29'S:26°07'E, beating, rocky hill, 16.x.2008, L. Lotz & C. Haddad (NMBA, 12906). *Northern Cape*: 2♂ 3♀ Prieska district, Green Valley Nuts, 29°33.993'S:22°55.005'E, canopy fogging, pistachio orchard no. 1, 2.v.2002, C. Haddad (NCA, 2010/209); 1♂ 1♀ same locality, 29°34.904'S: 22°55.027'E, canopy fogging, pistachio orchard no. 19, 27.iii.2002, C. Haddad (NCA, 2010/211); 2♂ 2♀ Prieska district, Remhoogte farm, 29°32.016'S:23°00.182'E, canopy fogging, experimental pistachio orchard, 27.iii.2002, C. Haddad (NCA, 2010/210).

Distribution: Widespread in the Afrotropical Region, recorded for the first time from the Free State and Northern Cape Provinces in South Africa (Fig. 224).

Habitat and biology: A species typically associated with foliage of broad-leaved shrubs and trees in savannah and forests, although generally uncommon. In pistachio orchards in the Northern Cape, *T. inflata* comprised 3.77% of the spiders collected by canopy fogging (Haddad *et al.* 2005).

Thyene natalii Peckham & Peckham, 1903

Fig. 192

Thyene natalii: Peckham & Peckham 1903: 227, pl. 25, fig. 4; Lessert 1936: 294, figs 92, 93; Wesołowska & Haddad 2009: 85, figs 230, 231.
Thyene strandi: Caporiacco 1939: 376, fig. 25: Prószyński 1987: 109, 113.
Thyene natali: Wesołowska & Cumming 2008: 216, figs 171–177.

Wesołowska and Cumming (2008) described both sexes; general appearance of female in Fig. 192.

Material examined: SOUTH AFRICA: *Free State Province*: 1♀ Bloemfontein, Langenhoven Park, 29°06'S: 26°09'E, on arum lily in garden, feeding on fly, 6.i.2010, C. Haddad (NMBA, 14717).

Distribution: Widespread in southern and eastern Africa. In South Africa it is known only from KwaZulu-Natal, and is recorded here from the Free State for the first time (Fig. 224).

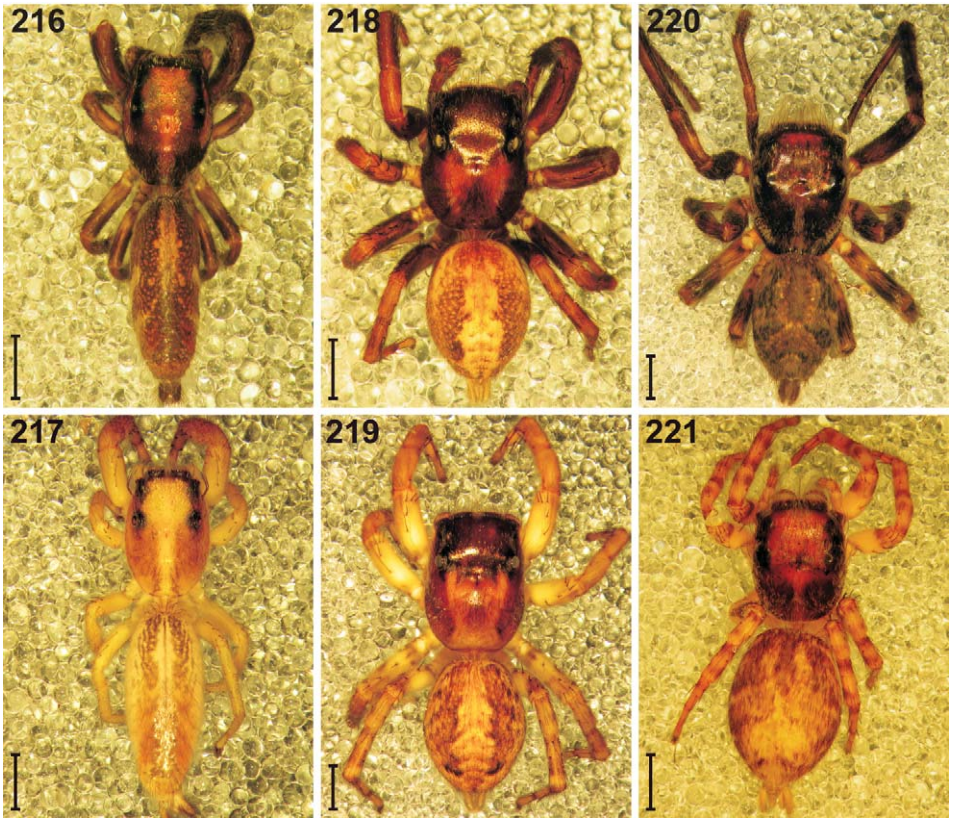
Habitat and biology: This species is often collected from foliage in savannah habitats in KwaZulu-Natal. Immature *Thyene* specimens with the characteristic transverse abdominal markings of this species have been collected by beating foliage and sifting leaf litter in the Free State before, and the female specimen presented here represents the first confirmed record of the species in the province.

Thyene thyenioides (Lessert, 1925)

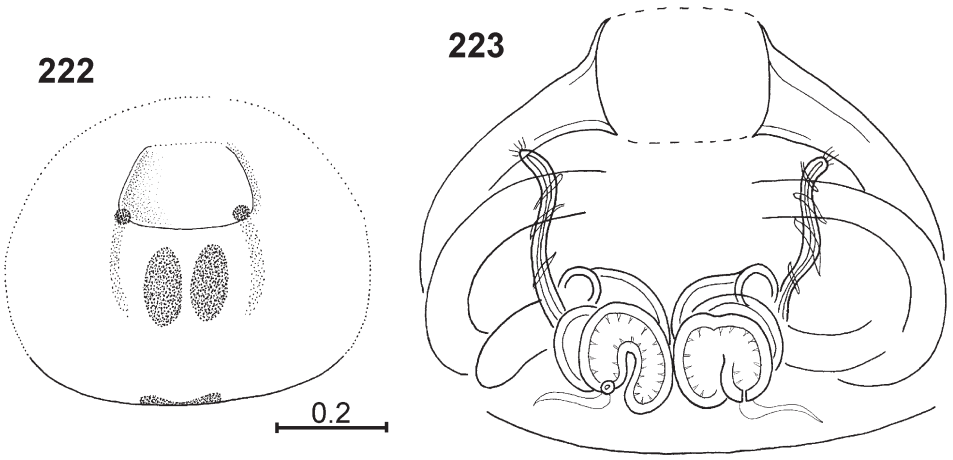
Figs 216, 217, 222, 223

Paramodunda thyenioides: Lessert 1925*b*: 471, figs 55–57; Prószyński 1984: 168.
Paramodunda thyeniformis: Caporiacco 1947: 243.
Thyene thyenioides: Wesołowska & Cumming 2008: 218, figs 178–180.

Wesołowska and Cumming (2008) described the male; general appearance of both sexes in Figs 216, 217.



Figs 216–221. Digital microscope photographs of the dorsal habitus of South African jumping spiders: (216, 217) *Thyene thyenoides*, male (216) and female (217); (218, 219) *Thyenula oranjensis*, male (218) and female (219); (220, 221) *Tusitala barbata*, male (220) and female (221). Scale bars = 1 mm.



Figs 222, 223. *Thyene thyenoides*: (222) epigyne; (223) internal structure of epigyne, dorsal view.

Description:

Female.

Measurements: Cephalothorax: length 2.3, width 1.5, height 0.7. Abdomen: length 3.6, width 1.4. Eye field: length 0.9, anterior width 1.1, posterior width 1.2.

Slender spider with elongate body. Carapace oval, eye field yellowish, with dark rings surrounding eyes; tufts of black long setae forming "horns" near posterior median eyes. Light scales encircling anterior eyes. Thoracic part dark brown, lighter medially. Mouthparts and sternum yellow. Abdomen elongate, with long brown bristles on anterior edge of abdomen; anterior part yellow, with median longitudinal brown line and several diagonal lines laterally; posterior half olive-brownish, with median silver streak (Fig. 217). Venter pale, with silver spots formed by translucent guanine crystals. Spinnerets long, yellowish. Legs yellowish brown. Epigyne typical for the genus, very weakly sclerotized, with central depression (Fig. 222). Internal structures as in Fig. 223, seminal ducts very weakly sclerotized, membranous, visible when stained in Chlorazol Black E, forming two large loops; receptacles composed of few chambers, accessory glands very long and thin.

Material examined: SOUTH AFRICA: *Free State*: 2♀ Bloemfontein district, Deelhoek farm, 28°54'S:26°07'E, sweep-netting, *Themeda triandra* grassland, 20.i.2001, C. Haddad (MRAC, 230327); 3♂ 2♀ same data but 19.xi.2001 (MRAC, 230328); 1♂ same data but 18.iii.2001 (MRAC, 230326); 1♂ Erfenis Dam Nat. Res., site 1, near trench, 28°29.892'S:26°48.508'E, pitfall traps, grassland, 28.x–4.xii.2009, R. Fourie & A. Grobler (NMSA, 22692); 1♂ same locality, site 2, eastern fence, 28°30.011'S:26°48.479'E, pitfall traps, grassland, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3580); 1♂ same locality, site 8, *Themeda* grassland, 28°29.804'S:26°48.503'E, pitfall traps, 28.x–4.xii.2009, R. Fourie & A. Grobler (NMSA, 22701); 1♂ Sandveld Nat. Res., 27°44.219'S:25°45.983'E, pitfalls, grassland and shrubs, 30.x–6.xii.2009, R. Fourie & A. Grobler (NMSA, 22685); 2♂ Willem Pretorius Nat. Res., 28°16.696'S:27°12.083'E, pitfall traps, grassland, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3518); 1♂ same locality, 28°16.660'S:27°12.207'E, pitfall traps, near water level, 30.ix–28.x.2009, R. Fourie & A. Grobler (NCA, 2009/3523). *North West*: 1♂ Potchefstroom district, Thabela Thabeng Mountain Retreat, 26°51.825'S:27°17.819'E, pitfall traps, woodland grassland, 1–29.x.2009, R. Fourie & A. Grobler (NCA, 2009/3545). *Northern Cape*: 1♀ Prieska district, Green Valley Nuts, 29°35.495'S:22°57.308'E, sweeps, Nama Karoo grassland, 19.xi.2001, C. Haddad (NMBA, 14125); 1♂ Reivilo district, Kees farm, 27°44.171'S:24°03.026'E, sweeping grasses, iv.2007, N. Shaw (NCA, 2010/207).

Fig. 224. Distribution of *Thyene inflata* (circles), *T. natalii* (squares) and *T. thyenoides* (diamonds) in South Africa. Solid icons indicate published records and open icons new records from central South Africa.

Distribution: Unclear; probably widespread in the Afrotropical Region, recently recorded from Zimbabwe. Recorded here from South Africa for the first time, where it is widespread in central South Africa (Fig. 224).

Habitat and biology: A rare, predominantly grass-dwelling species collected by pitfall trapping and sweeping. The elongate body and cryptic colouration of females and immatures suggest a strong association with grasses.

Remarks: The size, shape of body, colouration and palpal structure of the male specimens is identical to the male of *T. thyenioides* from Zimbabwe (Wesołowska & Cumming 2008), so we recognise the females collected together with males at Deelhoek as conspecifics. Therefore, the first description of the female of *T. thyenioides* is given here.

Genus *Thyenula* Simon, 1902

Type species: *Thyenula juvenca* Simon, 1902.

A small genus with only 10 species, all but one known from southern Africa.

Thyenula oranjensis Wesołowska, 2001

Figs 218, 219

Thyenula oranjensis: Wesołowska 2001: 262, figs 7–9, 12–14.

Wesołowska (2001) described both sexes; general appearance of both sexes in Figs 218, 219.

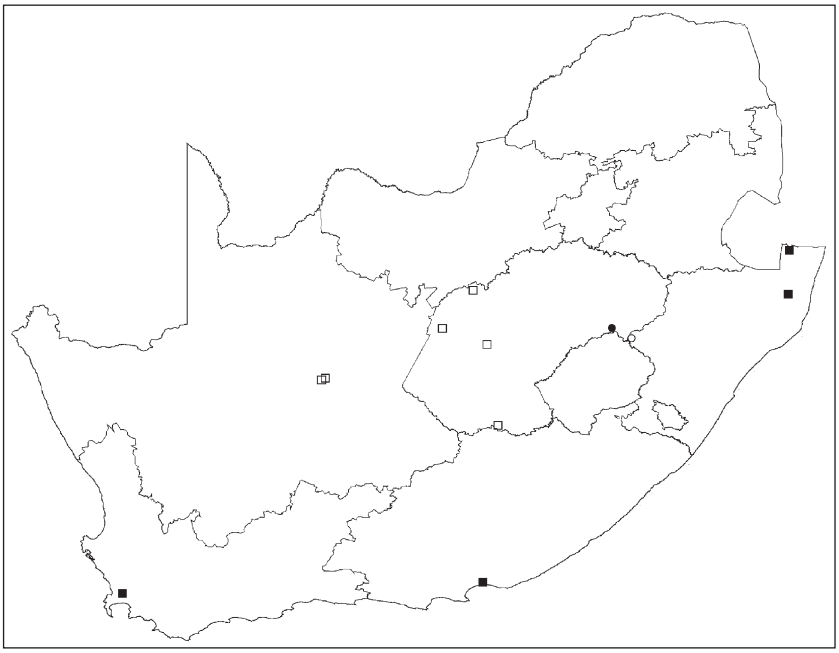


Fig. 225. Distribution of *Thyenula oranjensis* (circles) and *Tusitala barbata* (squares) in South Africa. Solid icons indicate published records and open icons new records from central South Africa.

Material examined: SOUTH AFRICA: *KwaZulu-Natal*: 1♂ 2♀ Bergville, Royal Natal National Park, 28°41'S: 28°56'E, beating, 18–22.iii.2006, D. Herbert (NMBA, 14081).

Distribution: The species was known only from the type locality (Golden Gate National Park) in the eastern Free State Province. It is recorded here from KwaZulu-Natal for the first time (Fig. 225).

Habitat and biology: This species has mainly been collected by beating, with only one specimen recorded from a trap (Wesołowska 2001). The two localities from which this species is known are both situated in montane grassland at altitudes approximately 1500–1900 m.

Genus *Tusitala* Peckham & Peckham, 1902

Type species: *Tusitala barbata* Peckham & Peckham, 1902.

The genus includes nine species, all distributed in the Afrotropical Region. The males can be distinguished by the long fissidentate chelicerae with very long and dense bristles forming a "basket" on their dorsal surface. The females have spirally coiled seminal ducts and characteristic receptacles composed of two chambers joined by a thin canal.

Tusitala barbata Peckham & Peckham, 1902

Figs 220, 221

Tusitala barbata: Peckham & Peckham 1902: 330; 1903: 243, pl. 28, fig. 2; Prószyński 1984: 149; Wesołowska & Russell-Smith 2000: 110, figs 307–309; Wesołowska & Cumming 2008: 222, figs 192–195; Wesołowska & Haddad 2009: 92, figs 203, 204.

Monclova brauni: Peckham & Peckham 1902: 331.
Tusitala emertoni: Lessert 1925*b*: 514, figs 98–100.

Wesołowska and Cumming (2008) described both sexes; general appearance of both sexes in Figs 220, 221.

Material examined: SOUTH AFRICA: *Free State*: 2♀ Boshof district, Boesmansrus farm, 28°32.543'S: 25°09.929'E, base of grass tussocks, 11.iii.2010, C. Haddad (NCA, 2010/302); 1♂ Sandveld Nat. Res., 27°41'S:25°41'E, under *Eucalyptus* bark, 14.x.2003, C. Haddad (NMBA, 14126); 1♀ Soetdoring Nat. Res., 28°49.831'S:26°02.645'E, under rocks in grassland, 27.iv.2004, C. Haddad (NCA, 2008/474); 1♀ Tussen-die-Riviere Nat. Res., 30°29'S:26°11'E, pitfalls, riverine bush, 13–16.x.2008, L. Lotz & C. Haddad (NMBA, 12985); 4 imm. 1♂ same locality, 30°29'S:26°11'E, beating, riverine bush, 15.x.2008, L. Lotz & C. Haddad (NMBA, 12792). *Northern Cape*: 2♀ Prieska district, Green Valley Nuts, pistachio orchard no. 19, 29°34.904'S:22°55.027'E, canopy fogging, 26.v.2001, C. Haddad (NMBA, 14127); 3♀ Prieska district, Remhoogte farm, experimental pistachio orchard, 29°32.016'S:23°00.182'E, canopy fogging, 24.iv.2001, C. Haddad (NMSA, 22674); 1♂ same data but 28.i.2001 (NCA, 2010/206).

Distribution: Species widely distributed in eastern and southern Africa, recorded from the Free State and Northern Cape Provinces for the first time (Fig. 225).

Habitat and biology: This species had previously been recorded mainly from savannah and forest habitats, usually from the foliage stratum. The records presented here from semi-arid grassland and arid Nama Karoo indicates more flexible habitat preferences than initially suspected.

DISCUSSION

A total of 51 jumping spider species have been treated in the present paper, of which 15 are described as new. Of the 36 previously described species, only eight were recorded from central South Africa in earlier taxonomic publications. The large proportion of new species described here (29.4%) is indicative of the minimal attention that central South Africa has received in past Salticidae research, particularly revisionary studies. In fact, only five of the genera treated in this paper have been subject to thorough revision in the Afrotropical Region, namely *Cyrba* (Wanless 1984), *Heliophanus* (Wesołowska 1986, 2003), *Menemerus* (Wesołowska 1999*a*), *Natta* (Wesołowska 1993) and *Nigorella* (Wesołowska 2009). Of the 13 species from these genera treated in the present paper, one is recorded from South Africa for the first time, six from the Free State and three from the North West Province for the first time. This study has thus greatly improved our knowledge of the Salticidae biodiversity in the Grassland and Nama Karoo biomes and contributed to a better understanding of the biogeography of South African Salticidae through revised distribution maps. The rich diversity of Salticidae in these two biomes prompts a brief discussion on their ecology and representation in spider communities.

The Grassland Biome is generally dominated by open grass plains, with shrubs and trees only occurring sporadically within this landscape or associated with hills. In a survey of the spider communities associated with three tree/shrub species in the Erfenis Dam Nature Reserve (*Rhus lancea*, *R. ciliata* and *Acacia karroo*), Fourie (2010) recorded only 11 species of Salticidae (20.8% of the total), while she recorded 13 Salticidae species (15.7% of the total) in a comparative study of spider communities in four contrasting grasslands. A year-long pitfall survey at six sites in the reserve yielded 11 Salticidae species (9.1% of the total) (Fourie 2010). Other published studies from the Grassland Biome yielded seven species (7.5%) from abandoned *Trinervitermes trinervoides* termitaria (Haddad & Dippenaar-Schoeman 2002, 2006*a*) and five species (8.8%) from *Themeda triandra* grassland (Haddad 2005).

The more arid Nama Karoo Biome is nearly devoid of trees, except near rivers and on hillsides, and is dominated by short thorny bushes. Grass only occurs in patches on sandy soils. Studies on spider ecology in the Nama Karoo Biome are largely restricted to pistachio orchards, where Salticidae were the most species rich family in ground covers (8 spp., 14.5% of the total) and tree canopies (15 spp., 18.8%), but were only moderately species rich on the ground (7 spp., 8.6% of total) (Haddad *et al.* 2004, 2005; Haddad & Dippenaar-Schoeman 2006*b*). In the only study in a natural habitat in central South African Nama Karoo, two species of Salticidae (3.6% of the total) were collected in a stand of undisturbed Nama Karoo grassland at the same locality (Haddad & Dippenaar-Schoeman 2005).

Thus, in the Grassland and Nama Karoo biomes there are similar numbers of Salticidae species occurring in each habitat stratum. However, when the species richness of other families is taken into account, Salticidae form a relatively higher proportion of species in trees and shrubs, while being less prominent in grasses (Araneidae, Thomisidae, Theridiidae and Linyphiidae are richer) and on the ground (richness dominated by Gnaphosidae and Lycosidae). Additional ecological studies in central South Africa are necessary to give an indication of how persistent this pattern is, and the current study provides a taxonomic base for further investigations into the ecology, distribution and conservation importance of the family in this area.

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