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***May* gen. n. (Araneae: Sparassidae): a unique lineage from southern Africa supported by morphological and molecular features**

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ABSTRACT

A new genus of huntsman spiders, *May* gen. n. is described from southern Africa, together with four new species: *M. bruno* sp. n. (♂, ♀; South Africa), *M. ansie* sp. n. (♂; Namibia), *M. rudy* sp. n. (♂; Namibia) and *M. norm* sp. n. (♀; Namibia). Diagnostic characters proposed include not only those for the genus but also for the so-called African clade. Unique within the entire family are the reduction of the gnathocoxal serrula and the prolateral embolus. Special claw tuft setae and metatarsi I to III with three prolateral and retrolateral spines, respectively, occur in the entire African clade. A proximal cymbial shoulder in the male palp, the fused lateral lobes of the epigyne and the prolateral proximal spine of leg I shifted to a median position is characteristic for *May* gen. n. A family-wide analysis of genetic distance in the nuclear 28S rDNA gene (28S), including *M. bruno* sp. n., supports its isolated placement and thus the genus hypothesis.

KEY WORDS: Afrotropical Region, South Africa, Namibia, Kalahari, sand dunes, claw tuft setae, serrula, spination, copulatory organs, 28S rDNA, molecular taxonomy.

INTRODUCTION

Only a few species of African Sparassidae Bertkau, 1872 are commonly known, since they are either widespread and common (such as *Palystes superciliosus* L. Koch, 1875, known as the “rain spider” and regularly invading gardens and houses) or exhibit special behaviours, such as the “Dancing White Lady” *Leucorchestris arenicola* Lawrence, 1962, with its threatening behaviour, or the “Wheeling Spider” *Carparachne aureoflava* Lawrence, 1962, with the spectacular escaping behaviour, wheeling down the sand dunes of the Namib Desert.

Southern African Sparassidae have been only rarely included in taxonomic revisions. Lawrence described and studied many taxa from southern Africa: seven new genera and 28 new species (World Spider Catalog 2015 and citations therein), 17 of which originate from Namibia, seven from South Africa, two from Angola and one from southern Africa. Recent contributions to the fauna of southern Africa have been few. Croeser (1996) revised the genus *Palystes* L. Koch, 1875 and described the genus *Parapalystes* Croeser, 1996. Jäger and Kunz (2005) published a key to African genera of Sparassidae and a few years later (2010) described one new *Palystes* species. Nørgaard *et al.* (2008a) synonymised a species of the genus *Leucorchestris* Lawrence, 1962 from the Namib Desert. Moradmand (2013) revised the African species of the genus *Eusparassus* Simon, 1903, described five new species and transferred one species from *Olios* Walckenaer, 1837 to *Eusparassus*. Jäger (2014a) described the female of *Olios sjostedti* Lessert, 1921 for the first time and recorded the species for the first time from southern Africa. Moradmand (2015) revised the genus *Pseudomicrommata* Järvi, 1914 in the Afrotropical Region. Reports on biology are even fewer, with Lawrence (1962) and Henschel's (1990,

1997) reports on the biology and behaviour of South African and Namibian species, as well as investigations on the territorial behaviour, vision and navigation of *L. arenicola* (Birkhofer *et al.* 2006; Nørgaard *et al.* 2006, 2008b; Nørgaard 2008).

From material collected by Dirk Kunz in South Africa, a species was recognised as new to science. Since it could not be assigned to any known genus, it was considered to erect a new one for this species. More material from museum collections in Windhoek and Pretoria revealed three more species belonging to the new genus. Several character states make this genus unique among the Sparassidae. An analysis of the genetic divergence of the 28SrDNA gene in different Sparassidae genera supports the erection of the new genus as a unique and isolated taxonomic group.

MATERIAL AND METHODS

The examined spiders are preserved in 70% denatured ethanol. Examination and drawings were carried out with a Leica MZ 16 stereomicroscope with camera lucida attachment. Female copulatory organs were dissected and the sclerotised internal duct system was cleared in 96% DL-lactic acid (C₃H₆O₃). All measurements are given in millimetres.

Prosoma length/width means length/width of the dorsal shield of the prosoma, and opisthosoma length/width the length without petiolus and spinnerets. Leg formula, leg spination pattern and size classes follow Jäger (2001). Bristles at the fang base are in some cases illustrated only as their particular sockets. Palp and leg lengths are listed as: total (femur, patella, tibia, metatarsus, tarsus). Arising points of tegular appendages in males are described as clock-positions of the left pedipalp in ventral view. In schematic illustrations of the internal duct system, the blind ending (glandular) appendage is marked with “T”, the copulatory orifice with a circle (here starting from guiding pockets), and the end of the fertilisation duct in the direction of the uterus externus with an arrow. The new term “fusion bubbles” is introduced for small sclerotised structures situated under the cuticle of the epigyne (Figs 14, 18, 78), indicating a previous fusion of structures (here: lateral lobes), interpreted here as remnants of a former suture (*cf.* “sclerotised bubbles” *sensu* Jäger & Praxaysombath 2009: figs 20–21 or “sclerotised spheres” *sensu* Jäger 2012: figs 1, 18, 22, 24, 27, 30, 55–56, 58, 61; compare also Jäger & Ono 2000: figs 27, 35, 37, 44, 46 and Jäger & Praxaysombath 2011: figs 13, 16, 25). As in Jäger (2005: 88), slit sensilla close to the epigyne are generally considered as a descriptive character. Slit sensilla on the sternum are considered and illustrated for the first time in Sparassidae. Coloration is in most cases described from specimens in ethanol; when images of live specimens were available, an additional description is provided. Maps were produced with DIVA GIS version 7.5.0.0.

To support the status of the new genus, we performed an analysis of genetic distances between distinct taxonomic groups within the Sparassidae. We sequenced an 850 bp fragment of the comparably slowly evolving nuclear 28SrDNA for a large dataset of different Sparassidae species. In addition, we include published 28S data from a previous taxonomic analysis (Jäger *et al.*, in press). Overall, our analysis includes 124 specimens in 19 genera. Primer sequences, PCR and sequencing conditions are described in Jäger *et al.* (in press) and in Krehenwinkel and Tautz (2013). Sequences were edited in CodonCode Aligner (CodonCode Cooperation, USA) and aligned using

MEGA (Tamura *et al.* 2007). We calculated uncorrected pairwise distances between all sequences, treating gaps as an additional character state. To gather insights into expected divergence patterns between and within genera, we first pruned our dataset by removing non-unique alleles. As our dataset contains numerous undescribed and yet unassigned species, we could not unambiguously assign alleles to separate species. For that reason we decided to use only unique alleles. We could only include one *May* species (*May bruno* sp. n.) in our analysis, due to pronounced DNA degradation in the other species. We calculated uncorrected pairwise distances in MEGA for all unique sequences (1) between all distinct genera, and (2) between alleles within each genus. We then compared the divergence of *M. bruno* sp. n. to representatives of all other genera. To visualise distances, we additionally generated a neighbour-joining phylogeny in MEGA. A maximum composite likelihood model of molecular evolution was applied and 1 000 bootstrap replicates were run for the phylogenetic reconstruction.

Abbreviations used in the text: ALE – anterior lateral eye; AME – anterior median eye; AW – anterior width of dorsal shield of prosoma; C – conductor; DS – dorsal shield of prosoma; E – embolus; LL – lateral lobes; OS – opisthosoma; PJ – subsequent reference numbers of Sparassidae individuals as examined by the authors; PL – length of dorsal shield of prosoma; PLE – posterior lateral eye; PME – posterior median eye; PW – width of dorsal shield of prosoma; RTA – retrolateral tibial apophysis; SD – serial number of tissue samples for molecular analyses; I–IV – referring to leg numbers.

Museum collections (with curators):

- NMSA – KwaZulu-Natal Museum, Pietermaritzburg, South Africa (Dai Herbert, Chrizelda Stoffels)
 NCA – National Collection of Arachnida, ARC – Plant Protection Research Institute, Pretoria, South Africa (Robin Lyle, Petro Marais)
 SMF – Senckenberg Museum, Frankfurt, Germany (Julia Altmann, Peter Jäger)
 SMN – State Museum of Namibia, Windhoek (Tharina Bird).

TAXONOMY

Family Sparassidae Bertkau, 1872

“African Clade” *sensu* Moradmand *et al.* 2014

Diagnosis (additional notes below): Tendency of having reduced serrula on gnathocoxae (Figs 33, 60, 63). Specialised claw tuft plates (Figs 20–21, 101–102) with so-called “Lawrence setae” on ventral distal tarsi (Figs 24–25, 44–45, 91–92). Dorsal claw tuft plate (Figs 22, 100) with long setae extending through the normal claw tufts (Figs 61, 76). Ventral transverse suture of tarsi distinct and narrow, running roughly transversely to lateral suture (Figs 20–21, 101–102). Chelicerae usually with 2 anterior and 3 posterior teeth (Figs 10, 32, 53, 88; may be reduced in number, e.g., in *Carparachne* Lawrence, 1962 and *Microrchestris* Lawrence, 1962). Metatarsi III without ventral distal spine. Tarsi I–III 3034 (with fewer lateral spines in other Sparassidae). Female palpal claw stretched (Figs 23, 90).

Genera included: *Arandisa* Lawrence, 1938, *Carparachne*, *Leucorchestris* Lawrence, 1962, *May* gen. n., *Microrchestris*, *Palystella* Lawrence, 1928, *Pseudomicrommata*.

Distribution: Zimbabwe, Botswana, South Africa, Namibia, Angola, Guinea, Ivory Coast, Cameroon, Kenya, Tanzania, Rwanda, Burundi, D.R. Congo (World

Spider Catalog 2015; South African National Survey of Arachnida, SANSA, unpubl.; Moradmand, pers. comm.).

Notes: Some characters listed in the above diagnosis are recorded for the first time within the family Sparassidae. Therefore, the amount of comparative data for other genera or subfamilies is relatively small. Only a random selection of some taxa could be examined and is listed in the following paragraph.

A reduced serrula could not be found in any other Sparassidae. In the following examples the number of denticles of the serrula is listed behind the taxon in square brackets: *Palystella* spp. [0–26, entirely reduced only in few females], *Pseudomicrommata* sp. [32–37], *Palystes* sp. cf. *karooensis* Croeser, 1996 [>40], *Heteropoda* sp. [87], *Olios* sp. [70], *Thelcticopis* sp. [42].

The presence of special setae (with several short sub-setae at their distal end; here called “Lawrence setae”, honouring Reginald F. Lawrence, who discovered many southern African taxa and illustrated this kind of setae for the first time; Lawrence 1962) on the ventral tip of leg tarsi is characteristic for members of the African clade (Figs 20–21, 101–102). In most of the taxa, additional sclerotised plates for these special setae were present (not in *Pseudomicrommata* sp., Fig. 106). Lawrence setae were not recorded in any of the other Sparassidae groups examined.

The prolateral proximal spines of femur I are not shifted into the distal half in most other Sparassidae as, for example, in *Thelcticopis* sp. (Fig. 115) or *Olios* sp. (Fig. 119). Also in the African clade there is no considerable shift of the proximal prolateral spine as, for instance, in *Palystella* sp. (Fig. 104) and *Pseudomicrommata* sp. (Fig. 107). Therefore, this character (shift of the prolateral proximal spine of femur I into distal half) is considered diagnostic for *May* gen. n. exclusively.

Prolateral and retrolateral spines of metatarsi I to III are usually reduced in other lineages of the family, e.g. in Heteropodinae (0–2), Sparianthinae (0), Sparassinae (2), Palystinae (2) and *Eusparassus* (2). Only in metatarsus IV do three pro- and retrolateral spines occur regularly in all Sparassidae taxa.

May gen. n.

Type species: *May bruno* sp. n.

Etymology: This new genus is named for Bruno May for supporting biodiversity research in Africa through BIOPAT e.V. (Patrons for Biodiversity; www-biopat.de); gender masculine.

Diagnosis: Small to medium-sized spiders belonging to the so-called “African clade” (Moradmand *et al.* 2014) with a body length of 8 to 20 mm. Distinguished from other members of this clade by the copulatory organs: males can be recognised by the course of the embolus, arising distally from the tegulum, running prolaterad (Figs 1, 50, 64; retrolaterad in other genera of this clade and almost in all other members of the entire family) and the short and compact RTA (at least one branch elongated in other members). Moreover, the proximo-retrolateral cymbium exhibits a distinct “shoulder” (Figs 4, 50, 59, 67, 75), whereas such a structure is missing in other members of the African clade. Females with epigynal furrows not reaching epigastric furrow, i.e. lateral lobes fused, indicated by “fusion bubbles” (Figs 11, 14, 17, 78, 81, 86). Serrula is dramatically reduced, i.e. in most cases entirely, in both sexes (Figs 33, 60, 63; some females of the

African clade also show an entire reduction, usually males and females of this group show up to 37 denticles in their serrula). Leg I shortest, not leg III as in all other Sparassidae; femora I with prolateral spines shifted into distal half, i.e. proximal prolateral spine almost reaching medial dorsal spine (Figs 7, 43, 57, 72, 93, 99).

Description: Widest point of DS in posterior half, close to coxa II and III; PL/PW 1.19–1.23 in males, 1.18–1.22 in females; fovea mostly above coxa III, may be situated more anteriorly above coxa II. Sternum broadest between posterior part of coxa II to anterior part of coxa III, with 3 pairs of lateral extensions, 3 pairs of double slit sense organs plus additional single slit sense organs posteriorly, long setae on entire sternum, single pair of dense setae brushes at posterior margin (Fig. 86). Opisthosoma: oval, OL/OW 1.53–1.69 in males, 1.54–1.61 in females. Eyes: in two rows, both rows recurved when viewed from above (Figs 6, 31, 54, 68, 87). Chelicerae: with 2 anterior and 3 posterior teeth, without denticles in between them, fang base ventrally with 1 to 9 bristles (Figs 10, 32, 53, 88; insertion sockets only partly illustrated). Palps in both sexes with two rows of elongated setae forming functional basket (Figs 40, 50, 58, 64–65, 73–74; most likely to dig burrows in loose sand/transport sand out of the burrow, as known for *Cebrennus* spp.; Jäger 2000, 2014b). Legs: length in most cases 2143 (n=5), also 2431 (n=3), 3421/4231 (n=1). Legs laterigrade (Figs 43, 48, 96), spination pattern following general pattern of Sparassidae with the following exceptions: Spination (only common patterns for all four species are listed): palp: 131; legs: femur I–III 323, IV 322; patella: variable, as in other Sparassidae, posterior patellae generally with more spines; tibia I–IV 22(3)26; metatarsus I–III 3034, IV 3037. Scopulae on tarsi and metatarsi moderately dense to sparse. Palpal claw in females present, elongated, with 8 to 12 long teeth (Figs 23, 90). Metatarsal stopper (*sensu* Ramírez 2014) not developed as the usual trilobate membrane, known to be apomorphic for Sparassidae, but with median hook and lateral projections only weakly (Fig. 30) to well developed (Figs 69, 89).

Coloration (in ethanol; Figs 34–39, 55–57, 70–72, 94–99): Pale brown to pale yellow, without distinct pattern; conspicuous white setae on prosoma, especially at clypeus and along margin, dark setae in front of and on spinnerets. Coloration (of live specimens; Figs 48–49, only known from one species): setae white to shimmering pink.

Male palp (Figs 1–4, 41–42, 50–52, 58–59, 64–67, 73–75): Cymbium with variable shapes. Tegulum extending over the largest part of alveolus, with spermophor running along prolateral margin and S-shaped on retrolateral side; embolus and membranous conductor arising in distal half from tegulum. Embolus relatively short, situated in distal part of alveolus, arising from retrolateral to distal part of tegulum, running prolaterally. Female copulatory organ (Figs 11–19, 78–85): Characterised by fused lateral lobes, i.e. epigynal ledges not reaching posteriorly epigastric furrow. Epigyne with atrium and guiding pockets leading to copulatory ducts. Internal duct system consisting of spherical spermathecae, short copulatory ducts and fertilisation ducts. Epigynal field slightly longer than wide, anteriorly converging, with or without one pair of slit sensilla.

Distribution: South Africa, Namibia (Fig. 120). Occurring most likely also in Botswana.

Species included: *M. bruno* sp. n., *M. ansie* sp. n., *M. rudy* sp. n., *M. norm* sp. n.

Biology: Not many observations could be made on live specimens so far. Spiders live in arid environments. One spider was observed in a burrow in a sand dune, while others were active during the night, running on the ground on gravel.

May bruno sp. n.

Figs 1–49, 120

Etymology: This new species is named for Bruno May, for supporting biodiversity research through BIOPAT e.V. (Patrons for Biodiversity; www-biopat.de); noun (name) in apposition.

Diagnosis: Medium-sized Sparassidae of the African clade with a body length of 18 mm in males and 16.8 to 19.8 in females. Males recognisable by cymbium a bit wider than tibia, with blunt tip, i.e. widest part close to tip (Fig. 1); embolus with long distal part, narrowing continuously to filiform tip (Fig. 3). Females may be recognised by a V- to U-shaped posterior margin of the atrium (Figs 11, 14, 17–18) and two pairs of spherical structures in the internal duct system (Figs 12–13, 15, 19).

Description:

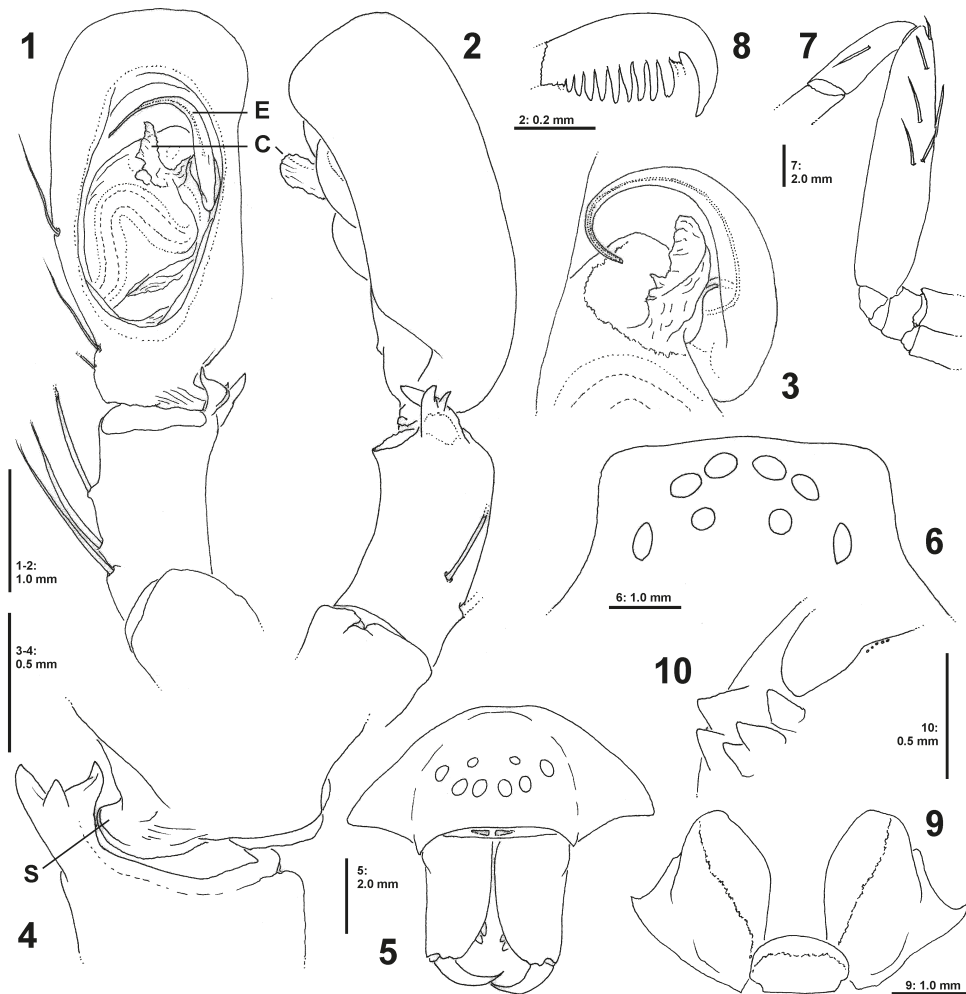
Male (holotype, PJ 3523).

DS length 9.0, width 7.4, anterior width 4.3, OS length 9.0, width 5.9. Eyes (Figs 5–6): AME 0.54, ALE 0.51, PME 0.36, PLE 0.56, AME–AME 0.20, AME–ALE 0.05, PME–PME 0.75, PME–PLE 0.52, AME–PME 0.46, ALE–PLE 0.45, clypeus height at AME 0.80, at ALE 0.95. Spination: palp: 131, 101, 2111, 2000; legs: femur I 3(4)23, II 323, III 32(3)3, IV 322; patella I–IV 101; tibia I–IV 2226; metatarsus I–III 3034, IV 3037. All metatarsi with dense scopula ventrally, metatarsus IV with few bristles mainly proximally in scopula. Tarsus I ventrally with 9 claw slit sensilla (*sensu* Ramirez 2014) in distal transverse suture (cf. Fig. 20). Leg formula: 2431. Measurements of palp and legs: palp 11.6 (4.0, 1.8, 2.1, -, 3.7), leg I 37.9 (10.0, 4.3, 9.8, 9.3, 4.5), leg II 42.1 (11.3, 4.6, 11.0, 10.3, 4.9), leg III 38.3 (11.0, 4.2, 9.9, 9.0, 4.2), leg IV 41.3 (12.0, 4.2, 10.5, 10.1, 4.5). Cheliceral furrow without denticles; promargin of chelicerae with 2 teeth, retromargin with 3 teeth, the proximal teeth fused at their base; with 5–6 bristles at fang base (Fig. 10). Gnathocoxae without serrula. Metatarsal stopper with very weak median hook and lateral projections [cf. Fig. 30; similar to that in *Cerbalus pulcherrimus* (Simon, 1880)]. Palp as in diagnosis (Figs 1–4, 41–42): Cymbium distally with dense brush of strong bristles, with weakly concave retrolateral side. Embolus arising at 2 to 2.30 o'clock from tegulum, proximal part sickle-shaped, transversal to distal part, distal tip of embolus with spermophor opening distally. Conductor arising at 1.30 o'clock from tegulum, distad. Spermophor running distinctly S-shaped across tegulum. Haematodochae visible in proximo-retrolateral part of alveolus. RTA short, extending barely beyond the cymbial "shoulder", with three distal tips, distad. Prolateral tibial spines forming with additional long setae on tibia one conspicuous row, another row formed by long setae on ventral tibia.

Coloration (Figs 34–36, 43): Yellowish brown without distinct pattern. DS with longitudinal fovea. White hairs present around eyes, along DS margins, on parts of chelicerae and legs, on parts of OS. Spinnerets and ventral area anterior of spinnerets with brown hairs.

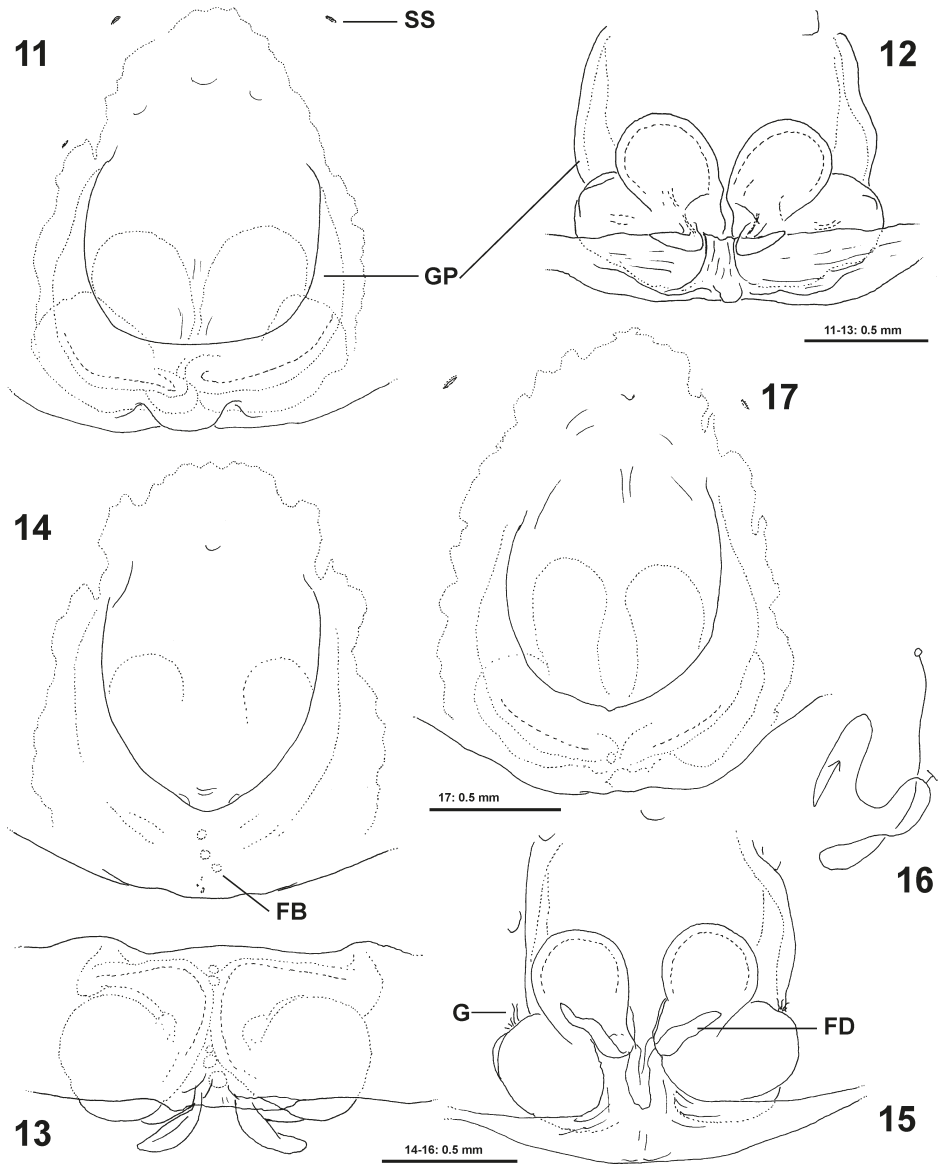
Female (paratype, PJ 3524).

DS length 9.8, width 8.1, anterior width 5.1, OS length 10.0, width 6.5. Eyes (Fig. 31): AME 0.58, ALE 0.55, PME 0.38, PLE 0.60, AME–AME 0.25, AME–ALE 0.04, PME–PME 0.86, PME–PLE 0.55, AME–PME 0.68, ALE–PLE 0.55, clypeus height



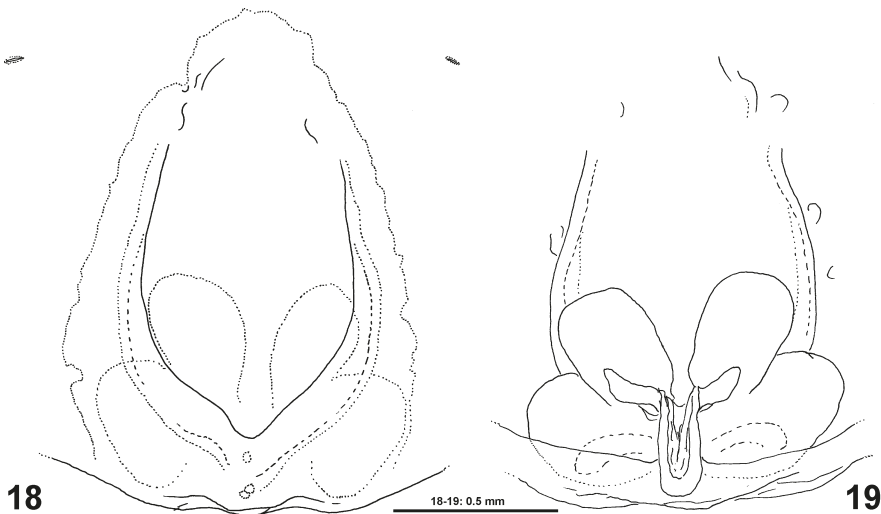
Figs 1–10. *May bruno* gen. n. sp. n. from Witsand, South Africa, holotype ♂: (1–4) left ♂ palp (1) ventral, (2) retrolateral, (3) distal tegulum, prolateral, (4) RTA, dorsal; (5–6) eye arrangement (5) frontal, (6) dorsal); (7) leg I, prolateral; (8) leg claw; (9) gnathocoxae and labium, ventral; (10) cheliceral dentition, ventral. Abbreviations: C – conductor; E – embolus; S – “shoulder” of basal cymbium.

at AME 0.90, at ALE 0.98. Spination: palp: 131, 101, 2121, 1014; legs: femur I 323, II 323(4), III 322, IV 322; patella I–IV 101; tibia I–IV 2226; metatarsus I–III 3034, IV 3037. All metatarsi with dense scopula, metatarsus IV ventrally with double row of bristles, hidden in scopula. Tarsus I ventrally with 13 claw slit sensilla (*sensu* Ramírez 2014) in distal transverse suture (Fig. 20). Leg formula: 2431. Measurements of palp and legs: palp 13.3 (4.0, 1.9, 2.7, -, 4.7), leg I 33.7 (8.9, 4.5, 8.4, 8.0, 3.9), leg II 37.8 (10.7, 4.7, 9.6, 8.6, 4.2), leg III 34.6 (10.0, 4.2, 8.9, 8.5, 4.1), leg IV 37.2 (11.5, 4.2, 8.9, 8.5, 4.1). Cheliceral furrow without denticles; promargin of chelicerae with 2 teeth, retromargin with 3 teeth (Fig. 32); with 7–9 bristles at fang base. Palpal claw with 10 teeth (Fig. 23), claw of leg I with 10–12 teeth (Fig. 21). Gnathocoxae without serrula.



Figs 11–17. *May bruno* gen. n. sp. n. from South Africa, ♀ paratypes from Witsand, South Africa (11–13) PJ 3524, (14–16) PJ 3525, (17) PJ 3526): (11, 14, 17) epigyne, ventral; (12, 15) vulva, dorsal; (13) vulva, posterior; (16) schematic course of internal duct system, dorsal. Abbreviations: FB – fusion bubbles; FD – fertilisation ducts; G – glands; GP – guiding pockets; SS – slit sensilla.

Metatarsal stopper (*sensu* Ramírez 2014) not developed as the usual trilobate membrane, known to be apomorphic for Sparassidae, but with only central area membranous and pale, lateral parts slightly sclerotised; median hook extending slightly beyond lateral projections [Fig. 30; similar to that in *Cerbalus pulcherrimus*].



Figs 18–19. *May bruno* gen. n. sp. n., ♀ from Twee Riviere, South Africa (PJ 3536): (18) epigyne, ventral; (19) vulva, dorsal.

Copulatory organ as in diagnosis (Figs 11–19): Epigynal field longer than wide, anteriorly converging, with one pair of slit sensilla. Posterior margin with median bulge (Figs 11, 18). Anterior margins of atrium with lateral guiding pockets leading to copulatory openings. Copulatory ducts with glandular parts in latero-posterior spherical structures, leading to medio-anterior spherical parts, then to fertilisation ducts.

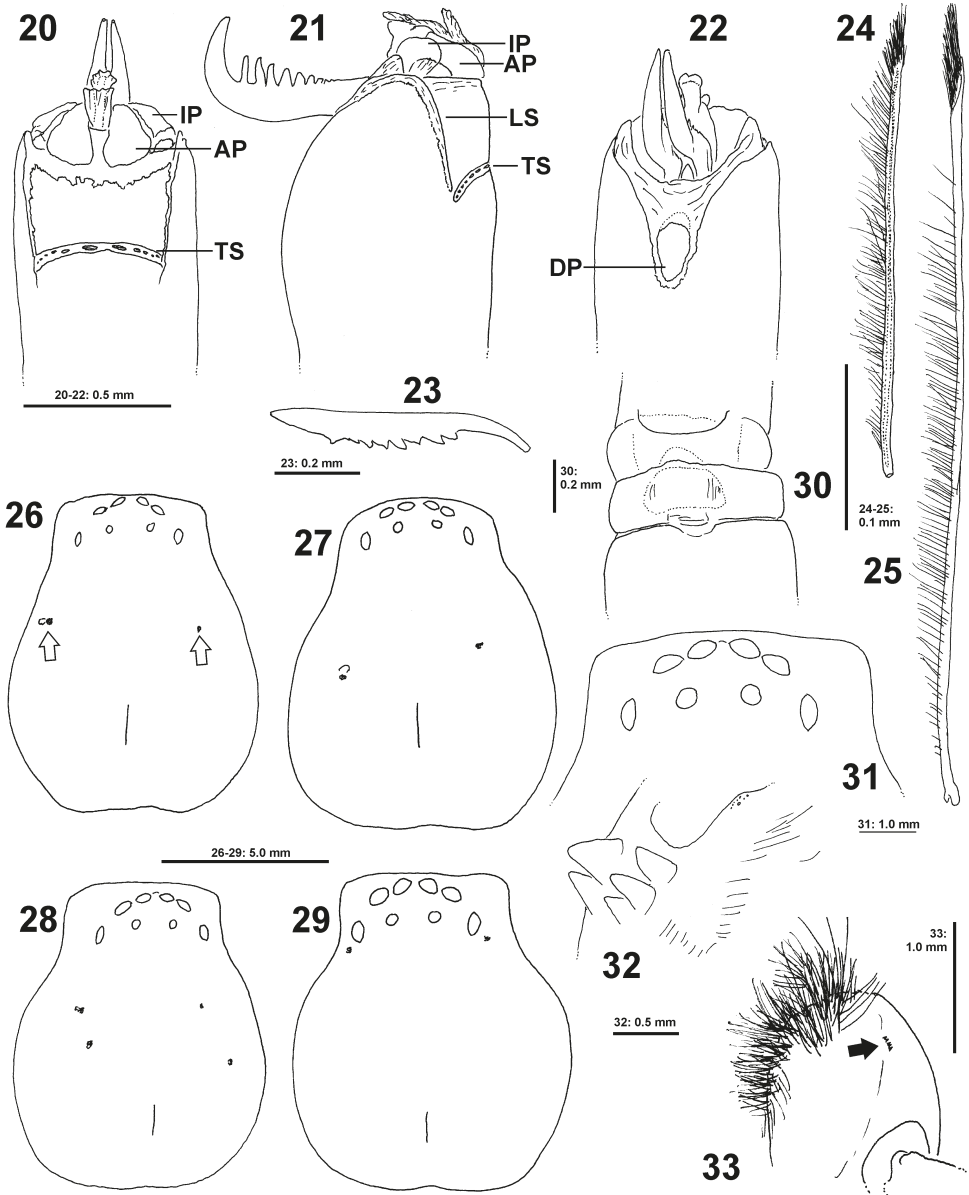
Coloration (Figs 37–39): As in male, but DS with indistinct median patch around fovea. Live spiders with slight pink shimmer (Figs 48–49).

Variation: Males ($n=3$): DS length 7.9–9.8. OS length 8.8–9.3 (OS of PJ 3526 shrivelled). Spination: Palpal patella 001(2), tarsus 1004/1003; femur I 3(4)23, III 324/3(4)23, IV 32(3)2[distal dorsal spine doubled]/3(4)22; tibia III 2126. Palpal claw with 8–9 teeth. Tarsus I ventrally with 10, tarsus III with 11, tarsus IV with 9–12 claw slit sensilla in distal transverse suture. Gnathocoxae with reduced serrula of 6 (right) and 2 (left) (PJ 3526) or with 10 (right) and no (left) (PJ 3525) denticles (Fig. 33). Chelicerae with 3/2 posterior teeth and 4–6 bristles at fang base (PJ 3536). DS with broad slightly darker median band rather than patch. Epigynal field without slit sensilla (Fig. 14), in specimens from Twee Riviere longer and more distinctly V-shaped (Fig. 18). Posterior margin without bulge (Figs 14, 17). Epigyne with fusion bubbles in posterior part (Figs 14, 17–18).

Holotype ♂ (PJ 3523): SOUTH AFRICA: *Northern Cape*: Kalahari, Witsand Nat. Res., white dunes, 28°33.606'S 22°28.972'E, 1198 m, D. Kunz leg., 13.xii.2004, DK 212 (SMF).

Paratypes: 1♀ (PJ 3524), same data as holotype but 28°33.517'S 22°29.043'E, J. Jessnitz leg., 11.xii.2004, DK 209 (SMF). 1♀ (PJ 3525), same data as holotype but 28°32.710'S 22°29.759'E, 1222 m, DK 214 (NCA). 1♀ (PJ 3526), same data as holotype but 28°32.961'S 22°29.558'E, 1220 m, DK 213, SD 356 (SMN).

Other material examined: SOUTH AFRICA: *Northern Cape*: 1♀ (PJ 3536), Kalahari, Twee Rivieren [Rest Camp] [26°28'20.55"S 20°36'42.31"E, 883 m], W. Haacke leg. 4.i.1967, sub *Nisueta kolosvaryi*, SD 1204 (NMSA 20250). 1 juvenile (PJ 3527), same data as holotype but 28°33.518'S 22°29.019'E, 1195 m, hiding in burrow under tussock, dug out from 20–30 cm depth, at night, J. Jessnitz leg., 11.xii.2004, DK 208, SD 361 (SMF).



Figs 20–33. *May bruno* gen. n. sp. n. from South Africa (♀ paratypes from Witsand, ♀ from Twee Rivieren): (20–22) tarsus tip: (20) ventral, (21) lateral, (22) dorsal); (23) ♀ palpal claw, lateral; (24–25) Lawrence setae; (26–29) prosoma of ♀♀, showing positions of dorsal marks (white arrows in Fig. 26); (30) metatarsal stopper, dorsal; (31) eye arrangement, dorsal; (32) cheliceral dentition, ventral; (33) gnathocoxae, ventro-distal, showing reduced serrula (black arrow). Abbreviations: AP – plate of Lawrence setae; DP – dorsal plate of elongated setae; IP – plate of indented claw tuft setae; TS – transverse suture with slit sensilla.



Figs 34–45. *May bruno* gen. n. sp. n. from Witsand, South Africa (34–36, 41–43) holotype ♂; (37–40, 44–45) ♀ paratype, PJ 3524. (34–39, 43) habitus of preserved spiders: (34, 37) dorsal; (35, 38) ventral; (36, 39, 43) frontal; (40) palp of ♀, lateral, showing rows of elongated setae; (41–42) palp of ♂: (41) ventral, (42) retrolateral; (44–45) tarsal tips, showing light-coloured indented claw tuft setae (white arrow), additional dark claw tufts with Lawrence setae (black arrow), and scopula hairs (grey arrow): (44) ventral, (45) lateral.



Figs 46–49. *May bruno* gen. n. sp. n. from Witsand, South Africa: (46) habitat; (47) burrow with opened lid; (48–49) habitus of live spider. (Figs 46–47, 49) by Jon Leroy; (48) by Dirk Kunz.

Distribution: Only known from the Witsand Nature Reserve (type locality) and the Twee Rivieren Rest Camp, Northern Cape, South Africa (Fig. 120).

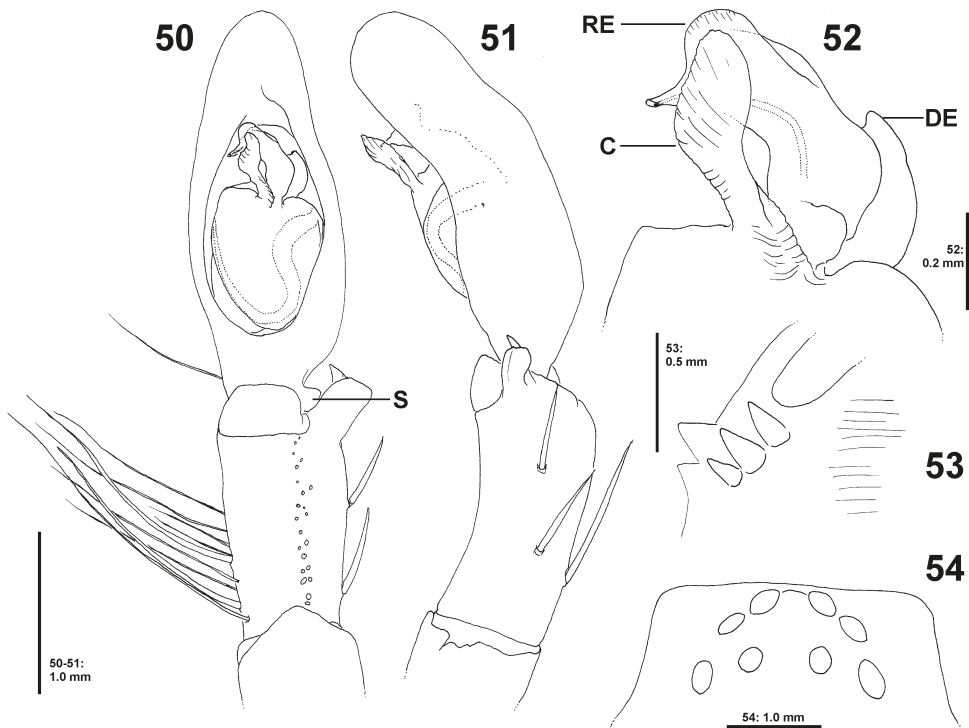
Biology: Spiders live in sand dunes (Fig. 46). According to one label, spiders of this species dig burrows, leading 20–30 cm in the ground. The burrow is closed with a lid (Fig. 47). The specialised elongated hairs situated in a row on the palps are most likely functionally connected to this digging behaviour, as is also known for species of *Cebrennus* Simon, 1880 (Jäger 2000, 2014b) or *Leuorchestris* (Henschel 1990).

An interesting observation concerns the prosoma: at the dorsal side of all female specimens at least two small sclerotised areas could be found (Figs 26–29, 39: arrows). From their irregular shapes and their arrangement they seem to be healed injuries. In three females there was one scar on each side, in the fourth female there were two such pairs of scars. The male lacked such marks. Although no evidence is given from observations on live spiders, it may be the case — considering the distance of the scars and the span of the opened male fangs — that the scars could be part of a pre-copulatory courtship behaviour. Such behaviour is known from the genus *Eusparassus*, where it was observed that the male bit the female in the petiolus (Moradmand 2013).

***May ansie* sp. n.**

Figs 50–63, 120

Etymology: This new species is named for Ansie Dippenaar-Schoeman, for her important and manifold contributions to arachnological research in Africa. Moreover, she is a wonderful person; noun (name) in apposition.



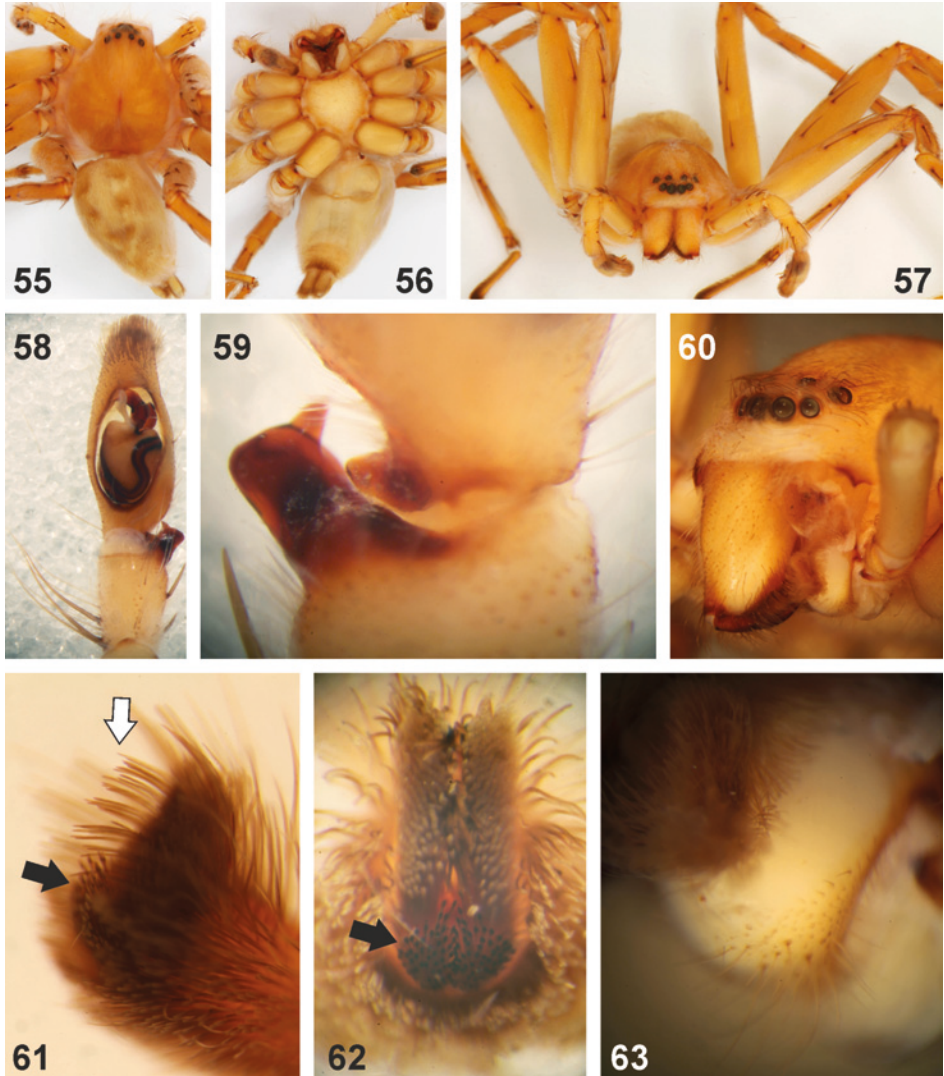
Figs 50–54. *May ansie* gen. n. sp. n., holotype ♂ from Kokerboom Forest, Namibia: (50–52) left ♂ palp: (50) ventral, (51) retrolateral, (52) detail of embolus, ventral; (53) chelicerae, ventral; (54) eye arrangement, dorsal. Abbreviations: C – conductor; DE – dorsal extension of proximal embolus; RE – round extension of distal embolus; S – “shoulder” of basal cymbium.

Diagnosis: Medium-sized spiders of the African clade with body length 13 to 13.2 mm in males. Cymbium narrow, as wide as tibia, widest point in proximal half (Figs 50, 58). Embolus stout with concave distal part and subdistal round extension (Fig. 52).

Description:

Male (holotype, PJ 2281).

DS length 6.3, width 5.3, anterior width 2.9, OS length 6.7, width 4.0. Eyes (Fig. 54): AME 0.40, ALE 0.32, PME 0.26, PLE 0.34, AME–AME 0.16, AME–ALE 0.05, PME–PME 0.50, PME–PLE 0.30, AME–PME 0.30, ALE–PLE 0.30, clypeus height at AME 0.53, at ALE 0.61. Spination: palp: 131, 001, 2121 (1010); legs: femur I–III 323, IV 322; patella I–IV 101; tibia I–IV 2226; metatarsus I–III 3034, IV 3037. All metatarsi with sparse scopula; leg IV ventrally with double row of bristles along entire length and additional rows in distal half. Tarsus IV ventrally with 6–7 claw slit sensilla (*sensu* Ramírez 2014) in distal transverse suture. Leg formula: 431. Measurements of palp and legs: palp 8.7 (3.0, 1.2, 1.9, –, 2.6), leg I 29.7 (7.5, 3.0, 7.8, 7.9, 3.5), leg II – (8.7, 3.2, 9.0, 8.9, –), leg III 30.4 (8.2, 3.0, 7.9, 8.0, 3.3), leg IV 32.2 (9.2, 2.7, 8.5, 8.5, 3.3). Cheliceral furrow without denticles; promargin of chelicerae with 2 teeth, retromargin with 3 teeth; with 1 bristle at fang base (Fig. 53). Gnathocoxae without serrula (Figs 60, 63). Palp as in diagnosis (Figs 50–52, 58–59): Cymbium distally with dense brush of strong



Figs 55–63. *Mayansie* gen. n. sp. n. from Kokerboom Forest, Namibia (55–57, 61–62) ♂ paratype; (58–60, 63) holotype ♂: (55–57, 60) habitus of preserved spider: (55) dorsal, (56) ventral, (57) frontal, (60) fronto-lateral [left chelicerae removed]; (58–59) ♂ palp: (58) ventral, (59) RTA, dorsal; (61–62) tarsal tips, showing additional claw tufts with Lawrence setae (black arrows) and dorsal setae (white arrow) penetrating the claw tuft: (61) lateral, (62) ventral; (63) gnathocoxae, frontal, showing absence of serrula.

bristles, with weakly developed retrolateral bulge. Embolus arising at 1 o'clock from tegulum, distal tip pointed with spermophor opening distally, proximal part with dorsal extension. Conductor arising at 12 to 12.30 o'clock from tegulum, distad. Spermophor running prolaterally submarginally, on retrolateral side slightly S-shaped. RTA short, extending barely beyond the cymbial "shoulder", with one distal tip, sharply pointed and disto-mediad. Prolateral tibial spines forming with additional long setae on tibia

one conspicuous row, another row formed by long setae on ventral tibia (Figs 50, 58). Coloration (Figs 55–57): Yellowish brown without distinct pattern. DS with longitudinal fovea. DS with white hairs around eyes, along DS margins and around fovea, in central part with brown hairs. Sternum, coxae, legs, gnathocoxae and labium light yellow, the two latter with white distal half and lip, respectively. OS dorsally with longer light and brown hairs, ventrally only with light hairs, except for part in front of spinnerets and spinnerets partially with long dark hairs.

Female. Unknown. The subadult female exhibits a pre-epigyne and pre-vulva that must not be confused with an epigyne and vulva of an adult female.

Variation: Male (n=1): DS length 6.1. OS length 7.1. Spination: Palpal patella 002, tarsus 0000 (only with bristles, without spines); tibia I 3236, II 3236/2226. Chelicerae with 3 posterior teeth, with proximal two fused at their base.

Holotype ♂ (PJ 2281): NAMIBIA: *Karas*: Kokerboom forest, 26°28'S 18°14'E, 1127 m, E. Griffin leg., 16.x.1984, SD 1205 (SMN 42866).

Paratype: 1 ♂ (PJ 2282), same data as holotype (SMF).

Other material examined: 1 subadult ♀ (PJ 2283), same data as holotype, SD 1206 (SMN 42866).

Distribution: Only known from the type locality (Fig. 120).

May rudy sp. n.

Figs 64–77, 120

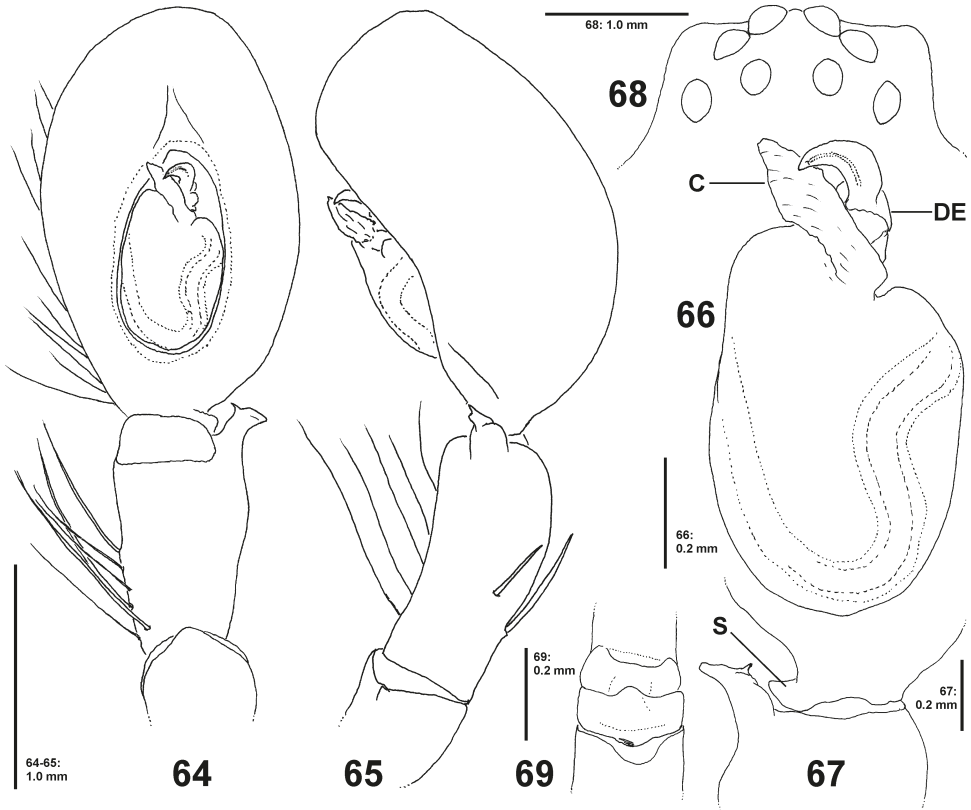
Etymology: This new species is named for Rudy Jocqué, for his important and manifold contributions to arachnological research in Africa; moreover, he inspired many arachnologists through his (sometimes unconventional) thoughts and ideas; noun (name) in apposition.

Diagnosis: Small Sparassidae with body length of 8.1 mm in males. Cymbium voluminous, much wider than tibia, leaving bulbous genitalis as small oval in the centre (Figs 64–65, 73–74). Embolus stout, sickle-shaped (Fig. 66). Female unknown.

Description:

Male (holotype, PJ 3537).

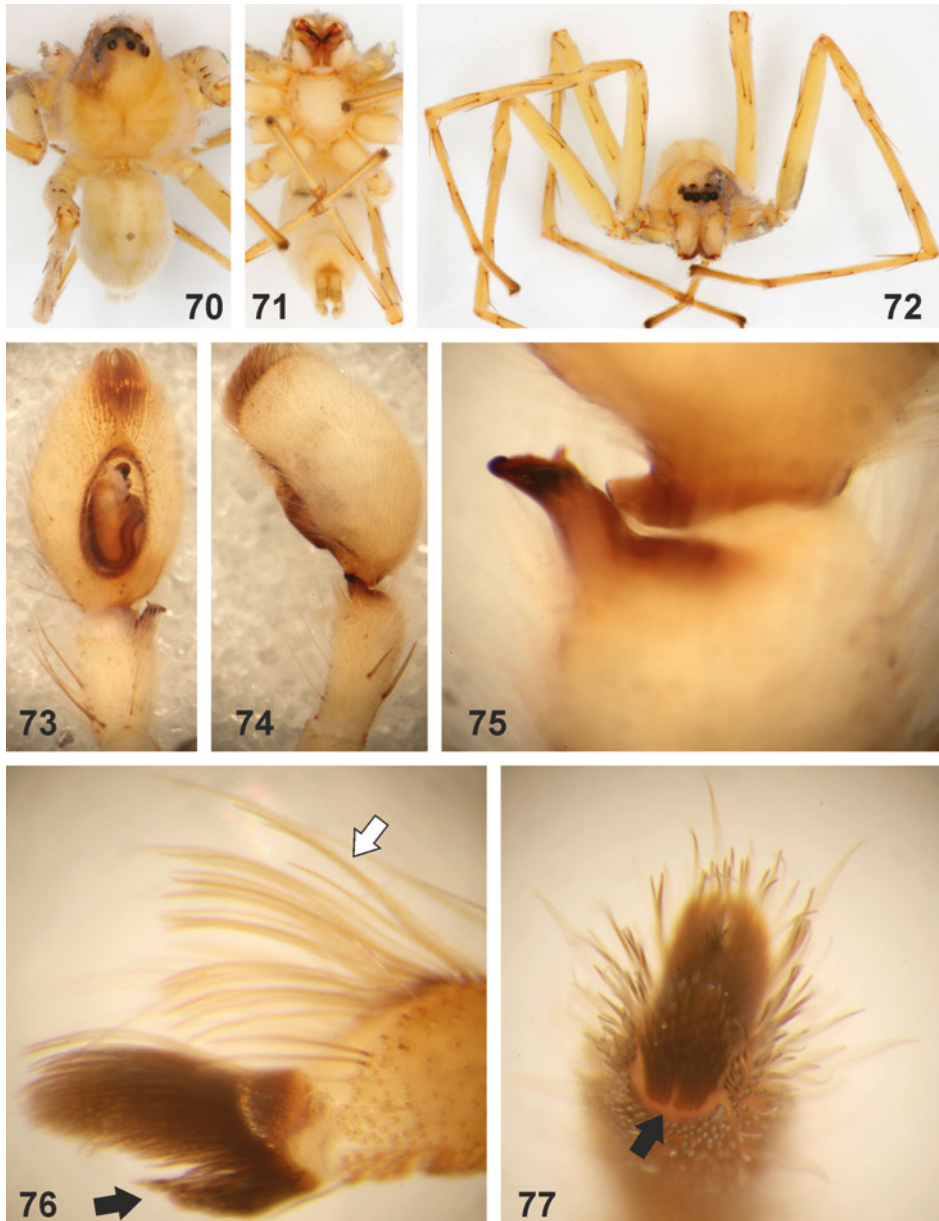
DS length 3.7, width 3.2, anterior width 1.8, OS length 4.4., width 2.6. Eyes (Fig. 68): AME 0.31, ALE 0.29, PME 0.19, PLE 0.30, AME–AME 0.09, AME–ALE 0.00, PME–PME 0.32, PME–PLE 0.23, AME–PME 0.23, ALE–PLE 0.20, clypeus height at AME 0.30, at ALE 0.35. Spination: palp: 131, 001, 2111; legs: femur I 323, II 323(4), III 323, IV 322; patella I–II, III 001, IV 101; tibia I 2226, II 1126, III–IV 2226; metatarsus I–II 3034, III 3024, IV 3037. All metatarsi with sparse scopula; legs III and IV with double row of bristles along entire length, continued with high number of bristles on tarsus in leg IV. Tarsi with scopula well developed, tarsus III ventrally with 5 claw slit sensilla (*sensu* Ramírez 2014) in distal transverse suture. Leg formula: 2431. Measurements of palp and legs: palp 5.9 (1.9, 0.9, 1.2, -, 1.9), leg I 19.7 (5.0, 2.0, 5.4, 5.1, 2.2), leg II 21.5 (5.4, 2.0, 6.1, 5.6, 2.4), leg III 20.2 (5.3, 1.9, 5.6, 5.3, 2.1), leg IV 21.1 (5.7, 1.7, 5.9, 5.5, 2.3). Cheliceral furrow without denticles; promargin of chelicerae with 2 teeth, retromargin with 3 separated teeth; with 2 bristles at fang base. Both gnathocoxae without serrula. Metatarsal stopper (*sensu* Ramírez 2014) with median hook and lateral projections weakly developed, median hook slightly extending beyond lateral projections (Fig. 69).



Figs 64–69. *May rudy* gen. n. sp. n., holotype ♂ from Copper Valley, Namibia: (64–67) left ♂ palp: (64) ventral, (65) retrolateral, (66) tegulum, ventral, (67) RTA, dorsal; (68) eye arrangement, dorsal; (69) metatarsal stopper, dorsal. Abbreviations: C – conductor; DE – dorsal extension of proximal embolus; S – “shoulder” of basal cymbium.

Palp as in diagnosis (Figs 64–67, 73–75): Cymbium distally with dense brush of strong bristles. Bulbus genitalis small, half the length or width of cymbium. Embolus arising at 12.30 o’clock from tegulum, distal part sickle-shaped, proximal part with dorsal extension, with spermophor opening subdistally on ventral side. Conductor arising at 12.30 o’clock from tegulum, prolaterodistad. Spermophor running prolaterally submarginally, on retrolateral side slightly S-shaped. RTA short, extending barely beyond the cymbial “shoulder”, with two distal tips, the inner small one sharply pointed and mediad, the outer larger, blunt. Proximal tibial spines forming with additional long setae on tibia and cymbium one conspicuous row (Fig. 64), another row formed by long setae on ventral tibia (Fig. 65).

Coloration (Figs 70–72): Yellowish brown without pattern. DS with longitudinal foveae; white hairs present along DS margins. Sternum, legs, gnathocoxae and labium pale yellowish, latter two with distal white half and lip, respectively. Opisthosoma dorsally with light and dark setae, heart patch without dark setae; ventrally light, epiandrous



Figs 70–77. *May rudy* gen. n. sp. n., holotype ♂ from Copper Valley, Namibia: (70–72) habitus of preserved spider: (70) dorsal, (71) ventral, (72) frontal; (73–75) ♂ palp: (73) ventral, (74) retrolateral, (75) RTA, dorsal; (76–77) tarsal tips, showing additional claw tufts with Lawrence setae (black arrows) and claw tuft penetrating dorsal setae (white arrow): (76) lateral, (77) ventral.

spigots in two patches; spinnerets ventrally and ventral area anterior of spinnerets with dark setae.

Female. Unknown.

Holotype ♂ (PJ 3537): NAMIBIA: *Erongo*: E Brandberg, Copper Valley, 21°05'S 14°14'E, 496 m, ground at night, E. Griffin leg., 27.x.1999, SD 1209 (SMN 44496).

Distribution: Only known from the type locality (Fig. 120).

May norm sp. n.

Figs 78–99

Etymology: This new species is named for Norman (“Norm”) Platnick, New York, for his eminent contributions to arachnological research and especially for his work on the most-used tool in arachnology, the World Spider Catalog; noun (name) in apposition.

Diagnosis: Small to medium-sized Sparassidae of the African clade with body length of 8.1–11.6 in females. Females may be recognised by two bow-shaped lateral margins of the atrium (Figs 78, 81) and one pair of spherical structures in the internal duct system (Figs 79, 82, 84). Male unknown.

Description:

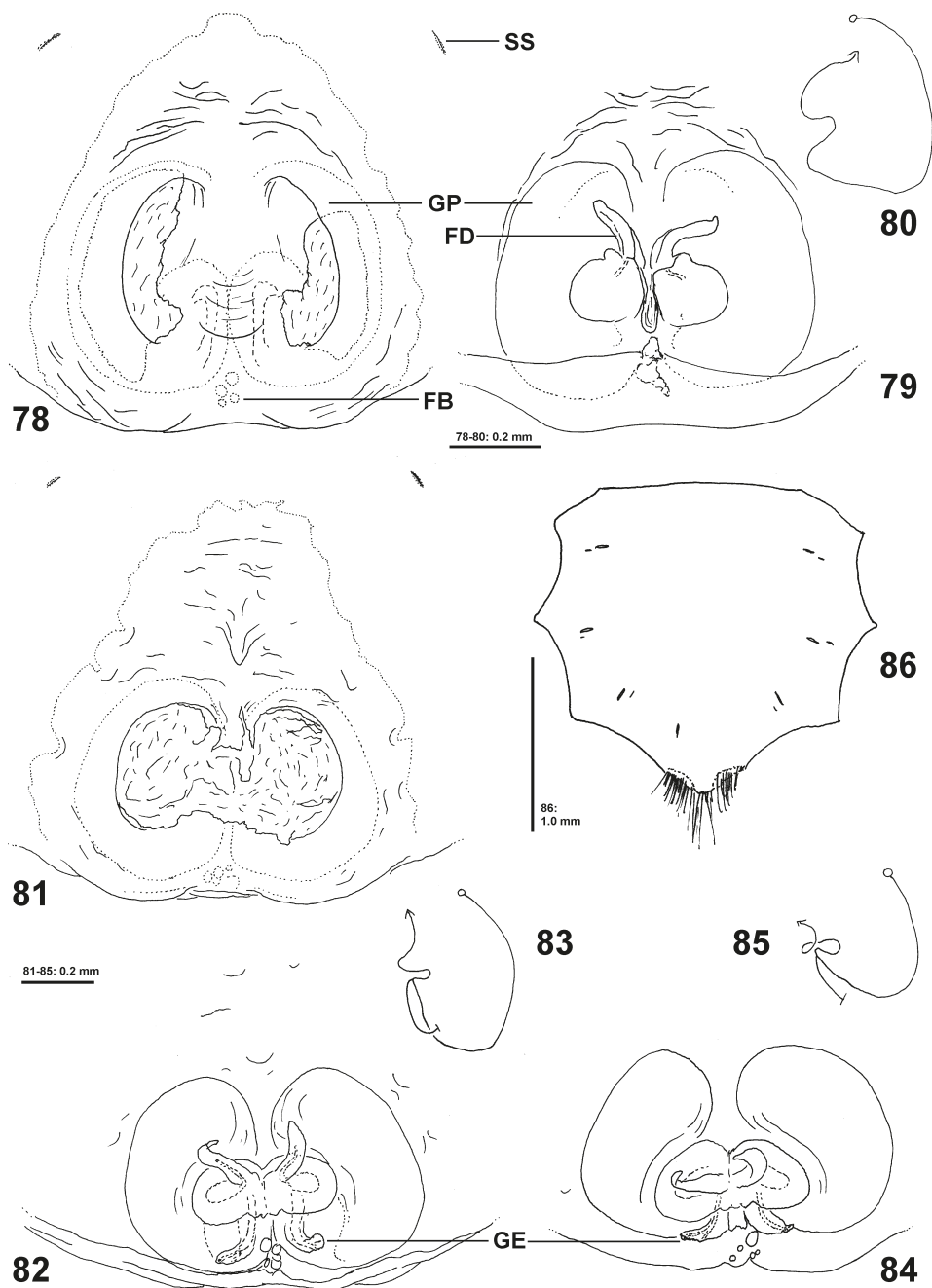
Female (holotype, PJ 1851).

DS length 3.9, width 3.3, anterior width 2.0, OS length 4.5, width 2.8. Eyes (Fig. 87): AME 0.32, ALE 0.40, PME 0.20, PLE 0.60, AME–AME 0.05, AME–ALE 0.01, PME–PME 0.30, PME–PLE 0.29, AME–PME 0.34, ALE–PLE 0.21, clypeus height at AME 0.26, at ALE 0.31. Spination: palp: 131, 001, 0110, 0012; legs: femur I–III 323, IV 322; patella I 000, II–III 100, IV 101; tibia I 23(2)26, II–IV 2326; metatarsus I–III 3034, IV 3037. All metatarsi with moderately dense to sparse scopula, metatarsus IV ventrally with double row of bristles, continued with only few bristles in tarsus. Tarsus II ventrally with 6 claw slit sensilla (*sensu* Ramírez 2014) in distal transverse suture. Leg formula: 3421. Measurements of palp and legs: palp 6.4 (1.9, 1.0, 1.4, -, 2.1), leg I 17.2 (4.9, 2.1, 4.6, 3.9, 1.7), leg II 18.7 (5.6, 2.2, 5.0, 4.1, 1.8), leg III 19.2 (5.5, 2.1, 4.8, 4.0, 1.8), leg IV 19.0 (6.0, 2.0, 5.0, 4.2, 1.8). Cheliceral furrow without denticles; promargin of chelicerae with 2 teeth, retromargin with 3 teeth (Fig. 88); with 1 bristle at fang base. Palpal claw with 10 teeth, claw of leg IV with 7 teeth.

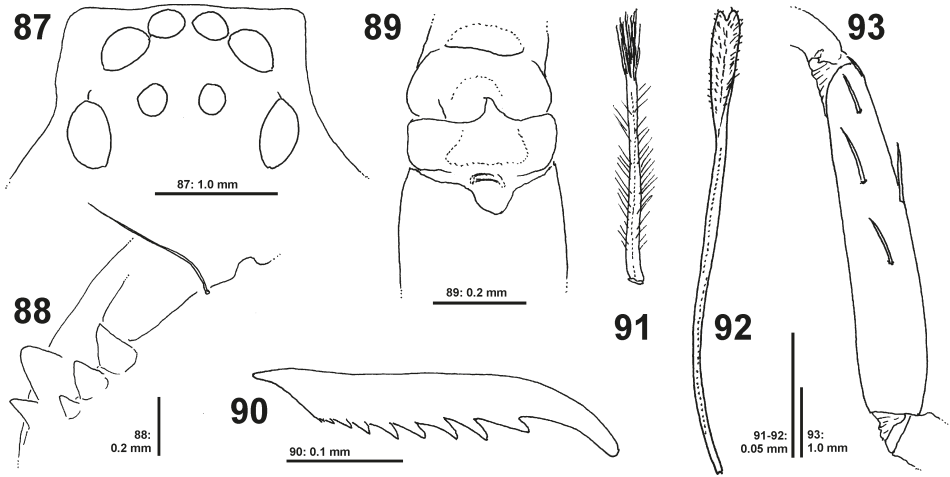
Palp with two rows of long setae on femur, tibia and tarsus forming a basket. Sternum with 3 pairs of doublets of slit sense sensilla, each doublet consisting of a larger and a smaller sensillum (cf. Fig. 86). Sternum ventrally and chelicerae frontally with long bristles. Gnathocoxae without serrula. Metatarsal stopper (*sensu* Ramírez 2014) with lateral projections weakly developed, median hook well extending beyond lateral projections (Fig. 89).

Copulatory organ as in diagnosis (Figs 78–85): Epigynal field almost as wide as long, anteriorly converging, without slit sensilla, with fusion bubbles on posterior part. Internal duct system with semi-circular guiding pockets leading to pair of spherical structures (spermathecae?) and glandular extensions situated posteriorly; fertilisation ducts arising anteriorly from these structures, antero-laterad. Both sides of the epigyne were covered with mating plugs.

Coloration (Figs 94–99): Yellowish to reddish brown without distinct markings. White hairs around eyes, margin of prosoma, chelicerae and legs. DS with longitudinal fovea and slightly marked striae, centrally with dark setae, eye region with stiff bristles. OS with dark hairs especially anteriorly and around heart patch, otherwise with light short



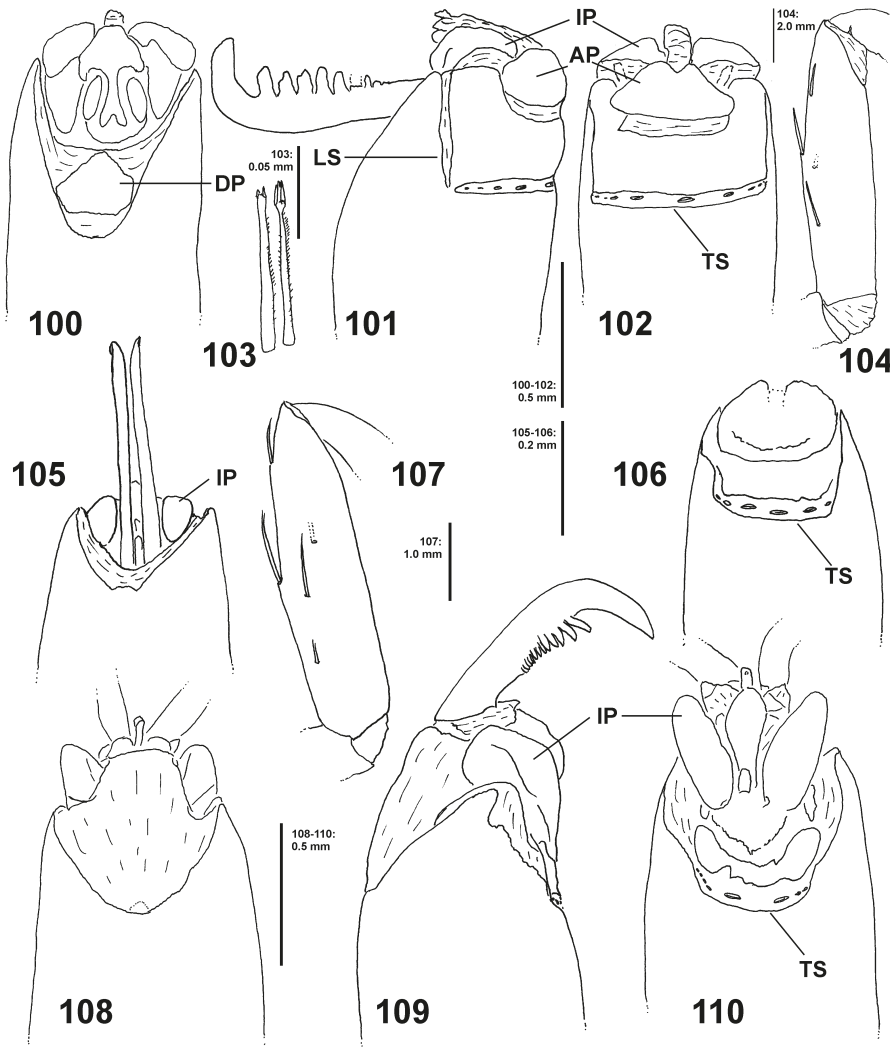
Figs 78–86. *May norm* gen. n. sp. n. from Messum Crater, Namibia (78–80) holotype ♂ [PJ 1851]; (81–85) ♀ paratype [PJ 3534]; 86 ♀ paratype [PJ 1852]: (78, 81) epigyne, ventral (with mating plugs); (79, 82) vulva, dorsal; (84) vulva, anterior; (80, 83) schematic course of internal duct system, dorsal; (85) schematic course of internal duct system, anterior; (86) sternum, ventral. Abbreviations: FB – fusion bubbles; FD – fertilisation ducts; GE – glandular extensions; GP – guiding pockets; SS – slit sensilla.



Figs 87–93. *May norm* gen. n. sp. n. from Messum Crater, Namibia (87–89, 91–93) ♀ paratype [PJ 1852]; (90) holotype ♂ [PJ 1851]: (87) eye arrangement, dorsal; (88) cheliceral dentition, ventral; (89) metatarsal stopper, dorsal; (90) ♀ palpal claw, lateral; (91) Lawrence setae; (92) Claw tuft setae, showing indented tip; (93) leg I, prolateral.



Figs 94–99. *May norm* gen. n. sp. n., paratypes from Messum Crater, Namibia (94–96) PJ 1852; (97–99) PJ 3543: habitus of preserved specimens (94, 97) dorsal; (95, 98) ventral; (96, 99) frontal.

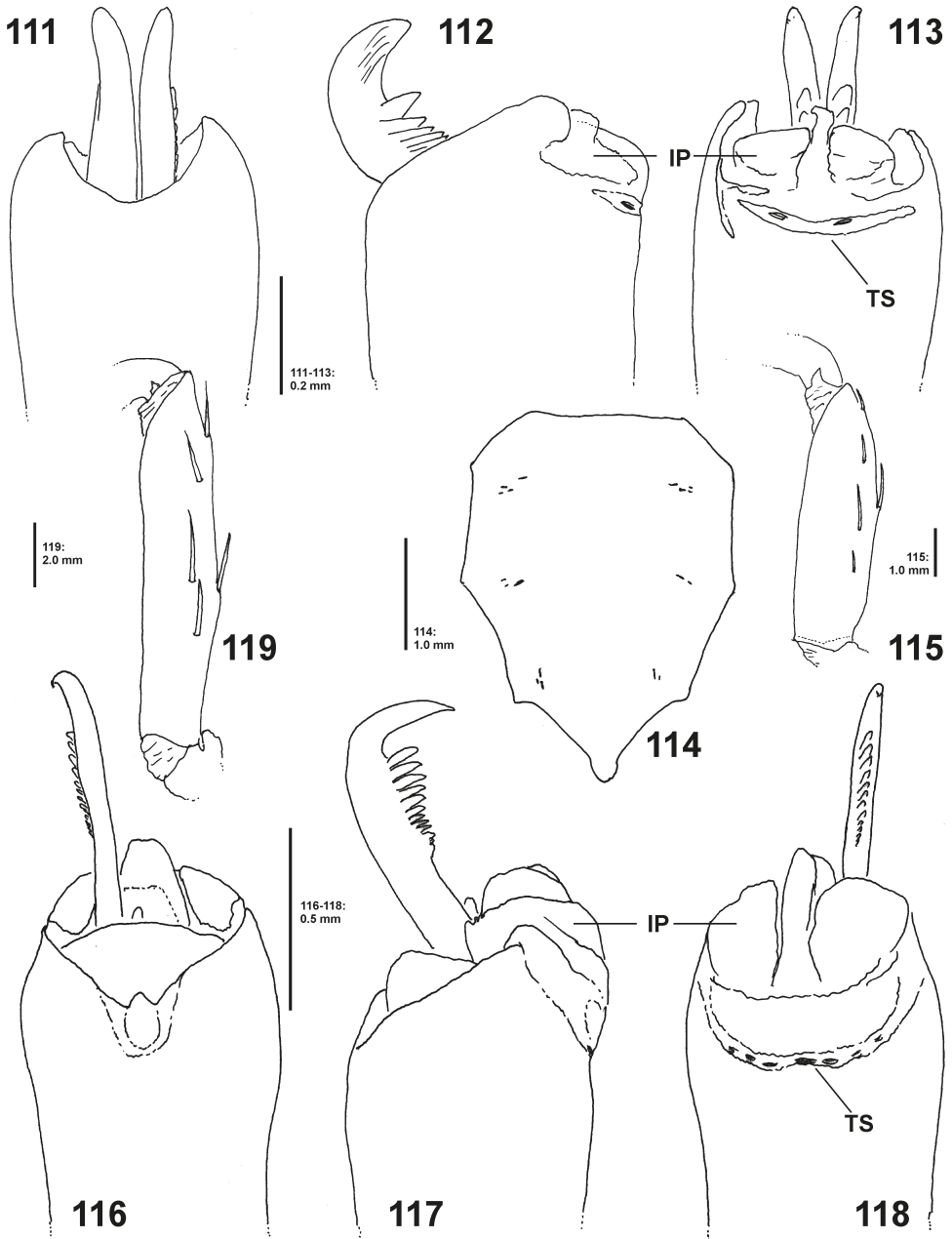


Figs 100–110. (100–104) *Palystella* sp. (100–102, 104 ♀ from Namibia, PJ 3533; 103 juvenile), (105–107) *Pseudomicrommata* sp. from Guinea and (108–110) *Heteropoda* sp. from Indonesia, Flores: (100, 105, 108) tarsus tip, dorsal; (101, 109) tarsus tip, lateral; (102, 106, 110) tarsus tip, ventral; (103) Lawrence setae; (104, 107) leg I, prolateral. Abbreviations: AP – plate of Lawrence setae; DP – dorsal plate of elongated setae; IP – plate of indented claw tuft setae; TS – transverse suture with slit sensilla.

setae interspersed with dark setae. Spinnerets and ventral area in front of spinnerets with dark setae.

Male. Unknown.

Variation: Females (n=5): DS length 3.8–5.6. OS length 4.3–6.0. Spination: Femur IV 322(1); patella I 101, II 101/000, III 100(1), IV 100. Palpal claw with 8 teeth. Tarsus II ventrally with 7 claw slit sensilla in distal transverse suture. Leg formula 4231 (n=3). One chelicerae of one female (PJ 3543) with 4 posterior teeth. Sternum with single additional



Figs 111–119. (111–115) *Thelcticopis* sp. from Hong Kong and (116–119) *Olios* sp. from Laos: (111, 116) tarsus tip, dorsal; (112, 117) tarsus tip, lateral; (113, 118) tarsus tip, ventral; (114) sternum, ventral, showing slit sense organs; (115, 119) leg I, prolateral. Abbreviations: IP – plate of indented claw tuft setae; TS – transverse suture with slit sensilla.

slit sensillum in posterior part (Fig. 86). Epigynal field of two females exhibited no slit sensilla. In the epigyne of one female (PJ 3542) a mating plug was found only on the right side, in another female (PJ 3538) one mating plug stretched across the entire atrium, two more females showed two plugs, each on one side.

Holotype ♀ (PJ 1851): NAMIBIA: *Erongo*: Messum crater, 21°26.430'S 14°13.215'E, 420 m, E. & M. Griffin leg., 5.iv.2000 (SMN 44693).

Paratypes: 1♀ (PJ 1852), same data as holotype (SMF); 1♀ (PJ 1853), same data as holotype (SMF); 1♀ (PJ 3538), same data as holotype, on ground at night, gravel plain, M. Griffin leg., SD 1211 (SMN 44723). 1♀ (PJ 3543), same data as holotype, on ground, at night, gravel plain, near rocky hillside, E. Griffin leg., 6.iv.2000 (SMN 44688).

Other material examined: NAMIBIA: *Kunene*: 1♀ (PJ 3542), Skeleton Coast Park, 20°00.407'S 13°15.932'E [310 m], on ground at night, M. Griffin leg., 21.vi.2000 (SMN 44700). *Erongo*: 3 juveniles, Damaraland, Brandberg, 21°26.430'S 14°13.215'E, M. Griffin leg., iv.1986 (SMN 44415).

Distribution: Known from three localities in northern Namibia (*Kunene*, *Erongo* regions) (Fig. 120).

Biology: According to information on the labels, spiders are nocturnal and active on the ground. Similarly to *M. bruno* sp. n., females of *M. norm* sp. n. exhibited scars, which may be an indicator that males bite the females during courtship. In the holotype female six such scars were located dorsally on right tibia II, one large scar ventro-proximally on the left palpal tibia, in the female paratype (PJ 3542) one scar each was located on left femur I prolaterally and on left coxa IV ventrally. One female (PJ 3538) had no scars, but a mating plug.

Note: Since this new species occurs in the same geographical range as the previous one and is only known from the female sex, whereas *M. rudy* sp. n. is described from the male sex only, both forms could be theoretically considered conspecific. However,



Fig. 120. Distribution records of *May* gen. n. in Namibia and South Africa: *M. bruno* sp. n. (green squares; South Africa), *M. ansie* sp. n. (red circles; Namibia), *M. rudy* sp. n. (pink diamond; Namibia), *M. norm* sp. n. (blue triangles; Namibia).

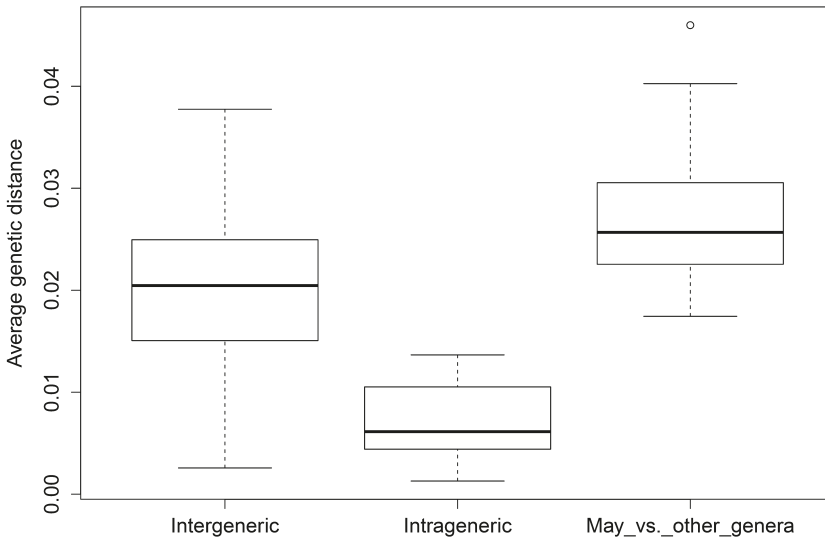


Fig. 121. Intrageneric and intergeneric distances and distance of *May* gen. n. to other genera for 850 bp of the nuclear 28S rDNA gene in 19 Sparassidae genera. All groups are significantly different.

considerable somatic differences, like the distinctly larger PLE, the considerably darker coloration with a higher number of dark setae, the (relatively and absolutely) much longer lateral spines on metatarsus IV, and the presence of a dense scopula on tarsus IV, with only few ventral bristles in *M. norm* sp. n., suggest that both forms in fact represent different species. Such strong differences between sexes of one species are not known from other Sparassidae nor from *May bruno* sp. n.

MOLECULAR RESULTS AND DISCUSSION

We analysed sequences from 124 Sparassidae specimens in 19 genera. However, many of these sequences were not unique. After pruning, 63 unique sequences in 19 genera remained. In addition, we included three sequences of *May bruno* gen. n. sp. n. Due to DNA degradation, we could not sequence other species of that genus. The intergeneric distances range from 0.26% (*Palystella* vs. *Carparachne*) to 3.78% (*Heteropoda* Latreille, 1804 vs. *Leucorchestris*). Within genera, we find an average distance of 0.68% and a range from 0.13% (*Arandisa*) to 1.37% (*Pandercetes* L. Koch, 1875) (Supplementary Tables 1 & 2). Intrageneric and intergeneric distances are significantly different (ANOVA, $F=26.78$, Games-Howell posthoc test, $p < 0.01$). Nevertheless, the distributional tail of the intergeneric distance overlaps with the intrageneric distance. A simple distance measure or divergence cut-off thus does not allow us to distinguish between recently diverged genera and long separated congeneric species. Still, genetic distance emerges as a useful addition to morphological traits in supporting taxonomic hypotheses.

May gen. n. shows an average distance of 2.73% compared to all other Sparassidae genera. The distances range from 1.74% (*May* vs. *Arandisa*) to 4.60% (*May* vs. *Heteropoda*). The divergence between *May bruno* sp. n. and other Sparassidae genera

SUPPLEMENTARY TABLE 1

Average intergeneric distances (in percent) between Sparassidae genera used in this analysis.

	Het	Psp	Pal	Par	Leu	May	Ceb	Psm	Pan	Rem	Ind	Pan	Ara	Paa	Car	Cer	Dam	Oli	Sin	
<i>Heteropoda</i>	Het	*																		
<i>Pseudopoda</i>	Psp	3,3	*																	
<i>Palystes</i>	Pal	3,8	2,5	*																
<i>Parapalystes</i>	Par	3,6	2,3	0,6	*															
<i>Leucochestris</i>	Leu	3,8	2,6	2,2	2	*														
<i>May</i>	May	0,1	3,1	2,3	2	2,7	*													
<i>Cebrennus</i>	Ceb	2,5	2	2,1	1,9	1,8	3	*												
<i>Pseudomicrommata</i>	Psm	3,3	2	1,4	1,3	1,5	2,2	1,1	*											
<i>Pandercetes</i>	Pan	3,4	2,1	2,2	2,1	3	3,1	2,1	2,2	*										
<i>Remmius</i>	Rem	3,1	2,5	1,9	1,5	2,2	2,7	1,7	1,6	2,4	*									
gen. indet.	Ind	3,6	2	1,5	1,4	1,2	2,3	1,8	1,1	2,2	2,1	*								
<i>Panaretella</i>	Pan	3,3	2,4	2	1,7	2	2,4	2	1,4	2,6	2,2	1,5	*							
<i>Arandisa</i>	Ara	3,3	2	1,3	1	1,8	1,7	1,1	0,3	2,1	1,2	1,3	1,4	*						
<i>Palystella</i>	Paa	3,6	2	1,5	1,7	1,3	2,3	1,9	1	2,3	2,2	0,8	1,5	1,3	*					
<i>Carparachne</i>	Car	3,6	2,1	1,6	1,8	1,1	2,5	1,9	0,9	2,2	2,2	0,8	1,6	1,2	0,3	*				
<i>Cerbalus</i>	Cer	3,4	2,2	1,9	2,1	2,4	3	1,6	1,3	2,2	2,5	2,1	2,3	1,1	1,9	1,7	*			
<i>Damastes</i>	Dam	3,1	2	1,5	1,4	1,5	2,1	1,3	1	2,1	1,6	1,3	1,6	1,1	1,2	0,8	1,3	*		
<i>Olios</i>	Oli	3,6	2,6	2,5	2,5	2,5	3,3	1,7	1,8	2,8	2,5	2,1	2,4	2	2,2	2,2	2	2,1	*	
<i>Sinopoda</i>	Sin	3,2	2,3	3	2,9	3,6	0	2,4	2,9	2,8	2,5	2,9	2,9	2,9	2,9	2,9	3	2,7	3,3	*

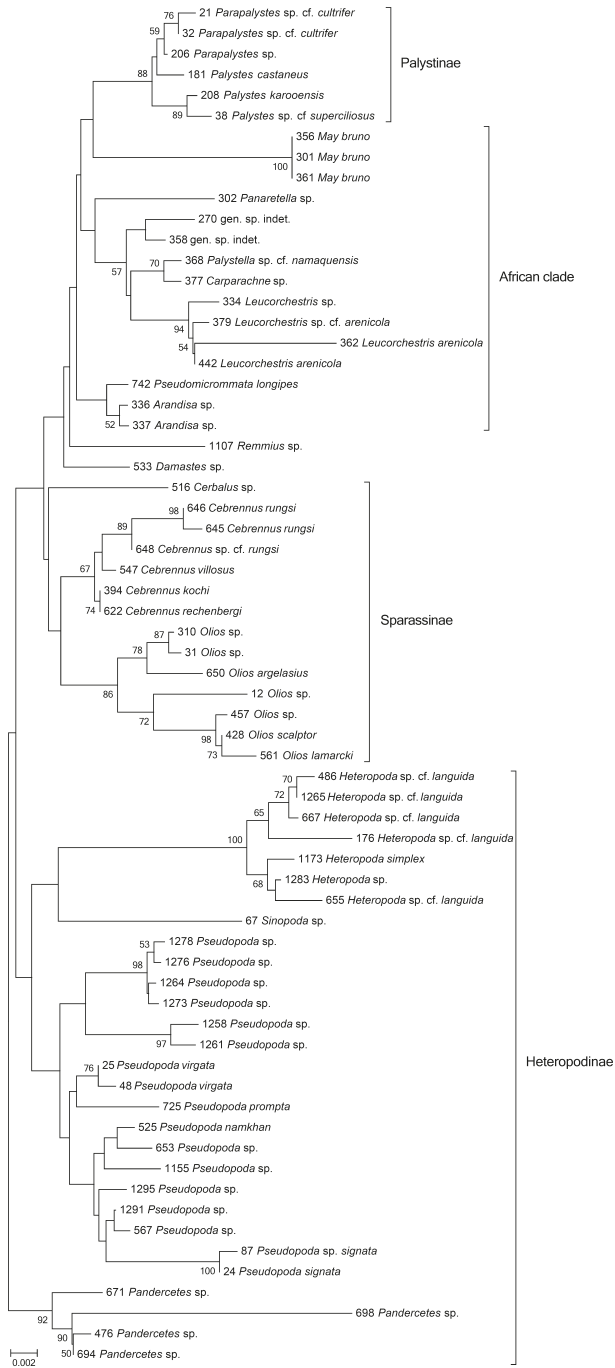
SUPPLEMENTARY TABLE 2

Average intrageneric distances (in percent) within Sparassidae genera used in this analysis.

<i>Arandisa</i>	0.13
<i>Cebrennus</i>	0.44
gen. indet.	0.51
<i>Heteropoda</i>	0.73
<i>Leucochestris</i>	0.71
<i>Olios</i>	1.05
<i>Palystes</i>	0.47
<i>Pandercetes</i>	1.37
<i>Parapalystes</i>	0.17
<i>Pseudopoda</i>	1.18

is significantly higher than the average intergeneric distance (ANOVA, Games-Howell posthoc test, $p < 0.01$) (Fig. 121). The distance analysis for *May* has to be treated cautiously. As we rely on a single species to derive our measures, we artificially inflate the divergence of *May* and other genera.

May bruno sp. n. clusters with other African genera of the family in our phylogeny. Members of the “African clade” (*sensu* Moradmand *et al.* 2014) are among the least



Suppl. Fig. 1. Midpoint rooted phylogenetic tree for 850 bp of the 28S rDNA of 19 Sparassidae genera. Subfamilies and similar entities are indicated by labelled brackets to the right. Bootstrap values below 50 not shown.

distant from *May* gen. n. However, due to low support values the exact placement of the new genus within African Sparassidae cannot currently be resolved. A comparably large branch length separating it from other lineages indicates a long and unique evolutionary history of the genus (Supplementary Fig. 1). Overall, the molecular data supports our morphological analysis very well, suggesting that *May* gen. n. is a distinct genus. However, with only 19 out of 84 described genera included (World Spider Catalog 2015) our analysis is far from being exhaustive. The sequence data are deposited in the Dryad Digital Repository (Jäger & Krehenwinkel 2015).

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REFERENCES

- BIRKHOFFER, K., SCHEU, S. & HENSCHER, J.R. 2006. Does territorial behaviour in the desert-living spider *Leucorchestris arenicola* Lawrence (Araneae: Sparassidae) affect its spatial distribution? *Bulletin of the British Arachnological Society* **13**: 341–346.
- CROESER, P.M.C. 1996. A revision of the African huntsman spider genus *Palystes* L. Koch 1875 (Araneae: Heteropodidae). *Annals of the Natal Museum* **37**: 1–122.
- HENSCHER, J.R. 1990. The biology of *Leucorchestris arenicola* (Araneae: Heteropodidae), a burrowing spider of the Namib dunes. In: Seely, M. (ed.): Namib Ecology: 25 years of Namib research. *Transvaal Museum Monograph* **7**: 115–127.
- 1997. Psammophily in Namib desert spiders. *Journal of Arid Environments* **37**: 695–707.
- JÄGER, P. 2000. The huntsman spider genus *Cebrennus*: four new species and a preliminary key to known species (Araneae: Sparassidae: Sparassinae). *Revue Arachnologique* **13**: 163–186.
- 2001. Diversität der Riesenkrabbenspinnen im Himalaya. Über eine Radiation zweier Gattungen in den Schneetropen (Araneae: Sparassidae: Heteropodinae). *Courier Forschungsinstitut Senckenberg* **232**: 1–136.
- 2005. New large-sized cave-dwelling *Heteropoda* species from Asia, with notes on their relationships (Araneae: Sparassidae: Heteropodinae). *Revue Suisse de Zoologie* **112**: 87–114.
- 2012. Revision of the genus *Sinopoda* Jäger 1999 in Laos with discovery of the first eyeless huntsman spider species (Sparassidae: Heteropodinae). *Zootaxa* **3415**: 37–57.
- 2014a. *Olios sjostedti* Lessert, 1921 (Araneae: Sparassidae): first description of the female and first record from South Africa and Botswana. *African Invertebrates* **55**: 201–208.
- 2014b. *Cebrennus* Simon, 1880 (Araneae: Sparassidae): a revisionary up-date with the description of four new species and an updated identification key for all species. *Zootaxa* **3790**: 319–356.
- JÄGER, P. & KREHENWINKEL, H. 2015. Data from: *May* gen. n. (Araneae: Sparassidae): a unique lineage from southern Africa supported by morphological and molecular features. Dryad Digital Repository. <http://dx.doi.org/10.5061/dryad.rg1cj>
- JÄGER, P. & KUNZ, D. 2005. An illustrated key to genera of African huntsman spiders (Arachnida, Araneae, Sparassidae). *Senckenbergiana biologica* **85**: 163–213.
- 2010. *Palystes kreutzmanni* sp. n. — a new huntsman spider species from fynbos vegetation in Western Cape Province, South Africa (Araneae: Sparassidae: Palystinae). *ZooKeys* **67**: 1–9.
- JÄGER, P., LI, S. & KREHENWINKEL, H. In press. Molecular analysis reveals two lineages of *Pseudopoda* Jäger, 2000 (Araneae: Sparassidae: Heteropodinae) in Sichuan Province, China. *Zootaxa*.
- JÄGER, P. & ONO, H. 2000. Sparassidae of Japan. I. New species of *Olios*, *Heteropoda* and *Sinopoda* with remarks on known species (Arachnida: Araneae). *Acta Arachnologica* **49**: 41–60.

- JÄGER, P. & PRAXAYSOMBATH, B. 2009. Spiders from Laos: new species and new records (Arachnida: Araneae). *Acta Arachnologica* **58**: 27–51.
- 2011. Spiders from Laos with forty-two new records and first results from the provinces Bolikhamsay and Champasak (Arachnida: Araneae). *Acta Arachnologica* **60**: 9–31.
- KREHENWINKEL, H. & TAUTZ, D. 2013. Northern range expansion of European populations of the wasp spider *Argiope bruennichi* is associated with global warming-correlated genetic admixture and population-specific temperature adaptations. *Molecular Ecology* **22**: 2232–2248.
- LAWRENCE, R.F. 1962. Spiders of the Namib desert. *Annals of the Transvaal Museum* **24**: 197–211.
- MORADMAND, M. 2013. The stone huntsman spider genus *Eusparassus* (Araneae: Sparassidae): systematics and zoogeography with revision of the African and Arabian species. *Zootaxa* **3675**: 1–108.
- 2015. Revision of the grass huntsman spider genus *Pseudomicrommata* Järvi, 1914 (Araneae: Sparassidae) in the Afrotropical Region. *African Invertebrates* **56** (2): 425–433.
- MORADMAND, M., SCHÖNHOFER, A.L. & JÄGER, P. 2014. Molecular phylogeny of the huntsman spider family Sparassidae with focus on the genus *Eusparassus* and notes on the RTA-clade and “Laterigradae”. *Molecular Phylogenetics and Evolution* **74**: 48–65.
- NØRGAARD, T. 2008. Nocturnal spider navigators in the Namib Desert. *Bulletin of the British Arachnological Society* **112**: 10–12.
- NØRGAARD, T., HENSCHL, J.R. & WEHNER, R. 2006. Tracking the Namib Desert spider *Leucorchestris arenicola* — reading the story in the sand (Arachnida, Araneae, Sparassidae). *Senckenbergiana biologica* **86**: 211–218.
- NØRGAARD, T., HENSCHL, J.R. & JÄGER, P. 2008a. Nomenclatural mating: *Leucorchestris kochi* Lawrence 1965 is a synonym of *Leucorchestris arenicola* Lawrence 1962 (Araneae, Sparassidae). *Senckenbergiana biologica* **88**: 41–44.
- NØRGAARD, T., NILSSON, D.-E., HENSCHL, J.R., GARM, A. & WEHNER, R. 2008b. Vision in the nocturnal wandering spider *Leucorchestris arenicola* (Araneae: Sparassidae). *Journal of Experimental Biology* **211**: 816–823.
- RAMÍREZ, M.J. 2014. The morphology and phylogeny of dionychan spiders (Araneae: Araneomorphae). *Bulletin of the American Museum of Natural History* **390**: 1–374.
- TAMURA, K., DUDLEY, J., NEI, M. & KUMAR, S. 2007. MEGA4: molecular evolutionary genetics analysis (MEGA) software version 4.0. *Molecular Biology and Evolution* **24**: 1596–1599.
- WORLD SPIDER CATALOG 2015. *World Spider Catalog, Version 15.5*. Bern: Natural History Museum. (<http://wsc.nmbe.ch>; accessed 07/01/2015).