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SOUTH AFRICAN NATIONAL SURVEY OF ARACHNIDA

SANSA NEWSLETTER

SANSA Newsletter 43

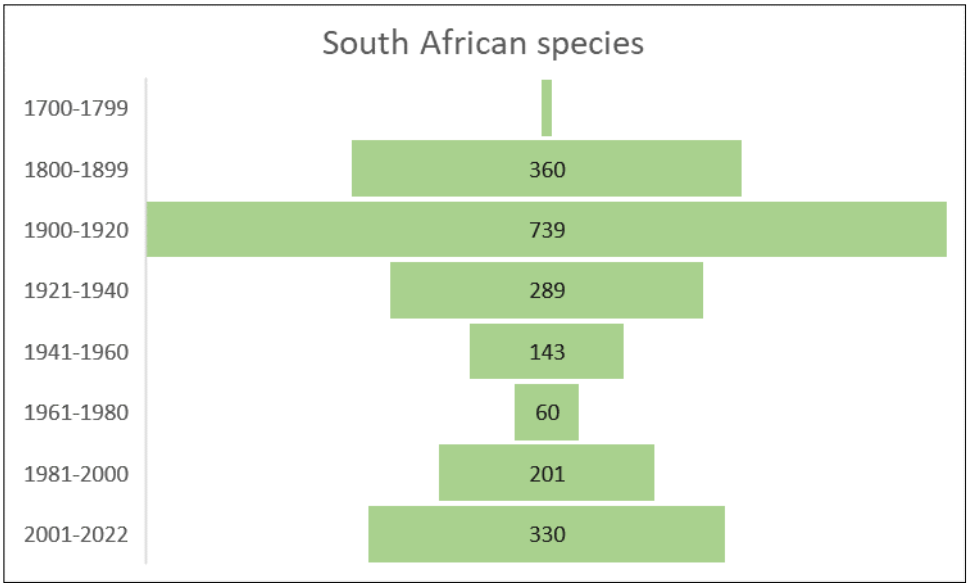
SPECIES DESCRIPTIONS

While preparing an updated checklist of the spiders of South Africa, we were able to collect information on when species found in South Africa were described. It could be divided into three periods.

Period 1 (1800-1920): The majority of South African species were described during this period (1 099 species) and more than half were descriptions by Simon (275 spp.), Purcell (127 spp.), Tucker (103 spp.), Pocock (92 spp.) and Hewitt (33 spp.).

Period 2 (1921-1960): Of the 432 spp. described during this period, Lawrence contributed 197 species.

Period 3 (1961-present): During this period, 2 404 spp. were added to the list with contributions by both local and overseas taxonomists. Here we have contributions by Haddad (172 spp.), Wesolowska (164 spp.), Lessert (86 spp.), Jocqué (82 spp.), Griswold (65 spp.), Lyle (59 spp.), and Lotz (53 spp.).



IN THIS ISSUE

OBITUARIES

DR GERALD NEWLANDS

Gerald Newlands of High River, Alberta passed away on May 26, 2022 at the age of 80 years.

Gerald was born in Pretoria, South Africa and he began his scientific career working in the Department of Biochemistry at the University of Pretoria. Following that, he worked at the Transvaal Museum studying arachnology and the evolution of man. Gerald then became more interested in the study of arachnids, specialising in scorpions and spiders. This sparked him to take a position as a Medical Entomologist at the South African Institute for Medical Research in Johannesburg. In 1983, Gerald returned to the University of Pretoria to teach medical students Clinical Entomology and science students Insect Physiology. In 1986 he was awarded a PhD in the faculty of medicine of the University of the Witwatersrand in Johannesburg, for his dissertation on necrotic arachnidism in Southern Africa. Gerald and his wife immigrated into Canada in 1992 and in 1993 he joined the archeology department at the University of Calgary where he became an Adjunct Associate Professor. Below are some of Gerry's spider publications:

NEWLANDS G. 1975. Review of the medically important spiders in southern Africa. *South African Medical Journal* 49: 823–826.

NEWLANDS G. 1976. Medically important spiders of southern Africa. *Toksiteit* 1405: 303–309.

NEWLANDS G. 1977. Notes on the bite of the spider *Chiracanthium* (Clubionidae). *Proceedings of the Congress of the Entomological Society of South Africa* 2: 36.

NEWLANDS G. 1978. Common poisonous spiders of the Transvaal. *Fauna & Flora* **34**: 14–17.

NEWLANDS G., MARTINDALE C.B., BERSON S.D. & RIPPEY J.J. 1980. Cutaneous necrosis caused by the bite of *Chiracanthium* spiders. *South African Medical Journal* 57: 171–173.

NEWLANDS G. 1981. A new violin spider from Johannesburg with notes on its medical and epidemiological importance. *Zeitschrift für Angewandte Zoologie* 68: 356–365.

NEWLANDS G. 1986. Necrotic arachnidism in southern Africa. Unpublished PhD thesis, University of the Witwatersrand.

NEWLANDS G. & ATKINSON P. 1988. Review of Southern African spiders of medical importance, with notes on the signs and symptoms of envenomation. *South African Medical Journal* 73: 235–239.

NEWLANDS G. & ATKINSON P. 1990a. Behavioral and epidemiological considerations pertaining to necrotic araneism in Southern Africa. *South African Medical Journal* 77: 92–95.

NEWLANDS G. & ATKINSON P. 1990b. A key for the clinical diagnosis of araneism in Africa south of the equator. *South African Medical Journal* 77: 96–97.

Gerry (with circle) attended the First African Arachnological colloquium in 1987 that was held in Pretoria.

DR RICHARD DEAN

One of South Africa's greatest naturalists and well-known ornithologists, Richard Dean, passed away in Prince Albert on Wednesday 3 August 2022. Richard Dean completed his MSc on ant-plant interactions at the University of Natal. He completed his PhD at the FitzPatrick Institute in 1995 on the conservation of nomadic birds in the Karoo.

Richard was a prolific researcher who is best known for his publications on the ecology of the Karoo where he lived and worked with his wife, Sue Milton-Dean, for the last 35 years.

They were stationed at Tierberg Karoo Research Centre, now known as Tierberg Long Term Ecological Research (LTER) near Prince Albert in the Western Cape, where they were involved in research and tertiary education in the natural sciences.

They were also involved in arachnids and sampled >100 arachnid species at Tierberg LTER, several of them new. The voucher specimens are housed at the NCA and for the Tierberg checklist of spiders (see pp. 21-28).

Dean published the following papers on the arachnids of Tierberg:

DEAN W.R.J. 1988. Spider predation on termites (Hodotermitidae). *Journal of the Entomological Society of Southern Africa* 51: 147–148.

DEAN W.R.J. 1993. Unpredictable foraging behaviour in *Microhodotermes viator* (Isoptera: Hodotermitidae): An anti-predator tactic? *Revue de Zoologie africaine* 107: 281–285.

DEAN W.R.J. & MILTON S.J. 1991. Prey capture by *Solpuga chelicornis* Lichtenstein (Solifugae: Solpugidae). *Journal of the Entomological Society of Southern Africa* 54: 266–267.

DEAN W.R.J. & GRIFFIN E. 1993. Seasonal activity patterns and habitats in Solifugae (Arachnida) in the southern Karoo, South Africa. *South African Journal of Zoology* 28: 91–94.

NEW PUBLICATION

Ground-dwelling spider assemblages in the Ndumo Game Reserve

HADDAD C.R. 2022. A preliminary survey of the ground-dwelling spider assemblages of the Ndumo Game Reserve, South Africa (Arachnida: Araneae). *Arachnology* 19(2): 517–526.

Abstract

Ground-dwelling spider assemblages were sampled by pitfall trapping in four contrasting biotopes in the Ndumo Game Reserve, South Africa, situated in the Maputaland-Pondoland-Albany biodiversity hotspot. Over two years (2006 and 2007) in two seasons (mid-summer and winter, 10 days each), 1 261 spiders were collected, representing 31 families and 121 species.

Twenty-five taxa were recorded from Ndumo for the first time. Spider activity densities and species richness were highest in the deciduous broadleaf woodland (BW, n = 538, S = 106), followed by *Albizia adianthifolia-Vachellia tortilis* woodland (AW, n = 358, S = 70), sand forest (SF, n = 188, S = 74), and Mahemane thicket (MT, n = 177, S = 53).

The four most abundant species were *Asemesthes ceresicola* Tucker, 1923 (Gnaphosidae, 27.8%), *Arctosa* sp. (Lycosidae, 8.4%), *Pardosa crassipalpis* Purcell, 1903 (Lycosidae, 7.4%), and *Stenaelurillus guttiger* Simon, 1901 (Salticidae, 5.2%). Species richness and activity densities were strongly seasonal, with sharp decreases in winter. Conservation assessments could not be carried out on a sizable proportion of the species collected, as they represent new taxa or were only represented by immatures (30.6%), but of the remainder the majority had a conservation status of Least Concern (64.5%), with very few being Data Deficient (4.1%) and a single vulnerable species being collected, *Massagris natalensis* Wesołowska & Haddad, 2009. However, among the new taxa not assessed there may be several Maputaland endemics.

Massagris natalensisa vulnerable species. Photo credit: Vida van der Walt.

NEW PUBLICATION

NAME CHANGES

SHERWOOD D. 2022. Replacement names for *Leroya* Lewis & Dippenaar-Schoeman, 2014 (Araneidae: Thomisidae) and *Tangaroa* Lehtinen, 1967 (Araneae: Uloboridae). Revista *Ibérica de Aracnología* 40: 203–204.

The spider genus *Leroya* Lewis & Dippenaar-Schoeman, 2014 (Araneae: Thomisidae) is preoccupied, by *Leroya* Grandidier, 1887 (Mollusca: Ampullariidae). Therefore, the respective replacement names *Ansistaria* are proposed for the preoccupied spider genus in accordance with Article 60 of the International Code of Zoological Nomenclature. The nomen is formed by adding "Ansi" with the ending "staria", the latter in reference to the morphological similarities between this genus and *Mystaria*. The gender of the generic epithet is feminine. Species included: *Ansistaria silva* (Lewis & Dippenaar-Schoeman, 2014), *Ansistaria unicolor* (Simon, 1895).

Ansistaria unicolor Photo credit A. Lewis.

SHERWOOD D. 2022. On the taxonomic and nomenclatural status of *Ocyale* Audouin, 1826 (Araneae: Pisauridae) and *Hippasosa* Roewer, 1960 (Araneae: Lycosidae), with notes on some other taxa. *Arachnology* 19(2): 582–584.

The genus *Ocyale* is regarded as a nomen dubium and the lycosid genus *Hippasosa* was restored for species listed in *Ocyale* (Sherwood, 2022). These include the two species *Hippasosa guttata* (Karsch, 1878) and *Hippasosa dewinterae* (Alderweireldt, 1996) recorded from South Africa.

Hippasosa guttata Photo credit: P. Webb.

NEW PUBLICATION

Southern African vernacular names of Solifugae

BIRD T.L., CHOBOLO L.L. & NDABA A. 2022. Southern African vernacular names of Solifugae (Arachnida) and their meanings. *African Entomology* 30: e10696 (5 pages) https://doi.org/10.17159/2254-8854/2022/a10696

The order Solifugae (Arachnida) often has the word 'spider' (e.g. sunspider, camelspider) or 'scorpion' (e.g., windscorpion) as the main descriptor in its common names. Being neither a spider nor a scorpion, we suggest 'solifuge', derived from the scientific name of the order, as the most neutral English vernacular name for these arachnids. Southern Africa is rich in solifuge diversity, which is also reflected in the rich and imaginative local vernacular names of this group. These names allude to myths associated with solifuges, to their characteristic behaviours, or to their unique and striking morphology. Here we briefly translate and discuss 40 vernacular terms used for solifuges in 25 languages and dialects in Southern Africa (Botswana, Malawi, Namibia, South Africa, and Zimbabwe), plus seven names in five languages in East Africa. Recognising solifuges as a distinct group, referred to by its own set of vernacular names, seems to be more common in rural compared to urban areas. The conservation of indigenous names of animals might be inextricably linked to the conservation of these animals.

Contact: Tharina Bird at tharina@ditsong.org.za

Solifuge feeding on a dead bird. Photo credit: Les Oates.

NEW PUBLICATION

JÄGER P. 2022. *Bowie* gen. nov., a diverse lineage of ground-dwelling spiders occurring from the Himalayas to Papua New Guinea and northern Australia (Araneae: Ctenidae: Cteninae) *Zootaxa* 5170.

A new Ctenidae genus *Bowie* Jäger, 2022 was described from Asia. *Bowie* belongs to the subfamily Cteninae and all members formerly described were placed so far in the genus *Ctenus* Walckenaer, 1805.

Only one species from South Africa, *Bowie corniger,* described from one male supposedly from Natal, South Africa, conforms to this group in having a similar cymbial spur and, embolus tip (see Fig. 1).

Despite these striking similarities between this African and all the Asian species of this group, Benoit (1979) placed *B. corniger* in the *Ctenus abditus* group. It seems more likely that it is either a mislabelled Asian specimen or an introduced spider.

The possibility that specimens were shipped with cargo at that time cannot be excluded. However, such a scenario is less likely since *Bowie* spp. have not been detected as shipping passengers cross oceans on a regular basis as, e.g., Sparassidae or Pholcidae.

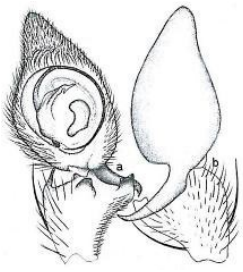


Fig. 1 Male palp after Benoit (1979)

NEW PUBLICATION

DIPPENAAR-SCHOEMAN A.S. & FOORD S.H. 2022. Notes on the butterfly theridiid *Episinus marignaci* (Lessert, 1933) (Araneae, Theridiidae) from South Africa. *Check List* 18(4): 1–4 https://doi.org/10.15560/18.4.1

We present the first records of the butterfly theridiid *Episinus marignaci* (Lessert, 1933) beyond its type locality, resulting in an extension of its geographic range from Angola to South Africa. Images of live specimens and a distribution map are provided. *Episinus marignaci* is rare locally but has a relatively large geographical distribution in South Africa.

Episinus marignaci. Photo credit: Peter Webb.

NEW PUBLICATION

What Fake News About Spiders Can Teach About the Global Spread of (Mis)information

It's no secret that the internet and social media fuel rampant spread of (mis)information in many areas of life. Now, researchers reporting in *Current Biology* on 22 August 2022 have explored this phenomenon as it applies to news about spiders. The verdict? Don't blindly trust anything you read online about these eight-legged arthropods – or anything else for that matter – and always consider the source.

"The quality of spider information in the global press is rather poor—errors and sensationalism are rampant," said Stefano Mammola of the National Research Council, Verbania Pallanza, Italy, and the University of Helsinki's Finnish Museum of Natural History. "Spider-related information in the press flows through a highly interconnected global network and the spread of misinformation is driven by a limited number of key factors, the sensationalistic tone of an article being particularly important."

Mammola said he was inspired to do the study initially based on general disappointment about the quality of spider-related newspaper articles in Italy. "Many articles on spiders in the Italian press are full of errors, or alarmistic, or even fake news, or a combination thereof," he says.

So, he and dozens of colleagues, including Catherine Scott, McGill University, Quebec, and Angela Chuang, University of Florida, Lake Alfred, wanted to see whether this was a global problem. They put together an impressive team of experts to collect all the data, representing 41 languages and 81 countries. During the COVID-19 pandemic, the project also offered a way to explore important questions on a global scale at a time when spider fieldwork had been halted, and without leaving home to do it.

Their analyses found that the level of sensationalism and misinformation drops when the "right" expert – namely an expert on spiders rather than a medical doctor or other professional – is consulted by journalists doing the writing. The data they amassed also showed the importance of events and news coverage on a local scale, as small-town stories can quickly hit the international news.

"I was particularly surprised by the fact that even very local-scale events—say, the story of a farmer bitten by a spider in some remote village in Australia—published by a regional newspaper can quickly become broadcast internationally," Mammola says.

"This implies that improving the quality of the information produced in these local nodes could have a positive effect reverberating across the information network—a typical example of a 'think globally, act locally' management strategy," they write.

Catherine Scott: catherine.elizabeth.scott@gmail.com

Credit: Jagoba Malumbres-Olarte.

Misinformation about spiders has many real-world implications. Some notable cases have led to school closures due to alarmist responses to false widow "invasions", they report. In another instance, a man lit his house on fire while blowtorching (harmless) spider webs from his backyard. The tone and quality of "news" stories about spiders shape our perception and ideas about them, with implications for us and for spiders' wildlife conservation.

They now want to explore more about how poor-quality information on spiders relates to the persistence of arachnophobic sentiments in the population. They also want to better understand how differences in cultural, social, and other factors influence differences in the way spiders are represented and talked about across various countries and regions. Ultimately, they may even expand the work beyond spiders.

"It would be nice to explore media representation of a broader selection of organisms, including animals that are venomous but not stigmatized in the same way, like bees, but also other feared venomous animals, such as snakes," Mammola said. "A similar exercise would allow comparing if the levels of misinformation and sensationalism are the same across a broad spectrum of taxa, testing the prediction if a negative framing by the traditional and social media translates to a lower chance of being prioritized for conservation, and vice versa."

MAMMOLA S. *et al*. 2022. The global spread of (mis)information on spiders. *Current Biology* 32: R855-R873. doi.org/10.1016/j.cub.2022.07.026

MAMMOLA S. *et al*., 2022. An expert-curated global database of online newspaper articles on spiders and spider ites. *Scientific Data* 9: 109. doi: 10.1038/s41597-022-01197-6

ANOTHER *LATRODECTUS* SPECIES NEWLY REPORTED FROM SOUTH AFRICA

The presence of the white widow *Latrodectus pallidus* in South Africa was confirmed. It was reported from the Western Cape as well as Gauteng. This is an invasive species and please report if you have seen it elsewhere as well.

For more information on the species see article pp. 29-30.

Female *Latrodectus pallidus* Photo credit: Cecile Roux.

RECENT PUBLICATIONS

BUSCK M.M., LUND M.B., BIRD T.L., BECHSGAARD J.S., BILDE T. & SCHRAMM A. 2022**.** Temporal and spatial microbiome dynamics of the social spider.*Stegodyphus dumicola*. *FEMS Microbiology Ecology* 98(2): fiac015. doi: 10.1093/femsec/fiac015. PMID: 35147190.

DIPPENAAR-SCHOEMAN A.S., BLAKE B., PELSER D. & WEBB P. 2022. Notes on two hairy crab spiders *Thomisus granulatus* Karsch, 1880 and *T. spiculosus* Pocock, 1901 from South Africa (Araneae: Thomisidae). *SANSA Newsletter* 42: 6–10. https://doi.org/10.5281/zenodo.6801418

DIPPENAAR-SCHOEMAN A.S. & FOORD S.H. 2022. Notes on the butterfly theridiid *Episinus marignaci* (Lessert, 1933) (Araneae, Theridiidae) from South Africa. *Check List* 18(4): 1–4. https://doi.org/10.15560/18.4.1

DIPPENAAR-SCHOEMAN A.S., STEENKAMP R. & BOOYSEN R. 2022. New records of the crab spider *Hewittia gracilis* Lessert, 1928 from South Africa (Araneae: Thomisidae). SANSA *Newsletter* 42: 17–19. https://doi.org/10.5281/zenodo.6801258.

DIPPENAAR-SCHOEMAN A.S. & WEBB P. 2022a. Interesting behaviour of two wolf spiders *Hogna spenceri* and *H. transvaalica* in South Africa (Araneae: Araneidae). *SANSA Newsletter* 42: 11–14. https://doi.org/10.5281/zenodo.6801372.

DIPPENAAR-SCHOEMAN A.S. & WEBB P. 2022b. First record of the crab spider *Diaea rohani* Fage, 1923 from South Africa (Araneae: Thomisidae). *SANSA Newsletter* 42: 15–16. https://doi.org/10.5281/zenodo.6801475

HADDAD C.R. 2022. A preliminary survey of the ground-dwelling spider assemblages of the Ndumo Game Reserve, South Africa (Arachnida: Araneae). *Arachnology* 19(2): 517–526.

HADDAD C.R., DIPPENAAR-SCHOEMAN A.S., ROUX C., & WEBB P. 2022. Observations on the Kalahari ground spider Asemesthes *subnubilus* Simon, 1887 (Araneae: Gnaphosidae). *SANSA Newsletter* 42: 20–22. https://doi.org/10.5281/zenodo.6800910.

JÄGER P. 2022**.** *Bowie* gen. nov., a diverse lineage of ground-dwelling spiders occurring from the Himalayas to Papua New Guinea and northern Australia (Araneae: Ctenidae: Cteninae). *Zootaxa* 5170(1): 1-200. https://doi:10.11646/zootaxa.5170.1.1.

JOCQUÈ R., JOCQUÈ M. & MBENDE M. 2022**.** A new *Cangoderces* (Araneae, Telemidae) from DR Congo, the first telemid from Central Africa. *Zootaxa* 5162(4): 430–438.

JONES A. & DIPPENAAR-SCHOEMAN A.S. 2022. Notes on the grass orb-web spider *Neoscona moreli* (Vinson, 1863) from South Africa (Araneae: Araneidae). *SANSA Newsletter* 42: 23–26. https://doi.org/10.5281/zenodo.6800889.

MAMMOLA S. *et al*. 2022a. The global spread of (mis)information on spiders. *Current Biology* 32: R855-R873. https://doi.org/10.1016/j.cub.2022.07.026

MAMMOLA S. *et al*. 2022b. An expert-curated global database of online newspaper articles on spiders and spider bites. *Scientific Data* 9: 109. https://doi: 10.1038/s41597-022-01197-6.

PRENDINI L., BIRD T.L., IRISH J., BECKER F. & KARUAERA N. 2022. National Museum of Namibia Scorpiones Collection Data 2022. Version 1.3. National Museum of Namibia. Occurrence dataset. https://doi.org/10.15468/gmn5t4.

ROSE C., SCHRAMM A., IRISH J., BILDE T.& BIRD T.L. 2022. Host plant availability and nest –site selection of the social spider *Stegodyphus dumicola*.Pocock, 1898 (Eresidae). *Insects* 13: 30. https://doi.org/10.3390/insects13010030.

SHERWOOD D. 2022a. Replacement names for *Leroya* Lewis & Dippenaar-Schoeman, 2014 (Araneidae: Thomisidae) and *Tangaroa* Lehtinen, 1967 (Araneae: Uloboridae). *Revista Ibérica de Aracnología* 40: 203–204.

SHERWOOD D. 2022b. On the taxonomic and nomenclatural status of *Ocyale* Audouin, 1826 (Araneae: Pisauridae) and *Hippasosa* Roewer, 1960 (Araneae: Lycosidae), with notes on some other taxa. *Arachnology* 19: 582–584.

DID YOU KNOW

- **GLOBAL BIODIVERSITY INFORMATION FACILITY (GBIF)**

GBIF is an international network and data infrastructure funded by the world's governments and aimed at providing anyone, anywhere, open access to data about all types of life on Earth. All the Namibian scorpion data are now on GBIF. For more information see:

PRENDINI L., BIRD T.L., IRISH J., BECKER F. & KARUAERA N. 2022. National Museum of Namibia Scorpiones Collection Data 2022. Version 1.3. National Museum of Namibia. Occurrence dataset. https://doi.org/10.15468/gmn5t4.

- **ATLAS OF NAMIBIA**

Solifuges are also now represented in the "Atlas of Namibia" that was released in August 2022. The book or chapters/sections is available at atlasofnamibia.online.

- **NEW CHAIRPERSON FOR THE SPIDER CLUB**

Congratulations to Rudi Steenkamp, who is the new chairperson of the Spider Club of Southern Africa after Astri Leroy stepped down.

The first record of *Apochinomma elongatum* Haddad, 2013 from South Africa (Arachnida: Araneidae)

A.S. Dippenaar-Schoeman[1], C.R. Haddad[2] & P. Webb[3‡]

[1]*Department of Zoology, University of Venda, Thohoyandou, South Africa.* [2]*Department of Zoology & Entomology, University of the Free State, Bloemfontein, South Africa.* [3]*SANSA team member, Gauteng, ‡deceased.*

ABSTRACT: The ant-like sac spider *Apochinomma elongatum* Haddad, 2013 is known from Botswana, Malawi, and Tanzania. This species was recorded for the first time from South Africa during the South African National Survey of Arachnida (SANSA). The general morphology of live specimens is discussed, with notes on their behaviour, distribution and conservation status.

Key words: biodiversity, distribution, new record, South African National Survey of Arachnida (SANSA)

INTRODUCTION

The genus *Apochinomma* Pavesi, 1881 represented by 16 species is recorded from the Afrotropical, Neotropical, and Oriental Regions (World Spider Catalog, 2022), but it remains unclear whether the genus is monophyletic. They belong to the Castianeirinae, a subfamily of the Corinnidae, that are generally regarded as good examples of Batesian mimics of ants (Hymenoptera: Formicidae). Representatives of the genus are particularly good examples of the morphological adaptations to ant mimicry, including their elongated cephalothoraxes, modified abdomens, and long legs to enforce an ant-like appearance (Haddad, 2013).

The Afrotropical species was revised by Haddad (2013) and six species were recognized, of which two species – *A. formicaeforme* Pavesi, 1881 and *A. decepta* Haddad, 2013 – were from South Africa. Since then, one West African species, *A. tuberculata* Haddad, 2013, was transferred to *Aetius* O.P.-Cambridge, 1897 by Caleb and Mathai (2016).

As part of the South African National Survey of Arachnida (SANSA), surveys were undertaken throughout the country (Dippenaar-Schoeman *et al*., 2015). One of the surveys focused on grassland areas in the Gauteng province (Webb, 2014). Over a period of six years, an *Apochinomma* species was repeatedly sampled and photographed by the third author (PW). The *Apochinomma* species was identified by the second author (CH) as *A. elongatum* Haddad, 2013. A single specimen was also sampled from Ndumo Game Reserve in KwaZulu-Natal in 2021.

The holotype male of *A. elongatum* was described from Nxai Pan National Park, in Botswana and paratype males from Zomba Plateau in Malawi and Mkomazi Game Reserve, Tanzania. The records of *A. elongatum* from Irene and Ndumo Game Reserve represent the first for South Africa.

Figures 1–3. *Apochinomma elongatum* male from Irene. Photo credits: Peter Webb.

TAXONOMIC NOTES

***Apochinomma elongatum* Haddad, 2013**

Apochinomma elongate Haddad, 2013: 2522 (m).

***Diagnostic characteristics*:** Male: TL 8.73 (7.40–13.60) mm. In live specimens the body and legs are dark grey with dense layer of short white setae; carapace and abdomen with black mottling on clypeus, in and behind eye region and along lateral margins of carapace; abdomen with dark markings on anterior edge and broad horizontal band posteriorly (Figs 1 & 2). Carapace elongate oval, eye region broad, tapering posteriorly to pedicel, broadest at coxa II–III; raised from eye region, without median depression (Figs 1–3); surface finely granulated, covered in short, straight, white setae (Fig. 7), with sparse white, feathery setae; eyes with anterior eye row narrower than posterior eye row; anterior row slightly procurved, medians larger than laterals; posterior eye row strongly recurved, laterals slightly larger than medians (Fig. 6).

Figures 4–8. *Apochinomma elongatum* male: 4. Habitus dorsal view (alcohol material). 5. Palp embolus tip. 6. Carapace showing eye pattern. 7. Anterior view. 8. Male palp. Photo credits: 4, 5, 8. Charles Haddad. 6–7. Peter Webb.

Abdomen elongate, broadened posteriorly, with distinct median constriction and long pedicel; dorsum densely covered in white, feathery setae. Leg formula 4123; legs with short spines, all segments except tarsi usually covered in white and pale yellow, feathery, and straight setae (Fig. 9). Palp slender, with long needle-like embolus, at least half tegulum length (Figs 5 & 8). Female: unknown.

GLOBAL DISTRIBUTION

Known from five scattered localities in Southern and East Africa: previously known from Botswana, Malawi, South Africa, and Tanzania and recorded from South Africa for the first time here.

DISTRIBUTION SOUTH AFRICA

Gauteng: Irene, Centurion (field opposite Gem Village) (-25.89, 28.23) (NCA 2014/990; 2014/3712; 2015/3303; 2016/5588). ***KwaZulu-Natal:*** Ndumo Game Reserve, Nyamiti Pan (-26.89, 32.31) (NCA 2021/246).

LIFESTYLE

A ground-dwelling species recorded from woodland (Tanzania), grassland (Botswana), and wetland habitats (Malawi). The specimens from South Africa were hand collected from a small patch of grassland near Irene (Fig. 10). Specimens at Irene were sampled on 14 June (2009), 12 and 23 November (2013), 16 November (2014), and 12 September (2015). At Ndumo it was found by hand collecting under logs on 3 December (2019). It is most likely a mimic of large epigeic ponerine ants.

Figure 10. The small pristine grassland area about 10 km from Irene where *Apochinomma elongatum* specimens were sampled. Photo credit: Peter Webb.

Figure 9. *Apochinomma elongatum* male. Photo credit: Peter Webb.

CONSERVATION STATUS

The species has a wide distribution in the Afrotropical Region but it is under-sampled in South Africa. It can be considered Least Concern.

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First record of *Acantharachne seydeli* Giltay, 1935 from South Africa (Arachnida: Araneae)

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ABSTRACT: *Acantharachne* Tullgren, 1910 is a genus known from eight species, all of which are endemic to Africa. One of the species, *A. seydeli* Giltay, 1935, previously known from the Democratic Republic of the Congo, was recorded for the first time from South Africa. The general morphology of live specimens is discussed, with notes on their distribution and conservation status.

Key words: biodiversity, distribution, orb-web, new record, South African National Survey of Arachnida (SANSA)

INTRODUCTION

The genus *Acantharachne* was erected by Tullgren in 1910 for the species *Acantharachne cornuta* from Tanzania. The genus is represented by eight species and is known only from Africa and Madagascar. From continental Africa the following six species are known: *A. cornuta* Tullgren, 1910 and *A. psyche* Strand, 1913 from Central Africa, *A. regalis* Hirst, 1925 from Cameroon and the Democratic Republic of the Congo (DRC), *A. lesserti* Giltay, 1930 from the DRC, and *A. seydeli* Giltrayi, 1935 and *A. giltayi* Lessert, 1938 from the DRC and Madagascar (World Spider Catalog, 2022).

The genus has not yet been revised and all the species were described more than 80 years ago. Members of *Acantharachne* received little to no attention since their description, and unfortunately nothing is known about their behaviour. The genus was also not included in the recent phylogenetic study of the orb-weaving spider family Araneidae (Scharff *et al*., 2020). Levi (2003) suggested that when males of *Acantharachne* are found, it probably will be synonymised with *Cladomelea* Simon, 1895 or *Ordgarius* Keyserling, 1886.

A few specimens were sampled during the South African National Survey of Arachnida and one was identified as *Acantharachne seydeli*. The general morphology of live specimens is discussed, with notes on their distribution and conservation status.

TAXONOMY

***Acantharachne seydeli* Giltay, 1935**

Acantharachne seydeli Giltay, 1935: 10, (f)

***Diagnostic characteristics*.** Female: TL 7–10 mm; carapace dark brown; high, and as wide as long; eyes in two rows; median eyes located on fairly low tubercle; median ocular area wider in front than posteriorly, slightly wider than long; lateral eyes widely spaced from median eyes; there are 8–10 small denticles arranged medially on carapace in a circle (Fig. 2). Clypeus wide, basal part curved forward. Sternum heart shaped; posterior tip inserted between hind legs. Abdomen large relative to carapace (Fig. 3), colour varies from cream (Fig. 2) to fawnish-brown (Fig. 3), mottled white with darker markings; wider than long, furnished dorsally with two circular humps bearing several blunt tubercles; circles well-separated from each other, situated posteriorly on highest part of abdomen; circular areas mottled brown. Legs same colour as carapace; legs variable in some specimens, strongly banded; legs spineless, front legs only slightly longer than hind legs; when resting, front legs arranged in front of body. Male unknown.

Figures 1–3. *Acantharachne seydeli* female: 1–2. Female from Kloof KwaZulu-Natal. 3. Female from Wakefield farm, near Hillcrest. Photo credits: 1–2. Andrea Sander. 3. Peter Webb.

Figures 4–6. *Acantharachne seydeli*: 4. Line drawing from Giltay (1935). 5–6. Female from Mookgopong in ethanol, anterior (5) and dorsal (6) views. Photo credits: Charles Haddad.

Figures 7–9. *Acantharachne seydeli:* 7. Female from Kloof. 8–9. Female from Wakefield. Photo credits: 7. Andrea Sander. 8–9. Peter Webb.

GLOBAL DISTRIBUTION

Democratic Republic of the Congo, South Africa.

DISTRIBUTION IN SOUTH AFRICA

***Limpopo*:** Rhemardo Holiday Resort, Mookgopong (-24.52, 28.7).
***KwaZulu-Natal*:** Kloof (-29.78, 30.83); Wakefield Farm near Hillcrest (-29.51, 29.90).

BEHAVIOUR

Nothing is known about the behaviour of *Acantharachne.* Emerit (2000) suggested that the Malagasy species may forage using a bolas, although there are no direct observations supporting the implied hunting strategy. They remarkably resemble a bird dropping, thanks to their large, globular abdomen and brownish colour. This is a form of defensive mimicry as the animals that prey on spiders pay little attention to bird droppings, which enables the spiders to rest unnoticed during the day in fairly exposed places. The specimens sampled here rest on the upper surface of leaves. The female from Limpopo was collected while fogging savannah trees.

CONSERVATION STATUS

The species has a wide distribution in the Afrotropical Region but it is under-sampled in South Africa. It can be considered Least Concern.

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WORLD SPIDER CATALOG. 2022. World Spider Catalog. Version 23.5. Natural History Museum Bern, online at http://wsc.nmbe.ch, doi: 10.24436/2

First record of *Leucauge argyrescens* Benoit, 1978 from South Africa (Araneae: Tetragnathidae)

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ABSTRACT: We present the first records of the black-spot silver marsh spider *Leucauge argyrescens* Benoit, 1978 from South Africa. This African endemic species was previously known only from the Comoros and Seychelles. The general morphology is discussed and photographs are provided, with notes on their behaviour, distribution, and conservation status.

Key words: biodiversity, distribution, new record, South African National Survey of Arachnida (SANSA)

INTRODUCTION

The genus *Leucauge* White, 1841 is known from 182 species and subspecies with 36 known from Africa (World Spider Catalog, 2022). As part of the South African National Survey of Arachnida (SANSA), large areas in South Africa (Dippenaar-Schoeman *et al*., 2015) were sampled, and many members of the family Tetragnathidae were collected.

Several specimens of a small *Leucauge* species were identified as *Leucauge argyrescens* Benoit, 1978, a species previously known only from the Comoros and Seychelles. The species is possibly undersampled and expected to occur in more African countries, but is reported here from South Africa for the first time. We present photographs of live specimens to demonstrate the general morphology and colouration, and notes are provided on their behaviour, distribution, and conservation status in the country.

METHODS

Several photographs were sent to the SANSA Virtual Museum database (Dippenaar-Schoeman *et al*., 2012) as shown here. Voucher specimens of the specimens collected during surveys are deposited in the National Collection of Arachnida (NCA) at the Agricultural Research Council, Pretoria.

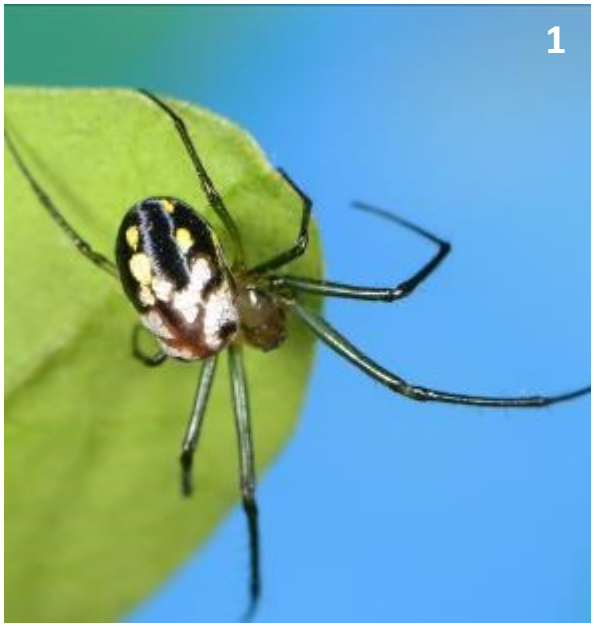
TAXONOMY

***Leucauge argyrescens* Benoit, 1978**

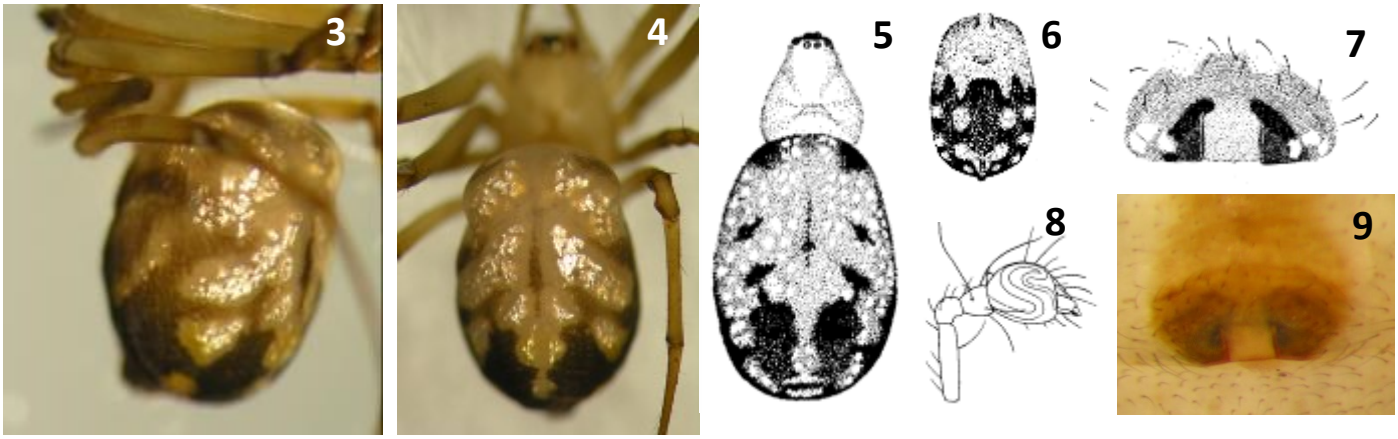
Leucauge argyrescens Benoit, 1978: 671; Locket, 1980: 122; Saaristo, 2003: 17; 2010: 230.
Leucauge russellsmithi Locket, 1980: 122 (syn).

MORPHOLOGY

Diagnostic characteristics: Size: TL female 3.5 mm, male 2.05 mm. *Leucauge argyrescens* is a small species that can be distinguished by the more or less globose abdomen (Figs 1 & 2). Female: carapace uniform fawn with an irregular median band; sternum whitish-yellow, with long setae. Abdomen fawn with blackish posterior end with three pairs of small yellow to silvery spots (Figs 3 & 4); the spots' colour varies, as in some specimens it was red (Figs 11–13). Legs: coxae and femora coloured as carapace; tibiae, metatarsi, and tarsi darkened. Epigyne with atrium s square shaped (Fig.7). Male: carapace pale yellow; sternum same colour as carapace, but with dusky radiations and thin black borderline. Abdomen darkened posteriorly; light silver patches dorsolaterally and ventrally (Fig. 10). Femora colour similar to carapace; tibiae I and II darkening gradually to the apex; metatarsi similar, with some darkening also on III and IV. Palp recognised by the relatively large, pointed conductor, slightly notched paracymbium, and unmodified cymbium (Fig. 8).



Figures 1–2. *Leucauge argyrescens:* 1. Female dorsal view. 2. Female lateral view, both from Wakefield Farm near Hillcrest. Photo credits: Peter Webb.



Figures 3–9: *Leucauge argyrescens:* 3. Female lateral view. 4. Female dorsal view from Mazeppa Bay. 5. Female dorsal view. 6. Abdomen ventrum. 7. Epigyne. 8. Male palp. 9. Epigyne female from Mazeppa Bay. Photo credits: 3, 4, 9 Charles Haddad. 5–8 Line drawings after Locket (1980).

BEHAVIOUR

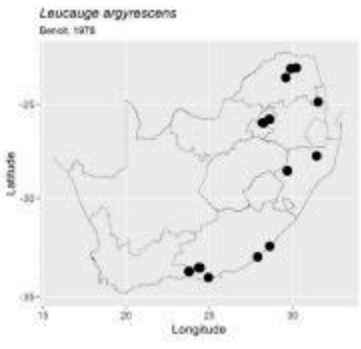
Small spider species that reside in orb-webs they build on low bushes and plants near the ground level. Species was sampled sweeping vegetation from the Forest, Savanna and Thicket Biomes in South Africa.

GLOBAL DISTRIBUTION

The species has also been recorded from the Comoros, Seychelles, and is newly recorded from South Africa. It is under-sampled and expected to occur in more African countries.

DISTRIBUTION SOUTH AFRICA

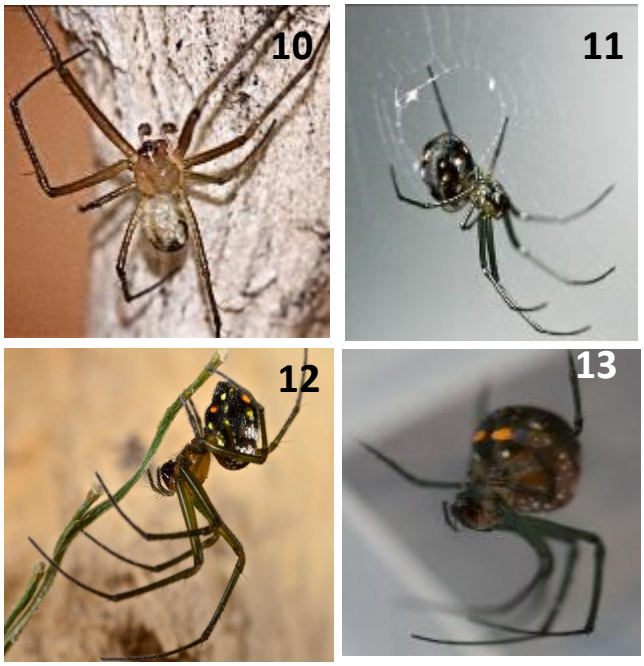
Eastern Cape: East London Pineapple Research Station (-33.01, 27.90); Jeffreys Bay (-34.04, 24.94); Mazeppa Bay (-32.47, 28.64); Thyspunt (-34.206, 24.708); Storms River (-33.98, 23.83). ***Gauteng***: Irene (field opposite Gem Village) (-25.89, 28.23); Pretoria National Botanical Garden (-25.74, 28.19). ***KwaZulu-Natal***: Ngome State Forest (-27.78, 31.45); Wakefield Farm near Hillcrest (-29.5, 29.90). ***Limpopo***: Entabeni State Forest (-23.00, 30.23); Swartbos Forest (-23.53, 29.59); Londolozi Game Reserve (-24.86, 31.53); Hanglip Forest (-23.04, 29.91).



Known distribution in South Africa

CONSERVATION

The species has a wide distribution in the Afrotropical Region but it is under-sampled in South Africa. It can be considered Least Concern.



Figures 10–13. *Leucauge argyrescens:* 10. Male from Jeffreys Bay. 11–12. Immature females from Thyspunt. 13. Juvenile from Storms River. Photo credits: 10–13. Linda Wiese.

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First record of the crab spider *Synema simoneae* Lessert, 1919 from South Africa (Araneae: Thomisidae)

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ABSTRACT: The female of the crab spider *Synema simoneae* Lessert, 1919 was described from Tanzania. It is for the first time recorded from South Africa. The general morphology of the species is discussed and photographs of live specimens provided. Notes on their behaviour, distribution in South Africa, and conservation are provided.

Key words: distribution, biodiversity, new record, South African National Survey of Arachnida

INTRODUCTION

As part of the South African National Survey of Arachnida (SANSA), large areas in South Africa were surveyed (Dippenaar-Schoeman *et al*., 2015) and several *Synema* species have been collected. The genus *Synema* Simon, 1864 is presently known from 125 species and six species are so far listed from South Africa (World Spider Catalog, 2022).

Synema simoneae, an African endemic, was described by Lessert (1919) from Tanzania with only the female known. It is one of the species newly identified from South Africa from material sampled during SANSA surveys. It is a rare species and fewer than 25 specimens were sampled over a period of 23 years.

In the present paper, the female is redescribed and new distribution records for the species are added, as well as notes of their behaviour and conservation status.

METHODS

Material used here was obtained from the SANSA surveys and voucher specimens are deposited in the National Collection of Arachnida (NCA) at the Agricultural Research Council, Pretoria. Additional information was obtained from the SANSA Virtual Museum database (Dippenaar-Schoeman *et al*., 2012) and these photographs were used to provide additional information on their morphology, distribution, and behaviour.

TAXONOMY

***Synema simoneae* Lessert, 1919**

Synema simoneae Lessert, 1919: 154 (f).

Diagnostic characteristics: Size TL: 4.1 mm. Female: carapace shiny (Fig. 1); colour varies from pale green (Fig. 2) to dark green (Fig. 7) in live specimens, eye region with fawn tint. Abdomen white, shiny, with six small black spots on border of abdomen (Figs 1–4); posteriorly with 2–3 dark transverse wavy black bands; sometimes dorsum translucent (Fig. 8). Legs I and II stronger than rest of legs; legs same colour as carapace; front legs sometimes with brownish tint. The male is still undescribed and an immature male sampled from Roodeplaatdam Nature Reserve resembles the female body in shape, size, and colour of abdomen but legs I and II tibiae with red-brown bands (Fig. 3).

BEHAVIOUR

They have been sampled from vegetation by hand and sweeping the vegetation. They are occasionally found inside flower corollas. The species have been sampled from the Fynbos, Indian Ocean Coastal Belt, Thicket and Savanna Biomes (Foord *et al*., 2011).

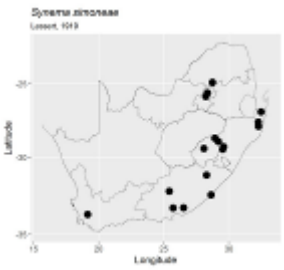
Figures 1–3. *Synema simoneae:* 1–2. Female dorsal view. 3. Immature male from Roodeplaat Dam Nature Reserve. Photo credits: Peter Webb.

GLOBAL DISTRIBUTION

Tanzania, Lesotho, South Africa.

DISTRIBUTION IN SOUTH AFRICA AND LESOTHO

Eastern Cape: Grahamstown (-33.30, 26.52); Mazeppa Bay (-32.47, 28.64); Mountain Zebra National Park (-32.24, 25.43); Prentjiesberg (-31.18, 28.28). ***Gauteng***: Irene, Gem Village Field (-25.87, 28.22); Roodeplaat Dam Nature Reserve (-25.64, 28.36). ***KwaZulu-Natal***: Cathedral Peak (-28.94, 29.19); Highmoor (-29.30, 29.59); iSimangaliso Wetland Park, False Bay Park (-27.92, 32.27); iSimangaliso Wetland Park, uMkuze Game Reserve (-27.63, 32.25); Loteni Nature Reserve (-29.47, 29.52); Ndumo Game Reserve (-26.87, 32.24); Royal Natal National Park (-28.73, 28.92); Tembe Elephant Park (-26.94, 32.47). ***Limpopo***: Tuinplaas (-24.90, 28.73). ***Western Cape***: Du Toitskloof (-33.724, 19.151). **Lesotho**: Mohale Dam Islands (-29.42, 28.08).



CONSERVATION

An African endemic known from Tanzania in the north and South Africa and Lesotho in the south. This species is possibly under-collected and suspected to occur in more localities.

Due to its wide range, it is listed as Least Concern. In South Africa the species is protected in the Mountain Zebra National Park, Roodeplaat Dam Nature Reserve (Dippenaar-Schoeman *et al.,* 1989), uMkuzi Game Reserve, Loteni Nature Reserve, Royal Natal National Park, Ndumo Game Reserve (Haddad *et al*., 2006), and Tembe Elephant Park.

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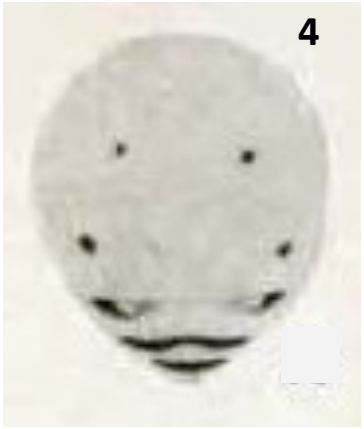

Figures 4–8. *Synema simoneae* female*:* 4–5. Line drawing of abdomen and epigyne after Lessert (1919). 6. Epigyne. 7–8. Female on vegetation at Irene. Photo credits: Peter Webb.

More on the crab spider *Phrynarachne melloleitaoi* Lessert, 1933 from South Africa (Araneae: Thomisidae)

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ABSTRACT: The crab spider *Phrynarachne melloleitaoi* Lessert, 1933 was described from Umbilo in KwaZulu-Natal but has been recorded throughout South Africa. The general morphology of the species is described based on photographs of live specimens. Notes on their behaviour, distribution in South Africa, and conservation are provided.

Key words: biodiversity, distribution, South African National Survey of Arachnida (SANSA), taxonomy

INTRODUCTION

A large number of Thomisidae have been sampled during the South African National Survey of Arachnida (SANSA) (Dippenaar-Schoeman *et al*., 2015) and based on the description and drawings of Lessert (1933), *Phrynarachne melloleitaoi* was recognised as one of the sampled thomisid species. The species was described from Umbilo in KwaZulu-Natal, South Africa. *Phrynarachne* Thorell, 1869 is represented by 35 species and 10 of the species are known from Africa and Madagascar (World Spider Catalog, 2022).

The only data on the species is the original description of the male and female in 1933. The general morphology of the species is discussed based on live specimens with notes on their behaviour, conservation, and distribution in South Africa.

METHODS

The voucher specimens sampled during SANSA surveys are deposited in the National Collection of Arachnida of the Agricultural Research Council in Pretoria. Requests were also made for photographs for the SANSA Virtual Museum and several photographs of *P. melloleitaoi* from several localities throughout South Africa have been received (Dippenaar-Schoeman *et al*., 2012).

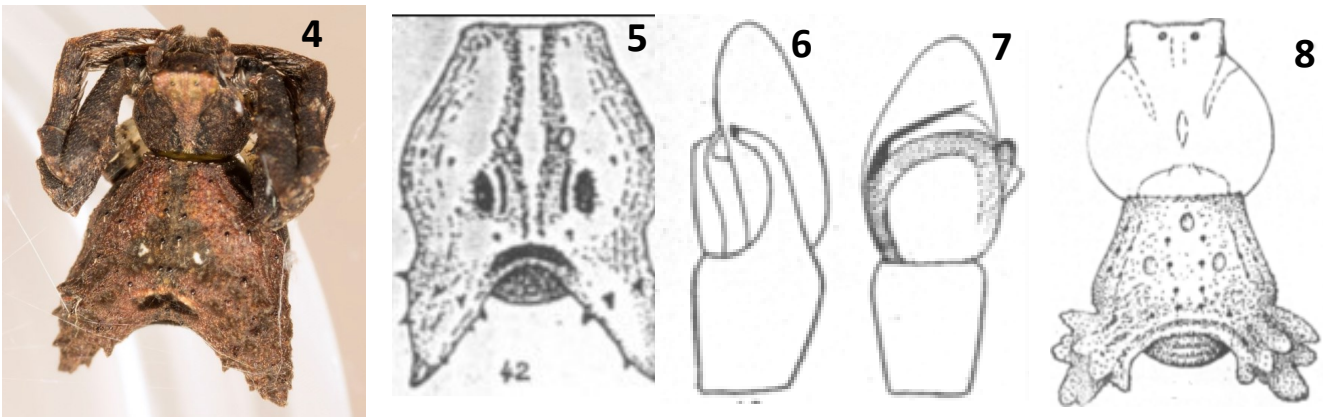
TAXONOMY

***Phrynarachne melloleitaoi* Lessert, 1933**

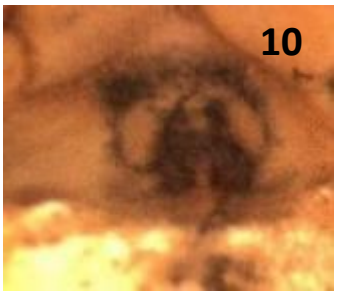
Phrynarachne melloleitaoi Lessert, 1933: 121; Dippenaar-Schoeman 2014: 246.

***Diagnostic characteristics*:** *Phrynarachne melloleitaoi* is recognised by the integument that is hard, unequal, grooved, and the abdomen bearing distinct tubercles; The abdomen shape and colour are variable and Lessert (1933) provided drawings of the abdomen of both the male and female. The abdomen is mottled yellow-brown to dark brown (Figs. 1–3); rugose, with two strong abdominal tubercles directed slightly upwards; shape of tubercles variable from almost smooth in a V-shape (Fig. 1) to very rugose with numerous tubercles (Figs 8, 12); some specimens with two white spots midway on abdomen (Fig. 1). The body and legs are covered by short, white, club-shaped setae frequently arranged in rows (Fig. 11). Carapace with eye region narrow anteriorly; two equally recurved eye rows; anterior row narrower than posterior row; median eyes half the size of the lateral eyes; lateral eyes raised on common tubercles. Legs dark brown, mottled, front legs longer, thicker and more robust than hind legs; with very strong paired setae (Figs 9). Female and male almost same size, males only slightly smaller and darker: total length 4–6 mm.

Figures 1–3. *Phrynarachne melloleitaoi:* 1. Male from Wakefield Farm. 2. Female from Camps Bay. 3. Female from Cloverly, Cape Town. Photo credits: Peter Webb.



Figures 4–8. *Phrynarachne melloleitaoi:* 4. Male abdomen. 5–8. Drawings of male abdomen and palp and female abdomen after Lessert, 1933).



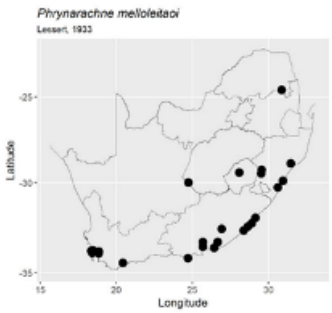
Figures 9–12. *Phrynarachne melloleitaoi*: 9. Macrosetae leg I. 10. Epigyne. 11. Setae on carapace. 12. Female from Addo National Park. Photo credits: 9–11 A. Dippenaar-Schoeman; 12. Linda Wiese.

GLOBAL DISTRIBUTION

Lesotho, South Africa.

DISTRIBUTION IN SOUTH AFRICA

Eastern Cape: Coffee Bay (-31.97, 29.14); Cwebe Nature Reserve (-32.28, 28.9); Hogsback (-32.59, 26.92); Kasouga, 16 km WSW of Port Alfred (-33.63, 26.43); Kei River Mouth (-32.68, 28.37); Mazeppa Bay (-32.47, 28.64); Zuurberg Pass (-33.32, 25.68); Addo Elephant NP, Woody Cape (-33.57, 25.68); Burg Lengeling, 15 km SE on R67 to Port Alfred (-33.32, 26.67); Thyspunt, 12 km WNW, Cape St Francis (-34.206, 24.708). ***KwaZulu-Natal***: Loteni Nature Reserve (-29.47, 29.52); Umbilo (-29.88, 30.96); Vernon Crookes Nature Reserve (-30.27, 30.62); Wakefield farm (-29.26, 29.56); Eshowe (-28.89, 31.47); Karkloof (-29.301, 30.21). ***Mpumalanga***: Mariepskop (-24.58, 30.87). ***Northern Cape***: Vanderkloof Dam Orange River (-29.99, 24.74). ***Western Cape***: Cape Town (-33.91, 18.42); De Hoop Nature Reserve (-34.45, 20.44); Stellenbosch (-33.93, 18.85); Bloubergstrand (-33.77, 18.45); Delvera Stellenbosch (-33.833, 18.857); Robben Island (-33. 8, 18.35). Camps Bay (-33.95,18.37).



Known distribution in South Africa

BEHAVIOUR

They are free-living plant dwellers and many of the specimens were sampled from trees. Specimens were sampled while beating and sweep netting the vegetation in the Fynbos, Forest, Grassland, Indian Ocean Coastal Belt, Savanna and Thicket Biomes (Haddad *et al*., 2013, Foord *et al*., 2011). The species has also been sampled from citrus orchards (Dippenaar-Schoeman *et al*., 2013). Adults were sampled throughout the year, and juveniles were sampled from May until October.

Members of *Phrynarachne* are known as bird-dropping crab spiders as some species make a disc of white silk on the surface of leaves on which they position themselves, resulting in a striking resemblance to the excrement of birds. However, this behaviour has not been observed in *P. melloleitoai.*

CONSERVATION

There are no known threats and no conservation actions are recommended. The species is protected in several reserves and parks such as Addo Elephant National Park (Dippenaar-Schoeman *et al*., 2020), Cwebe Nature Reserve, Loteni Nature Reserve, Vernon Crookes Nature Reserve, Thyspunt (Dippenaar-Schoeman & Wiese, 2022) and De Hoop Nature Reserve (Haddad & Dippenaar-Schoeman, 2009).

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Observations on the trapdoor spider *Ancylotrypa nigriceps* (Purcell, 1902) (Araneae: Cyrtaucheniidae)

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ABSTRACT: *Ancylotrypa* Simon, 1889 is a genus known from 43 species endemic to Africa, with 29 species known from South Africa. They are large ground-dwelling trapdoor spiders that live in burrows that are closed with a wafer lid. Although it is a large genus, little is still known about their general behaviour. The general morphology, behaviour and distribution, along with images of live specimens of the species *Ancylotrypa nigriceps* (Purcell, 1902) that is known from Gauteng and the Free State in South Africa are discussed.

Key words: biodiversity, distribution, South African National Survey of Arachnida (SANSA)

INTRODUCTION

The genus *Ancylotrypa,* described by Simon (1889), is known as the African wafer-lid trapdoor spiders. This African endemic genus is represented by 43 species, of which 29 are known from South Africa (Dippenaar-Schoeman *et al*., 2020; World Spider Catalog, 2022).

Species of *Ancylotrypa* live in silk-lined burrows of which the depth varies between species, with the main portion being as deep as 32 cm. The shape of the burrows varies from single burrows, to Y-shaped to the shape of a curved pipe. In some species, side chambers are made with or without lids (Dippenaar-Schoeman, 2006).

As part of the South African National Survey of Arachnida (SANSA), spiders were sampled throughout the country (Dippenaar-Schoeman *et al.,* 2015). During SANSA surveys in the Gauteng and Free State provinces, the species *Ancylotrypa nigriceps* (Purcell, 1902) were frequently sampled. We provide more information on its general morphology, behaviour, and distribution, along with images of live specimens.

Figures 1–2: *Ancylotrypa nigriceps:* 1–2. Male from Heidelberg, Gauteng, found in grassland. Photo credits: Johan van Zyl.

METHODS

Voucher specimens sampled during SANSA surveys are housed in the National Collection of Arachnida (NCA) at the Agricultural Research Council (ARC) in Pretoria. Series of photographs were taken by the second author (JVZ) in Gauteng.

TAXONOMIC NOTES

A South African endemic, described by Purcell (1902) as *Cyrtauchenius nigriceps* from Johannesburg. Although the species is presently known from only one sex, it has a wide geographical range and can be listed as being of Least Concern.

***Ancylotrypa nigriceps* (Purcell, 1902)**

Cyrtauchenius nigriceps Purcell, 1902: 358.
Pelmatorycter nigriceps: Simon, 1903: 899.
Ancylotrypa nigriceps: Roewer, 1942: 169; Raven, 1985: 157; Dippenaar-Schoeman 2002: 47; Dippenaar-Schoeman *et al*., 2020: 21.

***Diagnostic characteristics*:** Male. Carapace reddish brown, the cephalic portion blackish brown; chelicerae dark; legs and pedipalps, including the coxae, and the sternum pale ochraceous; abdomen pale yellowish below and at the sides, blackish brown above (Figs 1 & 2). Carapace longer than wide, with a row of stout, curved, marginal spines on each side above the bases of the posterior pairs of legs (Fig. 3); cephalic region strongly arched, posteriorly narrowed; fovea broad, procurved; clypeus narrow; chelicerae broad, rastellum with several short, blunt spines on low mound. Sternum posteriorly broad; posterior sigilla large, oval abdomen sometimes without bands or spots (Fig. 4); tarsus II with four small spines; tarsus IV with a distal group of small spines internally and double series of longer spines externally. Female unknown.

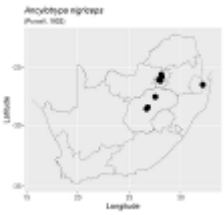
Figures 3–7: *Ancylotrypa nigriceps* male from Erfenisdam Nature Reserve (alcohol material): 3. Dorsal view. 4. Ventral view. 5. Eye pattern. 6. Male palp. Photo credits: Ansie Dippenaar-Schoeman.

GLOBAL DISTRIBUTION

South Africa.

DISTRIBUTION IN SOUTH AFRICA

Free State: Erfenis Dam Nature Reserve (-28.5, 26.8); Amanzi Private Game Reserve (-28.62, 26.68). ***Gauteng***: Roodepoort (Honingklip) (-26.14, 27.86); Johannesburg (-26.2, 28.04); Suikerbosrand Nature Reserve (-27.59, 27.53); Heidelberg, Van Riebeeck Nature Reserve (-25.85, 28.16); Irene Holgatfontein (-26.27, 28.49)*; Luipaardsvlei (-26.14, 27.79)*; Zwartkoppies (-25.75, 28.37)*. ***KwaZulu-Natal*:** Ndumo Game Reserve (-26.54, 32.17)

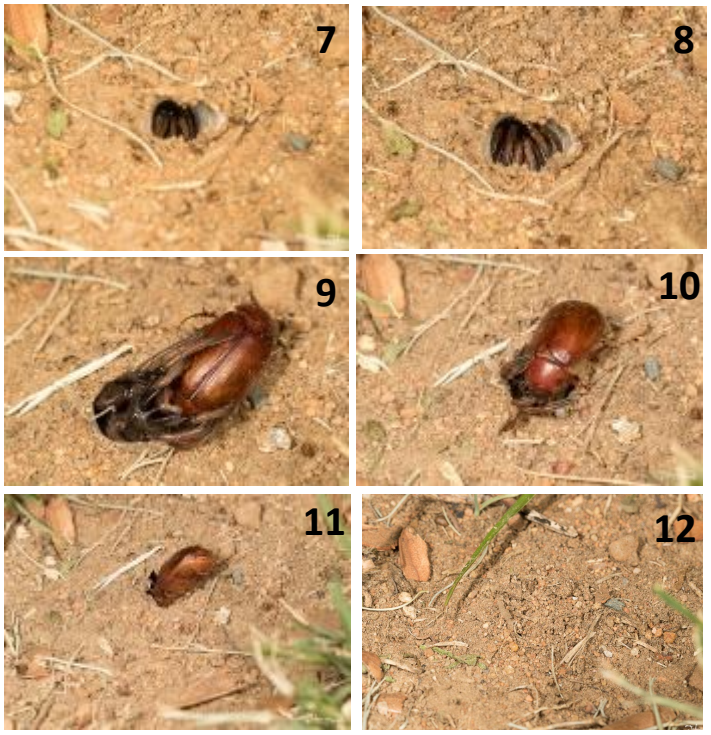


* Sampled by Engelbrecht (2013).

LIFESTYLE

Of the 29 species of *Ancylotrypa* known from South Africa, little is known about their behaviour. In Dippenaar-Schoeman (2002), burrows of seven species are discussed as observed by Hewitt (1915; 1919); Purcell (1903), and Van Dam & Roberts (1917). The vertical, silk-lined burrows are made in habitats ranging from grassy areas to open, barren ground and are frequently found under logs, stones, or rock overhangs, which afford shelter. The depth of the burrow varies between species with the main portion being as deep as 32 cm. Burrow shapes vary from simple to Y- or U-shaped. In some species side chambers are made with or without lids.

A male *A. nigriceps* was observed and photographed in a silk-lined burrow in Heidelberg, Gauteng. It was in a vertical, silk-lined burrow. The burrow was found in a grassy area in open, barren ground. The entrance is very well camouflaged (Fig. 12) and is closed over with a soft silk flap, and well camouflaged with sand particles (Fig. 7). The flap was a floppy extension of the burrow itself and, when open, it forms a rim around the burrow entrance on the ground (Fig. 8). To close it, the spider lifts the flap and pulls it towards the centre, forming a sand-covered trapdoor (Fig. 12). During the day, most of the spiders retire to the lower portion of the burrow. Here the male takes up position in the burrow entrance, waiting for prey that is grabbed and immediately pulled into the burrow (Figs 9–12). During surveys in the grassland at Irene, an immature female was sampled and photographed that might be the undescribed female of *A. nigrice*ps (Fig. 13).



Figures 7–12. *Ancylotrypa nigriceps* male catching a beetle, pulling it into its burrow. Photo credits: Johan van Zyl.

Figure 13. Possibly the female of *Ancylotrypa nigriceps* photographed from Irene (undescribed). Photo credit: Peter Webb.

The males are more active and are more easily collected in pitfall traps (Engelbrecht, 2013). In built-up areas they frequently drown in swimming pools. In South Africa they have been mainly sampled from the Grassland Biome (Haddad *et al*., 2013)and Savanna Biome (Foord *et al.,* 2011).

CONSERVATION MEASURES

Although the species is presently known from only one sex, it has a fairly wide geographical range and it is protected in the Erfenis Dam Nature Reserve (Haddad *et al*., 2015), Amanzi Private Game Reserve (Haddad & Butler, 2018), Ndumo Game Reserve, and Suikerbosrand Nature Reserve. It is possibly under-sampled and is listed as Least Concern.

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We would like to thank the late Peter Webb for his photograph.

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First records of the white widow spider *Latrodectus pallidus* O.P.-Cambridge, 1872 from South Africa (Araneae: Theridiidae)

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ABSTRACT: The white widow spider *Latrodectus pallidus* O.P.-Cambridge, 1872 was described from Israel. The species has a wide distribution and is now commonly found throughout North Africa, the Middle East, and Central Asia. During the South African National Survey of Arachnida (SANSA), *L. pallidus* was for the first time recorded from South Africa. The known distribution from South Africa is provided, with notes on the morphology and behaviour.

Key words: biodiversity, distribution, new record, South African National Survey of Arachnida (SANSA)

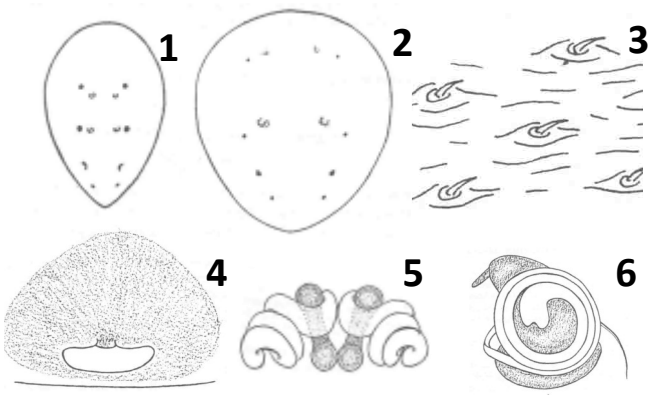
INTRODUCTION

The genus *Latrodectus* Walckenaer, 1805 is represented by 34 species with a wide distribution (World Spider Catalog, 2022). The genus was revised in the Afrotropical Region by Lotz (1994) and the six species recorded from South Africa were well documented in the First Spider Atlas of South Africa (Dippenaar-Schoeman *et al*., 2010) as well as the Identification Guides (Dippenaar-Schoeman *et al*., 2021). The number of species from the country was recently increased to seven, with the description of a new species, *L. umbukwane* Wright *et al.,* 2019, from KwaZulu-Natal (Wright *et al*. 2019).

As part of the South African National Survey of Arachnida (SANSA), more than 5 400 theridiid specimens were sampled, of which 10% were *Latrodectus* (Dippenaar-Schoeman *et al*., 2015, 2012). Among this material and photographs received, several specimens were identified as *L. pallidus* O.P.-Cambridge, 1872, representing the first records from South Africa. Additional information on their morphology, distribution in South Africa, and behaviour are provided here.

TAXONOMY

Latrodectus pallidus was originally described from Israel (World Spider Catalog, 2022) and is also found in North Africa, the Middle East, and Central Asia. The common name for the species in English is the white widow spider. The main distinguishing characteristics are the creamy white abdomen bearing dorsally six small black spots arranged in pairs present in males and females (Figs 1, 2, 7).



Figures 1–6. *Latrodectus pallidus* line drawings*:* 1.Line drawing male abdominal pattern. 2. Female abdominal pattern. 3. Female abdominal setae. 4. Female epigyne. 5. Female internal genitalia. 6. Male palp. (After Lotz, 1994).

In a juvenile sampled from Dwarskersbos, the black spots were absent (Fig. 10). The female is also recognised by the short sparse abdominal setae (Fig. 3). Venter of abdomen is black with a yellowish-white hourglass marking between the epigastric furrow and spinnerets (Figs 8–9). The carapace is brown with darker tint around the margins (Fig. 11). The legs are faintly banded.

The male palp has an embolus with three loops (Fig. 6). The female epigynal atrium is about twice as wide as long (Fig. 4) and spermathecal ducts have three loops (Fig. 5) (Levi, 1966, Lotz, 1994).

Figures 7–8. *Latrodectus pallidus:* 7. Female from Kloovenberg dorsal view. 8. Female from Kasteelberg ventral view. Photo credits: Cecile Roux.

Figures 9–12. *Latrodectus pallidus:* 9. Juvenile from Dwarskersbos, ventral view. 10. Juvenile in retreat from Dwarskersbos. 11. Female from Kasteelberg. 12. Female dorsal view from Irene. Photo credits: 9–11. Cecile Roux. 12. Peter Webb.

GLOBAL DISTRIBUTION

Cape Verde, Israel, Iran, Libya, Asian Russia, Turkey, Yemen. New record: South Africa.

DISTRIBUTION IN SOUTH AFRICA

Gauteng: Irene field opposite Gem Village (-25.89, 28.23). ***Western Cape***: Koringberg, Mooreesburg (-33.15, 18.65); Kasteelberg, Riebeek West (-33.47, 18. 52); Kloovenburg Riebeek Kasteel (-33.47, 19.04); Dwarskersbos (-32.42, 18 14).

LIFESTYLE

They construct a web at a height of 30–60 cm between the twigs of shrubs or soil debris in a variety of microhabitats. The spiders make use of the same web over a long period of time and the small male is found on the border of the web of the female. Information on the biology of *L. pallidus* is provided by Shulov (1940).

The juvenile photographed at Dwarskersbos made a circular retreat, incorporating small stones in the webbing (Fig. 10). The specimen collected at Irene was found under a dry leaf on the soil surface (Fig. 12).

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Cheliceral flashing not only in wolf spiders (Araneae: Lycosidae)

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ABSTRACT: Cheliceral flashing describes the behaviour during which a spider tilts its prosoma to expose red setae on its chelicerae, which are otherwise not visible. It was first reported in the Lycosidae of the genus *Hogna* and in particular for *H. spenceri* (Pocock, 1898) and *H. transvaalica* (Simon, 1898). We report here on cheliceral flashing that was also observed in members of Ctenidae (*Anahita* sp.) and Stasimopidae (*Stasimopus coronotus* Hewitt, 1915).

Key words: cheliceral setae, Ctenidae, Lycosidae, Stasimopidae

INTRODUCTION

Warning coloration (aposematism) is prominent in the animal kingdom, and spiders are no exception. The bright red and orange, often against a black background, in *Latrodectus* species is one example. There is, however, a trade-off between blending in with the environment versus standing out due to displaying bright warning colours. This is especially true for some ground-living spiders.

Ground-living spiders have colours that blend in with the soils or leaf litter of their habitat; bright coloration would advertise themselves to predators and would therefore be selected against. If the spider was, however, able to hide the bright colours and only display when needed, it would allow the spider to be camouflaged when not in danger, but display its aposomatic colours when threatened. The sudden display of colour would also startle a predator. A dense patch of orange-red hairs on the ventral side of the prosoma where the fangs are (Fig. 1) is particularly distinct within the Mygalomorphae. Several mygalomorph families rear up when threatened, which in turn expose this red patch of setae, which is normally hidden on the ventral side, as a warning (Fig. 2). This has been observed in the Theraphosidae (Fig. 1) and some Idiopidae genera (Fig. 2).

Similar to that, but more striking, is the flashing of red setae of the chelicerae. Cheliceral flashing describes the behaviour during which a spider tilts its prosoma to expose red setae on its chelicerae, which are otherwise not visible (Webb, 2013). As the spider tilts its prosoma, the intensity of the red increases from a pinkish colour to a fiery orange-red colour (Fig. 3), thereby changing the apparent colour of the chelicerae from the (usually earthy) colour that are similar to the rest of the prosoma, to a bright orange-red colour.

Cheliceral flashing was first reported in the Lycosidae of the genus *Hogna* and in particular for *H. spenceri* (Pocock, 1898) and *H. transvaalica* (Simon, 1898) (Dippenaar-Schoeman & Webb, 2022).This behaviour was observed in both males and females. In exuviae it could be seen that the red setae cover the top two-thirds of the chelicerae.

NEW RED CHELICERAE OBSERVATIONS

OBSERVATION 1: While sampling spiders for the NSF-funded *Biodiversity of the Waterberg Mountain Complex*, at Welgevonden Game Reserve, in Limpopo, South Africa, a hitherto unknown example of cheliceral flashing was observed, and the spider was collected and photographed (Figs 4–6). The species was identified as an *Anahita* species (Ctenidae) but unfortunately no *Anahita* species have yet been listed from South Africa. The voucher specimen, a male, is deposited in the Ditsong Museum as a voucher specimen. The orange-red setae on the chelicerae cover the top two-thirds of the chelicerae.

Figure 1. *Augacephalus junodi* (Simon, 1904) (Theraphosidae), with a close-up of the chelicerae to indicate the red patch of setae below the fangs. Photo credit: Peter Webb.

Figure 2. *Idiops gunningi* (Hewitt, 1913) (Idiopidae) in a defense position, which displays the red patch of setae that are normally hidden on the ventral side. Photo credit: Peter Webb.

Figure 3. *Hogna spenceri* (Pocock, 1898) (Lycosidae) from Lephalale displaying the red setae on the chelicerae. Photo credit: Peter Webb.

Figures 4–6. *Anahita* undetermined sp. Ctenide male: (4–5). Display of cheliceral flashing when threatened. (6) When not threatened. Photo credits: C. Warmenhove & M. Aucamp.

OBSERVATION 2: As part of the South African National Survey of Arachnida (SANSA) (Dippenaar-Schoeman *et al*., 2012; 2015), surveys are undertaken throughout the country. The fifth author (PW) was involved in surveys at Lephahlale in Limpopo, South Africa. He photographed all the species collected and while handling the species he observed that some specimens display the red setae on their chelicerae when disturbed. Two of the specimens, a female (Fig. 7) and male (Fig. 8), were identified as an *Anahita* species .The chelicerae bear orange-red setae but less intense as the specimen from Welgevonden. The Lephahlale specimens are deposited in the National Collection of Arachnida as voucher specimens.

OBSERVATION 3: While P. Webb photographed the material sampled at Lephalale, he observed similar red setae on the chelicerae of a Stasimopidae specimen. The species was identified as *Stasimopus coronatus* Hewitt, 1914 (Fig. 9). Here the red setae are present on the bottom half of the chelicerae (Figs 10–11).

Figures 7–8. Undetermined *Anahita* sp. (Ctenidae) from Lephahlale. 7. Female displaying the orange-red chelicerae. 8. Male. Photo credits: Peter Webb.

Figures 10-11. Colour of chelicerae setae visible on *Stasimopus coronatus* female from Lephalale, South Africa. Photo credits: Peter Webb.

CONCLUSION

Cheliceral flashing could prove to be more widespread in spiders than initially thought. If present in taxa from such different clades as the Araneomorphae and the Mygalomorphae, then it might be an example of convergent evolution in warning predators. It might be a method used by some burrow dwellers to scare off enemies.

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A checklist of the spiders (Arachnida, Araneae) of Tierberg Long Term Ecological Research site, Prince Albert, Western Cape, South Africa

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ABSTRACT: Surveys undertaken at Tierberg Karoo Research Centre, now known as Tierberg Long Term Ecological Research site near Prince Albert in the Western Cape, are reported on here. The plains landscape is characterised by circular biogenic patches 15–20 m in diameter, known as "*heuweltjies*". These are over-dispersed at a density of 2.2/ha and overlie the subterranean nest of the termite *Microhodotermes viator*. The first annotated species list of spiders sampled from 1988 to 1990 is presented. A total of 103 species from 76 genera and 32 families were recorded. The most species-rich families are the Gnaphosidae (25 spp.), Salticidae (8 spp.), Lycosidae (7 spp.) and Zodariidae (6 spp.). The conservation status and level of endemicity based on their known distribution are provided for each species, as well as termite associations. Seven species are recognised as new.

Keywords: South African National Survey of Arachnida, Western Cape, conservation assessment, termites

INTRODUCTION

Biodiversity is one of the most important concepts in contemporary biology, with a broad range of applications. In November 1995, South Africa ratified the Convention on Biological Diversity (CBD). Signatories are obligated to develop a strategic plan for the conservation and sustainable use of biodiversity. To meet the requirements of the CBD, the South African National Survey of Arachnida (SANSA) was initiated in 1997. SANSA is an umbrella project implemented at a national level in collaboration with researchers and institutions countrywide, dedicated to document and unify information on arachnids in South Africa. SANSA's aims are to: (1) discover, describe, and make an inventory of the arachnid fauna of South Africa; (2) organise all available information in a relational database and to make the data available to science and society; and (3) use this information to address issues concerning their conservation and sustainable use (Dippenaar-Schoeman *et al.,* 2015).

One of the key accomplishments of SANSA was the First Atlas of South African Spiders (Dippenaar-Schoeman *et al*., 2010), which served as the basis for a national Red List assessment of South African spiders. This was largely made possible through the digitization of species-level specimen records in collections and records from taxonomic publications into the SANSA database (Dippenaar-Schoeman *et al*., 2012).

Due to extensive collecting done by SANSA fieldwork managers, specimen bycatches from other research projects, student projects, and through public participation in collecting specimens, more than 40 degree square grids were sampled in previously poorly sampled areas (Dippenaar-Schoeman *et al*., 2013). This effort has provided valuable material that has improved our knowledge of the distribution of species and provided specimens for future taxonomic studies. This database is now central in addressing questions around patterns of species richness and endemism and provided the basis for initial analyses of South African spider biodiversity with the finalising of the first ever national Red List assessment of spiders (Foord *et al*., 2020).

Specimens in collections should not only be preserved, but the primary information associated with them contains valuable information on their distribution and general habitat. To make this information available to science, surveys undertaken throughout the years, that contributed to the red listing project, have now been published as checklists. In the Western Cape, some of the published surveys include checklists of the Karoo National Park (Dippenaar-Schoeman *et al*., 1999), the Swartberg Nature Reserve (Dippenaar-Schoeman *et al.,* 2005), and the Bontebok Nature Reserve (Dippenaar-Schoeman *et al*., 2021).

This paper presents the first species list on the spider fauna of the Tierberg Long Term Ecological Research (LTER) site with information on their endemicity and conservation status as well as association with termites.

METHODS

Study area: Most of the specimens were collected on the Tierberg Karoo Research Centre (TKRC), now known as the Tierberg LTER site. This 100-ha livestock exclosure was established on the sheep farm Tierberg in 1987 as part of Terrestrial Ecosystems Programme of the National Research Foundation that aimed to develop a predictive understanding of ecosystem structure and function in major biomes of South Africa (Arena *et al*., 2018).

Figure 1. Plains at Tierberg LTER showing the termitaria "*heuweltjies*" as lighter patches. Photo credit: Suzanne Milton.

Figure 2. Open structure of dwarf shrubland on plains at Tierberg LTER. Photo credit: Suzanne Milton.

Figure 3. The more succulent and closed vegetation on a "*heuweltjie*" at Tierberg LTER. Photo credit: Suzanne Milton.

Tierberg LTER lies at 33° 10' 06"S, 22° 15' 57"E and at an altitude of 745 m above sea level (a.s.l.), in the valley of the Sand River 20 km inland of the Swartberg mountains. The silty colluvial plains are flanked by Witteberg quartzite, Dwyka tillite, and Ecca mudstone hills (Fig. 1). The soils are silty and stony. Annual rainfall over the past 30 years averaged 195 mm and showed little seasonal pattern (summer = 56 mm; autumn = 62 mm; winter = 42 mm; spring = 36 mm) (Arena *et al*., 2018). The dwarf shrubland vegetation of the area, Prince Albert Succulent Karoo (Mucina & Rutherford, 2006), is characterised by a mixture of succulent and non-succulent shrubs 0.1–0.4 m in height and dominated by *Pteronia pallens* and *Ruschia spinosa*. Grasses are restricted to drainage lines and the projected canopy cover at the time of the study ranged from 11–30% (Milton *et al*., 1992). The plains landscape is characterised by circular biogenic patches 15–20 m in diameter known as "*heuweltjies*"(Figs 1 & 3). These are over-dispersed at a density of 2.2/ha and overlie the subterranean nest of *Microhodotermes viator* (Milton *et al*., 1992). Vegetation cover on the alkaline and nitrogen-enriched soils of "*heuweltjies"* is dominated by succulents and saltbushes and is generally denser than in the matrix vegetation of the plains (Milton *et al*., 1992) (Fig. 2).

A few additional specimens were collected on the farm Botterkraal 15 km east of the Tierberg LTER at 33° 06' 09"S, 22° 23' 47"E, 916 m a.s.l. The soils at this site were coarser and sandier and the vegetation, classified as Gamka Karoo (Mucina & Rutherford, 2006), was denser (40% cover), dominated by non-succulent dwarf shrubs, particularly *Pentzia incana* and *Chrysocoma ciliata* (Milton, unpublished data).

Sampling methods and identification: On the Tierberg LTER, traps were set on "*heuweltjies"* and plains for 24 hours per month for 29 months between March 1988 and July 1990. Pitfall traps were tin cans embedded in the ground with the lip flush with the soil surface. The cans were 90 mm in diameter and when open, contained plastic bag liner containing water and glycol. When not in use, the lids were replaced to avoid excessive trapping effects on local populations of epigaeic fauna.

On the plains, 20 pitfall traps were positioned in a grid of four rows 20 m apart, each with five traps at 5-m intervals. Twenty "*heuweltjies*" were selected on a "first encounter" basis and one trap was centred on each (Dean & Griffin, 1993). The total number of trap days on plains was 573 compared with 522 trap days on "*heuweltjies"* (Arena *et al*., 2020). The catch was sorted and labelled the day after capture and specimens were sent to the National Collections of Arachnida (NCA) of the Agricultural Research Council in Pretoria for identification and to deposit voucher specimens.

At Botterkraal, microarthropods on the soil surface were sampled by running a 12-V vacuum cleaner (intake width 33 mm) for 30 seconds across the soil in the open between shrubs and for a further 30 seconds below the canopy of shrubs (Dean & Milton, 2001). Faunal specimens collected in this way were labelled, preserved, and sent for identification as described above.

A survey of web spiders was conducted on 28 to 30 January 2017 at Tierberg LTER (Henschel & Lubin, 2018) to determine the impacts of livestock farming on arthropods and a range of related ecological processes. They sampled nine spider species from four web-building families. The study supports the hypothesis that web spider abundance is affected by shrub cover as they found that spider abundance is higher on densely vegetated mounds, termed "*heuweltjies*", than in the surrounding shrub matrix in both the exclosure and the sheep pasture. The species of three of the families Agelenidae, Eresidae, and Theridiidae were also sampled from pitfall traps. Three species of the Araneidae of this study (*Argiope australis*, *Nemoscolus vigintipunctatus,* and *Isoxya cicatricosa*) were added to the checklist of spiders from Tierberg LTER.

Endemicity value and conservation status of species: The global distribution of species was used to determine the endemicity value of each species (Table 3, Appendix 1). Values distinguished for species endemicity (E) are: (6) only known from the type locality (Tierberg LTERE); (5) known from several localities in the Western Cape (WCE); (4) known also from Northern or Eastern Cape, the two adjoining provinces; (3) known from more than two provinces in South Africa (SAE); (2) known from other Southern African countries (STHE); (1) known from other countries in the Afrotropical Region (AE); and (0) also from countries outside the Afrotropical Region (CE). The conservation status of each species was derived from a recent National Red List assessment of spiders in South Africa where spatial analysis on observed occurrences using functions for Extent of Occurrence (EOO), Area of Occupancy (AOO), and elevational range the area of occupation was determined. The assumed knowledge of the full range for all species based on their observed occurrences, and EOO, was calculated as the minimum convex polygon around all occurrences, and the 2-km^2 cells occupied were used to calculate AOO. The distribution of threats across lineages were visualised using a mosaic plot, with the size of rectangles representing the proportion of species in a specific family represented within four categories: data deficient, least concern, rare, and threatened (Foord *et al.,* 2020).

RESULTS AND DISCUSSION

Spider abundance by habitat: The traps captured a total of 754 individual spiders, of which 431 (or 82 per 100 trap days) were on "*heuweltjie*" habitat, and 323 (or 56 per 100 trap days) on the plains (Table 1). Thus, spiders, in common with ants (Arena *et al.,* 2017) were more abundant on the more productive "*heuweltjie*" habitat.

Table 1. The numbers of individual spiders in the genus *Ammoxenus* (Gnaphosidae) and other genera captured in pit traps on "*heuweltjie*" and plains habitats at Tierberg LTER.

HABITAT	NUMBER OF *Ammoxenus*	NUMBER OF SPIDERS	TOTAL	TRAP DAYS	NO./100 DAYS
Heuweltjies	206	225	431	522	82.56
Plain	168	155	323	573	56.36
TOTAL	374	380	754	1 095	68.85

Species present: A total of 103 species in 76 genera and 32 families were recorded (Table 2; Appendix 1). Seven species were not identified to species level and are possibly new to science.

The Tierberg LTER material housed in the NCA since 1990 were available for taxonomic research and seven of the species were already included in several taxonomic revisions: *Seothyra schreineri* Purcell, 1903 (Dippenaar-Schoeman, 1990); *Peucetia viridis* (Blackwall, 1858) (Fig. 7) (Van Niekerk & Dippenaar-Schoeman, 1994); *Tyrotama australis* (Simon, 1893) (Fig. 6) (Foord & Dippenaar-Schoeman, 2005); *Heriaeus allenjonesi* Van Niekerk & Dippenaar-Schoeman, 2013; *Micaria beaufortia* (Tucker, 1923) (Fig. 8) (Booysen & Haddad, 2021), and *Mallinus nitidiventris* Simon, 1893 (Fig. 9) (Haddad *et al*., 2019). Two species, *Langona warchalowskii* Wesołowska, 2007 (Fig. 10) and *Diploglena karooica* Haddad, 2015 (Fig. 12), were originally described with Tierberg LTER as the type locality. Of the four species of *Ammoxenus* collected at Tierberg LTER, one was identified as *Ammoxenus pentheri* Simon, 1896 (Figs 16–18) and the other three are new to science, but they still need to be described (Bird, 2003).

Family diversity: Of the 32 spider families collected from Tierberg LTER (Table 2; Appendix 1), the most species-rich families are the Gnaphosidae (25 spp.), Salticidae (8 spp.), Lycosidae (7 spp.), and Zodariidae (6 spp.). Many of the species sampled at Tierberg LTER were also recorded during a survey in the nearby Swartberg Nature Reserve (Dippenaar-Schoeman *et al.,* 2005), where 186 spp. were sampled, with the Gnaphosidae (33 spp.) and Salticidae (23 spp.) the most species-rich families. The difference in number of species is due to sampling in Tierberg LTER restricted to the ground layer.

Table 2: Spider diversity of Tierberg LTER site with the total number of families, genera (G), and species (SP.) sampled.

FAMILY	G	SP.	FAMILY	G	SP.
Agelenidae	3	3	Palpimanidae	1	1
Amaurobiidae	1	2	Philodromidae	3	3
Araneidae	3	4	Phyxelididae	1	1
Caponiidae	2	2	Prodidomidae	3	3
Cheiracanthiidae	2	3	Salticidae	6	8
Clubionidae	1	1	Scytodidae	1	1
Corinnidae	1	1	Segestriidae	1	1
Dictynidae	1	1	Selenopidae	1	1
Eresidae	4	4	Sicariidae	1	1
Gnaphosidae	10	25	Sparassidae	3	4
Hersiliidae	1	1	Theridiidae	2	4
Linyphiidae	3	3	Thomisidae	2	2
Liocranidae	1	1	Trachelidae	1	1
Lycosidae	6	7	Uloboridae	1	1
Oonopidae	1	1	Zodariidae	6	6
Orsolobidae	1	1			
Oxyopidae	2	5		76	103

Conservation status: The majority (84.5%) of species have a wide distribution with no known threats and are therefore of least concern (LC) (Table 3). A small number (5.8%) are data deficient (DD), lacking taxonomic resolution or lack of distribution data. Only the new species were not evaluated (NE).

Endemicity: Eight species found at the Tierberg LTER have a cosmopolitan range and are also found outside the Afrotropical Region and were introduced to South Africa (Table 3). Twenty-two species are African endemics, while 31 species are Southern African endemics and 42 are South African endemics.

Three of the species, *Dresserus nigellus* Tucker, 1920 (Fig. 11) (Eresidae), *Purcelliana problematica* Cooke, 1964 (Fig. 4) (Prodidomidae), and *Diores bifurcatus* Tucker, 1920 (Fig. 5) (Zodariidae) have a restricted distribution and are Western Cape endemics. Presently no species are threatened and of special concern.

Termite associations: The research on the association of spiders with termites in South Africa has thus far only involved three widespread termite species, namely the harvester termite *Hodotermes mossambicus* (Hagen), dealt with by Van den Berg & Dippenaar-Schoeman (1991), Dippenaar-Schoeman *et al*. (1996 a, b); Petráková *et al*. (2015), *Trinervitermes trinervoides* (Sjöstedt) by Haddad and Dippenaar-Schoeman, and *Microhodotermes viator* (Dean, 1988).

Table 3. Conservation status and endemicity of the spider species sampled at Tierberg LTER site (DD– data deficient; NE – not evaluated; LC – least concern)

	NO. SPP.	CODE	%
CONSERVATION STATUS			
Data deficient	6	DD	5.8
Not evaluated	7	NE	6.8
Least concern	90	LC	87.4
Rare	0	R	0
ENDEMICITY			
0 – Africa and wider (C)	8	LC	7.8
1 – Africa endemics (AE)	22	LC	21.4
2 – Southern Africa endemics	31	LC	30.1
3 – South Africa endemics (SAE):	21	LC	20.4
4 – South Africa endemics (SAE): two adjacent provinces	10	LC	9.7
5 – Western Cape endemics (WCE)	3		3
6 – Tierberg LTER	7?		7

Ammoxenus was the most abundant genus and all the species are associated with termites. A total of 374 specimens were collected 49% of all spiders surveyed (Table 1). *Ammoxenus* species are agile, free-running, ground-living spiders. They have the ability to dive head-first into sand by using their modified chelicerae while holding their legs close to their bodies, hence the common name sand divers (Dippenaar-Schoeman *et al*., 1996a).

The most extensive treatment of the biology of *Ammoxenu*s species is given by Dippenaar-Schoeman *et al*. (1996a,b), with reference to *A. pentheri* Simon, 1896.(Figs 17 & 18). They are also known as termite-eating spiders (Dippenaar-Schoeman *et al.,* 1996a) and all species of *Ammoxenus* seem to prey specifically on termites (Fig. 16). When the termites are inactive, these spiders bury themselves usually in the 20–60 mm high termite soil mounds of harvester termites near the termite foraging holes (Dippenaar-Schoeman *et al*., 1996b).

At Tierberg LTER, Dean (1988) observed an *Ammoxenus* species preying on the termite *Microhodotermes viato*r. Worker termites emerge from foraging holes to cut fallen twigs into manageable pieces. The twigs are then dragged or carried to the nest entrances, from where other workers then drag the pieces into the nest system. The soldiers usually remain close to the foraging holes. Dean (1988) observed three attacks by an *Ammoxenus* on *M. viator*. He suggested that the spiders used tactile cues to select optimal prey items after initial handling of the prey. *M. viator* forages dynamically and unpredictably within a wide range of ambient and soil-surface temperature and humidity (Dean, 1993).

Other families associated with termites include the Gnaphosidae, Salticidae, and Zodariidae. Gnaphosids are mostly free-running, active ground dwellers and species of the genera *Asemesthes*, *Drassodes* (Fig.13), and *Zelotes* were frequently sampled with termites and was observed feeding on them (Van den Berg & Dippenaar-Schoeman, 1991).

In the Salticidae, species of *Heliophanus, Stenaelurillus,* and *Phlegra* have been associated with termites (Haddad & Wesołowska, 2006; Van den Berg & Dippenaar-Schoeman, 1991).

In the Zodariidae, species of *Diores* were observed feeding on termites (Jocqué, 1990, Jocqué & Dippenaar-Schoeman, 1992), while species of the smaller zodariids *Akyttara*, *Palfuria* (Fig. 15), and *Ranops* (Fig. 14) that were sampled at Tierberg LTER are associated with ants (Jocqué, 1990).

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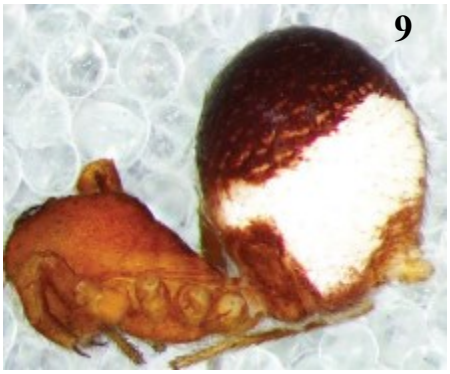

Figures 4–18. 4. *Purcelliana problematica* (Prodidomidae). 5. *Diores bifurcatus* (Zodariidae). 6. *Tyrotama australis* (Hersiliidae). 7. *Peucetia viridis* (Oxyopidae). 8. *Micaria beaufortia* (Gnaphosidae). 9. *Mallinus nitidiventris* (Zodariidae). 10. *Langona warchalowskii* (Salticidae). 11. *Dresserus nigellus* (Eresidae). 12. *Diploglena karooica* (Caponiidae). 13. *Drassodes stationis* (Gnaphosidae). 14. *Ranops* sp. (Zodariidae). 15. *Palfuria* sp. (Zodariidae). 16. *Ammoxenus pentheri* (feeding on termite) (Ammoxenidae). 17–18. *Ammoxenus pentheri* (Ammoxenidae). Photo credits: 5–8, 10, 11, 13–15 Peter Webb; 9 Charles Haddad; 16 Marie de Jager; 12 Neville Cornberg; 17–18 Les Oates.

APPENDIX 1. Spiders of Tierberg LTER, Western Cape, listing their endemicity (END), conservation status (CS), and global distribution (DIST), possibly new species. [LC – Least Concern; DD – Data Deficient; NE – Not Evaluated; AE – African Endemic; STHE – Southern Africa Endemic; SAE – South Africa Endemic ; C – wider than Africa.

FAMILY	SPECIES	END	CS	DST
Agelenidae	*Agelena gaerdesi* Roewer, 1955	2	LC	STHE
	Mistaria zuluana (Roewer, 1955)	2	LC	STHE
	Olorunia punctata Lehtinen, 1967	1	LC	AE
Amaurobiidae	*Pseudauximus pallidus* Purcell, 1903	4	LC	SAE
Araneidae	*Argiope australis* (Walckenaer, 1805)	1	LC	AE
	Nemoscolus tubicola (Simon, 1887)	2	LC	STHE
	Nemoscolus vigintipunctatus Simon, 1897	2	LC	STHE
	Isoxya cicatricosa (C.L. Koch, 1844)	1	LC	AE
Caponiidae	*Caponia braunsi* Purcell, 1904	4	DD	SAE
	Diploglena karooica Haddad, 2015	2	LC	STHE
Cheiracanthiidae	*Cheiracanthium africanum* Lessert, 1921	1	LC	AE
	Cheiracanthium furculatum Karsch, 1879	1	LC	AE
	Cheiramiona ansiae Lotz, 2002	4	LC	SAE
Clubionidae	*Clubiona africana* Lessert, 1921	1	LC	AE
Corinnidae	*Cambalida fulvipes* Simon, 1896	1	LC	AE
Dictynidae	*Archaeodictyna condocta* (O.P.-Cambridge, 1876)	0	LC	C
Eresidae	*Dresserus nigellus* Tucker, 1920	5	DD	SAE
	Gandanameno spenceri (Pocock, 1900)	2	LC	STHE
	Seothyra schreineri Purcell, 1903	2	LC	STHE
	Stegodyphus tentoriicola Purcell, 1904	2	LC	STHE
Gnaphosidae	*Ammoxenus* sp. 1 *	6	NE	SAE
	Ammoxenus sp. 2 *	6	NE	SAE
	Ammoxenus sp. 3 *	5	NE	SAE
	Ammoxenus pentheri Simon, 1896	2	LC	STHE
	Asemesthes ceresicola Tucker, 1923	3	LC	SAE
	Asemesthes decoratus Purcell, 1908	2	LC	STHE
	Camillina cordifera (Tullgren, 1910)	1	LC	AE
	Camillina procurva (Purcell, 1908)	1	LC	STHE
	Camillina setosa Tucker, 1923	3	LC	SAE
	Drassodes ereptor Purcell, 1907	3	LC	SAE
	Drassodes lophognathus Purcell, 1907	3	LC	SAE
	Drassodes splendens Tucker, 1923	2	LC	STHE
	Drassodes stationis Tucker, 1923	3	LC	SAE
	Ibala bilinearis (Tucker, 1923)	2	LC	STHE
	Micaria beaufortia (Tucker, 1923)	2	LC	STHE
	Megamyrmaekion schreineri Tucker, 1923	2	LC	STHE
	Poecilochroa anomala (Hewitt, 1915)	2	LC	STHE
	Trephopoda parvipalpa (Tucker, 1923)	2	LC	STHE
	Xerophaeus appendiculatus Purcell, 1907	3	LC	SAE

FAMILY	SPECIES	END	CS	DST
	Xerophaeus aurariarum Purcell, 1907	3	LC	SAE
	Xerophaeus communis Purcell, 1907	3	LC	SAE
	Xerophaeus spiralifer Purcell, 1907	4	LC	SAE
	Zelotes fuligineus (Purcell, 1907)	1	LC	AE
	Zelotes humilis (Purcell, 1907)	2	LC	STHE
	Zelotes reduncus (Purcell, 1907)	2	LC	STHE
Hersiliidae	*Tyrotama australis* (Simon, 1893)	2	LC	STHE
Linyphiidae	*Frontinellina locketi* Van Helsdingen, 1970	3	LC	SAE
	Microlinyphia sterilis (Pavesi, 1883)	1	LC	AE
	Ostearius melanopygius (O.P.-Cambridge, 1879)	0	LC	C
Liocranidae	*Rhaeboctesis secundus* Tucker, 1920	2	LC	STHE
Lycosidae	*Arctosa nivosa* (Purcell, 1903)	3	LC	SAE
	Evippomma squamulatum (Simon, 1898)	2	LC	STHE
	Hogna bimaculata (Purcell, 1903)	2	LC	STHE
	Pardosa crassipalpis Purcell, 1903	2	LC	STHE
	Proevippa albiventris (Simon, 1898)	2	LC	STHE
	Proevippa schreineri (Purcell, 1903)	2	LC	STHE
	Pterartoria subcrucifera (Purcell, 1903)	4	LC	SAE
Oonopidae	*Gamasomorpha humicola* Lawrence, 1947	3	LC	SAE
Orsolobidae	*Azaniolobus* sp. *		NE	
Oxyopidae	*Oxyopes bothai* Lessert, 1915	1	LC	AE
	Oxyopes longispinosus Lawrence, 1938	3	LC	SAE
	Oxyopes russoi Caporiacco, 1940	1	LC	AE
	Oxyopes vogelsangeri Lessert, 1946	1	LC	AE
	Peucetia maculifera Pocock, 1900	2	LC	STHE
Palpimanidae	*Palpimanus crudeni* Lessert, 1936	4	DD	SAE
Philodromidae	*Hirriusa variegata* (Simon, 1895)	3	LC	SAE
	Philodromus grosi Lessert, 1943	1	LC	AE
	Thanatus vulgaris Simon, 1870	0	LC	C
Phyxelididae	*Vidole capensis* (Pocock, 1900)	3	LC	SAE
Prodidomidae	*Austrodomus scaber* (Purcell, 1904)	2	LC	STHE
	Purcelliana problematica Cooke, 1964	5	DD	SAE
	Theuma capensis Purcell, 1907	2	LC	STHE
Salticidae	*Heliophanus insperatus* Wesołowska, 1986	1	LC	AE
	Heliophanus modicus Peckham & Peckham, 1903	1	LC	AE
	Kima variabilis Peckham & Peckham, 1903	3	LC	SAE
	Langona warchalowskii Wesołowska, 2007	2	LC	STHE
	Menemerus bivittatus (Dufour, 1831)	0	LC	C
	Natta chionogaster (Simon, 1901)	1	LC	AE

FAMILY	SPECIES	END	CS	DST
	Pellenes geniculatus (Simon, 1868)	0	LC	C
	Thyene inflata (Gerstäcker, 1873)	1	LC	AE
Scytodidae	*Scytodes triangulifera* Purcell, 1904	4	DD	SAE
Segestriidae	*Ariadna lightfooti* Purcell, 1904	3	LC	SAE
Selenopidae	*Anyphops hessei* (Lawrence, 1940)	3	LC	SAE
Sicariidae	*Loxosceles dejagerae* Lotz, 2017	3	LC	SAE
Sparassidae	*Olios correvoni nigrifrons* Lawrence, 1928	1	LC	AE
	Palystella pallida Lawrence, 1938	4	LC	SAE
	Palystes karooensis Croeser, 1996	3	LC	SAE
	Palystes castaneus (Latreille, 1819)	2	LC	STHE
Theridiidae	*Latrodectus indistinctus* O.P.-Cambridge, 1904	2	LC	STHE
	Latrodectus renivulvatus Dahl, 1902	1	LC	AE
	Steatoda capensis Hann, 1990	0	LC	C
	Steatoda erigoniformis (O.P.-Cambridge, 1872)	0	LC	C
Thomisidae	*Diaea puncta* Karsch, 1884	1	LC	AE
	Heriaeus allenjonesi Van Niekerk & Dippenaar-Schoeman, 2013	3	LC	SAE
Trachelidae	*Afroceto porrecta* Lyle & Haddad, 2010	4	DD	SAE
Uloboridae	*Uloborus plumipes* Lucas, 1846	0	LC	C
Zodariidae	*Akyttara* sp.*		NE	
	Diores bifurcatus Tucker, 1920	5	LC	SAE
	Heradida extima Jocqué, 1987	4	LC	SAE
	Mallinus nitidiventris Simon, 1893	3	LC	SAE
	Palfuria sp.*		NE	
	Ranops sp.*		NE	