The faunistic diversity of spiders (Arachnida: Araneae) of the South African Grassland Biome

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ABSTRACT

As part of the South African National Survey of Arachnida (SANSA), all available information on spider species distribution in the South African Grassland Biome was compiled. A total of 11 470 records from more than 900 point localities were sampled in the South African Grassland Biome until the end of 2011, representing 58 families, 275 genera and 792 described species. A further five families (Chummidae, Mysmenidae, Orsolobidae, Symphytognathidae and Theridiosomatidae) have been recorded from the biome but are only known from undescribed species. The most frequently recorded families are the Gnaphosidae (2504 records), Salticidae (1500 records) and Thomisidae (1197 records). The last decade has seen an exponential growth in the knowledge of spiders in South Africa, but there are certainly many more species that still have to be discovered and described. The most species-rich families are the Salticidae (112 spp.), followed by the Gnaphosidae (88 spp.), Thomisidae (72 spp.) and Araneidae (52 spp.). A rarity index, taking into account the endemicity index and an abundance index, was determined to give a preliminary indication of the conservation importance of each species. The endemicity index indicates that 58 species are endemic to the biome, while 38 species could be considered to be introduced, cosmopolitan, or having a distribution extending beyond the Afrotropical Region. Levels of endemism are highest for mygalomorph trapdoor spiders (7.14–50%) and selected araneomorph families with restricted dispersal capabilities (i.e. Archaeidae, Sicariidae and Scytodidae). A brief review of the published data of surveys from the biome and the patterns of spider assemblage structure in each is presented, together with information on the most species-rich spider families occurring in the biome.

Key words: conservation, diversity, endemic, habitat, survey

INTRODUCTION

Spiders (Arachnida: Araneae) can be considered a critical component of terrestrial biodiversity, and with more than 43 000 species already described (Dunlop & Penney, 2011; Platnick, 2012), the order ranks as the sixth most species rich in the phylum Arthropoda (Zhang, 2011). Spiders fulfil a critical function as faunal components of terrestrial ecosystems, as all species are predators and play an important role in the natural control of

populations of terrestrial invertebrates, particularly insects (Cardoso *et al.*, 2011). There has been a recent increase in the application of spiders as bio-indicators to measure ecological disturbance and pollution, which has raised the profile of the group and its importance as a surrogate taxon (Marc *et al.*, 1999; Cardoso *et al.*, 2011). As generalist predators, their importance as natural control agents of pest insects and mites in agroecosystems has also received increased attention during the last few decades (Riechert, 1999; Dippenaar-Schoeman *et al.*, in press).

The South African National Survey of Arachnida (SANSA) was launched in 1997 in accordance with the country's obligations to the Convention of Biological Diversity (CBD), with a specific focus on determining the biodiversity of the South African Arachnida. It is an umbrella project that was implemented at a national level in collaboration with researchers and institutions countrywide to document and unify information on arachnids. SANSA is providing essential data that is needed to address issues concerning the conservation and sustainable use of the arachnid fauna (Foord *et al.*, 2011a). As part of SANSA, a number of projects are underway to determine the diversity of the arachnid fauna of South Africa, which includes an inventory of the spider fauna of the different floral biomes. These projects recently culminated in the production of the First Atlas of South African Spiders (Dippenaar-Schoeman *et al.*, 2010), in which 2010 species from 71 families were reported from the country. Atlas data can be considered an important tool in biodiversity conservation as it offers reliable, high quality data that should be able to withstand public, scientific and legal scrutiny. This is despite challenges and tradeoffs between data quantity and quality, standardisation of sampling methods and sampling effort, and mismatches in the skills and expectations of data collectors and data users (Robertson *et al.*, 2010).

The aim of this study is to provide an overview of the diversity and present status of the spider fauna of the South African Grassland Biome, and follows on a paper dealing with the fauna of the Savanna Biome (Foord *et al.*, 2011b). A check list of spiders found in this biome is provided based on published records from scientific literature and identified museum specimens, together with data on the guilds each occupies, levels of endemicity, a rarity index, and patterns of family and species richness. A review of the ecological and biodiversity literature published to date from the Grassland Biome is also presented.

BACKGROUND

Grasses (Poaceae) evolved during the Eocene, which coincided with the evolution and radiation of grazing herbivorous mammals on land (Bredenkamp *et al.*, 2002). During the Miocene, extensive drying of the African continent resulted in the expansion of drought resistant savannas and grasslands, and during the Cenozoic the vegetation of southern African changed into the equivalents of the modern day biomes (Scott *et al.*, 1997). In modern history, climate change, fire and anthropogenic disturbances have continued to facilitate the expansion of grassland and savanna habitats in South Africa (Breman *et al*., in press). On the African continent, true grasslands now only occur in South Africa, the enclave of Lesotho and parts of Swaziland (Palmer & Ainslie, 2005; Mucina & Rutherford, 2006; Carbutt *et al.*, 2011), although grassy savannas are also prominent in East Africa (Reid *et al*., 2005).

In South Africa, grasslands cover approximately a quarter of the total land surface and are distributed primarily on the central plateau, although they extend into most of the major biomes (forest, savanna, thicket and Nama Karoo) in the region (Fairbanks *et al.*, 2000; Palmer & Ainslie, 2005). Grasslands are primarily found in the summer rainfall areas, from sea level to altitudes above 3000 m, and cover large parts of the Gauteng, Mpumalanga, Free State and North West provinces, but also occur on high mountains and in patches in Limpopo and along the coast of the Eastern Cape and KwaZulu-Natal (Mucina & Rutherford, 2006).

The climate of grassland areas typically consists of warm, wet summers followed by cold, dry winters with heavy frosts. Frost, fire and grazing are some of the factors that prevent the spread of woody shrubs and trees, which are largely restricted to protected valleys, rocky areas, river margins and dense woodlands. As such, the vegetation is dominated by grass species, with many forbs also present (Carbutt *et al.*, 2011). Although there is considerable altitudinal variation within the biome, the topography is generally comprised of rolling hills and valleys, which are often characterised by the presence of wetlands, particularly at higher altitudes. Grasslands burn regularly, often every year, and the plants and animals are often adapted to survive fires (e.g. Fourie, 2010; Hugo-Coetzee & Avenant, 2011; Jansen *et al.*, in press). In their review of the ecological factors influencing arthropod diversity in grasslands, Joern & Laws (2013) identified the direct and indirect effects of grazing, fire and climate, interspecific interactions, above- and below-ground interactions and landscape-level effects as some of the most important effects.

The Grassland Biome is considered to have an extremely high biodiversity, second only to the Fynbos Biome (Low & Rebelo, 1996). It is one of the most seriously threatened vegetation types in South Africa, with more than 40% of the area covered by the biome irreversibly transformed (O'Connor & Kuyler, 2005). Most of South Africa's grasslands have

been irreversibly transformed and generally lack the ability to recover after severe disturbance (Smit *et al*., 1997, Little *et al*., 2005), and are being increasingly degraded through cumulative influences. Agricultural activities are largely responsible for this, with maize, sunflowers, sorghum and wheat extensively cultivated, and livestock farming resulting in overgrazing (Tainton, 1981; Neke & Du Plessis, 2004), extensive burning (Lubin & Crouch, 2003), plantation forestry (Van der Merwe *et al.*, 1996) and invasion by alien plant species (Mgobozi *et al*., 2008) all impacting on the remaining grassland habitats. Furthermore, a considerable portion of this biome has been impacted by mining, industrial and urban development (Mentis & Huntley, 1982).

Unfortunately, only 2.8% of the biome is formally conserved (O'Connor & Kuyler, 2005), which makes any remaining untransformed grassland patches greatly significant from an ecological perspective, and thus highly irreplaceable (Egoh, 2009). Because large protected areas within the Grassland Biome are largely absent, the only two being the Golden Gate National Park and the Ukhahlamba-Drakensberg Transfrontier Conservation Area in the eastern montane areas, effective management and conservation of grasslands in smaller reserves and on private land is necessary to protect the highly endemic fauna and flora of this biome (Wessels *et al.*, 2003; Hamer & Slotow, 2008; McGeoch *et al*., 2011).

MATERIALS AND METHODS

Information from databases

Data on spider species richness for the Grassland Biome of South Africa were obtained from existing datasets compiled for the First Atlas of the Spiders of South Africa (Dippenaar-Schoeman *et al.*, 2010). The atlas was based on the SANSA database, which contains three forms of data: 1) information on all the preserved specimens housed in natural history collections worldwide and published in the primary literature (15 500 records); 2) primary data of specimens housed in the National Collection of Arachnida (NCA) at the ARC – Plant Protection Research Institute (PPRI), Pretoria (45 000 records), as well as 3) a digital photographic database containing images of species recorded by the public (2300 records). These digital data are available online (www.arc.agric.za quick link SANSA, Virtual Museum). Only records from the Virtual Museum that could be accurately identified to species level, or for which the specimen was collected for identification, were included. Also included were unpublished M.Sc and Ph.D theses, and longer-term surveys that have been undertaken since the 1970's.

Field work

Spiders were sampled during field work that formed part of SANSA surveys, as well as various student projects that were undertaken between 1997 and 2011 at several grassland sites in South Africa. A large proportion of the specimens were collected by pitfall trapping, leaf litter sifting or active searching at the base of grass tussocks and under rocks, thus accounting primarily for ground-dwelling spiders. Plant-dwelling species were collected by beating and sweeping the vegetation or actively searching on vegetation and flowers. Grassland sampling occasionally included bycatch samples collected by Malaise traps and yellow, blue and white pan traps. Voucher specimens from these surveys are housed in the National Collection of Arachnida at the ARC – Plant Protection Research Institute in Pretoria (NCA), the National Museum in Bloemfontein (NMBA), Ditsong National Museum of Natural History in Pretoria (TMSA) and the KwaZulu-Natal Museum in Pietermaritzburg (NMSA).

The focused SANSA field surveys employed a standard protocol that was used to collect in historically poorly sampled degree-square grids. Due to limitations of manpower to conduct sampling and subsequent identification of material, only selected degree-square grids in the biome could be sampled, which explains the low number of records and species for large parts of the biome (Figs 1a-c). In each degree-square grid, four contrasting habitat types were identified by the field work manager and his assistants. In each habitat type the following sampling was carried out: 500 sweeps of grasses and/or other low-growing vegetation; 500 beats of woody plants (trees and shrubs); 50 pitfalls with preservative (ethanediol) set out in a straight line transect 2m apart and emptied after 3–4 days; 2 man-hours of active searching under rocks, logs, bark and spider webs, and 10 leaf litter sifting samples. In one habitat site selected by the field work manager, 2 hours of nocturnal active searching was conducted and 10 Winkler trap samples (emptied after 3–4 days) were taken. All of the collected material was preserved in 70% ethanol, sorted to morphospecies in the laboratory, and identified to species level, where possible. In total, 8 degree-square grids (out of a total 28 sampled during SANSA phase II) were sampled in the Grassland Biome. Most of the material collected is deposited in NCA and NMBA.

Guilds

Spiders employ different strategies for capturing prey. Based on the way they capture prey, spiders can be divided into two main guilds: web-dwellers and wanderers. The capture webs constructed by web-builders show considerable variation in general appearance, silk structure and site of construction. The following web types are constructed by spiders and detailed descriptions of each are given in Foord *et al*. (2011b): funnel-webs, gumfoot-webs, orb-webs, retreat-webs, sheet-webs and space-webs.

Wandering spiders can be broadly grouped into plant- or ground-dwellers. The plant-dwellers can be further classified according to the type of plant or part of the plant that they usually inhabit, for example grass, bark, foliage, flowers and seed, but unfortunately basic biological data is lacking for many species and we have decided not to attempt a further division of the plant-dwelling wanderers. Ground-wanderers are species that actively forage on the soil surface in search of prey, or construct burrows from which they ambush their prey.

Rarity index

A rarity index was calculated for each species based on two of the three rarity criteria proposed by Rabinowitz (1981), namely population size and distribution (Table 1). The endemicity value included six categories, ranging from known only from type locality to cosmopolitan or with a distribution beyond the borders of the Afrotropical Region, and was determined based on current distribution data available in the three sources described above during preparation of the First Atlas of the Spiders of South Africa. Estimates of population size were based on the number of collecting records known for each species and were divided into three categories (Table 1). Although these latter categories are essentially crude estimates of population sizes, they do provide a basis from which to work. The rarity index was calculated based on the sum of the values of these two criteria, and ranged from 1 (cosmopolitan and locally abundant) to 9 (known only from the type locality and possibly very rare). It is important to note that the rarity index presented here is only a preliminary value based on currently available data. Future sampling will lead to the discovery of additional populations of the majority of the species treated here (Appendix 1), which will inevitably lead to a decrease in the RI values for many species.

RESULTS

Species inventory and faunal composition

A total of 11 470 records representing 58 families, 275 genera and 792 described species have been documented to date from more than 900 point localities in the South African Grassland Biome (Appendix 1; Table 2). This only includes records that have been identified to species level. A further five families, i.e. Chummidae, Mysmenidae, Orsolobidae, Symphytognathidae and Theridiosomatidae, have been collected from the biome but are only known from undescribed species. Additionally, there is a large number of undescribed species known from the biome that are not included in the check list (Appendix 1), particularly in the families Agelenidae, Clubionidae, Linyphiidae, Lycosidae and Theridiidae, none of which have been subjected to extensive modern taxonomic revisions in South Africa. Based on our estimates of unidentified morphospecies in museum collections and from recent field work, it is plausible that at least 1000 species occur in this biome.

The distribution of collecting records amongst families (Table 2) is somewhat indicative of the sampling methodologies historically used to collect in the Grassland Biome and the likelihood of collecting these particular taxa. Gnaphosidae (2504 records) and Lycosidae (712 records) are readily collected using pitfall traps, litter sifting and hand collecting on the ground; foliage and grass sampled by beating and sweeping, respectively, regularly collects Araneidae (575 records), Miturgidae (707 records), Theridiidae (635 records) and Thomisidae (1197 records), while Salticidae (1500 records) are often collected using all five methods.

Distribution of records at species level is somewhat consistent with the family level patterns. Only seven species have been recorded on more than 250 occasions in the biome (Appendix 1): *Cheiracanthium furculatum* Karsch, 1879 (Miturgidae, 558 records), *Zelotes scrutatus* (O.P.-Cambridge, 1872) (Gnaphosidae, 374 records), *Latrodectus geometricus* C.L. Koch, 1841 (Theridiidae, 364 records), *Z. frenchi* Tucker, 1923 (359 records), *Z. fuligineus* (Purcell, 1907) (286 records), *Misumenops rubrodecoratus* Millot, 1942 (Thomisidae, 256 records) and *Palystes superciliosus* L. Koch, 1875 (Sparassidae, 253 records). Three of these species, *C. furculatum*, *L. geometricus* and *P. superciliosus*, are considered synanthropic and are regularly collected around human habitation, which may explain the proportionally large number of records of these species. A total of 211 species (26.74%) have only been recorded from the biome once and 122 species (15.46%) are known from only two records (Appendix 1). This proportion should decrease considerably with further collecting, particularly that focused on historically poorly sampled microhabitats.

Rarity index and endemism

Of the 792 species known from the Grassland Biome, 58 species (7.32%) are endemic to this vegetation type (Table 2). Not surprisingly, the highest levels of endemism are found in the mygalomorph trapdoor spider families Atypidae (50%), Ctenizidae (46.67%), Idiopidae (30.43%) and Nemesiidae (20%), and less mobile araneomorph taxa such as Archaeidae (33.33%), Palpimanidae (20%), Pholcidae (23.08%), Scytodidae (25%) and Sicariidae (33.33%).

The combined values of the abundance index (1–3), based on numbers sampled, and endemicity index (0–6), indicate that 42 species (5.30%) have a rarity index value (RI) of 9, i.e. species that are only known from the type locality and that are very rare (1–3 specimens/locality), while 31 species have an RI value of eight and 42 species an RI value of seven (Appendix 1). A further 38 species (4.80%) collected from the biome can be considered to be introduced, cosmopolitan or with a distribution extending beyond the Afrotropical Region, and generally have RI scores of 1–3. Many of these species are synanthropic and of little conservation importance.

Guilds

The vast majority of the grassland species (605 spp., 76.38%) are free-living spiders, with 300 species (37.88%) actively hunting on the soil surface and 74 species (9.34%) constructing burrows from which they ambush prey. A further 231 species (29.17%) are preferential plant-dwellers, occurring on grasses and woody plants. Web-builders are represented by 187 spp. (23.61%), of which the largest proportion (80 spp., 10.10%) construct orb-webs. The remaining web-building guilds include the retreat-web builders (39 spp., 4.92%), sheet-web builders (30 spp., 3.79%), gumfoot-web builders (15 spp., 1.89%), space-web builders (13 spp., 1.64%) and the funnel-web builders (10 spp., 1.26%) (Appendix 1).

DISCUSSION

Sampling and taxonomic history and conservation implications

The current paper presents the first comprehensive synopsis of the spider fauna of the South African Grassland Biome, and provides much-needed baseline data for an order of arthropods occurring in the biome. While the total spider diversity in the biome is considerably lower than the 1230 species recorded from the Savanna Biome, one must bear in mind that this study was based on only 11 470 records, while that of the savanna involved

more than double the number of records (Foord *et al.*, 2011b). Thus, it would seem that with more comprehensive sampling (building on the recent SANSA phase II) and taxonomic emphasis on poorly known taxa in the future, the number of grassland species will increase considerably. As an example of this, a further five families have been collected in grasslands that were not included in these results, as they are only known from undescribed species. Furthermore, the use of litter sifting and canopy fogging as sampling techniques in future studies should be encouraged, as they have both been poorly utilised in past surveys and show considerable potential for the discovery of new taxa (e.g. Butler & Haddad, 2011; Haddad & Wesołowska, 2011; Wesołowska & Haddad, in press). Active searching at the base of grass tussocks and selection of pitfall trapping sites in areas with different soil characteristics are also likely to yield new and unusual grassland species (Foord *et al.*, 2011a).

When considering the distribution of records, genera and species documented from the Grassland Biome (Figs 1a-c), it is clear that the highest values for each category are concentrated around some of the major urban centres in the biome: Bloemfontein in the central Free State, Johannesburg and Pretoria in Gauteng Province, and Witbank (Emalahleni) in Mpumulanga Province. This corresponds largely with the distribution of available human resources that are available to undertake arachnological research, as well as volunteer collectors that have contributed to SANSA. Despite the considerable increase in sampling during the last decade, large areas in the biome remain neglected, and a considerable number of quarter-degree squares have yet to be sampled, particularly in the North West, Free State, Eastern Cape and Mpumulanga Provinces (Fig. 1a). This highlights the need for further sampling effort in this biome to provide basic baseline biodiversity data and material for taxonomic study.

The historical distribution of grassland records indicates that between 1976 and 2005 fewer than 500 records were sampled per year in the biome (Fig. 2a). Since the start of SANSA phase II there has been a marked increase in sampling in the biome as part of the field work component of the project, as well as from student projects in the Free State and Mpumulanga provinces, in particular. The baseline biodiversity studies conducted in the alpine grasslands of KwaZulu-Natal as part of the Maluti-Drakensberg Transfrontier Project also made a significant contribution in generating material from these grasslands.

Consistent with patterns in the Savanna Biome (Foord *et al.*, 2011b), the taxonomic descriptions of species recorded from the Grassland Biome reached a peak during the late 1800's and early 1900's (Fig. 2b), largely due to the descriptive work of arachnologists

including Eugene Simon, Roger de Lessert, Embrik Strand, Reginald Pocock, William Purcell, George and Elizabeth Peckham, John Hewitt, Roger Tucker and Reginald Lawrence (Appendix 1). However, only a small proportion of the species that they described are grassland endemics, of which the majority are trapdoor spiders described by Hewitt (1913, 1915a,b, 1916, 1919) and Tucker (1917). From 1950 onwards there was a considerable drop in the description of new species, although the recent increase in taxonomic studies of South African spiders during the last two decades has seen a slight increase in the number of new species described (Fig. 2b). Significantly, a sizable proportion of these species are endemics, comparable to the number of endemics described in the era of maximum taxonomic productivity (Fig. 2c). Considering the drastic increase in number of records sampled during the last decade and the poor taxonomic resolution of several families, it is likely that a large number of new species (some endemic) will be described in the future, especially when the proportion of new species to described species in certain genera (e.g. Lotz, 2003; Haddad & Lyle, 2008; Lyle & Haddad, 2010) and families (e.g. Griswold, 1990; Haddad & Wesołowska, 2011) that are subjected to revision is considered. This is supported by the lack of an asymptote in both the accumulation curves for total grassland species richness (Fig. 2b) and grassland endemics (Fig. 2c).

Determining which species are of conservation concern is problematic, considering the degree of undersampling in large areas of the biome. Further sampling is clearly needed to generate additional distribution data for the apparently rare species, particularly those in RI categories 8 and 9. Indeed, many of the species with a RI score of 7 and 8 are not biome endemics and have also been recorded in the Savanna, Nama Karoo or Forest biomes (Dippenaar-Schoeman *et al.*, 2010). It has been suggested (Foord *et al.*, 2011b) that species with a RI score of six and higher should be assessed for Red Data listing under IUCN requirements due to their often restricted distributions and small population sizes. While such a conservation assessment will afford potentially threatened species some protection, their status should be reviewed at a later stage when more data has been generated from the biome.

Protected areas (PA) play an important role in conserving suitable habitats for spider populations. Although large PA within the Grassland Biome are largely absent, SANSA surveys have been undertaken or are presently underway in several PA in the Gauteng, Free State, Mpumalanga and Eastern Cape provinces. This includes surveys in several reserves, including the Erfenis Dam Nature Reserve (Fourie, 2010; Fourie *et al.*, in press), Mkambati Nature Reserve (Dippenaar-Schoeman *et al.*, 2011), Verloren Vallei Nature Reserve (Jansen *et al.*, in press), two botanical gardens (e.g. Butler & Haddad, 2011; Neethling & Haddad, in

review) and several caves (Dippenaar-Schoeman & Myburgh, 2009; Durand *et al.*, 2012). Unpublished surveys from PA in which >50 species have so far been recorded include the following nature reserves: Abe Bailey, Enzemvelo, Kloofendal, Sandveld, Suikerbosrand, Tussen-die-Riviere, Willem Pretorius and Witbank. Continued sampling in PA will provide important data to monitor spider populations and species of conservation concern, and provide additional locality data to evaluate the conservation status of species from the biome.

Patterns of spider assemblage composition

Very few published studies exist on the spider fauna of the Grassland Biome, the majority of which were undertaken in the Free State Province (Table 3). Regarding spider abundance, the ground-dwelling fauna is dominated by Gnaphosidae (Lotz *et al.*, 1991; Van den Berg & Dippenaar-Schoeman, 1991) or Lycosidae (Jansen *et al*., in press), that of abandoned termitaria by Gnaphosidae and Salticidae (Haddad & Dippenaar-Schoeman, 2002, 2006), and leaf litter assemblages by Amaurobiidae and Gnaphosidae (Butler & Haddad, 2011). Gnaphosidae and Salticidae were often the most species-rich ground-dwelling families in the aforementioned studies. For some families not only is the habitat structure crucial, but that in combination with the presence of particular prey may play a key role in determining their distribution. For example, species of the genus *Ammoxenus* Simon, 1893 (Ammoxenidae) are obligate termite eaters and require high densities of these insects, in combination with loose sand in which they dive to hide (Van den Berg & Dippenaar-Schoeman, 1991; Dippenaar-Schoeman *et al.*, 1996a,b). Such ideal conditions are frequently found in the Grassland Biome.

The dominant grass-dwelling families apparently vary geographically and according to grassland type. In the drier grasslands of the central Free State, the numerically dominant grass-dwelling families include Thomisidae, Philodromidae, Salticidae and Araneidae, although the abundance of each may vary between different grassland types (Haddad, 2005; Fourie *et al*., in press). The most species-rich families were the Thomisidae and Araneidae, with the Salticidae, Philodromidae, Linyphiidae and Theridiidae varying in richness between the two surveys. In contrast, the fauna of moist coastal grasslands in the Eastern Cape are dominated by Araneidae, Salticidae and Theridiidae, while Philodromidae and Thomisidae are much lower in abundance (Dippenaar-Schoeman *et al*., 2011). The most species-rich families were the Theridiidae, Salticidae, Thomisidae and Araneidae.

The foliage-dwelling fauna is dominated by Philodromidae, Salticidae, Araneidae, Theridiidae, Miturgidae and Thomisidae in abundance, although family dominance varies

considerably between sites and between tree species in the biome (Fourie *et al.*, in press; Neethling & Haddad, in review). The most species-rich families are the Salticidae, Araneidae and Thomisidae. The latter two studies showed very conflicting results as to the significance of vegetation structure in shaping spider assemblages. Fourie *et al.* (in press) found much lower abundance and species richness of spiders on *Searsia lancea* than on *Acacia karroo* and *Searsia ciliata*, while Neethling & Haddad (in review) found no significant differences in abundance and species richness between four tree species (*A. karroo, S. lancea, Buddleja saligna* and *Olea europaea africana*) sampled in the central Free State. Thus, it seems that local microclimatic and habitat factors may play a significant role in shaping the assemblages associated with woody vegetation.

Several surveys of spiders in agroecosystems in the Grassland Biome have been undertaken but only a few of them have been published (Dippenaar-Schoeman *et al*., in press). Although maize is an important crop in South Africa, little is known of the spiders found on this crop. Midega *et al*. (2005) sampled ground-dwelling spiders in maize fields in the Grassland Biome using a combination of pitfall traps and soil samples. They collected a total of 284 spiders, with the Lycosidae the most abundant family. A second, unpublished survey was undertaken on the farm Buiteplaas in the Delmas district in Mpumalanga Province, South Africa during the 2004–2005 and 2005–2006 summer growing seasons. Three treatments were evaluated, namely Bt maize, conventionally sprayed maize, and unsprayed maize. Pitfall traps were used to sample the spiders (M. van Jaarsveld, personal communication). Fourteen families were collected, representing 32 genera and 38 species. The Linyphiidae, represented by four species, occurred in the highest numbers, with the Lycosidae, represented only by *Pardosa crassipalpis* Purcell, 1904, second. In maize, the most abundant linyphiids were *Limoneta sirimoni* (Bosmans, 1979), *Meioneta habra* Locket, 1968 and *Ostearius melanopygius* (O.P.-Cambridge, 1879) (Dippenaar-Schoeman *et al*., in press).

Several surveys have been undertaken in the tomato-producing areas of the Limpopo, North West and Gauteng Provinces in search of biological control agents of tomato pests (Krüger & Dippenaar-Schoeman, 2000). During these surveys, a total of 356 spiders were sampled, representing 16 families, 50 genera and 62 species. Araneidae was the most species rich and abundant family collected. Leslie & Boreham (1981) used cross-over electrophoresis on the stomach contents of arthropods sampled on sugar cane, and determined that ants and spiders were the commonest predators that fed on the sugarcane borer, *Eldana saccharina* Walker, 1865 (Lepidoptera: Pyralidae).

In many areas of Africa, the planting of exotic trees has superseded the area covered by indigenous forests. Two spider surveys in pine plantations that occur in the Grassland Biome have been undertaken in South Africa to date. The first was done at Sabie in the Mpumalanga Province (Van den Berg & Dippenaar-Schoeman, 1988). Of the 1484 spiders collected, 38.54% belonged to Clubionidae, 12.94% to the Lycosidae, 9.97% to the Tetragnathidae and 8.22% Salticidae. A second survey was undertaken in pine plantations, indigenous forests and grassland at Ngome State Forest on the escarpment of northern KwaZulu-Natal (Van der Merwe *et al*., 1996). A total of 9360 spiders represented by 136 species were trapped in the five habitats sampled, of which grassland had the highest family diversity (28) and species richness (89 spp.). Pine had the lowest spider diversity while grassland had the highest spider diversity

Dominant families and genera

Patterns of species richness in the Grassland Biome are somewhat consistent with the number of records for each family, but are not directly correlated. While Gnaphosidae has been recorded on the largest number of occasions (2504 records), it is the second most species-rich family (88 spp.). The most species-rich family is the Salticidae (112 spp.), despite being represented by approximately 40% fewer records than Gnaphosidae (1500 records). This could partly be explained by the prominence of certain species of Gnaphosidae in pitfall surveys that dominate the total number of records of grassland species, as mentioned above. While three gnaphosid species have been collected on more than 250 occasions each in the biome, no salticids have been recorded this frequently (Appendix 1). Other diverse families include the Thomisidae (72 spp.) and Araneidae (52 spp.), which are also well represented in terms of number of records from the biome. These same four families are also the most species-rich in the Savanna Biome of South Africa (Foord *et al.*, 2011b), suggesting that patterns of family richness are not necessarily an artefact of the habitat characteristics of a particular biome, but may be consistent at a regional scale. Although the Linyphiidae (4461 spp.) and Theridiidae (2513 spp.) rank as the second and fourth most diverse families globally (Dunlop & Penney, 2011), they are very poorly represented in the Grassland Biome, with only 18 and 15 species respectively. However, many more specimens of both families have been sampled in the biome, but could not be identified to species level and are probably undescribed. This underrepresentation is indicative of the gross taxonomic impediment of these families rather than actual species diversity. In both cases there is a large number of

undescribed species not only known from grasslands, but also from the other biomes in South Africa.

Salticidae: jumping spiders are globally the most diverse spider family, with approximately 5500 species in nearly 600 genera (Dunlop & Penney, 2011). They are diurnally active hunters preying on a variety of arthropods and are, for the most part, generalist predators. Certain African species have evolved specialised diets and may feed on termites (Wesołowska & Cumming, 1999, 2002; Wesołowska & Haddad, 2002; Haddad & Wesołowska, 2006), ants (Pekár & Haddad, 2011), blood-fed mosquitoes (e.g. Jackson *et al.*, 2005; Nelson *et al*., 2005; Nelson & Jackson, 2006) or other spiders (e.g. Jackson & Hallas, 1986; Li *et al.*, 1997). When not actively hunting, jumping spiders usually rest in silk retreats constructed under rocks and logs, in grass inflorescences, in leaves or under bark. Similar retreats are used by females for the construction of their egg cases, which are often guarded by the female until the spiderlings disperse (e.g. Haddad & Louw, 2006). Several ground-dwelling grassland species are cryptically coloured (e.g. *Phlegra* Simon, 1876, *Langona* Simon, 1901 and *Evarcha* Simon, 1902) and some grass-dwelling species have pale colouration and/or elongate bodies (e.g. *Festucula* Simon, 1901 spp., *Thyene thyenioides* (Lessert, 1925) and *Evarcha flagellaris* Haddad & Wesołowska, 2011) to enhance their survival in their preferred microhabitats (Haddad & Wesołowska, 2011).

Jumping spiders are collected from all of the strata in grassland habitats and are a moderately prominent component of spider assemblages in all of the surveys conducted thus far (Table 3), where they are consistently one of the more abundant (2.34–21.1%) and species-rich (3–12 spp.) families collected. A considerable proportion of the 112 species (39 genera) recorded from the biome are endemics (12 spp., 10.71%), but this can be partly attributed to the recent description of several species from the biome that are only known from a few localities (Wesołowska, 2001, 2003; Haddad & Wesołowska, 2011; Wesołowska & Haddad, in press). Despite the recent progress made in describing the jumping spider fauna of central South Africa, new species continue to be discovered in grassland habitats. It is likely that further sampling in this biome will yield additional species and new records, and a projected 150 species may occur in the biome.

Gnaphosidae: flat-bellied ground spiders are the sixth most diverse family globally, with 2147 species described in 123 genera (Dunlop & Penney, 2011). Their proportionately high representation in grassland habitats is indicative of the success and radiation of the family in

the subtropical and temperate latitudes and their prominence in the more arid grassland, savanna and karoo habitats that dominate southern Africa. Ground spiders are predominantly nocturnal generalist predators, and are mainly associated with the soil surface, although certain genera such as *Aphantaulax* Simon, 1878 are sometimes also collected in trees and grasses (e.g. Neethling & Haddad, in review). Many species construct a fine silk retreat in leaf litter or under rocks and logs on the soil surface in which they rest during the day. These resting retreats are also used as sites for moulting and, in some cases, for egg sac production. There are several undescribed species of the genus *Micaria* Westring, 1851 that occur in the Grassland Biome, all of which are generalised mimics of ants.

Gnaphosids are a very prominent component of the ground-dwelling fauna in grasslands, and often dominate abundance in surveys. In central Free State grasslands, Lotz *et al.* (1991) found gnaphosids most abundant during a pitfall-trapping survey (34.86%), Haddad & Dippenaar-Schoeman (2002, 2006) found them dominating the spider fauna in abandoned *Trinervitermes trinervoides* (Sjöstedt, 1911) termitaria (37.87%), and Butler & Haddad (2011) found Gnaphosidae to be the most abundant family in leaf litter of three woody tree species (26.88%). In the moist grasslands of Mpumulanga, however, they only contributed 8.98% of the ground-dwelling fauna sampled in pitfall traps; here Lycosidae were very strongly dominant, representing nearly 65% of the fauna (Jansen *et al.*, in press). In northern Gauteng, a study on the spider predators of harvester termites found that 55% of the fauna sampled were gnaphosids; several genera (*Asemesthes* Simon, 1887, *Drassodes* Westring, 1851 and *Zelotes* Gistel, 1848 spp.) are closely associated with termites in several regions in South Africa (Van den Berg & Dippenaar-Schoeman, 1991). Many of the gnaphosids recorded from grasslands are not particularly habitat specific, and have also been recorded from savanna and/or Nama Karoo habitats, in particular. Only six species (6.82%) are endemic to the biome.

Thomisidae: crab spiders are free-living spiders that are predominantly found on grasses, herbs and the foliage and bark of woody plants, although certain genera (e.g. *Xysticus*) are predominantly ground-dwelling. Globally, they are the fifth most species-rich family, with 2183 species described in 190 genera (Dunlop & Penney, 2011). Many genera occurring in the Grassland Biome have morphological adaptations that enable them to successfully utilise particular microhabitats. *Monaeses* Thorell, 1869 and *Runcinia* Simon, 1875 are elongate, somewhat flattened spiders with cryptic colouration that are regularly collected from grasses (Dippenaar-Schoeman, 1980, 1983, 1984). *Tmarus* Simon, 1875 are flattened brown or grey

spiders that often rest on the bark or branches of trees, where they are effectively camouflaged (Dippenaar-Schoeman, 1985), while some *Thomisus* Walckenaer, 1805 spp. are very well known for their ability to change colour using integumental ommachromes (varying from white to pink and bright yellow) and are regularly encountered on flowers or grasses (Dippenaar-Schoeman, 1983; Heiling *et al.*, 2005a,b; Théry & Casas, 2009). Thomisids are ambush predators that usually rest on a suitable substrate and wait for approaching prey (Morse, 1984; Rocha-Filho & Rinaldi, 2011), and are usually regarded as generalist predators (e.g. Romero & Vasconcellos-Neto, 2003; Guseinov, 2006). Thomisids usually do not construct a resting retreat, only a retreat to shelter the eggs. Some genera, e.g. *Mystaria*, hang from vegetation at night using a dragline to avoid foraging nocturnal predators. Most grass-living thomisids construct a retreat in the inflorescences of grasses, wherein they deposit the egg sac, and in many genera (e.g. *Monaeses*, *Runcinia* and *Thomisus*) they guard the egg sac.

Thomisids are generally rare on the soil surface and leaf litter, and are absent from abandoned termitaria in the Grassland Biome (Lotz *et al.*, 1991; Haddad & Dippenaar-Schoeman, 2002, 2006; Butler & Haddad, 2011; Jansen *et al.*, in press). In contrast, they are one of the dominant families in terms of species richness and abundance on grass (Haddad, 2005; Fourie *et al.*, in press) and from the foliage of woody plants (Fourie *et al.*, in press; Neethling & Haddad, in review) in central the Free State. While species-rich in coastal grasslands, they are not particularly abundant (Dippenaar-Schoeman *et al.*, 2011).

Araneidae: orb-web spiders are the third largest spider family with more than 3000 described species in 185 genera (Dunlop & Penney, 2011). They are perhaps best known for their construction of often symmetrical orb-webs, comprising threads radiating from a central hub and a spiral of capture threads (Blackledge *et al.*, 2011). The majority of species are nocturnally active, spinning their webs at dusk and consuming them at dawn, thereby recycling their silk. Some genera, e.g. *Argiope* Audouin, 1826 and *Cyclosa* Menge, 1866, are diurnal and their webs are more permanent structures. Several diurnal taxa include decorative structures in their webs, including stabilimenta and various types of debris, which are thought to play a role in camouflage, prey attraction or serve as a warning signal to flying predators as to the presence of the web (Scharff & Coddington, 1997; Théry & Casas, 2009). Some species construct a retreat above the orb-web, in which the females also deposit their egg sacs. Species occurring in the Grassland Biome are often cream to brown in colour, sometimes with longitudinal stripes or other markings on the abdomen, e.g. *Kilima decens* (Blackwall, 1866) and *Neoscona moreli* (Vinson, 1863). Members of the genus *Pycnacantha*

Blackwall, 1865 have strongly spined abdomens to camouflage on grass inflorescences, while *Caerostris* Thorell, 1868 and *Cyphalonotus* Simon, 1895 have a coarse integument and abdominal tubercles as adaptations for crypsis on the bark of trees.

Several genera in the Cyrtarachninae are known from the Grassland Biome. Some have evolved specialised behaviour, reducing or adapting the structure of their orb-webs and using aggressive chemical mimicry to attract male moths as prey (Dippenaar-Schoeman & Leroy, 2006; Leroy *et al.*, 1998; Roff & Dippenaar-Schoeman, 2004). A member of the genus *Cyrtarachne* Thorell, 1868 has been discovered in the Free State that constructs a modified orb-web known as a spanning thread web (Stowe, 1986). This is a basic orb-web, but the web diameter, sticky spiral spacing and viscid thread diameter differs from that of the typical orb-webs. The viscid threads are studded with large droplets that are very effective in catching prey that comes into contact with them. Each of the short threads between the radii is known as a spanning thread and is unique in that it breaks when prey comes in contact with it (Dippenaar-Schoeman & Jones, 2008).

Araneids are prominent components of the grass- and tree-dwelling spider communities in the Grassland Biome. In two studies in central Free State grassland they formed 14.77% (9 spp.) and 21.77% (13 spp.) of the grass-dwelling fauna, respectively (Haddad, 2005; Fourie *et al.*, in press). In coastal grasslands in the Eastern Cape they represented nearly 40% of the spider fauna collected by sweep-netting and were represented by 12 species (Dippenaar-Schoeman *et al.*, 2011). They formed 14.3% and 17.7% of the total fauna in two studies of foliage-dwelling spiders in the central Free State, being represented by 10 and nine species, respectively (Fourie *et al.*, in press; Neethling & Haddad, in review).

Lycosidae: Forty-one species of wolf spiders have been found in the Grassland Biome (Appendix 1) and the most regularly recorded species, *Pardosa crassipalpis* Purcell, 1904 (194 records), was recorded in abundance from crops, e.g. maize and sugar cane, and is considered an agrobiont species (Dippenaar-Schoeman *et al.*, in press). Lycosids are cursorial hunters and are usually observed running on the ground or hiding under dry leaves, and they are only occasionally collected on the leaves and flowers of short herbaceous plants and grasses. Lycosid spiders apparently radiated in parallel with the diversification and dominance of grasses since the Miocene, and are much more common in open habitats than in closed ones, although some of the more basal taxa are web-building forest species (Jocqué & Alderweireldt, 2006). Lycosidae are rare in dense forest and are apparently replaced by Ctenidae, which are the main large-sized free roaming hunters in that habitat (Jocqué &

Alderweireldt, 2006). While this may be true for the forests of tropical and subtropical Africa, data from the NCA indicate that the temperate Afromontane forests of South Africa are more strongly dominated by Zoropsidae in the southern half of the country, while Ctenidae are more prominent in Afromontane forests in the northern half of the country, savanna and some coastal forests; Lycosidae are generally scarce or absent. Lycosids represent a total of 64.3% of the ground fauna from five sites in Afromontane grassland in Mpumalanga (Jansen *et al*., in press), 27.73% of the ground-dwelling (Lotz *et al.*, 1991) and 11.4% of the leaf litter fauna in the central Free State (Butler & Haddad, 2011), but are uncommon in abandoned *T. trinervoides* termite mounds (Haddad & Dippenaar-Schoeman, 2002, 2006).

Genera: The most diverse genera recorded from the Grassland Biome, represented by 10 or more species, include *Zelotes* (Gnaphosidae, 25 spp.), *Heliophanus* C.L. Koch, 1833 (Salticidae, 20 spp.), *Anyphops* Benoit, 1968 (Selenopidae, 18 spp.), *Stasimopus* Simon, 1892 (Ctenizidae, 15 spp.) and *Xerophaeus* Purcell, 1907 (Gnaphosidae, 14 spp.). Two genera are represented by 13 species each (*Neoscona* Simon, 1864, Araneidae; *Thomisus*, Thomisidae), three by 11 species each (*Clubiona* Latreille, 1804, Clubionidae; *Oxyopes* Latreille, 1804, Oxyopidae; *Theuma* Simon, 1893, Prodidomidae) and two by 10 species each (*Ancylotrypa* Simon, 1889, Cyrtaucheniidae; *Cheiramiona* Lotz & Dippenaar-Schoeman, 1999, Miturgidae). Most of these genera also feature amongst the most diverse for the Savanna Biome (Foord *et al.*, 2011b).

Concluding remarks

The South African Grassland Biome harbours a rich diversity of spiders, although the persistent taxonomic impediment of the African spider fauna contributes to an underestimation of its true richness. A considerable proportion of the species present have morphological, behavioural and/or physiological adaptations to survive in this habitat. The recent increase in ecological studies in the biome during the last decade has only scratched the surface of the factors affecting spider assemblages in grasslands, and there is considerable scope for expansion of ecological and biodiversity research.

Perhaps the greatest obstacle to the effective conservation of grassland spiders is the small proportion of undisturbed natural grasslands that are formally protected, estimated at 2.8% of the area by O'Connor & Kuyler (2005). It is clear that this area is unlikely to be

expanded greatly in the foreseeable future despite it being the biome requiring the largest addition of land to reach conservation targets (Carbutt *et al*., 2011), which is largely due to the importance of central South Africa as an economic, agricultural and mining hub. Therefore, the natural grasslands utilised for livestock and wildlife farming can be considered as critical in providing suitable habitats for spiders and other organisms, and should be carefully managed by landowners to reduce degradation through overgrazing, excessive fire management, erosion and alien plant invasions, all of which could potentially impact the fauna negatively.

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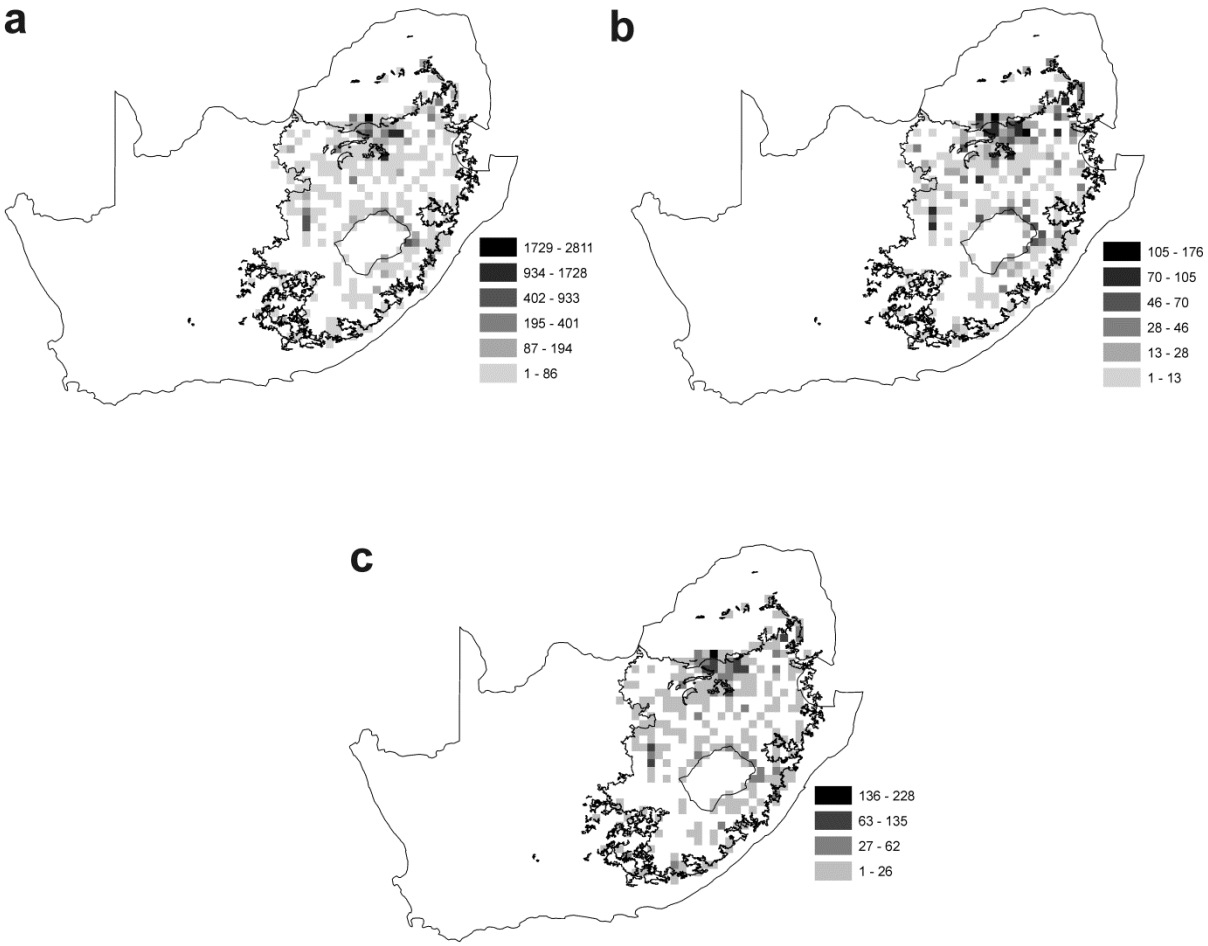

Figure 1. (a) Number of records, **(b)** genera, and **(c)** species per quarter-degree square in the Grassland Biome of South Africa.

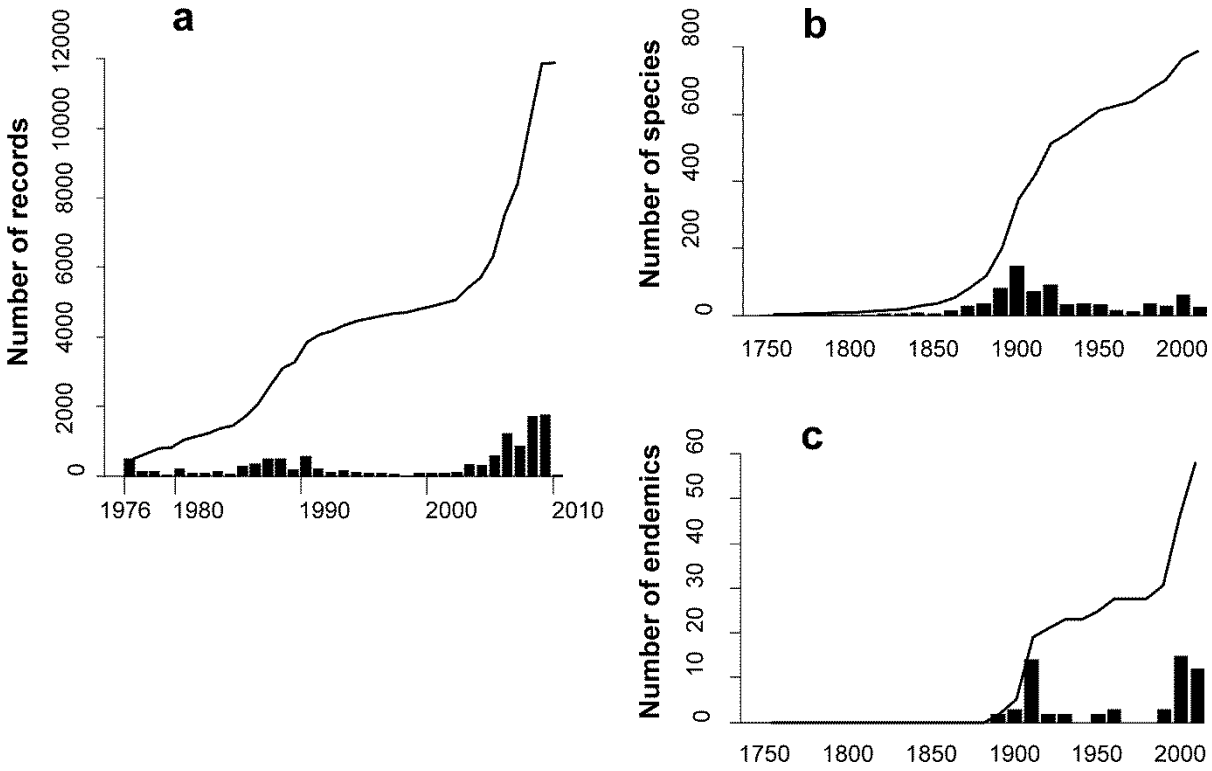

Figure 2. (a) Number of accessions per year deposited in the ARC – National Collection of Arachnida (NCA) since its inception in 1976 from the Grassland Biome of South Africa; **(b)** Number of species and **(c)** number of endemic species recorded from the Grassland Biome of South Africa, arranged by decade in which each was described. Lines represent the respective accumulation curves, ending at 792 species and 58 endemic species, respectively.

Table 1: Index values reflecting distribution data (level of endemicity) and abundance data of each spider species scored for the Grassland Biome.

Endemicity value	
6	Endemic – known only from type locality / one locality only in the Grassland Biome
5	Known from one province only, wider than type locality
4	Known only from two adjoining provinces
3	South Africa, known from more than two provinces or two disjunct provinces
2	Southern Africa (south of Zambezi and Kunene Rivers)
1	Afrotropical Region
0	Cosmopolitan or introduced
Local abundance value	
3	Very rare: 1–3 specimens/locality
2	Rare: 4–10 specimens/locality
1	Abundant: 10–20 specimens/locality

Table 2: Summary of the family diversity, proportion of endemic species and number of collecting records of spiders from the Grassland Biome of South Africa

FAMILY	Total species	% of total	Endemic species	% of total	Total records	% of total	Average records/ species
Agelenidae	6	0.76	0	0.00	27	0.24	4.50
Amaurobiidae	2	0.25	0	0.00	18	0.16	9.00
Ammoxenidae	5	0.63	0	0.00	257	2.24	51.40
Araneidae	52	6.59	1	1.96	575	5.01	11.06
Archaeidae	3	0.38	1	33.33	5	0.04	1.67
Atypidae	2	0.25	1	50.00	15	0.13	7.50
Barychelidae	1	0.13	0	0.00	1	0.01	1.00
Caponiidae	3	0.38	0	0.00	36	0.31	12.00
Clubionidae	11	1.39	0	0.00	46	0.40	4.18
Corinnidae	26	3.30	3	11.54	376	3.28	14.46
Ctenidae	1	0.13	0	0.00	1	0.01	1.00
Ctenizidae	15	1.90	7	46.67	99	0.86	6.60
Cyatholipidae	2	0.25	0	0.00	14	0.12	7.00
Cyrtaucheniidae	14	1.77	1	7.14	203	1.77	14.50
Deinopidae	3	0.38	0	0.00	11	0.10	3.67
Desidae	1	0.13	0	0.00	4	0.03	4.00
Dictynidae	2	0.25	0	0.00	4	0.03	2.00
Dipluridae	4	0.51	0	0.00	10	0.09	2.50
Dysderidae	1	0.13	0	0.00	4	0.03	4.00
Eresidae	13	1.65	0	0.00	66	0.58	5.08
Gallieniellidae	2	0.25	0	0.00	8	0.07	4.00
Gnaphosidae	88	11.15	6	6.82	2504	21.83	28.45
Hahniidae	2	0.25	0	0.00	81	0.71	40.50
Hersiliidae	4	0.51	0	0.00	40	0.35	10.00
Idiopidae	23	2.92	7	30.43	106	0.92	4.61
Linyphiidae	18	2.28	0	0.00	376	3.28	20.89
Liocranidae	3	0.38	0	0.00	24	0.21	8.00
Lycosidae	41	5.20	3	7.32	712	6.21	17.37
Microstigmatidae	2	0.25	0	0.00	31	0.27	15.50
Migidae	4	0.51	0	0.00	10	0.09	2.50
Mimetidae	3	0.38	0	0.00	10	0.09	3.33
Miturgidae	17	2.15	2	11.76	707	6.16	41.59
Nemesiidae	5	0.63	1	20.00	31	0.27	6.20
Nephilidae	4	0.51	0	0.00	86	0.75	21.50
Oecobiidae	3	0.38	0	0.00	21	0.18	7.00
Oonopidae	2	0.25	0	0.00	9	0.08	4.50
Oxyopidae	18	2.28	0	0.00	61	0.53	3.39
Palpimanidae	5	0.63	1	20.00	21	0.18	4.20
Penestomidae	1	0.13	0	0.00	7	0.06	7.00
Philodromidae	15	1.90	0	0.00	158	1.38	10.53
Pholcidae	13	1.65	3	23.08	120	1.05	9.23
Phyxelididae	15	1.90	1	6.67	153	1.33	10.20

Pisauridae	16	2.03	0	0.00	70	0.61	4.38
Prodidomidae	13	1.65	0	0.00	33	0.29	2.54
Salticidae	112	14.20	12	10.71	1500	13.08	13.39
Scytodidae	8	1.01	2	25.00	22	0.19	2.75
Segestriidae	2	0.25	0	0.00	2	0.02	1.00
Selenopidae	21	2.66	1	4.76	66	0.58	3.14
Sicariidae	3	0.38	1	33.33	30	0.26	10.00
Sparassidae	16	2.03	1	6.25	310	2.70	19.38
Tetragnathidae	16	2.03	0	0.00	129	1.12	8.06
Theraphosidae	10	1.27	0	0.00	107	0.93	10.70
Theridiidae	15	1.90	0	0.00	635	5.54	42.33
Thomisidae	72	9.13	0	0.00	1197	10.44	16.63
Trochanteriidae	3	0.38	0	0.00	50	0.44	16.67
Uloboriidae	5	0.63	0	0.00	46	0.40	9.20
Zodariidae	19	2.41	2	10.53	185	1.61	9.74
Zoropsidae	6	0.76	1	16.67	40	0.35	6.67
TOTAL	792	100.00	58	7.32	11 470	100.00	—

Table 3: Summary of spider family, generic and species richness for published studies from the Grassland Biome of South Africa.

Province	Habitat stratum	Method	Fam.	Gen.	Spp.	References
Eastern Cape	Grass	Sweeping, hand collecting, pan traps, Malaise traps	27	68	97	Dippenaar-Schoeman *et al*. (2011)
Free State	Ground	Pitfalls	31	–	–	Lotz *et al*. (1991)
	Leaf litter	Sifting	26	52	56	Butler & Haddad (2011)
	Termitaria	Excavation	21	60	82	Haddad & Dippenaar-Schoeman (2002, 2006a)
	Grass	Sweeping	16	45	57	Haddad (2005)
	Grass	Sweeping	15	59	82	Fourie *et al*. (in review)
	Foliage	Beating	17	43	52	Fourie *et al*. (in review)
	Foliage	Beating	17	42	54	Neethling & Haddad (in review)
Gauteng	Ground	Pitfalls	21	41	55	Van den Berg & Dippenaar-Schoeman (1991)
KwaZulu-Natal	Ground	Pitfalls	28	–	89	Van der Merwe *et al*. (1996)
Mpumulanga	Ground	Pitfalls	26	60	86	Jansen *et al*. (in press)
North West	Ground	Pitfalls, soil samples	9	–	34	Midega *et al*. (2008)

Appendix 1: Check list of the spiders found in the Grassland Biome of South Africa, indicating their guilds, number of collecting records and status as South African (SAE) and Grassland (GE) endemic species (1 = endemic, 0 = wider distribution). Index values are given as per Table 1 for distribution data (DIS) and relative abundance (ABUN), as well as the combined rarity index values (RI). Grassland endemics (GE = 1) are highlighted in light grey, and cosmopolitan/introduced species or those with a distribution beyond the Afrotropical Region (DIS = 0) are highlighted in dark grey. Guild abbreviations: OWB, orb–web builder; BGW, burrow-dwelling ground wanderer; FPW, free-living plant wanderer; FWB, funnel-web builder; RWB, retreat-web builder; FGW, free-living ground wanderer; GWB, gumfoot-web builder; SHWB, sheet-web builder; SPWB, space-web builder.

	Guild	Records	SAE	GE	DIS	ABUN	RI
1. Agelenidae							
Benoitia deserticola (Simon, 1910)	FWB	1	0	0	2	2	4
Benoitia ocellata (Pocock, 1900)	FWB	18	0	0	2	1	3
Benoitia raymondeae (Lessert, 1915)	FWB	3	0	0	1	2	3
Mistaria leucopyga (Pavesi, 1883)	FWB	1	0	0	1	1	2
Olorunia punctata Lehtinen, 1967	FWB	2	0	0	1	1	2
Tegenaria domestica (Clerck, 1757)	FWB	2	0	0	0	2	2
2. Amaurobiidae							
Chresiona invalida (Simon, 1898)	RWB	5	1	0	3	3	6
Macrobunus caffer (Simon, 1898)	RWB	13	1	0	3	2	5
3. Ammoxenidae							
Ammoxenus amphalodes Dippenaar & Meyer, 1980	FGW	177	1	0	3	1	4
Ammoxenus coccineus Simon, 1893	FGW	2	0	0	2	1	3
Ammoxenus pentheri Simon, 1896	FGW	11	0	0	2	1	3
Ammoxenus psammodromus Simon, 1910	FGW	56	0	0	2	2	4
Rastellus florisbad Platnick & Griffin, 1990	FGW	11	1	0	5	2	7
4. Araneidae							
Aethriscus olivaceus Pocock, 1902	OWB	2	0	0	1	2	3
Araneus apricus (Karsch, 1884)	OWB	11	0	0	1	1	2
Araneus legonensis Grasshoff & Edmunds, 1979	OWB	1	0	0	1	2	3
Araneus nigroquadratus Lawrence, 1937	OWB	5	0	0	2	1	3
Argiope aurocincta Pocock, 1898	OWB	1	0	0	1	1	2
Argiope australis (Walckenaer, 1805)	OWB	46	0	0	1	1	2
Argiope lobata (Pallas, 1772)	OWB	6	0	0	1	2	3
Argiope trifasciata (Forsskål, 1775)	OWB	11	0	0	1	1	2
Caerostris corticosa Pocock, 1902	OWB	3	0	0	2	2	4
Caerostris sexcuspidata (Fabricius, 1793)	OWB	17	0	0	1	1	2
Cladomelea akermani Hewitt, 1923	OWB	3	1	0	5	3	8
Cladomelea debeeri Roff & Dippenaar-Schoeman, 2005	OWB	1	1	1	6	3	9
Cyclosa insulana (Costa, 1834)	OWB	5	0	0	1	1	2
Cyclosa oculata (Walckenaer, 1802)	OWB	2	0	0	1	1	1
Cyphalonotus larvatus (Simon, 1881)	OWB	3	0	0	1	1	2
Cyrtarachne ixidioides (Simon, 1871)	OWB	3	0	0	1	3	4
Cyrtophora citricola (Forsskål, 1775)	OWB	43	0	0	0	1	1
Gasteracantha milvoides Butler, 1873	OWB	1	0	0	1	1	2
Gasteracantha sanguinolenta C.L. Koch, 1844	OWB	6	0	0	1	1	2
Gasteracantha versicolor (Walckenaer, 1842)	OWB	7	0	0	1	1	2
Hypsosinga lithyphantoides Caporiacco, 1947	OWB	7	0	0	1	1	2
Isoxya cicatricosa (C.L. Koch, 1844)	OWB	5	0	0	1	1	2
Isoxya mucronata (Walckenaer, 1842)	OWB	1	0	0	1	2	3
Isoxya stuhlmanni (Bösenberg & Lenz, 1885)	OWB	5	0	0	1	1	2
Isoxya tabulata (Thorell, 1859)	OWB	2	0	0	1	1	2
Isoxya yatesi Emerit, 1973	OWB	1	1	0	4	3	7
Kilima decens (Blackwall, 1866)	OWB	31	0	0	1	1	2
Lipocrea longissima (Simon, 1881)	OWB	12	0	0	1	1	2
Nemoscolus cotti Lessert, 1933	OWB	5	0	0	1	2	3
Nemoscolus elongatus Lawrence, 1947	OWB	3	1	0	3	1	4
Nemoscolus tubicola (Simon, 1887)	OWB	1	0	0	2	1	3
Nemoscolus vigintipunctatus Simon, 1897	OWB	9	1	0	3	1	4

Neoscona alberti (Strand, 1913)	OWB	1	0	0	1	3	4
Neoscona blondeli (Simon, 1885)	OWB	47	0	0	1	1	2
Neoscona chiarinii (Pavesi, 1883)	OWB	1	1	0	1	3	4
Neoscona hirta (C.L. Koch, 1844)	OWB	5	0	0	1	1	2
Neoscona moreli (Vinson, 1863)	OWB	45	0	0	1	1	2
Neoscona penicillipes (Karsch, 1879)	OWB	1	0	0	1	1	2
Neoscona quincasea Roberts, 1983	OWB	3	0	0	1	1	2
Neoscona rapta (Thorell, 1899)	OWB	1	0	0	1	1	2
Neoscona rufipalpis (Lucas, 1858)	OWB	9	0	0	1	1	2
Neoscona subfusca (C.L.Koch, 1837)	OWB	119	0	0	1	1	2
Neoscona theisi theisiella(Tullgren, 1910)	OWB	2	0	0	1	2	3
Neoscona triangula (Keyserling, 1864)	OWB	34	0	0	1	1	2
Neoscona vigilans (Blackwall, 1865)	OWB	10	0	0	1	1	2
Paraplectana thorntoni (Blackwall, 1865)	OWB	1	0	0	1	3	4
Pararaneus cyrtoscapus (Pocock, 1898)	OWB	10	0	0	1	1	2
Pararaneus spectator (Karsch, 1886)	OWB	10	0	0	1	1	2
Poltys furcifer Simon, 1881	OWB	2	0	0	1	1	2
Pycnacantha tribulus (Fabricius, 1781)	OWB	13	0	0	2	1	3
Singa albodorsata Kauri, 1950	OWB	1	1	0	3	2	5
Singa lawrencei (Lessert, 1930)	OWB	1	0	0	1	2	3
5. Archaeidae							
Afrarchaea godfreyi (Hewitt, 1919)	FGW	2	0	0	1	2	3
Afrarchaea harveyi Lotz, 2003	FGW	2	1	1	6	3	9
Eriauchenius cornutus (Lotz, 2003)	FGW	1	1	0	4	3	7
6. Atypidae							
Calommata meridionalis Fourie, Haddad & Jocqué, 2011	BGW	14	1	1	5	2	7
Calommata transvaalica Hewitt, 1916	BGW	1	1	0	4	2	6
7. Barychelidae							
Pisenor arcturus (Tucker, 1917)	BGW	1	0	0	2	2	4
8. Caponiidae							
Caponia chelifera Lessert, 1936	FGW	1	0	0	2	1	3
Caponia hastifera Purcell, 1904	FGW	25	0	0	2	2	4
Caponia spiralifera Purcell, 1904	FGW	10	1	0	3	2	5
9. Clubionidae							
Clubiona abbajensis Strand, 1906	FPW	1	0	0	1	1	2
Clubiona africana Lessert, 1921	FPW	21	0	0	1	1	2
Clubiona bevisi Lessert, 1923	FPW	3	1	0	3	2	5
Clubiona citricolor Lawrence, 1952	FPW	1	1	0	4	3	7
Clubiona durbana Roewer, 1951	FPW	1	1	0	4	2	6
Clubiona lawrencei Roewer, 1951	FPW	1	1	0	3	2	5
Clubiona pongolensis Lawrence, 1952	FPW	2	1	0	3	2	5
Clubiona pupillaris Lawrence, 1938	FPW	2	1	0	3	1	4
Clubiona sigillata Lawrence, 1952	FPW	2	1	0	4	2	6
Clubiona vachoni Lawrence, 1952	FPW	11	1	0	5	2	7
Clubiona valens Simon, 1897	FPW	1	1	0	5	3	8
10. Corinnidae							
Afroceto arca Lyle & Haddad, 2010	FGW	24	0	0	2	1	3
Afroceto croeseri Lyle & Haddad, 2010	FGW	1	1	0	4	3	7
Afroceto gracilis Lyle & Haddad, 2010	FGW	5	1	1	5	2	7
Afroceto martini (Simon, 1897)	FPW	31	0	0	1	1	2
Afroceto plana Lyle & Haddad, 2010	FPW	3	0	0	1	2	3
Austrophaea zebra Lawrence, 1952	FGW	2	1	0	4	2	6
Cambalida dippenaarae Haddad, 2012	FGW	7	0	0	1	1	2
Cambalida fulvipes (Simon, 1896)	FGW	19	0	0	1	1	2
Copa flavoplumosa Simon, 1885	FGW	25	0	0	1	1	2

Copuetta lacustris (Strand, 1916)	FPW	49	0	0	1	1	2
Copuetta lotzi Haddad, in press	FGW	13	1	0	3	1	4
Corinnomma semiglabrum (Simon, 1896)	FGW	3	0	0	1	1	2
Fuchibotulus kigelia Haddad & Lyle, 2008	FGW	7	0	0	2	1	3
Graptartia mutillica Haddad, 2004	FGW	69	0	0	1	1	2
Graptartia tropicalis Haddad, 2004	FGW	12	0	0	1	1	2
Hortipes schoemanae Bosselaers & Jocqué, 2000	FGW	1	1	0	2	2	4
Merenius alberti Lessert, 1923	FGW	3	0	0	2	1	3
Orthobula radiata Simon, 1897	FGW	10	0	0	1	1	2
Poachelas montanus Haddad & Lyle, 2008	FGW	2	1	1	6	3	9
Poachelas striatus Haddad & Lyle, 2008	FGW	27	1	0	3	1	4
Pronophaea natalica Simon, 1897	FGW	12	1	0	3	1	4
Pronophaea proxima (Lessert, 1923)	FGW	1	1	0	5	3	8
Spinotrachelas montanus Haddad, Neethling & Lyle, 2011	FGW	3	1	0	4	2	6
Thysanina absolva Lyle & Haddad, 2006	FGW	32	1	1	5	2	7
Trachelas pusillus Lessert, 1923	FGW	13	0	0	1	1	2
Trachelas schenkeli Lessert, 1923	FPW	2	0	0	2	1	3
11. Ctenidae							
Ctenus parvoculatus Benoit, 1979	FGW	1	1	0	3	1	4
12. Ctenizidae							
Stasimopus bimaculatus Purcell, 1903	BGW	1	1	0	3	3	6
Stasimopus coronatus Hewitt, 1915	BGW	4	1	0	3	3	6
Stasimopus dreyeri Hewitt, 1915	BGW	2	1	1	6	3	9
Stasimopus filmeri Engelbrecht & Prendini, 2012	BGW	6	1	1	6	1	7
Stasimopus gigas Hewitt, 1915	BGW	1	1	1	6	3	9
Stasimopus hewitti Engelbrecht & Prendini, 2012	BGW	9	1	0	5	3	8
Stasimopus minor Hewitt, 1915	BGW	9	1	1	6	3	9
Stasimopus nanus Tucker, 1917	BGW	1	1	1	6	3	9
Stasimopus nigellus Pocock, 1902	BGW	7	1	0	3	3	6
Stasimopus obscurus Purcell, 1908	BGW	1	0	0	2	3	5
Stasimopus oculatus Pocock, 1897	BGW	38	1	0	3	1	4
Stasimopus qumbu Hewitt, 1913	BGW	2	1	1	6	3	9
Stasimopus robertsi Hewitt, 1910	BGW	14	1	0	4	1	5
Stasimopus rufidens (Ausserer, 1871)	BGW	2	1	0	5	3	8
Stasimopus suffuscus Hewitt, 1916	BGW	2	1	1	6	3	9
13. Cyatholipidae							
Cyatholipus hirsutissimus Simon, 1894	SHWB	8	1	0	3	3	6
Ulwembua denticulata Griswold, 1987	SHWB	6	1	0	3	2	5
14. Cyrtaucheniidae							
Ancylotrypa brevicornis (Hewitt, 1919)	BGW	9	1	0	4	2	6
Ancylotrypa brevipalpis (Hewitt, 1916)	BGW	36	1	0	3	1	4
Ancylotrypa dreyeri (Hewitt, 1915)	BGW	8	1	1	6	3	9
Ancylotrypa magnisigillata (Hewitt, 1914)	BGW	2	1	0	5	3	8
Ancylotrypa nigriceps (Purcell, 1902)	BGW	7	1	0	3	2	5
Ancylotrypa nuda (Hewitt, 1916)	BGW	13	1	0	3	1	4
Ancylotrypa pretoriae (Hewitt, 1913)	BGW	64	1	0	3	1	4
Ancylotrypa pusilla Purcell, 1903	BGW	3	1	0	4	3	7
Ancylotrypa spinosa Simon, 1889	BGW	1	1	0	5	3	8
Ancylotrypa zebra (Simon, 1892)	BGW	14	1	0	3	2	5
Homostola abernethyi (Purcell, 1903)	BGW	1	1	0	5	3	8
Homostola pardalina (Hewitt, 1913)	BGW	5	1	0	3	2	5
Homostola vulpecula Simon, 1892	BGW	25	1	0	3	1	4
Homostola zebrina Purcell, 1902	BGW	15	0	0	2	1	3
15. Deinopidae							
Deinopis cylindrica Pocock, 1898	OWB	1	1	0	3	1	4
Menneus camelus Pocock, 1902	OWB	9	1	0	3	1	4

Menneus dromedarius Purcell, 1904	OWB	1	0	0	1	2	3
16. Desidae							
Badumna longinqua (L. Koch, 1867)	RWB	4	0	0	0	2	2
17. Dictynidae							
Archaeodictyna ulova Griswold & Meikle-Griswold, 1987	RWB	2	1	0	2	3	5
Mashimo leleupi Lehtinen, 1967	RWB	2	0	0	1	2	3
18. Dipluridae							
Allothele caffer (Pocock, 1902)	FWB	1	0	0	1	2	3
Allothele malawi Coyle, 1984	FWB	1	0	0	1	2	3
Allothele teretis Tucker, 1920	FWB	7	1	0	3	1	4
Thelechoris striatipes (Simon, 1889)	FWB	1	0	0	1	3	4
19. Dysderidae							
Dysdera crocata C.L. Koch, 1838	FGW	4	0	0	0	2	2
20. Eresidae							
Dresserus colsoni Tucker, 1920	RWB	6	1	0	3	1	4
Dresserus kannemeyeri Tucker, 1920	RWB	15	1	0	3	2	5
Dresserus obscurus Pocock, 1898	RWB	1	1	0	5	3	8
Gandanameno purcelli (Tucker, 1920)	RWB	1	1	0	3	2	5
Gandanameno spenceri (Pocock, 1900)	RWB	1	0	0	2	1	3
Paradonea parva (Tucker, 1920)	RWB	1	1	0	4	2	6
Paradonea splendens (Lawrence, 1936)	RWB	1	0	0	2	3	5
Seothyra perelegans Simon, 1906	RWB	2	1	0	4	3	7
Seothyra semicoccinea Simon, 1906	RWB	1	1	0	4	3	7
Stegodyphus africanus (Blackwall, 1866)	RWB	3	0	0	1	1	2
Stegodyphus dumicola Pocock, 1898	RWB	21	0	0	1	1	2
Stegodyphus mimosarum Pavesi, 1883	RWB	3	0	0	1	1	2
Stegodyphus tentoriicola Purcell, 1904	RWB	10	0	0	2	1	3
21. Gallieniellidae							
Austrachelas incertus Lawrence, 1938	FGW	6	1	0	4	2	6
Austrachelas natalensis Lawrence, 1942	FGW	2	1	0	5	2	7
22. Gnaphosidae							
Amusia cataracta Tucker, 1923	FGW	3	1	0	3	2	5
Aphantaulax inornata Tucker, 1923	FGW	1	0	0	2	1	3
Aphantaulax signicollis Tucker, 1923	FGW	1	0	0	2	2	4
Asemesthes decoratus Purcell, 1908	FGW	41	0	0	3	1	4
Asemesthes lineatus Tucker, 1923	FGW	4	0	0	2	2	4
Asemesthes montanus Tucker, 1923	FGW	2	0	0	2	2	4
Asemesthes numisma Tucker, 1923	FGW	2	0	0	2	2	4
Asemesthes oconnori Tucker, 1923	FGW	1	1	0	4	3	7
Asemesthes paynteri Tucker, 1923	FGW	2	1	0	3	2	5
Asemesthes purcelli Tucker, 1923	FGW	4	0	0	2	1	3
Camillina aestus Tucker, 1923	FGW	13	0	0	2	3	5
Camillina capensis Platnick & Murphy, 1987	FGW	11	1	0	3	2	5
Camillina cordifera (Tullgren, 1910)	FGW	128	0	0	1	1	2
Camillina maun Platnick & Murphy, 1987	FGW	59	0	0	2	1	3
Camillina pavesii (Simon, 1897)	FGW	7	0	0	2	2	4
Camillina procurva (Purcell, 1908)	FGW	3	0	0	2	1	3
Camillina setosa Tucker, 1923	FGW	1	1	0	3	2	5
Drassodes bechuanicus Tucker, 1923	FGW	6	0	0	2	2	4
Drassodes caffrerianus Purcell, 1907	FGW	1	1	1	6	3	9
Drassodes lophognathus Purcell, 1907	FGW	19	1	0	3	1	4
Drassodes masculus Tucker, 1923	FGW	1	0	0	2	3	5
Drassodes solitarius Purcell, 1907	FGW	29	1	0	3	1	4
Drassodes splendens Tucker, 1923	FGW	15	1	0	2	1	3

Drassodes stationis Tucker, 1923	FGW	94	1	0	3	1	4
Drassodes tesselatus Purcell, 1907	FGW	1	1	0	3	2	5
Drassodes tortuosus Tucker, 1923	FGW	2	1	1	6	3	9
Eilica lotzi FitzPatrick, 2002	FGW	6	1	1	6	3	9
Ibala arcus (Tucker, 1923)	FGW	3	1	0	3	1	4
Ibala lapidaria (Lawrence, 1928)	FGW	1	0	0	2	3	5
Latonigena africanus Tucker, 1923	FGW	5	1	0	3	2	5
Megamyrmaekion schreineri Tucker, 1923	FGW	3	1	0	3	2	5
Megamyrmaekion transvaalense Tucker, 1923	FGW	15	1	0	3	1	4
Nomisia transvaalica Dalmas, 1921	FGW	1	1	1	6	3	9
Nomisia tubula (Tucker, 1923)	FGW	1	0	0	3	2	5
Nomisia varia (Tucker, 1923)	FGW	7	0	0	2	3	5
Poecilochroa involuta Tucker, 1923	FGW	2	1	0	3	2	5
Scotophaeus marleyi Tucker, 1923	FGW	2	1	0	3	2	5
Scotophaeus natalensis Lawrence, 1938	FGW	1	1	0	5	3	8
Scotophaeus purcelli Tucker, 1923	FGW	2	1	0	3	2	5
Scotophaeus relegatus Purcell, 1907	FGW	1	1	0	3	2	5
Setaphis browni (Tucker, 1923)	FGW	44	0	0	1	1	2
Setaphis subtilis (Simon, 1897)	FGW	103	0	0	1	1	2
Smionia lineatipes (Purcell, 1908)	FGW	3	1	0	3	2	5
Trachyzelotes jaxartensis (Kroneberg, 1875)	FGW	25	0	0	0	1	1
Trephopoda aplanita (Tucker, 1923)	FGW	3	1	0	3	3	6
Trephopoda kannemeyeri (Tucker, 1923)	FGW	4	1	0	3	2	5
Trephopoda parvipalpa (Tucker, 1923)	FGW	2	1	0	3	1	4
Trichothyse hortensis Tucker, 1923	FGW	2	0	0	2	3	5
Urozelotes rusticus (L.Koch, 1872)	FGW	9	0	0	0	2	2
Xerophaeus appendiculatus Purcell, 1907	FGW	6	1	0	3	1	4
Xerophaeus aridus Purcell, 1907	FGW	5	0	0	2	2	4
Xerophaeus aurariarum Purcell, 1907	FGW	3	1	0	3	1	4
Xerophaeus bicavus Tucker, 1923	FGW	11	1	0	3	1	4
Xerophaeus biplagiatus Tullgren, 1910	FGW	1	0	0	1	1	4
Xerophaeus communis Purcell, 1907	FGW	1	1	0	3	2	5
Xerophaeus hottentottus Purcell, 1908	FGW	1	1	0	3	2	5
Xerophaeus longispinus Purcell, 1908	FGW	2	1	0	4	3	7
Xerophaeus patricki Purcell, 1907	FGW	3	0	0	2	3	5
Xerophaeus rostratus Purcell, 1907	FGW	11	1	0	3	2	5
Xerophaeus rubeus Tucker, 1923	FGW	10	1	0	3	3	6
Xerophaeus spoliator Purcell, 1907	FGW	2	1	0	3	2	5
Xerophaeus tenebrosus Tucker, 1923	FGW	3	1	0	3	3	6
Xerophaeus vickermani Tucker, 1923	FGW	7	1	0	3	2	5
Zelotes albanicus (Hewitt, 1915)	FGW	12	1	0	3	1	4
Zelotes bastardi (Simon, 1896)	FGW	1	0	0	1	3	4
Zelotes capensis FitzPatrick, 2007	FGW	5	1	0	4	3	7
Zelotes capsula Tucker, 1923	FGW	1	1	0	3	2	5
Zelotes corrugatus (Purcell, 1907)	FGW	95	0	0	1	1	2
Zelotes florisbad FitzPatrick, 2007	FGW	21	1	1	6	3	9
Zelotes frenchi Tucker, 1923	FGW	359	0	0	2	1	3
Zelotes fuligineus (Purcell, 1907)	FGW	286	0	0	1	1	2
Zelotes gooldi (Purcell, 1907)	FGW	8	0	0	2	1	3
Zelotes haplodrassoides (Denis, 1955)	FGW	1	0	0	1	3	4
Zelotes humilis (Purcell, 1907)	FGW	193	0	0	2	1	3
Zelotes invidus (Purcell, 1907)	FGW	4	0	0	2	1	3
Zelotes lavus Tucker, 1923	FGW	30	0	0	2	1	3
Zelotes lightfooti (Purcell, 1907)	FGW	19	1	0	3	2	5
Zelotes lotzi FitzPatrick, 2007	FGW	6	1	0	3	3	6
Zelotes mashonus FitzPatrick, 2007	FGW	1	0	0	1	3	4
Zelotes natalensis Tucker, 1923	FGW	29	1	0	3	1	4
Zelotes pallidipes Tucker, 1923	FGW	2	0	0	2	3	5
Zelotes qwabergensis FitzPatrick, 2007	FGW	3	1	1	6	3	9
Zelotes reduncus (Purcell, 1907)	FGW	17	1	0	3	1	4
Zelotes sclateri Tucker, 1923	FGW	223	0	0	2	1	3

Zelotes scrutatus (O.P.-Cambridge, 1872)	FGW	374	0	0	1	1	2
Zelotes tuckeri Roewer, 1951	FGW	11	0	0	1	1	2
Zelotes uquathus FitzPatrick, 2007	FGW	9	1	0	3	2	5
Zelotes zonognathus (Purcell, 1907)	FGW	32	0	0	1	2	3
23. Hahniidae							
Hahnia laticeps Simon, 1898	SHWB	54	1	0	3	2	5
Hahnia tabulicola Simon, 1898	SHWB	27	0	0	1	1	2
24. Hersiliidae							
Hersilia arborea Lawrence, 1928	FPW	1	0	0	2	2	4
Hersilia sericea Pocock, 1898	FPW	2	0	0	1	1	2
Hersilia setifrons Lawrence, 1928	FPW	13	0	0	2	1	3
Tyrotama australis (Simon, 1893)	FGW	24	1	0	3	1	4
25. Idiopidae							
Ctenolophus cregoei (Purcell, 1902)	BGW	4	1	0	3	2	5
Ctenolophus fenoulheti Hewitt, 1913	BGW	2	1	0	3	2	5
Ctenolophus oomi Hewitt, 1913	BGW	9	1	0	4	2	6
Ctenolophus pectinipalpis (Purcell, 1903)	BGW	6	1	0	5	3	8
Galeosoma coronatum Hewitt, 1915	BGW	6	1	0	4	3	7
Galeosoma crinitum Hewitt, 1919	BGW	1	1	1	6	3	9
Galeosoma hirsutum Hewitt, 1916	BGW	8	1	0	3	2	5
Galeosoma pallidum Hewitt, 1915	BGW	8	1	1	5	3	8
Galeosoma pilosum Hewitt, 1916	BGW	6	1	1	5	3	8
Galeosoma planiscutatum Hewitt, 1919	BGW	5	1	0	3	3	6
Galeosoma robertsi Hewitt, 1916	BGW	6	1	1	4	2	6
Galeosoma scutatum Purcell, 1903	BGW	3	1	0	4	3	7
Gorgyrella schreineri Purcell, 1903	BGW	4	1	0	3	1	4
Idiops fryi (Purcell, 1903)	BGW	4	1	0	3	2	5
Idiops gunningi Hewitt, 1913	BGW	4	1	0	4	3	7
Idiops hamiltoni (Pocock, 1902)	BGW	2	1	1	6	3	9
Idiops hepburni (Hewitt, 1919)	BGW	1	0	0	2	3	5
Idiops monticola (Hewitt, 1916)	BGW	4	1	0	3	1	4
Idiops nigropilosus (Hewitt, 1919)	BGW	2	1	1	6	3	9
Idiops parvus Hewitt, 1915	BGW	1	1	1	6	3	9
Idiops pretoriae (Pocock, 1898)	BGW	6	1	0	5	2	7
Segregara abrahami (Hewitt, 1913)	BGW	2	1	0	5	3	8
Segregara transvaalensis (Hewitt, 1913)	BGW	12	1	0	3	1	4
26. Linyphiidae							
Ceratinopsis irandensis Locket & Russell-Smith, 1980	SHWB	1	0	0	1	3	4
Ceratinopsis sinuata Bosmans, 1988	SHWB	1	0	0	1	3	4
Erigone irrita Jocqué, 1984	SHWB	3	1	0	3	2	5
Erigone prominens Bösenberg & Strand, 1906	SHWB	1	0	0	0	3	3
Limoneta sirimoni (Bosmans, 1979)	SHWB	56	0	0	1	2	3
Meioneta habra Locket, 1968	SHWB	47	0	0	1	1	2
Meioneta natalensis Jocqué, 1984	SHWB	1	1	0	3	2	5
Meioneta prosectoides Locket & Russell-Smith, 1980	SHWB	1	0	0	1	3	4
Metaleptyphantes familiaris Jocqué, 1984	SHWB	59	1	0	3	2	5
Metaleptyphantes perexiguus (Simon & Fage, 1922)	SHWB	4	0	0	1	1	2
Microctenonyx subitaneus (O. P.-Cambridge, 1875)	SHWB	1	0	0	0	3	3
Microlinyphia aethiopica (Tullgren, 1910)	SHWB	1	0	0	1	3	4
Microlinyphia sterilis (Pavesi, 1883)	SHWB	62	0	0	0	1	1
Ostearius melanopygius (O.P.-Cambridge, 1879)	SHWB	118	0	0	0	1	1
Pelecopsis janus Jocqué, 1984	SHWB	14	0	0	2	1	3
Tybaertiella convexa (Holm, 1962)	SHWB	1	0	0	1	1	2
Tybaertiella krugeri (Simon, 1894)	SHWB	4	0	0	1	1	2
Typhistes gloriosus Jocqué, 1984	SHWB	1	1	0	5	3	8
27. Liocranidae							

Rhaeboctesis secundus Tucker, 1920	FGW	6	1	0	3	3	6
Rhaeboctesis transvaalensis Tucker, 1920	FGW	6	1	0	3	3	6
Rhaeboctesis trinotatus Tucker, 1920	FGW	12	0	0	2	2	4
28. Lycosidae							
Allocosa lawrencei (Roewer, 1951)	FGW	1	1	0	3	2	5
Allocosa montana Roewer, 1959	FGW	2	0	0	1	3	4
Allocosa tuberculipalpa (Caporiacco, 1940)	FGW	11	0	0	1	2	3
Allocosa umtalica (Purcell, 1903)	FGW	1	0	0	1	3	5
Amblyothele albocincta Simon, 1910	FGW	3	0	0	2	3	5
Amblyothele latedissipata Russell-Smith, Jocqué & Alderweireldt, 2009	FGW	9	0	0	1	2	3
Evippomma squamulatum (Simon, 1898)	FGW	66	0	0	2	1	3
Foveosa adunca Russell-Smith, Alderweireldt & Jocqué, 2007	FGW	10	1	0	3	2	5
Foveosa foveolata (Purcell, 1903)	FGW	65	0	0	1	1	2
Hippasa australis Lawrence, 1927	FWB	18	0	0	1	1	2
Hippasa funerea Lessert, 1925	FWB	15	0	0	2	1	3
Hogna spenceri (Pocock, 1898)	FGW	7	0	0	1	2	3
Hogna transvaalica (Simon, 1898)	FGW	2	1	0	3	2	5
Lycosa connexa Roewer, 1960	FGW	1	1	1	6	3	9
Lycosa pachana Pocock, 1898	FGW	5	0	0	1	2	3
Minicosa neptuna Alderweireldt & Jocqué, 2007	FGW	8	0	0	2	2	4
Ocyale guttata (Karsch, 1878)	FGW	1	0	0	1	2	3
Pardosa clavipalpis Purcell, 1903	FGW	22	0	0	2	1	3
Pardosa crassipalpis Purcell, 1904	FGW	194	0	0	2	1	3
Pardosa injucunda (O.P.-Cambridge, 1876)	FGW	2	0	0	1	3	4
Pardosa leipoldti Purcell, 1903	FGW	1	0	0	2	2	4
Pardosa manubriata Simon, 1898	FGW	1	0	0	2	1	3
Pardosa nebulosa (Roewer, 1960)	FGW	6	0	0	1	2	3
Pardosa oncka Lawrence, 1927	FGW	3	0	0	1	2	2
Proevippa albiventris (Simon, 1898)	FGW	14	0	0	2	1	3
Proevippa biampliata (Purcell, 1903)	FGW	139	0	0	2	1	3
Proevippa bruneipes (Purcell, 1903)	FGW	2	0	0	3	2	5
Proevippa fascicularis (Purcell, 1903)	FGW	25	0	0	2	1	3
Proevippa hirsuta (Russell-Smith, 1981)	FGW	2	0	0	2	3	5
Proevippa schreineri (Purcell, 1903)	FGW	13	1	0	3	2	5
Proevippa wanlessi (Russell-Smith, 1981)	FGW	1	1	0	3	3	6
Pterartoria flavolimbata Purcell, 1903	FGW	1	1	0	3	3	6
Schizocosa darlingi (Pocock, 1898)	FGW	1	0	0	2	3	5
Trabea natalensis Russell-Smith, 1982	FGW	8	1	0	5	2	7
Trabea ornatipalpis Russell-Smith, 1982	FGW	2	1	0	3	3	6
Trabea purcelli Roewer, 1951	FGW	41	0	0	3	1	4
Trabea rubriceps Lawrence, 1952	FGW	3	1	0	3	2	5
Trochosippa modesta Roewer, 1960	FGW	1	1	1	6	3	9
Trochosippa nigerrima Roewer, 1960	FGW	1	1	1	6	3	9
Zenonina albocaudata Lawrence, 1952	FGW	2	1	0	4	2	6
Zenonina mystacina Simon, 1898	FGW	2	0	0	2	2	4
29. Microstigmatidae							
Microstigmata longipes (Lawrence, 1938)	FGW	22	1	0	3	1	4
Microstigmata ukhahlamba Griswold, 1985	FGW	9	1	0	4	2	6
30. Migidae							
Moggridgea microps Hewitt, 1915	BGW	1	0	0	2	2	4
Moggridgea paucispina Hewitt, 1916	BGW	2	1	0	3	2	5
Moggridgea peringueyi Simon, 1903	BGW	1	1	0	3	1	4
Poecilomigas abrahami (O. P.-Cambridge, 1889)	BGW	6	1	0	3	1	4
31. Mimetidae							
Ero capensis Simon, 1895	FPW	1	1	0	3	2	5
Ero lawrencei Unzicker, 1966	FPW	2	1	0	4	2	6
Mimetus natalensis Lawrence, 1938	FPW	7	1	0	3	1	4

32. Miturgidae							
Cheiracanthium aculeutum Simon, 1884	FPW	6	0	0	1	1	2
Cheiracanthium africanum Lessert, 1921	FPW	41	0	0	1	1	2
Cheiracanthium furculatum Karsch, 1879	FPW	558	0	0	1	1	2
Cheiracanthium minshullae Lotz, 2007	FPW	1	0	0	2	3	5
Cheiracanthium shiluvanensis Lotz, 2007	FPW	5	0	0	3	3	6
Cheiracanthium vansoni Lawrence, 1936	FPW	20	0	0	1	1	2
Cheiramiona amarifontis Lotz, 2002	FPW	1	1	0	4	2	6
Cheiramiona collinita (Lawrence, 1938)	FPW	5	1	0	5	2	7
Cheiramiona filipes (Simon, 1898)	FPW	6	0	0	2	2	4
Cheiramiona florisbadensis Lotz, 2002	FPW	15	0	0	2	1	3
Cheiramiona fontanus Lotz, 2003	FPW	3	1	1	6	3	9
Cheiramiona krugerensis Lotz, 2003	FPW	2	1	0	3	1	4
Cheiramiona langi Lotz, 2003	FPW	2	0	0	2	3	5
Cheiramiona mlawula Lotz, 2003	FPW	3	0	0	2	2	4
Cheiramiona paradisus Lotz, 2002	FPW	30	0	0	2	1	3
Cheiramiona regis Lotz, 2002	FPW	7	1	1	4	3	7
Parapostenus hewitti Lessert, 1923	FGW	2	1	0	4	2	6
33. Nemesiidae							
Entypesa schoutedeni Benoit, 1965	BGW	4	1	0	3	2	5
Hermacha bicolor (Pocock, 1897)	BGW	23	1	0	5	2	7
Hermacha mazoena Hewitt, 1915	BGW	2	0	0	2	3	5
Lepthercus dregei Purcell, 1902	BGW	1	1	0	5	3	8
Spiroctenus pilosus Tucker, 1917	BGW	1	1	1	6	3	9
34. Nephilidae							
Nephila fenestrata Thorell, 1859	OWB	57	0	0	1	1	2
Nephila inaurata (Walckenaer, 1841)	OWB	1	0	0	1	1	2
Nephila senegalensis (Walckenaer, 1842)	OWB	25	0	0	1	1	2
Nephilengys cruentata (Fabricius, 1775)	OWB	3	0	0	0	1	1
35. Oecobiidae							
Oecobius navus Blackwall, 1859	RWB	19	0	0	0	1	1
Oecobius putus O. P.-Cambridge, 1876	RWB	1	0	0	0	3	3
Uroecobius ecribellatus Kullmann & Zimmermann, 1976	RWB	1	1	0	3	2	5
36. Oonopidae							
Opopaea mattica Simon, 1893	FGW	5	1	0	3	3	6
Opopaea speciosa (Lawrence, 1952)	FGW	4	0	0	1	1	2
37. Oxyopidae							
Hamataliwa kulczynskii (Lessert, 1915)	FPW	1	0	0	1	1	2
Oxyopes affinis Lessert, 1915	FPW	4	0	0	1	1	2
Oxyopes bothai Lessert, 1915	FPW	4	0	0	1	1	2
Oxyopes flavipalpis (Lucas, 1858)	FPW	1	0	0	1	1	2
Oxyopes hoggi Lessert, 1915	FPW	1	0	0	1	1	2
Oxyopes jacksoni Lessert, 1915	FPW	8	0	0	1	1	2
Oxyopes longispinosus Lawrence, 1938	FPW	3	1	0	3	1	4
Oxyopes pallidecoloratus Strand, 1906	FPW	2	0	0	1	1	2
Oxyopes russoi Caporiacco, 1940	FPW	4	0	0	1	1	2
Oxyopes schenkeli Lessert, 1927	FPW	4	0	0	1	1	2
Oxyopes vanderysti Lessert, 1946	FPW	1	0	0	1	3	4
Oxyopes vogelsangeri Lessert, 1946	FPW	2	0	0	1	2	3
Peucetia maculifera Pocock, 1900	FPW	7	0	0	2	1	3
Peucetia nicolae Van Niekerk & Dippenaar-Schoeman, 1994	FPW	1	1	0	4	1	5
Peucetia pulchra (Blackwall, 1865)	FPW	1	0	0	1	2	3
Peucetia striata Karsch, 1878	FPW	9	0	0	1	1	2
Peucetia transvaalica Simon, 1896	FPW	7	0	0	1	1	2
Peucetia viridis (Blackwall, 1858)	FPW	1	0	0	0	1	1

38. Palpimanidae							
Diaphorocellus biplagiatus Simon, 1893	FGW	2	0	0	2	1	3
Palpimanus armatus Pocock, 1898	FGW	1	1	0	3	2	5
Palpimanus capensis Simon, 1893	FGW	1	1	0	3	2	5
Palpimanus transvaalicus Simon, 1893	FGW	16	1	0	3	1	4
Palpimanus tuberculatus Lawrence, 1952	FGW	1	1	1	6	3	9
39. Penestomidae							
Penestomus montanus Miller, Griswold, Haddad, 2010	RWB	7	0	0	2	3	5
40. Philodromidae							
Hirriusa arenacea (Lawrence, 1927)	FGW	1	0	0	2	1	3
Hirriusa bidentata (Lawrence, 1927)	FGW	2	0	0	2	2	4
Hirriusa variegata (Simon, 1895)	FGW	3	1	0	3	1	4
Philodromus bigibbus (O.P.-Cambridge, 1876)	FPW	1	0	0	1	2	3
Philodromus browningi Lawrence, 1952	FPW	5	1	0	3	1	4
Philodromus grosi Lessert, 1943	FPW	1	0	0	1	2	3
Philodromus guineensis Millot, 1941	FPW	1	0	0	1	1	2
Suemus punctatus Lawrence, 1938	FGW	8	1	0	3	1	4
Thanatus dorsilineatus Jézéquel, 1964	FPW	9	0	0	1	1	2
Thanatus vulgaris Simon, 1870	FGW	19	0	0	0	1	1
Tibellus gerhardi Van den Berg & Dippenaar-Schoeman, 1994	FPW	1	0	0	1	2	3
Tibellus hollidayi Lawrence, 1952	FPW	55	0	0	1	1	2
Tibellus kibonotensis Lessert, 1919	FPW	4	0	0	1	2	3
Tibellus minor Lessert, 1919	FPW	47	0	0	1	1	2
Tibellus seriepunctatus Simon, 1907	FPW	1	0	0	1	3	4
41. Pholcidae							
Crossopriza lyoni (Blackwall, 1867)	SPWB	1	0	0	0	3	3
Quamtana bonamanzi Huber, 2003	SPWB	1	1	0	3	2	5
Quamtana filmeri Huber, 2003	SPWB	5	0	0	2	3	5
Quamtana hectori Huber, 2003	SPWB	3	1	0	3	2	5
Quamtana lotzi Huber, 2003	SPWB	2	1	1	5	3	8
Quamtana mabusai Huber, 2003	SPWB	10	0	0	4	2	6
Quamtana meyeri Huber, 2003	SPWB	1	1	1	6	3	9
Smeringopus badplaas Huber, 2012	SPWB	1	1	0	4	2	6
Smeringopus florisbad Huber, 2012	SPWB	20	1	1	4	2	6
Smeringopus koppies Huber, 2012	SPWB	4	0	0	2	2	4
Smeringopus lotzi Huber, 2012	SPWB	21	1	0	3	1	4
Smeringopus natalensis Lawrence, 1947	SPWB	49	0	0	2	1	3
Smeringopus ubicki Huber, 2012	SPWB	2	1	0	4	2	6
42. Phyxelididae							
Phyxelida makapanensis Simon, 1894	RWB	6	1	0	4	2	6
Pongolania chrysionaria Griswold, 1990	RWB	6	1	1	5	3	8
Themacrys cavernicola (Lawrence, 1939)	RWB	3	1	0	5	3	8
Themacrys irrorata Simon, 1906	RWB	3	1	0	4	2	6
Themacrys monticola (Lawrence, 1939)	RWB	21	1	0	4	2	6
Themacrys silvicola (Lawrence, 1938)	RWB	2	1	0	4	2	6
Themacrys ukhahlamba Griswold, 1990	RWB	4	1	0	5	3	8
Vidole capensis (Pocock, 1900)	RWB	3	1	0	3	1	4
Vidole helicigyna Griswold, 1990	RWB	5	1	0	5	3	8
Vidole lyra Griswold, 1990	RWB	2	1	0	3	2	5
Vidole schreineri (Purcell, 1904)	RWB	2	1	0	4	2	6
Vidole sothoana Griswold, 1990	RWB	91	0	0	2	1	3
Xevioso aululata Griswold, 1990	RWB	2	1	0	5	3	8
Xeviosa lichmadina Griswold, 1990	RWB	1	1	0	4	3	7
Xevioso orthomeles Griswold, 1990	RWB	2	0	0	2	2	4
43. Pisauridae							

Afropisaura rothiformis (Strand, 1908)	FPW	1	0	0	1	2	3
Chiasmopes hystrix (Berland, 1922)	SHWB	2	0	0	1	3	4
Chiasmopes lineatus (Pocock, 1898)	SHWB	5	0	0	1	1	2
Chiasmopes namaquensis (Roewer, 1955)	SHWB	1	0	0	2	3	5
Cispius kimbius Blandin, 1978	SHWB	1	1	0	3	2	5
Euprosthenops australis Simon, 1898	FWB	5	0	0	1	1	2
Euprosthenops bayaonianus (Brito Capello, 1867)	FWB	4	0	0	1	1	2
Euprosthenopsis armata (Strand, 1913)	SHWB	1	0	0	1	3	4
Euprosthenopsis pulchella (Pocock, 1902)	SHWB	3	0	0	2	1	3
Euprosthenopsis vuattouxi Blandin, 1977	SHWB	3	0	0	1	1	2
Maypacius bilineatus (Pavesi, 1895)	SHWB	1	0	0	1	2	3
Nilus curtus O.P.-Cambridge, 1876	FGW	2	0	0	1	1	2
Nilus margaritatus Pocock, 1898	FGW	4	0	0	1	2	3
Nilus massajae (Pavesi, 1883)	FGW	2	0	0	1	1	2
Rothus purpurissatus Simon, 1898	FPW	31	0	0	1	1	2
Rothus vittatus Simon, 1898	FPW	4	1	0	3	2	5
44. Prodidomidae							
Austrodomus scaber (Purcell, 1904)	FGW	1	1	0	3	3	6
Austrodomus zuluensis Lawrence, 1947	FGW	2	1	0	3	2	5
Theuma ababensis Tucker, 1923	FGW	2	0	0	2	2	4
Theuma capensis Purcell, 1907	FGW	1	0	0	3	2	5
Theuma cedri Purcell, 1907	FGW	3	1	0	3	3	6
Theuma elucubata Tucker, 1923	FGW	2	1	0	3	2	5
Theuma foveolata Tucker, 1923	FGW	1	0	0	2	2	4
Theuma fusca Purcell, 1907	FGW	15	0	0	2	1	3
Theuma maculata Purcell, 1907	FGW	1	0	0	2	1	3
Theuma parva Purcell, 1907	FGW	1	0	0	2	2	4
Theuma schreineri Purcell, 1907	FGW	2	1	0	3	2	5
Theuma schultzei Purcell, 1908	FGW	1	1	0	3	2	5
Theuma tragardhi Lawrence, 1947	FGW	1	1	0	3	3	6
45. Salticidae							
Asemonea murphyae Wanless, 1980	FGW	1	0	0	1	3	4
Baryphas ahenus Simon, 1902	FPW	46	0	0	1	1	2
Brancus bevisi Lessert, 1925	FPW	2	0	0	1	1	2
Brancus mustelus (Simon, 1902)	FPW	4	0	0	2	3	5
Carrhotus singularis Simon, 1902	FGW	2	1	0	4	3	7
Cyrba boveyi Lessert, 1933	FGW	1	0	0	1	2	3
Cyrba lineata Wanless, 1984	FGW	6	1	0	3	1	4
Cyrba nigrimana Simon, 1900	FGW	10	1	0	3	1	4
Dendryphantes hararensis Wesołowska & Cumming, 2008	FPW	11	0	0	2	3	5
Dendryphantes purcelli Peckham & Peckham, 1903	FPW	8	0	0	1	1	2
Dendryphantes rafalskii Wesołowska, 1999	FPW	1	0	0	2	3	5
Evarcha dotata (Peckham & Peckham, 1903)	FPW	4	0	0	1	1	2
Evarcha flagellaris Haddad & Wesołowska, 2011	FGW	7	1	0	3	2	5
Evarcha prosimilis Wesołowska & Cumming, 2008	FGW	82	0	0	1	1	2
Evarcha vittula Haddad & Wesołowska, 2011	FGW	18	1	0	4	2	6
Festucula festuculaeformis (Lessert, 1925)	FPW	2	0	0	1	2	3
Festucula lawrencei Lessert, 1933	FPW	2	0	0	1	1	2
Goleba puella (Simon, 1885)	FPW	1	0	0	1	2	3
Habrocestum albimanum Simon, 1901	FGW	2	1	0	4	3	7
Harmochirus luculentus Simon, 1885	FPW	1	0	0	1	2	3
Hasarius adansoni (Audouin, 1826)	FPW	12	0	0	0	1	1
Heliophanus aberdarensis Wesołowska, 1986	FPW	1	0	0	1	3	4
Heliophanus charlesi Wesołowska, 2003	FPW	4	1	0	3	2	5
Heliophanus deamatus Peckham & Peckham, 1903	FPW	3	0	0	1	3	4
Heliophanus debilis Simon, 1901	FPW	14	0	0	1	1	2
Heliophanus demonstrativus Wesołowska, 1986	FPW	1	0	0	1	2	3
Heliophanus fascinatus Wesołowska, 1986	FPW	5	0	0	1	3	4
Heliophanus gladiator Wesołowska, 1986	FPW	2	0	0	1	3	4

Heliophanus hastatus Wesołowska, 1986	FPW	18	0	0	2	1	3
Heliophanus insperatus Wesołowska, 1986	FPW	2	0	0	1	2	3
Heliophanus modicus Peckham & Peckham, 1903	FPW	3	0	0	1	2	3
Heliophanus nanus Wesołowska, 2003	FPW	18	1	0	4	2	6
Heliophanus orchesta Simon, 1885	FPW	6	0	0	1	2	3
Heliophanus orchestioides Lessert, 1925	FPW	5	0	0	1	3	4
Heliophanus patellaris Simon, 1901	FPW	3	1	0	3	2	5
Heliophanus pistaciae Wesołowska, 2003	FPW	33	0	0	2	1	3
Heliophanus proszynskii Wesołowska, 2003	FPW	12	1	0	3	2	5
Heliophanus sororius Wesołowska, 2003	FPW	3	1	1	6	3	9
Heliophanus termitophagus Wesołowska & Haddad, 2002	FGW	17	1	0	5	2	7
Heliophanus thaleri Wesołowska, 2009	FPW	1	1	1	6	3	9
Heliophanus transvaalicus Simon, 1901	FPW	11	1	0	3	2	5
Holcolaetis vellerea Simon, 1910	FPW	4	0	0	1	3	4
Holcolaetis zuluensis Lawrence, 1937	FPW	2	0	0	1	1	2
Hyllus argyrotoxus Simon, 1902	FPW	5	0	0	1	1	2
Hyllus brevitarsis Simon, 1902	FPW	4	0	0	1	1	2
Hyllus treleaveni Peckham & Peckham, 1902	FPW	6	0	0	1	1	2
Icius insolidus (Wesołowska, 1999)	FGW	22	0	0	2	1	3
Icius pulchellus Haddad & Wesołowska, 2011	FGW	2	1	1	6	3	9
Langona hirsuta Haddad & Wesołowska, 2011	FGW	86	1	0	4	2	6
Langona lotzi Haddad & Wesołowska, 2011	FGW	27	1	1	6	3	9
Langona manicata Simon, 1901	FGW	3	1	0	4	3	7
Langona warchalowskii Wesołowska, 2007	FGW	32	1	0	3	2	5
Menemerus bifurcus Wesołowska, 1999	FPW	6	0	0	2	3	5
Menemerus bivittatus (Dufour, 1831)	FPW	1	0	0	0	2	2
Menemerus congoensis Lessert, 1927	FPW	1	0	0	2	3	5
Menemerus transvaalicus Wesołowska, 1999	FPW	31	1	0	3	1	4
Mexcala elegans Peckham & Peckham, 1903	FGW	4	0	0	1	1	2
Mexcala rufa Peckham & Peckham, 1902	FGW	1	0	0	2	2	4
Microheros termitophagus Wesołowska & Cumming, 1999	FGW	32	0	0	2	2	4
Mogrus mathisi (Berland & Millot, 1941)	FPW	2	0	0	0	3	3
Myrmarachne foreli Lessert, 1925	FPW	1	0	0	1	2	3
Myrmarachne inflatipalpis Wanless, 1978	FPW	10	0	0	2	2	4
Myrmarachne kiboschensis Lessert, 1925	FGW	1	0	0	0	3	3
Myrmarachne laurentina Bacelar, 1953	FPW	1	0	0	2	2	4
Myrmarachne leleupi Wanless, 1978	FPW	2	1	0	3	2	5
Myrmarachne marshalli Peckham & Peckham, 1903	FPW	9	0	0	1	2	3
Myrmarachne solitaria Peckham & Peckham, 1903	FPW	3	0	0	2	1	3
Myrmarachne uvira Wanless, 1978	FGW	1	0	0	1	3	4
Natta chionogaster (Simon, 1901)	FGW	25	0	0	1	1	2
Natta horizontalis Karsch, 1879	FGW	30	0	0	1	1	2
Nigorella hirsuta Wesołowska, 2009	FGW	56	0	0	2	1	3
Pellenes bulawayoensis Wesołowska, 2000	FGW	93	0	0	2	1	3
Pellenes epularis (O.P.-Cambridge, 1872)	FGW	2	0	0	0	3	3
Pellenes geniculatus (Simon, 1868)	FGW	46	0	0	0	1	1
Pellenes modicus Wesołowska & Russell-Smith, 2000	FGW	19	0	0	1	2	3
Pellenes tharinae Wesołowska, 2006	FGW	95	0	0	2	1	3
Phintella australis (Simon, 1902)	FPW	1	1	0	3	2	5
Phlegra bresnieri (Lucas, 1846)	FGW	20	0	0	0	3	3
Phlegra etosha Logunov & Azarkina, 2006	FGW	4	0	0	2	3	5
Phlegra karoo Wesołowska, 2006	FGW	160	0	0	2	1	3
Pignus simoni (Peckham & Peckham, 1903)	FGW	29	0	0	2	1	3
Plexippus paykulli (Audouin, 1826)	FPW	1	0	0	0	3	3
Portia schultzi Karsch, 1878	FPW	5	0	0	1	1	2
Pseudicius africanus Peckham & Peckham, 1903	FPW	1	1	0	3	3	6
Pseudicius dependens Haddad & Wesołowska, 2011	FPW	12	1	0	4	2	6
Pseudicius elegans Wesołowska & Cumming, 2008	FPW	1	0	0	2	3	5
Pseudicius gracilis Haddad & Wesołowska, 2011	FPW	6	1	1	5	3	8
Pseudicius karinae Haddad & Wesołowska, 2011	FPW	4	1	1	6	3	9
Pseudicius maculatus Haddad & Wesołowska, 2011	FPW	6	1	1	6	3	9

Pseudicius solitarius Haddad & Wesołowska, 2011	FPW	3	1	1	6	3	9
Rhene konradi Wesołowska, 2009	FPW	6	1	1	5	2	7
Rhene lingularis Haddad & Wesołowska, 2011	FPW	10	1	1	5	3	8
Schenkelia modesta Lessert, 1927	FPW	1	0	0	1	3	4
Sonoita lightfooti Peckham & Peckham, 1903	FPW	1	0	0	1	3	4
Stenaelurillus guttiger (Simon, 1901)	FGW	8	0	0	2	1	3
Tanzania meridionalis Haddad & Wesołowska, 2011	FGW	8	1	1	6	3	9
Tanzania mkomaziensis (Wesołowska & Russell-Smith, 2000)	FGW	1	0	0	1	3	4
Thyene bucculenta (Gerstäcker, 1873)	FPW	2	0	0	1	3	4
Thyene coccineovittata (Simon, 1885)	FPW	3	0	0	1	1	2
Thyene dakarensis (Berland & Millot, 1941)	FPW	2	0	0	1	3	4
Thyene inflata (Gerstäcker, 1873)	FPW	10	0	0	1	1	2
Thyene natalii Peckham & Peckham, 1903	FPW	14	0	0	1	1	2
Thyene ogdeni Peckham & Peckham, 1903	FPW	2	0	0	1	1	2
Thyene semiargentea (Simon, 1884)	FPW	19	0	0	1	2	3
Thyene thyenioides (Lessert, 1925)	FPW	24	0	0	1	2	3
Thyenula armata Wesołowska, 2001	FGW	32	1	1	6	3	9
Thyenula aurantiaca (Simon, 1902)	FGW	2	0	0	2	1	3
Thyenula fidelis Wesołowska & Haddad, 2009	FGW	2	0	0	2	2	4
Thyenula juvenca Simon, 1902	FPW	2	1	0	3	2	5
Thyenula oranjensis Wesołowska, 2001	FGW	20	1	0	4	3	7
Tusitala barbata Peckham & Peckham, 1902	FPW	19	0	0	1	1	2
Tusitala hirsuta Peckham & Peckham, 1902	FPW	9	0	0	1	2	3
46. Scytodidae							
Scytodes caffra Purcell, 1904	FGW	2	0	0	1	1	2
Scytodes drakensbergensis Lawrence, 1947	FGW	7	1	0	4	2	6
Scytodes elizabethae Purcell, 1904	FGW	7	1	0	3	3	6
Scytodes flagellata Purcell, 1904	FGW	1	1	0	3	2	5
Scytodes fusca Walckenaer, 1837	FGW	2	0	0	0	1	1
Scytodes maritima Lawrence, 1938	FGW	1	1	0	3	1	4
Scytodes marshalli Pocock, 1902	FGW	1	1	1	6	3	9
Scytodes symmetrica Lawrence, 1938	FGW	1	1	1	6	3	9
47. Segestriidae							
Ariadna corticola Lawrence, 1952	RWB	1	1	0	3	1	4
Ariadna hottentotta Purcell, 1908	RWB	1	1	0	3	3	6
48. Selenopidae							
Anyphops barbertonensis (Lawrence, 1940)	FGW	1	1	0	3	2	5
Anyphops civicus (Lawrence, 1940)	FGW	3	1	0	3	3	6
Anyphops dubiosus (Lawrence, 1952)	FGW	1	1	1	6	3	9
Anyphops fitzsimonsi (Lawrence, 1940)	FGW	1	1	0	5	2	7
Anyphops hessei (Lawrence, 1940)	FGW	1	1	0	4	2	6
Anyphops immaculatus (Lawrence, 1940)	FGW	2	1	0	3	3	6
Anyphops lawrencei (Roewer, 1951)	FGW	2	1	0	4	2	6
Anyphops longipedatus (Roewer, 1955)	FGW	4	1	0	4	3	7
Anyphops marshalli (Pocock, 1902)	FGW	1	1	0	5	3	8
Anyphops natalensis (Lawrence, 1940)	FGW	1	0	0	1	3	4
Anyphops pococki (Lawrence, 1940)	FGW	2	1	0	4	3	7
Anyphops purcelli (Lawrence, 1940)	FGW	1	1	0	4	3	7
Anyphops rubicundus (Lawrence, 1940)	FGW	1	1	0	3	2	5
Anyphops septemspinatus (Lawrence, 1937)	FGW	2	0	0	2	2	4
Anyphops spenceri (Pocock, 1896)	FGW	2	1	0	3	1	4
Anyphops stauntoni (Pocock, 1902)	FGW	2	0	0	1	1	2
Anyphops transvaalicus (Lawrence, 1940)	FGW	4	1	0	5	3	8
Anyphops tuckeri (Lawrence, 1940)	FGW	5	1	0	3	2	5
Selenops feron Corronca, 2002	FGW	1	0	0	1	3	4
Selenops kruegeri Lawrence, 1940	FGW	15	0	0	1	2	3
Selenops radiatus Latreille, 1819	FGW	14	0	0	0	1	1

49. Sicariidae							
Loxosceles parramae (Newlands, 1981)	FGW	6	1	0	3	1	4
Loxosceles simillina Lawrence, 1927	FGW	20	0	0	1	1	2
Loxosceles speluncarum Simon, 1893	FGW	4	1	1	5	3	8
50. Sparassidae							
Micrommata darlingi Pocock, 1901	FGW	1	0	0	2	3	5
Olios auricomis (Simon, 1880)	FPW	6	0	0	1	2	3
Olios biarmatus Lessert, 1925	FPW	1	1	0	4	2	6
Olios correvoni Lessert, 1921	FPW	7	0	0	2	1	3
Olios machadoi Lawrence, 1952	FPW	2	1	0	3	1	4
Olios marshalli (Pocock, 1898)	FPW	1	1	1	6	3	9
Olios sjostedti Lessert, 1921	FPW	1	0	0	1	3	4
Palystes ansiedippenaarae Croeser, 1996	FPW	2	1	0	4	3	7
Palystes castaneus (Latreille, 1819)	FPW	1	0	0	2	1	3
Palystes crawshayi Pocock, 1902	FPW	1	0	0	2	2	4
Palystes karooensis Croeser, 1996	FPW	2	1	0	3	1	4
Palystes leroyorum Croeser, 1996	FPW	17	1	0	3	3	6
Palystes perornatus Pocock, 1900	FPW	2	1	0	3	2	5
Palystes superciliosus L. Koch, 1875	FPW	253	0	0	2	1	3
Panaretella minor Lawrence, 1952	FPW	2	1	0	4	2	6
Pseudomicrommata longipes (Bösenberg & Lenz, 1895)	FPW	11	0	0	1	1	2
51. Tetragnathidae							
Leucauge auronotum Strand, 1907	OWB	2	1	0	4	3	7
Leucauge decorata (Blackwall, 1864)	OWB	28	0	0	0	1	1
Leucauge festiva (Blackwall, 1866)	OWB	58	0	0	1	1	2
Leucauge kibonotensis Tullgren, 1910	OWB	1	0	0	1	1	2
Leucauge levanderi (Kulczynski, 1901)	OWB	4	0	0	1	1	2
Leucauge medjensis Lessert, 1930	OWB	1	0	0	1	2	3
Meta meruensis Tullgren, 1910	OWB	10	0	0	1	3	4
Pachygnatha zappa Bosmans & Bosselaers, 1994	OWB	1	0	0	1	2	3
Tetragnatha boydi O.P.-Cambridge, 1898	OWB	3	0	0	0	1	1
Tetragnatha ceylonica O.P.-Cambridge, 1869	OWB	1	0	0	0	1	1
Tetragnatha demissa L. Koch, 1872	OWB	1	0	0	0	1	1
Tetragnatha isidis (Simon, 1880)	OWB	1	0	0	0	2	2
Tetragnatha maxillosa Thorell, 1895	OWB	2	0	0	0	2	2
Tetragnatha nitens (Audouin, 1826)	OWB	13	0	0	0	2	2
Tetragnatha subsquamata Okuma, 1985	OWB	1	0	0	1	1	2
Tetragnatha vermiformis Emerton, 1884	OWB	2	0	0	0	2	2
52. Theraphosidae							
Augacephalus breyeri (Hewitt, 1919)	BGW	1	0	0	2	1	3
Augacephalus junodi (Simon, 1904)	BGW	15	0	0	1	1	2
Brachionopus pretoriae Purcell, 1904	BGW	13	1	0	3	1	4
Ceratogyrus brachycephalus Hewitt, 1919	BGW	1	0	0	2	2	4
Ceratogyrus darlingi Pocock, 1897	BGW	10	0	0	2	1	3
Harpactira gigas Pocock, 1898	BGW	1	1	0	4	2	6
Harpactira hamiltoni Pocock, 1902	BGW	33	1	0	3	1	4
Harpactira tigrina Ausserer, 1875	BGW	2	1	0	4	2	6
Idiothele nigrofulva (Pocock, 1898)	BGW	21	0	0	3	1	4
Pterinochilus lugardi Pocock, 1900	BGW	10	0	0	1	1	2
53. Theridiidae							
Anelosimus nelsoni Agnarsson, 2006	GWB	2	1	0	3	1	4
Enoplognatha inornata O.P.-Cambridge, 1904	GWB	1	1	0	3	2	5
Enoplognatha molesta O.P.-Cambridge, 1904	GWB	20	1	0	3	1	4
Latrodectus cinctus Blackwall, 1865	GWB	10	0	0	1	1	2
Latrodectus geometricus C.L. Koch, 1841	GWB	364	0	0	1	1	2
Latrodectus indistinctus O.P.-Cambridge, 1904	GWB	23	0	0	2	1	3
Latrodectus renivulvatus Dahl, 1902	GWB	109	0	0	1	1	2

Latrodectus rhodesiensis Mackay, 1972	GWB	11	0	0	2	2	4
Phoroncidia eburnea (Simon, 1895)	GWB	7	1	0	3	2	5
Rhomphaea nasicus (Simon, 1873)	GWB	1	0	0	2	3	5
Steatoda capensis Hann, 1990	GWB	48	0	0	1	1	2
Steatoda erigoniformis (O.P.-Cambridge, 1872)	GWB	9	0	0	0	2	2
Theridion auberti Simon, 1904	GWB	2	1	0	3	3	6
Theridion piliphilum Strand, 1907	GWB	2	1	0	3	2	5
Theridion purcelli O.P.-Cambridge, 1904	GWB	26	0	0	1	1	2
54. Thomisidae							
Ansiae tuckeri (Lessert, 1919)	FPW	3	0	0	1	1	2
Avelis hystriculus Simon, 1895	FPW	1	1	0	4	2	6
Camaricus nigrotesselatus Simon, 1895	FPW	2	0	0	1	1	2
Diaea puncta Karsch, 1884	FPW	11	0	0	1	1	2
Heriaeus crassispinus Lawrence, 1942	FPW	2	1	0	3	1	4
Hewittia gracilis Lessert, 1928	FPW	3	0	0	1	1	2
Holopelus albibarbis Simon, 1895	FPW	1	0	0	2	1	3
Misumenops rubrodecoratus Millot, 1942	FPW	256	0	0	1	1	2
Monaeses austrinus Simon, 1910	FPW	21	0	0	3	1	4
Monaeses fuscus Dippenaar-Schoeman, 1984	FPW	4	0	0	1	2	3
Monaeses gibbus Dippenaar-Schoeman, 1984	FPW	2	1	0	3	1	4
Monaeses griseus Pavesi, 1897	FPW	18	0	0	1	1	2
Monaeses paradoxus Lucas, 1864	FPW	24	0	0	1	1	2
Monaeses pustulosus Pavesi, 1895	FPW	11	0	0	1	1	2
Monaeses quadrituberculatus Lawrence, 1927	FPW	8	0	0	1	1	2
Mystaria rufolimbata Simon, 1895	FPW	1	0	0	1	3	4
Oxytate argenteooculata (Strand, 1886)	FPW	8	0	0	1	1	2
Oxytate concolor (Caporiacco, 1947)	FPW	3	0	0	1	2	3
Pactactes compactus Lawrence, 1947	FPW	5	1	0	3	1	4
Pactactes trimaculatus Simon, 1895	FPW	2	0	0	1	1	2
Parabomis martini Lawrence, 1928	FPW	5	0	0	1	1	2
Parasmodix quadrituberculata Jézéquel, 1966	FPW	1	0	0	1	2	3
Pherecydes lucinae Dippenaar-Schoeman, 1980	FPW	1	1	0	3	2	5
Pherecydes nicolaasi Dippenaar-Schoeman, 1980	FPW	2	1	0	3	2	5
Pherecydes tuberculatus O.P.-Cambridge, 1883	FPW	18	0	0	2	1	3
Pherecydes zebra Lawrence, 1927	FPW	1	0	0	2	1	3
Phrynarachne melloleitaoi Lessert, 1933	FPW	4	0	0	2	1	3
Runcinia aethiops (Simon, 1901)	FPW	60	0	0	1	1	2
Runcinia affinis Simon, 1897	FPW	21	0	0	0	1	1
Runcinia depressa Simon, 1906	FPW	3	0	0	1	1	2
Runcinia erythrina Jézéquel, 1964	FPW	97	0	0	1	1	2
Runcinia flavida (Simon, 1881)	FPW	58	0	0	1	1	2
Runcinia grammica (L. Koch, 1937)	FPW	5	0	0	0	1	1
Runcinia johnstoni Lessert, 1919	FPW	11	0	0	1	1	2
Runcinia tropica Simon, 1907	FPW	2	0	0	1	3	4
Simorcus cotti Lessert, 1936	FPW	4	0	0	1	1	2
Simorcus lotzi Van Niekerk & Dippenaar-Schoeman, 2010	FPW	7	0	0	2	3	5
Stiphropus affinis Lessert, 1923	FGW	13	1	0	3	2	5
Synema decens (Karsch, 1878)	FPW	2	1	0	3	1	4
Synema diana (Audouin, 1826)	FPW	1	0	0	1	2	3
Synema imitator (Pavesi, 1883)	FPW	20	0	0	1	1	2
Synema langheldi Dahl, 1907	FPW	1	0	0	1	2	3
Synema marlothi Dahl, 1907	FPW	2	0	0	3	2	5
Synema nigrotibiale Lessert, 1919	FPW	25	0	0	1	1	2
Synema vallotoni Lessert, 1923	FPW	8	0	0	2	2	4
Thomisops bullatus Simon, 1895	FPW	1	0	0	2	1	3
Thomisops lesserti Millot, 1941	FPW	1	0	0	1	3	4
Thomisops melanopes Dippenaar-Schoeman, 1989	FPW	1	1	0	3	2	5
Thomisops pupa Karsch, 1879	FPW	1	0	0	1	1	2
Thomisops sulcatus Simon, 1895	FPW	10	0	0	1	1	2
Thomisus australis Comellini, 1957	FPW	52	0	0	1	1	2

Thomisus blandus Karsch, 1880	FPW	20	0	0	1	1	2
Thomisus citrinellus Simon, 1875	FPW	11	0	0	1	1	2
Thomisus congoensis Comellini, 1957	FPW	1	0	0	1	1	2
Thomisus dalmasi Lessert, 1919	FPW	16	0	0	1	1	2
Thomisus daradioides Simon, 1890	FPW	10	0	0	1	1	2
Thomisus granulatus Karsch, 1880	FPW	6	0	0	1	1	2
Thomisus kalaharinus Lawrence, 1936	FPW	27	0	0	1	1	2
Thomisus machadoi Comellini, 1959	FPW	17	0	0	1	2	3
Thomisus schultzei Simon, 1910	FPW	4	0	0	2	2	4
Thomisus scrupeus (Simon, 1886)	FPW	9	0	0	1	1	2
Thomisus spiculosus Pocock, 1901	FPW	2	0	0	1	2	3
Thomisus stenningi Pocock, 1900	FPW	151	0	0	1	1	2
Tmarus africanus Lessert, 1919	FPW	1	0	0	1	1	2
Tmarus cameliformis Millot, 1942	FPW	9	0	0	1	1	2
Tmarus comellinii Garcia-Neto, 1989	FPW	12	0	0	1	1	2
Tmarus foliatus Lessert, 1928	FPW	8	0	0	1	1	2
Xysticus fagei Lessert, 1919	FGW	1	0	0	1	2	3
Xysticus mulleri Lawrence, 1952	FGW	19	1	0	3	2	5
Xysticus natalensis Lawrence, 1938	FGW	22	0	0	2	1	3
Xysticus tugelanus Lawrence, 1942	FGW	15	1	0	3	2	5
Xysticus urbensis Lawrence, 1952	FGW	12	0	0	2	2	4
55. Trochanteriidae							
Platyoides leppanae Pocock, 1902	FPW	2	0	0	1	2	3
Platyoides pusillus Pocock, 1898	FPW	2	0	0	1	2	3
Platyoides walteri (Karsch, 1886)	FPW	46	1	0	3	1	4
56. Uloboriidae							
Hyptiotes akermani Wiehle, 1964	OWB	3	1	0	3	2	5
Miagrammopes brevicaudus O.P.-Cambridge, 1882	OWB	4	1	0	3	1	4
Miagrammopes constrictus Purcell, 1904	OWB	2	1	0	3	2	5
Uloborus planipedius Simon, 1896	OWB	1	0	0	1	2	3
Uloborus plumipes Lucas, 1846	OWB	36	0	0	1	1	2
57. Zodariidae							
Caesetius politus (Simon, 1893)	FGW	2	1	0	3	3	6
Caesetius spenceri (Pocock, 1900)	FGW	1	1	0	5	3	8
Capheris abrupta Jocqué, 2009	FGW	6	0	0	2	3	5
Capheris decorata Simon, 1904	FGW	6	0	0	2	1	3
Chariobas cylindraceus Simon, 1893	FPW	1	0	0	1	1	2
Chariobas lineatus Pocock, 1900	FPW	1	1	0	4	2	6
Cydrela spinimana Pocock, 1898	FGW	12	1	0	5	2	7
Diores annetteae Jocqué, 1990	FGW	24	1	0	4	3	7
Diores femoralis Jocqué, 1990	FGW	53	1	1	4	3	7
Diores pauper Jocqué, 1990	FGW	13	1	1	6	3	9
Diores poweri Tucker, 1920	FGW	23	0	0	2	1	3
Diores recurvatus Jocqué, 1990	FGW	3	1	0	3	2	5
Diores spinulosus Jocqué, 1990	FGW	1	1	0	5	3	8
Diores termitophagus Jocqué & Dippenaar-Schoeman, 1992	FGW	1	1	0	5	3	8
Diores triangulifer Simon, 1910	FGW	11	0	0	2	2	4
Heradida loricata Simon, 1893	FGW	4	1	0	4	3	7
Psammorygma aculeatum (Karsch, 1878)	FGW	1	1	0	4	3	7
Systenoplacis fagei (Lawrence, 1936)	FGW	4	1	0	3	2	5
Systenoplacis vandami (Hewitt, 1916)	FGW	18	1	0	3	1	4
58. Zoropsidae							
Griswoldia melana (Lawrence, 1938)	FGW	2	0	0	2	3	5
Griswoldia natalensis (Lawrence, 1938)	FGW	1	1	1	6	3	9
Griswoldia punctata (Lawrence, 1942)	FGW	18	1	0	5	1	6
Griswoldia transversa (Griswold, 1991)	FGW	1	1	0	5	3	8
Griswoldia urbensis (Lawrence, 1942)	FGW	14	1	0	4	1	5

Phanotea simoni Lawrence, 1951	FGW	4	1	0	5	3	8