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An integrative taxonomy of the genus *Stasimopus* Simon 1892 (Araneae: Mygalomorphae) of the Karoo with the description of nine new species and a *Stasimopus maraisi* Hewitt 1914 male


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Abstract

The genus *Stasimopus* Simon 1892 is endemic to Southern Africa, but is historically largely understudied. This paper provides a taxonomic revision for the *Stasimopus* species of the Karoo region of South Africa and includes the description of nine new species (*S. dylani* sp. nov., *S. finni* sp. nov., *S. hamartia* sp. nov., *S. ignis* sp. nov., *S. karooensis* sp. nov., *S. malesociatus* sp. nov., *S. tera* sp. nov., *S. theaei* sp. nov. and *S. venterstadensis* sp. nov.). A description of the genetically matched *S. maraisi* Hewitt 1914 male is provided. The original *S. maraisi* male is designated to its own new species (*S. malesociatus* sp. nov.). An identification key is provided for species occurring in the Karoo region. This is the first integrative taxonomy for the genus that includes morphological, geometric morphometric as well as genetic data.

Key words: Integrative taxonomy, *Stasimopus*, Karoo, new species, trapdoor spider

1. Introduction

The genus *Stasimopus* Simon 1892, is a group of trapdoor spiders endemic to Southern Africa, recorded in the Western Cape, Eastern Cape, Northern Cape, Free State, Kwazulu-Natal, North-West and Gauteng provinces of South Africa and in Lesotho. The genus currently comprises 47 species (World Spider Catalog 2022), but the actual species diversity is likely much higher.

The first member of the genus was originally described by Koch (1842) under the name *Actinopus caffrus* Koch, 1842 (now the type species for the genus). Two more species were later described under two separate genera; *Cyrtocarenum rufidens* Ausserer, 1871 and *Pachlyomerus natalensis* Cambridge, 1889. These species were later synonymised and placed in the genus *Stasimopus*, as *S. rufidens* (Ausserer, 1871) by Simon (1892).

An abundance of species were subsequently described by Karsch (1879), Pocock (1897, 1900, 1901, 1902a, 1902b), Purcell (1902, 1903a, 1903b, 1908), Hewitt (1910, 1913, 1914, 1915a, 1915b, 1916, 1917, 1919, 1927), Tucker (1917), Hendrixson & Bond (2004) and Engelbrecht & Prendini (2012). No subsequent comprehensive taxonomic treatments of the genus have since occurred.

There has historically been extensive debate around the phylogenetic placement of the genus *Stasimopus*. The genus was originally placed within the family Ctenizidae Thorell 1887 by Raven (1885). This was based on a range of plesiomorphic characteristics: three claws on the tarsi; in females claws are paired with few teeth; on the first and second legs are patches of dense short spines on the lateral surfaces on the distal segments in females; males have a simple, pyriform pedipalpal bulb; the chelicerae have two rows of teeth; fang's outer surface is smooth and a strongly procurved fovea on the carapace (Engelbrecht & Prendini 2012). The genus was often found to be paraphyletic in phylogenetic studies regardless of morphological conservancy (Ayoub *et al.* 2007; Hedin & Bond 2006; Opatova *et al.* 2013). In 2020 the genus was elevated to its own family Stasimopidae Bond, Opatova and Hedin 2020 based on subgenomic data (Opatova *et al.* 2020). No studies have looked at the phylogenetic relationships within the genus or the phylogeography of any of its species.

Due to the confounding morphological characters of the genus and reoccurring incorrect placement, there is a need for a more integrative taxonomic approach (Bond *et al.* 2012; Bond *et al.* 2021; Newton *et al.* 2020). The integrative taxonomic approach we employ makes use of the generalised species concept to separate and diagnose species by identifying a species as separately evolving metapopulation lineages using multiple lines of evidence (De Queiroz 2007; Rix *et al.* 2018). Thus the first criterion for identifying a species is that it must be a lineage, which is evolving separately from other such lineages (monophyletic) (Bond *et al.* 2022). The species delimitation is then supported or falsified by secondary properties, viewed as lines of evidence for the species delimitation (Yeates *et al.* 2011). Secondary properties are of vital importance as they may be what is used to actually identify the species (such as morphological characters), because of this, numerous sources state the importance of using more than one line of evidence when looking at a species' taxonomy (Dayrat 2005; De Queiroz 2007; Fujita *et al.* 2012; Yeates *et al.* 2011). For this reason, standard morphological characters and the geometric morphometric determined ocular patterns will be used to aid in species designation (Brandt *et al.* 2023b).

The Karoo region of South Africa is an arid/semi-arid area that spans one third of the land surface of South Africa over four provinces (Northern Cape, Western Cape, Eastern Cape and Free State) (Henschel *et al.* 2018). The Karoo contains unique and sensitive ecosystems which respond poorly to disturbance and have slow recovery rates (Holness *et al.* 2016). This region has long been neglected in studies due to the assumption of low biodiversity

in semi-arid regions (Roth-Monzón *et al.* 2018). The area has recently undergone a Strategic Environmental Assessment (SEA) under the BioGaps project due to the threat of impending land-use change (Holness *et al.* 2016). All the *Stasimopus* material collected during this assessment is used to form this integrative taxonomy for the Karoo region of South Africa.

The aim of this article is to produce an integrative taxonomy for the *Stasimopus* of the Karoo region using genetics, geometric morphometrics and morphology. Nine new species found in the Karoo are described, as well as a description of the *S. maraisi* male.

2. Methods and Materials

2.1. *Sample collection*

Stasimopus specimens were collected from part of the Great Karoo, South Africa. The region is within the demarcated area for potential shale gas fracking (Figure 1). The sites were selected by the Karoo BioGaps team to cover the range of environmental conditions present in the region. Within each site drainage line habitats were targeted for sampling as they are favoured by trapdoor spiders. A total of 79 sites were sampled, on average 50 km apart (Figure 1). At each site four people spent one-hour, thereby four person-hours soil scraping. Soil scraping involves removing the top layer of soil to expose burrow entrances. Once entrances were exposed, the burrows were excavated using a hand shovel and taking care to not injure the specimens. This methodology was effective for collecting female and juvenile specimens. In order to collect male specimens, road cruising was done after rain in the evenings. This involves slowly driving on isolated roads with torches to find males which are crossing in search of potential mates. All specimens were preserved in a solution of cold alcohol and kept in an ice box.

Specimens were later preserved in 80% ethanol in glass polytop vials for long-term storage. All locality information is available in Table S1. All newly collected material was deposited in the National Collection of Arachnida (NCA) of the Agricultural Research Council (ARC), Pretoria, South Africa.

2.2. *Taxonomic methods*

The taxonomic methods largely follow that of Ríos Tamayo & Lyle (2020). Photographs were taken with either a Zeiss Axio Zoom V16 with the AxioCam 512 color and stacked with ZEN 2.3 SPI (Blue Edition) for smaller characters or Canon EOS 5D camera equipped with a 100 mm macro lens for habitus photographs and larger characters. Rendering of the image slices was done with Helicon Focus software.

All measurements are given in millimeters (mm). If multiple specimens were used to describe the species, a range of lengths are provided, with the holotype / allotype value given in parentheses. Ocular measurements, Leg lengths and spination is only given for the largest specimen. Lengths of leg segments are always given in the order: femur, patella, tibia, metatarsus, tarsus. Legs are described from I to IV and from the proximal to distal end (femur to tarsus). Each segment surface will be described in the order of prolateral, dorsal, retrolateral, ventral. Genitalia are dissected and were examined in alcohol. Epygines cleared and photographed in clove oil.

All specimen were examined and identified against existing species descriptions and type specimens. The following collections were accessed; Albany Museum (AMGS)—T. Bellingan, Grahamstown, South Africa; The National Museum (NMBA)—J. A. Neethling, Bloemfontein, South Africa; Ditsong Museum of Natural History (TMSA)—T. Bird, Pretoria, South Africa; Iziko Museum of Cape Town (SAMC)—S. van Nooit, Cape Town, South Africa; Museum für Naturkunde (ZMB)—B. Huber, Berlin, Germany; National Collection of Arachnida (NCA)—P. Marais, Pretoria, South Africa. Species that occur in the Karoo region were reexamined for the species diagnoses, this includes *S. artifex* Pocock 1902a, *S. astutus* Pocock 1902a, *S. erythrognathus* Purcell 1903b, *S. leipoldti* Purcell 1902, *S. maraisi* Hewitt 1914, *S. mandelai* Hendrixson & Bond 2004, *S. palpiger* Pocock 1902a, *S. patersonae* Hewitt 1913, *S. schonlandi* Pocock 1900, *S. schrieneri* Purcell 1903a, *S. spinosus* Hewitt 1914, *S. steynsbergensis* Hewitt 1915b and *S. unispinosus* Purcell 1903a. *Stasimopus bimaculatus* Purcell 1903b could not be examined as it is missing from the museum collections.

All the examined morphological characters are in a character matrix and is available in Table 1 and 2. The

matrices includes all species for which types could be located excluding species from Gauteng province and the Free State province localities which border Gauteng. This information was used to form species diagnoses.

Where geographical locality co-ordinates were not provided on specimen labels or were unavailable on institutional databases, they were searched for using the Global Gazetteer Version 2.2 (www.fallingrain.com/world/) and are indicated in square brackets.

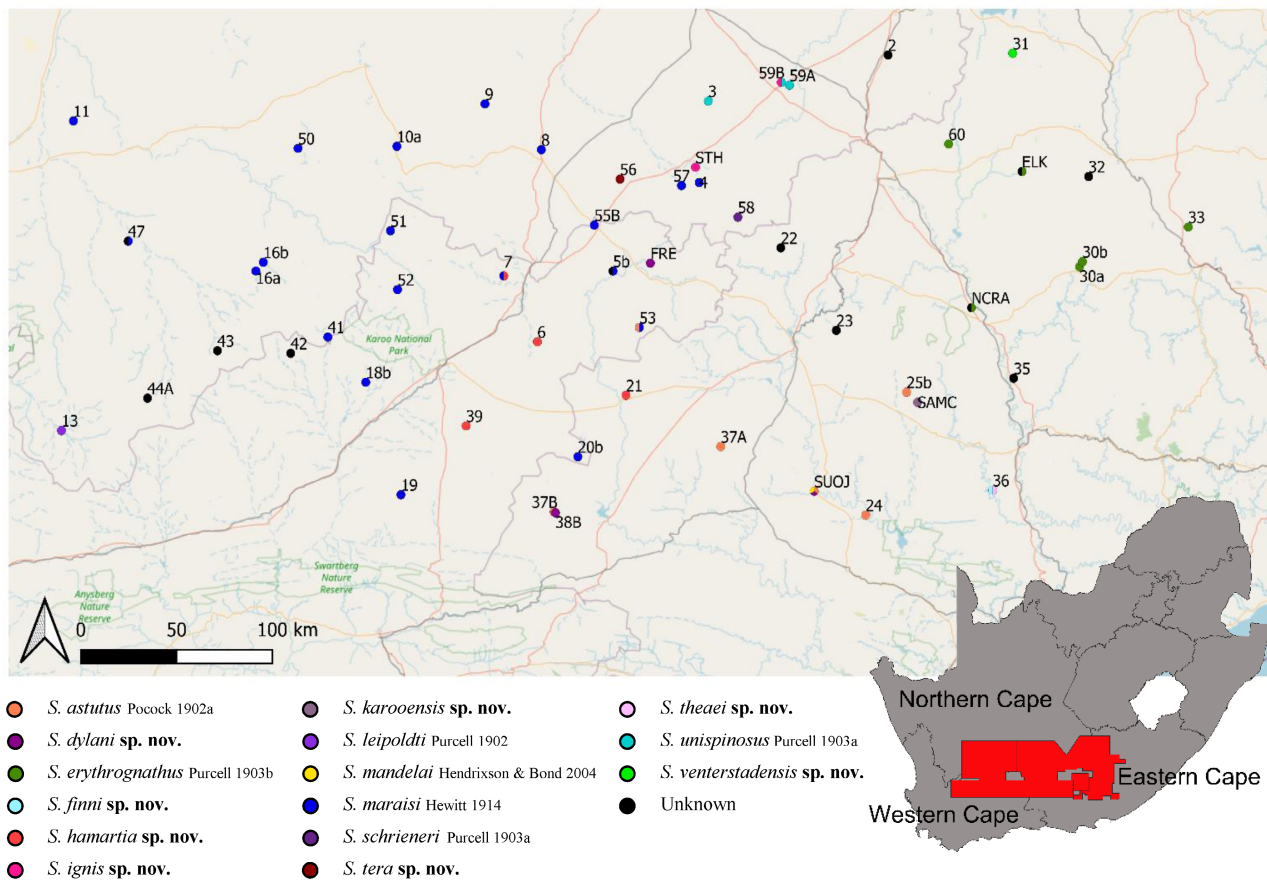


FIGURE 1. Map of the study area in the greater Karoo region, in the south-western part of South Africa. Markers indicate the 55 sites where *Stasimopus* specimens were found. If sites were near one another, they are denoted as ‘a’ and ‘b’. The localities are coloured according to the species found there. Red polygons indicate areas identified for shale gas exploration. Map created in QGIS version 3.4.8-Madeira (2019), available at: <http://qgis.osgeo.org>.

2.3. *Phylogenetic analyses*

For the phylogenetic analyses, three gene regions were used; two mitochondrial genes and one nuclear. These were ribosomal 16S, mitochondrial cytochrome c oxidase subunit 1 (CO1) and nuclear elongation factor 1 gamma (EF-1γ). DNA extraction and sequencing are as stated in Brandt *et al.* (2023a). All sequences generated were assembled in CLC Bio Main Workbench Version 6.9 (<http://www.clcbio.com>). All gene regions were submitted to GenBank and the accession numbers are recorded in Table S1. The CO1, 16S and EF-1γ datasets were concatenated using FASconCAT v1.11 (Kück and Meusemann, 2010). The edited sequences for each gene were aligned using MAFFT online (Katoh, 2005; Katoh and Toh, 2008). The ‘Auto’ strategy for alignment was used in MAFFT followed by visual inspection.

All analyses were applied to a concatenated-molecular dataset. The Akaike information criterion (AIC) and the Bayesian information criterion (BIC) were both implemented within jModelTest v2.1.7 (Posada 2008). This allows for the selection of the best model to account for varying base pair substitution rates (Posada 2008).

Maximum likelihood (RAxML v8.1.20; Stamatakis 2014) analyses were performed in RAxML implementing a General Time Reversible (GTR) model. A maximum likelihood search was done followed by bootstrapping for support of 1000 pseudoreplicates (Felsenstein 1985). To ensure the effective sampling of the tree space, the analyses

were repeated, using a different starting seed. For the analysis the rapid hill-climbing algorithm was implemented (Stamatakis *et al.* 2008).

For Bayesian inference (MrBayes v3.2.5 (Ronquist & Huelsenbeck 2003)) analyses, the parameters for each partition were unlinked in order to obtain separate estimates for each gene region, the rate-prior was set to variable and flat Dirichlet-priors used. The analysis was run by two simultaneous Monte-Carlo-Markov-Chains (Drummond & Rambaut 2007). These were run for 10 million iterations, sampling every 500th iteration. The first 25% was discarded as burn-in. The analysis was repeated and all four runs combined to create a majority-rule consensus tree (Drummond *et al.* 2006). Outgroup selection also follows Brandt *et al.* (2023a).

2.4. *Geometric morphometric analysis of ocular patterns*

Ocular patterns have long been used in the identification of the Araneae, but not always in a quantitative manner. A study by Brandt *et al.* (2023b) showed that ocular patterns can be used to distinguish between morphospecies of the genus *Stasimopus*. For this reason, the average ocular pattern (relative eye size and position) for each species is included, so that it can be used to distinguish between the species of the Karoo. The average eye patterns were obtained through landmark data as stated in Brandt *et al.* (2023b). These data underwent a procrustes fit to superimpose images and remove the effects of size, orientation and position, followed by a general procrustes analyses. These average positions were then averaged by species variables. Please see Brandt *et al.* (2023b) for a more detailed explanation of the statistical analyses.

2.5. *List of abbreviations*

Morphology: anterior eye row (AER); anterior lateral eyes (ALE); anterior median eyes (AME); bootstrap value (BS); dorsal (*do*); median ocular quadrangle (MOQ); posterior eye row (PER); prolateral (*pl*); posterior lateral eyes (PLE); posterior median eyes (PME); posterior probability (PP); retrolateral (*rl*); ventral (*v*).

3. Results

3.1. *Morphological character matrices*

List of characters and character states (codification) for table 1 & 2 (Both sex characters):

1 Eye pattern clustering: (0) highly clustered (Fig 17); (1) fairly clustered (Fig 17D); (2) not clustered (Fig 17A); (3) sparse (*S. patersonae*). **2** Largest eye: (0) AME; (1) ALE; (2) PME; (3) PLE. **3** Smallest eye: (0) AME; (1) ALE; (2) PME; (3) PLE. **4** Eyes of similar sizes: (0) yes; (1) no.

List of characters and character states (codification) for table 1 (male characters):

5 PLE in separate line: (0) yes (Fig 11C); (1) no (Fig 11A). **6** Carapace texture: (0) smooth (Fig 7D); (1) rugose (Fig 6C); (2) highly rugose (Fig 5B). **7** Shape of sternal sigilla: (0) narrow (Fig 21C); (1) broad; (2) fused (Fig 8A). **8** Sternum shape/ coxa imprints: (0) absent (Fig 25E); (1) shallow (Fig 21C); (2) distinct (Fig 8A). **9** Number of cheliceral teeth in proventral row: (0) 3; (1) 4; (2) 5. **10** Number of cheliceral teeth in retroventral row: (0) 3; (1) 4; (2) 5. **11** Number of cheliceral denticles: (0) 0–5; (1) 6–10; (2) 11–15; (3) 16–20. **12** Length of pedipalp relative to leg I segments: (0) tibia; (1) metatarsus; (2) tibia; (3) exceeds leg I. **13** Distance pedipalp reaches of segment in 12: (0) 1/10; (1) 1/8; (2) 1/6; (3) 1/5; (4) 1/3; (5) 1/2; (6) 3/4; (7) full length; (8) exceeds. **14** Bulb shape: (0) compact (Fig 10B); (1) oval (Fig 14B); (2) elliptical (Fig 25B). **15** Embolus direction in relation to tibia (when palpal bulb is perpendicular to tibia): (0) parallel (Fig 10B); (1) perpendicular (Fig 21B); (2) distal (Fig 25B); (3) posterior (Fig 40B). **16** Leg I & II tarsus spines present: (0) 0–5; (1) 6–10; (2) 11–15; (3) 16–20; (4) 21–25. **17** Leg I & II metatarsus spines present: (0) 0–5; (1) 6–10; (2) 11–15; (3) 16–20; (4) 21–25; (5) 26–30; (6) >30. **18** Leg I & II tibia spines present: (0) 0–5; (1) 6–10; (2) 11–15; (3) 16–20; (4) 21–25; (5) 26–30; (6) >30. **19** Scopula extends onto metatarsus I & II: (0) no;

(1) yes. **20** Leg III tarsus spines present: (0) 0–5; (1) 6–10; (2) 11–15; (3) 16–20; (4) 21–25; (5) 26–30; (6) >30. **21** Leg III metatarsus spines present: (0) 0–5; (1) 6–10; (2) 11–15; (3) 16–20; (4) 21–25; (5) 26–30; (6) >30. **22** Leg III tibia dorsal spines present: (0) 0–5; (1) 6–10; (2) 11–15; (3) 16–20; (4) 21–25; (5) 26–30; (6) >30. **23** Leg IV tarsus spines present: (0) 0–5; (1) 6–10; (2) 11–15; (3) 16–20; (4) 21–25; (5) 26–30; (6) >30. **24** Leg IV metatarsus spines present: (0) 0–5; (1) 6–10; (2) 11–15; (3) 16–20; (4) 21–25; (5) 26–30; (6) >30. **25** Leg IV tibia spines present: (0) 0–5; (1) 6–10; (2) 11–15.

List of characters and character states (codification) for table 2 (female characters):

5 Number of labial cuspules present: (0) None; (1) 0–5; (2) 6–10; (3) 11–15. **6** Sternal sigilla (0) distinct; (1) indistinct. **7** Sternal sigilla shape: (0) narrow (Fig 34A); (1) broad (Fig 19A); (2) fused (Fig 8A). **8** number of maxillary cuspules (0) none; (1) 0–5; (2) 6–10; (3) 11–15; (4) 16–20; (5) 21–25; (6) >26. **9** Number of cheliceral teeth in proventral row: (0) 4; (1) 5; (2) 6; (3) 7. **10** Number of cheliceral teeth in retroventral row: (0) 4; (1) 5; (2) 6; (3) 7. **11** Number of cheliceral denticles: (0) 0–10; (1) 11–15; (2) 16–20; (3) 21–30; (4) 31–40; (5) 41–50; (6) >51. **12** Pedipalp tarsus retrolateral spines present: (0) 0–5; (1) 6–10; (2) 11–15; (3) 16–20; (4) 21–25; (5) >26. **13** Pedipalp tarsus prolateral spines present: (0) 0–5; (1) 6–10; (2) 11–15; (3) 16–20; (4) 21–25; (5) >26. **14** Pedipalp tarsus prolateral spines length: (0) short; (1) long. **15** Pedipalp tibia retrolateral spines present: (0) 0–5; (1) 6–10; (2) 11–15; (3) 16–20; (4) 21–25. **16** Pedipalp tibia retrolateral spines present: (0) 0; (1) 1; (2) 2; (3) 3; (4) 4; (5) 5; (6) >6. **17** Extent of spine patch on metatarsus I: (0) < $\frac{1}{10}$; (1) < $\frac{1}{8}$; (2) < $\frac{1}{6}$; (3) < $\frac{1}{4}$; (4) $\frac{1}{3}$; (5) $\frac{1}{2}$; (6) > $\frac{3}{4}$. **18** Extent of spine patch on metatarsus II: (0) < $\frac{1}{10}$; (1) < $\frac{1}{8}$; (2) < $\frac{1}{6}$; (3) < $\frac{1}{4}$; (4) $\frac{1}{3}$; (5) $\frac{1}{2}$; (6) > $\frac{3}{4}$. **19** Spine patch extends onto tibia I & II: (0) yes; (1) no. **20** Metatarsus III covered in small red spinules: (0) yes; (1) no. **21** Metatarsus III with two rows of red spines: (0) yes; (1) no. **22** Number of spines in each row stated in 21: (0) 10–15; (1) 16–20; (2) 21–25; (3) 26–30; (4) >30. **23** Apical tuft present on metatarsus III: (0) yes (Fig 20E); (1) no. **24** Number of spines present in metatarsus III apical tuft: (0) 0; (1) 1–3; (2) 4–5; (3) 6–8; (4) 9–10; (5) 11–13; (6) >14. **25** Number of spines present in metatarsus IV apical preening comb: (0) comb absent; (1) 1; (2) 2; (3) 3; (4) 4–5; (5) 6–7; (6) 8–10; (7) 11–15. **26** Spermathecae terminus shape: (0) inflated (Fig 22A, B); (1) same width as spermathecae base (Fig 22C, D). **27** Spermathecae tubes shape: (0) straight (Fig 22A, B); (1) slightly curved inwards (Fig 22C, D); (2) extremely curved inwards (Fig 22G, H).

It is noted that some of the characters described are not discrete but are rather continuous. These characters have been placed into categories to attempt to capture the variation across the various species. These characters were used to inform the species diagnoses and can be used to do so in future.

3.2. *Phylogenetic results*

The results of the JModel test, infer a best model for the analysis of the data was GTR+G+I. The results for only identified specimens are given in Figure 4, but the phylogenies for all specimens collected (including unidentified juveniles) is given in figure S1–S2. These phylogenies demonstrate that the species diversity is significantly higher than suggested in Figure 4, as the unidentified specimens form multiple distinct genetic clades (S1, S2). The Bayesian inference phylogeny and the maximum likelihood phylogeny are fairly congruent, with only a few topological differences (Figure S2—Maximum likelihood phylogeny). The largest difference is the placement of clade B. In the Bayesian inference tree, clade B is sister to clade A, whereas in the maximum likelihood tree it is sister to clade H. The only other differences are small changes in the placement of individuals within species.

3.3. *Geometric morphometric ocular patterns*

There are clear differences between the ocular patterns of each species (Figure 2–3). The patterns scaled by centroid size make it easier to detect the differences visually, and when analysed statistically, the species are distinct (Brandt *et al.* 2023b).

The eye pattern photographs and landmark data is available so that it can be used by future researchers to distinguish species in this manner (Brandt *et al.* 2023b).

TABLE 1. Morphological matrix of characters and character states used to identify males of the various *Stasimopus* species. Unknown character, due to damage or missing (-); Unknown, due to not being dissected (?).

Species	Specimen	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
<i>S. astutus</i>	AMGS-1829	1	1	2	1	1	1	-	2	-	-	-	0	3	-	-	0	3	4	1	0	3	1	1	2	0
<i>S. brevipalpis</i>	SAMC-B778	1	1	2	1	1	1	0	1	1	1	2	-	-	-	-	-	3	3	0	1	1	0	2	1	0
<i>S. dylani</i> sp. nov.	NCA 2019/663	1	0	2	1	1	1	2	2	1	2	2	2	4	0	0	1	4	2	0	0	2	1	1	2	0
<i>S. erythrognaethus</i>	AMGS-84628	1	1	2	1	1	2	-	2	2	2	2	0	5	0	1	0	4	3	1	0	0	1	0	1	0
<i>S. finni</i> sp. nov.	NCA 2019/605	1	1	0	1	1	1	2	2	1	1	2	2	3	1	0	0	4	3	0	1	2	0	2	3	0
<i>S. hamartia</i> sp. nov.	NCA 2017/1891	-	-	-	-	1	1	0	1	-	-	-	-	-	0	1	0	4	1	0	-	-	-	2	2	0
<i>S. ignis</i> sp. nov.	NCA 2019/642	1	0	3	1	0	1	-	0	0	0	0	2	7	1	2	0	3	2	0	1	1	1	1	1	0
<i>S. insculptus</i>	BMNH-78.3	2	1	3	1	1	1	2	1	1	1	2	0	7	1	1	2	4	3	0	2	2	2	5	3	0
<i>S. insculptus peddiensis</i>	AMGS-2717 (NM15348)	2	1	3	1	1	2	-	2	1	1	1	0	6	0	1	0	1	0	0	2	2	1	2	3	1
<i>S. karoensis</i> sp. nov.	SAM-ENW-C007293	1	0	2	1	1	1	2	2	1	1	1	1	3	0	1	0	2	4	0	0	3	1	1	2	0
<i>S. kentanicus</i>	SAMC-14685	1	4	3	0	1	1	0	1	1	2	2	0	6	0	2	2	6	6	0	5	6	2	6	6	2
<i>S. longipalpis</i>	AMGS-4222	1	0	2	1	1	1	-	0	-	-	-	3	8			0	5	2	0	1	1	3	1	1	0
<i>S. malesociatus</i> sp. nov.	AMGS-8367	2	0	2	1	1	1	2	2	0	1	0	0	4	2	2	0	2	2	0	0	2	1	2	2	0
<i>S. maraisi</i>	NCA 2019/630	1	1	3	1	1	0	0	1	1	1	1	2	0	1	3	0	3	3	0	0	1	0	1	1	0
<i>S. palpiger</i>	BMNH-1901.3.13.112	1	0	2	1	0	2	0	2	1	1	2	3	8	0	1	0	3	3	0	0	2	6	3	1	0
<i>S. patersonae</i>	SAMC-B4655	1	0	2	1	1	1	0	2	1	1	0	0	6	2	3	1	4	3	0	1	2	0	1	1	0
<i>S. purcelli</i>	SAMC-150432	1	0	2	1	1	1	0	2	-	-	-	0	5	0	2	0	3	3	1	0	1	0	1	0	0
<i>S. qumbu</i>	AMGS-2052	1	0	2	1	1	2	-	2	-	-	-	-	-	0	0	2	6	4	0	-	-	-	1	2	0
<i>S. schrieneri</i>	SAMC-9159	2	1	3	1	0	1	0	1	1	1	0	2	4	1	2	0	4	2	0	0	2	4	1	0	0
<i>S. spinipes</i>	AMGS-16728 (2785)	1	1	3	1	1	1	0	1	1	1	2	0	3	0	2	4	6	6	0	3	6	6	6	4	0
<i>S. steynsbergensis</i>	BMNH-1905.3.30.32	1	0	2	1	1	2	1	1	-	-	-	1	6	0	2	2	4	3	0	1	4	4	0	2	0
<i>S. tysoni</i>	AMGS-3068 (NM14956)	1	0	2	1	1	2	-	2	-	-	-	-	-	0	1	2	6	6	0	6	5	4	4	4	0
<i>S. umtaticus rangeri</i>	AMGS (NM14770)	1	1	3	1	1	1	0	1	-	-	-	1	7	1	3	4	6	2	0	5	6	1	4	4	1

TABLE 2. Morphological matrix of characters and character states used to identify females of the various *Stasimopus* species. Unknown character, due to damage or missing (-); Unknown, due to not being dissected (?).

Species	Specimen	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
<i>S. artifex</i>	BMNH1899-7-24-47	1	1	2	1	2	-	-	4	-	-	-	5	3	0	2	6	0	0	0	0	0	3	0	3	6	?	?
<i>S. astutus</i>	BMNH-01-3-13-110-111	0	1	4	0	3	1	0	4	1	1	2	3	2	1	2	3	3	3	0	0	0	3	1	0	6	?	?
<i>S. brevipalpis</i>	SAMC 12394	2	1	0	1	2	0	2	6	-	-	-	3	1	1	1	2	4	3	0	0	0	1	1	0	5	?	?
<i>S. erythrognaethus</i>	AMGS-84633	1	1	0	1	2	0	1	4	0	1	1	5	2	1	2	2	6	4	0	0	0	1	0	3	5	?	?
<i>S. hamartia</i> sp. nov.	NCA 2017/1852	1	4	4	0	2	1	1	3	0	0	3	4	1	1	1	4	5	5	0	0	0	2	0	5	5	0	0
<i>S. ignis</i> sp. nov.	NCA 2019/653	2	1	2	1	1	0	1	4	0	0	1	4	2	1	2	3	2	2	0	0	0	3	1	0	6	1	1
<i>S. insculptus</i>	AMGS- OCT-1912	1	1	2	1	2	0	1	6	0	1	5	5	3	0	2	4	0	0	0	0	0	4	0	2	4	?	?
<i>S. insculptus peddiensis</i>	AMGS2717 (NM15345)	1	1	3	1	1	1	0	4	0	1	4	5	4	0	2	5	1	2	0	0	0	4	1	0	4	?	?
<i>S. kentanicus</i>	SAMC-12411	1	1	3	1	-	-	-	3	0	0	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	?	?
<i>S. kolbei</i>	SAMC-5317	0	4	3	0	1	0	0	3	-	-	-	3	2	1	3	6	2	2	0	0	0	1	1	0	5	?	?
<i>S. leipoldti</i>	SAMC-2909	2	1	0	1	1	0	0	3	1	1	2	4	0	1	2	1	1	2	0	0	0	4	1	0	4	?	?
<i>S. maraisi</i>	AMGS1806 (NM14631)	1	1	3	1	1	0	0	3	0	2	3	3	2	1	1	2	2	3	0	0	0	1	1	0	3	?	?
<i>S. meyeri</i>	ZMBH-2903	2	1	0	1	2	1	0	4	1	1	0	3	1	1	1	2	1	2	0	0	0	1	1	0	6	?	?
<i>S. obscurus</i>	ZMBH-9412	1	1	0	1	2	0	0	4	-	-	-	4	3	0	1	2	6	6	0	0	0	2	1	0	4	?	?
<i>S. patersonae</i>	AMGS1634 (NM14650)	3	1	0	1	1	0	1	5	1	1	3	4	3	0	1	6	1	2	0	0	0	2	1	0	4	?	?
<i>S. poweri</i>	NM15358 (AMGS)	2	1	2	1	2	-	-	4	0	1	6	3	1	1	1	1	6	4	0	0	0	1	0	6	7	?	?
<i>S. quadratimaculatus</i>	SAMC-12398	3	1	2	1	1	0	0	3	0	0	1	4	2	0	1	4	5	5	0	0	0	1	-	-	6	?	?

...Continued on the next page

TABLE 2. (Continued)

Species	Specimen	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
<i>S. qumbu</i>	AMGS-84734	2	1	2	1	1	1	0	4	0	1	4	5	2	1	4	3	5	4	0	0	0	0	3	0	3	4	?	?
<i>S. schoenlandi</i>	BMNH1899-7-24-45-46	3	2	4	0	2	1	0	5	0	0	3	5	5	0	2	3	2	1	0	0	0	0	3	0	3	5	?	?
<i>S. schrieneri</i>	SAMC-9513	3	1	0	1	1	1	0	3	0	0	1	5	3	0	1	4	1	0	0	0	0	0	3	1	0	4	?	?
<i>S. schultzei</i>	SAMC-150514	1	1	0	1	1	1	0	3	0	1	0	5	1	0	1	2	5	4	0	0	0	0	1	1	0	5	?	?
<i>S. spinipes</i>	AMGS/ NM14861	1	1	0	1	3	1	0	5	0	1	1	5	3	1	2	5	3	2	0	0	0	0	2	1	0	6	?	?
<i>S. shonlandi</i> var. <i>spinosus</i>	AMGS (NM15172)	3	1	0	1	2	0	1	3	3	3	6	5	5	0	3	5	4	2	0	0	0	0	3	0	6	5	?	?
<i>S. teras</i> sp. nov.	NCA 2019/643	-	-	-	-	1	1	-	3	0	1	1	3	2	1	1	3	2	2	0	0	0	0	2	1	0	6	1	1
<i>S. theaei</i> sp. nov.	NCA 2019/606	1	1	0	1	3	0	0	4	0	1	6	4	2	1	1	2	5	4	0	0	0	0	2	1	0	6	0	0
<i>S. tysoni</i>	AMGS (NM14965)	3	2	3	1	2	0	1	5	1	1	4	5	4	0	2	5	2	1	0	0	0	0	2	0	1	4	?	?
<i>S. umtaticus</i>	SAMC 8848	1	0	2	1	1	-	-	5	-	-	-	-	-	-	-	-	2	2	0	0	0	0	3	0	5	6	?	?
<i>S. umtaticus rangeri</i>	AMGS (NM14772)	1	1	0	1	1	0	1	6	0	0	3	5	4	0	4	6	1	0	0	0	0	0	4	1	0	6	?	?
<i>S. unispinosus</i>	SAMC 5923	1	1	4	0	2	0	0	4	0	1	1	4	1	1	3	2	5	4	0	0	0	0	1	0	3	1	?	?
<i>S. venterstadensis</i> sp. nov.	NCA 2019/610	0	1	2	1	2	0	1	3	0	1	3	4	1	1	2	2	3	3	0	0	0	0	2	0	3	4	0	2

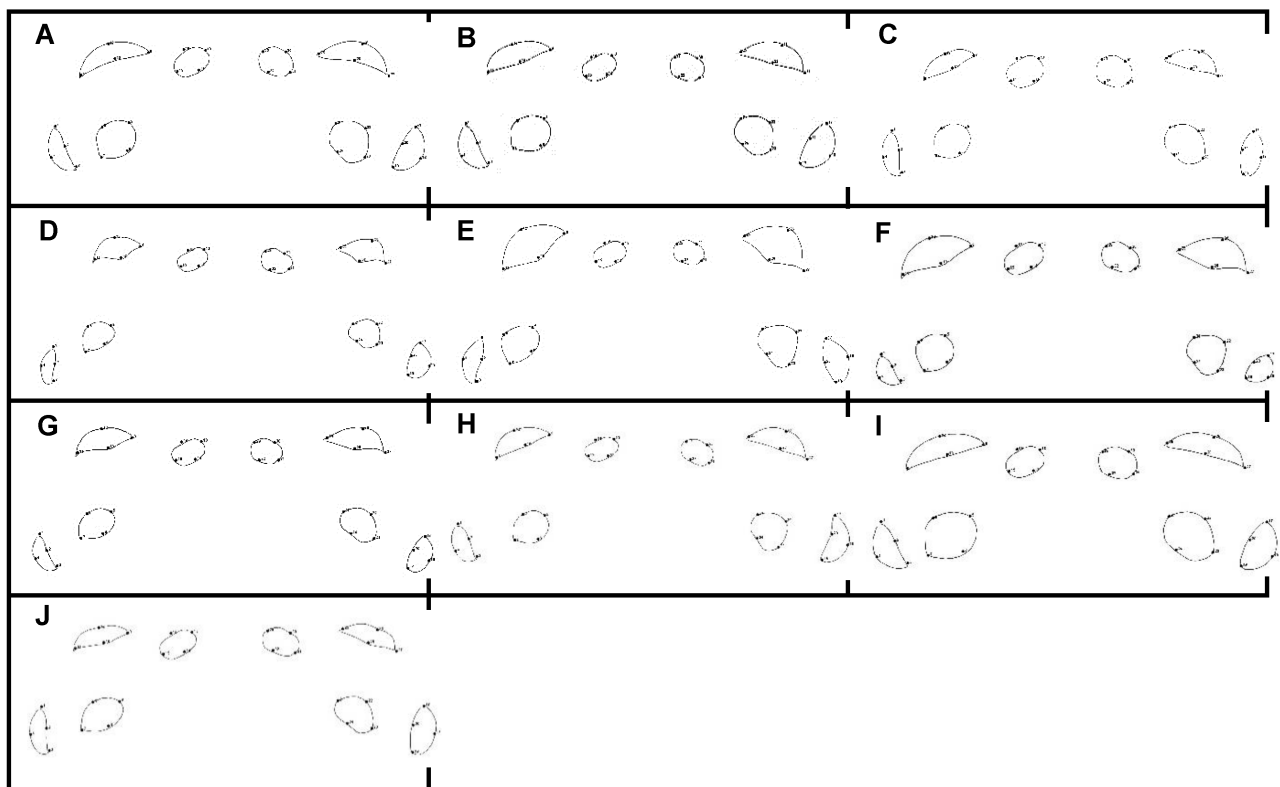


FIGURE 2. Average ocular pattern for the female *Stasimopus* species occurring in the Karoo region. A. *S. astutus*. B. *S. erythrognathus*. C. *S. hamartia* **sp. nov.** D. *S. ignis* **sp. nov.** E. *S. leipoldti*. F. *S. maraisi*. G. *S. schrieneri*. H. *S. theaei* **sp. nov.** I. *S. unispinosus*. J. *S. venterstadensis* **sp. nov.**

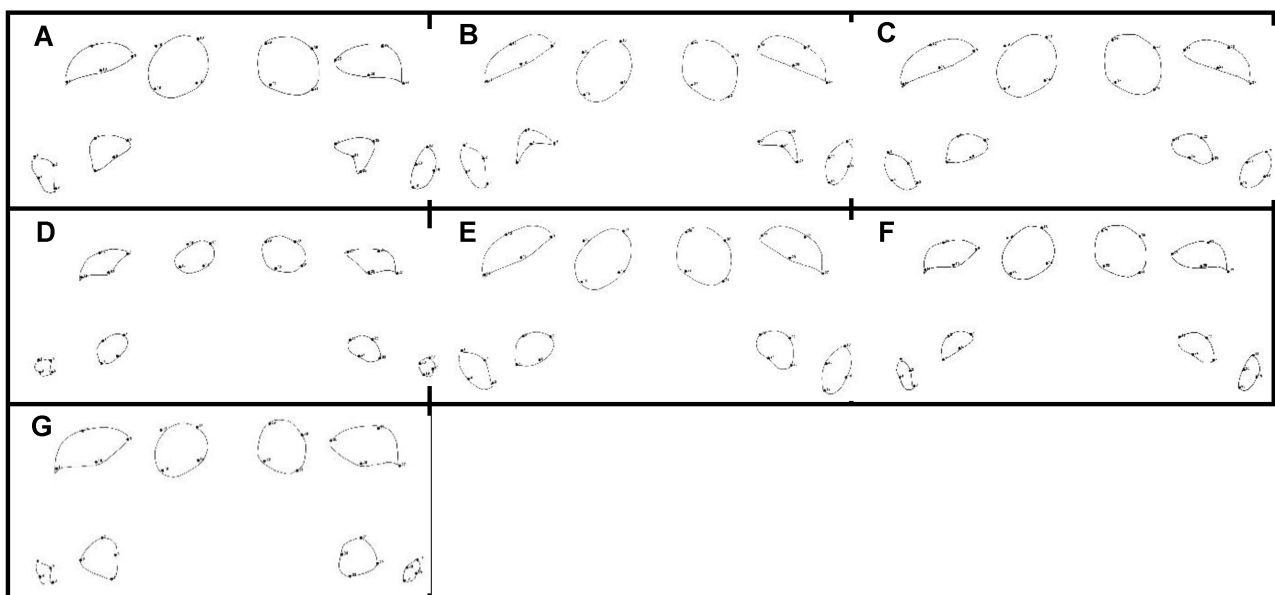


FIGURE 3. Average ocular pattern for the male *Stasimopus* species occurring in the Karoo. A. *S. astutus*. B. *S. dylani* **sp. nov.** C. *S. erythrognathus*. D. *S. ignis* **sp. nov.** E. *S. karoensis* **sp. nov.** F. *S. mandelai*. G. *S. maraisi*.

3.4. Integrative taxonomy

Based on these data, *Stasimopus* is a well-supported monophyletic clade (BS: 95; PP:1.00) (Figure 4). Fifteen distinct species were recovered. The phylogeny is divided into nine clades (A–I) for ease of discussion.

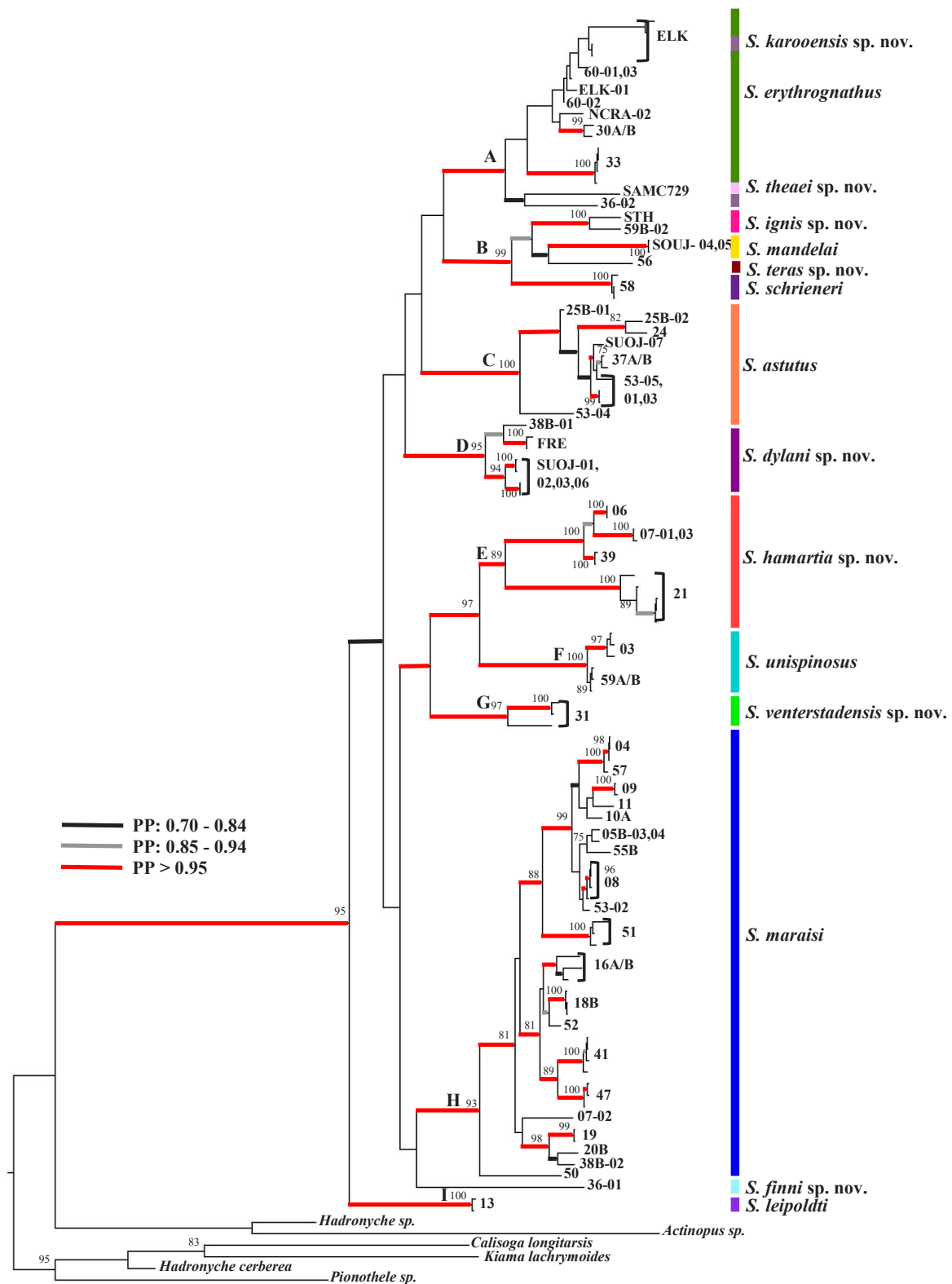


FIGURE 4. Bayesian inference consensus tree for the concatenated dataset of CO1, 16S and EF-1 γ for the *Stasimopus* dataset from the Karoo region. Posterior probabilities are shown by the use of coloured bars. Bootstrap support values above 70 are given on the corresponding node. The phylogeny is divided into nine clades for ease of discussion (A–I). The numbers for each specimen correspond to localities in figure 1.

The first clade (Figure 4, A) comprises an apparent species complex. The clade has high PP support (1.00), the species identified in the genetic complex are *S. erythrognathus*, *S. karooensis* **sp. nov.** and *S. theaei* **sp. nov.** These species are however, morphologically distinct. The males of *S. erythrognathus* and *S. karooensis* **sp. nov.** are distinguishable based on the length of the pedipalp in relation to leg I, ocular pattern, the pedipalpal bulb shape as well as the spination pattern on the metatarsus of all legs (Figures 3E, 11D, 27A, B, D–F, Table 1). The females of *S. erythrognathus* and *S. theaei* **sp. nov.** are differentiated based on the density of cheliceral denticles (Figure 34C, Table 2). Clade B consists of many species, each with very few representatives (Figure 4). These species are *S. mandelai*, *S. schrieneri*, *S. ignis* **sp. nov.** and *S. teras* **sp. nov.** The two individuals from *S. ignis* **sp. nov.** are grouped with high support (BS: 100; PP:1.00), the same is true for *S. mandelai* (BS: 100; PP:1.00) and *S. schrieneri* (BS: 100; PP:1.00). *Stasimopus schrieneri* females can be differentiated from *S. ignis* **sp. nov.** and *S. teras* **sp. nov.** based on the preening comb on metatarsus IV as well as the extent of spination on leg I (Figures 24A & E, 31D, 32B, Table 1). Clade C (Figure 4) is a well-supported monophyletic group (BS: 100; PP:1.00) and was morphologically identified as *S. astutus*, based on the following characteristics, the females having distinctly high number of labial cuspules, the length of spine extent on leg I and II and the preening comb on leg IV (Table 1). The male was identified based on the length of the pedipalp and the pedipalp bulb (Table 2). Clade D is identified as *S. dylani* **sp. nov.** (Figure 4), this is a strongly supported monophyletic group (BS: 100; PP:1.00). The was identified by the male ocular pattern (Figures 3B, 11A, Table 2) and relative length of the pedipalp. Clade E is a monophyletic group with high support and identified as *S. hamartia* **sp. nov.** (BS: 89; PP:1.00). This clade has good representation, but the male cannot be used for identification as it was found in poor condition. The females are identified based on the tuft present on metatarsus III, spination on leg I and cheliceral denticles (Figures 19C, 20A, E, Table 2). Clade F has been identified as *S. unispinosus* and is also a well-supported monophyletic lineage (BS: 100; PP:1.00). The clade consists of only female specimens and were primarily identified based on the preening comb on metatarsus IV and the extent of spination on legs I and II (Table 2). Clade G is comprised of three females from one locality and described as *S. venterstadensis* **sp. nov.** This clade has high support (BS: 97; PP:1.00) and is morphologically distinct based on the tuft present on metatarsus III and the preening comb on metatarsus IV (Figures 38E, F, Table 2). Clade H is the clade with the most representation. It is a well-supported monophyly (Figure 4; BS: 93; PP:1.00) and was identified based on the females as *S. maraisi*. The key identifying characters were the preening comb on metatarsus IV, the labial and maxillary cuspules as well as Leg I spination (Table 2). The male (NCA 2019/630) which was genetically identified as *S. maraisi* did however, not match the type nor description of *S. maraisi* (Hewitt 1927). For this reason, the male (NCA 2019/630), has been described as the true male for the species *S. maraisi*, and the originally described male (AMGS-5367), has been redescribed as a new species, *S. malesociatus* **sp. nov.** *Stasimopus finni* **sp. nov.** is sister to clade H, but is represented by only one male specimen (thus not forming a clade) (Figure 4). This species is however morphologically distinct due to the relative length of the pedipalp, the pedipalp bulb and cheliceral denticles (Figures 13A, 14A, B, Table 1). The last clade (Figure 4; clade I), is identified as *S. leipoldti* and is a well-supported lineage (BS: 100; PP:1.00). The species was identified by the spination on leg I metatarsus, cuspules on the maxilla and labium and the spination on metatarsus III (Table 2).

3.5. Taxonomic results

The species diversity of *Stasimopus* for the Karoo region has been increased by 11 species; two of which have range expansions and nine are newly described species. The male which genetically matched the female specimens identified as *S. maraisi*, is described below. The original *S. maraisi* male is described further under the new name *S. malesociatus* **sp. nov.** The new species are described below as well as the description for *S. maraisi* male.

Systematics

Stasimopidae Bond, Opatova and Hedin 2020

Genus *Stasimopus* Simon 1892

Simon 1892: 82; Pocock 1897: 726–728; Hewitt 1915b: 75–85; Roewer 1942: 159; Raven 1985: 143–144; Dippenaar-Schoeman 2002: 31–38; Engelbrecht and Prendini 2012: 8.

Type species: *Stasimopus caffrus* (Koch 1842).

Diagnosis: The family Stasimopidae is monogeneric (Opatova *et al.* 2020). The characters for distinguishing this genus thus applies to the family. The family differs from other Ctenizid-like taxa based on the following suite of characteristics based on Raven (1985): The tibia of leg III lacking a saddle-like excavation, the ocelli is twice as wide as it is long and the anterior lobe of the maxillae is anteriorly produced (Engelbrecht & Prendini 2012; Opatova *et al.* 2020).

Description:

General: Medium to large bodied spiders (22–42 mm) (Dippenaar-Schoeman 2002).

Carapace: Cephalic region dome shaped with procurved fovea (Dippenaar-Schoeman 2002). In *S. filmeri*, the fovea forms into horn-like protrusion (Engelbrecht & Prendini 2012).

Ocelli: The eyes occur in single cluster on forefront of cephalic region and eyes arranged in two transverse rows (Dippenaar-Schoeman 2002; Pocock 1897). Posterior row wider than anterior row (Dippenaar-Schoeman 2002; Raven 1985).

Chelicerae: Distinct rastellum with thick spines, as well as cheliceral furrow with two rows of teeth (Dippenaar-Schoeman 2002).

Sternum, labium and maxillae: The sternum has single pair of sigilla present. Sigilla are situated opposite III coxa (Dippenaar-Schoeman 2002; Pocock 1897). In some male species sigilla are fused at anterior end, forming an arrow-like shape. Labium cuspules present in females and bare in males (Dippenaar-Schoeman 2002). Maxilla has longer process only at distal end forming a long cone (Pocock 1897; Raven 1985). Maxilla has few basal teeth present (Pocock 1897).

Abdomen: Varies in colour. Four spinnerets. Posterior spinnerets have domed apical segments (Dippenaar-Schoeman 2002).

Pedipalps: Male bulb is simple pyriform (Dippenaar-Schoeman 2002).

Legs: Female legs are short and stocky. Three tarsal claws present, the paired claw with one large tooth and two smaller teeth below, third claw is untoothed (Dippenaar-Schoeman 2002). Distal segments of leg I and II densely spined (Dippenaar-Schoeman 2002). Males have long slender legs.

Spermathecae: Multilobular (Dippenaar-Schoeman 2002).

Distribution: The genus is currently recorded from Lesotho and South Africa, in all provinces except Limpopo. It is an endemic to the Afrotropical region.

Included taxa: In this paper, nine new species are described and a description of a *S. maraisi* male. This increases the number of species in the genus to 56, with 23 of them found in the Karoo region.

Key to adult females of five *Stasimopus* species in the Karoo region

1. Tuft of spines present ventrally on metatarsus III (Fig 20E) 2
- Tuft of spines not present ventrally on metatarsus III 3
2. Patch of spinules on metatarsus I extends $\frac{1}{2}$ the segment length (Fig 20A) *S. hamartia* sp. nov.
- Patch of spinules on metatarsus I extends $\frac{1}{4}$ the segment length (Fig 38A) *S. venterstadensis* sp. nov.
3. Chelicera with extremely dense denticles (>45) (Fig 34C) *S. theaei* sp. nov.
- Chelicera with few denticles (<15) (Fig 23C) 4
4. Metatarsus III with >26 spines in each row dorsally (Fig 24C) *S. ignis* sp. nov.
- Metatarsus III with <21 spines in each row dorsally (Fig 31E) *S. teras* sp. nov.

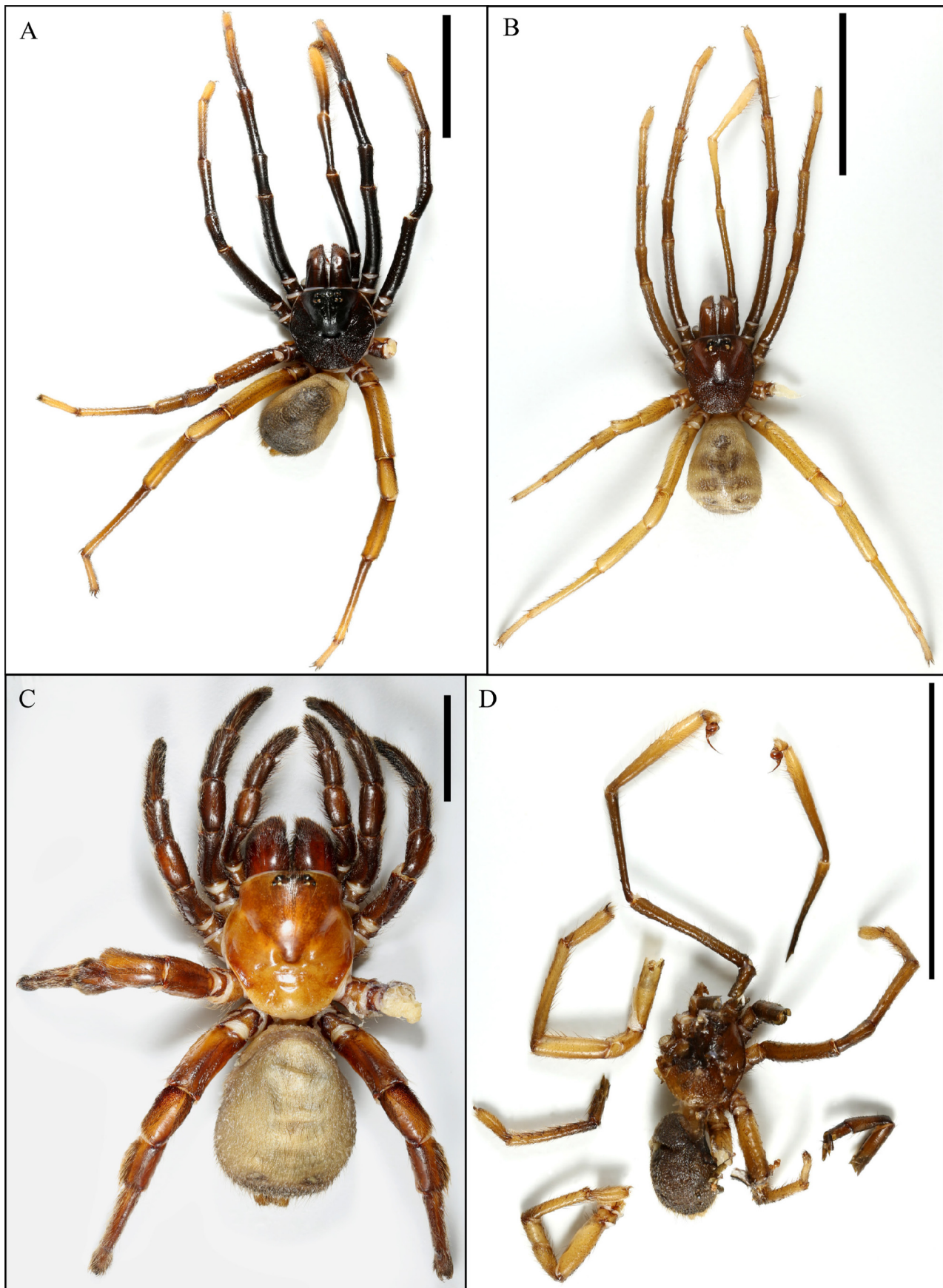


FIGURE 5. Three *Stasimopus* species in habitus view. (A) Male of *Stasimopus dylani* **sp. nov.** (NCA 2019/663). (B) Male of *Stasimopus finni* **sp. nov.** (NCA 2019/605). (C) Female of *Stasimopus hamartia* **sp. nov.** (NCA 2017/1852). (D) Male of *Stasimopus hamartia* **sp. nov.** (NCA 2017/1891). Scale: 1cm.

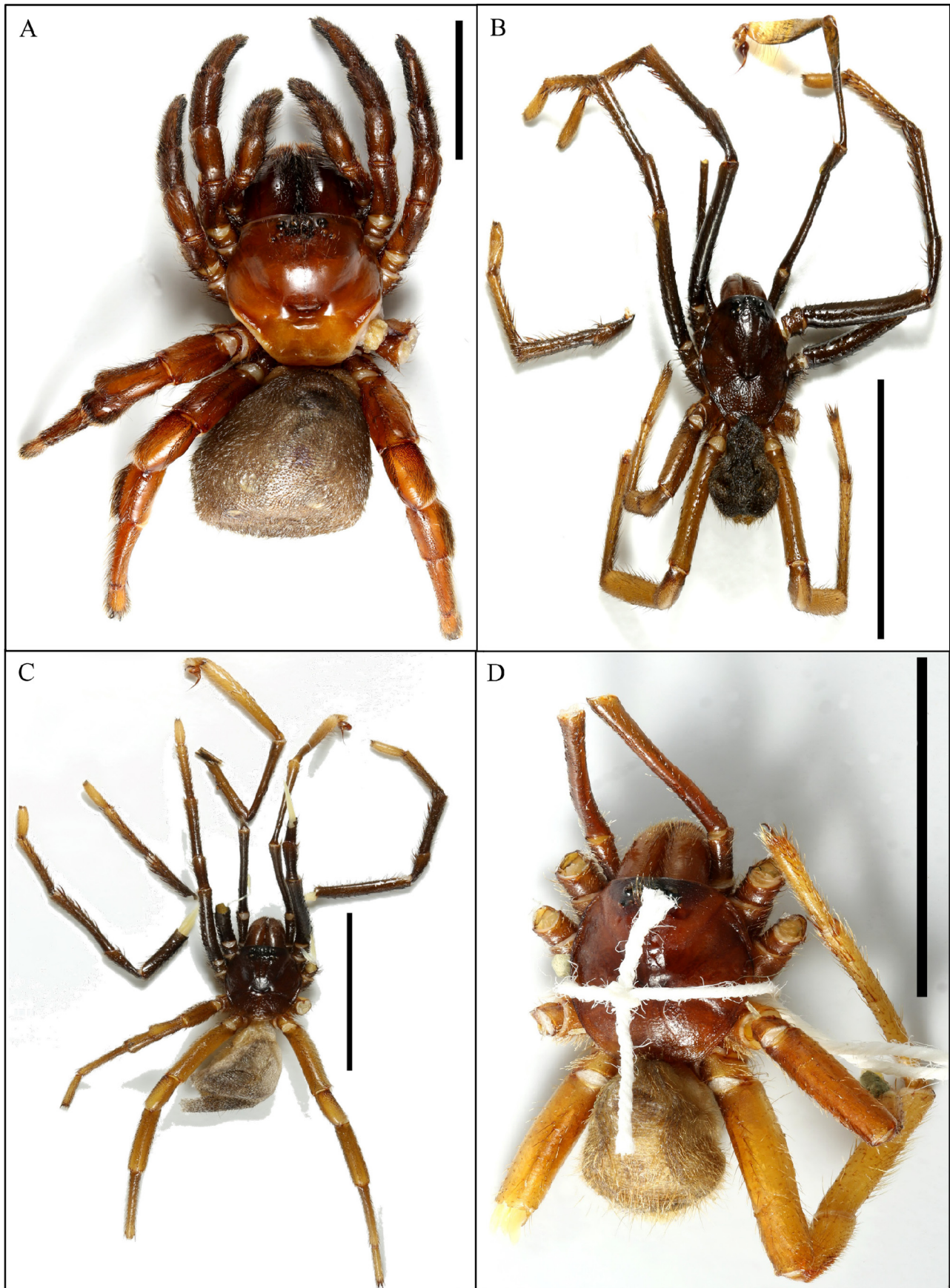


FIGURE 6. Three *Stasimopus* species in habitus view. (A) Female of *Stasimopus ignis* **sp. nov.** (NCA 2019/653). (B) Male of *Stasimopus ignis* **sp. nov.** (NCA 2019/642). (C) Male of *Stasimopus karoensis* **sp. nov.** (SAM- ENW-C007293). (D) Male of *Stasimopus malesociatus* **sp. nov.** (AMGS-5367). Scale: 1cm.

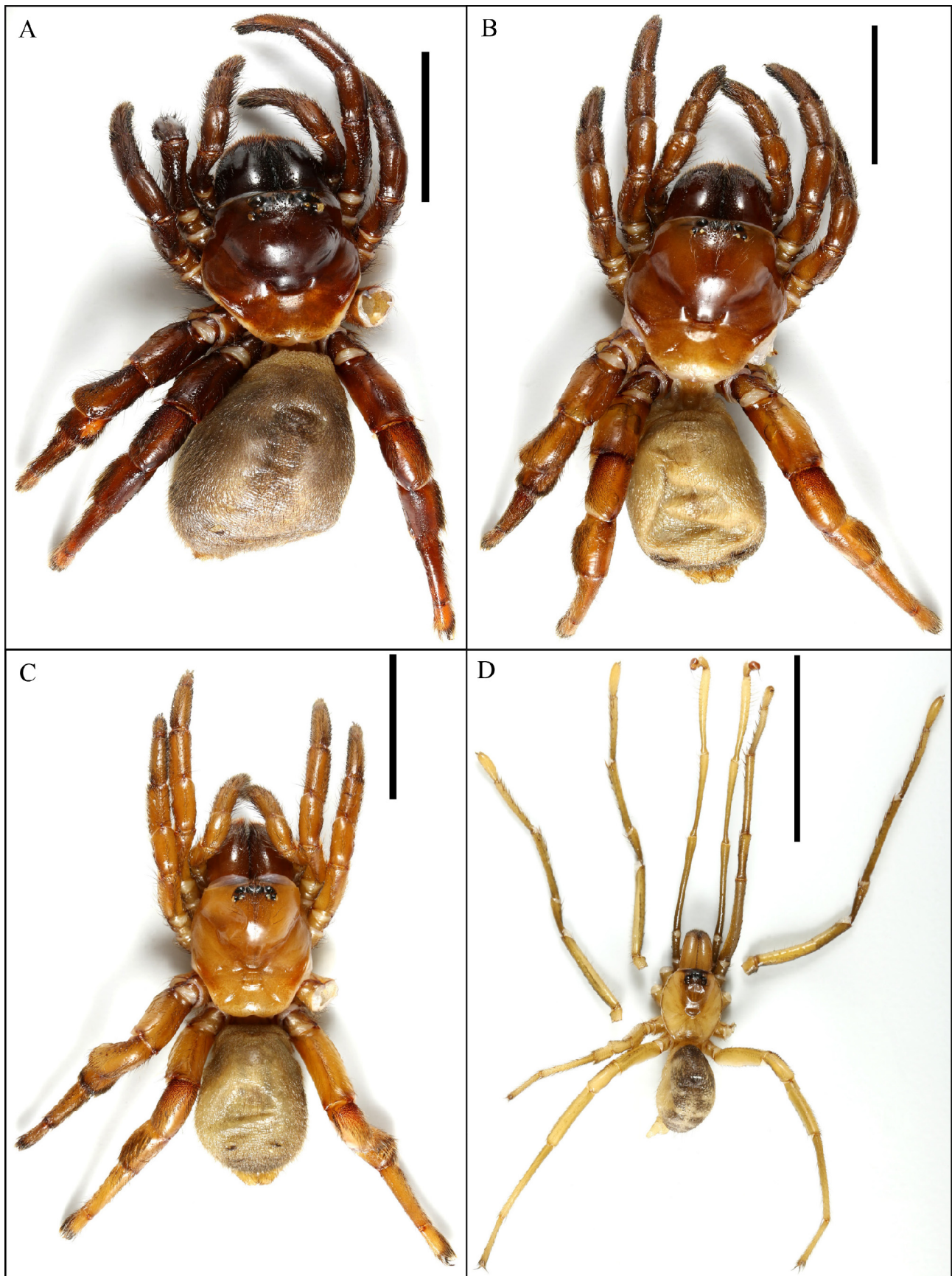


FIGURE 7. Four *Stasimopus* species in habitus view. (A) Female of *Stasimopus teras* **sp. nov.** (NCA 2019/643). (B) Female of *Stasimopus theaei* **sp. nov.** (NCA 2019/606). (C) Female of *Stasimopus venterstadensis* **sp. nov.** (NCA 2019/610). (D). Male of *Stasimopus maraisi* (NCA 2019/630). Scale: 1cm.

Key to adult males of six *Stasimopus* species in the Karoo region*

* *S. hamartia* not included due to damaged state.

1. The largest eye is the AME (Fig 11D) 2
- The largest eye is the ALE (Fig 11B) 3
2. Embolus extends posteriorly in relation to pedipalp tibia (Fig 29B) *S. malesociatus* sp. nov.
- Embolus extends perpendicularly in relation to pedipalp tibia (Fig 27A) *S. karooensis* sp. nov.
3. Pedipalp reaches <1/5 of tibia I length. 4
- Pedipalp reaches >1/3 of tibia I length. 5
4. The carapace is smooth in texture (Fig 7D) *S. maraisi* sp. nov.
- The carapace is rugose in texture (Fig 5B) *S. finni* sp. nov.
5. Embolus extends almost parallel in relation to pedipalp tibia (Fig 10B) *S. dylani* sp. nov.
- Embolus extends distally in relation to pedipalp tibia (Fig 25B) *S. ignis* sp. nov.

Stasimopus dylani sp. nov.

(Figures 3B, 5A; 8, 9, 10, 11A)

Type material: Holotype ♂ SOUTH AFRICA: Western Cape Province: Murraysburg (-31.8884, 23.7310), 21.v.2018, S. Brandt, C. Sole, E. Engelbrecht and E. Brand, (NCA 2019/663). Paratypes. Same data, 21.v.2018, 1♂ (NCA 2019/664); Eastern cape Province: Jansenville (-32.8772, 24.4952), 17.vii.2015, I. Engelbrecht and D. Kambas, 4♂♂ (NCA 2019/697, NCA 2019/698, NCA 2019/699, NCA 2019/702), Willowmore (-33.0423, 23.1958), 15.v.2018, S. Brandt, C. Sole, E. Engelbrecht and E. Brand, 1♀ juv. (NCA 2019/676).

Etymology: This species is a patronym in recognition of Dylan Cecil Brandt, for his unending support and encouragement of the first author during her postgraduate studies.

Diagnosis: The males of *S. dylani* sp. nov. are distinguishable from other members of the genus occurring in the Karoo based on the following combination of characters. Differentiated from *S. astutus*, *S. erythrognathus*, *S. malesociatus* sp. nov., *S. patersonae*, *S. steynsbergensis*, *S. karooensis* sp. nov. and *S. mandelai* based on the pedipalp not extending beyond the tarsus of leg I. It is distinguished from *S. palpiger* by the pedipalp that is longer than leg I, which is not the case with *S. dylani* sp. nov. The species can be distinguished from *S. schrieneri*, *S. ignis* sp. nov., *S. finni* sp. nov. and *S. maraisi* based on the largest eye, which in these species is the ALE, whereas in *S. dylani* sp. nov. it is the AME.

Description: Based on the holotype ♂ (NCA 2019/663) and paratypes 5♂ (NCA 2019/664, NCA 2019/697, NCA 2019/698, NCA 2019/699, NCA 2019/702).

Remarks: ♀: Known only from males.

General: ♂: (Fig 5A) Medium bodied spiders, ranging between 10.68–13.03 (13.03) total length.

Carapace: ♂: Carapace length 4.78–6.28 (6.28); width 4.42–5.74 (5.74). Black colouration, thoracic region with rugose texture. The fovea strongly procurved, between 1.00–1.38 (1.11) in length.

Ocelli: ♂: (Fig 11A, Fig 3B) AME diameter 0.26–0.28 (0.28), PME diameter 0.16–0.20 (0.19), MOQ anterior width 1.30–1.67 (1.67), MOQ posterior width 1.72–2.09 (2.05); AME-AME 0.25, AME-ALE 0.15, ALE-ALE 1.08, PME-PME 1.02, PME-PLP 0.16, PLP-PLP 1.62. AER arrangement slightly recurved, PER recurved.

Chelicerae: ♂: (Fig 8B) Two teeth rows present, 4 teeth in proventral row, 5 teeth in retroventral row; 12 cuspules in between.

Sternum, labium and maxillae: ♂: (Fig 8A) Sternum length 2.27–3.48 (3.48); sternum width 2.47–3.05 (3.05). Sternum shape has distinct impressions of where the coxa are situated. Sigilla in the shape of a fused arrow, distal end fused, proximal end 1.06–1.45 (1.12) apart; cuspules absent on labium and maxilla.

Abdomen: ♂: (Fig 5A) Abdomen length 5.56–6.75 (6.75); width 3.45–4.63 (4.63). Colour, do- dark grey, v- and laterally beige.

Pedipalps: ♂: (Fig 10A, B) Total length 19.01; Segment lengths 1.77, 6.41, 4.82, - ,6.02. Spination: spines absent. Bulb compact, embolus elongated, tapering into sharp point, extending downwards, almost parallel to tibia.

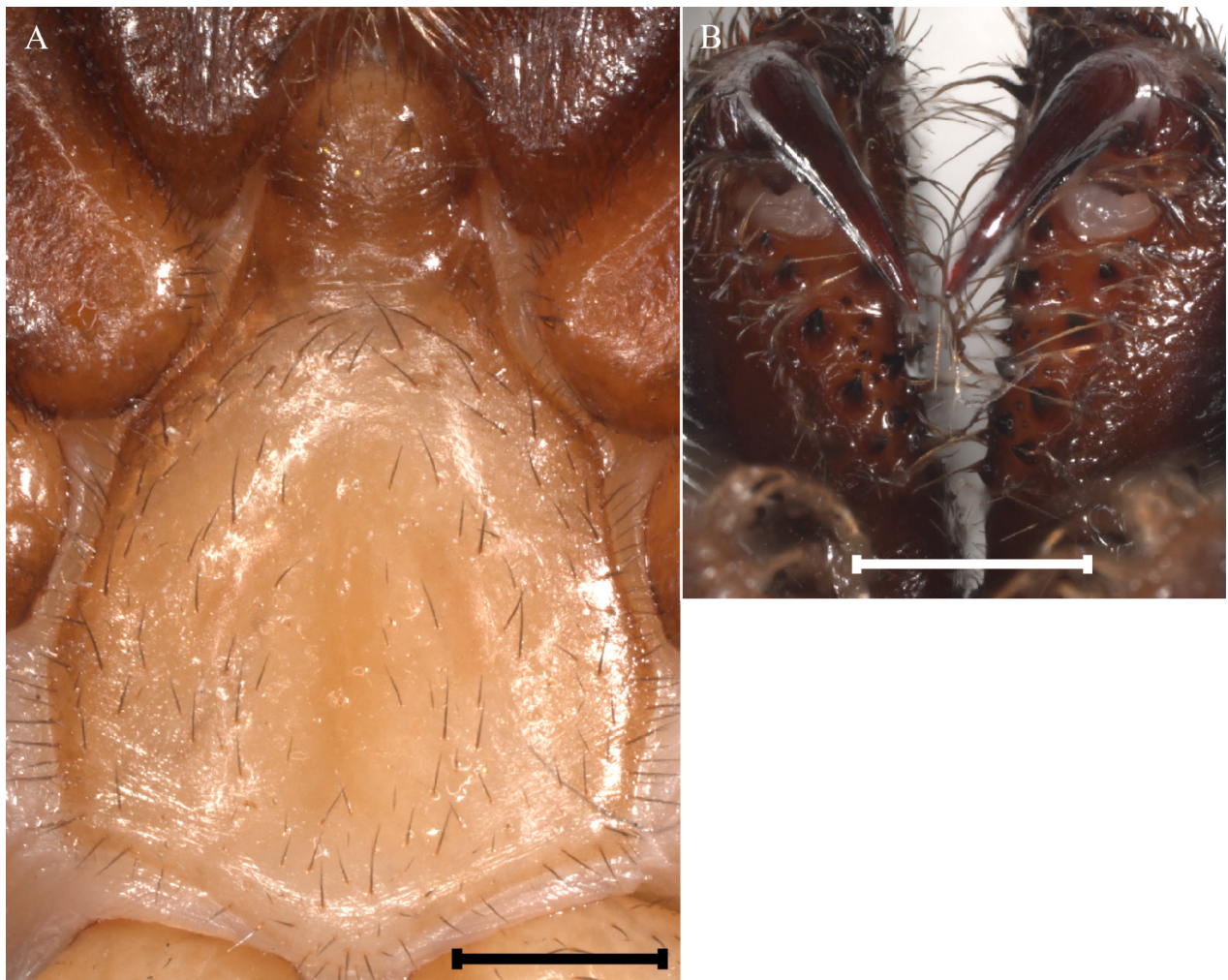


FIGURE 8. Male of *Stasimopus dylani* sp. nov. (NCA 2019/663). (A) Sternum with fused labium and visible sigilla (as shown by the arrows). (B) Fangs with cheliceral teeth. Scale: 1mm.

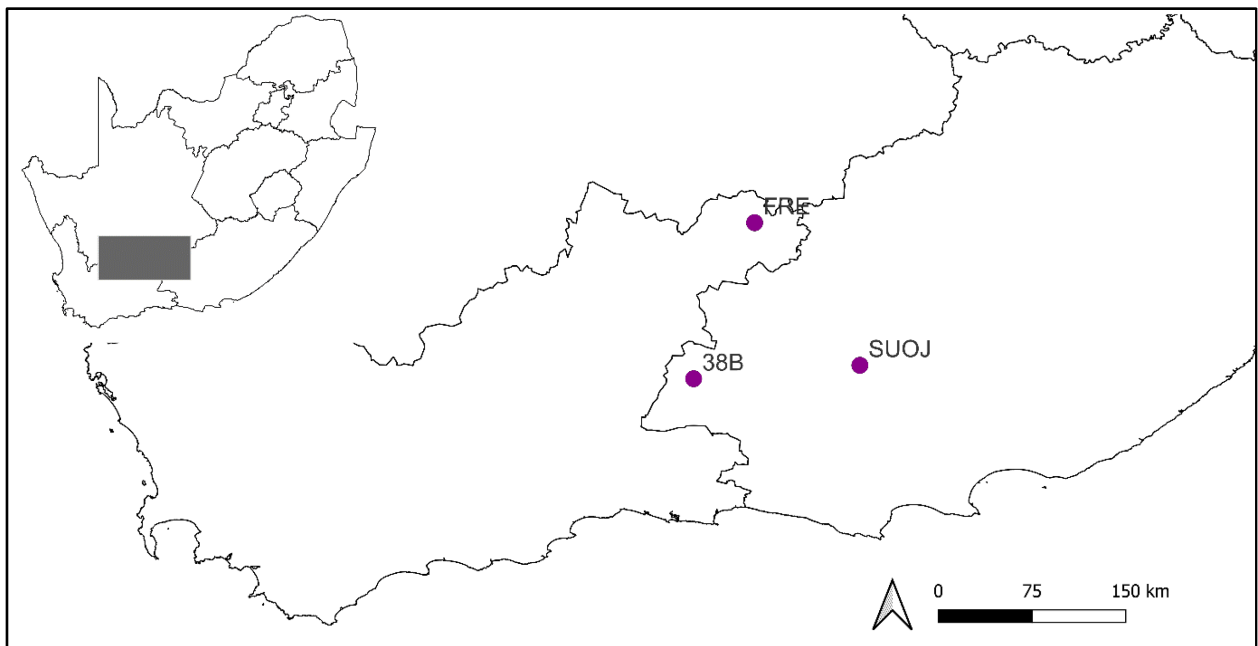


FIGURE 9. Map of the localities where *Stasimopus dylani* sp. nov. specimens were collected. Numbers match the site numbers in Figure 1. Map created in QGIS version 3.4.8-Madeira (2019), available at: <http://qgis.osgeo.org>.

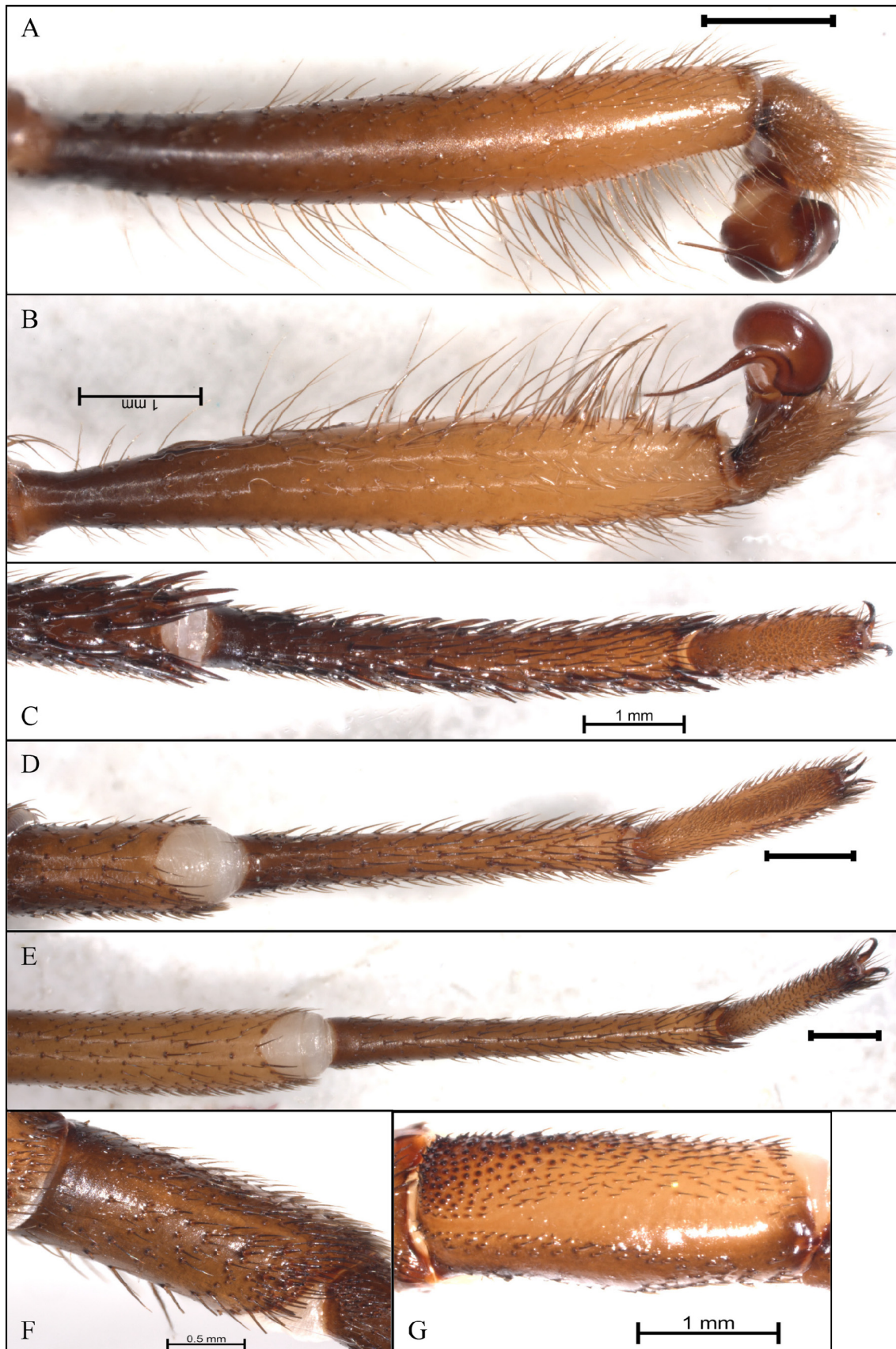


FIGURE 10. Male of *Stasimopus dylani* **sp. nov.** (NCA 2019/663). (A) Pedipalp tibia, bulb, retrolateral aspect. (B) Pedipalp tibia, bulb, prolateral aspect. (C) Leg I metatarsus, tarsus. Ventral aspect. (D) Leg III metatarsus, tarsus. Ventral aspect. (E) Leg IV metatarsus, tarsus. Ventral aspect. (F) Leg III tibia, dorsal aspect. Scale: 0.5mm. (G) Leg IV patella, dorsal aspect. Scale: 1mm.

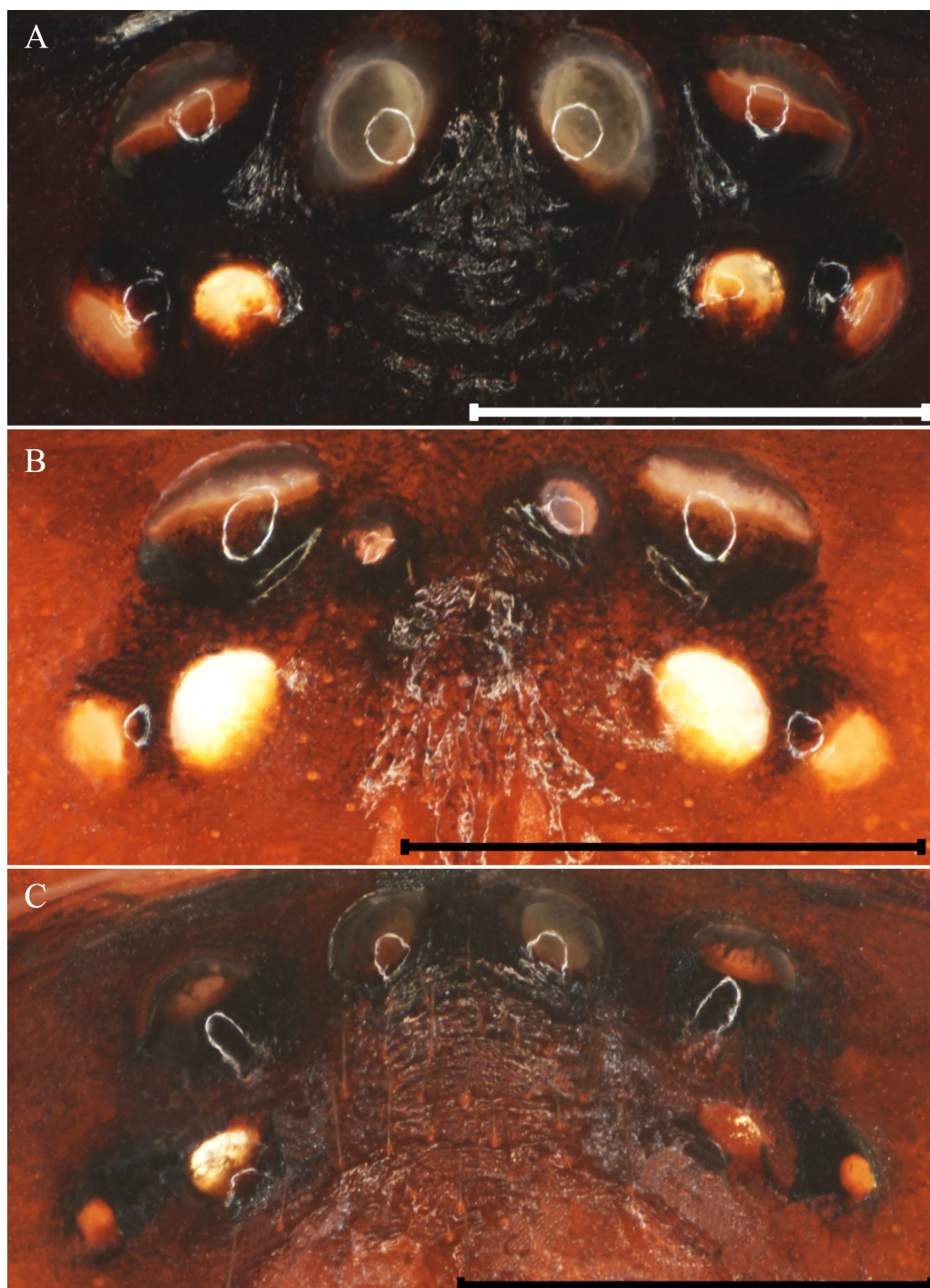


FIGURE 11. Ocular patterns for the male *Stasimopus* Simon, 1892 species. (A) *S. dylani* **sp. nov.** (NCA 2019/663). (B) *Stasimopus finni* **sp. nov.** (NCA 2019/605). (C) *Stasimopus ignis* **sp. nov.** (NCA 2019/642). (D) *Stasimopus karoensis* **sp. nov.** (SAM-ENW-C007293). Scale: 1mm.

Legs: ♂: Length order: I, IV, II, III. I Total length 22.94; Segment lengths 7.07, 3.23, 4.86, 5.62, 2.16; Spination: spines absent on femur and patella, with sparse setae. Tibia v- 19 large spines (extending *pl&rl*), covering only distal half. Metatarsus (Fig 10C) *pl*- 19 large spines extending v, 21 large spines *rl* (slightly v). Tarsus (Fig 10C) *pl*- 4 spines, *rl*- 4 spines, v- scopulate. II Total length 20.88; Segment lengths 6.42, 2.86, 4.32, 5.21, 2.07; Spination: spines absent on femur and patella, with sparse setae. Tibia v- 5–7 spines distally. Metatarsus *pl*- 12–13 large spines extending v, *rl*- 10–11 large spines extending v. Tarsus *pl*- 4 spines, *rl*- 3–4 spines, v- scopulate. III Total length 16.45; Segment lengths 4.64, 2.26, 2.55, 4.35, 2.66; Spination: spines absent on femur, with sparse setae. Patella, *do* (slightly *pl*)- 7

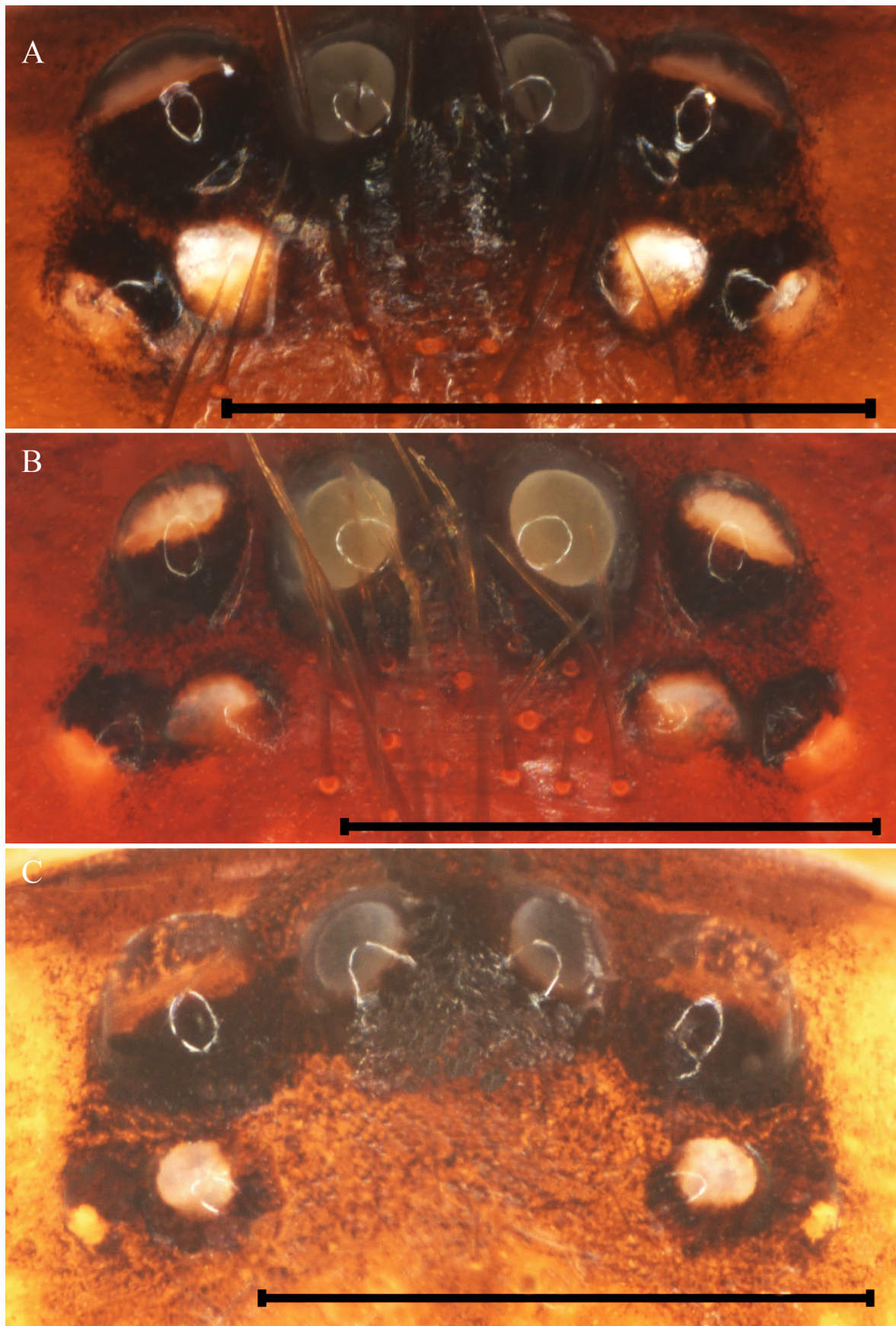


FIGURE 12. Ocular patterns for the male *Stasimopus* Simon, 1892 species. (A) *Stasimopus malesociatus* **sp. nov.** (AMGS-5367). (B) *Stasimopus maraisi* (NCA 2019/630). Scale: 1mm.

small spines. Tibia (Fig 10F), *do*- Distally dense patch of spines (approx. 25), extend to metatarsus. Metatarsus (Fig 10D), *pl*- 11 spines, *do*- small patch of spines proximally (approx. 15) connecting to tibia, *rl*- 3 spines, *v*- 5 spines. Tarsus (Fig 10D) *pl*- 8 spines, *rl*- 7 spines. IV Total length 22.85; Segment lengths 5.32, 2.65, 4.50, 7.42, 2.96; Spination: spines absent on femur, with sparse setae. Patella (Fig 10G), *do*- short red spines proximally, less dense distally, interspersed with black setae. Tibia short black setae. Metatarsus (Fig 10E) *pl*- 5 spines, *rl*- 6 spines. Tarsus (Fig 10E) *pl*- 10 spines, *rl*- 9 spines.

Distribution and environment notes:

The species is found in the localities indicated in Figure 9. The species appears to have a broader distribution in the Western and Eastern Cape provinces of South Africa. The areas typically had sandy soils. The juvenile female was collected from a flat pan. All the males were collected while they were crossing quite roads. The SUOJ locality had no rain on the day collected, but a slight drizzle did occur after collection, whereas the males from FRE were collected after very heavy rain.

***Stasimopus finni* sp. nov.**

(Figures 5B, 11B, 13A, 14, 15)

Type material: Holotype ♂ SOUTH AFRICA: Eastern Cape Province, Somerset East (-32.9386, 25.6612), 14.v.2018, S. Brandt, C. Sole, E. Engelbrecht and E. Brand, (NCA 2019/605).

Etymology: The specific epithet is patronym in honour of Finn Robert Pirk the son of the third author, who loves all creepy crawlies.

Diagnosis: The males of *S. finni* sp. nov. are distinguishable from other members of the genus occurring in the Karoo based on the following combination of characters. It is differentiated from *S. astutus*, *S. erythrognathus*, *S. malesociatus* sp. nov., *S. patersonae*, *S. steynsbergensis*, *S. karooensis* sp. nov. and *S. mandelai* based on the pedipalp not reaching the tarsus of leg I. Distinguished from *S. palpiger* as the pedipalp is longer than leg I, which *S. finni* sp. nov. is not. The species has denser cheliceral denticles (>11) than *S. schrieneri* (<5), *S. ignis* sp. nov. (<5) and *S. maraisi* (<10). *Stasimopus finni* sp. nov. is in general more spinose on the legs than *S. dylani* sp. nov. (Tibia of leg I and IV).

Description: Based on the holotype ♂ (NCA 2019/605).

Remarks: ♂: The left AME is reduced in size, making some eye measurements unreliable. ♀: Known only from the type male.

General: ♂: (Fig 5B) Medium bodied spider, 10.84 total length.

Carapace: ♂: Carapace length 4.76; width 4.05. Deep red-brown colouration, thoracic region with rugose texture. Fovea procurved, 0.81 in length.

Ocelli: ♂: (Fig 11B) AME diameter 0.14, PME diameter 0.19, MOQ anterior width 1.22 (may not be accurate due to deformity), MOQ posterior width 1.71; AME-AME 0.31 (may not be accurate due to deformity), AME-ALE 0.10, ALE-ALE 0.65, PME-PME 0.79, PME-PLE 0.16, PLE-PLE 1.14. AER procurved, PER recurved.

Chelicerae: ♂: (Fig 13A) Two teeth rows present, 4 teeth proventral row, 4 in retroventral row; 11–13 cuspules between rows.

Sternum, labium and maxillae: ♂: (Fig 14C) Sternum length 2.66; sternum width 2.19. Sternum shape has distinct impressions of where the coxa are situated. Sigilla in the shape of a fused arrow, distal end fused, proximal end 0.69 apart; cuspules on labium absent; maxilla absent.

Abdomen: ♂: (Fig 5B) Abdomen length 6.08; width 4.30. Pale beige colouration with dark grey banding, smaller band near carapace, followed by broader and wider band, then a narrower band, lastly two shorter bands next to one another.

Pedipalps: ♂: (Fig 14A, B) Total length 16.03; Segment lengths 1.57, 5.42, 4.15, -, 4.88. Spines absent. Bulb oval, embolus elongated, tapering retrolaterally into sharp point.

Legs: ♂: Length order: I, IV, II, III. I Total length 17.40; Segment lengths 5.54, 2.36, 4.22, 3.93, 1.35; Spination: spines absent on femur, with sparse setae. Patella *v*- 2–3 spines distally. Tibia (Fig 14D) *v*- 16–18 large spines extend *pl&rl*, denser distally. Metatarsus (Fig 14D) *v*- 15–16 large spines extend *pl&rl*. Tarsus (Fig 14D) *pl&rl*- 1–2 small spines, *v*- scopulate. II Total length 15.53; Segment lengths 4.77, 2.23, 3.63, 3.57, 1.33; Spination: spines absent on femur, with sparse setae. Patella *v*- 2–3 spines distally. Tibia *v*- 16 large spines extend *pl&rl*, denser distally. Metatarsus *v*- 14–16 large spines, 1 distinctly large spine distally on *pl* and *rl* aspects. Tarsus *pl&rl*- 2–3 small spines, *v*- scopulate.

III Total length 11.75; Segment lengths 3.01, 1.54, 1.38, 3.68, 2.14; Spination: spines absent on femur, with sparse setae. Patella *do*- 11 small spines. Tibia *pl*- 1 spine, almost *v*, *do*- 2 unorganised rows of red spinules (11 *pl/do*; 8–9 *rl/do*). Metatarsus *do*- 8 spines in two 2, *v* (Fig 14E)—18 spines, 3 are large and distal. Tarsus *v* (Fig 14E)—7 small spines, extend *pl&rl*, dense setae covering spines. IV Total length 17.38; Segment lengths 4.27, 2.31, 3.66, 4.85, 2.29; Spination: spines absent on femur, with sparse setae. Patella *do*- short dense red spines proximally, less dense distally; interspersed with fine black setae. Tibia *pl/v*- 2–3 small spines. Metatarsus *pl*- 8 spines, *v* (Fig 14F)—15 spines (4 large spines distally), spines extend *pl*. Tarsus (Fig 14F) *pl*- 11–14 spines, extend *v*, *v*- 7 small spines.

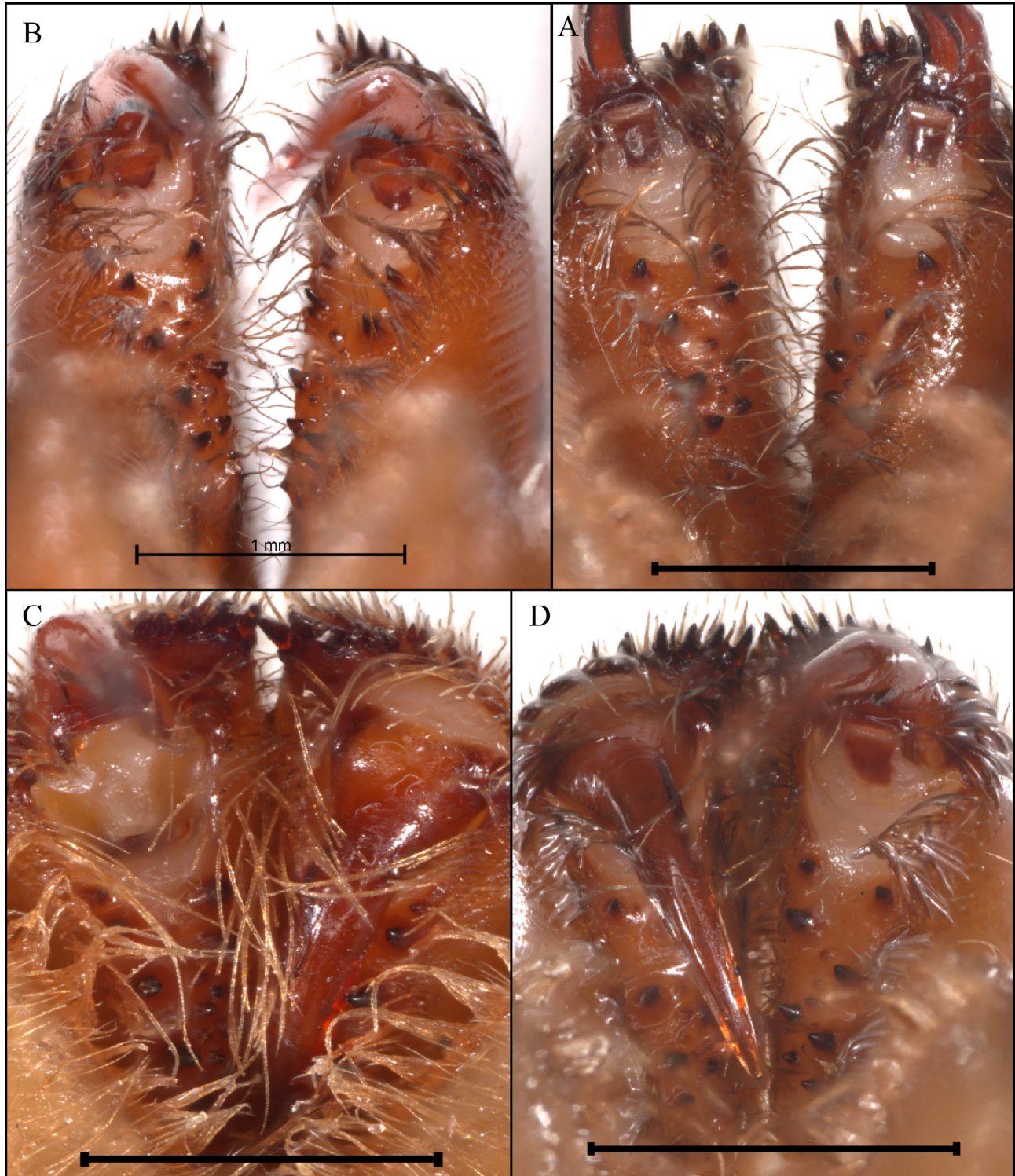


FIGURE 13. Cheliceral teeth of various male *Stasimopus* species. (A) *Stasimopus finni* **sp. nov.** (NCA 2019/605). (B) *Stasimopus karoensis* **sp. nov.** (SAM-ENW-C007293). (C) *Stasimopus malesociatus* **sp. nov.** (AMGS-5367). (D) *Stasimopus maraisi* (NCA 2019/630). Scale: 1mm.

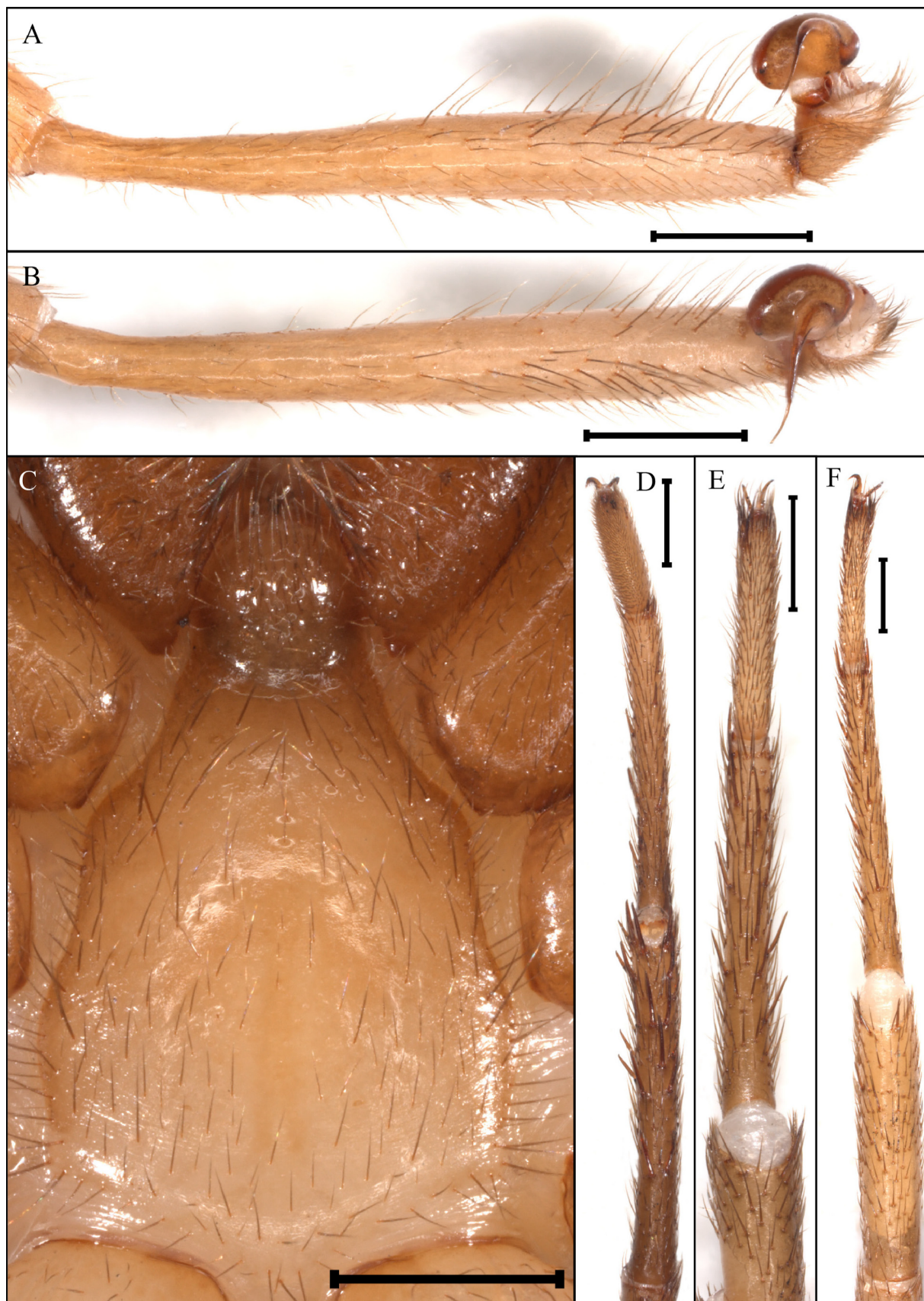


FIGURE 14. Male of *Stasimopus finni* **sp. nov.** (NCA 2019/605). (A) Pedipalp tibia, bulb, retrolateral aspect. (B) Pedipalp tibia, bulb, prolateral aspect. (C) Sternum with fused labium and visible sigilla (as shown by the arrows). (D) Leg I tibia, metatarsus, tarsus. Ventral aspect. (E) Leg III partial tibia, metatarsus, tarsus. Ventral aspect. (F) Leg IV tibia, metatarsus, tarsus. Ventral aspect. Scale: 1mm.

Distribution and environment notes:

The species is found in the localities indicated in Figure 15. The species is only known from the type locality near Somerset East in the Eastern Cape province. The location was a flat between small hills. The vegetation was dominated by low shrubs and aloe plants. The soil was very hard, chalky and pale. The specimen was found in a short burrow (Approx. 10cm deep).

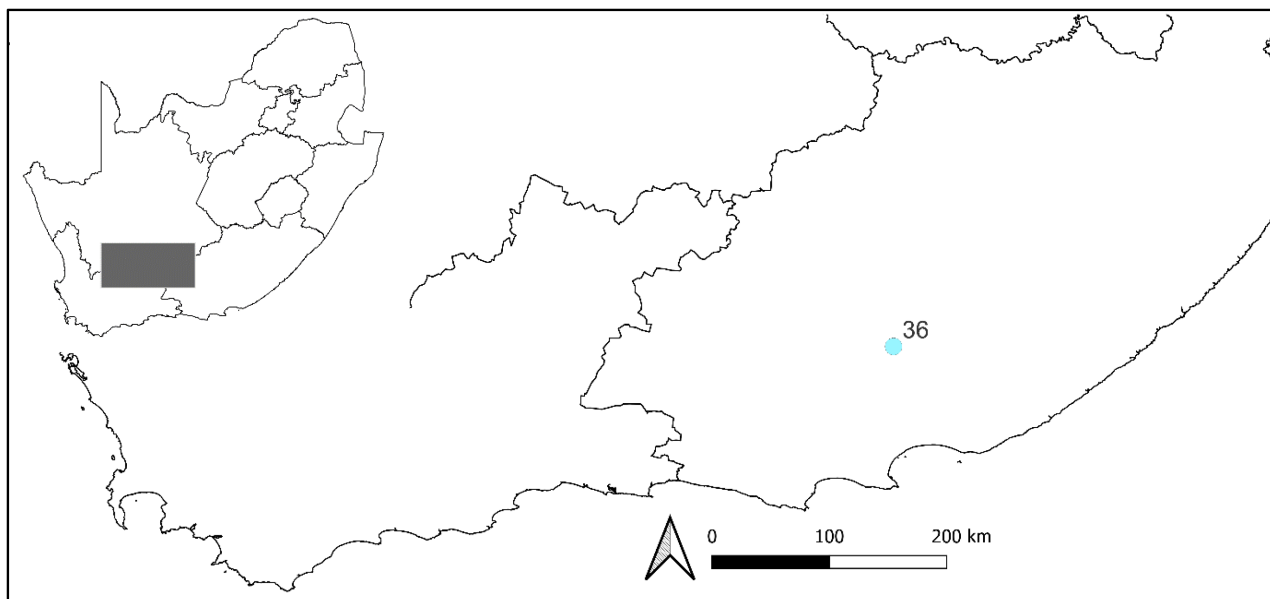


FIGURE 15. Map of the locality where the *Stasimopus finni* **sp. nov.** specimen was collected. Numbers match the site numbers in Figure 1. Map created in QGIS version 3.4.8-Madeira (2019), available at: <http://qgis.osgeo.org>.

Stasimopus hamartia **sp. nov.**

(Figures 2C, 5C&D, 16, 17A, 19, 20, 21, 22A&B)

Type material: Holotype ♀ SOUTH AFRICA: Western Cape Province, Beaufort West (-31.9265, 22.9042), 20.iv.2017, S. Brandt, C. Sole, E. Engelbrecht and T. Majelantle, (NCA 2017/1852). Allotype ♂ Eastern Cape Province, Willowmore (-32.5015, 23.5935), 14.iv.2017, S. Brandt, C. Sole, E. Engelbrecht and T. Majelantle, (NCA 2017/1891). Paratypes. Western Cape Province, Beaufort West (-32.2535, 23.0939), 20.iv.2017, S. Brandt, C. Sole, E. Engelbrecht and T. Majelantle, (1♀ NCA 2017/1849, 1♀ *juv.* NCA 2017/1850); same data, 20.iv.2017, 1♀ *juv.* (NCA 2017/1854); same data, 14.iv.2017, 2♀♀ (NCA 2017/1888, NCA 2017/1889), 2♀♀ *juv.* (NCA 2017/1890, NCA 2017/1892); Western Cape Province, Farm Tulpleege (-32.6422, 22.6914), 15.v.2018, S. Brandt, C. Sole, E. Engelbrecht and E. Brand, 1♀ (NCA 2019/660), 1♀ *juv.* (NCA 2019/661).

Etymology: The specific epithet is a Greek noun ‘hamartia’ meaning fatal error or flaw. It is so because the allotype specimen when collected was being eaten by an Idiopidae species found in her burrow.

Diagnosis: The females of *S. hamartia* **sp. nov.** are distinguishable from other members of the genus occurring in the Karoo based on the following combination of characters. It is differentiated from *S. astutus*, *S. leipoldti*, *S. maraisi*, *S. patersonae*, *S. schrieneri*, *S. theaei* **sp. nov.**, *S. ignis* **sp. nov.** and *S. teras* **sp. nov.** by the presence of an apical tuft being present on metatarsus III. Further differentiation can be made based on the extent of the spination present on the dorsal surface of metatarsus I. Only *S. hamartia* **sp. nov.**, *S. erythrognathus* and *S. unispinosus* have spines extending half or more of the segment. This species can then be differentiated from *S. erythrognathus* and *S. unispinosus* as these species have less than 15 cheliceral denticles, whereas *S. hamartia* **sp. nov.** has over 20 denticles present. The male of this species is difficult to diagnose due to the state of the allotype, which was found half-eaten by a female idiopid.

Description: Based on the holotype ♀ (NCA 2017/1852) and paratypes 4♀ (NCA 2017/1849, NCA 2017/1888, NCA 2017/1889, NCA 2019/660) and the allotype ♂ (NCA 2017/1891).

Remarks: ♂: The allotype is in poor condition as it was found half-eaten in a female idiopid burrow (Fig 5D). For this reason, many measurements and characters could not be determined.

General: ♀: (Fig 5C) Large bodied spiders, ranging between 20.10–31.30 (27.30) total length. ♂: (Fig 5D) Length could not be determined.

Carapace: ♀: Carapace length 8.62–14.01 (12.07); width 7.45–12.06 (10.88). Reddish orange colouration. Smooth texture, with some pleats in thoracic region. Fovea strongly procurved, between 1.36–2.82 (2.09) in length. ♂: Length and width undetermined. Reddish orange colouration, thoracic region with rugose texture. Fovea length undetermined.

Ocelli: ♀: (Fig 2C, 17A) AME diameter 0.25–0.36 (0.30), PME diameter 0.27–0.30 (0.28), MOQ anterior width 1.81–2.92 (2.62), MOQ posterior width 3.05–4.80 (4.16); AME-AME 0.72, AME-ALE 0.51, ALE-ALE 2.39, PME-PME 2.51, PME-PLE 0.39, PLE-PLE 3.83. AER slightly procurved, PER almost straight. ♂: Eye measurements could not be taken.

Chelicerae: ♀: (Fig 19C) Two teeth rows present, 3–4 teeth in proventral row, 4 teeth in retroventral row; 16 cuspules in between.

Sternum, labium and maxillae: ♀: (Fig 19A) Sternum length 5.20–7.74 (6.78); sternum width 4.25–6.99 (6.20). Longitudinally elongated sigilla, distal end 0.47–0.95 (0.70) apart, proximal end 1.75–3.14 (2.27) apart; labium with 6–11 cuspules present (Fig 19B); maxillae with 8–14 cuspules present. ♂: (Fig 21C) Sternum length 2.73; sternum width undetermined. Sternum shape has shallow impressions of where the coxa are situated. Longitudinally elongated sigilla, distal end 0.43 apart, proximal end 0.93 apart; cuspules on labium absent; maxilla absent.

Abdomen: ♀: Abdomen length 11.48–17.29 (15.13); width 7.62–12.18 (11.56). Grey colour, two black spots posteriorly situated, closer towards spinnerets, some specimens with larger darker patch connecting the two dots and extending further towards the spinnerets. ♂: Length and width are undetermined. Dark brown in colour.

Pedipalps: ♀: Total length 16.79; Segment lengths 5.78, 3.75, 3.49, -, 3.79. Spination: spines absent in femur and patella, with sparse setae. Tibia *pl*- 2 tibial spurs, 1 proximal, 1 distal, *do*- small patch of spinules distally extend onto the tarsus. *Rl*- 20–21 spinules along the segment. Tarsus *pl*- 5 large spines on the distal end, *do*- patch of 15–17 spinules, less dense distally, extend $\frac{1}{4}$ – $\frac{1}{5}$ of segment, *rl*- covered in dense spines (20–24). ♂: (Fig 21A, B) Total length not determined; Segment lengths damaged, 6.38, 4.83, -, 5.89. Spines absent. Bulb compact, embolus elongated tapering into sharp point, perpendicular to tibia.

Legs: ♀: Length order: IV, I, III, II. I Total length 24.43; Segment lengths 7.58, 4.75, 4.68, 5.56, 1.86; Spination: spines absent on femur and patella, with sparse setae. Tibia *pl&rl*- dense spines extend entire segment, less dense proximally, *do* (Fig 20A)- patch of dense spines distally, extend onto metatarsus, reaches $\frac{1}{8}$ of segment. Metatarsus *pl&rl*- dense spines extend entire segment, *do* (Fig 20A)- patch of dense spines extending $\frac{1}{2}$ segment from proximal end, *v*- highly scopulate. Tarsus *pl&rl*- dense spines extend entire segment, *v*- highly scopulate. II Total length 21.30; Segment lengths 6.58, 4.49, 3.77, 4.89, 1.58; Spination: spines absent on femur and patella, with sparse setae. Tibia *pl*- dense spines extend $\frac{1}{8}$ of segment from distal end, 2–3 spines proximally, *do* (Fig 20B)- patch of dense spines distally reaching $\frac{1}{8}$ of segment length. *Rl*- dense spines extend entire segment, less dense proximally. Metatarsus and tarsus same as in I (Fig 20B). III Total length 22.63; Segment lengths 6.36, 6.02, 2.09, 5.17, 3.03; Spination: spines absent on femur with sparse setae. Patella *do/rl* with 2–3 short spines. Tibia *do* (Fig 20C)- stout red spines dense patch distally, hidden by long setae. Metatarsus *do* (Fig 20C)- 2 rows of stout red spines (14–18 in each), between smaller red spinules, *v*- Terminally 8–9 long spines present (Fig 20E). Tarsus *pl*- dense patch of red spines on the distal $\frac{1}{3}$ of the segment. IV Total length 28.04; Segment lengths 7.14, 5.73, 5.42, 6.87, 2.88; Spination: spines absent on femur with sparse setae. Patella *do*- short dense red spines proximally, less dense distally, interspersed with short black setae. Tibia (Fig 20D) *pl*- 12–13 spines along segment, *do*- dense setae. Metatarsus (Fig 20D) *pl*- 9–10 spines along segment, denser distally, *v*- 5–6 randomly scattered spinules, six spines in a transverse row in the preening comb (Fig 20F). Tarsus *pl*- dense patch of red spines extending distally. ♂: Length order undetermined. I Total length undetermined; Segment lengths -, -, -, 4.63, 1.96; Spination: Metatarsus *v* (Fig 21D)- 25 spines segment. Tarsus *v*- scopulate. II Total length 14.41; Segment lengths 4.35, 2.18, 3.54, 2.9, 1.45; Spination: spines absent on femur. Patella *v*- 4 small thickened setae distally. Tibia *v*- 11 long spines along segment, 2 most distal are thicker. Metatarsus *v*- 23 spines along segment. Tarsus *do*- dense patch of spinules (7–8) distally, *v*- scopulate. III Total length 12.21; Segment lengths 3.41, 2.05, 1.37, 3.36, 2.02; Spination: spines absent on femur. Patella *pl*- 2–3 spines distally. Tibia *do*- dense patch of spinules (9–10 each) on distal end more *pl&rl*. Metatarsus *pl*- 1 spine, *do*- 9–10 spines along segment, *v*- 4 spines scattered. Tarsus *pl*- 1 spine distally, *v*- scopulate. IV Length order undetermined. I Total length undetermined; Segment lengths -, 2.14, 3.46, 5.01, 2.6; Spination: Patella *do*- dense red spines proximally (extends *rl*). Tibia *pl*- 1 small spine. Metatarsus *v* (Fig 21E)- 5 spines, distal 3 are larger. Tarsus *pl&rl*- 12 small spines along surface, denser distally, *v*- scopulate.

Spermathecae: (Fig 22A, B) Entire, with inflated terminus, similar to a giraffe's ossicones.

Distribution and environment notes:

The species is found in the localities indicated in Figure 16. The species occurs on the border of the Western and Eastern Cape provinces of South Africa. All the sample locations were flat pans near drainage lines, with typical low to medium height Karoo shrubs. All the soil was hard and compact, except for at site 21 where the soil was softer (this was the most specimen rich site). The burrow trapdoor lids were visible on the surface only at sites 6 and 7. At site 39 several empty *Stasimopus* burrows were excavated, and a pompilid wasp was found in one. One burrow which had a live female specimen in was deep (Approx. 30cm).



FIGURE 16. Map of the localities where *Stasimopus hamartia* **sp. nov.** specimens were collected. Numbers match the site numbers in Figure 1. Map created in QGIS version 3.4.8-Madeira (2019), available at: <http://qgis.osgeo.org>.

***Stasimopus ignis* sp. nov.**

(Figures 2D, 3D, 6A&B, 11C, 17B, 22C&D, 23, 24, 25, 26)

Type material: Holotype ♂ SOUTH AFRICA: Northern Cape Province, Richmond (-31.4412, 23.9851), 22.v.2018, S. Brandt, C. Sole, E. Engelbrecht and E. Brand, (NCA 2019/642). Allotype ♀. Hanover (-31.0439, 24.4689), 24.v.2018, S. Brandt, C. Sole, E. Engelbrecht and E. Brand, (NCA 2019/653).

Etymology: The specific epithet is a Latin noun 'ignis' taken in apposition meaning fire/flame. This is in reference to both the colouration of the female of the species, as well as an allusion to the increasing fire frequency (historically rare) in the Nama Karoo which is likely due to climate change.

Diagnosis: The males of *S. ignis* **sp. nov.** are distinguishable from other members of the genus occurring in the Karoo based on the following combination of characters. It is differentiated from *S. astutus*, *S. erythrognathus*, *S. malesociatus* **sp. nov.**, *S. patersonae*, *S. steynsbergensis*, *S. karooensis* **sp. nov.** and *S. mandelai* based on the pedipalp not reaching the tarsus of leg I. It is further distinguished from *S. palpiger* by the pedipalp which is longer than leg I, that is not the case with *S. ignis* **sp. nov.** The species can be differentiated from the rest of the species (*S. schrieneri*, *S. dylani* **sp. nov.**, *S. finni* **sp. nov.** and *S. maraisi*) as *S. ignis* **sp. nov.** only has 3 cheliceral teeth in the inner cheliceral row whereas the other species have 4 or more.

The females of *S. ignis* **sp. nov.** are distinguishable from other members of the genus occurring in the Karoo based on the following combination of characters. The preening comb on metatarsus IV has 8 or more spines in a transverse row, only shared or exceeded by *S. artifex*, *S. theaei* **sp. nov.** and *S. teras* **sp. nov.** The species can be differentiated from *S. artifex* (< 1/10 segment) and *S. theaei* **sp. nov.** (> 1/2 segment) by the extent of spination on metatarsus I, extending less than 1/6 the segment. Can be separated from *S. teras* **sp. nov.** by the extent of spination on the tarsus of the pedipalp (*S. teras* **sp. nov.** is less spinose).

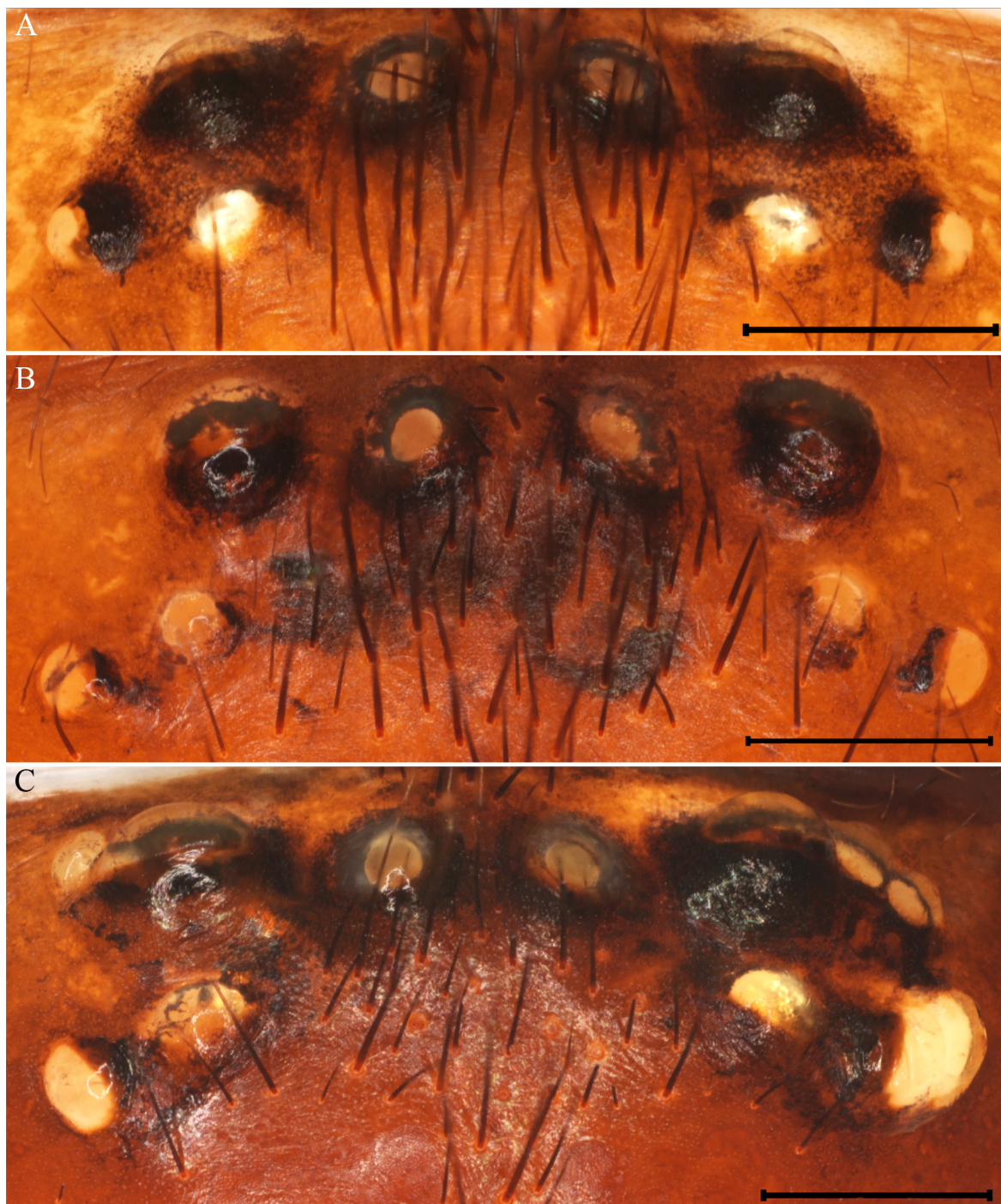


FIGURE 17. Ocular patterns for the newly described female *Stasimopus* Simon, 1892 species. (A) *S. hamartia* **sp. nov.** (NCA 2017/1852). (B) *S. ignis* **sp. nov.** (NCA 2019/653). (C) *S. teras* **sp. nov.** (NCA 2019/643). (D) *S. theaei* **sp. nov.** (NCA 2019/606). Scale: 1mm.

Description: Based on the holotype ♀ (NCA 2019/642) and the allotype ♂ (NCA 2019/653).

Remarks: ♂: male specimen abdomen is severely dehydrated, making abdomen and total length measurements challenging.

General: ♂: (Fig 6B) Medium bodied spiders, 8.29 total length. ♀: (Fig 6A) total length 22.54.

Carapace: ♂: Carapace length 4.73; width 4.30. Reddish brown colouration, thoracic region with rugose texture. Fovea strongly procurved, 0.88 in length. ♀: Carapace length 9.98; width 9.55. Reddish orange colouration, smooth texture, with some pleats in thoracic region. Fovea procurved, 1.99 in length.

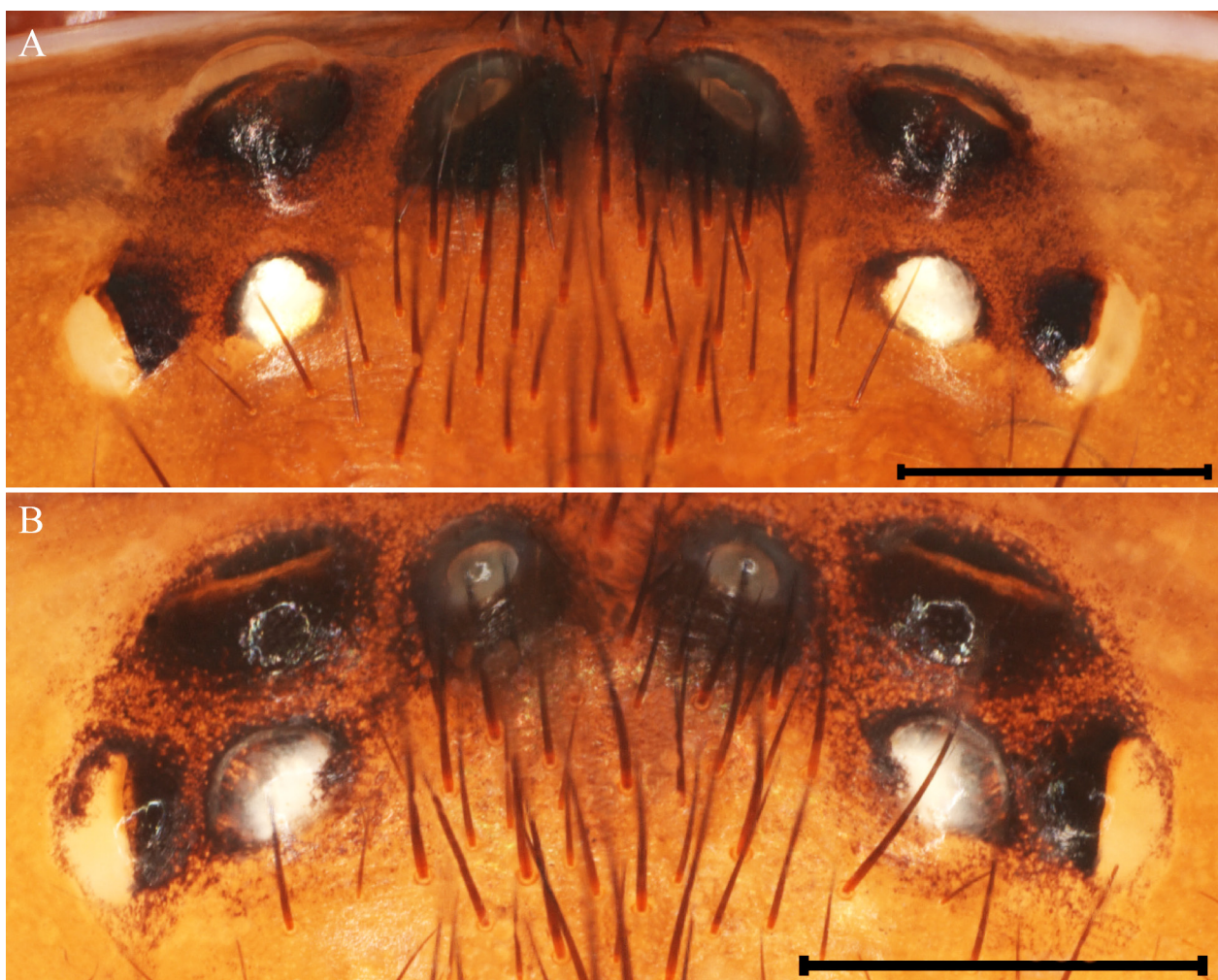


FIGURE 18. Ocular patterns for the *Stasimopus* Simon, 1892 species. (A) Female of *Stasimopus venterstadensis* **sp. nov.** (NCA 2019/610). Scale: 1mm.

Ocelli: ♂: (Fig 3D, 11C) AME diameter 0.20, PME diameter 0.13, MOQ anterior width 1.21, MOQ posterior width 1.80; AME-AME 0.20, AME-ALE 0.19, ALE-ALE 0.98, PME-PME 1.02, PME-PLE 0.19, PLE-PLE 1.62. AER and PER slightly recurved. ♀: (Fig 2D, 17B). AME diameter 0.31, PME diameter 0.26, MOQ anterior width 2.79, MOQ posterior width 4.27; AME-AME 0.62, AME-ALE 0.61, ALE-ALE 2.29, PME-PME 2.55, PME-PLE 0.42, PLE-PLE 3.66. AER slightly procurved, PER strongly recurved.

Chelicerae: ♂: (Fig 25D) Two teeth rows present, 3–4 teeth in proventral row, 3 in retroventral row; no cuspules in between. ♀: (Fig 23C) Two teeth rows present, 4 teeth in proventral row and 4 in retroventral row; 10–11 cuspules in between.

Sternum, labium and maxillae: ♂: (Fig 25E) Sternum length 2.22; sternum width 2.17. Sternum shape has no impressions of where the coxa are situated. Sigilla in the shape of a fused arrow, distal end fused, proximal end 0.89 apart. Cuspules on labium absent; cuspules on maxilla absent. ♀: (Fig 23A) Sternum length 6.02; sternum width 5.68. Longitudinally elongated sigilla, distal end 0.71 apart, proximal end 1.82 apart. Labium with 5 cuspules present (Fig 25B), maxillae with 13–16 cuspules present.

Abdomen: ♂: Abdomen length 3.56; width 3.18. Mottled grey colouration. ♀: Abdomen length 12.56; width 11.28. Grey/brown colouration, with one large dark spot near the carapace followed by a smaller one, two small black markings terminally.

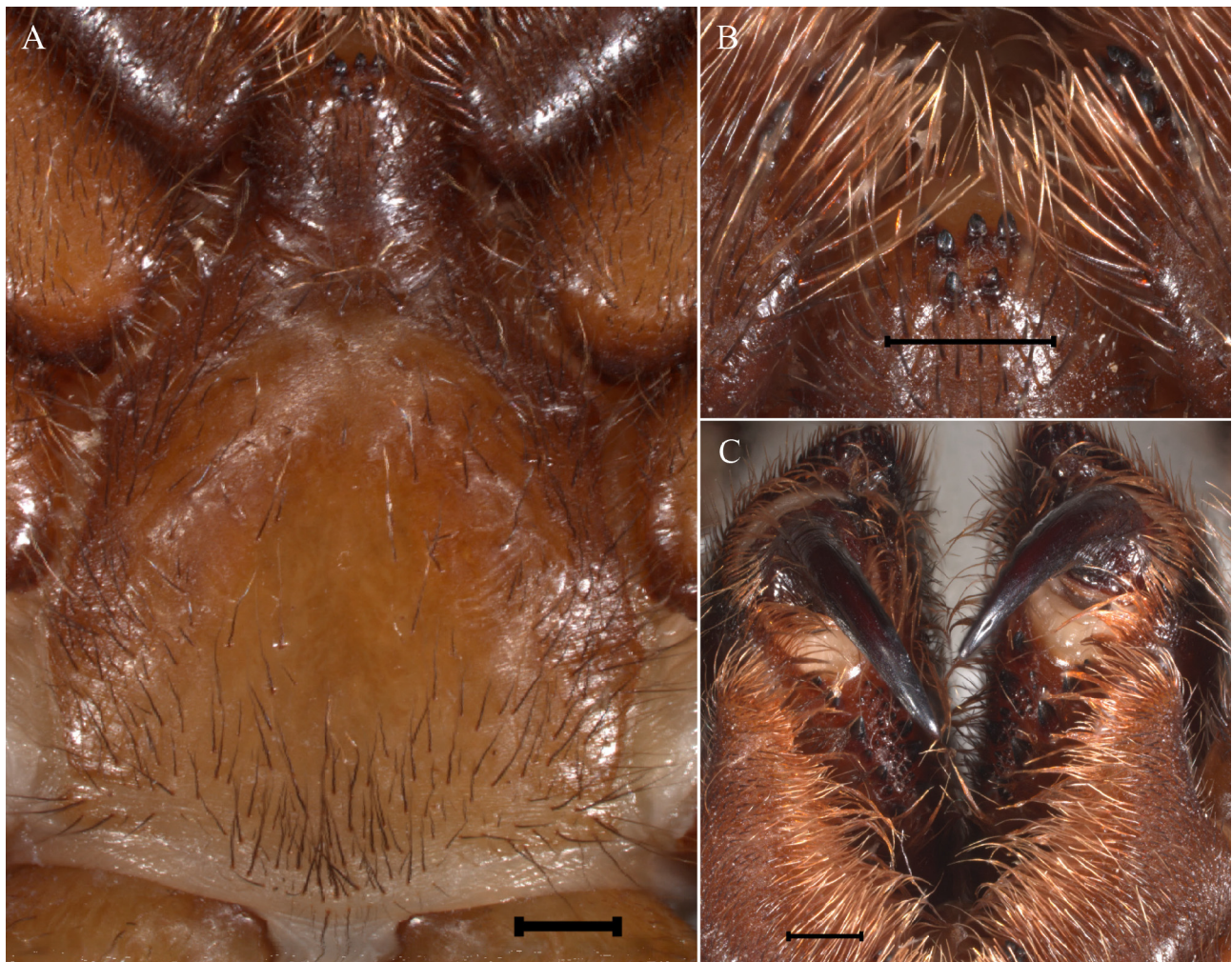


FIGURE 19. Female of *Stasimopus hamartia* **sp. nov.** (NCA 2017/1852). (A) Sternum with fused labium and visible sigilla (as shown by the arrows). (B) Labium teeth. (C) Fangs with cheliceral teeth. Scale: 1mm.

Pedipalps: ♂: (Fig 25A–C) Total length 16.22; Segment lengths, 4.55, 1.48, 5.16, -, 5.05. Spines absent. Bulb small, embolus with broad base, tapering distally away from tibia. ♀: Total length 12.65; Segment lengths 4.25, 2.44, 2.76, -, 3.20. Spination: spines absent on femur, with sparse setae. Patella *pl*- 3–4 long thin spines. Tibia *pl*- 2–3 tibial spurs, 1 proximal and 1 distal, *do*- small patch of spinules distally extends onto tarsus (7–9 spinules), *rl*- 23 spinules along segment. Tarsus *pl*- 12–13 large spines distally, *do*- patch of 15–17 spinules, less dense distally, extend $\frac{1}{4}$ – $\frac{1}{5}$ segment, *rl*- covered in dense spines (>30).

Legs: ♂: Length order: I, IV, II, III. I Total length 17.18; Segment lengths 4.88, 2.40, 3.98, 3.82, 2.10; Spination: spines absent on femur, with sparse setae. Patella *v*- 2 long spines distally. Tibia (Fig 25F) *v*- 8–10 large spines. Metatarsus (Fig 25F) *v*- 18–19 large spines, extending *pl*&*rl*. Tarsus (Fig 25F) *v*- highly scopulate. II Total length 14.57; Segment lengths 3.92, 2.12, 3.42, 3.32, 1.79; Spination: spines absent on femur, with sparse setae. Patella *v*- 2 small thickened setae distally. Tibia *v*- 12 long spines along segment. Metatarsus *v*- 18 spines along segment, extend *pl*&*rl*. Tarsus *pl*- 1 small spine, *rl*- 3 small red spines, *v*- scopulate. III Total length 11.82; Segment lengths 3.10, 1.99, 1.41, 3.30, 2.03; Spination: spines absent on femur, with sparse setae. Patella *pl*- 17 spines, 9 distally situated, *do*- 8 spines, extend *rl*. Tibia *do*- dense patch of spinules (12) distally. Metatarsus *do*- 8 spines along segment (4 distal), *rl*- 2 spines, *v* (Fig 25G)- 4 spines scattered. Tarsus *rl*- 4–5 small spines, *v* (Fig 25G)—scopulate, 7 spines more distally situated. IV Total length 16.87; Segment lengths 4.70, 2.20, 3.19, 4.61, 2.18; Spination: spines absent on femur, with sparse setae. Patella *do*- dense red spines proximally, interspersed with black setae. Tibia *pl*- 2 small spines. Metatarsus *pl*- 3 spines (one large distally), *rl*- 1 large spine distally, *v* (Fig 25H)- 7 spines. Tarsus *v*- 12 spines scattered, almost *pl*, *v*- Scopulate. ♀: Length order: IV, III, I, II. I Total length 18.05; Segment lengths 5.93,



FIGURE 20. Female of *Stasimopus hamartia* **sp. nov.** (NCA 2017/1852). (A) Leg I tibia, metatarsus, tarsus. Dorsal aspect. (B) Leg II tibia, metatarsus, tarsus. Dorsal aspect. (C) Leg III tibia, metatarsus, tarsus. Dorsal aspect. (D). Leg IV partial tibia, metatarsus, tarsus. Prolateral aspect. (E) Leg III metatarsal tuft. Ventral aspect. (F) Leg IV metatarsus preening comb. Scale: 1mm.

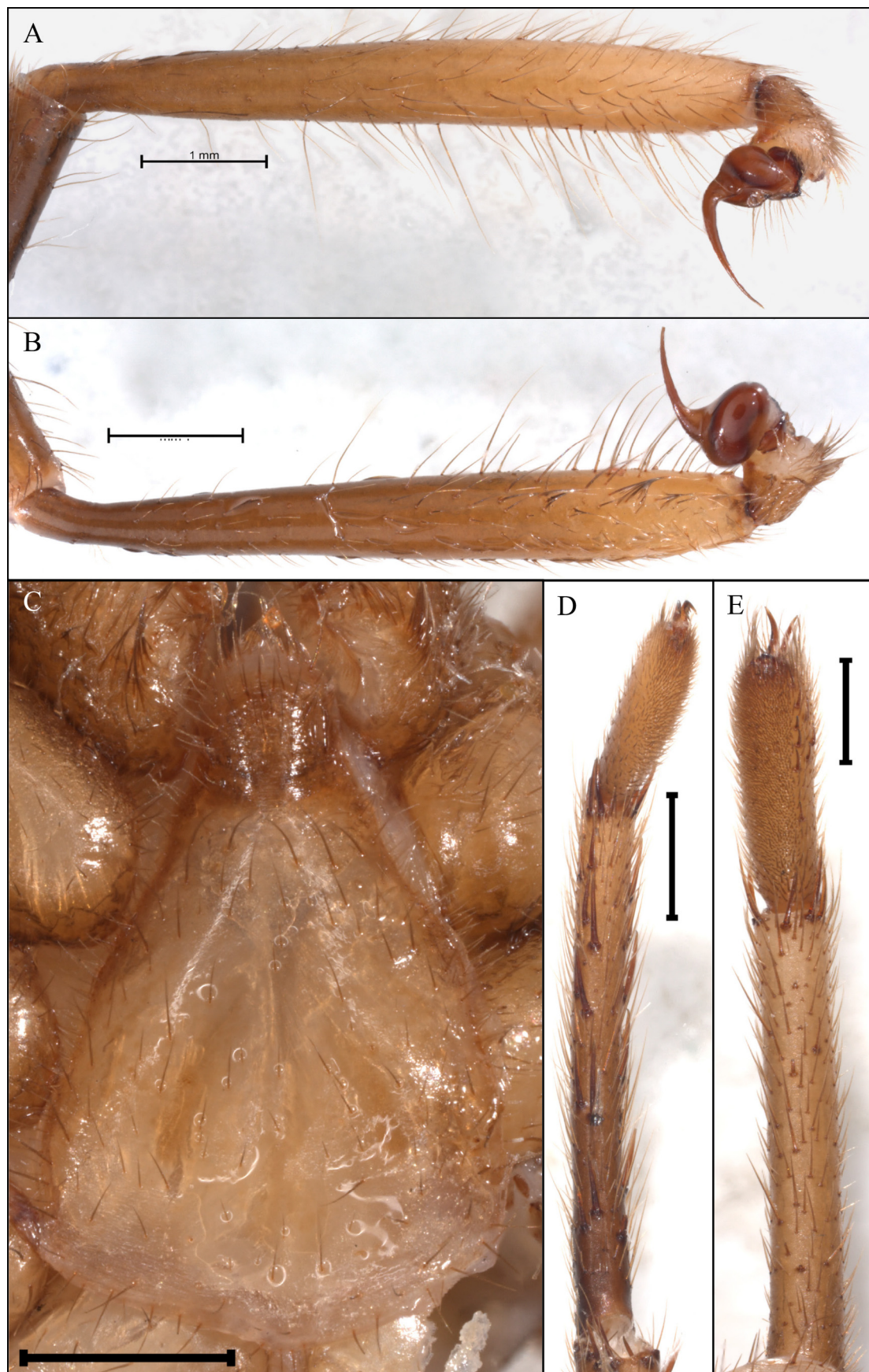


FIGURE 21. Male of *Stasimopus hamartia* **sp. nov.** (NCA 2017/1891). (A) Pedipalp tibia, bulb, retrolateral aspect. (B) Pedipalp tibia, bulb, prolateral aspect. (C) Sternum with fused labium and visible sigilla (as shown by the arrows).. (D). Leg I metatarsus, tarsus. Ventral aspect. (E) Leg IV metatarsus, tarsus. Ventral aspect. Scale: 1mm.

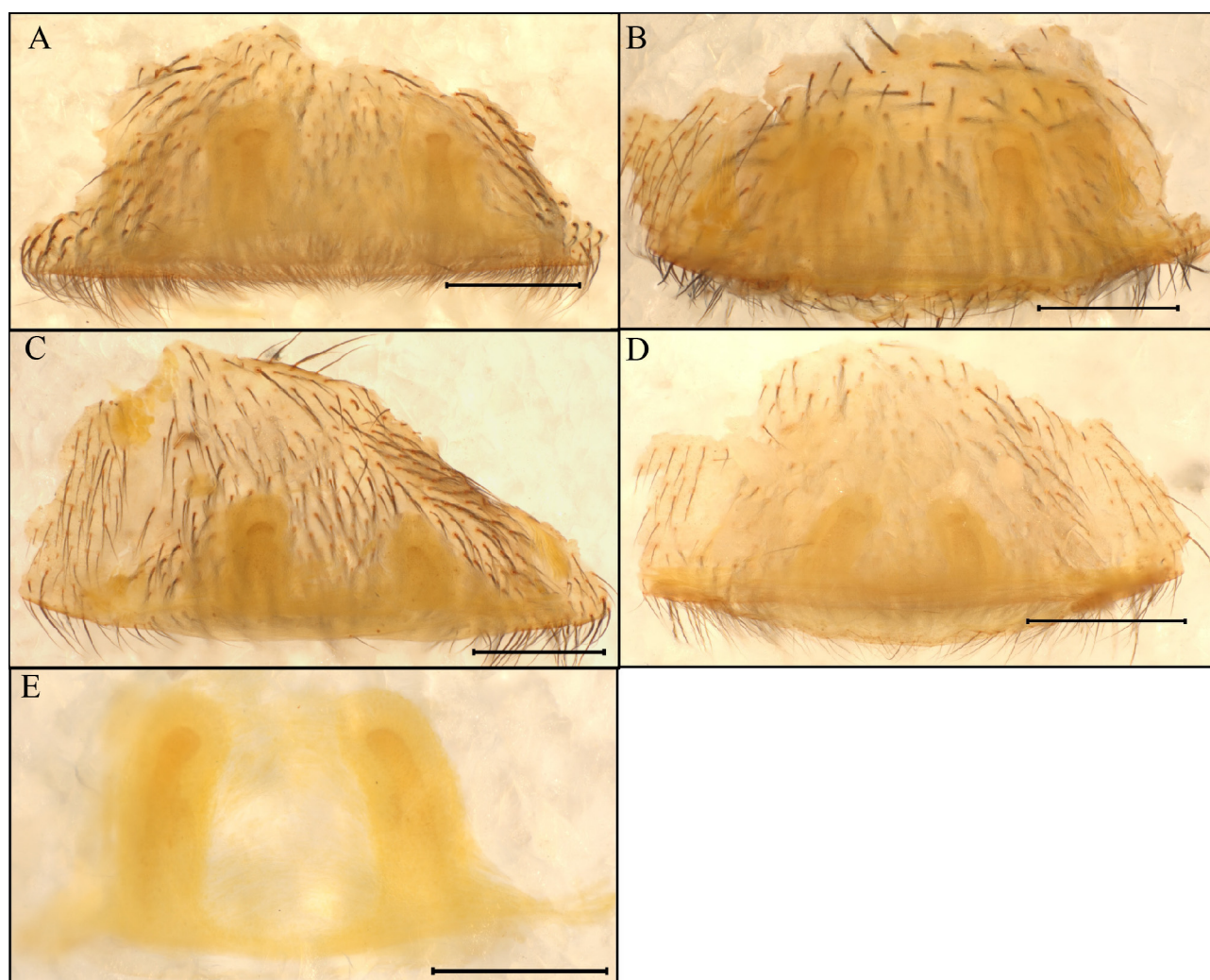


FIGURE 22. Vulva and spermathecae respectively for the newly described female *Stasimopus* Simon, 1892 species. (A and B) *S. hamartia* **sp. nov.** (NCA 2017/1852). (C and D) *S. ignis* **sp. nov.** (NCA 2019/653). (E and F) *S. theaei* **sp. nov.** (NCA 2019/606). (G and H) *S. venterstadensis* **sp. nov.** (NCA 2019/610). (I) Spermathecae of *S. tera* **sp. nov.** (NCA 2019/643). The spermathecae detached from the vulva, and the vulva is thus not presented. Scale: 1mm.

2.88, 3.61, 3.91, 1.72; Spination: spines absent on femur and patella, with sparse setae. Tibia *pl*- small spines extend $\frac{1}{2}$ distally along segment, *do* (Fig 24A)- patch of dense spines distally, extend approx. $\frac{1}{4}$ segment, *rl*- small spines extend entire segment, less dense proximally. Metatarsus *pl&rl*- dense spines extend entire segment, *do* (Fig 24A)- patch of dense spines extend $\frac{1}{4}$ segment length from the proximal end, *v*- highly scopulate. Tarsus *pl&rl*- dense spines extend entire segment, *v*- highly scopulate. II Total length 17.58; Segment lengths 5.33, 3.12, 3.66, 3.69, 1.79; Spination, follows that of leg I (Fig 24B). III Total length 19.00; Segment lengths 5.10, 4.18, 2.87, 4.16, 2.71; Spination: spines absent on femur, with sparse setae. Patella *pl*- 8–9 red spinules with rows of black setae. Tibia *do* (Fig 24C)- dense patch of stout red spines distally situated, hidden by long setae. Metatarsus *do* (Fig 24C)- 2 rows of stout red spines (26–30 in each), between smaller red spinules. Tarsus *pl*- >15 spines along surface, dense distally (covered in setae). IV Total length 21.20; Segment lengths 5.12, 3.76, 4.40, 5.25, 2.39; Spination: spines absent on femur, with sparse setae. Patella *pl*- 3–4 long spines. Tibia *pl* (Fig 24D)- 4–8 spines along segment, *do*- dense setae. Metatarsus *pl* (Fig 24D)- 22 spines along segment, *v*- 5–6 spines in transverse row in the preening comb (Fig 24E). Tarsus *pl* (Fig 24D)- dense patch of red spines extending distally (>25 spines), covered in setae.

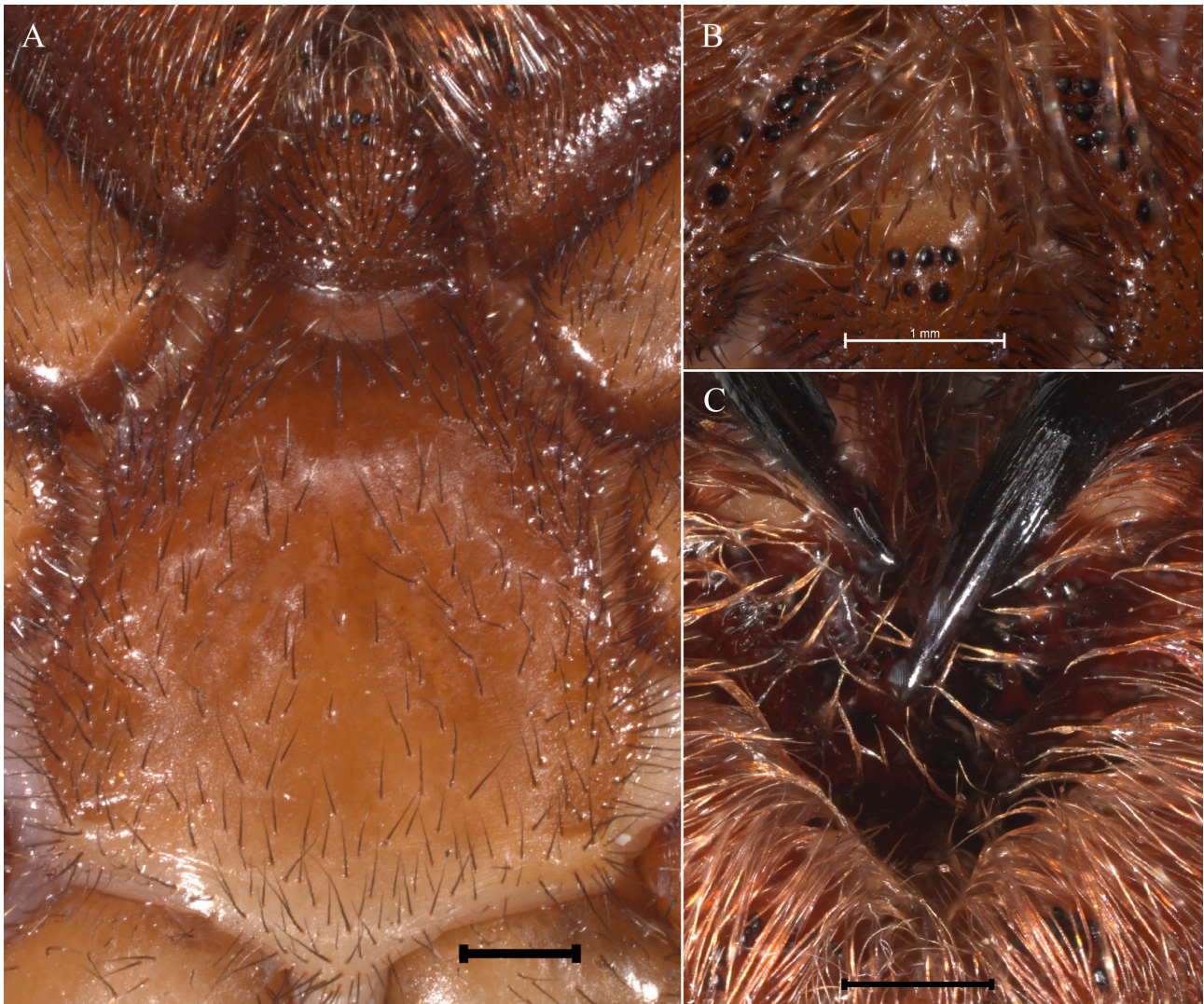


FIGURE 23. Female of *Stasimopus ignis* **sp. nov.** (NCA 2019/653). (A) Sternum with fused labium and visible sigilla (as shown by the arrows). (B) Labium teeth. (C) Fangs with cheliceral teeth. Scale: 1mm.

Spermathecae: (Fig 22C&D) Entire, with terminus as broad as base.

Distribution and environment notes:

The species is found in the localities indicated in Figure 26. The species is only known from two localities in the Northern Cape province. Female found on a gentle slope in loamy soil which had a hard subsoil layer. The vegetation was dominated by typical Karoo low shrubs and grasses. The male was found under a door mat at the Toonbothasfontein farm.

***Stasimopus karooensis* sp. nov.**

(Figs 3E, 6C, 11D, 13B, 27, 28)

Type material: Holotype ♂ SOUTH AFRICA: Eastern Cape Province, Pearston, Camdeboo Game Reserve (-32.5339, 25.2378), 09.iv.2010–26.vi.2010, S. van Noort, (SAM-ENW-C007293). Paratypes. Same data, 1♂ (SAM-ENW-C007746). Jansenville (-32.8772, 24.4952), 17.vii.2015, I. Engelbrecht and D. Kambas, 1♂ (NCA 2019/616).



FIGURE 24. Female of *Stasimopus ignis* **sp. nov.** (NCA 2019/653). (A) Leg I tibia, metatarsus, tarsus. Dorsal aspect. (B) Leg II tibia, metatarsus, tarsus. Dorsal aspect. (C) Leg III tibia, metatarsus, tarsus. Dorsal aspect. (D). Leg IV partial tibia, metatarsus, tarsus. Prolateral aspect. (E) Leg IV metatarsus preening comb. Scale: 1mm.

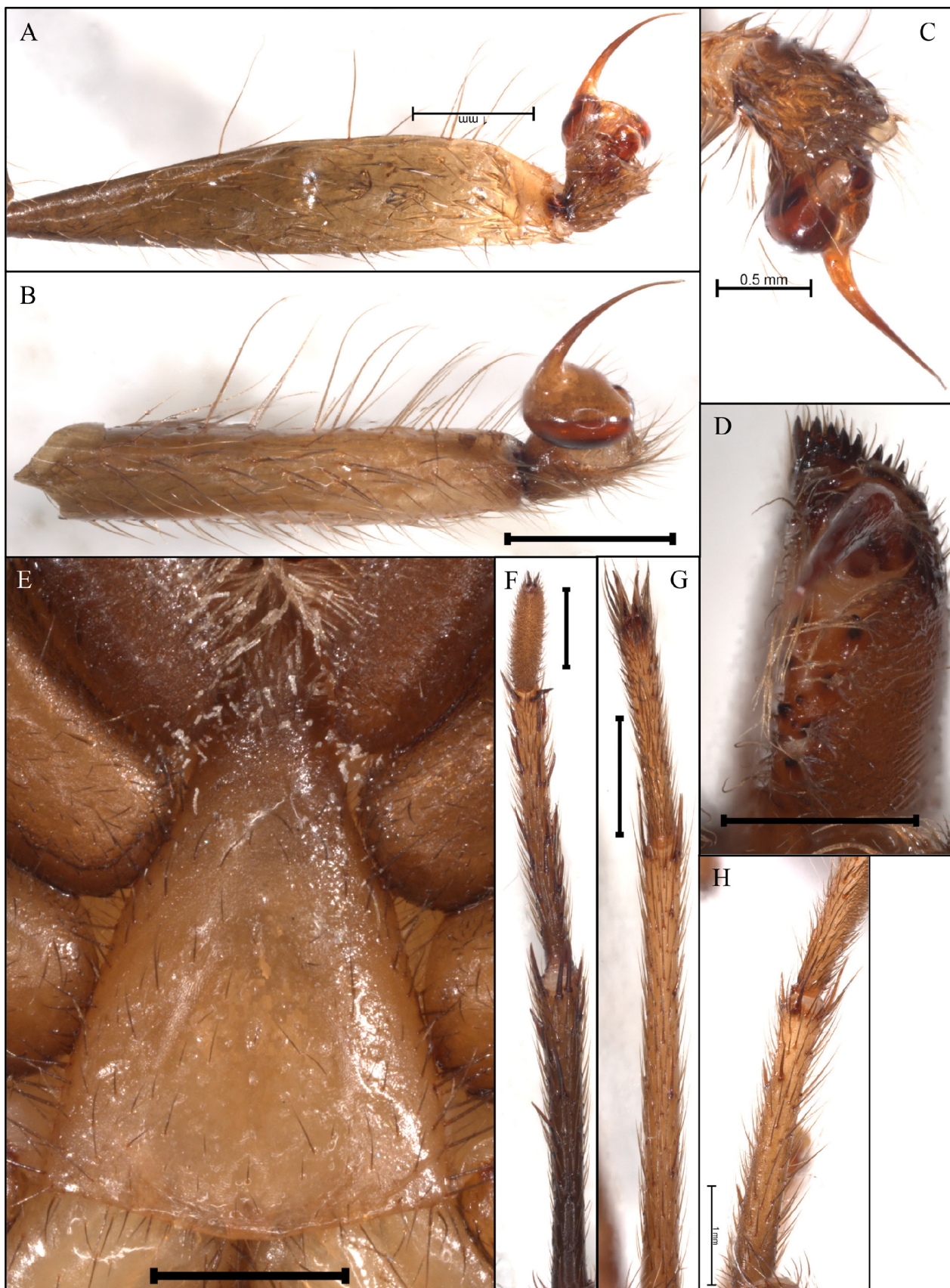


FIGURE 25. Male of *Stasimopus ignis* sp. nov. (NCA 2019/642). (A) Pedipalp tibia, bulb, retrolateral aspect. (B) Pedipalp tibia, bulb, prolateral aspect. (C) Pedipalpal bulb, ventral aspect. (D) Cheliceral teeth. (E) Sternum with fused labium and visible sigilla (as shown by the arrows). (F) Leg I tibia, metatarsus, tarsus. Ventral aspect. (G) Leg III metatarsus, tarsus. Ventral aspect. (H) Leg IV metatarsus. Ventral aspect. Scale: 1mm.

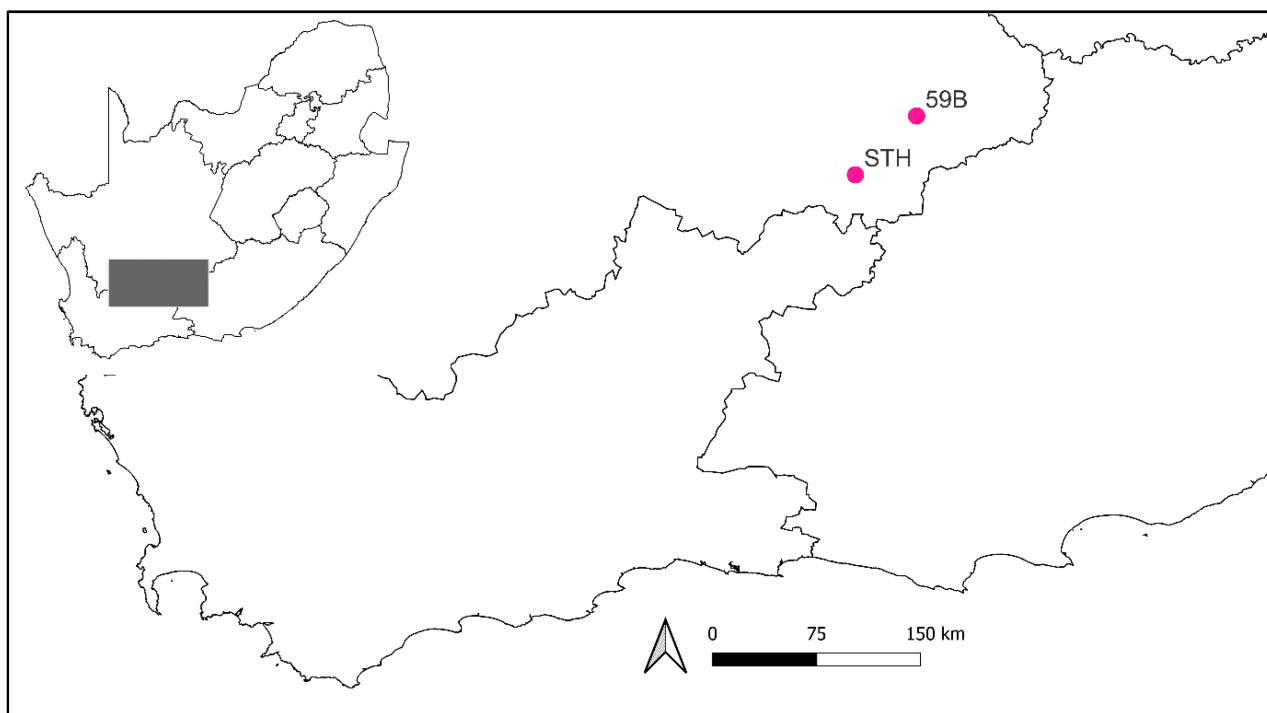


FIGURE 26. Map of the localities where *Stasimopus ignis* **sp. nov.** specimens were collected. Numbers match the site numbers in Figure 1. Map created in QGIS version 3.4.8-Madeira (2019), available at: <http://qgis.osgeo.org>.

Etymology: The specific species name refers to the large distribution of the species within the Karoo. It is an acknowledgement to the Karoo BioGaps project, which provided some funding and the sampling organisation for this project.

Diagnosis: The males of *S. karoensis* **sp. nov.** are distinguishable from other members of the genus occurring in the Karoo based on the following combination of characters. It is differentiated from *S. schrieneri*, *S. dylani* **sp. nov.**, *S. ignis* **sp. nov.**, *S. finni* **sp. nov.**, *S. maraisi* and *S. palpiger* by the pedipalp being shorter in relation to leg I (only reaching metatarsus I). It is distinguished from *S. astutus*, *S. erythrognathus*, *S. malesociatus* **sp. nov.** and *S. patersonae* as the pedipalp is longer in relation to leg I (extending past the tibia). Lastly, it is differentiated from *S. mandelai* and *S. steynsbergensis* by being more spinose on tarsus IV.

Description: Based on the holotype ♂ (SAM-ENW-C007293) and paratypes 2♂ (SAM-ENW-C007746, NCA 2019/616).

Remarks: ♀: Known only from males.

General: ♂: (Fig 6C) Medium bodied spiders, ranging between 8.34–9.29 (8.34) total length.

Carapace: ♂: Carapace length 3.99–4.98 (3.99); width 3.62–4.35 (3.62). Dark red colouration, thoracic region with rugose texture. Fovea procurved, between 0.78–0.94 (0.78) in length.

Ocelli: ♂: (Fig 3E, 11D) AME diameter 0.20–0.22 (0.20), PME diameter 0.12–0.15 (0.15), MOQ anterior width 1.08–1.23 (1.08), MOQ posterior width 1.29–1.69 (1.29); AME-AME 0.18, AME-ALE 0.10, ALE-ALE 0.84, PME-PME 0.15, PME-PLE 0.78, PLE-PLE 1.20; AER almost straight, PER slightly recurved.

Chelicerae: ♂: (Fig 13B) Two teeth rows present, 4 teeth in proventral row, 4 in retroventral row. Number of cuspsules could not be determined as the fangs could not be opened without damaging an old specimen.

Sternum, labium and maxillae: ♂: (Fig 27C) Sternum length 2.56–2.76 (2.73); sternum width 2.12–2.54 (2.12). Sternum shape has distinct impressions of where the coxa are situated. Sigilla in the shape of a fused arrow, distal end fused, proximal ends 0.68–1.14 (0.68) apart; cuspsules on labium absent; maxilla absent.

Abdomen: ♂: Abdomen length 4.31–4.36 (4.36); width 2.78–3.07 (2.78). Mottled grey colouration.

Pedipalps: ♂: (Fig 27A, B) Total length 16.60; Segment lengths 4.64, 4.68, 3.14, -, 4.14. Spination: spines absent. Bulb compact and flattened. Embolus elongated tapering to sharp point, extending perpendicular from tibia.

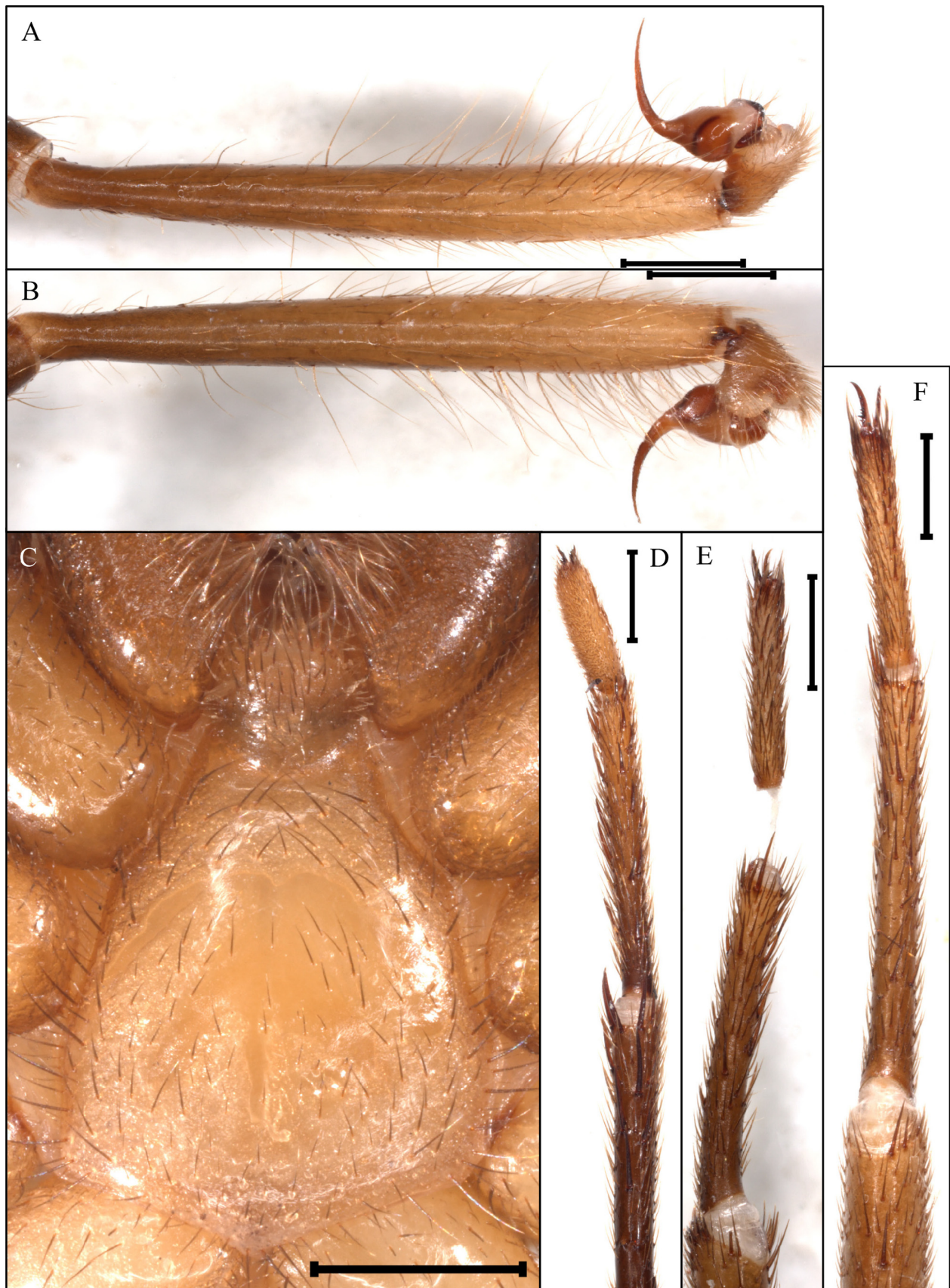


FIGURE 27. Male of *Stasimopus karoensis* **sp. nov.** (SAM-ENW-C007293). (A) Pedipalp tibia, bulb, retrolateral aspect. (B) Pedipalp tibia, bulb, prolateral aspect. (C) Sternum with fused labium and visible sigilla (as shown by the arrows). (D) Leg I partial tibia, metatarsus, tarsus. Ventral aspect. (E) Leg III metatarsus, tarsus. Ventral aspect. (F) Leg IV metatarsus, tarsus. Ventral aspect. Scale: 1mm.

Legs: ♂: Length order: I, IV, II, III. I Total length 19.32; Segment lengths 5.83, 2.66, 4.21, 4.61, 2.02; Spination: spines absent on femur and patella, with sparse setae. Tibia *v*- 13 large spines extending *pl&rl*. Metatarsus *v* (Fig 27D)- 10–12 large spines. Tarsus *v*- scopulate. II Total length 16.82; Segment lengths 5.16, 2.30, 3.70, 3.87, 1.81; Spination: spines absent on femur, with sparse setae. Patella *pl*- 1 large spine. Tibia *v*- 13–14 large spines extend *pl&rl*. Metatarsus *v*- 14–15 large spines. Tarsus *v*- scopulate. III Total length 12.12; Segment lengths 3.25, 1.75, 1.45, 3.52, 2.16; Spination: spines absent on femur, with sparse setae. Patella *do*- 4 red spines. Tibia *pl&rl*- dense patches of short spines distally (9–10 in each patch). Metatarsus (Fig 27E) *pl&rl*- dense spines along each surface (15–17 in each patch), extend *do&v*. Tarsus *pl&rl*- small spines along each surface (10–11 in each patch), denser distally, *v*- scopulate. IV Total length 18.85; Segment lengths 4.50, 2.39, 3.67, 5.34, 2.96; Spination: spines absent on femur, with sparse setae. Patella *do*- short dense red spines proximally, less dense distally, interspersed with fine black setae. Tibia *pl*- 5 spines. Metatarsus *pl*- 10 spines, *v* (Fig 27F)- 1 spine. Tarsus *pl&rl*- 15–16 spines along each surface, denser distally, *v* (Fig 27F)- scopulate.

Distribution and environment notes:

The species is found in the localities indicated in Figure 28. The species is only known from two localities in the Eastern Cape province. These two localities are a great distance apart. The SAMC specimens were collected in Camdeboo Escarpment Thicket vegetation in yellow pan traps. The ELK specimens were all collected while crossing a quite road after heavy rains.

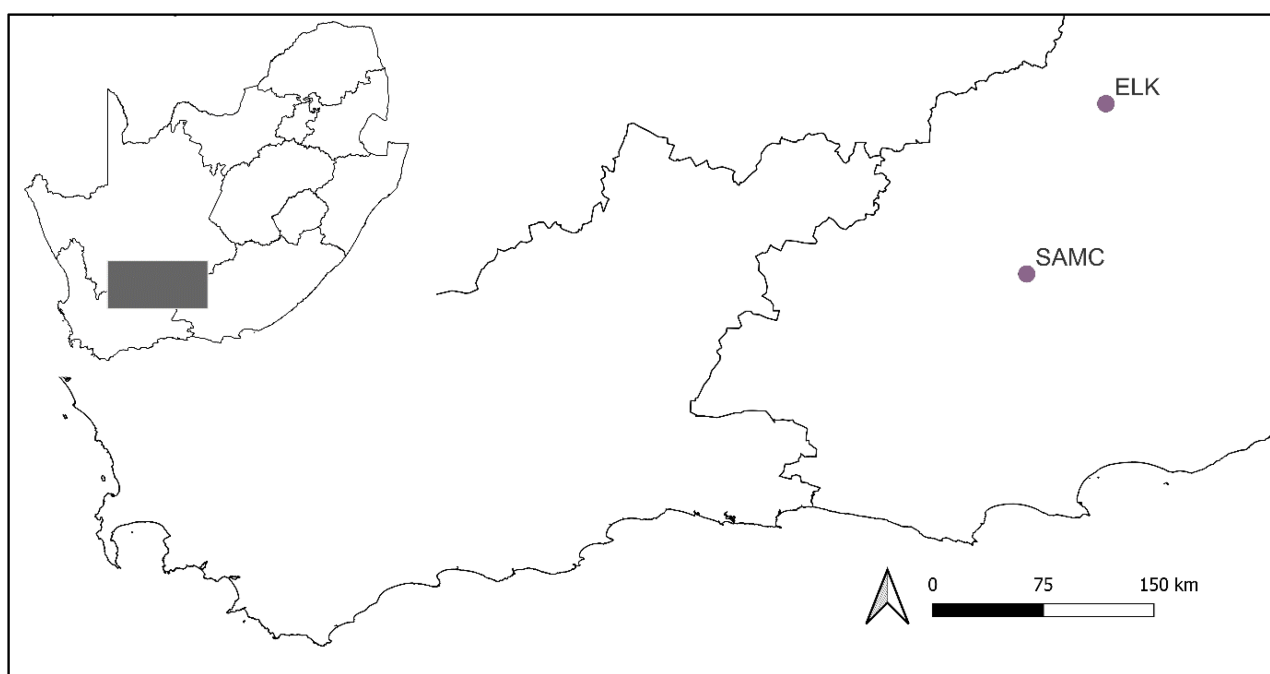


FIGURE 28. Map of the localities where *Stasimopus karooensis* **sp. nov.** specimens were collected. Numbers match the site numbers in Figure 1. Map created in QGIS version 3.4.8-Madeira (2019), available at: <http://qgis.osgeo.org>.

***Stasimopus malesociatus* sp.comb.**

***Stasimopus maraisi* Hewitt, 1927: 424 (Dm)**

(Figures 6D, 12A, 13C, 29, 30)

Type material: Holotype ♂ SOUTH AFRICA: Northern Cape Province, Victoria West, no collection date, H. James, (AMGS-5367).

Etymology: The specific epithet is a Latin adjective ‘malè sociatus’ taken in apposition meaning mismatched. This is in reference to this specimen being incorrectly assigned as the allotype to the previously described species *Stasimopus maraisi*.

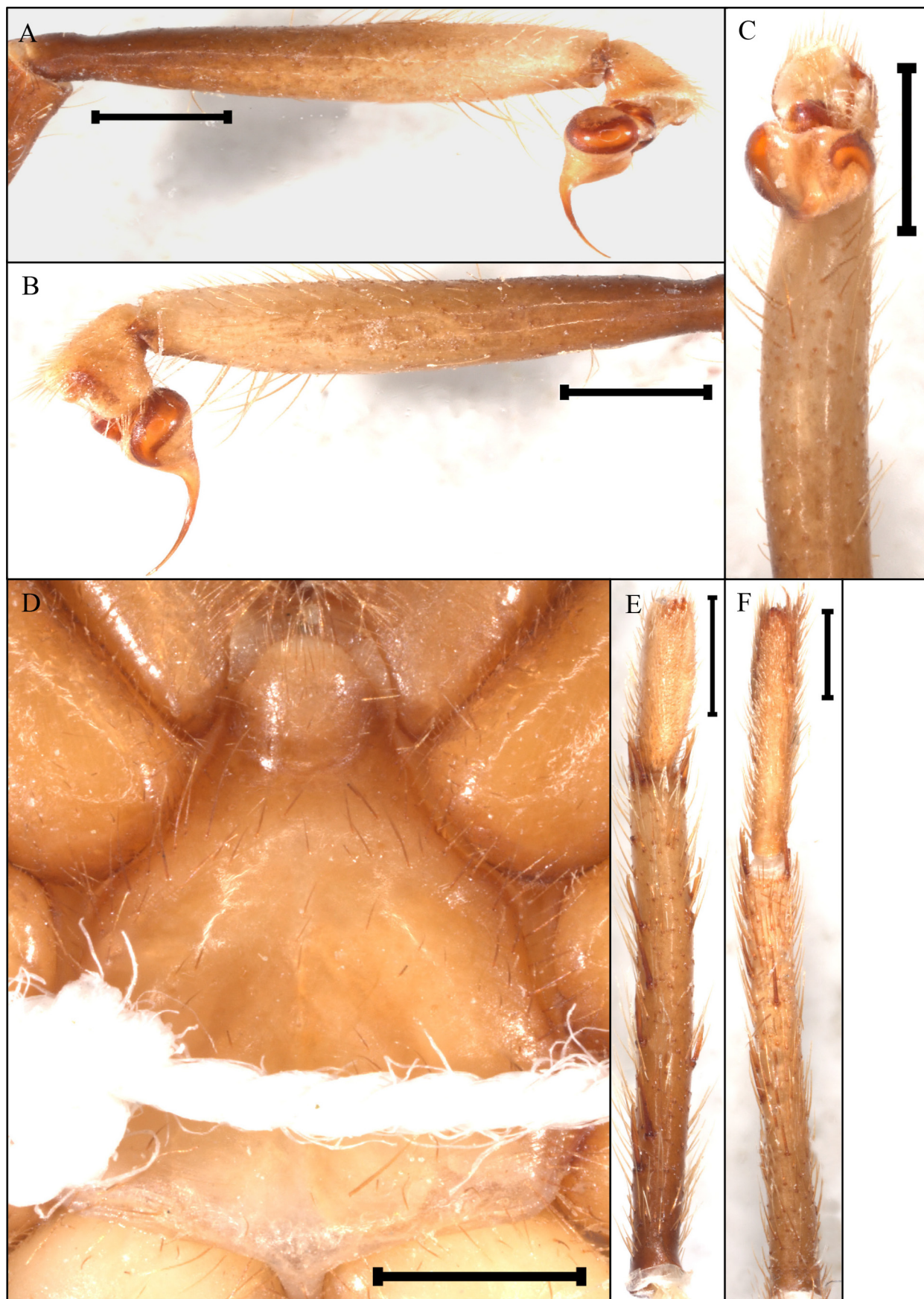


FIGURE 29. Male of *Stasimopus malesociatus* **sp. nov.** (AMGS-5367). (A) Pedipalp tibia, bulb, retrolateral aspect. (B) Pedipalp tibia, bulb, prolateral aspect. (C) Pedipalpal bulb, ventral aspect. (D) Sternum with fused labium and visible sigilla (as shown by the arrows). (E) Leg I tibia, metatarsus, tarsus. Ventral aspect. (F) Leg IV metatarsus. Ventral aspect. Scale: 1mm.

Diagnosis: The males of *S. malesociatus* **sp. nov.** are distinguishable from other members of the genus occurring in the Karoo based on the following combination of characters. It is differentiated from *S. astutus*, *S. erythrognaethus*, *S. schrieneri*, *S. finni* **sp. nov.** and *S. maraisi* by the AME being the largest eye. It is distinguished from *S. ignis* as PLE is the smallest eye. The species is distinguished from *S. patersonae*, *S. karooensis* **sp. nov.**, *S. dylani* **sp. nov.** and *S. palpiger* as *S. malesociatus* **sp. nov.** only has 3 cheliceral teeth in the inner row, whereas the others have 4. The metatarsus of legs I and II are less spinous than *S. steynsbergensis*.

Description: ♂: Originally described in Hewitt 1927 pg. 425–426. Additional description is given below.

Remarks: The specimen is in poor condition with various limbs severed or damaged. The spination patterns may be inaccurate due to the removal of a hard clay-like substance.

General: ♂: (Fig 6D) Medium bodied spider, 9.09 total length.

Carapace: ♂: Carapace length 4.93; width 4.61. Reddish orange colouration, thoracic region with rugose texture. Fovea procurved, 0.77 in length.

Ocelli: ♂: (Fig 12A) AME diameter 0.23, PME diameter 0.13, MOQ anterior width 1.21, MOQ posterior width 1.68; AME-AME 0.20, AME-ALE 0.12, ALE-ALE 0.87, PME-PME 0.77, PME-PLE 0.16, PLE-PLE 1.29; AER slightly recurved, PER recurved.

Chelicerae: ♂: (Fig 13C) Two teeth rows present, 3 teeth in proventral row, 4 in retroventral row; 4–5 cuspules in between.

Sternum, labium and maxillae: ♂: (Fig 29D) Sternum length 2.77; sternum width 2.65. Sternum shape has distinct impressions of where the coxa are situated. Sigilla in the shape of a fused arrow, distal end fused, proximal ends 1.0 apart; cuspules on labium absent; maxilla absent.

Abdomen: ♂: Abdomen length 4.16; width 3.48. Mottled brownish red colouration.

Pedipalps: ♂: (Figs 29A–C) Total length 13.48; Segment lengths 1.39, 4.37, 3.18, -, 4.54. Spination: spines absent. Bulb elliptical, embolus with broad base, tapering into sharp point, curving distally.

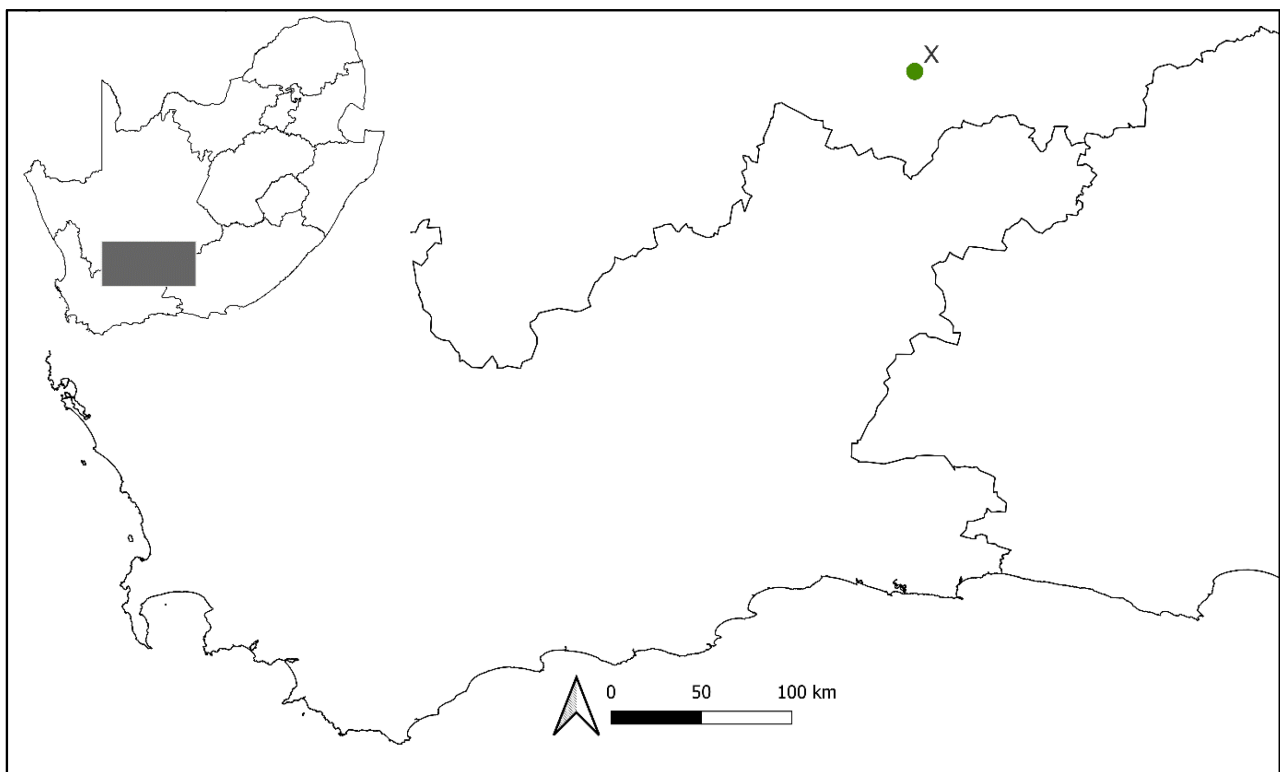


FIGURE 30. Map of the locality where the *Stasimopus malesociatus* **sp. nov.** specimen was collected. Map created in QGIS version 3.4.8-Madeira (2019), available at: <http://qgis.osgeo.org>.

Legs: ♂: Length order: undetermined. I Total length undetermined; Segment lengths -, -, -, 4.78, 1.98; Spination: spines absent on femur, with sparse setae. Metatarsus v (Fig 29E)- 13 large spines. Tarsus v- scopulate. II Total length 18.31; Segment lengths 5.63, 2.55, 3.96, 4.15, 2.02; Spination: spines absent on femur, with sparse setae.

Patella *v*- 1 large spine. Tibia *v*- 12–14 large spines. Metatarsus *v*- 8 spines. Tarsus *v*- scopulate. III Total length undetermined; Segment lengths 3.81, 2.00, 1.78, -, -; Spination: spines absent on femur, with sparse setae. Patella *do*- damaged, 8 red spines, extend *pl*, *v*- 1 spine. Tibia *pl&rl*- dense patches of short red spines distally (7–9 in each patch), *v*- 3 thin spines. IV Total length 20.68; Segment lengths 5.06, 2.69, 4.26, 5.81, 2.87; Spination: spines absent on femur, with sparse setae. Patella *do*- short dense red spines proximally (approx. 50–60), less dense distally, interspersed with fine black setae. Tibia *pl/v* (Fig 29F)- 5 spines. Metatarsus *v* (Fig 29F)- 9 spines. Tarsus *pl* (Fig 29F)- 11 spines along surface.

Distribution and environment notes:

The species is found in the locality indicated in Figure 30. The species is only known from the type locality near Victoria West in the Northern Cape province. The original description does not describe the area where the specimen was collected.

***Stasimopus teras* sp. nov.**

(Figs 7A, 17C, 22I, 31, 32, 33)

Type material: Holotype ♀ SOUTH AFRICA: Northern Cape Province, Victoria West (-31.4965, 23.5597), 22.v.2018, S. Brandt, C. Sole, E. Engelbrecht and E. Brand, (NCA 2019/643).

Etymology: The specific epithet is a Greek noun ‘teras’ taken in apposition meaning monster or marvel. This is in reference to the extreme eye deformity of the type specimen. It is also a homage to the field of teratology which is the “study of marvels and monstrosities”.

Diagnosis: The authors acknowledge that the type specimen being used to describe the species is deformed, but despite this we believe this to be a valid species. The other characters and the genetic evidence (clear genetic distance from all other species) are overwhelming to support this deduction. The females of *S. teras* sp. nov. are distinguishable from other members of the genus occurring in the Karoo based on the following combination of characters. The preening comb on metatarsus IV has 8 or more spines in a transverse row, only shared or exceeded by *S. artifex*, *S. theaei* sp. nov. and *S. ignis* sp. nov. The species can be differentiated from *S. artifex* (< 1/10 segment) and *S. theaei* sp. nov. (>1/2 segment) by the extent of spination on metatarsus I, extending less than 1/6 the segment. Can be separated from *S. ignis* sp. nov. by the extent of spination on the tarsus of the pedipalp (*S. teras* sp. nov. is less spinose).

Description: Based on the holotype ♀ (NCA 2019/643).

Remarks: ♀: Severe eye deformity present, thus many eye measurements were not taken. For more information, please see Mitchell *et al.* (2020). ♂: Known only from the type female.

General: ♀: (Fig 7A) Medium bodied spider, 23.20 total length.

Carapace: ♀: Carapace length 9.16; width 9.27. Reddish orange colouration, smooth texture, with pleats in thoracic region. Fovea strongly procurved, 2.29 in length.

Ocelli: ♀: (Fig 17C) AME diameter 0.29, PME diameter 0.42; AME-AME 0.55, AME-ALE 0.52, ALE-ALE 2.11, PME-PME 2.19, PME-PLE 0.40, PLE-PLE 3.59. AER procurved, PER strongly recurved.

Chelicerae: ♀: (Fig 31C) Two teeth rows present, 4 teeth in proventral row, 5 teeth in retroventral row; 11–12 cuspules in between which vary in sizes.

Sternum, labium and maxillae: ♀: (Fig 31A) Sternum length 5.70; sternum width 5.44. Sigilla indistinct. Labium (Fig 31B) with 5 cuspules present, maxillae with 12–15 cuspules present.

Abdomen: ♀: Abdomen length 14.04; width 9.57. Greyish brown colouration, with long vertical band marking along the ventral surface, less apparent towards the spinnerets.

Pedipalps: ♀: Total length 12.38; Segment lengths 4.10, 2.67, 2.68, -, 2.94. Spination: spines absent on femur, with sparse setae. Patella *pl*- 2–3 long thin spines. Tibia *pl*- 3 tibial spurs, *do*- small patch of spinules distally extend onto tarsus with 3–4 spines, *rl*- 8–10 spinules along segment. Tarsus *pl*- 10–11 long spines, *do*- patch of 12–13 spinules, less dense distally, extend ¼–½ of segment, *rl*- covered in dense spines (22–25), difficult to see distally due to dense setae.



FIGURE 31. Female of *Stasimopus teras* **sp. nov.** (NCA 2019/643). (A) Sternum with fused labium and visible sigilla (as shown by the arrows). (B) Labium teeth. (C) Fangs with cheliceral teeth. (D) Leg I tibia, metatarsus, tarsus. Dorsal aspect. (E) Leg III tibia, metatarsus, tarsus. Dorsal aspect. Scale: 1mm.



FIGURE 32. Female of *Stasimopus teras* **sp. nov.** (NCA 2019/643) (A). Leg IV partial tibia, metatarsus, tarsus. Prolateral aspect. (B) Leg IV metatarsus preening comb. Scale: 1mm.

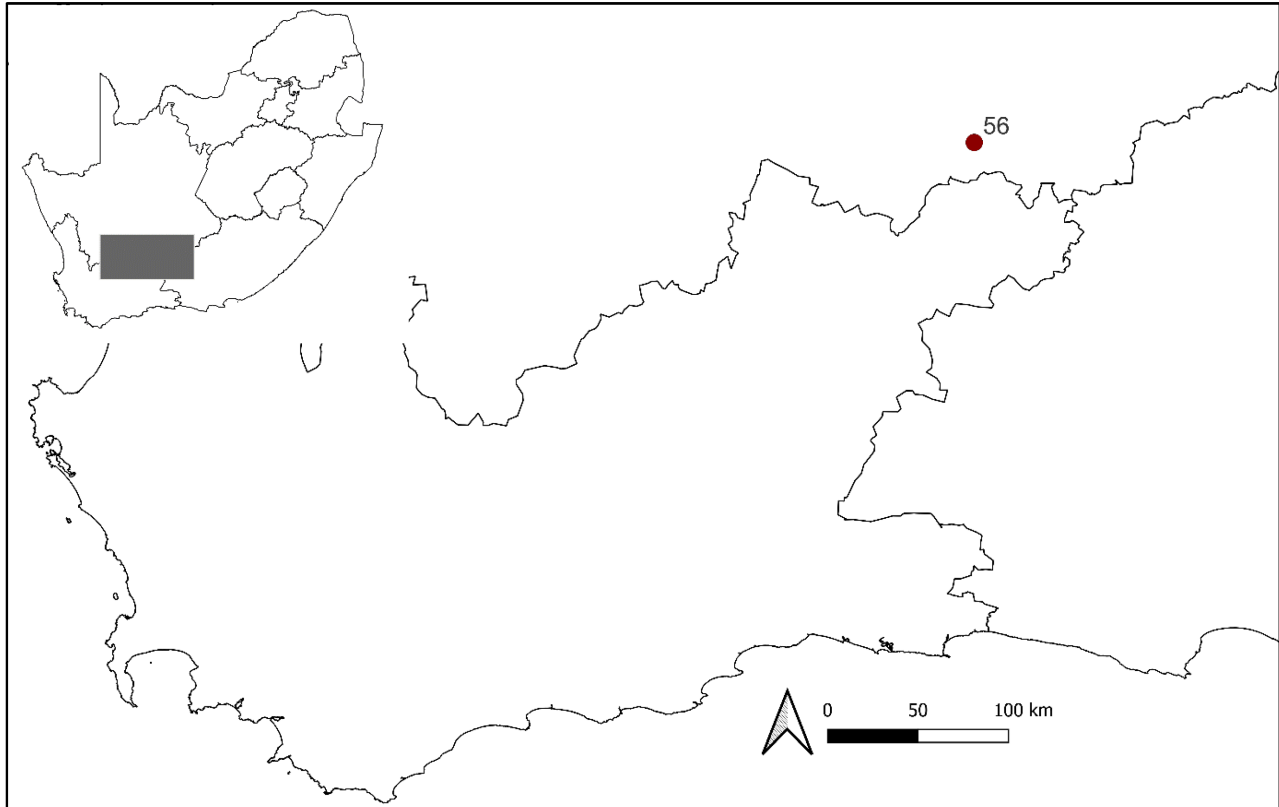


FIGURE 33. Map of the locality where the *Stasimopus teras* **sp. nov.** specimen was collected. Numbers match the site numbers in Figure 1. Map created in QGIS version 3.4.8-Madeira (2019), available at: <http://qgis.osgeo.org>.

Legs: ♀: Length order: IV, I, II, III. I Total length 16.67; Segment lengths 4.74, 3.39, 3.39, 3.62, 1.52; Spination: spines absent on femur and patella, with sparse setae. Tibia *pl&rl*- spinules extend entire segment, less dense proximally, *do* (Fig 31D)- distal dense patch of spines, reach $\frac{1}{5}$ of segment length, continued on metatarsus. Metatarsus *pl&rl*- dense spinules along entire segment, *do* (Fig 31D)- patch of dense spines proximally, covering approx. $\frac{1}{4}$ of segment, *v*- scopulate. Tarsus *pl&rl*- dense spinules along entire segment, *v*- scopulate. II Total length 16.07; Segment lengths 4.98, 3.24, 2.96, 3.45, 1.44; Spination: spines absent on femur and patella, with sparse setae. Tibia *pl&rl*- spinules extend entire segment, less dense proximally, *do*- distally dense patch of spines, reach $\frac{1}{4}$ of segment, continues on metatarsus. Metatarsus and tarsus have same spination as leg I. III Total length 15.99; Segment lengths 4.52, 3.89, 1.39, 4.07, 2.12; Spination: spines absent on femur, with sparse setae. Patella *pl*- 8 spinules interspersed with thick setae, *do*- 5 spinules. Tibia *do* (Fig 31E)- stout red spines dense distally, covered in long setae (extending *pl&rl*), *rl*- 3 spinules proximally. Metatarsus *do* (Fig 31E)- 2 rows of stout red spines, 17–21 in each, with small red spinules between. Tarsus *pl*- 11–12 large red spines extend from distal tip to half segment. IV Total length 19.54; Segment lengths 5.05, 3.79, 3.82, 4.88, 1.99; Spination: spines absent on femur, with sparse

setae. Patella *do*- short dense red spines proximally, less dense distally, interspersed with stout black setae. Tibia *pl*- many spines extending under the dorsal setae, *do*- very dense setae cover randomly scattered spinules. Metatarsus *pl* (Fig 32A)- 9–13 spines denser distally, *v*- 9–10 spines in a transverse row (preening comb) (Fig 32B). Tarsus *pl* (Fig 32A)- 15 short spines, denser distally, *rl*- 4–5 spines distally.

Spermathecae: (Fig 22I) Entire, with terminus gradually curving inwards, spermathecae equal width entire length.

Distribution and environment notes:

The species is found in the localities indicated in Figure 33. The species is only known from the type locality near Victoria West in the Northern Cape province. The site where the specimen was found was under powerlines on a flat plain. The vegetation was dominated by typical Karoo low to medium shrubs with some grass patches. The soil was grey with a russet-coloured surface layer which was slightly cracked. The burrow lid was clearly visible.

***Stasimopus theaei* sp. nov.**

(Figures 2H, 7B, 17D, 22E & F, 34, 35, 36)

Type material: Holotype ♀ SOUTH AFRICA: Eastern Cape Province, Somerset East (-32.9386, 25.6612), 14.v.2018, S. Brandt, C. Sole, E. Engelbrecht and E. Brand, (NCA 2019/606).

Etymology: The specific epithet is a patronym in homage to Thea Lyle Subramoney the daughter of the second author.

Diagnosis: The females of *S. theaei* sp. nov. are distinguishable from other members of the genus occurring in the Karoo based on the following combination of characters. Easily distinguished by the highly dense denticles on the chelicera (>50), all other species but *S. spinosus* have less than 30. Distinguishable from *S. spinosus* by the extent of spines on metatarsus 1 extending more than half the segment (only matched or exceeded by *S. unispinosus*, *S. hamartia* sp. nov. and *S. erythrognathus*).

Description: Based on the holotype ♀ (NCA 2019/606).

Remarks: ♂: Known only from the type female.

General: ♀: (Fig 7B) Medium bodied spider, 21.66 total length.

Carapace: ♀: Carapace length 10.29; width 9.61. Reddish colour, smooth texture, with some pleats in the thoracic region. The fovea strongly procurved, 2.20 in length.

Ocelli: ♀: (Fig 2H, 17D) AME diameter 0.25, PME diameter 0.26, MOQ anterior width 2.57, MOQ posterior width 3.89; AME-AME 0.58, AME-ALE 0.34, ALE-ALE 1.83, PME-PME 1.86, PME-PLE 0.48, PLE-PLE 3.10. AER fairly straight, PER slightly recurved.

Chelicerae: ♀: (Fig 34C) Two teeth rows present, 4 teeth in proventral row, 5 in retroventral row; 48–50 cuspules in between which vary in sizes.

Sternum, labium and maxillae: ♀: (Fig 34A) Sternum length 5.51; sternum width 5.75. Longitudinally elongated sigilla, distal end 0.72 apart, proximal end 1.66 apart. Labium (Fig 34B) 14 cuspules present, maxillae 13–14 cuspules present.

Abdomen: ♀: Abdomen length 11.37; width 8.41. Greyish yellow colouration, end of abdomen towards the spinnerets darker grey than the rest of abdomen.

Pedipalps: ♀: Total length 11.49; Segment lengths 3.58, 2.41, 2.62, -, 2.89. Spination: spines absent on femur, with sparse setae. Patella *pl*- 2–3 long thin spines. Tibia *pl*- 2 tibial spurs, 1 proximal and 1 distal, *do*- small patch of spinules distally extend onto tarsus. *rl*- 22 spinules along segment. Tarsus *pl*- 12–14 large spines, *do*- patch of 17–19 spinules, less dense distally, extend $\frac{1}{3}$ – $\frac{1}{4}$ of segment, *rl*- covered in dense spines (25–30).

Legs: ♀: Length order: IV, III, I, II. I Total length 17.76; Segment lengths 5.97, 3.56, 3.81, 3.98, 1.40; Spination: spines absent on femur and patella, with sparse setae. Tibia *pl*- small spines extending $\frac{1}{2}$ – $\frac{1}{3}$ from the distal end, *do* (Fig 35A)- distally dense patch of spines, extend to $\frac{1}{7}$ of segment, continues on metatarsus, *rl*- spinules extend entire segment less dense proximally. Metatarsus *pl&rl*- very dense spinules along the entire segment, *do* (Fig 35A)- patch of dense spines proximally, cover approx. $\frac{2}{3}$ of segment, *v*- scopulate. Tarsus *pl&rl*- dense spinules along entire segment, *v*- scopulate. II Total length 15.38; Segment lengths 4.59, 3.05, 2.95, 3.53, 1.26; Spination: spines absent on femur and patella, with sparse setae. Tibia *pl*- small spines extending $\frac{1}{2}$ of section from distal end, *do* (Fig 35B)- distally dense patch of spines, extend $\frac{1}{5}$ of segment, continues on metatarsus, *rl*- spinules extend entire segment, less

dense proximally. Metatarsus *pl&rl*- dense spinules along the entire segment, *do* (Fig 35B)- patch of dense spines proximally, covering approx. $\frac{1}{3}$ of segment, *v*- scopulate. Tarsus *pl&rl*- dense spinules along the entire segment, *v*- scopulate. III Total length 17.85; segment lengths 4.80, 4.21, 2.10, 4.12, 2.62; Spination: spines absent on femur, with sparse setae. Patella *pl*- 12 red spinules, has rows of black setae. Tibia *do* (Fig 35C)- stout red spines very dense distally, covered in long setae. Metatarsus *do* (Fig 35C)- 2 rows of stout red spines (18–22 in each), between small red spinules. Tarsus *pl*- dense patch of red spines extend distally and covered in dense setae, *pl&rl*- 3–5 stout black spines along both surfaces, denser distally, *v*- scopulate. IV Total length 20.93; Segment lengths 5.05, 4.52, 4.17, 5.03, 2.17; Spination: spines absent on femur, with sparse setae. Patella *do*- short dense red spines proximally, less dense distally, interspersed with stout black setae. Tibia *pl* (Fig 35D)- many spines extending under the dorsal setae, *do*- dense setae covering randomly scattered spinules. Metatarsus *pl* (Fig 35D)- 17–20 spines extending ventrally, *v*- 7–8 spines in a transverse row (preening comb) (Fig 35E). Tarsus *pl* (Fig 35D)- very dense setae covering randomly scattered spinules.

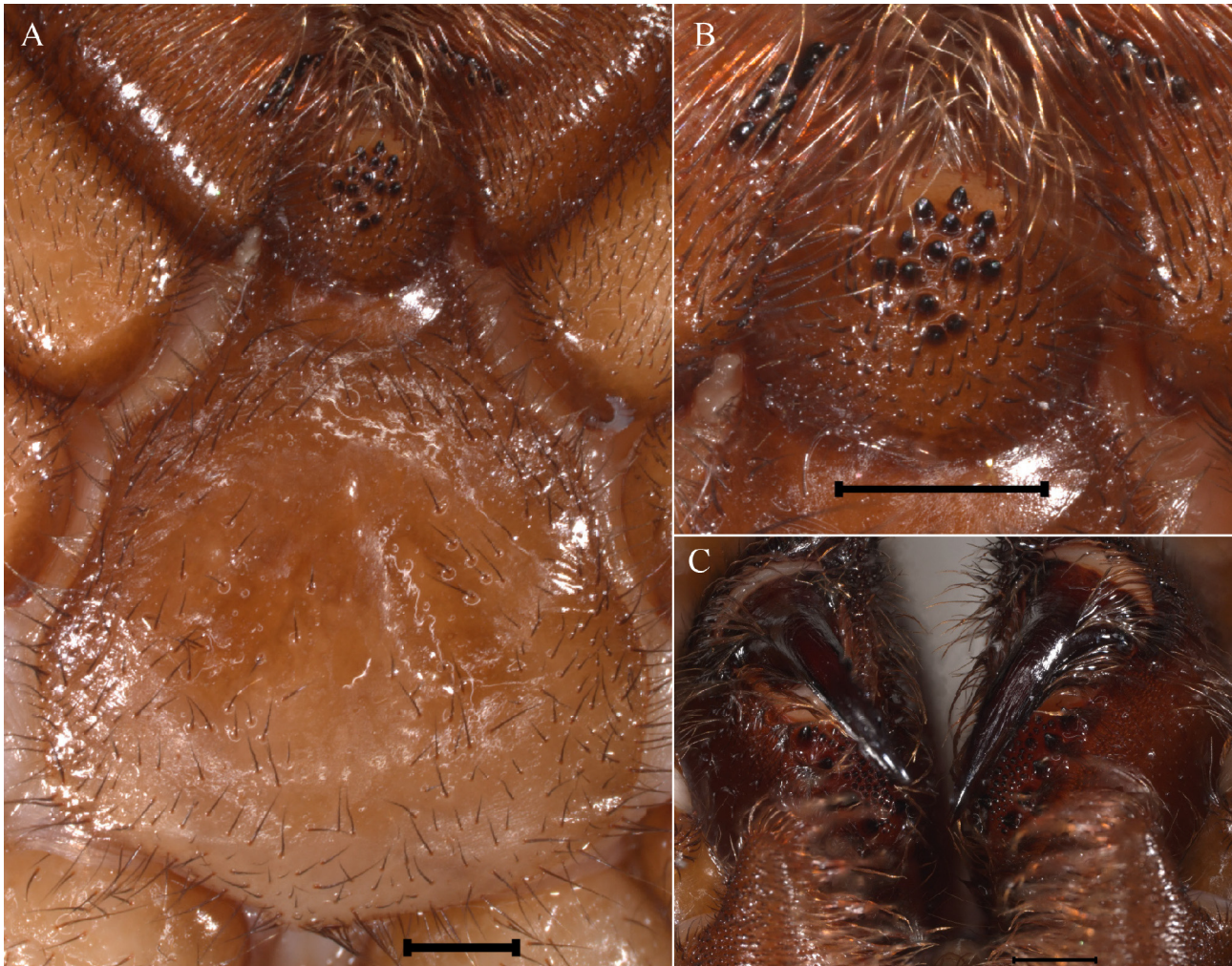


FIGURE 34. Female of *Stasimopus theaei* **sp. nov.** (NCA 2019/606). (A) Sternum with fused labium and visible sigilla (as shown by the arrows). (B) Labium teeth. (C) Fangs with cheliceral teeth. Scale: 1mm.

Spermathecae: (Fig 22E, F) Entire, with short inflated terminus, one appears $\frac{2}{3}$ length of other spermathecae.

Distribution and environment notes:

The species known from the type locality indicated in Figure 36. It has been collected near Somerset East in the Eastern Cape province. The location was a flat between small hills. The vegetation was dominated by low shrubs and aloe plants. The soil was very hard, chalky and pale. The specimen was found in a deep vertical burrow (approx. 30 cm deep), which angled slightly near the bottom.



FIGURE 35. Female of *Stasimopus theaei* **sp. nov.** (NCA 2019/606). (A) Leg I tibia, metatarsus, tarsus. Dorsal aspect. (B) Leg II tibia, metatarsus, tarsus. Dorsal aspect. (C) Leg III tibia, metatarsus, tarsus. Dorsal aspect. (D). Leg IV tibia, metatarsus, tarsus. Prolateral aspect. (E) Leg IV metatarsus preening comb. Scale: 1mm.

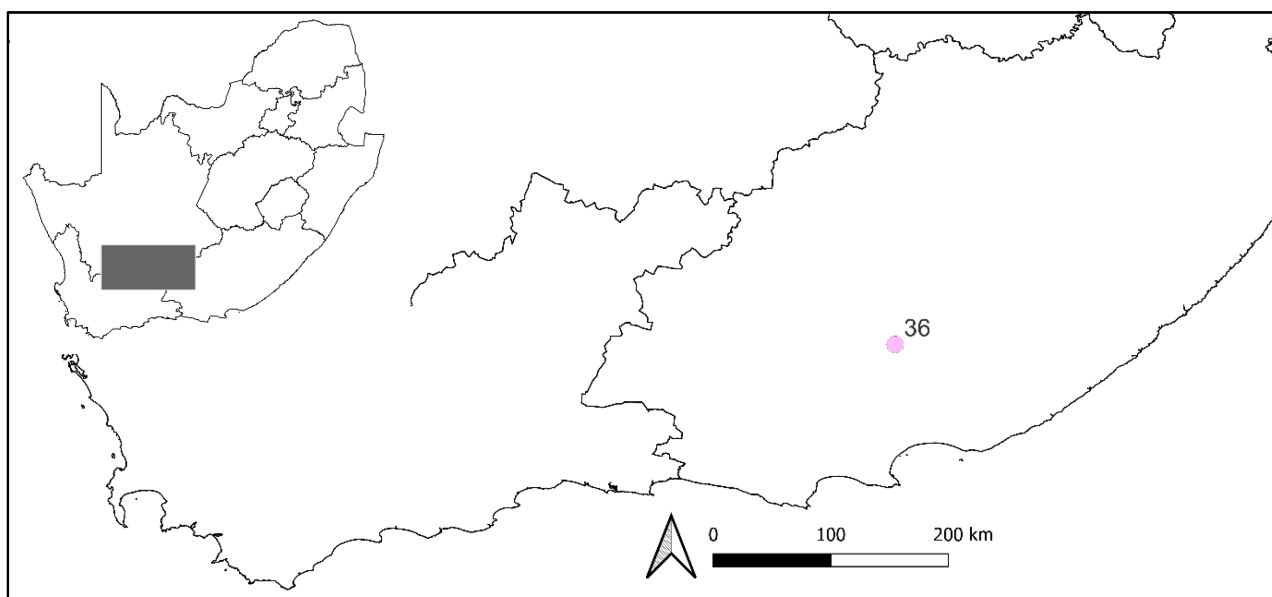


FIGURE 36. Map of the locality where the *Stasimopus theaei* **sp. nov.** specimen was collected. Numbers match the site numbers in Figure 1. Map created in QGIS version 3.4.8-Madeira (2019), available at: <http://qgis.osgeo.org>.

***Stasimopus venterstadensis* sp. nov.**

(Figures 2J, 7C, 18, 22G & H, 37, 38, 39)

Type material: Holotype ♀ SOUTH AFRICA: Eastern Cape Province, Venterstad (−30.9077, 25.7738), 12.v.2018, S. Brandt, C. Sole, E. Engelbrecht and E. Brand, (NCA 2019/610). Paratypes: Same data, 12.v.2018, 2♀♀ (NCA 2019/608, NCA 2019/609).

Etymology: The species is named after the type locality, Venterstad, on the Eastern Cape province in South Africa.

Diagnosis: The females of *S. venterstadensis* **sp. nov.** are distinguishable from other members of the genus occurring in the Karoo based on the following combination of characters. It is differentiated from *S. astutus*, *S. leipoldti*, *S. maraisi*, *S. patersonae*, *S. schrieneri*, *S. theaei* **sp. nov.**, *S. ignis* **sp. nov.** and *S. teras* **sp. nov.** by the presence of an apical tuft being present on metatarsus III. This species is distinguishable from the other species based on the number of spines in the preening comb on metatarsus IV, *S. unispinosus* having less than 3, whereas, *S. schonlandi*, *S. artifex* and *S. spinosus* all have more than 6.

Description: Based on the holotype ♀ (NCA 2019/610) and the paratypes 2♀ (NCA 2019/608, NCA 2019/609).

Remarks: ♂: Known only from females. **General:** ♀: (Fig 7C) Large bodied spiders, ranging between 18.48–25.32 (18.48) total length.

Carapace: ♀: Carapace length 8.98–11.12 (8.98); width 7.52–10.40 (7.52). Dark reddish orange colouration. Smooth texture, with pleats in thoracic region. Fovea strongly procurved, between 1.63–1.94 (1.63) in length.

Ocelli: ♀: (Fig 2J, 18) AME diameter 0.28–0.34 (0.28), PME diameter 0.30–0.38 (0.30), MOQ anterior width 2.04–2.64 (2.04), MOQ posterior width 3.26–4.17 (3.26); AME-AME 0.56, AME-ALE 0.30, ALE-ALE 1.81, PME-PME 1.83, PME-PLE 0.38, PLE-PLE 3.19. AER and PER almost straight.

Chelicerae: ♀: (Fig 37C) Two teeth rows present, 6 teeth in proventral row, 6 teeth in retroventral row; 29–31 cuspules in between.

Sternum, labium and maxillae: ♀: (Fig 37A) Sternum length 5.00–5.88 (5.00); sternum width 4.47–6.14 (4.47). Longitudinally elongated sigilla, distal end 0.64–0.72 (0.67) apart, proximal end 1.61–1.87 (1.80) apart; labium (Fig 37B) 12–16 cuspules present; maxillae 5–7 cuspules present.

Abdomen: ♀: Abdomen length 9.50–14.20 (9.50); width 7.02–10.12 (7.02). Grey colour, with one large dark spot near the carapace followed by a smaller one towards the spinnerets.

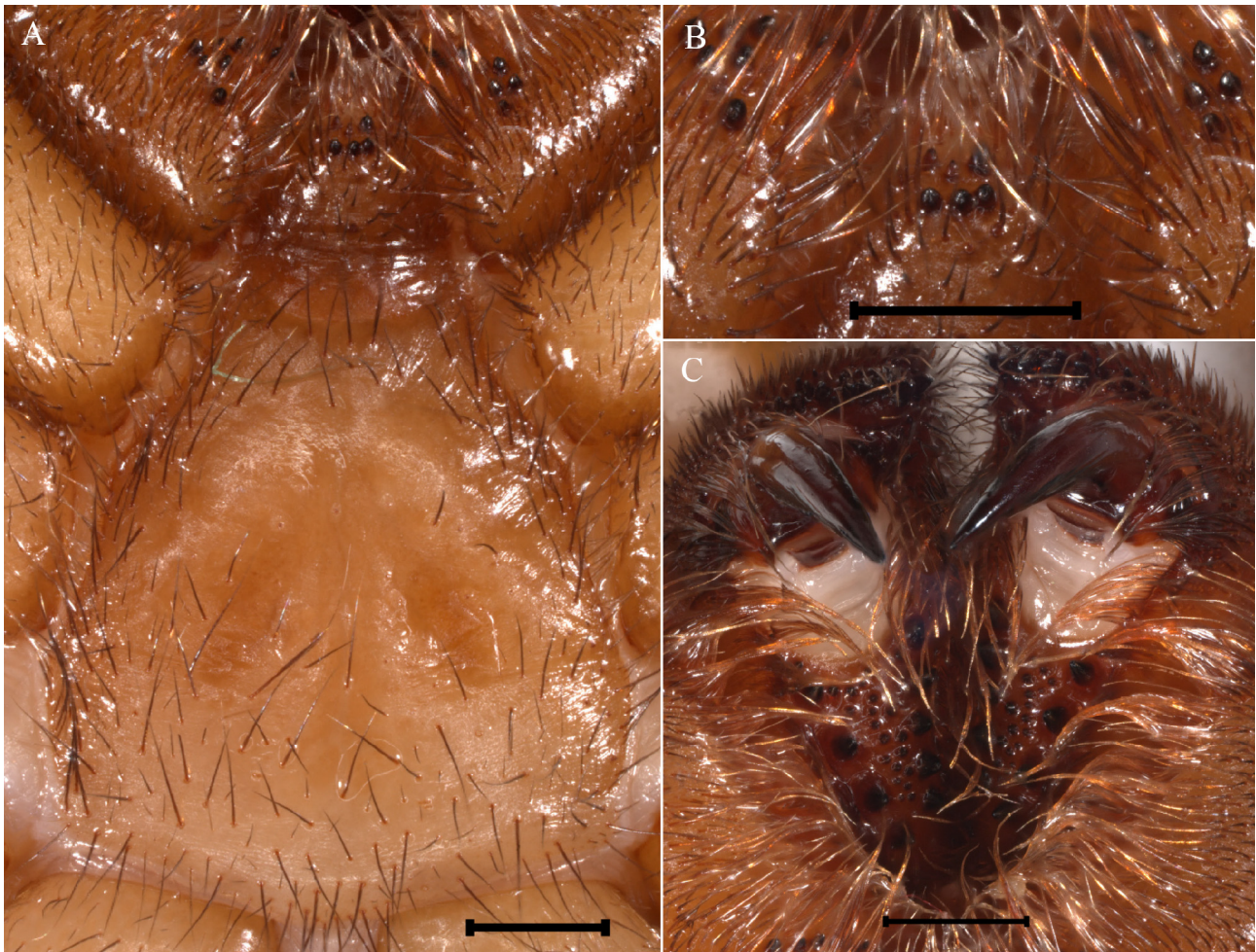


FIGURE 37. Female of *Stasimopus venterstadensis* sp. nov. (NCA 2019/610). (A) Sternum with fused labium and visible sigilla (as shown by the arrows). (B) Labium teeth. (C) Fangs with cheliceral teeth. Scale: 1mm.

Pedipalps: ♀: Total length 13.08; Segment lengths 4.45, 2.90, 2.69, -, 3.05. Spination: spines absent on femur, with sparse setae. Patella *pl*- 2–3 long thin spines. Tibia *pl*- 2 tibial spurs, 1 proximal and 1 distal, *do*- small patch spinules distally extending onto the tarsus, *rl*- 15–16 spinules along segment. Tarsus *pl*- 8–10 large spines, *do*- a patch of 16–18 spinules, less dense distally, extend - of segment, *rl*- covered in dense spines (24–27).

Legs: ♀: Length order: IV, III, I, II. I Total length 18.72; Segment lengths 5.97, 3.56, 3.81, 3.98, 1.40; Spination: spines absent on femur and patella, with sparse setae. Tibia *pl*- small spines extending - segment from distal end, *do* (Fig 38A)- distally dense patch of spines, extending segment, and continued on metatarsus, *rl*- spinules extending entire segment, less dense proximally. Metatarsus *pl&rl*- very dense spinules along entire segment, *do* (Fig 38A)- patch of dense spines proximally, extending approx. segment, *v*- scopulate. Tarsus *pl&rl*- very dense spinules along entire segment, *v*- scopulate. II Total length 16.52; Segment lengths 5.20, 3.22, 2.98, 3.61, 1.51; Spination follows that of leg I (Fig 38B). III Total length 19.35; Segment lengths 4.89, 4.52, 3.12, 4.12, 2.71; Spination: spines absent on femur and patella, with sparse setae. Tibia *do* (Fig 38C)- stout red spines dense distally, hidden by long setae. Metatarsus *do* (Fig 38C)- 2 rows of stout red spines (22–27 in each), between smaller red spinules, *V*- 8 spines distally (Fig 38E). Tarsus *pl&rl*- 10–15 stout black spines along both surfaces, denser distally, *v*- scopulate. IV Total length 23.03; Segment lengths 6.00, 4.66, 4.31, 5.41, 2.66; Spination: spines absent on femur, with sparse setae. Patella *do*- covered in red dense spinules. Tibia *do*- dense setae covering randomly scattered spinules. Metatarsus *pl* (Fig 38D)- 22 spines, *v*- 8 spines in a transverse row (preening comb) (Fig 38F). Tarsus *pl* (Fig 38D)- dense setae covering randomly scattered spinules.

Spermathecae: (Fig 22G, H) Entire, with inflated terminus directed inwards.



FIGURE 38. Female of *Stasimopus venterstadensis* **sp. nov.** (NCA 2019/610). (A) Leg I tibia, metatarsus, tarsus. Dorsal aspect. (B) Leg II tibia, metatarsus, tarsus. Dorsal aspect. (C) Leg III tibia, metatarsus, tarsus. Dorsal aspect. (D). Leg IV metatarsus, tarsus. Prolateral aspect. (E) Leg III metatarsal tuft. Ventral aspect. (F) Leg IV metatarsus preening comb. Scale: 1mm.

Distribution and environment notes:

The species is found in the localities indicated in Figure 39. The species is only known from one locality near Venterstad in the Eastern Cape province. Specimen collected from a flat plain with sandy soil. The vegetation was dominated by typical Karoo shrubs and buffalo grass.

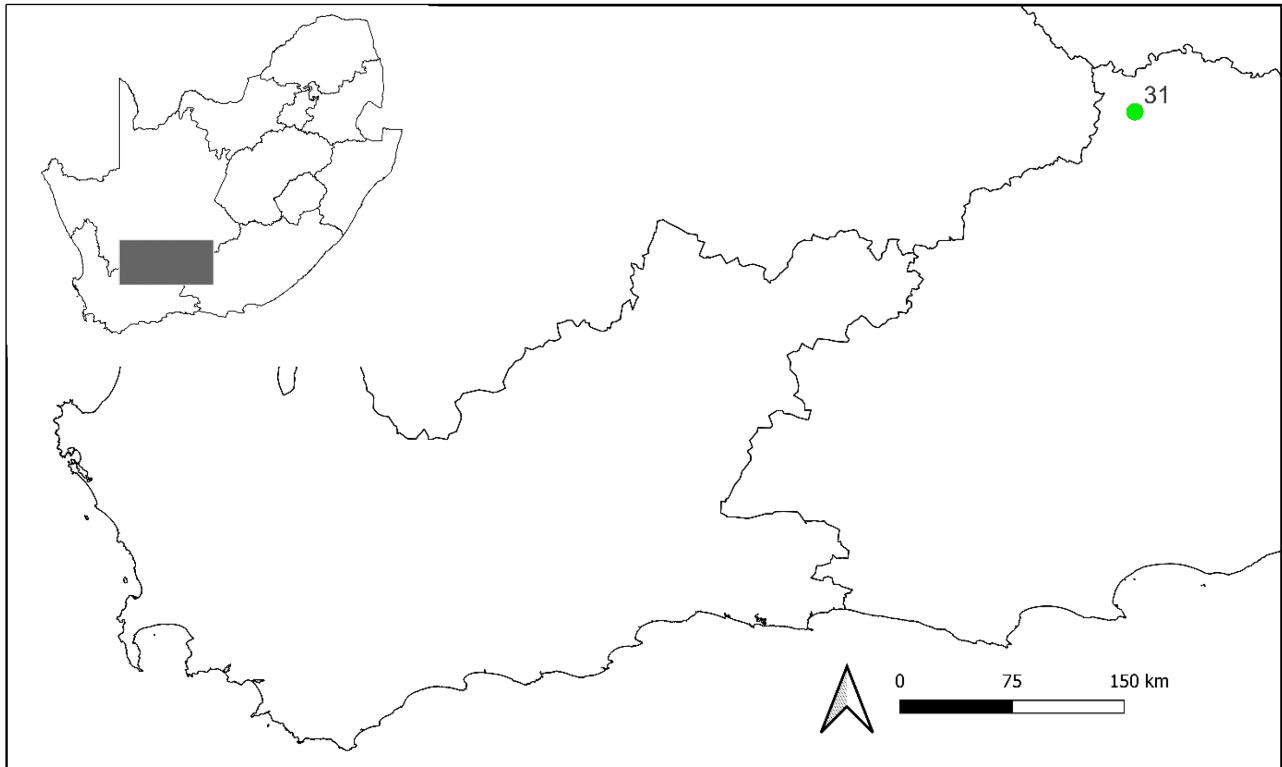


FIGURE 39. Map of the locality where *Stasimopus venterstadensis* **sp. nov.** specimens were collected. Numbers match the site numbers in Figure 1. Map created in QGIS version 3.4.8-Madeira (2019), available at: <http://qgis.osgeo.org>.

Stasimopus maraisi male description

(Figs 3G, 7D, 12B, 13D, 40, 41)

Material examined: ♂ SOUTH AFRICA: Northern Cape Province, Williston (-31.7863, 20.7857), 19.v.2018, S. Brandt, C. Sole, E. Engelbrecht and E. Brand, (NCA 2019/630).

Diagnosis: The males of *S. maraisi* are distinguishable from other members of the genus occurring in the Karoo based on the following combination of characters. The main distinguishing feature is that *S. maraisi* has a carapace which is smooth in texture, whereas other species are more rugose. Further differentiation can be made from *S. astutus*, *S. erythrognaethus*, *S. malesociatus* **sp. nov.**, *S. patersonae*, *S. steynsbergensis*, *S. karooensis* **sp. nov.** and *S. mandelai* based on the pedipalp not reaching the tarsus of leg I. Distinguished from *S. palpiger* as the pedipalp is longer than leg I, which *S. maraisi* is not.

Description: ♀: The female description is available in Hewitt 1914. Based on a ♂ (NCA 2019/630).

Remarks: ♂: The original male described in Hewitt 1927 pg. 425–426 was found to not be a genetic match for the characters describing the female holotype for the species. For this reason, the male that does match genetically is described here.

General: ♂: (Fig 7D) Medium bodied spider, 8.46 total length.

Carapace: ♂: Carapace length 3.86; width 3.46. Orange yellow colouration, smooth in texture. Fovea procurved, 0.85 in length.

Ocelli: ♂: (Fig 3G, 12B) AME diameter 0.18, PME diameter 0.13, MOQ anterior width 1.11, MOQ posterior width 1.34; AME-AME 0.16, AME-ALE 0.10, ALE-ALE 0.69, PME-PME 0.73, PME-PLE 0.11, PLE-PLE 1.15 AER strongly recurved, PER also recurved.

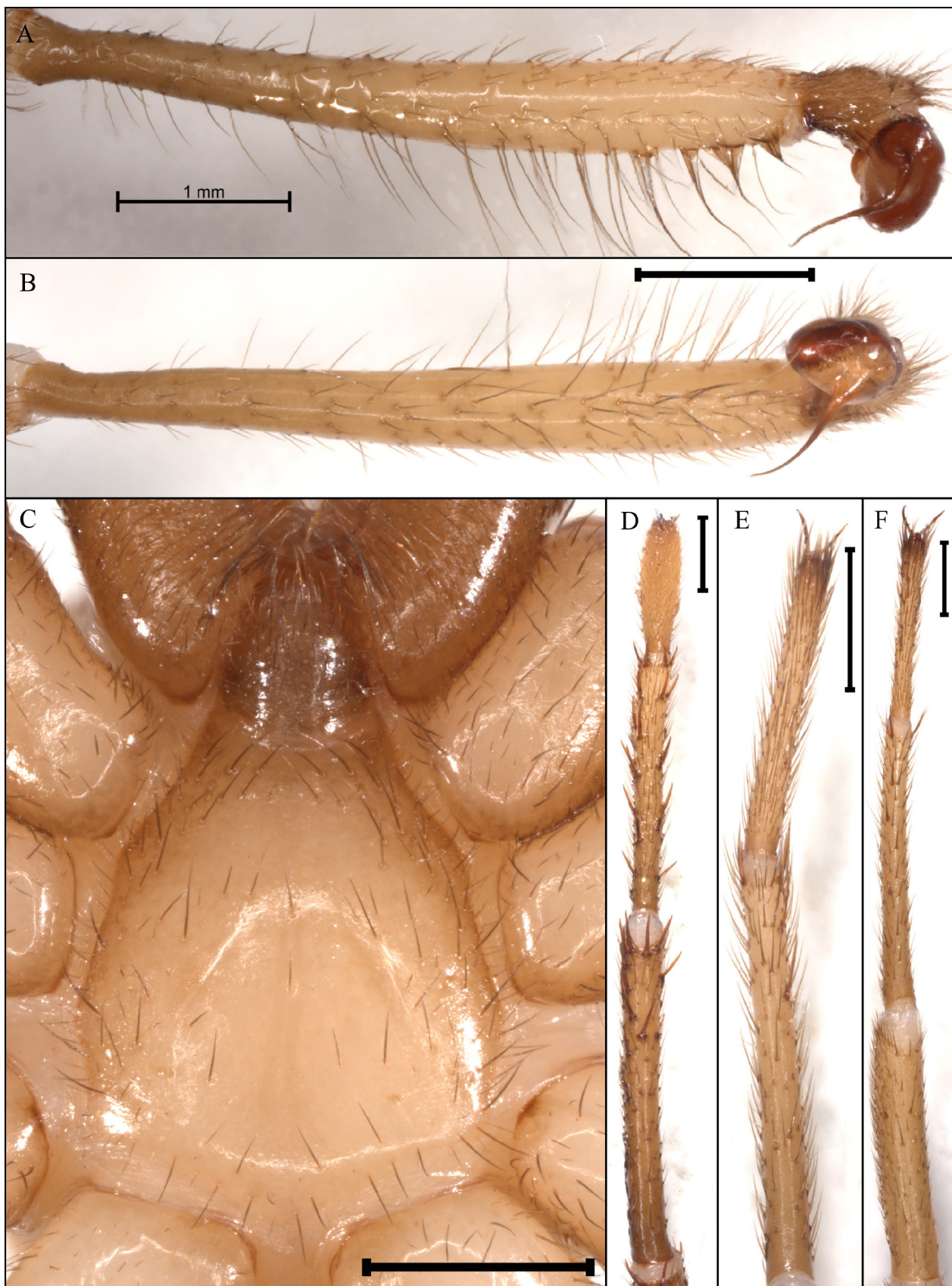


FIGURE 40. Male of *Stasimopus maraisi* (NCA 2019/630). (A) Pedipalp tibia, bulb, retrolateral aspect. (B) Pedipalp tibia, bulb, prolateral aspect. (C) Sternum with fused labium and visible sigilla (as shown by the arrows). (D) Leg I tibia, metatarsus, tarsus. Ventral aspect. (E) Leg III metatarsus, tarsus. Ventral aspect. (F) Leg IV tibia, metatarsus, tarsus. Ventral aspect. Scale: 1mm.

Chelicerae: ♂: (Fig 13D) Two teeth rows present, 3 teeth in proventral row, 4 in retroventral row. 5–6 cuspules between rows.

Sternum, labium and maxillae: ♂: (Fig 40C) Sternum length 2.21; sternum width 1.93. Sternum shape has shallow impressions of where the coxa are situated. Sigilla in the shape of fused arrow, distal end fused, proximal end 0.93 apart. Cuspules on labium absent; maxilla cuspules absent.

Abdomen: ♂: Abdomen length 4.61; width 3.10. Light grey colouration with dark bands. Large dark patch proximally covering 1/3 total abdomen dorsally, followed by 4 smaller dark bands which are lighter in the middle.

Pedipalps: ♂: (Fig 40A, B) Total length 15.32; Segment lengths 1.34, 5.15, 4.22, -, 4.61. Spination: spines absent. Bulb oval, embolus elongated tapering into sharp point, curving posteriorly.

Legs: ♂: Length order: I, IV, II, III. I Total length 17.76; Segment lengths 5.31, 2.29, 4.40, 3.97, 1.79; Spination: spines absent on femur, with sparse setae. Patella *do*- 1 small spine, *v*- 4 spines distally (slightly *rl*). Tibia *v* (Fig 40D)- 12 large spines extending *rl*, only on distal half. Metatarsus *v* (Fig 40D)- 17 large spines extending *pl&rl*. Tarsus *v* (Fig 40D)- scopulate. II Total length 15.10; Segment lengths 4.52, 2.02, 3.59, 3.24, 1.73; Spination: Femur 4 randomly scattered spines. Spines absent on patella. Tibia *v*- 11 large spines extending *rl*. Metatarsus *v*- 18 large spines, extending *pl&rl*. Tarsus *v*- scopulate. III Total length 11.56; Segment lengths 3.10, 1.63, 1.37, 3.31, 2.16; Spination: spines absent on femur, with sparse setae. Patella *do*- 8 small spines along surface, *rl*- 6 spines. Tibia *pl*- 1 spine, *do*- 6–8 spines distally, *v*- 2 spines. Metatarsus *pl*- 3 red spines, *v* (Fig 40E)- 4 spines, *rl*- 2 spines. Tarsus *pl&rl*- 2–3 spines on either edge, *v* (Fig 40E)- 7 small spines, dense setae covering spines. IV Total length 16.63; Segment lengths 4.39, 1.87, 3.43, 4.40, 2.55; Spination: spines absent on femur, with sparse setae. Patella *do*- short dense red spines proximally (approx. 30), less dense distally, interspersed with fine black setae. Tibia *v* (Fig 40F)- 1 small spine. Metatarsus *pl*- 5–6 spines, *v* (Fig 40F)- 8 spines, *rl*- 1 spine distally. Tarsus *pl*- 4–5 spines, *v* (Fig 40F)- 9 spines (extend *pl*), *rl*- 1 spine distally.

Distribution and environment notes:

This species is widely distributed across the Karoo region, mostly in the Western and Northern Cape provinces of South Africa as seen in Figure 41. The species occurs in a range of soil and vegetation types. The soil types include clay, loam, sand and occasionally silt, but the specimens were most often found in clay or loam soils. All the specimens were collected on open plains near to drainage lines. In these areas the vegetation was mostly low shrubs, with grasses present at few sites.

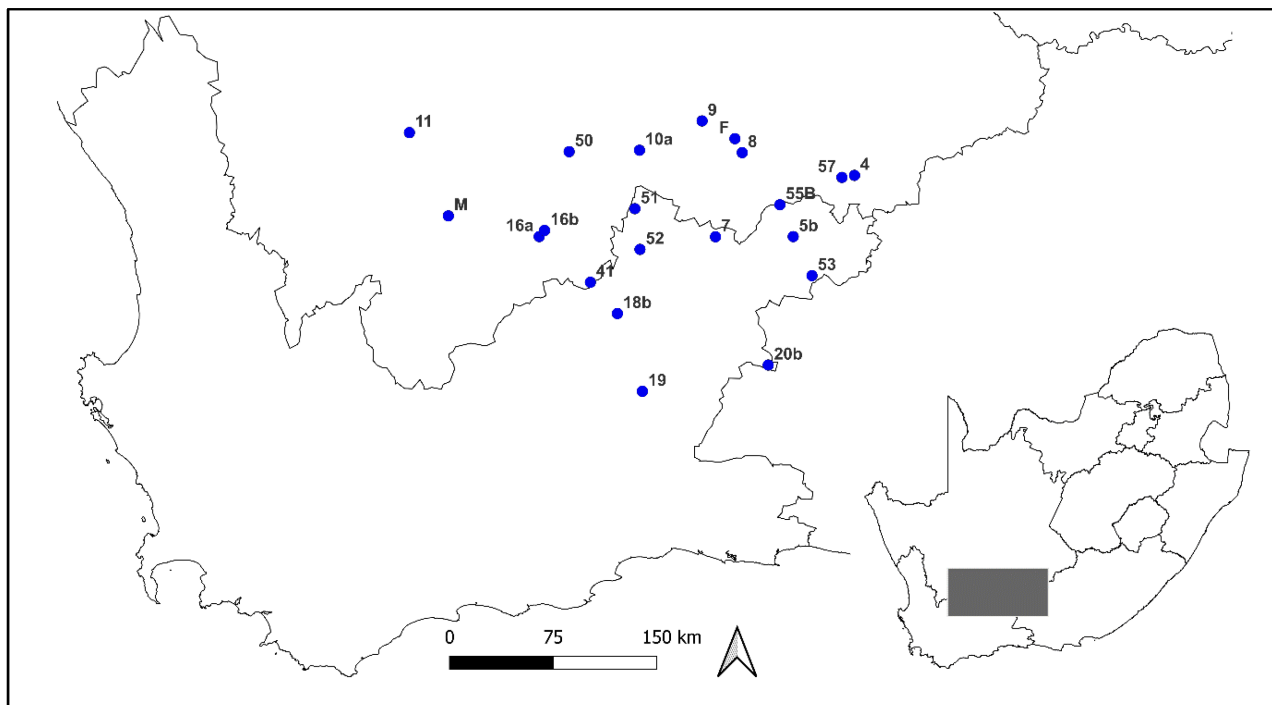


FIGURE 41. Map of the localities where *S. maraisi* Hewitt 1914 specimens were collected. Numbers match the site numbers in Figure 1. The points denoted as F and M represent the female and male type localities for this species. Map created in QGIS version 3.4.8-Madeira (2019), available at: <http://qgis.osgeo.org>.

4. Discussion

4.1. *Karoo species diversity*

Based on the taxonomic literature, 12 species of *Stasimopus* are known from within or nearby this part of the Karoo (Dippenaar-Schoeman *et al.* 2010). Our study has increased the number of species from the Karoo region to 23 species. Two of these additional species were already described, but they had never been recorded in the Karoo region. *Stasimopus erythrognathus* was initially believed to only occur in the Western cape (Worster), but its range has been expanded to the Eastern Cape (700 km in distance). *Stasimopus leipoldti* is reported from Clanwilliam in the Western Cape and has now also been recorded in the Tankwa Karoo.

4.2. *Integrative taxonomy*

Integrative taxonomy stresses the importance of using multiple lines of evidence when testing taxonomic hypotheses (Bond 2012; Ferretti *et al.* 2019; Hedin & Bond 2006). Under this framework we have examined distinct evolutionary lineages (genetic monophyletic groups) as well as morphological characters to find a higher than expected species diversity present in the Karoo region of South Africa.

Each species identified and described in this manuscript is supported following the integrated taxonomic framework. Within this context, a species complex was found. There is a genetic species complex between *S. erythrognathus*, *S. karooensis* **sp. nov.** and *S. theaei* **sp. nov.** Each of these species is however, morphologically distinct based on a range of characteristics. In order to resolve this genetic complex, more samples of *S. karooensis* **sp. nov.** and *S. theaei* **sp. nov.** are required, as this is currently based on small sample sizes (two and one specimen respectively) as well as possibly including additional gene regions. The integrative framework allows us to be confident in the description of *S. teras* despite the physical deformity in the ocular pattern. The other characters used to identify and describe the species are distinct enough without the use of the ocular pattern to separate the species from others. This is further supported by the molecular phylogeny which clearly separates the species. It would be useful for the type locality to be sampled to find an undeformed member of the species (so that the true ocular pattern can be described) and a male representative.

Mygalomorph spiders are notorious for their homoplasious morphology, making identification and taxonomy challenging (Bond *et al.* 2021; Ferretti *et al.* 2019; Hamilton *et al.* 2011; Montes de Oca *et al.* 2022; Wilson *et al.* 2023). This is apparent from the mismatch of the original *S. maraisi* holotype and allotype. Further inflating the morphological identification problem is that the majority of *Stasimopus* species (and mygalomorphs generally) are described on the basis of only one sex (53%) of which most are described only based on females (40%) (Bond *et al.* 2021; Engelbrecht & Prendini 2012). This is especially problematic as males of the genus are known to be more diagnostic than females (Engelbrecht & Prendini 2012; Hendrixson & Bond 2004). In this manuscript however, females did display a few distinct diagnostic characters, most prominently the presence or absence of an apical tuft on metatarsus III, the spination of the preening comb, extent of spination on legs I and II as well as the density of cuspules on the labium, maxilla and chelicera.

The species described here, add to the issue of species described by only one sex. This is a challenging issue to resolve due to the difficulty of sampling spiders with the life histories observed here. To compensate for this the DNA evidence is important. In this study both mitochondrial and nuclear DNA was used. Mitochondrial DNA is faster evolving than nuclear, leading to an increased amount of informative sites, often recovering deeper population divergences (Ferretti *et al.* 2019; Hendrixson & Bond 2005). Mitochondrial DNA does tend to conflate population structure to species diversity due to the sedentary habits of females of the species (Ferretti *et al.* 2019; Harvey *et al.* 2015). This emphasises the need to include both mitochondrial and nuclear DNA when constructing phylogenies for taxonomies (Ferretti *et al.* 2019; Hedin *et al.* 2013; Satler *et al.* 2013). The DNA data generated for this study as well as the morphological matrices are invaluable resources. It is suggested that if a wider range of *Stasimopus* species can be genetically sequenced, these data should feed into a combined molecular and morphology analyses. This would create a fully integrated taxonomy for the entire genus if the funding for sequencing can be obtained.

The field of taxonomy is of vital importance as it is foundational to all other biological sciences. This study a first step to understanding the diversity of *Stasimopus* which will enable us to better understand their conservation status and our understanding of the Karoo ecosystem.

5. Conclusion

This study is the first integrative taxonomy for the genus *Stasimopus*. It is however, limited to the species occurring in the Karoo, and future studies should extend this to the entire genus. The information gathered greatly increases the species diversity as well as expanding the distribution range for various species. It is apparent that there is a great amount of undiscovered diversity present within the mygalomorphs in southern Africa and more comprehensive sampling is needed. It is also important that going forward in the field of mygalomorph systematics that DNA evidence is considered when identifying and describing species due to the conservative nature of the morphology.

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