

Southern African pholcid spiders: revision and cladistic analysis of *Quamtana* gen. nov. and *Spermophora* Hentz (Araneae: Pholcidae), with notes on male–female covariation

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The southern African pholcid spiders previously assigned to *Pholcus* and *Spermophora* are revised and their phylogenetic position within Pholcidae is analysed cladistically. Two distinct groups are recognized: the first is restricted to the Cape region and probably correctly placed in *Spermophora*; it includes *Spermophora peninsulae* Lawrence and four new species. The second is more widely distributed in southern and eastern South Africa, and reaches as far north as Cameroon, Congo (Democratic Republic) and Uganda; it is assigned generic status (*Quamtana* gen. nov.), and includes two species transferred from *Pholcus* [*Q. leptopholcica* (Strand), *Q. ciliata* (Lawrence)] as well as 23 new species. A key to the pholcid spiders of South Africa is presented. A close correlation between a male character (distance between cheliceral apophyses) and a female character (distance between pockets on epigynum) is documented in *Quamtana*. © 2003 The Linnean Society of London, *Zoological Journal of the Linnean Society*, 2003, **139**, 477–527.

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INTRODUCTION

Pholcids are among the most diverse families of spiders, and recent revisions of New World, Australian and African taxa (Huber, 2000, 2001, 2003a,b) have shown that less than about 10–30% of the species present in collections have been described. Circumstantial evidence (patchiness of collection sites, low numbers of shared species among sites) suggests that only a small percentage of extant species has been collected and that the present estimate of c.800 may represent no more than perhaps 10% of the actual diversity.

Within South Africa it is the western part that contains the best known biodiversity hotspots, the Cape Floristic Province and Succulent Karoo (Myers *et al.*, 2000). However, recent studies have shown that for certain groups of organisms the eastern part has sim-

ilar or even higher levels of endemism at both the generic and specific levels (e.g. Griswold, 1990, 2001; Bosselaers & Jocqué, 2000). The impetus for the present study came during a 1-week trip in this area in 2001, during which I collected more species of pholcids than had previously been described for the entire country. Moreover, it became clear that South African ‘*Pholcus*’ species were misplaced, and that a cladistic analysis and thorough revision of southern African taxa were badly needed.

The taxonomic history of South African pholcids starts with Strand’s (1909) description of *Pholcus* (now *Quamtana*) *leptopholcicus*, but mainly relates to the work of R. F. Lawrence, who described three additional species between 1938 and 1964 (*Pholcus* (now *Quamtana*) *ciliatus* Lawrence, 1938; *Smeringopus natalensis* Lawrence, 1947; *Spermophora peninsulae* Lawrence, 1964). Two more species were recorded in this time [*Smeringopus pallidus* (Blackwall) by Lawrence (1964), and *Smeringopus hypocrita* Simon by Kraus (1957)], but nothing has been added for almost 40 years.

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MATERIAL AND METHODS

Pholcids resembling *Spermophora* and potential relatives (*Belisana*, *Spermophorides*, *Paramicromerys*) were borrowed from more than 40 institutions and individuals worldwide, and the list below covers only those whose material was used in the present paper. The remaining material is described in other recent (Huber, 2003a,b) and forthcoming papers.

AMNH, American Museum of Natural History, New York; BMNH, Natural History Museum, London; CAS, California Academy of Sciences, San Francisco; DMSA, Durban Museum, Durban; MHNG, Muséum d'Histoire Naturelle, Genève; MNHN, Muséum National d'Histoire Naturelle, Paris; MRAC, Musée royal de l'Afrique Centrale, Tervuren; NCP, National Collection, Pretoria; NMP, Natal Museum, Pietermaritzburg; NMSA, National Museum, Bloemfontein; SAM, South African Museum, Cape Town; TMP, Transvaal Museum, Pretoria; USNM, National Museum of Natural History, Washington, D.C.; ZFMK, Zoological Research Institute and Museum Alexander Koenig, Bonn.

Methods and terminology are as in Huber (2000). Measurements are in mm (± 0.02 mm if two decimals are given) unless otherwise indicated. Eye measurements are ± 5 μ m. Drawings were done with a camera lucida on a Nikon Labophot-2 compound microscope. Photos were made with a Nikon Coolpix 950 digital camera (1600 \times 1200 pixels) mounted on a Nikon SMZ-U dissecting scope. For SEMs, specimens were cleaned ultrasonically, dried in HMDS (Brown, 1993), and photographed with a Hitachi S-2460 scanning electron microscope. The numerical cladistic analysis was done using NONA, version 1.8 (Goloboff, 1993), Pee-Wee, version 2.8 (Goloboff, 1997) and Hennig86, version 1.5 (Farris, 1988). Cladogram analysis was done with Winclada, version 0.9.9+ (Nixon, 1999).

RELATIONSHIPS

Relationships were analysed by cladistic analysis. The matrix used is a modification of a previous one (Huber, 2003b), differing only in the addition of seven taxa and four characters, resulting in a total of 84 taxa and 64 characters. The following taxa were added (see Appendix 1 for coding): *Quamtana merwei* sp. nov., *Q. entabeni* sp. nov., *Q. ciliata* (Lawrence), *Q. hectori* sp. nov., *Q. mabusai* sp. nov., *Q. embuleni* sp. nov. and *Q. oku* sp. nov. Four South African taxa were included previously (see Huber, 2003b): *Q. vidal* sp. nov. (as '*Spermophora*' sp. 5), *Q. bonamanzi* sp. nov. (as '*Spermophora*' sp. 4), *Spermophora schoemanae* sp. nov. (as *Spermophora* sp. 3), and *S. peninsulae* Lawrence. These taxa were chosen as representatives because sufficient mate-

rial was available for SEM and because both sexes were known. The following characters were added (numbering as in Appendix 1):

- (61) *Proximal bulbal sclerite*: (0) absent or poorly developed and hidden; (1) strongly developed and prominent in prolateral view (e.g. Figs 51, 153). This character may define a large monophyletic clade within pholcines (node 1 in Appendix 2), but it also occurs in *Micromerys*; in the analysis using successive weighting (see below), this character defines a paraphyletic group including *Micromerys*.
- (62) *Attachment site of bulb*: (0) prolateral; (1) dorsal. In the analyses using equally weighted characters, this character appears twice (nodes 9 and 13 in Appendix 2); using successive weighting, however, the character is the unique synapomorphy of a large monophylum (node 1 in Appendix 3).
- (63) *Sclerotized cone accompanying modified hairs on male cheliceral apophyses*: (0) absent; (1) present. This character (e.g. Figs 167, 173) is the synapomorphy of the new genus *Quamtana* s.s. (the 'core group' below; node 4 in Appendix 2), supported by all types of analyses.
- (64) *Unpaired projection on rim of male clypeus*: (0) absent; (1) present. This character is the synapomorphy of a species group tentatively assigned to *Quamtana* (node 7 in Appendix 2).

Using NONA with hold/50, mult*100, and amb results in four cladograms. One of these is what Coddington & Scharff (1994) have called a 'strict consensus of possible optimizations', i.e. a cladogram in which collapsing of all potentially zero-length branches results in a globally less parsimonious topology (154 steps in the present case). The other three cladograms have a length of 153 (CI = 46; RI = 84). These cladograms differ only with respect to the relationships between the four subfamilies provisionally named pholcines, holocnemes, ninetines and the New World clade described in Huber (2000; see that paper for arguments against using formal names before a stable and convincing cladogram is found). For simplicity, the cladogram presented in Appendix 2 shows only the pholcines. Two details of this cladogram are significant in the present context. The studied South African taxa fall into two groups, the first closely related to *Spermophora* and the second to *Pholcus*, *Leptopholcus*, *Micropholcus* and *Belisana*. The latter is not considered monophyletic but paraphyletic (although see below) and includes *Pholcus* and its closest relatives. Using amb = as a less strict way to collapse nodes (nodes are not collapsed if at least one optimization results in node support, while with

amb- nodes must be supported by all possible optimizations to remain intact), results in 42 cladograms, 34 of which have a length of 153 after collapsing unsupported nodes. However, the strict consensus is identical to the cladogram shown in Appendix 2. Using Hennig86 with the commands mh* and bb* results in 21 cladograms. After collapsing unsupported nodes, 19 of these have the same tree statistics as the NONA cladograms above. Again, the strict consensus is identical to the cladogram shown in Appendix 2.

In addition to the analyses using equally weighted characters, two types of weighting were employed: implied weighting using Pee-Wee (version 2.8; Goloboff, 1997), and successive weighting using NONA. The latter (with the consistency index as weighting function) resulted in 40 cladograms, 18 of which have a minimum length of 154 (CI = 46, RI = 84). Excluding the variation in the relationships among subfamilies and concentrating on pholcines only reveals that there are six different topologies, resulting from the combination of two topologies for the resolution of basal clades and three topologies for the resolution of distal clades (Appendix 3). Significant about these cladograms are three details: first, *Quamtana* is considered monophyletic in all of them; second, the sister taxon of *Quamtana* is either *Pholcus* and its closest relatives, or it remains unknown, with *Quamtana* as part of a tetrachotomy; third, like in the analysis with equally weighted characters above, a second group of South African species falls close to *Spermophora* (included in *Spermophora* in Appendix 3).

Implied weighting in Pee-Wee (which resolves character conflict in favour of the characters that have less homoplasy) with all possible settings of the constant of concavity K (1–6) results in higher numbers of trees (up to 100 with K = 5), implying more variation among topologies. With respect to *Quamtana*, the cladograms are similar to those obtained by successive weighting. *Quamtana* is considered monophyletic in all cases, and the second group of South African species falls close to *Spermophora* using K = 3–6, but not K = 1–2. In the latter cases (that weigh most strongly against homoplasy), South African '*Spermophora*' fall closer to *Metagonia* (a New World genus!).

Clade stability was estimated using the Bremer support function in NONA which calculates the number of extra steps required before a clade is lost from the strict consensus of near-minimum length cladograms. Most clades relevant in the present context have low stability, and the ambiguity is supported by inspection of the actual character support in the cladograms: most are supported by a single synapomorphy. The clades relevant in the present context are

numbered in Appendix 2, and are supported by the following synapomorphies: (1) proximal bulbal sclerite strongly developed (cf. Figs 51, 153); (2) modified hairs on male cheliceral apophyses long (cf. Figs 68, 166–168 with 229, 235, 241); (3) AME regained (presumably an improbable event); (4) conical projection accompanies modified hairs on cheliceral apophyses (cf. Figs 167, 173); (5) wide distance between eye triads; (6) shift of male palpal tibia-tarsus joints to retrolateral side (Fig. 160); (7) male with median projection on clypeus; (8) male chelicerae with globular hairs imbedded in apophysis; (9, 13) bulb attached to cymbium dorsally (cf. Figs 226, 238); (10) '*Spermophora*-flap' present (cf. Figs 227, 233); (11) pocket behind epigynum present; (12) bulb with serrate apophysis.

The main reason for the lack of stability and the ambiguity of support for placing the South African taxa in the cladogram is probably the fact that none of the potential closest relatives (*Pholcus* and close relatives, *Belisana*, *Spermophora*) has hitherto been revised or cladistically analysed with a larger sample of taxa than in the present paper. Therefore, while the present analysis provides only weak evidence for the phylogenetic position of South African pholcids, it strongly underlines the need for further revisionary work.

The main conclusions from the cladistic analysis are threefold. (1) Southern African pholcines (excluding introduced species) appear to be divided into two groups, one largely restricted to the Western Cape province, the other widely distributed in southern and eastern South Africa, apparently including some species from as far north as Cameroon, Democratic Republic of Congo and Uganda. (2) The Western Cape group appears closest to *Spermophora*, and is here assigned to this genus even though the support for this clade is not particularly strong. (3) The larger and more widely distributed group may or may not be monophyletic. The species representing this group are here assigned to a single new genus because both alternatives appear worse than provisionally creating a potentially paraphyletic genus. The species could be included within *Pholcus*, but this would require synonymizing *Leptopholcus* and *Micropholcus*, a measure that is certainly premature. Alternatively, several new genera could be established for each clade appearing to be monophyletic in the cladogram, a measure that would result in several poorly supported genera (some of them monotypic). The solution preferred herein is to choose a representative of one well supported subgroup (the 'core group' below, node 4 in Appendix 2) as type species for the genus, and assign all species outside the core-group tentatively.

KEY TO SOUTH AFRICAN PHOLCIDAE

- 1 Abdomen very long and thin (vermiform, i.e. >9× as long as wide); pale spiders with thin long legs *Leptopholcus*
Note: This genus has not been previously recorded from South Africa; the collections studied contain a few unidentified females from KwaZulu-Natal, Limpopo and Western Cape.
- Abdomen not vermiform (<7× as long as wide); but cylindrical, oval, globular, or elevated 2
- 2 (1) Carapace with median depression; male chelicerae without proximo-lateral apophyses 3
- Carapace without median depression; male chelicerae with proximo-lateral apophyses (barely visible in *Q. molimo*; Fig. 100) 4
- 3 (2) Male chelicerae with two pairs of frontal apophyses; abdomen pointed dorso-posteriorly; male femora 1 with ventral spines *Crossopriza lyoni* (Blackwall)
Note: Widespread introduced species, apparently only in and around buildings.
- Male chelicerae with one pair of small frontal apophyses; abdomen cylindrical, rounded dorso-posteriorly; male femora 1 without spines *Smeringopus*
Note: Several species of this genus occur in southern Africa; two nominal species are recorded in South Africa (*S. hypocrita*, *natalensis*), two in Namibia (*S. atomarius*, *S. similis*), but no revision of the genus has been made since Kraus (1957).
- Male chelicerae with large black protrusions set with many cone-shaped projections (modified hairs); abdomen globular; very large pholcid *Artema atlanta* (Walckenaer)
Note: Widespread introduced species, apparently only in and around buildings.
- 4 (2) Bulb attached dorsally to cymbium; procurus with hinged process (e.g. Figs 226, 232), six eyes (*Spermophora*) 5
- Bulb attached prolaterally to cymbium; procurus without hinged process; six or eight eyes 8
- 5 (4) Male chelicerae with pair of widely spread apophyses (Fig. 254) *S. pembai*
- Male chelicerae with relatively long, converging apophyses (Fig. 256) *S. suurbraak*
- Male chelicerae with very small frontal apophyses; male palpal femora with small proximodorsal projection (arrows in Figs 227, 233, 239) 6
- 6 (5) Male chelicerae with small cone close to distal apophyses (Fig. 240) *S. peninsulae*
- Male chelicerae with single pair of small apophyses frontally 7
- 7 (6) Bulb with pointed projection (Fig. 227) *S. schoemanae*
- Bulb without pointed projection *S. gordimeriae*
- 8 (4) Large pholcid (usually >5 mm) with cylindrical opisthosoma *Pholcus phalangioides* (Fuesslin)
Note: This cosmopolitan synanthropic spider is apparently the only representative of the genus in South Africa.
- Smaller pholcids (usually <4 mm) with globular or elevated opisthosoma (*Quamtana*) 9
- 9 (8) Male clypeus with median projection 10
- Male clypeus unmodified 12
- 10 (9) Procurus very long and slender (Fig. 80) *Q. umzinto*
- Procurus not as long and slender 11
- 11 (10) Male chelicerae with three modified hairs on each apophysis (Fig. 85); palpal tibia only slightly enlarged (Fig. 84) *Q. lotzi*
- Male chelicerae with two modified hairs on each apophysis; palpal tibia significantly enlarged; for species identification see shapes of procurus and bulbal apophysis (Figs 51, 52, 57, 58, 63, 64) *Q. entabeni*, *Q. mbaba*, *Q. ciliata*
- 12 (9) Six eyes (no trace of AME) 13
- Eight eyes (AME sometimes reduced to pigment spots) 15
- 13 (12) Male cheliceral apophyses attached laterally (Fig. 124) *Q. hectori*
- Male cheliceral apophyses attached frontally or close to median line 14
- 14 (13) Male chelicerae with additional projection close to distal apophyses (Fig. 115) *Q. lajuma*
- Male chelicerae with single pair of apophyses; for species identification see shapes of procurus and bulbal apophysis (Figs 117, 118, 148, 149, 189, 190) *Q. vidal*, *Q. tsui*, *Q. knysna*
- 15 (12) Male cheliceral apophyses very long (Figs 88, 89, 99, 100); for species identification see shapes of procurus and bulbal apophysis (Figs 86, 87, 93, 94, 97, 98) *Q. meyeri*, *Q. nylsvley*, *Q. molimo*
- Male cheliceral apophyses much shorter 16
- 16 (15) Male palpal femur larger than tibia (Fig. 104) *Q. leleupi*
- Male palpal femur smaller than tibia 17
- 17 (16) Male cheliceral apophyses frontally or close to median line; for species identification see shapes of procurus and bulbal apophysis (Figs 107, 108, 138, 139, 143, 144, 183, 184) *Q. leptopholcica*, *Q. mabusai*, *Q. nandi*, *Q. filmeri*
- Male cheliceral apophyses attached laterally; for species identification see shapes of procurus and bulbal apophysis (Figs 153, 154, 159, 160, 178, 179) *Q. merwei*, *Q. bonamanzi*, *Q. embuleni*

TAXONOMY

QUAMTANA GEN. NOV.

Type species. Quamtana merwei sp. nov.

Etymology. The generic name is derived from Quamtana, supreme god of the Xhosa people in South Africa, worshipped at stone mounds to which one stone is added by each worshipper. Gender feminine.

Diagnosis. Long-legged, six- or eight-eyed pholcids with globular, oval or elevated and often posteriorly pointed opisthosoma, varying in total size from 1 to 4 mm. Distinguished from other genera by the pair of long modified hairs on the male cheliceral apophyses (e.g. Figs 68, 137, 166–168; only *Q. lotzi* with three shorter modified hairs: Fig. 85) and from other southern African genera as follows: from *Spermophora* by the prolateral attachment of the bulb (dorsal in *Spermophora*); from *Smeringopus*, *Artema* and *Crosso-priza* by the lateral cheliceral apophyses (e.g. Figs 54, 155) and by the absence of an indentation on the carapace; from *Leptopholcus* and *Pholcus* by the short opisthosoma (vermiform in *Leptopholcus*, long cylindrical in *Pholcus*).

Description. Total length in males usually ~1–4 mm. Carapace oval or round, without median groove or pit; often with dark median band that may or may not include ocular area and clypeus (Figs 1–30). Six or eight eyes; triads in some species on stalks; AME absent or very small, rarely >30 µm diameter (*Q. lotzi*, *Q. leptopholcica*, *Q. filmeri*). Distance PME–ALE small (~20–40% of PME diameter), distance PME–PME very variable (~85–440% of PME diameter). Clypeus unmodified or with median projection at rim. Male chelicerae with lateral apophyses proximally and distinctive pair in varying position distally; distal apophyses usually provided with two long modified hairs each, sometimes accompanied by sclerotized cone (e.g. Figs 68, 137, 166, 167, 168); chelicerae never with stridulatory ridges. Male palps small to large in relation to overall size (cf. Figs 16, 22); coxa unmodified (except *Q. lotzi*: Fig. 84); trochanter with retrolateral and sometimes also ventral apophysis; femur variable in shape, rarely with small modifications at varying position (e.g. Figs 80, 83, 118); tibia moderately to highly expanded (cf. Figs 63, 103), with two trichobothria; procursus often complex distally, but without hinged process; with capsulate tarsal organ (e.g. Figs 72, 77); bulb consisting of globular part (often elongated) connected to cymbium by prominent proximal bulbal sclerite (Figs 51, 153), usually membranous embolus, and species-specific bulbal apophysis; some species with single bulbal projection (*Q. meyeri*, *Q. nylsveyi*, *Q. molimo*, *Q. leleupi*). Legs usually long (leg 1 about 5–10 × body length, shorter

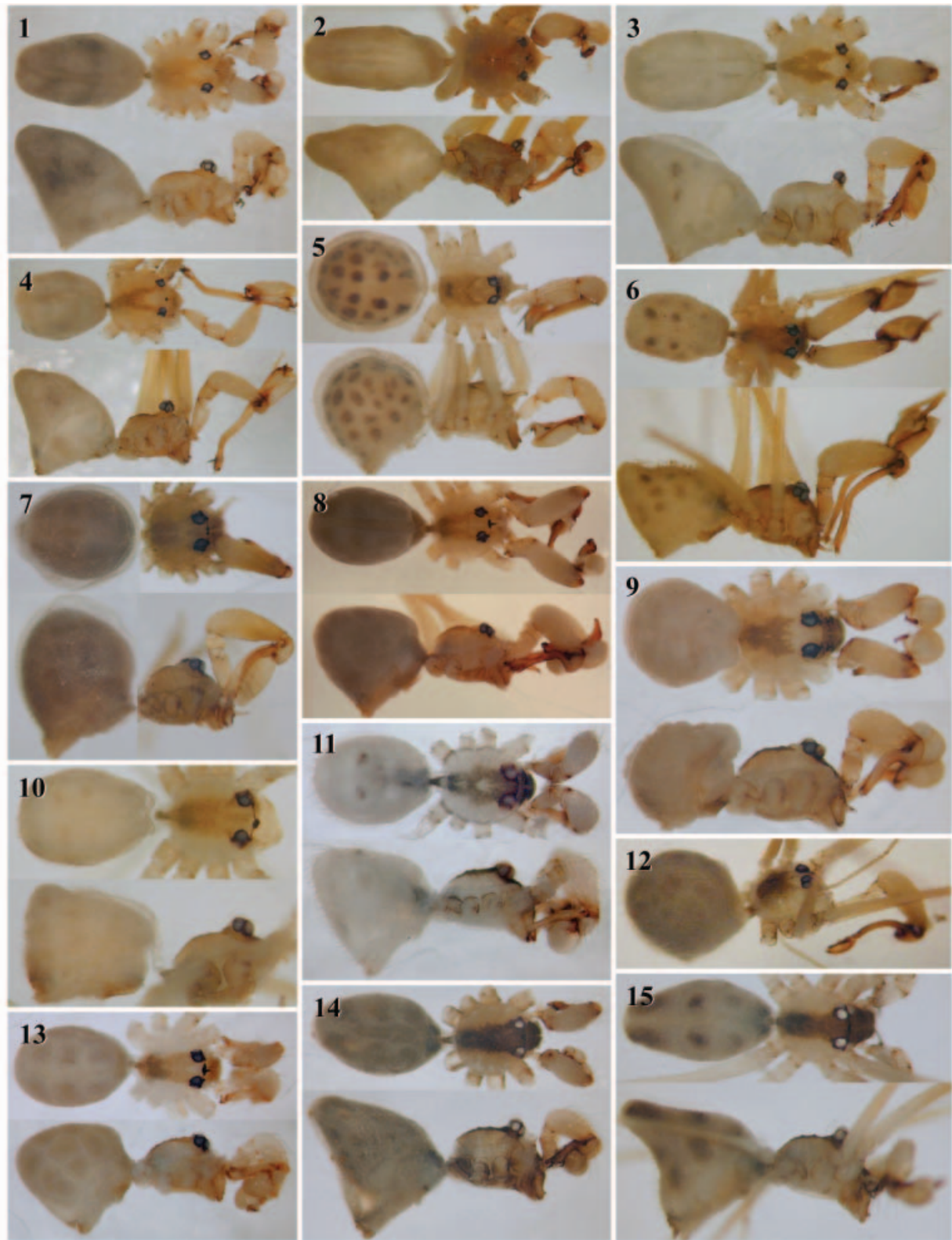
in *Q. biena*, longer in *Q. oku* and *Q. kitahurira*), medium-thin (tibia 1 L/d ~35–68), leg 1 always longest, legs 2 and 4 about same length, leg 3 shortest. Legs without spines, with few vertical hairs, without curved hairs; retrolateral trichobothrium of tibia 1 usually at 4–11% (at 2% in *Q. kitahurira*, at 17% in *Q. filmeri*). Prolateral trichobothrium missing on tibiae 1, present in all others. Tarsus 1 usually with >20 pseudosegments, but only ~10–20 distal pseudosegments easily visible in dissecting microscope. Opisthosoma globular, oval, or elevated and pointed posteriorly (Figs 1–30). Male gonopore with four epia-androus spigots in all species examined (e.g. Figs 67, 74, 128); ALS with several (usually five) spigots in addition to basic set of two (e.g. Figs 71, 129, 170); other spinnerets typical for family (cf. Huber, 2000).

Sexual dimorphism slight. Female clypeus and chelicerae never modified, triads never on stalks. Epigynum shape usually very simple (Figs 31–50), with distinctive pair of pockets at varying position (e.g. Figs 55, 176) but otherwise of limited use for species identification; internally with usual pair of pore plates (sometimes divided into several platelets: Figs 92, 102, 127, 147) and complex system of sclerites and membranes of unknown function.

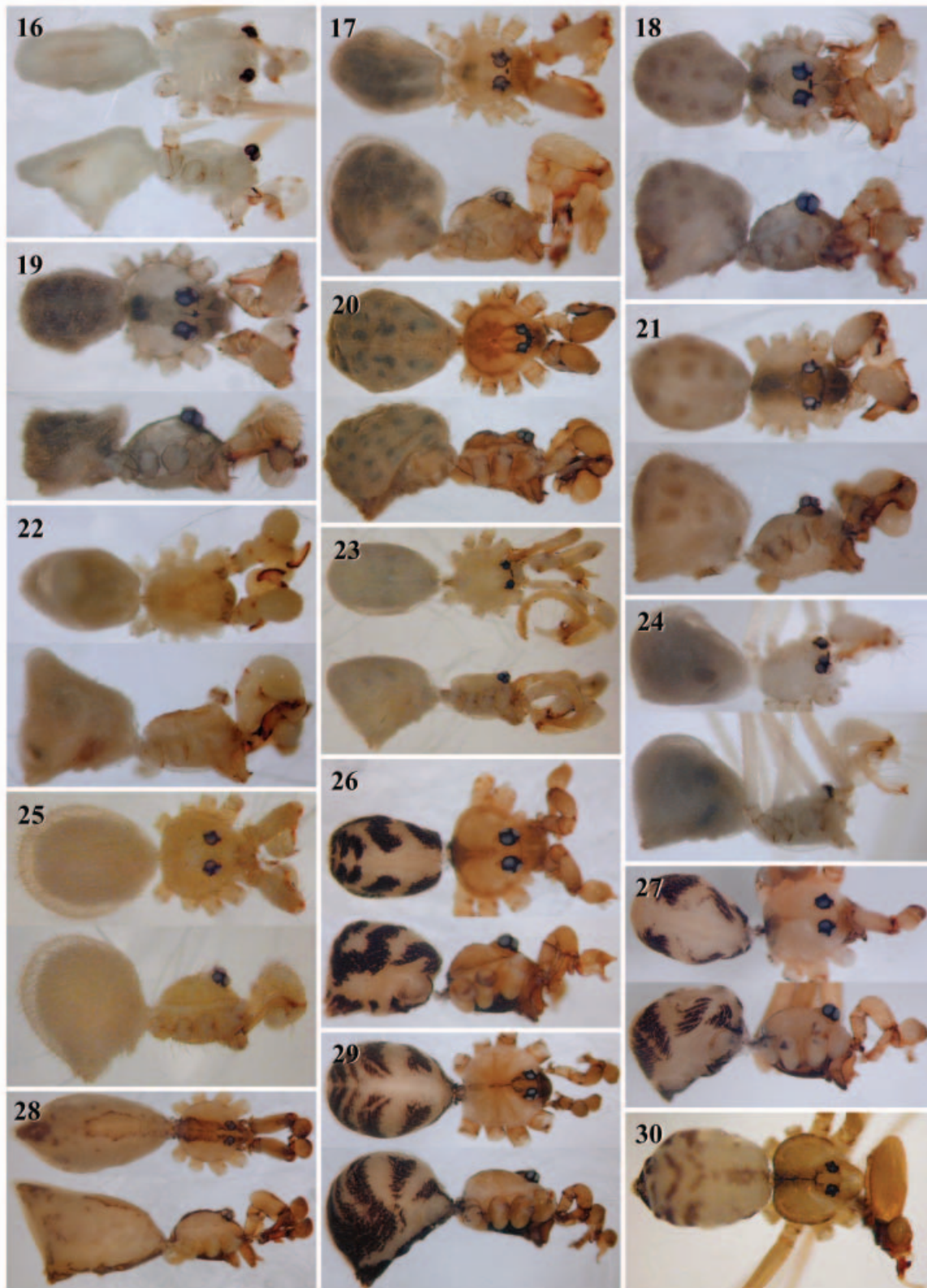
Monophyly. In the analyses using differential character weights, the monophyly of *Quamtana* is supported by one synapomorphy, the pair of long modified hairs imbedded in the male cheliceral apophyses. The monophyly of the 'core group' (see below) is more strongly supported by a sclerotized cone accompanying the pair of modified hairs (Figs 167, 173).

Generic relationships. As discussed above, *Quamtana* appears most closely related to *Pholcus* and its closest relatives (e.g. *Leptopholcus*, *Micropholcus*), and to *Belisana*. Other African taxa of similar size and habitus (*Buitinga* in Eastern Africa, *Paramicromerys* on Madagascar, *Spermophora* and *Spermophorides*) appear more distantly related.

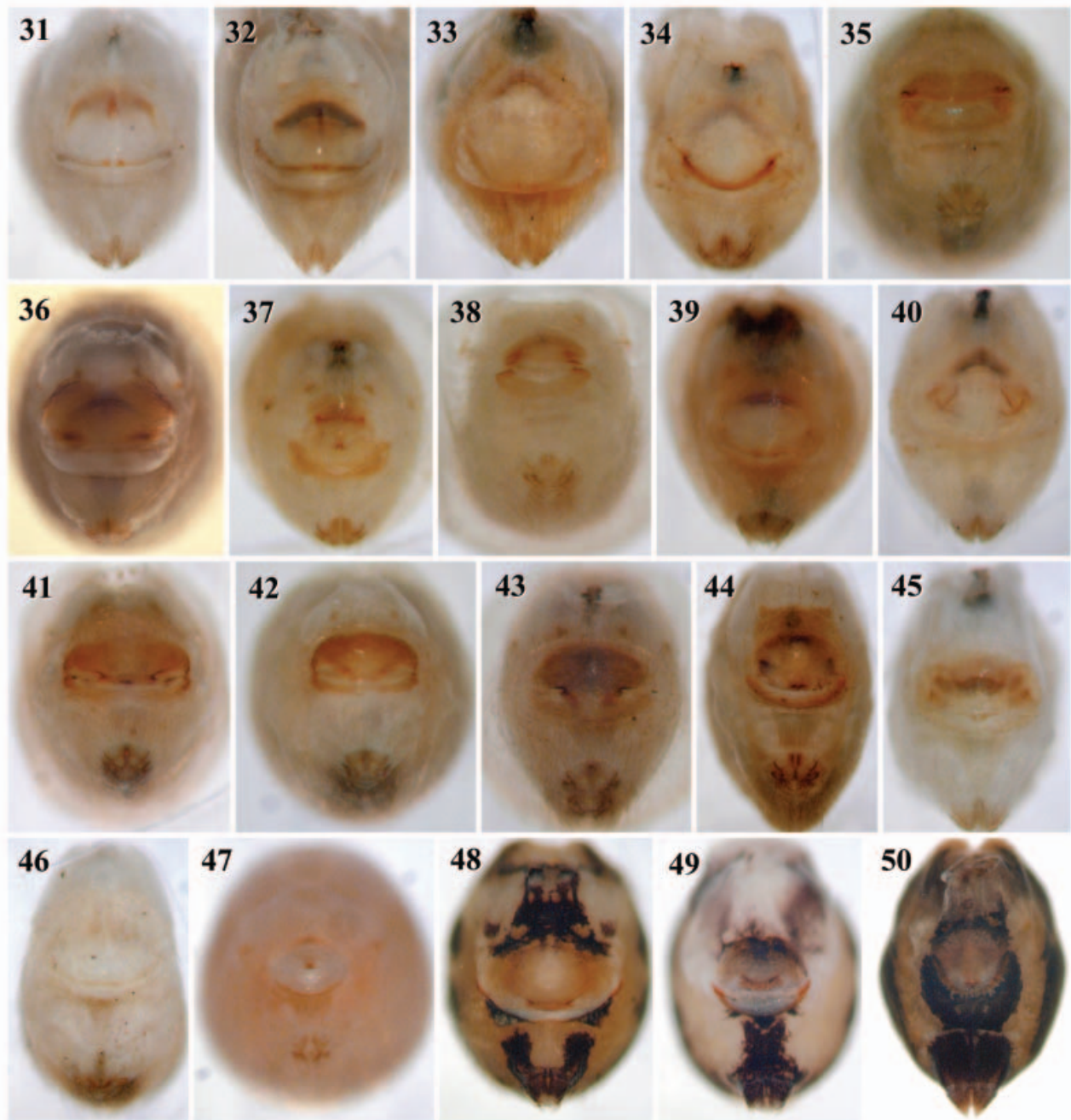
Specific relationships. Several synapomorphies support species groups within *Quamtana*. Most importantly, a core group of species (including the type species *Q. merwei*), is characterized by a cone-shaped projection accompanying the two modified hairs on each male cheliceral apophysis. Unfortunately, this character is very difficult to see in light microscopy, and SEM photos could be made of a few species only. Unambiguous representatives of this core group are: *Q. merwei*, *Q. bonamanzi*, *Q. embuleni*. Possibly included are also *Q. vidal*, *Q. hectori*, *Q. mabusai*, *Q. nandi*, *Q. tsui*. A second group of species share a median protrusion on the male clypeus: *Q. entabeni*, *Q. mbaba*, *Q. ciliata*, *Q. umzinto*, *Q. lotzi*; these species also have a large protrusion proximo-prolaterally on the procursus, but this is difficult to code



Figures 1–15. *Quamtana* habitus, males in dorsal and lateral views. 1. *Q. entabeni*. 2. *Q. mbaba*. 3. *Q. ciliata*. 4. *Q. umzinto*. 5. *Q. lotzi*. 6. *Q. meyeri*. 7. *Q. nylsvley*. 8. *Q. molimo*. 9. *Q. hectori*. 10. *Q. leleupi*. 11. *Q. vidal*. 12. *Q. lajuma*. 13. *Q. leptopholcica*. 14. *Q. mabusai*. 15. *Q. nandi*.



Figures 16–30. *Quamtana* and *Spermophora* habitus, males in dorsal and lateral views. 16. *Q. tsui*. 17. *Q. merwei*. 18. *Q. bonamanzi*. 19. *Q. embuleni*. 20. *Q. filmeri*. 21. *Q. knysna*. 22. *Q. kabale*. 23. *Q. oku*. 24. *Q. kitahurira*. 25. *Q. biena*. 26. *S. schoemanae*. 27. *S. gordimerae*. 28. *S. pembai*. 29. *S. peninsulae*. 30. *S. suurbraak*.



Figures 31–50. *Quamtana* and *Spermophora*, female opisthosomata, ventral views with epigynum. 31. *Q. entabeni*. 32. *Q. mbaba*. 33. *Q. umzinto*. 34. *Q. meyeri*. 35. *Q. nylsvley*. 36. *Q. molimo*. 37. *Q. leptopholcica*. 38. *Q. hectori*. 39. *Q. mabusai*. 40. *Q. nandi*. 41. *Q. merwei*. 42. *Q. bonamanzi*. 43. *Q. embuleni*. 44. *Q. filmeri*. 45. *Q. kabale*. 46. *Q. oku*. 47. *Q. biena*. 48. *S. schoemanae*. 49. *S. gordimeriae*. 50. *S. peninsulae*.

unambiguously, and seems to be present in other species also (e.g. *Q. leptopholcica*), though to a lesser degree. Some species have but a single projection on the bulb – *Q. meyeri*, *Q. nylsvley*, *Q. molimo*, *Q. leleupi* – but the homology is unclear as in only one case (*Q. molimo*) is there evidence that this is the functional embolus. Finally, *Q. oku* and *Q. kitahurira*

share several similarities (palpal tarsal organ on projection, connection between proximal bulbal sclerite and bulbal apophysis) that probably represent synapomorphies. All other species (*Q. lajuma*, *Q. filmeri*, *Q. knysna*, *Q. kabale*, *Q. biena*) cannot be assigned to any species group, and the relationships among groups remain obscure.

Natural history. No species has ever been studied in any detail, and little can be inferred from notes on the collection labels. Several species have been collected by sieving litter and pit-trapping, others were collected by beating vegetation. Most species seem to live close to the ground, often under leaves, logs, and stones. So far, no cave species is known.

Distribution. Most known species occur in eastern South Africa (see maps, Figs 261–264, Appendix 5), but the few species from Cameroon, Congo and Uganda (Fig. 261) show that the genus is actually widely distributed in Africa. To a certain degree, the bias in favour of South Africa might result from a bias in collecting effort, but at least for East Africa, there is good evidence of the near-total absence of *Quamtana*. During a recent revision of East African 'Spermophora-like' pholcids (Huber, 2003b), I observed large collections containing more than 30 species, but only two representatives of *Quamtana* from Uganda and not a single representative from the Eastern Arc and Kenya. The same is true for Madagascar (Huber, 2003a). On the other hand, much more collecting needs to be done in a large area ranging from Mozambique to Nigeria before the distribution of *Quamtana* can be properly ascertained. In South Africa, its distribution closely follows the area with >600 mm mean annual precipitation. As with other groups (e.g. scorpions: Newlands, 1978), water is probably the single most important factor affecting distribution.

Composition. The genus includes a total of 25 described species, all of which are treated below. The collections studied contain a few additional new species of *Quamtana* that are not described for a variety of reasons: they offer no additional insights into the phylogeny, morphology or distribution of the group, are only known from females, or are poorly preserved.

QUAMTANA ENTABENI SP. NOV.

(FIGS 1, 31, 51–56, 66–72)

Type. Male holotype from Entabeni Forest, Soutpansberg, ~20 km N Levubu (22°59'S, 30°17'E), 1360 m a.s.l., Limpopo, South Africa; December 1–2, 1996 (C. E. Griswold); in CAS.

Etymology. Named after the type locality.

Diagnosis. Relatively large species with triads far apart and vestigial AME; distinguished from close relatives (*Q. mbaba*, *Q. ciliata*) by the hook-shaped bulbal apophysis (Figs 51, 70).

Male (holotype). Total length 2.6 (2.9 with clypeus), carapace width 0.9. Leg 1: 25.1 (6.5 + 0.4 + 6.4 + 10.0 + 1.8), tibia 2: 4.3, tibia 3: 2.8, tibia 4: 4.2; tibia 1 L/d: 64. Habitus as in Figure 1. Carapace ochre-

yellow, slightly darker medially; sternum whitish. Legs ochre-yellow, patellae and tibia-metatarsus joints darker. Opisthosoma grey with darker spots shining through cuticle. Ocular area slightly elevated, triads on distinct stalks; distance PME–PME 320 µm; diameter PME 90 µm; AME reduced to black pigment spots, apparently without lenses. Clypeus with median projection ~80 µm long. Sternum wider than long (0.65/0.60). Chelicerae as in Figure 54, with pair of modified hairs (Fig. 68) on apophyses, tips 95 µm apart. Palps as in Figures 51, 52; trochanter with retrolateral apophysis, procursus with large protuberance proximally prolaterally (Fig. 51), complex distally (Figs 53, 69); bulb with distinctive hooked sclerite and membranous embolus (Figs 51, 70). Retrolateral trichobothrium of tibia 1 at 10%; tarsus 1 with >30 pseudosegments, distally ~20 quite distinct. Gonopore with four epiandrous spigots (Fig. 67); ALS with several piriform gland spigots, PMS with usual pair of spigots (Fig. 71).

Variation. Tibia 1 in 10 other males: 5.5–6.0 (\bar{x} = 5.75).

Female. In general similar to male but eyes not on stalks (Fig. 66); several females with different pattern on carapace: wide, dark brown band. Tibia 1 in 15 females: 4.3–4.8 (\bar{x} = 4.54). Epigynum as in Figures 31, 55, with pair of pockets 70 µm apart. Dorsal view as in Figure 56. Palpal tip as in Figure 72.

Distribution. Known from three localities in Limpopo, South Africa (Fig. 262).

Material examined. SOUTH AFRICA: LIMPOPO: Soutpansberg, Entabeni Forest: type above, together with 8♂ 5♀ (CAS); same collection data, 6♀ 2 juveniles (CAS); same locality, December 1, 1996 (R. Jocqué), 1♂ (MRAC 203.580); Soutpansberg, Lajuma Farm (~23°02'S, 29°26'E), on litter, January 15, 1999 (S. Ford), 2♂ 1♀ (NCP 77/899); 30 km SSW Tzaneen (~23°53'S, 30°00'E), Magoebaskloof Hotel, forest at 1800 m a.s.l., November 22–23, 1996 (C. Griswold), 3♂ 4♀ (CAS).

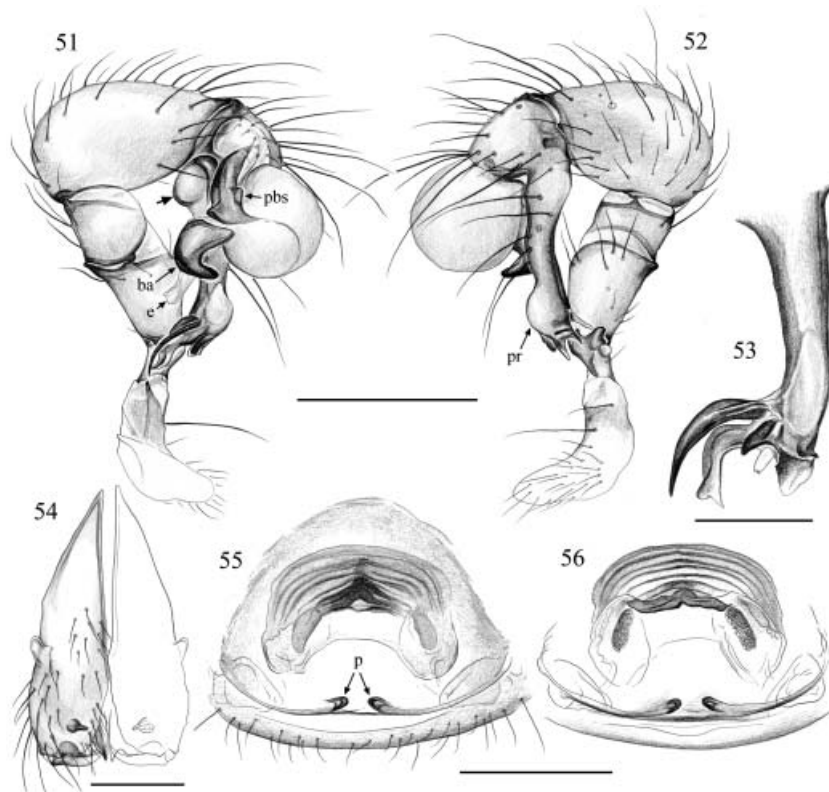
QUAMTANA MBABA SP. NOV.

(FIGS 2, 32, 57–62)

Type. Male holotype from Mhlatuzana River, Jackson's Fall (29°48'S, 30°45'E), 500 m a.s.l., dense indigenous forest, KwaZulu-Natal, South Africa; December 18, 1990 (V. D. & B. Roth); in CAS.

Etymology. Named after Mbaba Mwana Waresa, a goddess of the Zulu people, who gave mankind the gift of beer.

Diagnosis. Relatively large species with triads far apart and small but distinct AME; distinguished from



Figures 51–56. *Quamtana entabeni* sp. nov. Left male palp in prolateral (51) and retrolateral (52) views, procursus in dorsal view (53), male chelicerae in frontal view (54), and cleared epigynum in ventral (55) and dorsal (56) views. ba: bulbal apophysis, e: embolus, p: pockets on epigynum, pbs: proximal bulbal sclerite, pr: procursus. Arrowed: prolateral projection on procursus. Scale bars = 0.2 mm (53, 54), 0.3 mm (55, 56), 0.5 mm (51, 52).

close relatives (*Q. entabeni*, *Q. ciliata*) by the T-shaped bulbal apophysis (Fig. 57).

Male (holotype). Total length 3.0 (3.3 with clypeus), carapace width 1.1. Leg 1: 27.7 (7.2 + 0.4 + 6.9 + 11.2 + 2.0), tibia 2: 4.3, tibia 3: 2.9, tibia 4: 4.3; tibia 1 L/d: 64. Habitus as in Figure 2. Entire spider ochre-grey, only carapace with faint brown pattern, patellae and tibiae-metatarsus joints brown. Ocular area slightly elevated, triads on distinct stalks; distance PME–PME 360 µm; diameter PME 100 µm; diameter AME 25 µm. Clypeus with sclerotized, hooked median projection. Sternum wider than long (0.75/0.65). Chelicerae as in Figure 59, with pair of modified hairs (Fig. 60) on apophyses, tips 70 µm apart. Palps as in Figures 57, 58; trochanter with retrolateral apophysis (distinct in dorsal view), procursus with large protuberance proximally prolaterally (Fig. 57), only distal tip complex; bulb with distinctive T-shaped apophysis and long membranous embolus (Fig. 57). Retrolateral trichobothrium of tibia 1 at 8%; tarsus 1 with >20 pseudosegments, distally ~10 quite distinct.

Female. In general similar to male, but median brown pattern on carapace more distinct and triads not on stalks and closer together. Tibia 1: 5.5. Epigynum as in Figures 32, 61, with pair of pockets 55 µm apart. Dorsal view as in Figure 62.

Distribution. Only known from type locality in KwaZulu-Natal, South Africa (Fig. 262).

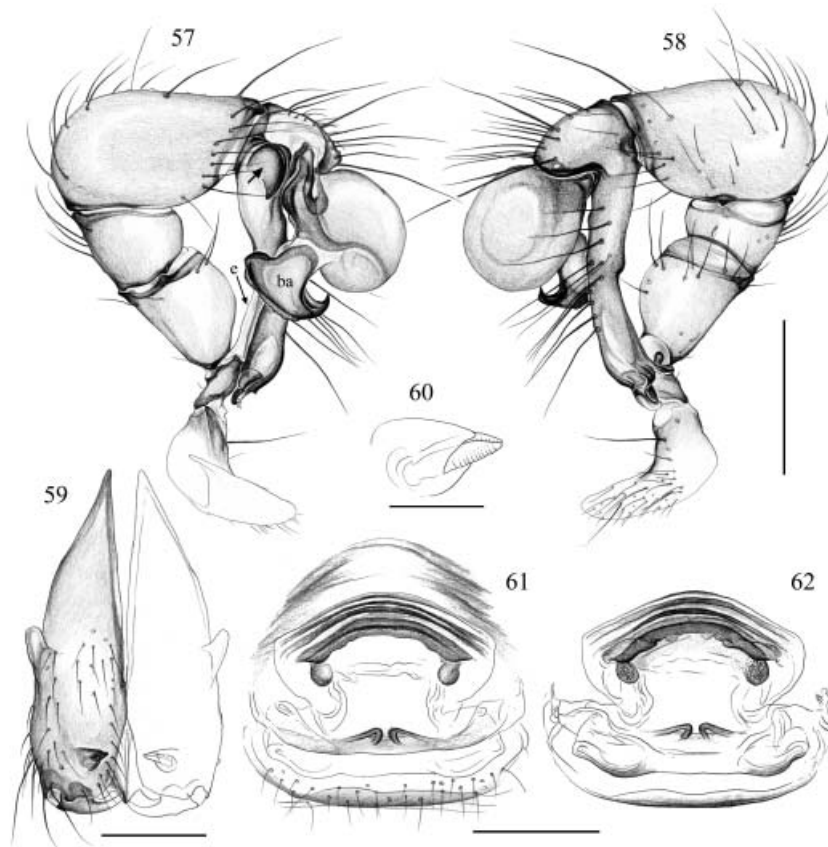
Material examined. SOUTH AFRICA: KWAZULU-NATAL: Mhlatuzana River, Jackson's Fall: type above, together with 1 ♀ (CAS).

QUAMTANA CILIATA (LAWRENCE, 1938) COMB. NOV.
(FIGS 3, 63–65, 73–78)

Pholcus ciliatus Lawrence, 1938: 482–483; fig. 16a–e.

Type. Male holotype from Nkandhla Forest (28°43'S, 31°08'E), KwaZulu-Natal, South Africa; January 1937 (R. F. Lawrence); in NMP (N.M.1410; Type No. A271), examined.

Diagnosis. Relatively large species with triads far apart and small but distinct AME; distinguished from



Figures 57–62. *Quamtana mbaba* sp. nov. Left male palp in prolateral (57) and retrolateral (58) views, male chelicerae in frontal view (59), modified hairs on male chelical apophysis (60), and cleared epigynum in ventral (61) and dorsal (62) views. ba: bulbal apophysis, e: embolus. Arrowed: prolateral projection on procurus. Scale bars = 50 μ m (60), 0.2 mm (59), 0.3 mm (61, 62), 0.5 mm (57, 58).

close relatives (*Q. entabeni*, *Q. mbaba*) by the flat bulbal apophysis directed prolaterad (Figs 63, 75), and by the longer procurus (Fig. 64).

Male (NCA 81/298). Total length 2.8 (3.0 with clypeus), carapace width 1.0. Leg 1: 25.2 (6.4 + 0.5 + 6.3 + 10.3 + 1.7), tibia 2: 3.9, tibia 3: 2.7, tibia 4: 3.7; tibia 1 L/d: 64. Habitus as in Figure 3. Carapace ochre-yellow, slightly darker medially, sternum and legs ochre yellow, patellae and tibia-metatarsus joints light brown, opisthosoma whitish. Ocular area slightly elevated, triads on distinct stalks (Fig. 73); distance PME–PME 310 μ m; diameter PME 70 μ m; diameter AME 25 μ m. Clypeus with median projection. Sternum wider than long (0.70/0.55). Chelicerae as in *Q. entabeni* (cf. Fig. 54), with modified hairs (Fig. 78), tips 100 μ m apart. Palps as in Figures 63, 64; trochanter with retrolateral apophysis (distinct in dorsal view: Fig. 76), procurus with large protuberance proximally prolaterally, only distal tip complex (Fig. 76); bulb with distinctive flattened apophysis and long membranous embolus (Figs 63, 75).

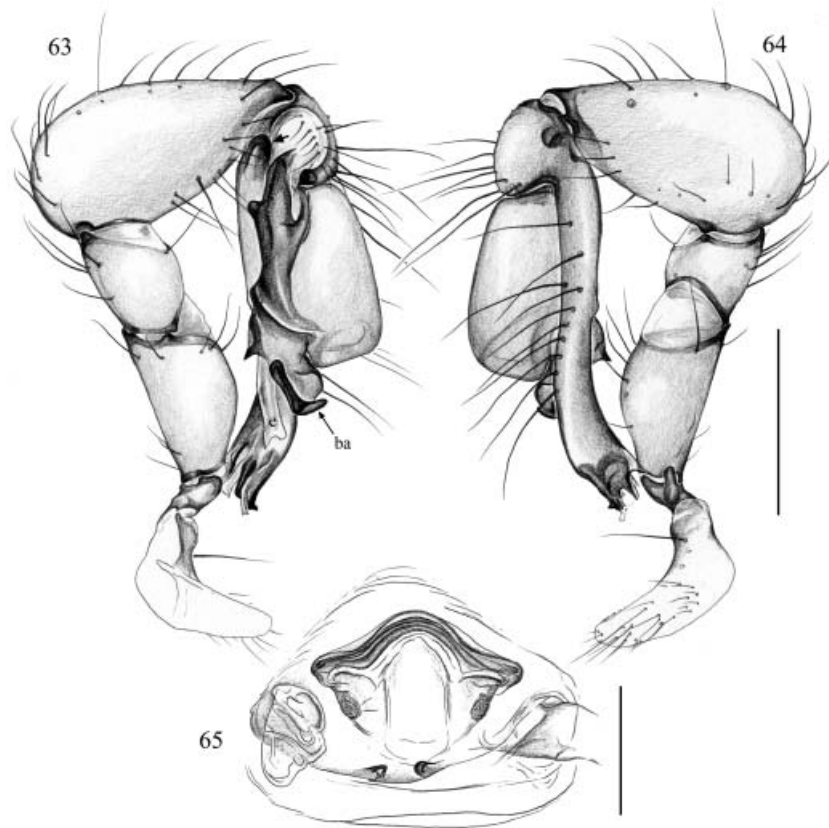
Retrolateral trichobothrium of tibia 1 at 9%; tarsus 1 with >20 pseudosegments, only distally distinct. Gonopore with four epiandrous spigots (Fig. 74). Palpal tarsal organ capsulate (Fig. 77).

Variation. Measurements of type: carapace width 1.0, tibia 1: 6.9. Tibia 1 in five other males: 5.3–6.7 (\bar{x} = 5.9). In some males median spot on carapace more distinct (as in male shown in Fig. 3) and some dark spots on opisthosoma.

Female. In general similar to male, but triads only slightly elevated. Tibia 1: 4.5. Epigynum very simple externally, with pair of pockets 100 μ m apart. Dorsal view as in Figure 65.

Distribution. Known from Nkandhla and Ngome Forests in KwaZulu-Natal, South Africa (Fig. 262).

Material examined. SOUTH AFRICA: KWAZULU-NATAL: Nkandhla Forest: type above; same locality, in dense climbers, April 9, 1979 (P. Reavell), 2♂ (NCP 81/298); Ngome Forest Reserve, Ngotshe (27°48'S,



Figures 63–65. *Quamtana ciliata* **comb. nov.** Left male palp in prolateral (63) and retrolateral (64) views, and cleared epigynum in dorsal view (65). ba: bulbal apophysis, e: embolus. Arrowed: prolateral projection on procursus. Scale bars = 0.3 mm (65), 0.5 mm (63, 64).

31°26'E), December 4, 1994 (L. Lotz), 2♂ (NMSA 7094); Ngome State Forest (27°49'S, 31°26'E), open forest, June 1992 (M. v.d. Merwe), 1♀ (NCP 94/652); same locality, dense forest, December 1992 (M. v.d. Merwe), 1♂ (NCP 94/607); same locality, February 15, 1992 (M. v.d. Merwe), 1♀ (NCP 94/334).

QUAMTANA UMZINTO SP. NOV.

(FIGS 4, 33, 79–82)

Type. Male holotype from Vernon Crookes Nature Reserve, Umzinto (30°16'S, 30°37'E), KwaZulu-Natal, South Africa; January 1, 1992 (L. Lotz); in NMSA (5959).

Etymology. Named after the type locality.

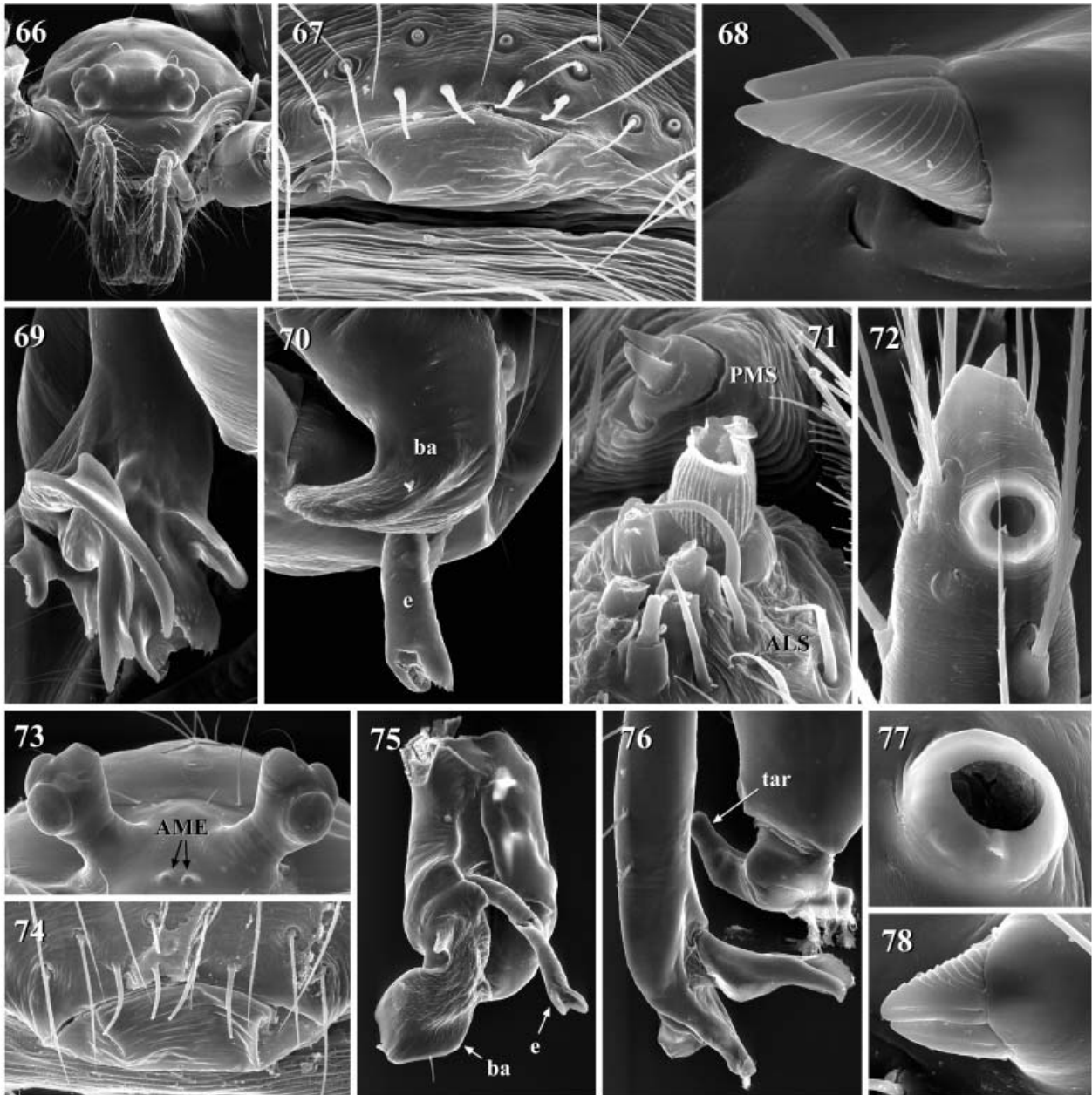
Diagnosis. Distinguished from congeners by the long and slender procursus (Fig. 80), and by the short bulbal apophysis (Figs 79, 80).

Male (holotype). Total length 2.3 (2.5 with clypeus), carapace width 1.0. Leg 1: 5.6 + 0.4 + 5.9 (metatarsus and tarsus missing), tibia 2 missing, tibia 3: 2.3, tibia 4: 3.6; tibia 1 L/d: 60. Habitus as in Figure 4. Carapace

ochre-yellow, with brown V-mark; sternum ochre-yellow. Legs ochre-yellow, patellae and tibia-metatarsus joints brown. Opisthosoma grey with few indistinct spots shining through cuticle. Ocular area slightly elevated, triads on distinct stalks; distance PME–PME 320 µm; diameter PME 90 µm; diameter AME 20 µm. Clypeus with short median projection at rim. Sternum wider than long (0.65/0.55). Chelicerae as in *Q. entabeni* (cf. Fig. 54), distance between tips of modified hairs on apophyses 85 µm. Palps as in Figures 79, 80 (note artificial position of bulb); trochanter with long retrolateral apophysis, femur with distinct projection retrolaterally (Fig. 80), procursus with sclerotized protuberance proximally prolaterally, complex distal tip; bulb with distinctive apophysis and membranous embolus. Retrolateral trichobothrium of tibia 1 at 10%; tarsus 1 (male from DMSA) with >20 pseudosegments, distally ~15 quite distinct.

Variation. Tibia 1 in two other males: 6.1, 6.3.

Female. In general similar to male, but eyes not on stalks. Tibia 1 in 2 females: 4.8, 4.9. Epigynum as in Figures 33, 81, with pair of pockets 60 µm apart. Dorsal view as in Figure 82.

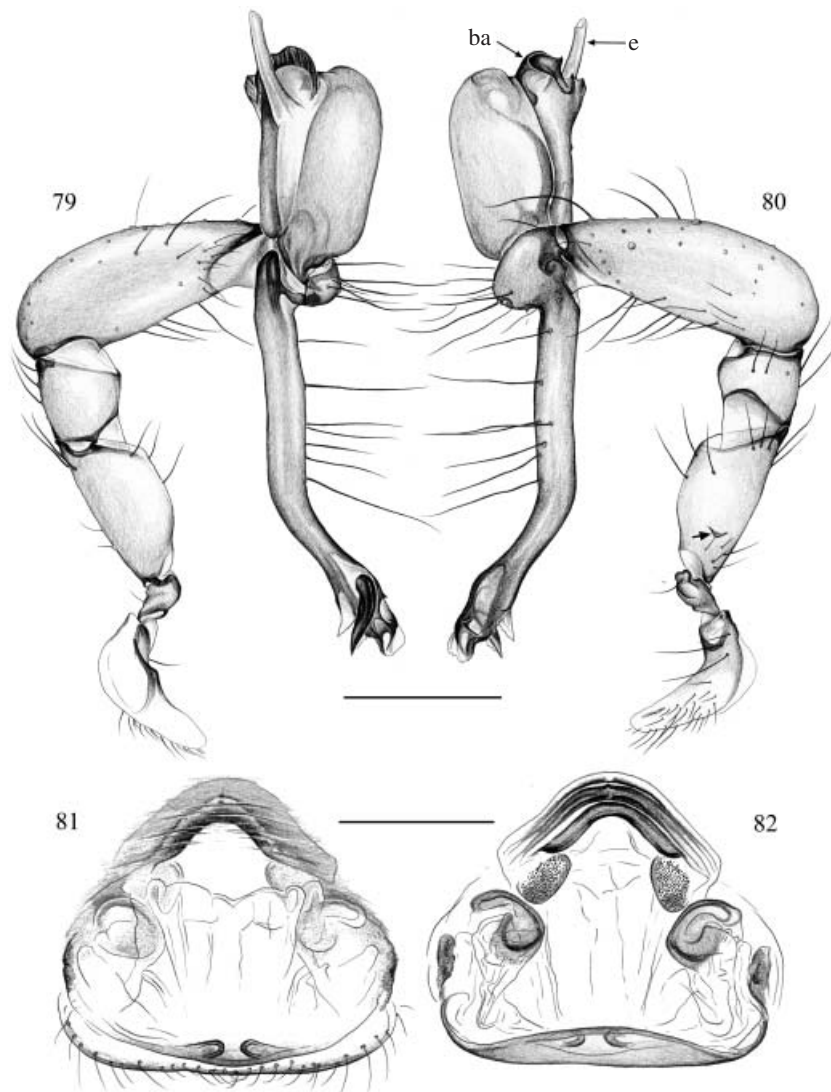


Figures 66–78. *Quamtana entabeni* sp. nov. (66–72), and *Q. ciliata* comb. nov. (73–78) 66, Female prosoma, frontal view. 67, 74, Male gonopores with epiandrous spigots. 68, 78, Distal male cheliceral apophyses with modified hairs. 69, Left procurus, prolateral view. 70, Right bulbal apophysis (ba) and embolus (e). 71, Male ALS and PMS. 72, Tip of female pedipalp with tarsal organ. 73, Male ocular area, with elevated triads and small AME. 75, Right male bulb, showing bulbal apophysis (ba) and embolus (e). 76, Tip of right procurus and palpal coxa with retrolateral apophysis (tar). 77, Male palpal tarsal organ.

Distribution. Known only from Vernon Crookes Nature Reserve, KwaZulu-Natal, South Africa (Fig. 262).

Material examined. SOUTH AFRICA: KWAZULU-NATAL: Vernon Crookes Nature Reserve, Umzinto:

type above, together with 1 ♀ (NMSA); same locality, September 25, 1995 (L. Lotz), 1 ♂ 1 ♀ (NMSA 8018); same locality, January 1, 1992 (L. Lotz), 1 ♀ (NMSA 5942); Vernon Crookes Nature Reserve, Mthakati Valley (30°17'S, 30°35'E), December 10, 2000 (G.B.P. Davies), 1 ♂ (DMSA ARA 700).



Figures 79–82. *Quamtana umzinto* sp. nov. Left male palp in prolateral (79) and retrolateral (80) views, and cleared epigynum in ventral (81) and dorsal (82) views. ba: bulbal apophysis, e: embolus. Arrowed: small projection on palpal femur. Scale bars = 0.3 mm (81, 82), 0.5 mm (79, 80).

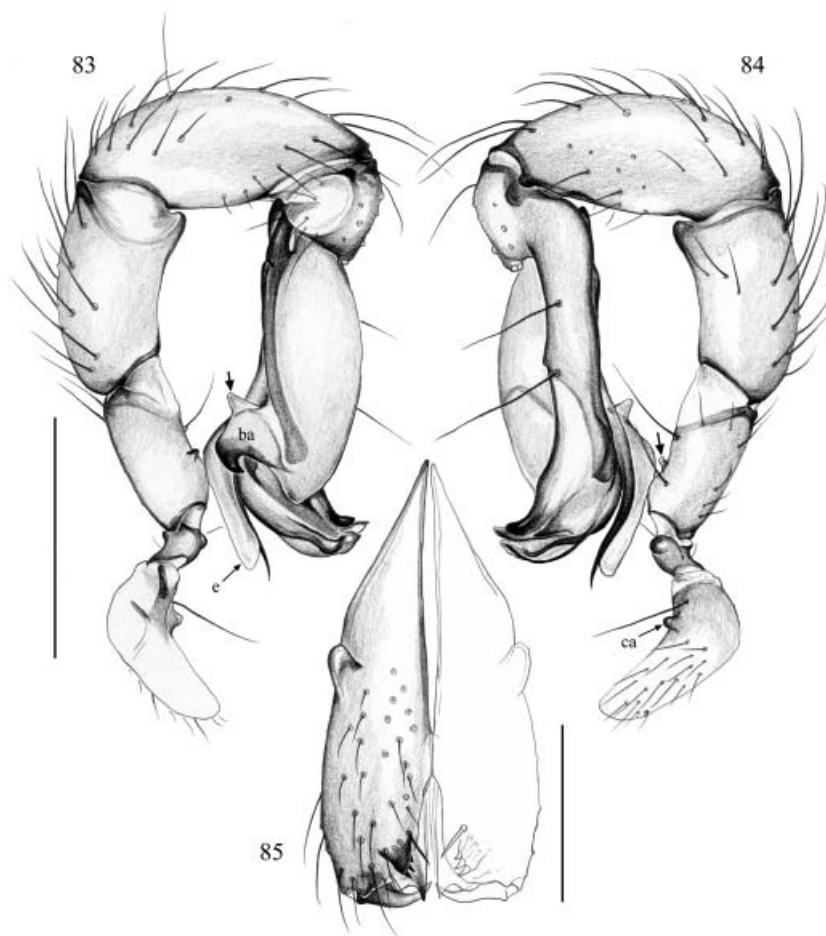
***QUAMTANA LOTZI* SP. NOV.**
(FIGS 5, 83–85)

Type. Male holotype from Koppiesdam Nature Reserve, Koppies (27°13'S, 27°42'E), 1400 m a.s.l., Free State, South Africa; September 28, 1993 (L. Lotz); in NMSA (6608).

Etymology. Named after the collector, Leon Lotz from the National Museum in Bloemfontein.

Diagnosis. Distinguished from congeners by the shapes of bulb and procurus (bulbal apophysis, distal sclerites of procurus, Figs 83, 84), by the long male palpal patella (Fig. 83), and by the cheliceral apophyses with three modified hairs each (Fig. 85).

Male (holotype). Total length 1.8 (1.85 with clypeus), carapace width 0.75. Leg 1: 14.4 (3.7 + 0.3 + 4.0 + 5.3 + 1.1), tibia 2: 2.2, tibia 3: 1.3, tibia 4: 2.1; tibia 1 L/d: 60. Habitus as in Figure 5. Carapace ochre-yellow, light brown medially (including ocular area and clypeus); sternum whitish. Legs ochre-yellow, slightly darker rings on femora (subdistally) and tibiae (proximally and subdistally). Opisthosoma grey with many blackish spots except ventrally. Ocular area slightly elevated; distance PME–PME 100 µm; diameter PME 80 µm; diameter AME 45 µm. Clypeus with long median projection provided with six small sclerotized cones distally. Sternum wider than long (0.55/0.50). Chelicerae as in Figure 85. Palps as in Figures 83, 84; coxa with retrolateral apophysis; trochanter with ret-



Figures 83–85. *Quamtana lotzi* sp. nov. Left male palp in prolateral (83) and retrolateral (84) views, and male chelicerae in frontal view (85). ba: bulbal apophysis, ca: coxa apophysis, e: embolus. Arrowed: transparent projection on bulb (83) and apophysis on femur (84). Scale bars = 0.2 mm (85), 0.5 mm (83, 84).

rolateral apophysis (distinct in dorsal view), femur with small ventral projection, patella very long, procursus distally complex, with long spine originating prolaterally and winding around procursus ventrally; bulb with hooked sclerite, transparent projection and long membranous embolus (Fig. 83). Retrolateral trichobothrium of tibia 1 at 8.5%; tarsus 1 with >10 pseudosegments, fairly distinct distally.

Female. Unknown.

Distribution. Known from type locality only (Fig. 262).

Material examined. SOUTH AFRICA: FREE STATE: Koppies, Koppiesdam Nature Reserve: type above.

***QUAMTANA MEYERI* SP. NOV.**

(FIGS 6, 34, 86–92)

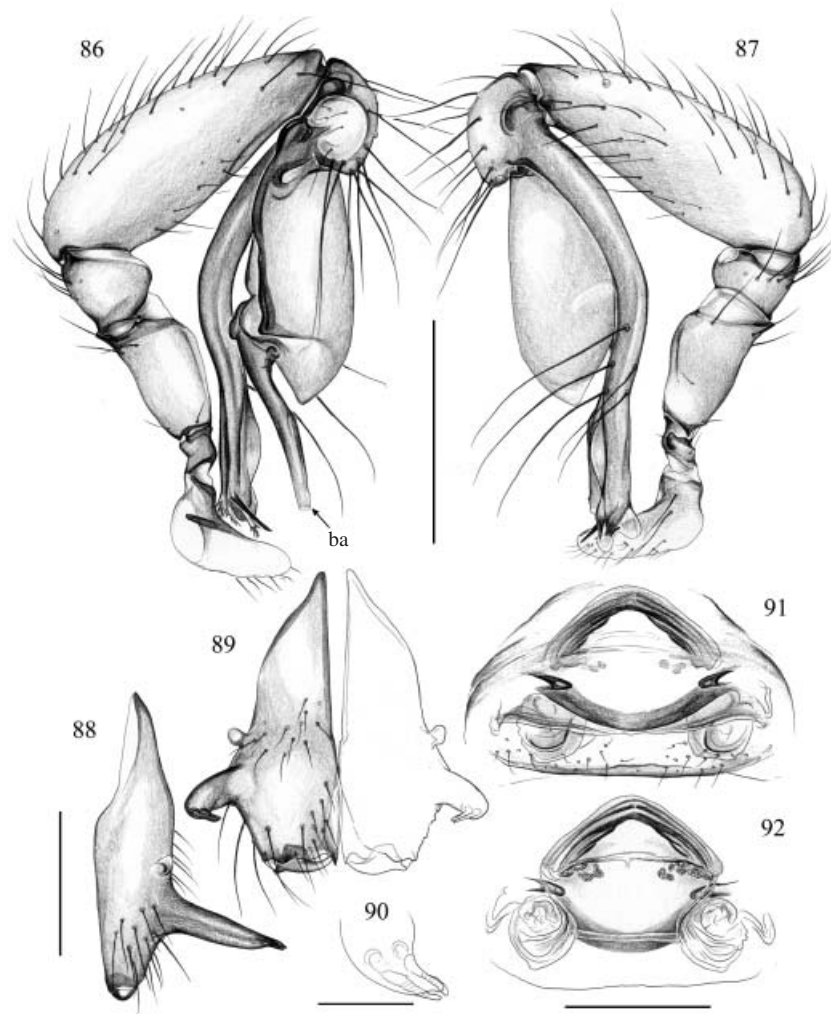
Type. Male holotype from Giant's Castle (29°20'S,

29°28'E), KwaZulu-Natal, South Africa; February 3, 1982 (M. Meyer); in NCP (82/739).

Etymology. Named after the collector M. Meyer.

Diagnosis. Small species with slightly pointed opisthosoma and small but distinct AME; distinguished from similar congeners by the long and slender procursus (Fig. 87; similar to *Q. umzinto*), by the single long projection on the bulb (Fig. 86), and by the widely spread male cheliceral apophyses (Figs 88, 89; identical to *Q. nylsvley*).

Male (holotype). Total length 1.65 (1.8 with clypeus), carapace width 0.65. Leg 1: 11.7 (3.1 + 0.3 + 3.3 + 4.0 + 1.0), tibia 2: 1.8, tibia 3: 1.2, tibia 4: 1.9; tibia 1 L/d: 52. Habitus as in Figure 6. Carapace ochre-yellow, with brown band medially including ocular area and clypeus; sternum pale ochre-yellow centrally, margins brown. Legs ochre-yellow. Opisthosoma ochre-grey with dark spots shining through cuticle; genital area



Figures 86–92. *Quamtana meyeri* sp. nov. Left male palp in prolateral (86) and retrolateral (87) views, male chelicerae in lateral (88) and frontal (89) views, modified hairs on male chelical apophysis (90), and cleared epigynum in ventral (91) and dorsal (92) views. ba: bulbal apophysis. Scale bars = 50 μ m (90), 0.2 mm (88, 89), 0.3 mm (91, 92), 0.5 mm (86, 87).

with large, brown trapezoidal mark. Ocular area slightly elevated; distance PME–PME 115 μ m; diameter PME 80 μ m; diameter AME 30 μ m. Clypeus unmodified. Sternum wider than long (0.5/0.45). Chelicerae as in Figures 88, 89, distance between tips of modified hairs (Fig. 90) on apophyses 285 μ m. Palps as in Figures 86, 87; trochanter with retrolateral apophysis distinct in dorsal view, procursus very long but simple, only distally complex; bulb slightly pointed distally, with long sclerotized projection (containing sperm duct?) and small hump at its basis (Fig. 86). Retrolateral trichobothrium of tibia 1 at 10%; tarsus 1 with ~15 pseudosegments quite distinct distally.

Variation. Tibia 1 in other male: 3.2. Note that the bulbs in Figure 6 are artificially rotated out of their usual position, while Figures 86 and 87 show the usual position.

Female. In general similar to male; sternum with narrow dark margin. Tibia 1: 2.35. Epigynum as in Figures 34, 91, with pair of pockets 280 μ m apart. Dorsal view as in Figure 92.

Distribution. Known from type locality only (Fig. 262).

Material examined. SOUTH AFRICA: KWAZULU-NATAL: Giant's Castle: type above, together with 1♂ 1♀ (NCP 82/739).

QUAMTANA NYLSVLEY SP. NOV.

(FIGS 7, 35, 93–96)

Type. Male holotype from Nylsvley Nature Reserve (24°39'S, 28°42'E), pittrap, Limpopo, South Africa; October 26, 1975 (G. Ferriera); in NCP (2000/324).

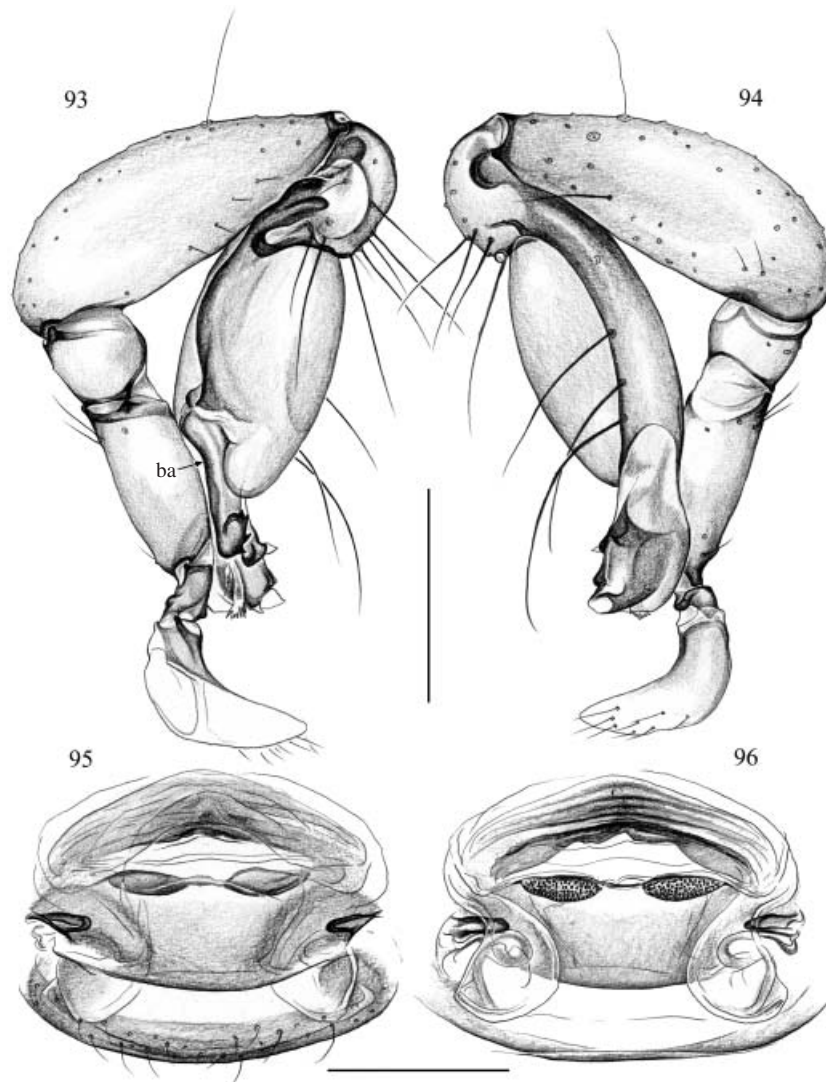
Etymology. Named after the type locality.

Diagnosis. Small species with rounded opisthosoma and small but distinct AME; distinguished from similar congeners by the widely spread male cheliceral apophyses (identical in shape to *Q. meyeri*; cf. Figs 88, 89), and by the shape of the single projection on the bulb (Fig. 93).

Male (holotype). Total length 1.3 (1.4 with clypeus), carapace width 0.55. Leg 1 missing, tibia 2: 1.1, tibia 3: 0.7, tibia 4 missing. Habitus as in Figure 7. Carapace ochre-yellow, slightly darker medially; chelicerae shining dark through clypeus; sternum ochre to light brown, with light triangle behind labium. Legs ochre-yellow. Opisthosoma grey with dark spots shining through cuticle except ventrally. Ocular area barely

elevated; distance PME–PME 105 μ m; diameter PME 60 μ m; diameter AME 20 μ m. Clypeus unmodified. Sternum wider than long (0.4/0.35). Chelicerae as in *Q. meyeri* (cf. Figs 88, 89), distance between tips of modified hairs on apophyses 340 μ m. Palps as in Figures 93, 94; trochanter with retrolateral apophysis distinct in dorsal view, procurus with large distal structure that appears hinged and prolateral spine (hidden by bulb in Fig. 93); bulb with only one, sclerotized and apparently hinged projection provided with sclerotized teeth distally (Fig. 93).

Female. In general similar to male. Tibia 1 in two females: 1.75, 1.9. Epigynum as in Figures 35, 95, with pair of pockets 280 μ m apart. Dorsal view as in Figure 96.



Figures 93–96. *Quamtana nylsvley* sp. nov. Left male palp in prolateral (93) and retrolateral (94) views, and cleared epigynum in ventral (95) and dorsal (96) views. ba: bulbal apophysis. Scale bars = 0.2 mm (95, 96), 0.3 mm (93, 94).

Distribution. Known from type locality only (Fig. 262).

Material examined. SOUTH AFRICA: LIMPOPO: Nylsvley Nature Reserve: type above, together with 4♀ and 4 juveniles (NCP 2000/324).

QUAMTANA MOLIMO SP. NOV.

(FIGS 8, 36, 97–102, 128–133)

Type. Male holotype from Molimo Nhtuse (~29°20'S, 27°40'E), Lesotho; in herbs and grass, April 16, 1974 (A. Russell-Smith); in ZFMK.

Etymology. Named after the type locality.

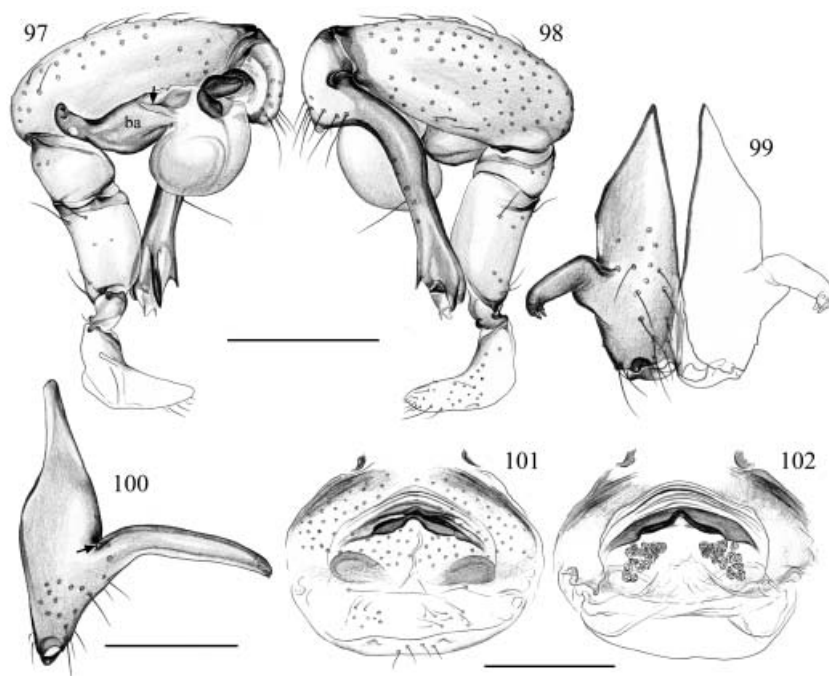
Diagnosis. Small species with rounded opisthosoma and small but distinct AME; distinguished from similar congeners by the long and widely spread male cheliceral apophyses (Figs 99, 100), and by the shapes of procurus and of bulb (distinctive bulbal apophysis; Figs 97, 98).

Male (holotype). Total length 1.65 (1.75 with clypeus), carapace width 0.67. Leg 1: 8.75 (2.3 + 0.3 + 2.4 + 2.9 + 0.85), tibia 2: 1.35, tibia 3: 0.95, tibia 4: 1.5; tibia 1 L/d: 60. Habitus as in Figure 8. Carapace ochre-yellow with brown median band; ocular area and clypeus only slightly darkened; sternum light brown with ochre-yellow spots

at bases of leg coxae and medially. Legs ochre-yellow. Opisthosoma grey with dark spots shining through cuticle except ventrally. Ocular area barely elevated; distance PME–PME 140 µm; diameter PME 70 µm; diameter AME 30 µm. Clypeus unmodified. Sternum wider than long (0.5/0.47). Chelicerae as in Figures 99, 100, each long apophyses with pair of modified hairs on tip (Fig. 133), lateral apophyses transparent and small, barely visible. Palps as in Figures 97, 98; trochanter with retrolateral apophysis distinct in dorsal view, procurus complex distally, with strong prolateral spine; bulb with prominent sclerotized projection that seems to carry opening of sperm duct (Figs 97, 131) and small transparent structure at its basis. Retrolateral trichobothrium of tibia 1 at 9%; tarsus 1 with ~15 pseudosegments quite distinct. Gonopore with four long epiandrous spigots (Fig. 128). ALS with several piriform gland spigots, PMS with usual pair of two spigots (Fig. 129). Palpal tarsal organ capsulate (Fig. 130).

Variation. Tibia 1 in two other males: 2.4, 2.5.

Female. In general similar to male. Tibia 1 in three females: 1.8, 2.0, 2.1. Epigynum as in Figures 36, 101, apparently without pockets. Dorsal view as in Figure 102.



Figures 97–102. *Quamtana molimo* sp. nov. Left male palp in prolateral (97) and retrolateral (98) views, male chelicerae in frontal (99) and lateral (100) views, and cleared epigynum in ventral (101) and dorsal (102) views. ba: bulbal apophysis. Arrowed: transparent projection on bulb (97) and proximolateral tiny apophysis on chelicera (100). Scale bars = 0.2 mm (99, 100), 0.3 mm (101, 102), 0.4 mm (97, 98).

Distribution. Known from type locality only (Fig. 262).

Material examined. LESOTHO: MOLIMO NHTUSE: type above, together with 3♂ 3♀ (ZFMK).

QUAMTANA LELEUPI SP. NOV.

(FIGS 10, 103–106)

Type. Male holotype from near Port Shepstone (~30°45'S, 30°15'E), 'dans humus', KwaZulu-Natal, South Africa; December 1961 (N. Leleup); in MRAC (132.664).

Etymology. Named after the collector N. Leleup.

Diagnosis. Small species with slightly pointed opisthosoma and small but distinct AME; distinguished from known congeners by the large male palpal femur (Fig. 103), the shape of the procurus (Fig. 104) and by the single, simple projection on the bulb (Fig. 103).

Male (holotype). Total length 1.6 (1.8 with clypeus), carapace width 0.60. Leg 1: 11.9 (3.1 + 0.3 + 3.2 + 4.4 + 0.9), tibia 2: 1.7, tibia 3: 1.2, tibia 4: 1.9; tibia 1 L/d: 60. Habitus as in Figure 10. Carapace pale ochre, with brown median mark including clypeus; sternum pale ochre with dark margins. Legs pale ochre with darker patellae and tibia-metatarsus joints. Opisthosoma grey with very faint darker spots, genital area light brown. Ocular area slightly elevated; distance PME–PME 180 µm; diameter PME 60 µm; diameter AME 25 µm. Clypeus unmodified. Sternum wider than long (0.5/0.45). Chelicerae as in Figure 105, distance between tips of modified hairs (Fig. 106) on apophyses 115 µm. Palps as in Figures 103, 104; trochanter with retrolateral apophysis and small ventral projection; femur very large, with retrolateral ridge proximally; procurus simple, only distally more complex (Fig. 104); bulb with only one, barely sclerotized projection (containing sperm duct?) and small knob at its base (Fig. 103). Retrolateral trichobothrium of tibia 1 at 9%; tarsus 1 with >10 pseudosegments, distally ~7 fairly distinct.

Female. Unknown.

Distribution. Known from type locality only (Fig. 262).

Material examined. SOUTH AFRICA: KWAZULU-NATAL: near Port Shepstone: type above.

QUAMTANA LEPTOPHOLCICA

(STRAND, 1909) **COMB. NOV.**

(FIGS 13, 37, 107–112)

Pholcus (?) leptopholicus Strand, 1909: 557–558.

Types. Two females from 'Millers Point, Simonstown' and 'Simonstown, Weg nach Millers Point' (~34°15'S,

18°30'E), Western Cape, South Africa; July 23, 1903 (German South Pole expedition 1901–03); not examined (see Note below).

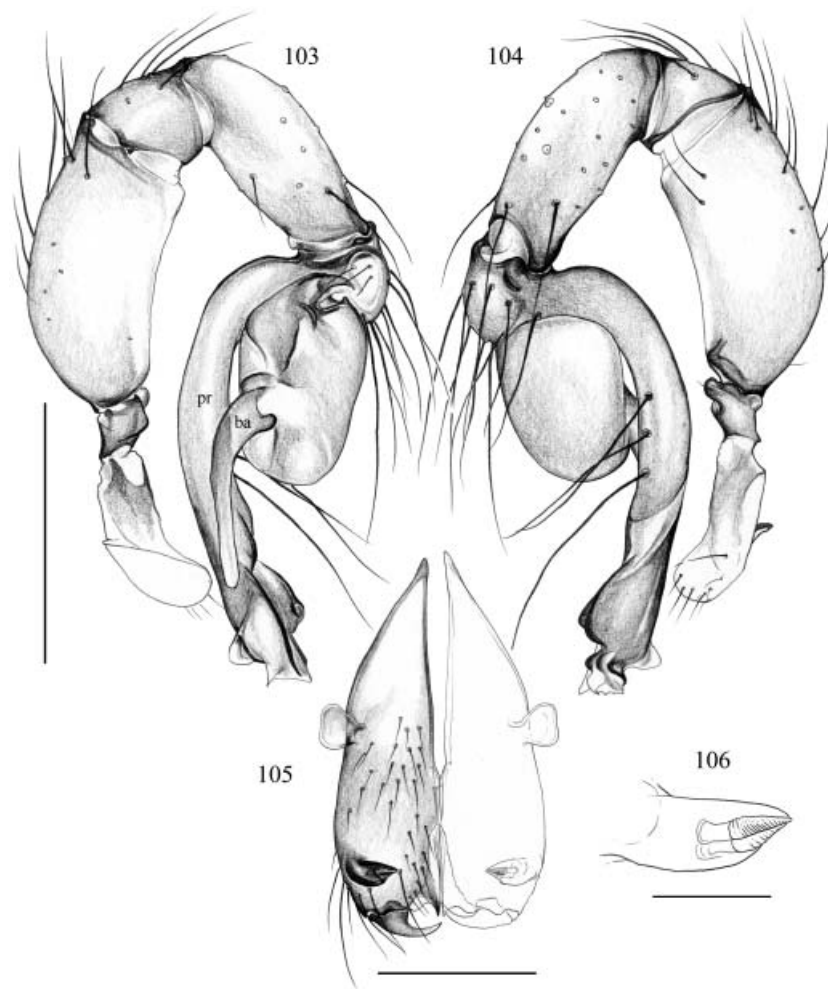
Note. The types were probably deposited in Stuttgart and destroyed in World War II. Strand's original description is long but offers few distinctive characters. Therefore, while the assignment of the new specimens to this species is not unambiguous, it is supported by the following evidence: the original description of size, leg length, ocular area, opisthosoma shape, and coloration fits the present material, the black narrowing stripe running down from the AME is almost unique to the present species among the genus, and the localities are all on Cape Peninsula. However, taking into account the degree of incompleteness of collections from the Peninsula, I consider it premature to designate a neotype at this point.

Diagnosis. Small species with slightly elevated and pointed opisthosoma and distinct AME; distinguished from congeners by the long ventral trochanter apophysis on the male palp (Fig. 107), by the shapes of procurus and bulb (distal elements on procurus, curved bulbal apophysis; Figs 107, 108), and by the pockets on the epigynum in advanced position (not at rim; Fig. 111).

Male (MRAC 177.011). Total length 1.4 (1.5 with clypeus), carapace width 0.65. Leg 1: 11.45 (3.2 + 0.25 + 3.2 + 4.0 + 0.8), tibia 2 missing, tibia 3: 1.0, tibia 4 missing; tibia 1 L/d: 55. Habitus as in Figure 13. Carapace pale ochre with brown band medially including ocular area and clypeus, with black narrowing line running down from between AME; sternum ochre-yellow laterally, whitish medially; legs pale ochre with light brown rings on femora and tibiae (subdistally); opisthosoma grey with dark spots except ventrally, genital area light brown. Ocular area barely elevated; distance PME–PME 105 µm; diameter PME 70 µm; diameter AME 35 µm. Clypeus unmodified. Sternum wider than long (0.45/0.4). Chelicerae as in Figure 109, with pair of modified hairs (Fig. 110), tips 35 µm apart. Palps as in Figures 107, 108; trochanter with long ventral and shorter retrolateral apophyses, procurus relatively simple, with distinct protuberance proximally prolaterally; bulb with distinctive curved apophysis, membranous embolus, and further membranous structure (Figs 107, 108). Retrolateral trichobothrium of tibia 1 at 6%; tarsus 1 with ~10 pseudosegments, very indistinct.

Variation. Tibia 1 in two other males: 3.1, 3.4.

Female. In general similar to male. Tibia 1 in six females: 2.15–2.5 (\bar{x} = 2.37). Epigynum as in



Figures 103–106. *Quamtana leleupi* sp. nov. Left male palp in prolateral (103) and retrolateral (104) views, male chelicerae in frontal view (105), and modified hairs on male cheliceral apophysis (106). ba: bulbal apophysis, pr: procursus. Scale bars = 50 μ m (106), 0.2 mm (105), 0.5 mm (103, 104).

Figures 37, 111, with pair of pockets centrally on frontal plate, 25 μ m apart. Dorsal view as in Figure 112.

Distribution. Known from Cape Peninsula only (Fig. 262).

Material examined. SOUTH AFRICA: WESTERN CAPE: Table Mountain, top ($\sim 34^{\circ}00'S$, $18^{\circ}35'E$), 1050 m a.s.l., January 21, 1989 (R. Jocqué), 1 σ 5 ϕ (MRAC 169.715); Table Mountain, base near Kirstenbosch ($34^{\circ}00'S$, $18^{\circ}35'E$), litter, January 23, 1989 (R. Jocqué), 1 ϕ (MRAC 169.737); Cape Peninsula, Constantia, Vlakkenberg ($34^{\circ}02'S$, $18^{\circ}23'E$), fynbos near summit, November 8–23, 1992 (B. Heydenrych), 1 σ (MRAC 177.011); same collection data but October 19–November 8, 1992, 1 σ (MRAC 177.007).

QUAMTANA LAJUMA SP. NOV.

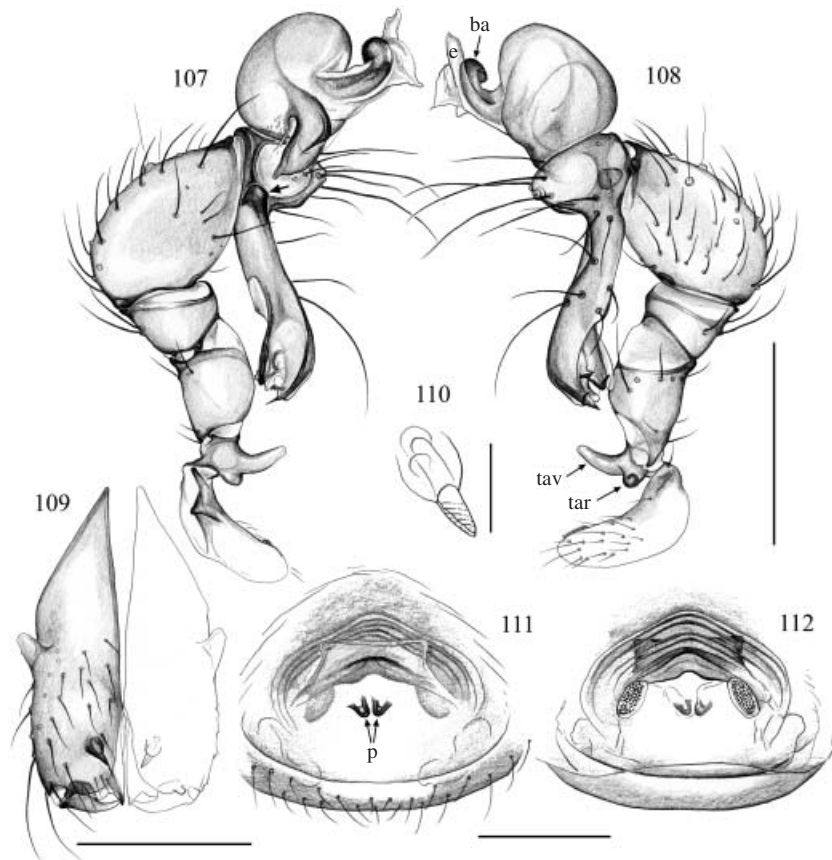
(FIGS 12, 113–116)

Type. Male holotype from Soutpansberg, Lajuma Farm ($\sim 23^{\circ}02'S$, $29^{\circ}26'E$), Limpopo, South Africa; August 8, 1997 (R. Jocqué); in MRAC (206.530).

Etymology. Named after the type locality.

Diagnosis. Medium size species with globular opisthosoma, without AME; distinguished from similar congeners by the shape of procursus and bulbal apophysis (Figs 113, 114), and by the pair of frontal projections on the male chelicerae (arrow in Fig. 115).

Male (holotype). Total length 2.05 (2.25 with clypeus), carapace width 0.85. Leg 1: $7.3 + 0.4 + 7.2$, metatarsus and tarsus missing, tibia 2: 4.1, tibia 3: 2.5, tibia 4 missing. Habitus as in Figure 12. Cara-



Figures 107–112. *Quamtana leptopholcica* **comb. nov.** Left male palp in prolateral (107) and retrolateral (108) views, male chelicerae in frontal view (109), modified hairs on male chelical apophysis (110), and cleared epigynum in ventral (111) and dorsal (112) views. ba: bulbal apophysis, e: embolus, p: pockets on epigynum, tar: retrolateral trochanter apophysis, tav: ventral trochanter apophysis. Arrowed: proximal projection on procurus. Scale bars = 30 μ m (110), 0.2 mm (109, 111, 112), 0.4 mm (107, 108).

pace pale ochre-yellow with brown median mark, clypeus with pair of dark marks under triads; sternum whitish. Legs ochre-yellow. Opisthosoma grey with many dark spots barely visible through cuticle, ventrally without spots. Ocular area slightly elevated; distance PME–PME 105 μ m; diameter PME 100 μ m; no trace of AME. Clypeus unmodified. Sternum wider than long (0.65/0.55). Chelicerae as in Figure 115, with unsclerotized short projections between frontal and lateral apophyses; distance between tips of modified hairs (Fig. 116) on frontal apophyses 115 μ m. Palps as in Figures 113, 114; trochanter with small but distinct retrolateral and ventral apophyses; procurus simple, only distally more complex (Fig. 113), with prolateral flat sclerite that appears hinged; bulb with hooked apophysis and membranous embolus arising from same, poorly sclerotized base (Figs 113, 114). Retrolateral trichobothrium of tibia 1 at 4%; tarsus 2 with >10 pseudo-segments quite distinct distally.

Distribution. Known from type locality only (Fig. 264).

Material examined. SOUTH AFRICA: LIMPOPO: Soutpansberg: type above.

QUAMTANA VIDAL SP. NOV.

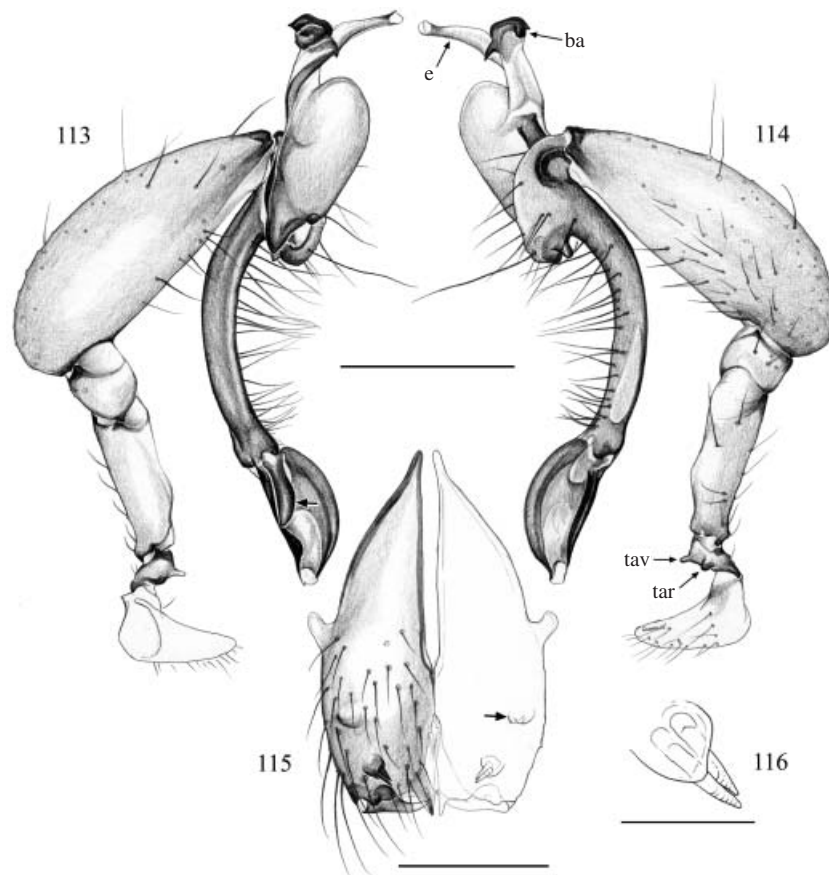
(FIGS 11, 117–121, 134–135)

'Spermophora' sp. 5: Huber, 2003a,b

Type. Male holotype from Cape Vidal (28°08'S, 32°33'E), coastal *Casuarina* forest, on underside of leaves, 10 m a.s.l., KwaZulu-Natal, South Africa; April 2–3, 2001 (B. A. Huber); in NCP.

Etymology. Named after the type locality.

Diagnosis. Small six-eyed species with slightly elevated and pointed opisthosoma; distinguished from similar species by the shapes of procurus and bulbal apophyses (Figs 117, 118).



Figures 113–116. *Quamtana lajuma* sp. nov. Left male palp in prolateral (113) and retrolateral (114) views, male chelicerae in frontal view (115), and modified hairs on male cheliceral apophysis (116). ba: bulbal apophysis, e: embolus, tar: retrolateral trochanter apophysis, tav: ventral trochanter apophysis. Arrowed: distinctive sclerite on procurus (113), and proximal projection on chelicera (115). Scale bars = 50 μ m (116), 0.2 mm (115), 0.5 mm (113, 114).

Male (holotype). Total length 1.15 (1.30 with clypeus), carapace width 0.50. Leg 1: 7.7 (2.0 + 0.2 + 2.1 + 2.6 + 0.8), tibia 2: 1.1, tibia 3: 0.6, tibia 4: 1.1; tibia 1 L/d: 42. Habitus as in Figure 11. Carapace pale ochre-yellow with brown mark, ocular area and clypeus dark brown; sternum whitish. Legs pale ochre-yellow, patellae and tibia-metatarsus joints darker. Opisthosoma ochre-grey with pair of spots dorsally. Ocular area barely elevated; distance PME–PME 100 μ m; diameter PME 80 μ m; no trace of AME. Clypeus unmodified. Sternum wider than long (0.40/0.35). Chelicerae as in Figure 119, with pair of modified hairs on apophyses, tips 17 μ m apart. Palps as in Figures 117, 118; trochanter with retrolateral apophysis, femur with small retrolateral apophysis, procurus mostly simple but with complex tip; bulb with distinctive set of membranous and sclerotized structures (Fig. 117). Retrolateral trichobothrium of tibia 1 at 5%; tarsus 1 with >10 pseudosegments, only distally fairly distinct. Palpal tarsal organ capsulate

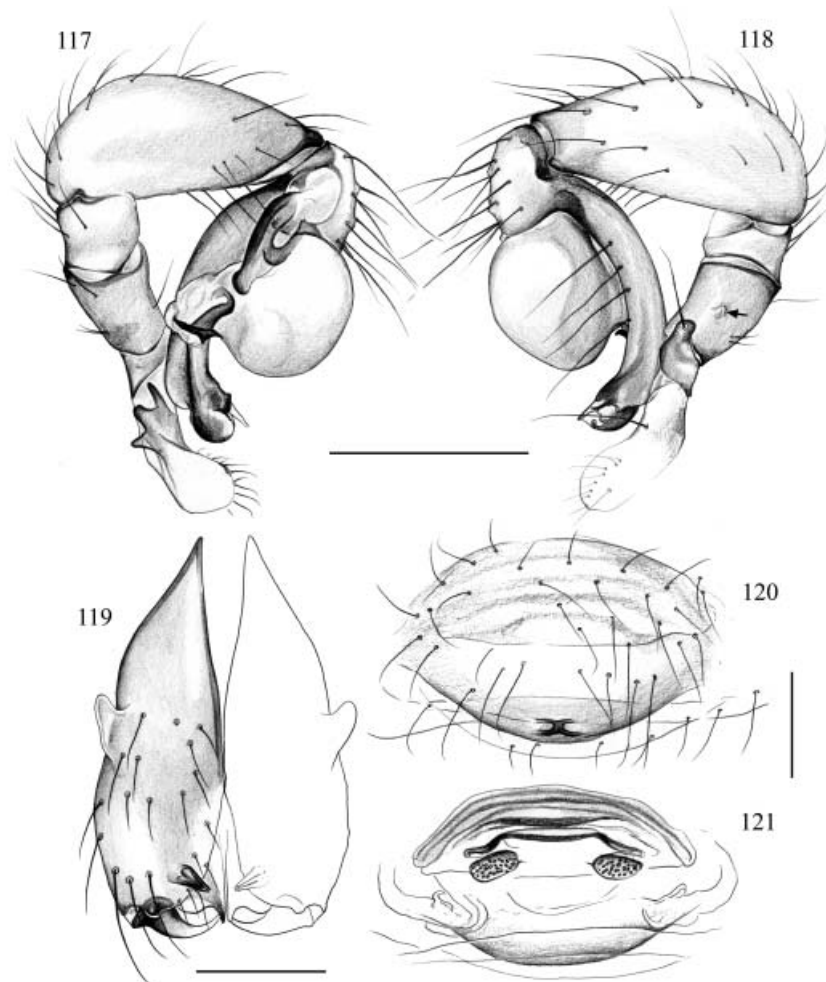
(Fig. 134). Gonopore with four epiandrous spigots (Fig. 135).

Variation. Tibia 1 in six other males: 2.05–2.35 (\bar{x} = 2.12). The male from Keimond has longer legs (tibia 1: 2.70) but has identical genitalia and chelicerae.

Female. In general similar to male, but dark pattern on carapace more reduced, with fairly distinct light brown rings subdistally on femora and tibiae. Tibia 1 in 10 females: 1.50–1.70 (\bar{x} = 1.63). Epigynum as in Figure 120, with pair of pockets 12 μ m apart. Dorsal view as in Figure 121.

Distribution. Known from three localities in KwaZulu-Natal and Eastern Cape, South Africa (Fig. 264).

Material examined. SOUTH AFRICA: KWAZULU-NATAL: Cape Vidal: type above, together with 4♂ 10♀ (NCP), and 3♂ 3♀ (ZFMK); Durban, Botanical



Figures 117–121. *Quamtana vidal* sp. nov. Left male palp in prolateral (117) and retrolateral (118) views, male chelicerae in frontal view (119), and cleared epigynum in ventral (120) and dorsal (121) views. Arrowed: projection on femur. Scale bars = 0.1 mm (119–121), 0.3 mm (117, 118).

Garden (~30°00'S, 30°50'E), April 4, 2001 (B. A. Huber), 1♂ (ZFMK). EASTERN CAPE: Keimond (~32°41'S, 28°23'E), "sweepnet-herbs", December 3, 1977 (A. S. Dippenaar-Schoeman), 1♂ 1 juvenile (NCP 177/1239).

***QUAMTANA HECTORI* SP. NOV.**
(FIGS 9, 38, 122–127, 136, 137)

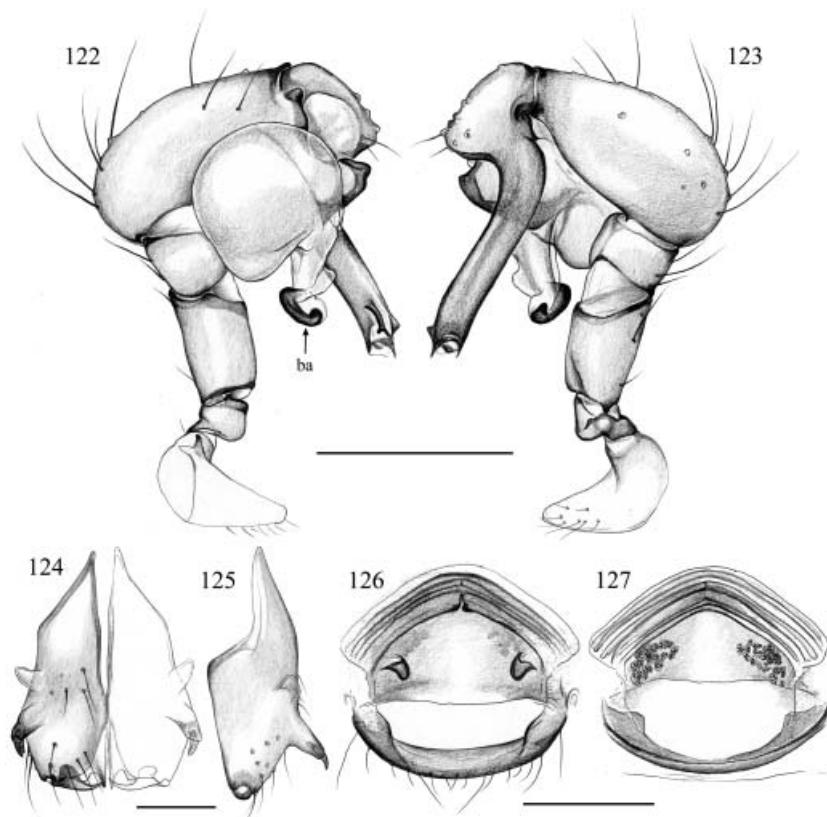
Type. Male holotype from 15 km NW Klaserie, Guernsy Farm (~24°30'S, 30°55'E), Limpopo, South Africa; woodland, malaise, December 19–31, 1985 (S. & J. Peck); in AMNH.

Etymology. Commemorates Hector Pietersen and the other children shot in Soweto, June 16, 1976 by police.

Diagnosis. Small six-eyed species with globular opisthosoma; distinguished from similar species by

the shapes of procursus and bulbal apophyses (Figs 122, 123).

Male (holotype). Total length 1.3 (1.4 with clypeus), carapace width 0.6. Leg 1: 12.2 (3.4 + 0.3 + 3.4 + 4.1 + 1.0), tibia 2: 2.0, tibia 3: 1.1, tibia 4: 1.9; tibia 1 L/d: 55. Habitus as in Figure 9. Carapace ochre-yellow with brown mark excluding ocular area, clypeus also brown; sternum pale ochre-yellow. Legs ochre-yellow, opisthosoma grey. Ocular area barely elevated; distance PME–PME 60 µm; diameter PME 70 µm; no trace of AME. Clypeus unmodified. Sternum wider than long (0.45/0.35). Chelicerae as in Figures 124, 125, with pair of modified hairs on apophyses (Fig. 137), tips 215 µm apart. Palps as in Figures 122, 123; trochanter with short but distinct retrolateral apophysis, procursus simple with more complex tip, prolateral projection subdistally; bulb with distinctive apophysis on membranous basis (Fig. 122). Retrolat-



Figures 122–127. *Quamtana hectori* sp. nov. Left male palp in prolateral (122) and retrolateral (123) views, male chelicerae in frontal (124) and lateral (125) views, and cleared epigynum in ventral (126) and dorsal (127) views. ba: bulbal apophysis. Scale bars = 0.1 mm (124, 125), 0.2 mm (126, 127), 0.3 mm (122, 123).

eral trichobothrium of tibia 1 at 4%; tarsus 1 with ~8 pseudosegments fairly distinct distally, proximally pseudosegmentation not visible. Gonopore with four epiandrous spigots (Fig. 136).

Variation. Tibia 1 in five other males: 3.3–4.3. Some males with indistinct rings on legs (see females). In the males from Witpoortjie Falls the procursus is minimally shorter and wider; these specimens are assigned tentatively to the present species.

Female. In general similar to male, but dark rings on legs quite distinct: subdistally on femora and proximally and subdistally on tibiae. Tibia 1 in five females: 2.2–2.9. Epigynum as in Figures 38, 126, with pair of pockets 170 µm apart. Dorsal view as in Figure 127.

Distribution. Known from several localities in north-eastern South Africa (Fig. 264).

Material examined. SOUTH AFRICA: LIMPOPO: 15 km NW Klaserie: type above, together with 2♂ (AMNH); Makalali 24°09'S, 30°42'E, February – December 1999 (C. Whitmore), 1♂ 2♀ (DMSA ARA

479). GAUTENG: Magaliesburg: Kroondal (~25°50'S, 27°20'E), December 1, 1990 (V. D. & B. Roth), 2♂ 3♀ (CAS); Witpoortjie Falls, Roodepoort distr. (~26°00'S, 27°50'E), under stones, January 29, 1977 (A. LeRoy), 2♂ 2♀, assigned tentatively (NCP 177/862). NORTH-WEST PROVINCE: Rustenburgkloof (~25°35'S, 27°10'E), December 11, 1979 (A. S. Dippenaar-Schoeman, M. Stiller), sweep net, beating, 2♂ 2♀ (NCP 94/361).

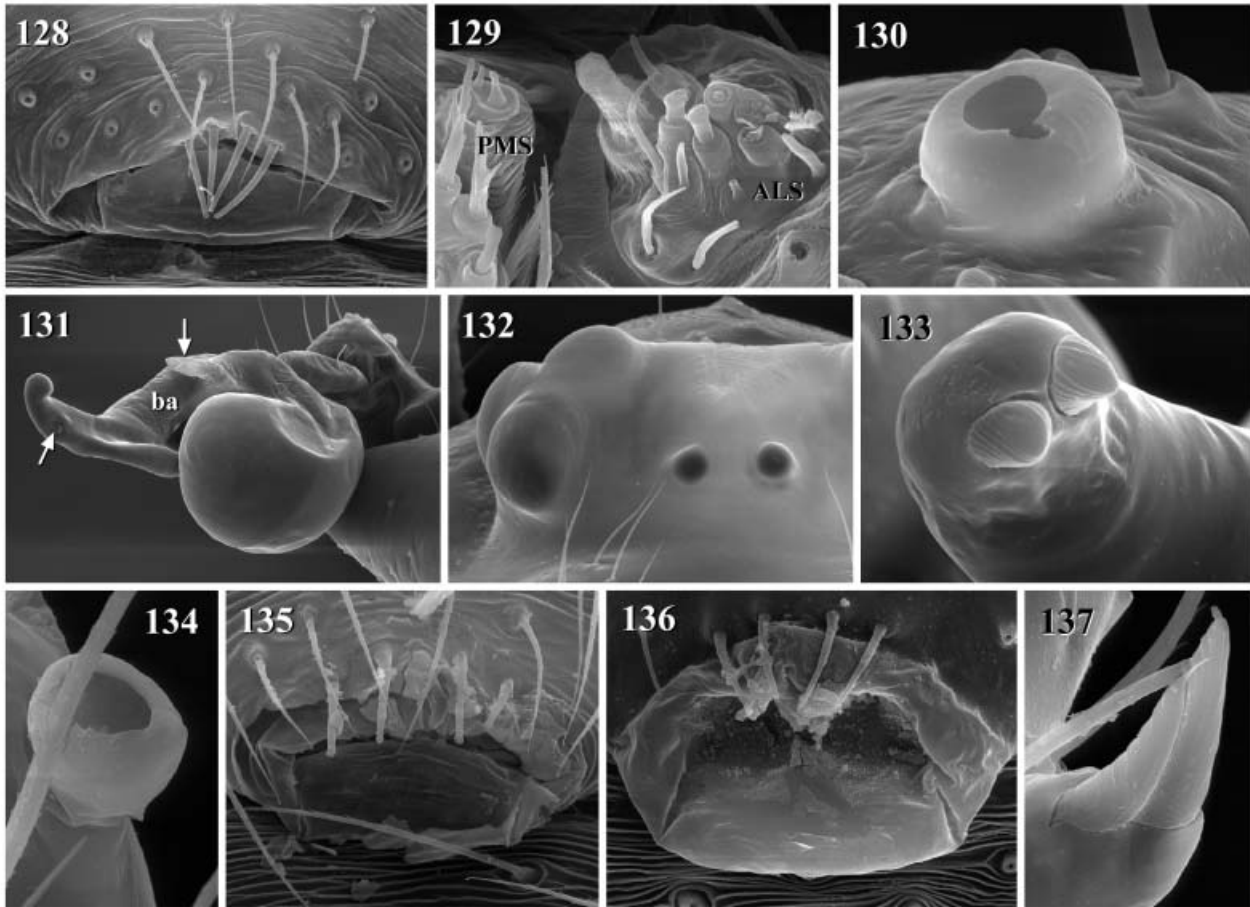
***QUAMTANA MABUSAI* SP. NOV.**

(FIGS 14, 39, 138–142, 166)

Type. Male holotype from 11 km SE Pilgrim's Rest (~24°55'S, 30°40'E), Mpumalanga, South Africa; 1400 m a.s.l., relict native forest, December 11–31, 1985 (S. & J. Peck); in AMNH.

Etymology. Named after Nukain Mabusa, South African 'outsider artist' (died 1981) known for his strong yet sophisticated sense of colour and pattern and his ingenious use of available materials.

Diagnosis. Small eight-eyed species with elevated and pointed opisthosoma; distinguished from similar con-



Figures 128–137. *Quamtana molimo* (128–133), *Q. vidal* (134, 135) and *Q. hectori* (136, 137) **spp. nov.** 128, 135, 136, Male gonopores with epiandrous spigots. 129, Male ALS and PMS. 130, 134, Male palpal tarsal organs. 131, Genital bulb with bulbal apophysis (ba). Arrowed: putative opening of sperm duct and proximal transparent projection. 132, Male AME and lateral triad, frontal view. 133, 137, Modified hairs on male cheliceral apophyses.

genera by the shapes of procurus and bulbal apophyses (Figs 138, 139).

Male (holotype). Total length 1.6 (1.7 with clypeus), carapace width 0.7. Leg 1: 16.45 (4.4 + 0.35 + 4.4 + 6.2 + 1.1), tibia 2: 2.4, tibia 3: 1.4, tibia 4: 2.4; tibia 1 L/d: 62. Habitus as in Figure 14. Carapace ochre-yellow with wide brown median band including ocular area and clypeus; sternum pale ochre with brown margins. Legs ochre-yellow with light brown patellae. Opisthosoma grey with slightly darker spots shining through cuticle. Ocular area slightly elevated and triads on short stalks; distance PME–PME 160 µm; diameter PME 70 µm; diameter AME 15 µm. Clypeus unmodified. Sternum wider than long (0.50/0.45). Chelicerae as in Figure 140, with pair of modified hairs on apophyses (Fig. 166), tips 70 µm apart. Palps as in Figures 138, 139; trochanter with wide retrolateral apophysis, procurus with distinctive blade-like sclerite distally (Fig. 139); bulb with distinctive Y-shaped

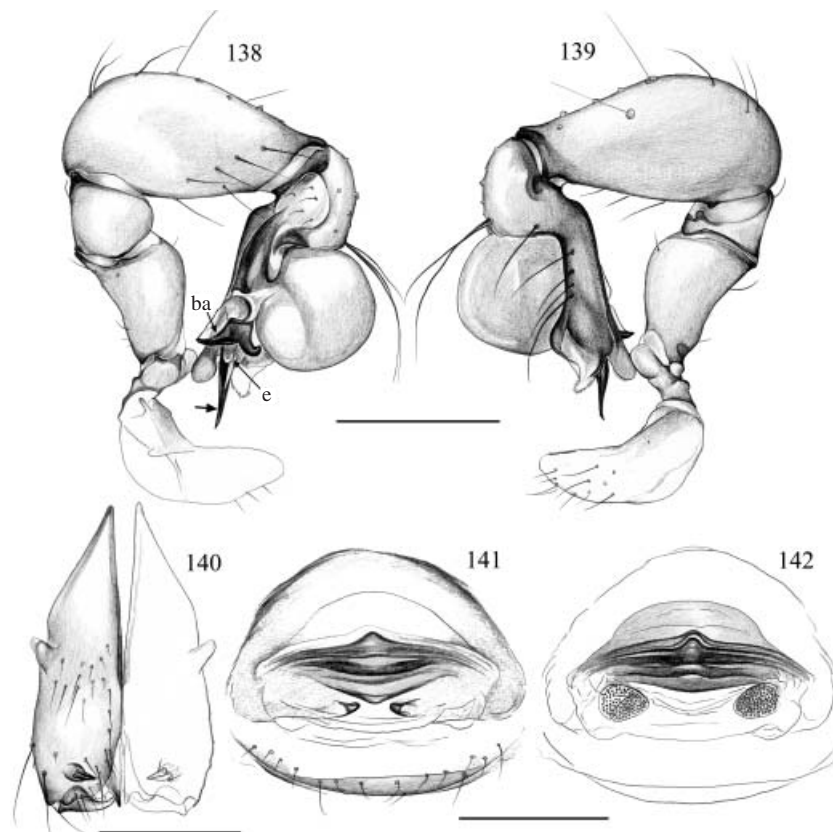
apophysis and short membranous embolus (Fig. 138). Retrolateral trichobothrium of tibia 1 at 7%; few pseudosegments barely visible on tarsi 1.

Variation. Tibia 1 in four other males: 3.5–4.3. Pattern on sternum variable (see female below).

Female. In general similar to male, but triads not on stalks. Tibia 1 in 6 females: 1.7–2.9 (\bar{x} = 2.46). Light median area on sternum ranging from narrow stripe to occupying most of the sternum. Epigynum as in Figures 39, 141, with pair of pockets 50 µm apart. Dorsal view as in Figure 142.

Distribution. Known from several localities in north-eastern South Africa and Swaziland (Fig. 263).

Material examined. SOUTH AFRICA: MPUMALANGA: 11 km SE Pilgrim's Rest: type above, together with 1♂ 1♀ (AMNH); same collection data, 1♂ 3♀ (2 vials, AMNH); same collection data but



Figures 138–142. *Quamtana mabusai* sp. nov. Left male palp in prolateral (138) and retrolateral (139) views, male chelicerae in frontal view (140), and cleared epigynum in ventral (141) and dorsal (142) views. ba: bulbal apophysis, e: embolus. Arrowed: blade-like sclerite on procursus. Scale bars = 0.3 mm (138, 139), 0.2 mm (140–142).

forest edge, 1♂ 5♀ (AMNH); Ceylon Forest W of Sabie 25°05'S, 30°42'E, 1100 m a.s.l., indigenous forest, sifting leaf litter, December 4, 1996 (C. E. Griswold), 2♂ 2♀ 1 juvenile (CAS); 14 km E Nelspruit (~25°25'S, 31°00'E), Pama Motel 'Boommomster', February 26, 1976 (E. Ueckermann), 1♂ (NCP 76/9994). LIMPOPO: 21 km W Trichardsdal (~24°10'S, 30°10'E), 940 m a.s.l., riverine forest, December 20–30, 1985 (S. & J. Peck), 1♂ (AMNH); 15 km NW Klaserie, Guernsy Farm (~24°30'S, 30°55'E), December 18–31, 1985 (S. & J. Peck), woodland, 1♂ (AMNH). SWAZILAND: Piggs Peak area (~26°00'S, 31°00'E), forest near Transvaal, October 1961 (N. Leleup), 1♂ (MRAC 132.663).

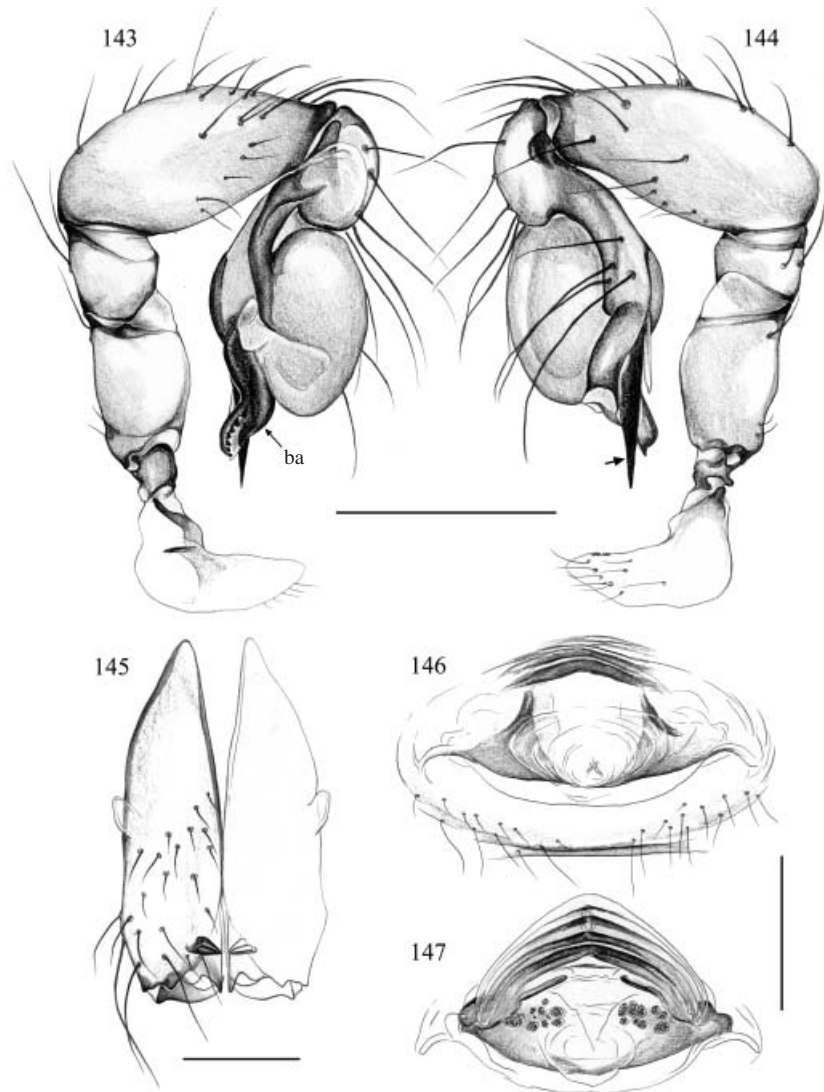
QUAMTANA NANDI SP. NOV.
(FIGS 15, 40, 143–147)

Type. Male holotype from Botanical Garden, Durban (~30°00'S, 30°50'E), KwaZulu-Natal, South Africa; on underside of leaves, April 4, 2001 (B. A. Huber); in NCP.

Etymology. Named after Nandi, Queen of Zululand (1778–1826). To this day, the Zulu people use her name to refer to a woman of high esteem.

Diagnosis. Small eight-eyed species with elevated and pointed opisthosoma; distinguished from similar congeners by the shapes of procursus and bulbal apophyses (Figs 143, 144), from most congeners also by the very close male cheliceral apophyses (Fig. 145; identical to *Q. tsui*).

Male (holotype). Total length 1.35 (1.40 with clypeus), carapace width 0.45. Leg 1: 12.1 (3.2 + 0.2 + 3.1 + 4.6 + 1.0), tibia 2: 1.6, tibia 3: 0.9, tibia 4: 1.7; tibia 1 L/d: 70. Habitus as in Figure 15. Carapace ochre-yellow with wide brown median band including ocular area and clypeus; sternum whitish. Legs ochre-yellow, patellae and tibia-metatarsus joints brown. Opisthosoma ochre-grey with slightly darker spots shining through cuticle. Ocular area slightly elevated and triads on short stalks; distance PME–PME 115 µm; diameter PME 70 µm; diameter AME 20 µm. Clypeus unmodified. Sternum wider than long (0.40/0.35). Chelicerae as in Figure 145, with pair of modified hairs on



Figures 143–147. *Quamtana nandi* sp. nov. Left male palp in prolateral (143) and retrolateral (144) views, male chelicerae in frontal view (145), and cleared epigynum in ventral (146) and dorsal (147) views. ba: bulbal apophysis. Arrowed: distinctive sclerite on procursus. Scale bars = 0.1 mm (145), 0.2 mm (146, 147), 0.3 mm (143, 144).

apophyses, tips 9 µm apart. Palps as in Figures 143, 144; trochanter with retrolateral apophysis distinct in dorsal view, procursus with distinctive pointed sclerite distally (Fig. 144; arising on prolateral side); bulb with short membranous projection (embolus?) and distinctive apophysis provided with cuticular teeth (Fig. 143). Retrolateral trichobothrium of tibia 1 at 6%; tarsus 1 with ~10 pseudosegments quite distinct distally.

Variation. Tibia 1 in other male: 3.0.

Female. In general similar to male, but triads not on stalks. Tibia 1 in two females: 2.5, 2.55. Epigynum as in Figures 40, 146, with pair of pockets 9 µm apart.

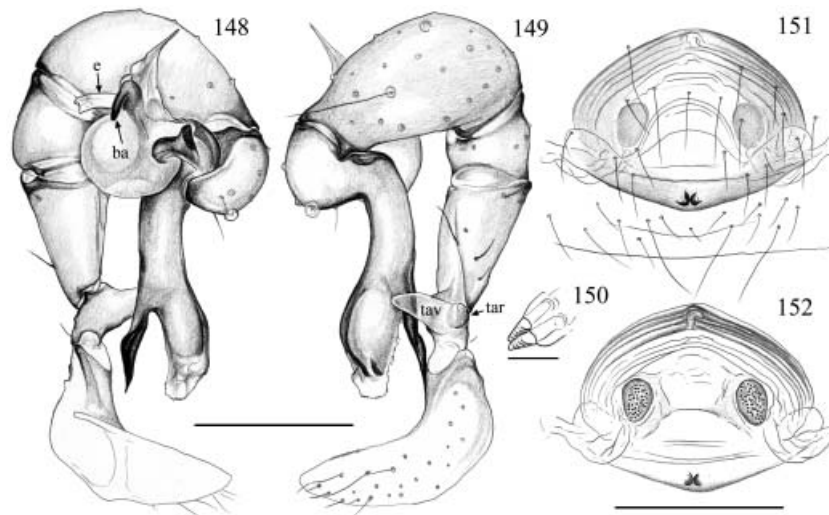
Dorsal view as in Figure 147. Both females were carrying egg sacs containing nine eggs each.

Distribution. Known from type locality only (Fig. 263).

Material examined. SOUTH AFRICA: KWAZULU-NATAL: Durban: type above, together with 1♂ 2♀ (NCP).

QUAMTANA TSUI SP. NOV.
(FIGS 16, 148–152)

Type. Male holotype from Vernon Crookes Nature Reserve (30°16'S, 30°37'E), Umzinto, KwaZulu-Natal,



Figures 148–152. *Quamtana tsui* sp. nov. Left male palp in prolateral (148) and retrolateral (149) views, modified hairs on male cheliceral apophysis (150), and cleared epigynum in ventral (151) and dorsal (152) views. ba: bulbal apophysis, e: embolus, tar: retrolateral trochanter apophysis, tav: ventral trochanter apophysis. Scale bars = 20 μ m (150), 0.2 mm (148, 149, 151, 152).

South Africa; September 25, 1995 (L. Lotz); in NMSA (8008; together with penultimate male of other species).

Etymology. Named after Tsui, Khoikhoi god of rain, thunder and sorcerers.

Diagnosis. Small six-eyed species with triads far apart and pointed opisthosoma; distinguished from similar congeners by the shapes of procursus and bulbal apophyses (Figs 148, 149), from most congeners also by the very close male cheliceral apophyses (identical to *Q. nandi*; cf. Fig. 145).

Male (holotype). Total length 1.65 (1.75 with clypeus), carapace width 0.65. Leg 1: 16.5 (4.1 + 0.3 + 4.1 + 6.8 + 1.2), tibia 2: 2.35, tibia 3: 1.4, tibia 4: 2.4; tibia 1 L/d: 66. Habitus as in Figure 16. Prosoma and legs very pale ochre, opisthosoma whitish. Ocular area not elevated; distance PME–PME 240 μ m; diameter PME 55 μ m; no trace of AME. Clypeus unmodified. Sternum wider than long (0.50/0.40). Chelicerae as in *Q. nandi* (cf. Fig. 145), with pair of modified hairs on apophyses (Fig. 150), tips 10 μ m apart. Palps as in Figures 148, 149; trochanter with large ventral and smaller retrolateral projection, procursus simple, with distinctive black ventral spine (Fig. 148); bulb with short membranous embolus, triangular apophysis, and pointed membranous projection (Fig. 148). Retrolateral trichobothrium of tibia 1 at 11%; tarsus 1 with ~10 pseudo-segments very indistinct.

Variation. Tibia 1 in other male: 4.15.

Female. In general similar to male. Tibia 1 in two females: 4.0 (both). Epigynum as in Figure 151, with pair of pockets 12 μ m apart. Dorsal view as in Figure 152.

Distribution. Known from two localities in south-eastern South Africa (Fig. 263).

Material examined. SOUTH AFRICA: KWAZULU-NATAL: Vernon Crookes Nature Reserve: type above; same locality, January 14, 1992 (L. Lotz), 2♀ (NMSA 5915); same locality at 30°16'S, 30°35'E, April 28, 2001 (T. E. Crouch), 1♂ (DMSA ARA 717). EASTERN CAPE: Dwesa Forest (32°15'S, 28°49'E), sifted litter, dense forest, December 11, 1979 (collector not given), 1♂ (TMP, TM 15614).

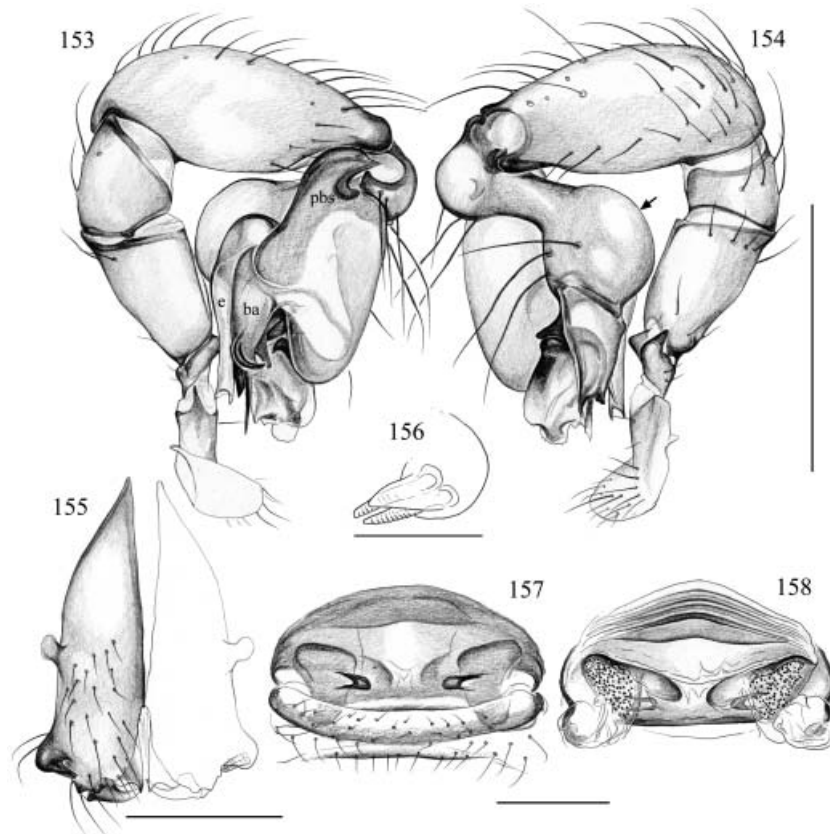
QUAMTANA MERWEI SP. NOV.

(FIGS 17, 41, 153–158, 167–172)

Type. Male holotype from Ngome State Forest (27°49'S, 31°26'E), KwaZulu-Natal, South Africa; 'pittrap, plantation 2 (pine)', October 1992 (M. v.d. Merwe); in NCP (94/647).

Etymology. Named after the collector Marius van der Merwe.

Diagnosis. Small eight-eyed species with high opisthosoma; distinguished from similar congeners by the shapes of procursus and bulbal apophyses (Figs 153, 154); from the very similar *Q. bonamanzi* by the inflated median part of the procursus (Fig. 154),



Figures 153–158. *Quamtana merwei* sp. nov. Left male palp in prolateral (153) and retrolateral (154) views, male chelicerae in frontal view (155), modified hairs on male cheliceral apophysis (156), and cleared epigynum in ventral (157) and dorsal (158) views. ba: bulbal apophysis, e: embolus, pbs: proximal bulbal sclerite. Arrowed: distinctive enlarged section of procursus. Scale bars = 50 μ m (156), 0.2 mm (155, 157, 158), 0.5 mm (153, 154).

the wider distance between the male cheliceral apophyses (Fig. 155), and the larger size (no overlap in tibia 1 length in specimens seen).

Male (holotype). Total length 1.33 (1.46 with clypeus), carapace width 0.65. Leg 1: 10.25 ($2.7 + 0.25 + 2.7 + 3.7 + 0.9$), tibia 2: 1.75, tibia 3: 1.1, tibia 4: 1.7; tibia 1 L/d: 51. Habitus as in Figure 17. Prosoma and legs ochre-yellow, opisthosoma grey with large spots shining through cuticle. Ocular area slightly elevated; distance PME–PME 105 μ m; diameter PME 70 μ m; diameter AME 20 μ m. Clypeus unmodified. Sternum wider than long (0.45/0.40). Chelicerae as in Figure 155, with pair of modified hairs on apophyses (Figs 167, 168), tips 185 μ m apart. Palps as in Figures 153, 154; trochanter with small but distinct retrolateral apophysis and ventral knob, procursus complex distally (Fig. 171), entire distal part appears hinged; bulb with long membranous embolus and apophysis with distal hook (Figs 153, 169). Retrolateral trichobothrium of tibia 1 at 6%; tarsus 1 with ~10 pseudosegments fairly distinct. Gonopore with four

epiandrous spigots (Fig. 172). ALS with several piri-form gland spigots, PMS with usual pair of two spigots (Fig. 170).

Variation. Tibia 1 in 6 other males: 2.45–2.90 ($\bar{x} = 2.58$); some specimens with light brown prosoma.

Female. In general similar to male. Tibia 1 in seven females: 2.0–2.5 ($\bar{x} = 2.21$). Epigynum as in Figures 41, 157, with pair of pockets 145 μ m apart. Dorsal view as in Figure 158. Females of this species appear indistinguishable from those of *Q. bonamanzi*, except for the longer legs. The vials below containing females only are therefore assigned tentatively.

Distribution. Known from type locality only (Fig. 264).

Material examined. SOUTH AFRICA: KWAZULU-NATAL: Ngome State Forest: type above; same collection data but May–November 1992, 3♂ 4♀ (NCP 94/637, 639, 653, 656); same locality, 'pittrap, ecotone pine', June–December 1992 (M. v.d. Merwe), 4♀ (NCP 94/640, 642, 655); same locality, 'pittrap, plantation 1

(pine)', July 1992 (M. v.d. Merwe), 1♂ (NCP 94/644); same locality, 'pittrap, open forest', June 1992–January 1993 (M. v.d. Merwe), 12♂ 7♀ (NCP 94/605, 609, 612, 643, 645, 646, 648, 651, 654); same locality, 'pit-trap, grass', September 1992 (M. v.d. Merwe), 1♂ (NCP 94/604).

QUAMTANA BONAMANZI SP. NOV.

(FIGS 18, 42, 159–165, 173–177)

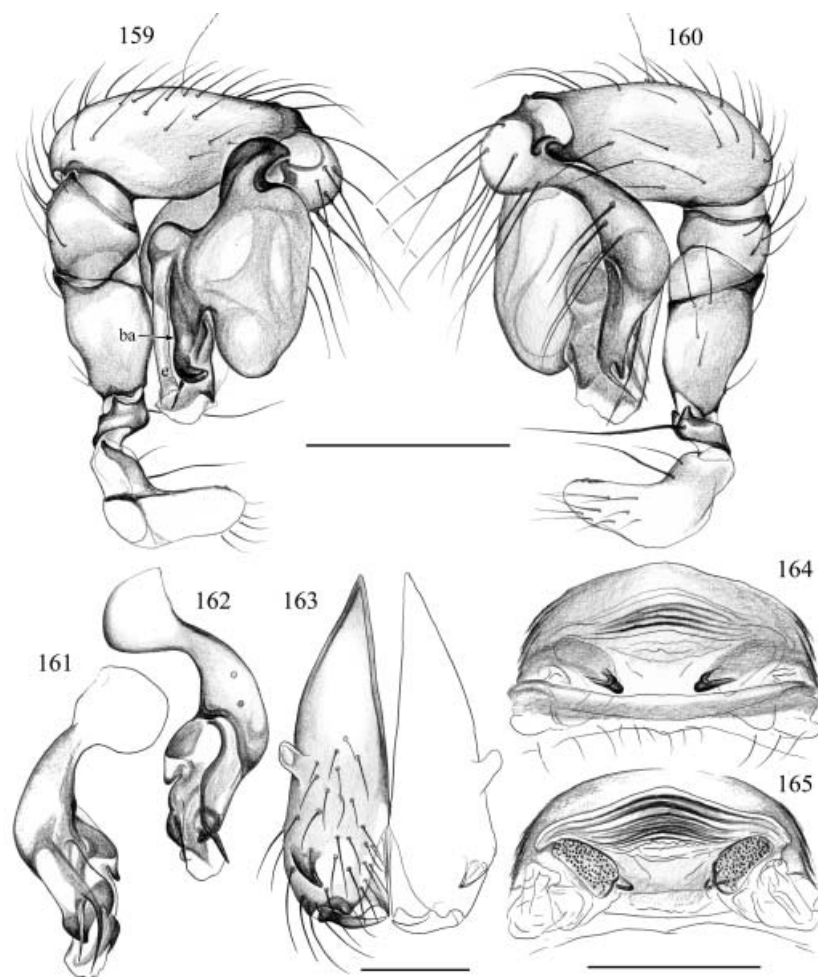
'Spermophora' sp. 4: Huber, 2003a,b

Type. Male holotype from Bonamanzi Reserve (28°04'S, 32°18'E), KwaZulu-Natal, South Africa; from dead palm leaves, 57 m a.s.l., April 1, 2001 (B. A. Huber); in NCP.

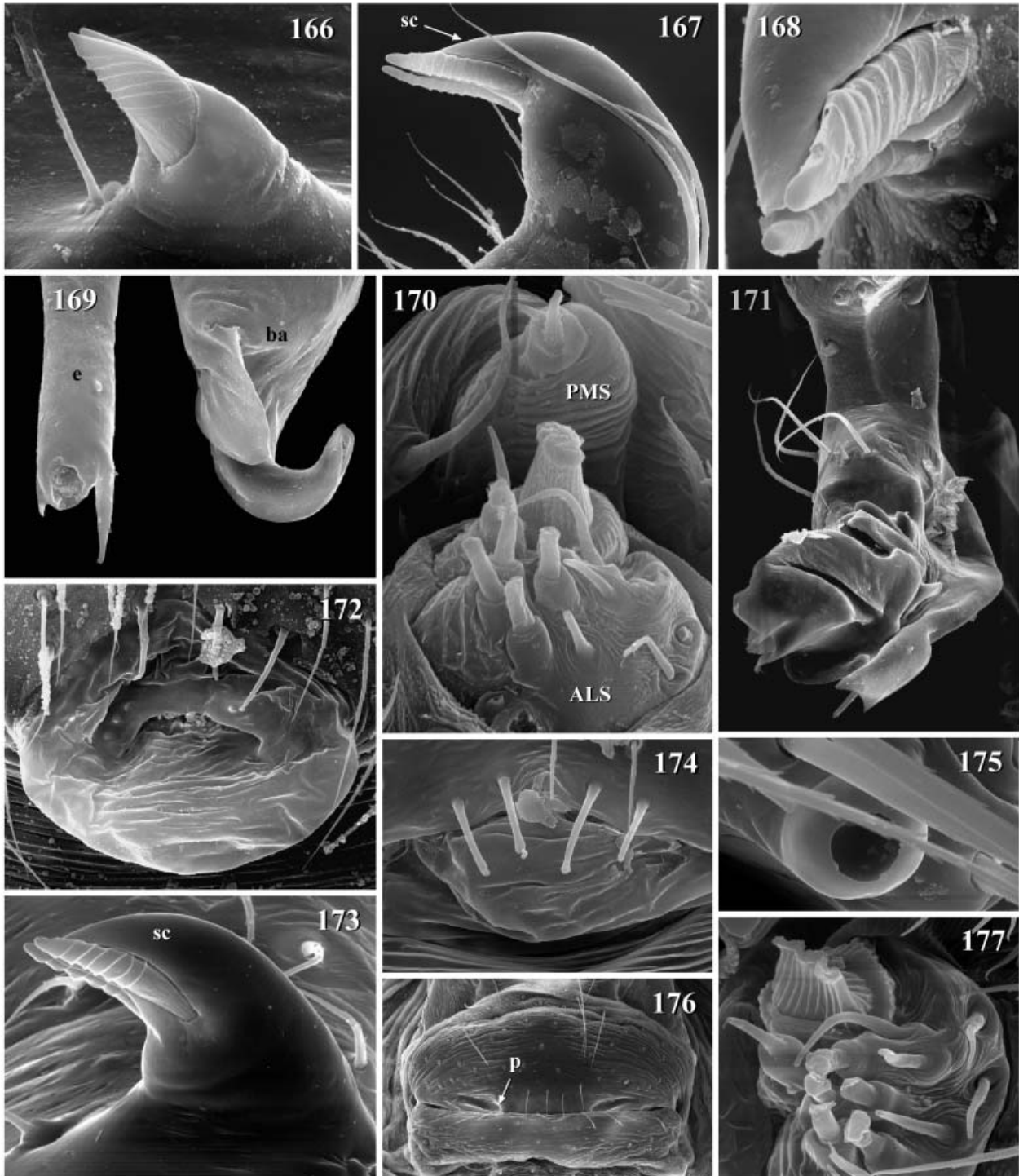
Etymology. Named after the type locality.

Diagnosis. Small eight-eyed species with high opisthosoma; distinguished from similar congeners by the shapes of procursus and bulbal apophyses (Figs 159, 160); from the very similar *Q. merwei* by the more slender procursus, the closer male cheliceral apophyses (Fig. 163), and the smaller size (no overlap in tibia 1 length in specimens seen).

Male (holotype). Total length 1.18 (1.26 with clypeus), carapace width 0.50. Leg 1: 7.7 (2.1 + 0.2 + 2.1 + 2.6 + 0.7), tibia 2: 1.2, tibia 3: 0.8, tibia 4: 1.4; tibia 1 L/d: 48. Habitus as in Figure 18. Carapace ochre-yellow, slightly darker wide band medially; sternum ochre, margin darker; legs ochre yellow; opisthosoma ochre-grey with some darker spots shining through cuticle, genital area minimally darker. Ocular area barely elevated; distance PME–PME 60 µm; diameter PME 70 µm; diameter AME 15 µm. Clypeus unmodified.



Figures 159–165. *Quamtana bonamanzi* sp. nov. Left male palp in prolateral (159) and retrolateral (160) views, procursus in prolateral (161) and dorso-retrolateral (162) views, male chelicerae in frontal view (163), and cleared epigynum in ventral (164) and dorsal (165) views. ba: bulbal apophysis, e: embolus. Scale bars = 0.1 mm (163), 0.2 mm (164, 165), 0.3 mm (159, 160).



Figures 166–177. *Quamtana mabusai* (166), *Q. merwei* (167–172) and *Q. bonamanzi* (173–177) **spp. nov.** 166–168, 173, Modified hairs on male cheliceral apophyses (sc: sclerotized cone). 169, Bulbal apophysis (ba) and embolus (e). 170, Male ALS and PMS. 171, Procursus, dorsal view. 172, 174, Male gonopores with epiandrous spigots. 175, Male palpal tarsal organ. 176, Epigynum with pair of pockets (p). 177, Male ALS.

Sternum wider than long (0.40/0.35). Chelicerae as in Figure 163, with pair of modified hairs on apophyses (Fig. 173), tips 130 µm apart. Palps as in Figures 159, 160; trochanter with small but distinct retrolateral apophysis, procursus complex distally (Figs 161, 162), entire distal part appears hinged; bulb with long membranous embolus and apophysis with distal hook (Fig. 159). Retrolateral trichobothrium of tibia 1 at 11%; tarsus 1 with ~20 pseudosegments indistinct. Gonopore with four epiandrous spigots (Fig. 174). ALS with several piriform gland spigots (Fig. 177). Palpal tarsal organ capsulate (Fig. 175).

Variation. Tibia 1 in 28 other males: 1.52–2.44 (\bar{x} = 1.89); some males with light brown sternum. The male from Enseleni Game Reserve has the cheliceral apophyses slightly farther apart and differs minimally with respect to the procursus. The males from the Lajuma area have minimally smaller genitalia, but are identical in shape.

Female. In general similar to male. Tibia 1 in 22 females: 1.2–1.8 (\bar{x} = 1.51). Epigynum as in Figures 42, 164, 176, with pair of pockets 95 µm apart. Dorsal view as in Figure 165.

Distribution. Widely distributed in eastern South Africa (Fig. 263).

Material examined. SOUTH AFRICA: KWAZULU-NATAL: Bonamanzi: type above, together with 10♂ 4♀ (ZFMK); Enseleni Game Reserve, Lower Umfolozi 28°42'S, 31°59'E, December 12, 1994 (L. Lotz), 1♂ (NMSA 7267). LIMPOPO: Hanglip Forest, Soutpansberg, 8 km NW Louis Trichardt (~23°00'S, 29°50'E), plantation, ~1300 m a.s.l., September 30, 1996 (C. E. Griswold), 1♂ (CAS); Lajuma, 30 km E Vivo (23°00'S, 29°25'E), June–July, 1997 (M. v.d. Merwe), pittraps, 15♂ 6♀ (NCP 98/16–19); Soutpansberg, Lajuma Farm (23°02'S, 29°26'E), forest, sieved leaf litter, August 9–10, 1997 (R. Jocqué), 6♂ 12♀ 8 juveniles (MRAC 206.531, 206.344, 206.532 part); Lajuma Mountain Retreat, ~50 km W Louis Trichardt (23°00'S, 29°25'E), evergreen montane forest, 1300–1400 m a.s.l., April 1–4, 2001 (P. Schwendinger), 5♂ 5♀ (MHNG). MPUMALANGA: Agricultural College Nelspruit (25°25'S, 30°50'E), 'citrus, pittrap', November 12, 1999 (P. Stephen), 2♂ (NCP 2000/186, part). WESTERN CAPE: Maitland Dunes, 35 km W Port Elizabeth (33°45'S, 25°22'E), sieved litter, in fynbos, April 29, 1999 (R. Jocqué), 1♂ 2♀ 1 juvenile (MRAC 208.715).

QUAMTANA EMBULENI SP. NOV.
(FIGS 19, 43, 178–182, 215–218)

Type. Male holotype from Embuleni Reserve (25°57'S, 30°33'E) near Badplaas, Mpumalanga, South Africa;

in litter, native woodland, 1115 m a.s.l., March 28, 2001 (A. Russell Smith); in NCP.

Etymology. Named after the type locality.

Diagnosis. Small eight-eyed species with globular opisthosoma, AME sometimes reduced to pigment spots; distinguished from similar congeners by the shapes of procursus and bulbal apophyses (Figs 178, 179).

Male (holotype). Total length 1.17 (1.27 with clypeus), carapace width 0.55. Leg 1: 9.55 (2.6 + 0.25 + 2.55 + 3.25 + 0.9), tibia 2: 1.4, tibia 3: 0.9, tibia 4: 1.45; tibia 1 L/d: 52. Habitus as in Figure 19. Prosoma ochre-grey, darker medially (including ocular area and clypeus); sternum light ochre medially, darker laterally; legs ochre-yellow; opisthosoma ochre-grey with large spots shining through cuticle except ventrally. Ocular area barely elevated; distance PME–PME 105 µm; diameter PME 60 µm; AME lenses in type not visible (in other specimens still discernible). Clypeus unmodified. Sternum wider than long (0.40/0.35). Chelicerae as in Figure 180, with pair of modified hairs on apophyses (Fig. 215), tips 155 µm apart. Palps as in Figures 178, 179; trochanter with wide retrolateral apophysis, procursus with long spine distally pointing prolaterad; bulb with membranous embolus and massive T-shaped apophysis (Fig. 178). Retrolateral trichobothrium of tibia 1 at 7%; tarsus 1 with ~10 pseudosegments fairly distinct distally.

Variation. Tibia 1 in seven other males: 1.9–2.4 (\bar{x} = 2.21).

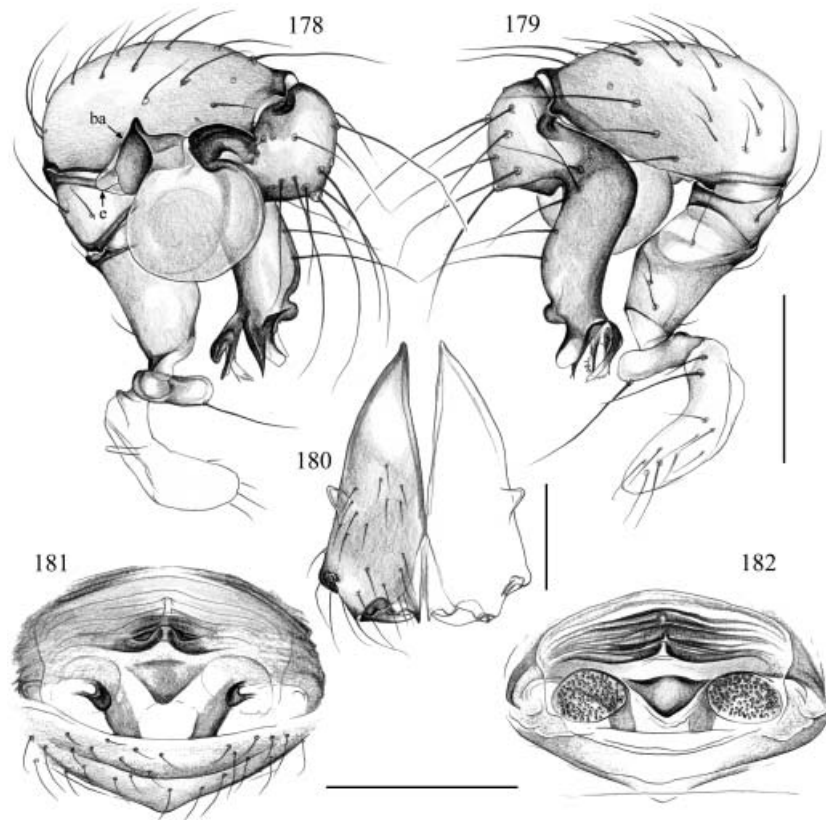
Female. In general similar to male. Tibia 1 in 17 females: 1.2–2.2 (\bar{x} = 1.73). Epigynum as in Figures 43, 181, 218, with pair of pockets 135 µm apart. Dorsal view as in Figure 182. Tip of female palp as in Figure 217. ALS with several piriform gland spigots and PMS with usual pair of spigots (Fig. 216).

Distribution. Known from two localities in Mpumalanga Province, South Africa (Fig. 264).

Material examined. SOUTH AFRICA: MPUMALANGA: Embuleni Reserve: type above, together with 2♂ 3♀ (NCP); same locality, sifting litter, March 23, 2001 (B. A. Huber), 2♂ 8♀ (ZFMK); same locality at dumping ground, March 26, 2001 (P. Horak), 2♂ 9♀ (collection P. Horak), and 2♂ 2♀ (ZFMK); Agricultural College Nelspruit (~25°25'S, 30°50'E), 'citrus, pittrap', November 12, 1999 (P. Stephen), 1♂ (NCP 2000/186, part).

QUAMTANA FILMERI SP. NOV.
(FIGS 20, 44, 183–188)

Type. Male holotype from Ficksburg (~28°50'S, 27°45'E), Free State, South Africa; March 3, 1989



Figures 178–182. *Quamtana embuleni* sp. nov. Left male palp in prolateral (178) and retrolateral (179) views, male chelicerae in frontal view (180), and cleared epigynum in ventral (181) and dorsal (182) views. ba: bulbal apophysis, e: embolus. Scale bars = 0.1 mm (180), 0.2 mm (178, 179, 181, 182).

(M. Filmer); in webs in old garage, in NCP (89/585).

Etymology. Named after the collector Martin R. Filmer.

Diagnosis. Large eight-eyed species with globular to oval opisthosoma; distinguished from similar congeners by the shapes of procurus and bulbal apophyses (Figs 183, 184); also by the pattern on the carapace (Fig. 20).

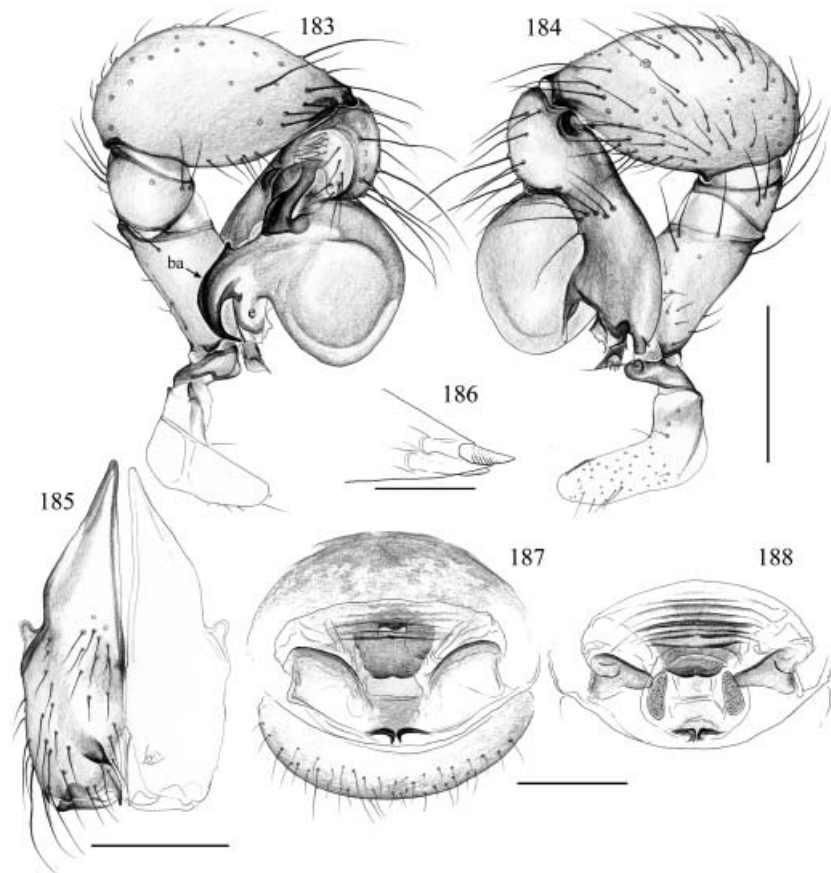
Male (holotype). Total length 3.0 (3.2 with clypeus), carapace width 1.15. Leg 1: 23.9 (6.1 + 0.5 + 6.3 + 9.1 + 1.9), tibia 2: 4.0, tibia 3: 2.7, tibia 4: 4.0; tibia 1 L/d: 59. Habitus as in Figure 20. Prosoma orange-ochre with distinctive, light brown pattern; clypeus also with brown marks; sternum with three pairs of brown dots at bases of coxae 2–4; legs orange-ochre with brown rings on femora (subdistally) and tibiae (proximally and subdistally); opisthosoma grey with many spots except ventrally. Ocular area slightly elevated; distance PME–PME 115 µm; diameter PME 100 µm; diameter AME 65 µm. Clypeus unmodified. Sternum

wider than long (0.85/0.60). Chelicerae as in Figure 185, with pair of modified hairs on apophyses (Fig. 186), tips 65 µm apart. Palps as in Figures 183, 184; retrolateral trochanter apophysis short but distinct in dorsal view; procurus complex distally, apparently with hinged structure prolaterally; bulb with curved apophysis and short membranous embolus (Fig. 183). Retrolateral trichobothrium of tibia 1 at 17%; tarsus 1 with >20 pseudosegments, about 15 distally very distinct.

Variation. Tibia 1 in four other males: 6.4, 6.8, 7.9, 8.8. Pattern on sternum quite variable (in contrast to pattern on carapace).

Female. In general similar to male. Tibia 1 in two females: 6.0, 6.8. Epigynum as in Figures 44, 187, with pair of pockets 35 µm apart. Dorsal view as in Figure 188. External appearance of epigynum varies considerably, apparently due to differences in sclerotization and coloration.

Distribution. Known from three localities in Free State and KwaZulu-Natal, South Africa (Fig. 263).



Figures 183–188. *Quamtana filmeri* sp. nov. Left male palp in prolateral (183) and retrolateral (184) views, male chelicerae in frontal view (185), modified hairs on male chelicerapophysis (186), and cleared epigynum in ventral (187) and dorsal (188) views. ba: bulbal apophysis, e: embolus. Scale bars = 50 μ m (186), 0.3 mm (185, 187, 188), 0.5 mm (183, 184).

Material examined. SOUTH AFRICA: FREE STATE: Ficksburg: type above, together with 1♀ (NCP 89/585); Ficksburg, 'pool filter room', August 1988 (M. v. Gelder), 1♂ (NCP 90/200). KWAZULU-NATAL: Natal National Park (~28°40'S, 28°50'E), under stones, April 4, 1972 (Sheasby), 1♂ 1♀ (NCP 77/899); Natal Champagne Nature Reserve near Estcourt (~29°00'S, 29°45'E), January 12, 1991 (V. D. & B. Roth), 2♂ 3♀ (CAS).

QUAMTANA KNYSNA SP. NOV.
(FIGS 21, 189–192)

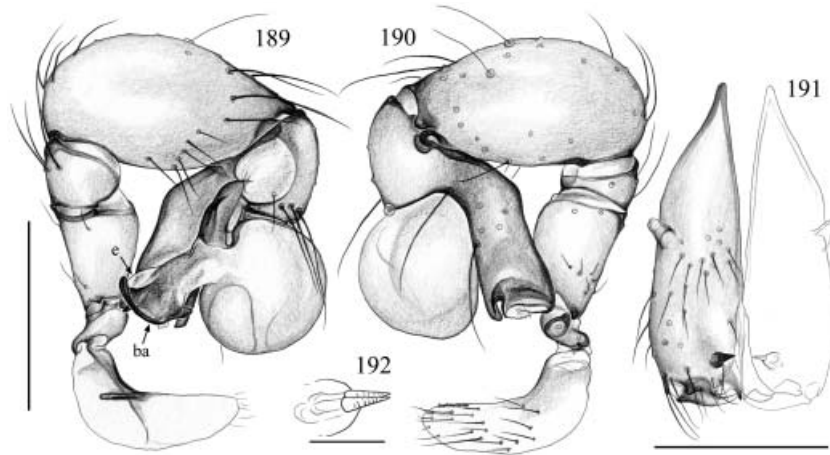
Type. Male holotype from Knysna (~34°00'S, 23°00'E), Western Cape, South Africa; October 6, 1999 (D. Ubick, S. Prinsloo); in CAS.

Etymology. Named after the type locality.

Diagnosis. Small six-eyed species with slightly elevated opisthosoma; distinguished from similar conge-

ners by the shapes of procursus and bulbal apophyses (Figs 189, 190).

Male (holotype). Total length 1.6 (1.75 with clypeus), carapace width 0.65. Leg 1: 9.25 (2.4 + 0.25 + 2.5 + 3.2 + 0.9), tibia 2: 1.3, tibia 3: 0.95, tibia 4: 1.5; tibia 1 L/d: 47. Habitus as in Figure 21. Carapace ochre-yellow with median brown band including ocular area and clypeus; sternum whitish; legs pale with brown patellae and tibia-metatarsus joints; opisthosoma grey with large dark spots except ventrally, genital area brown. Ocular area slightly elevated; distance PME–PME 135 μ m; diameter PME 80 μ m; no trace of AME. Clypeus with small cone-shaped projection at rim. Sternum wider than long (0.50/0.45). Chelicerae as in Figure 191, with pair of modified hairs on apophyses (Fig. 192), tips 20 μ m apart. Palps as in Figures 189, 190; retrolateral trochanter apophysis short but distinct in dorsal view; procursus simple, with hinged spine distally (on prolateral side; hidden by bulb in Fig. 189); bulb with T-shaped apophysis and



Figures 189–192. *Quamtana knysna* sp. nov. Left male palp in prolateral (189) and retrolateral (190) views, male chelicerae in frontal view (191), and modified hairs on male chelicerapophysis (192). ba: bulbal apophysis, e: embolus. Scale bars = 30 μ m (192), 0.2 mm (191), 0.3 mm (189, 190).

membranous embolus (Fig. 189). Retrolateral trichobothrium of tibia 1 at 9%; tarsus 1 with ~8 indistinct pseudosegments.

Variation. Tibia 1 in other male: 2.7.

Female. In general similar to male. Tibia 1 in two females: 1.6 (adult?), 2.0. Epigynum extremely simple, unsclerotized, pockets not seen.

Distribution. Known only from the Knysna area, Western Cape province, South Africa (Fig. 262).

Material examined. SOUTH AFRICA: WESTERN CAPE: Knysna: type above; Gouna State Forest N of Knysna (33°58'S, 23°02'E), litter in dry forest, July 1983 (J. H. Koen), 1♂ 1♀ (NCP 97/399); Kranshoek, 20 km E Knysna (34°05'S, 23°14'E), forest, 180 m a.s.l., December 13, 1996 (C. E. Griswold), 1♂ 1♀ (CAS).

QUAMTANA KABALE SP. NOV.

(FIGS 22, 45, 193–198)

Type. Male holotype from Impenetrable Forest National Park (1°03'S, 29°47'E), Ruhiza, Bwindi, Kabale District, Uganda; 2300 m a.s.l., 'Nature Trail' forest, September 13–16, 1996 (C. E. Griswold), in CAS.

Etymology. Named after the type locality.

Diagnosis. Small six-eyed species with triads on stalks (in male), and elevated and pointed opisthosoma; distinguished from similar congeners by the shapes of procursus and bulbal apophyses (Figs 193, 194).

Male (holotype). Total length 1.65 (1.80 with clypeus), carapace width 0.65. Leg 1: 14.55 (3.7 + 0.3 + 3.85 +

5.7 + 1.0), tibia 2: 2.2, tibia 3: 1.4, tibia 4: 2.2; tibia 1 L/d: 67. Habitus as in Figure 22. Carapace pale ochre-yellow with light brown median band excluding ocular area and clypeus; sternum whitish; legs ochre-yellow; opisthosoma pale grey. Triads on distinct stalks; distance PME–PME 240 μ m; diameter PME 65 μ m; no trace of AME. Clypeus unmodified. Sternum wider than long (0.45/0.40). Chelicerae as in Figure 195, with pair of modified hairs on apophyses (Fig. 196), tips 35 μ m apart. Palps as in Figures 193, 194; trochanter with long ventral and shorter but distinct retrolateral apophysis; procursus rather simple, distally with long apophysis directed prolaterad; bulb with triangular sclerite and short membranous embolus. Retrolateral trichobothrium of tibia 1 at 7%; pseudosegments on tarsi not discernible in dissecting microscope.

Variation. Tibia 1 in other male: 3.55.

Female. In general similar to male, but triads not on stalks. Tibia 1 in seven females: 3.0–3.3 (\bar{x} = 3.13). Epigynum as in Figures 45, 197, with pair of pockets 20 μ m apart. Dorsal view as in Figure 198.

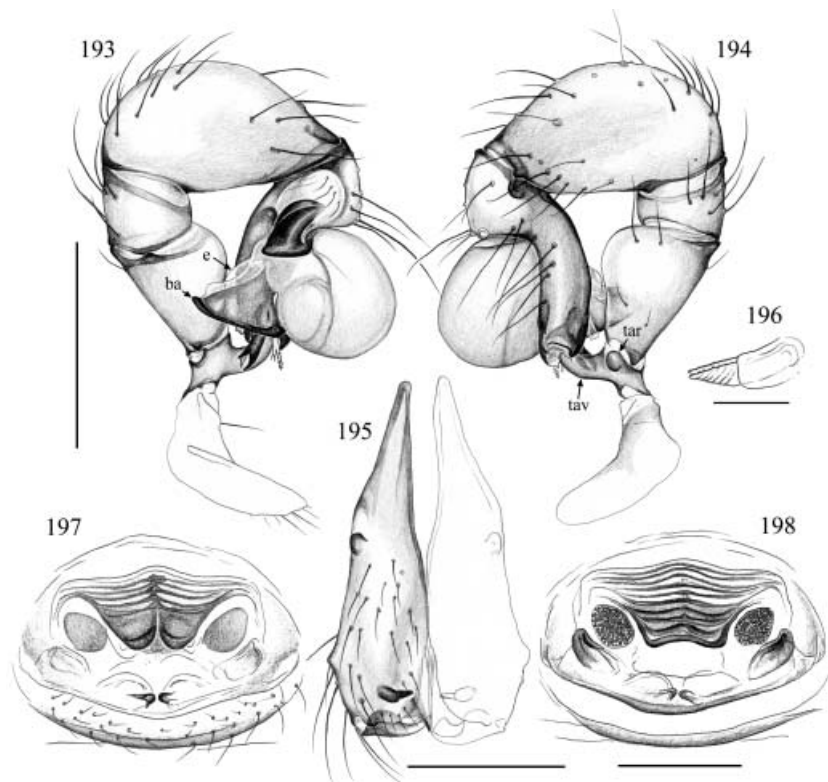
Distribution. Known from south-western Uganda only (Fig. 261).

Material examined. UGANDA: KABALE DISTRICT: Impenetrable Forest N. P.: type above, together with 6♀; 'Ruwenzori' 1952 (G. O. Evans), 'Pholcidae 165', 2♂ 2♀ 1 juvenile (BMNH).

QUAMTANA OKU SP. NOV.

(FIGS 23, 46, 199–203, 219–223)

Type. Male holotype from forest near Lake Oku (6°12'N, 10°27'E), Menchum Division, North-west



Figures 193–198. *Quamtana kabale* sp. nov. Left male palp in prolateral (193) and retrolateral (194) views, male chelicerae in frontal view (195), modified hairs on male cheliceral apophysis (196), and cleared epigynum in ventral (197) and dorsal (198) views. ba: bulbal apophysis, e: embolus, tar: retrolateral trochanter apophysis, tav: ventral trochanter apophysis. Scale bars = 30 µm (196), 0.2 mm (195, 197, 198), 0.4 mm (193, 194).

Province, Cameroon; 2150 m a.s.l., February 7–13, 1992 (C. E. Griswold, S. Larcher, N. Scharff, C. Wanzie), in CAS.

Etymology. Named after the type locality.

Diagnosis. Small eight-eyed species with slightly elevated and pointed opisthosoma; easily distinguished from congeners by the extremely long, curved procurus (Fig. 200).

Male (holotype). Total length 1.65 (1.80 with clypeus), carapace width 0.65. Leg 1: 19.6 (4.9 + 0.35 + 5.05 + 8.1 + 1.2), tibia 2: 3.1, tibia 3: 1.9, tibia 4: 2.8; tibia 1 L/d: 76. Habitus as in Figure 23. Prosoma and legs whitish, only patellae slightly darker; opisthosoma greenish grey with some faint spots shining through cuticle. Ocular area almost flat; distance PME–PME 115 µm; diameter PME 70 µm; diameter AME 20 µm. Clypeus unmodified. Sternum as wide as long (0.5). Chelicerae as in Figure 201, with pair of modified hairs on apophyses (Figs 219, 220), tips 155 µm apart. Palps as in Figures 199, 200; trochanter with short but distinct

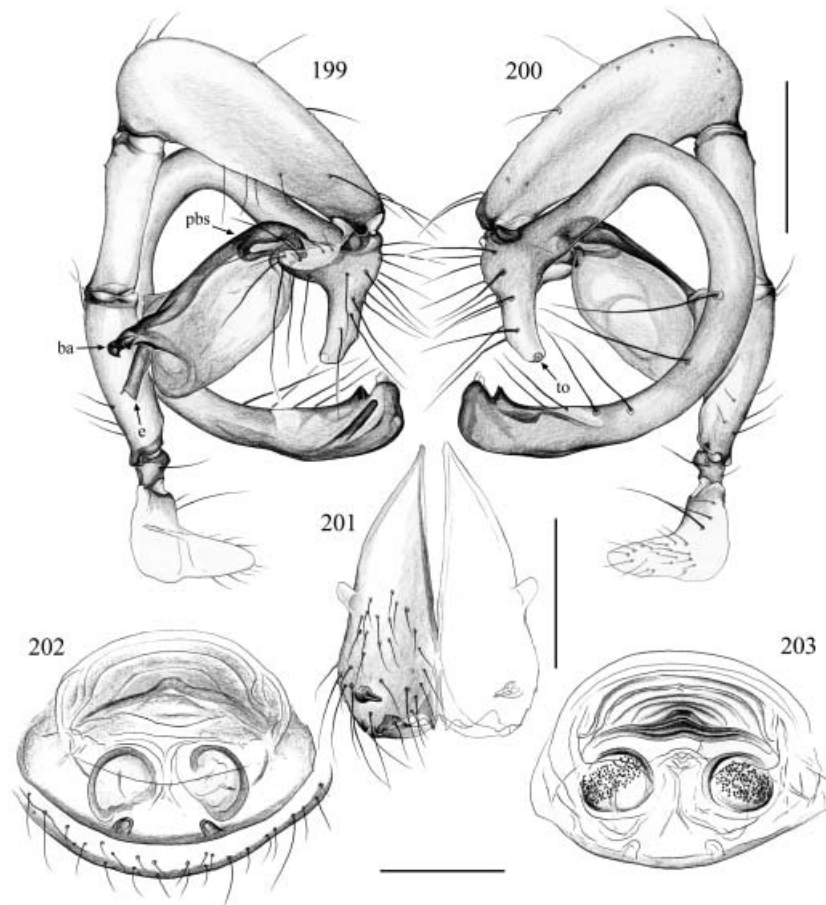
retrolateral apophysis; extremely long patella; cymbium with dorsal projection bearing capsulate tarsal organ (Fig. 200); procurus long but simple, only distally slightly more complex; bulbal apophysis connected to proximal bulbal sclerite (Fig. 199); simple tubular embolus weakly sclerotized. Retrolateral trichobothrium of tibia 1 at 4%; tarsus 1 with >15 pseudosegments, distally quite distinct. Gonopore with four epiandrous spigots (Fig. 223). ALS with several piriform gland spigots (Fig. 221).

Variation. Tibia 1 in six males: 4.5–5.2 (\bar{x} = 4.93).

Female. In general similar to male. Tibia 1 in three females: 3.7, 3.75, 4.1. Epigynum very simple externally (Figs 46, 202), but entire area strongly protruding, with pair of pockets 120 µm apart. Dorsal view as in Figure 203.

Distribution. Known from type locality only (Fig. 261).

Material examined. CAMEROON: NORTH-WEST PROVINCE: forest near Lake Oku: type above, together with 2♂ 2♀ (CAS); same collection data, 4♂ 1♀ (USNM).



Figures 199–203. *Quamtana oku* sp. nov. Left male palp in prolateral (199) and retrolateral (200) views, male chelicerae in frontal view (201), and cleared epigynum in ventral (202) and dorsal (203) views. ba: bulbal apophysis, e: embolus, pbs: proximal bulbal sclerite, to: tarsal organ. Scale bars = 0.2 mm (201–203), 0.4 mm (199, 200).

***QUAMTANA KITAHURIRA* SP. NOV.**

(FIGS 24, 204–208)

Type. Male holotype from Impenetrable Forest National Park (0°58'S, 29°41'E), Kitahurira, Bwindi, Rukungiri District, Uganda; 'pholcid 6', 1740 m a.s.l., September 18–20, 1996 (C. E. Griswold), in CAS.

Etymology. Named after the type locality.

Diagnosis. Small eight-eyed species with posteriorly elevated opisthosoma; distinguished from similar congeners by the shapes of procursus and bulbal apophysis (Figs 204, 205); from *Q. oku* (which has a very similar bulb) by the procursus and the wide distance between the male cheliceral apophyses (Fig. 207).

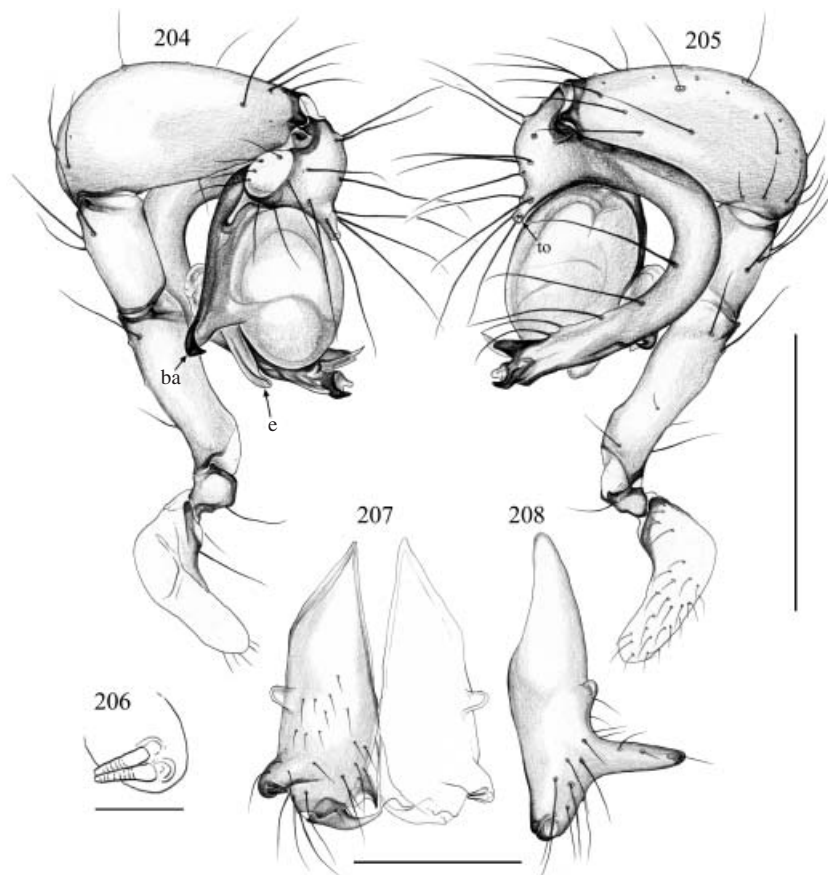
Male (holotype). Total length 1.45 (1.55 with clypeus), carapace width 0.60. Leg 1: 18.05 (4.6 + 0.3 + 4.55 + 7.4 + 1.2), tibia 2: 2.6, tibia 3: 1.5, tibia 4: 2.3; tibia 1 L/d: 79. Habitus as in Figure 24. Prosoma and legs very pale ochre-yellow; opisthosoma pale greenish

grey. Triads slightly elevated; distance PME–PME 105 µm; diameter PME 80 µm; diameter AME 20 µm. Clypeus unmodified. Sternum as wide as long (0.45). Chelicerae as in Figures 207, 208, with pair of modified hairs on apophyses (Fig. 206), tips 214 µm apart. Palps as in Figures 204, 205; trochanter with very short but distinct retrolateral apophysis; long patella; cymbium with short dorsal projection bearing tarsal organ (Fig. 205); procursus widely curved, rather simple, only distally slightly more complex; bulbal apophysis connected to basal sclerite (Fig. 204); simple tubular embolus weakly sclerotized. Retrolateral trichobothrium of tibia 1 at 2%; tarsus 1 with >15 pseudosegments, distally quite distinct.

Female. Unknown.

Distribution. Known from type locality only (Fig. 261).

Material examined. UGANDA: RUKUNGIRI DISTRICT: Impenetrable Forest N. P.: type above.



Figures 204–208. *Quamtana kitahurira* sp. nov. Left male palp in prolateral (204) and retrolateral (205) views, modified hairs on male cheliceral apophysis (206), and male chelicerae in frontal (207) and lateral (208) views. ba: bulbal apophysis, e: embolus, to: tarsal organ. Scale bars = 30 μ m (206), 0.2 mm (207, 208), 0.5 mm (204, 205).

***QUAMTANA BIENA* SP. NOV.**

(FIGS 25, 47, 209–214, 224–225)

Type. Male holotype from Réserve forestale de la Biena (0°10'S, 29°14'E), terr. Lubero, Kivu, Congo Republic; April 1969 (M. Lejeune), in MRAC (136.283).

Etymology. Named after the type locality.

Diagnosis. Very small six-eyed species with globular opisthosoma; distinguished from congeners by the shapes of procursus and bulbal apophysis (Figs 209, 210).

Male (holotype). Total length 0.95 (1.05 with clypeus), carapace width 0.50. Leg 1: 4.75 (1.4 + 0.15 + 1.35 + 1.35 + 0.5), tibia 2: 0.85, tibia 3: 0.55, tibia 4: 0.85; tibia 1 L/d: 31. Habitus as in Figure 25. Prosoma and legs ochre-yellow; opisthosoma pale grey. Ocular area not elevated; distance PME–PME 80 μ m; diameter PME 55 μ m; no trace of AME. Clypeus unmodified. Sternum slightly wider than long (0.33/0.30). Chelicerae as in Figure 211, with pair of modified hairs on

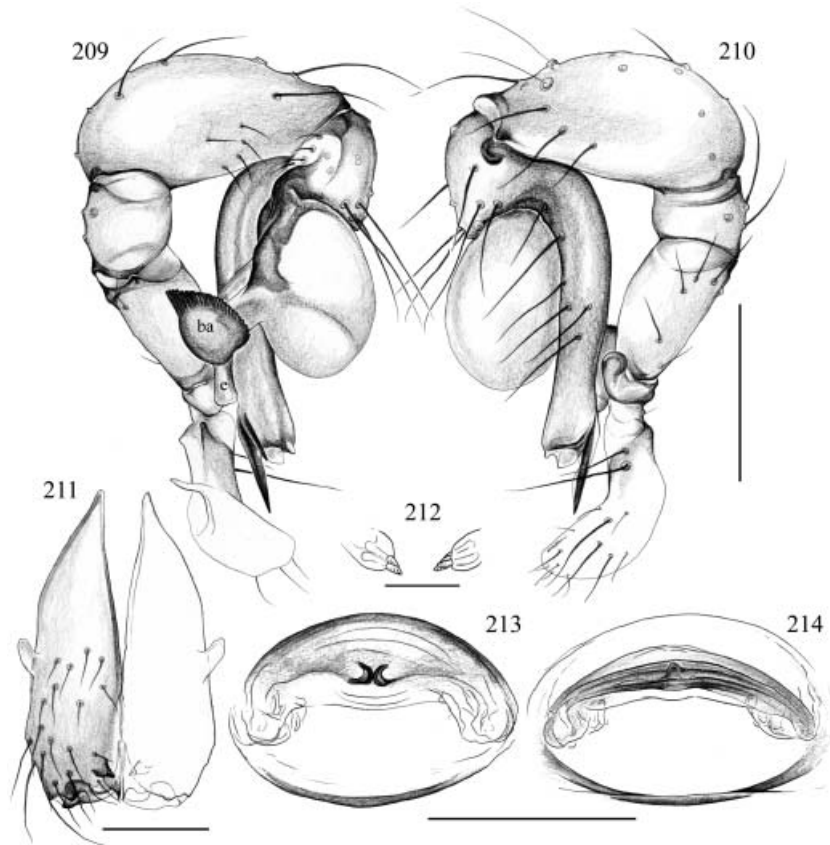
apophyses (Fig. 212), tips 14 μ m apart. Palps as in Figures 209, 210; trochanter with short retrolateral apophysis (distinct in dorsal view); procursus with strong spine that appears hinged; bulb with distinctive triangular apophysis and embolus arising from same membranous basis. Retrolateral trichobothrium of tibia 1 at 9%; tarsus 1 with ~8 indistinct pseudosegments. Gonopore with four epiandrous spigots (Fig. 224). ALS with several piriform gland spigots, PMS with usual pair of spigots (Fig. 225).

Variation. Tibia 1 in six other males: 1.30–1.73 (\bar{x} = 1.54).

Female. In general similar to male. Tibia 1: 1.10. Epigynum very simple externally (Figs 47, 213), with pair of pockets 10 μ m apart. Dorsal view as in Figure 214.

Distribution. Known from several close localities in Nord Kivu province, Congo Republic (Fig. 261).

Material examined. CONGO REPUBLIC: NORD KIVU: Réserve forest. de la Biena: type above, together



Figures 209–214. *Quamtana biena* sp. nov. Left male palp in prolateral (209) and retrolateral (210) views, male chelicerae in frontal view (211), modified hairs on male chelical apophyses (212), and cleared epigynum in ventral (213) and dorsal (214) views. ba: bulbal apophysis, e: embolus. Scale bars = 30 μ m (212), 0.1 mm (211), 0.2 mm (209, 210, 213, 214).

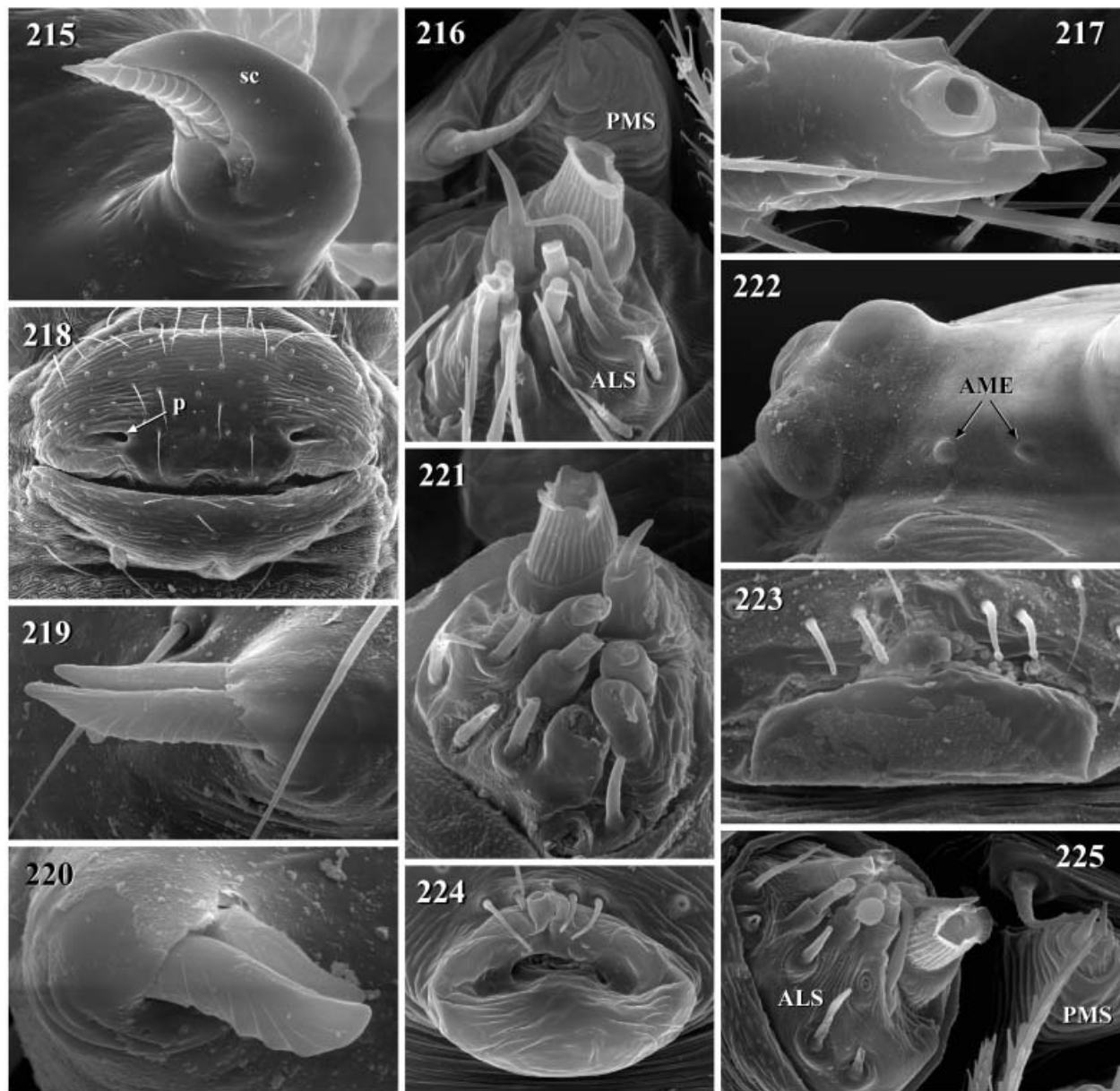
with 1♀ (MRAC 136.283); Kambaila, Sindani (0°10'S, 29°10'E), 1800 m a.s.l., forêt de montagne, May 1973 (M. Lejeune), 3♂ (MRAC 145.903); Kambaila, vallée Kalingoling (0°10'S, 29°10'E), June 1973 (M. Lejeune), 1♂ (MRAC 145.785, 145.825); Kambaila, vallée Tantaliritanda (0°10'S, 29°10'E), June 1973 (M. Lejeune), 1♂ (MRAC 145.785); Mt. Lubwe SE of Butembo (0°02'N, 29°18'E), 2400 m a.s.l., April 14, 1971 (M. Lejeune), 'dans bois mort', 1♂ (MRAC 138.895); Plaine de la Ruindi (0°47'S, 29°17'E), Bulemba, June 20, 1972 (R. P. M. Lejeune), 'dans termitière', 1♂ (MRAC 144.463); [near] Butembo (0°09'S, 29°17'E), 1740 m a.s.l., March 1965 (M. J. Celis), 1♂ (MRAC 128.347).

SPERMOPHORA HENTZ, 1841

The results of the cladistic analysis provide support, albeit weak, for at least some of the following species being more closely related to 'real' *Spermophora* than to any other African genus, or to species assigned tentatively to *Spermophora*. The character supporting

this position is the '*Spermophora* flap', a distinctive ventral projection distally on the procursus (e.g. Figs 227, 233). Note that in two of the species below – *S. pembai* and *S. suurbraak* – this flap is absent, and their assignment is tentative. This phylogenetic position is surprising, as the closest relatives of the type species (the synanthropic *S. senoculata* (Dugès) with worldwide distribution) occur in East Asia and Australia, and other African representatives were assigned to *Spermophora* tentatively for want of a better hypothesis (Huber, 2003a,b).

South African representatives of *Spermophora* are long-legged, six-eyed pholcids with globular or oval opisthosoma, varying in total size from 2.0 to 3.5 mm. They are distinguished from other southern African genera as follows: from *Quamtana* by the dorsal attachment of the bulb (e.g. Figs 226, 232), hinged process on the procursus (e.g. Figs 226, 232), and single or missing modified hair on the male chelical apophysis (e.g. Figs 229, 235); from *Smeringopus*, *Crossopriza* and *Artema* by the lateral chelical apophyses (e.g. Figs 228, 234); from



Figures 215–225. *Quamtana embuleni* (215–218), *Q. oku* (219–223) and *Q. biena* (224, 225) **spp. nov.** 215, 219, 220, Modified hairs on male cheliceral apophyses (sc: sclerotized cone). 216, Female ALS and PMS. 217, Tip of female pedipalp with tarsal organ. 218, Epigynum with pair of pockets (p). 221, Male ALS. 222, Male AME and lateral triad. 223, 224, Male gonopores with epiandrous spigots. 225, Male ALS and PMS.

Leptopholcus and *Pholcus* by the short opisthosoma (vermiform in *Leptopholcus*, long cylindrical in *Pholcus*).

In South African *Spermophora* species, the clypeus is always unmodified; chelicerae never with stridulatory ridges; legs without spines, with few vertical hairs, without curved hairs; prolateral trichobothrium missing on tibiae 1, present in all others. For other characters, see descriptions below.

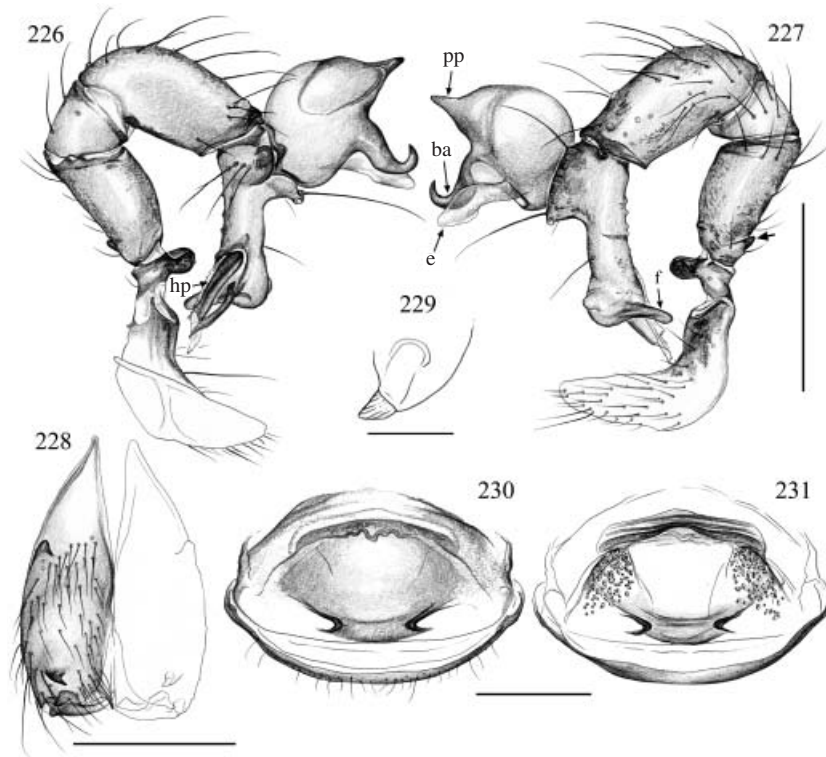
Most species are from Western Cape; only *S. pembai* occurs in Eastern Cape (Fig. 264).

***SPERMOPHORA SCHOEMANAE* SP. NOV.**

(FIGS 26, 48, 226–231, 244–247)

Spermophora sp. 3: Huber, 2003a,b

Type. Male holotype from forest in Grootvadersbosch near Heidelberg (~34°00'S, 21°00'E), Western Cape,



Figures 226–231. *Spermophora schoemanae* sp. nov. Left male palp in prolateral (226) and retrolateral (227) views, male chelicerae in frontal view (228), modified hair on male cheliceral apophysis (229), and cleared epigynum in ventral (230) and dorsal (231) views. ba: bulbal apophysis, e: embolus, f: *Spermophora*-flap, hp: hinged process, pp: pointed projection of bulb. Arrowed: femur-apophysis. Scale bars = 30 μ m (229), 0.3 mm (228, 230, 231), 0.4 mm (226, 227).

South Africa; February 1, 1989 (A. S. Dippenaar-Schoeman), in NCP (89/887).

Etymology. Named after the collector, Ansie Dippenaar-Schoeman from the Plant Protection Research Institute, Pretoria.

Diagnosis. Medium size species, distinguished from congeners by the pointed projection of the bulb and the shape of the bulbal apophysis (Fig. 227).

Male (holotype). Total length 1.90 (2.1 with clypeus), carapace width 0.90. Leg 1: 18.9 (4.7 + 0.4 + 5.2 + 6.8 + 1.8), tibia 2: 3.1, tibia 3: 2.2, tibia 4: 2.7; tibia 1 L/d: 58. Habitus as in Figure 26. Carapace orange-ochre with some darker marks; sternum brown with many tiny light spots; legs orange-ochre; opisthosoma grey with blackish pattern; ventral pattern as in female (cf. Fig. 48) but with triangular black mark in genital area. Ocular area slightly elevated; distance PME–PME 120 μ m; diameter PME 80 μ m; no trace of AME. Clypeus unmodified. Sternum wider than long (0.70/0.55). Chelicerae as in Figure 228, with one cone-shaped hair on each apophysis (Figs 229, 246), tips 175 μ m apart. Palps as in Figures 226, 227; trochanter with wide retrolateral apophysis; femur proximodorsally with distinct apophysis, ventrally with small

cone; procursus prolaterally with proximal projection and distal hinged process; bulb with hook-shaped apophysis, membranous embolus, and distinctive pointed projection (Fig. 227). Retrolateral trichobothrium of tibia 1 at 13%; tarsus 1 with ~15 pseudosegments, distally very distinct. Gonopore with four epiandrous spigots (Fig. 244). ALS with several piriform gland spigots (Fig. 245). Palpal tarsal organ capsulate (Fig. 247).

Variation. Tibia 1 in five other males: 4.3–5.2 (\bar{x} = 4.93).

Female. In general similar to male. Tibia 1 in two females: 3.7, 4.1. Epigynum simple externally (Figs 48, 230) but strongly protruding, with pair of pockets 195 μ m apart. Dorsal view as in Figure 231.

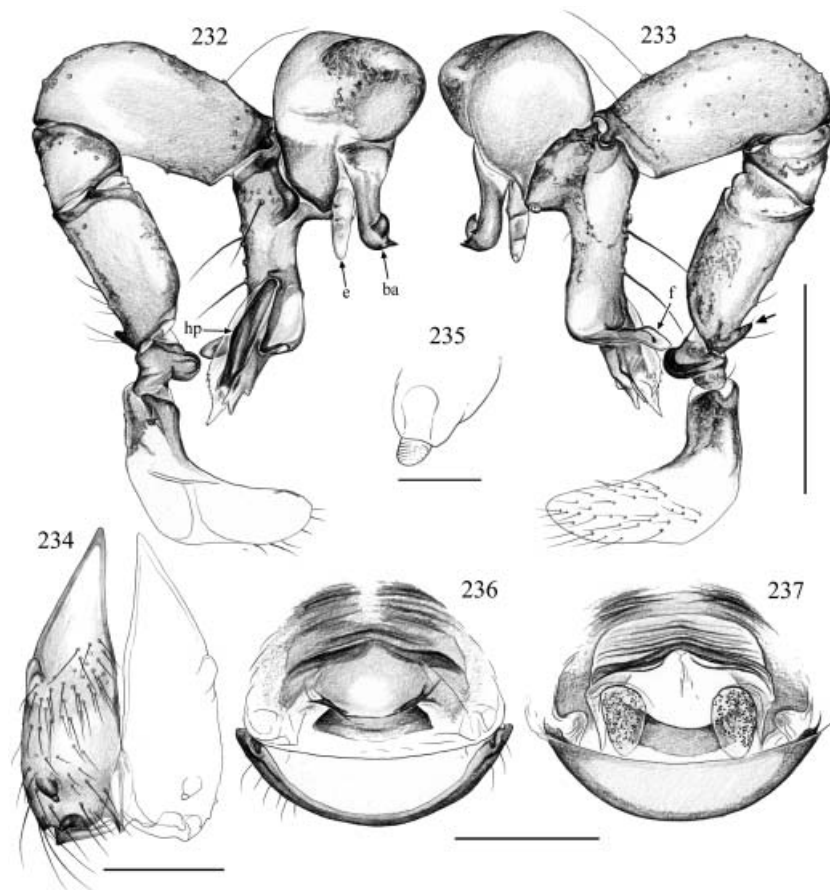
Distribution. Known from type locality only (Fig. 264).

Material examined. SOUTH AFRICA: WESTERN CAPE: Heidelberg: type above, together with 7♂ 2♀ (NCP 89/887).

***SPERMOPHORA GORDIMERAE* SP. NOV.**

(FIGS 27, 49, 232–237)

Type. Male holotype from Kirstenbosch Botanical Gardens, Cape Town (~34°00'S, 18°30'E), Western



Figures 232–237. *Sperophora gordimerae* sp. nov. Left male palp in prolateral (232) and retrolateral (233) views, male chelicerae in frontal view (234), modified hair on male chelicerapophysis (235), and cleared epigynum in ventral (236) and dorsal (237) views. ba: bulbal apophysis, e: embolus, f: *Sperophora*-flap, hp: hinged process. Arrowed: femur-apophysis. Scale bars = 30 µm (235), 0.2 mm (234), 0.3 mm (236, 237), 0.4 mm (232, 233).

Cape, South Africa; August 12, 1978 (A. Russell Smith), in ZFMK.

Etymology. Named after Nadine Gordimer, South African writer and Nobel laureate.

Diagnosis. Medium size species, distinguished from the very similar *S. schoemanae* by the shape of the bulb (no pointed projection, Fig. 232), from other southern African congeners also by the shape and position of the male chelicerapophyses (Fig. 234).

Male (holotype). Total length 2.4 (2.6 with clypeus), carapace width 1.05. Leg 1: 5.6 + 0.4 + 5.7 + 8.1, tarsus missing, tibia 2: 3.5, tibia 3: 2.5, tibia 4: 3.3; tibia 1 L/d: 53. Habitus as in Figure 27. Carapace ochre-yellow with darker median line and posterior mark, sternum dark brown, clypeus slightly darker than carapace; legs ochre-yellow; opisthosoma pale ochre-grey with black spots dorso-laterally and ventrally. Ocular area barely elevated; distance PME–PME 140 µm; diameter PME 100 µm; no trace of AME.

Clypeus unmodified. Sternum wider than long (0.75/0.65). Chelicerae as in Figure 234, with one cone-shaped hair on each apophysis (Fig. 235), tips 205 µm apart. Palps as in Figures 232, 233; trochanter with wide retrolateral apophysis (distinct in dorsal view); femur proximo-dorsally with distinct apophysis; procurus with distal hinged process prolaterally; bulb with distinctive apophysis and membranous embolus (Figs 232, 233). Retrolateral trichobothrium of tibia 1 at 13%.

Variation. Tibia 1 in other male: 5.3.

Female. In general similar to male, but dark mark on carapace more distinct, palps dark brown; ventral pattern on opisthosoma confined to area behind epigynum. Tibia 1 in three females: 4.4, 4.6, 4.9. Epigynum simple externally (Figs 49, 236), with pair of pockets 175 µm apart. Dorsal view as in Figure 237.

Distribution. Known only from Cape Town area (Fig. 264).

Material examined. SOUTH AFRICA: WESTERN CAPE: Cape Town: type above, together with 1♀ (ZFMK); Cape Town, Table Mountain (~34°00'S, 18°35'E), Newlands forest, river valley, March 7, 1993 (R. Jocqué), 1♂ 2♀ (MRAC 174.693).

SPERMOPHORA PENINSULAE LAWRENCE, 1964
(FIGS 29, 50, 238–243, 248–251)

Spermophora peninsulae Lawrence, 1964: 65–67; figs 9–14. Huber, 2003a,b

Types. Male holotype and 1♀ paratype from Kalk Bay Caves, Cape Peninsula (34°15'S, 18°30'E), Western Cape, South Africa; September 1932 (R. F. Lawrence), in SAM (B7897); not seen (see Notes below).

Notes. I have not seen the holotype, but Lawrence's (1964) illustrations of the palp and male chelicerae (his figs 10, 11) leave no doubt as to the correct identification of the specimens below. Moreover, I have seen some of the nontype material described by Lawrence (see below) all of which is identical to the material described below. There are several inconsistencies between the information on labels and the data presented by Lawrence (1964), but these mostly concern collection dates, and do not seem relevant.

Diagnosis. Large species, distinguished from other southern African congeners by the two pairs of apophyses frontally on the male chelicerae (Figs 240, 250). Also by the shapes of bulbal apophysis (Fig. 238) and epigynum (pockets close together, Figs 50, 242).

Male (CAS). Total length 3.1 (3.3 with clypeus), carapace width 1.4. Leg 1: 33.2 (8.3 + 0.6 + 8.4 + 13.1, 2.8), tibia 2: 5.4, tibia 3: 3.9, tibia 4: 5.0; tibia 1 L/d: 63. Habitus as in Figure 29. Carapace ochre, ocular area and clypeus light to dark brown, sternum dark brown; legs light brown; opisthosoma grey with blackish pattern, ventrally like female (cf. Fig. 50) but with black genital area. Ocular area slightly elevated; distance PME–PME 160 µm; diameter PME 100 µm; no trace of AME. Clypeus unmodified. Sternum wider than long (1.0/0.8). Chelicerae with distinctive pair of apophyses (Fig. 250), with one modified hair on each of the distal apophyses (Figs 241, 250), tips 40 µm apart. Palps as in Figures 238, 239; trochanter with large retrolateral apophysis; femur proximo-dorsally with small apophysis; procurus with distal hinged process prolaterally; bulb with distinctive apophysis and membranous embolus (Figs 238, 239). Retrolateral trichobothrium of tibia 1 at 9%. Tarsus 1 with >30 pseudosegments, ~20 quite distinct. Gonopore with four epiandrous spigots (Fig. 248). ALS with several piriform gland spigots (Fig. 249). Palpal tarsal organ capsulate (Fig. 251).

Variation. Tibia 1 in nine other males: 7.25–8.25 (\bar{x} = 7.70). Lawrence (1964) noted considerable varia-

tion in the degree of coloration. It was not clear, however, whether the paleness of some specimens was an artefact of preservation or whether cave populations are indeed paler than forest populations. I have not seen newly collected cave specimens, but Lawrence himself described several specimens from caves with distinct patterns.

Female. In general similar to male. Tibia 1 in seven females: 5.25–6.33 (\bar{x} = 5.82), in one exceptional female from Wynberg Cave entrance: 8.1. Epigynum simple externally (Figs 50, 242), with pair of pockets 30 µm apart. Dorsal view as in Figure 243.

Distribution. Known only from Cape Town area (Fig. 264).

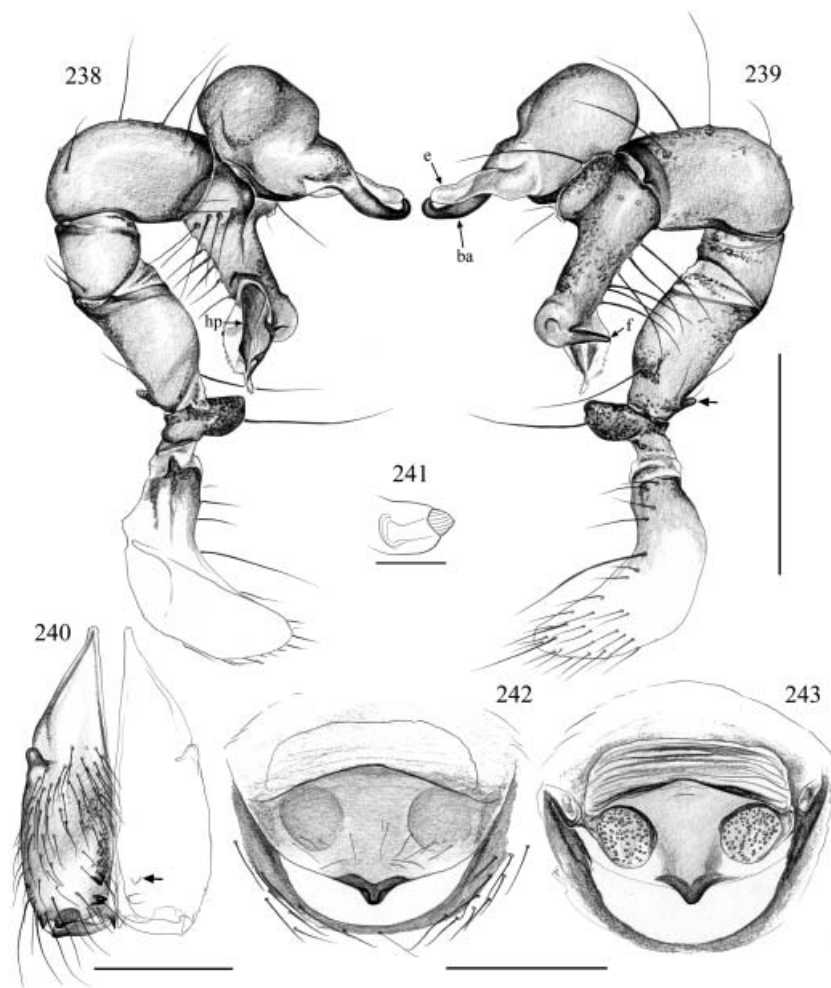
Material examined. SOUTH AFRICA: WESTERN CAPE: Table Mountain, Wynberg Caves, Oread Hall (34°07'S, 18°27'E), June 13, 1954 (J. R. Grindley), 1♂ 2 juveniles (not adult females as stated in Lawrence, 1964) (SAM B10021); Wynberg Caves (33°59'S, 18°24'E), March 1931 (collector not given, probably R. F. Lawrence), 4 juveniles (not adult females as stated in Lawrence, 1964) (SAM B7896); Wynberg Caves, Kalk Bay Caves (33°59'S, 18°24'E), July 1932 (collector not given, probably R. F. Lawrence), 1♀ (not ♂ as on label) (SAM B7895); Wynberg Caves, Table Mountain (33°59'S, 18°24'E), August 5, 1956 (J. R. Grindley), 1 penultimate ♂ and 1♀ (not 2♀ as stated in Lawrence, 1964) (SAM B10022 and B10024); Table Mountain, Powder Room Cave (33°58'S, 18°25'E), March 4, 1956 (Speleological Assoc.), 1♀ (SAM B10023); Table Mountain, Wynberg Cave entrance (~34°00'S, 18°30'E), February 13, 1991 (V. D. & B. Roth), 3♀ 1 juvenile (CAS); Cape Town, Table Mountain, Fernwood Gully indigenous forest (33°58'S, 18°27'E), 150 m a.s.l., December 18, 1996 (C. E. Griswold), 7♂ 5♀ (CAS); Table Mountain, Newlands Ravine indigenous forest (33°58'S, 18°27'E), 120 m a.s.l., December 18, 1996 (C. E. Griswold), 5♂ 4♀ (CAS).

SPERMOPHORA PEMBAI SP. NOV.
(FIGS 28, 252–255)

Type. Male holotype from Great Fish River Reserve (33°08'S, 26°39'E), Eastern Cape, South Africa; at boundary of Farm Ulster, on soil, pittrap, December 3, 1993 (M. Burger), in NCP (96/113).

Etymology. Named after George Milwa Mnyaluza Pemba (1912–2001), one of South Africa's greatest pioneering artists.

Diagnosis. Large species with elongated and pointed opisthosoma, distinguished from southern African congeners by the shape of the bulb (no pointed projection,



Figures 238–243. *Spermophora peninsulae*. Left male palp in prolateral (238) and retrolateral (239) views, male chelicerae in frontal view (240), modified hair on male cheliceral apophysis (241), and cleared epigynum in ventral (242) and dorsal (243) views. ba: bulbal apophysis, e: embolus, f: *Spermophora*-flap, hp: hinged process. Arrowed: femur-apophysis (239) and distinctive small cone on male chelicera (240). Scale bars = 30 μ m (241), 0.3 mm (240, 242, 243), 0.5 mm (238, 239).

shape of apophysis; Fig. 252), and by the wide distance between the long male cheliceral apophyses (Fig. 254).

Male (holotype). Total length 3.2 (3.3 with clypeus), carapace width 0.9. Leg 1: 4.9 + 0.3 + 4.7, metatarsus and tarsus missing, tibia 2: 2.8, tibia 3: 2.0, tibia 4: 2.9; tibia 1 L/d: 53. Habitus as in Figure 28. Carapace ochre-yellow with darker median band, ocular area medially light, clypeus dark brown under triads, sternum dark brown with slightly lighter spots at bases of coxae and medially. Legs ochre-yellow; opisthosoma grey with few blackish spots dorsally and prominent brown pattern ventrally. Ocular area slightly elevated; distance PME–PME 115 μ m; diameter PME 90 μ m; no trace of AME. Clypeus unmodified. Sternum wider than long (0.70/0.55). Chelicerae as in Figures 254, 255, with pair of long apophyses, tips 360 μ m apart, without modified hairs on tips. Palps as

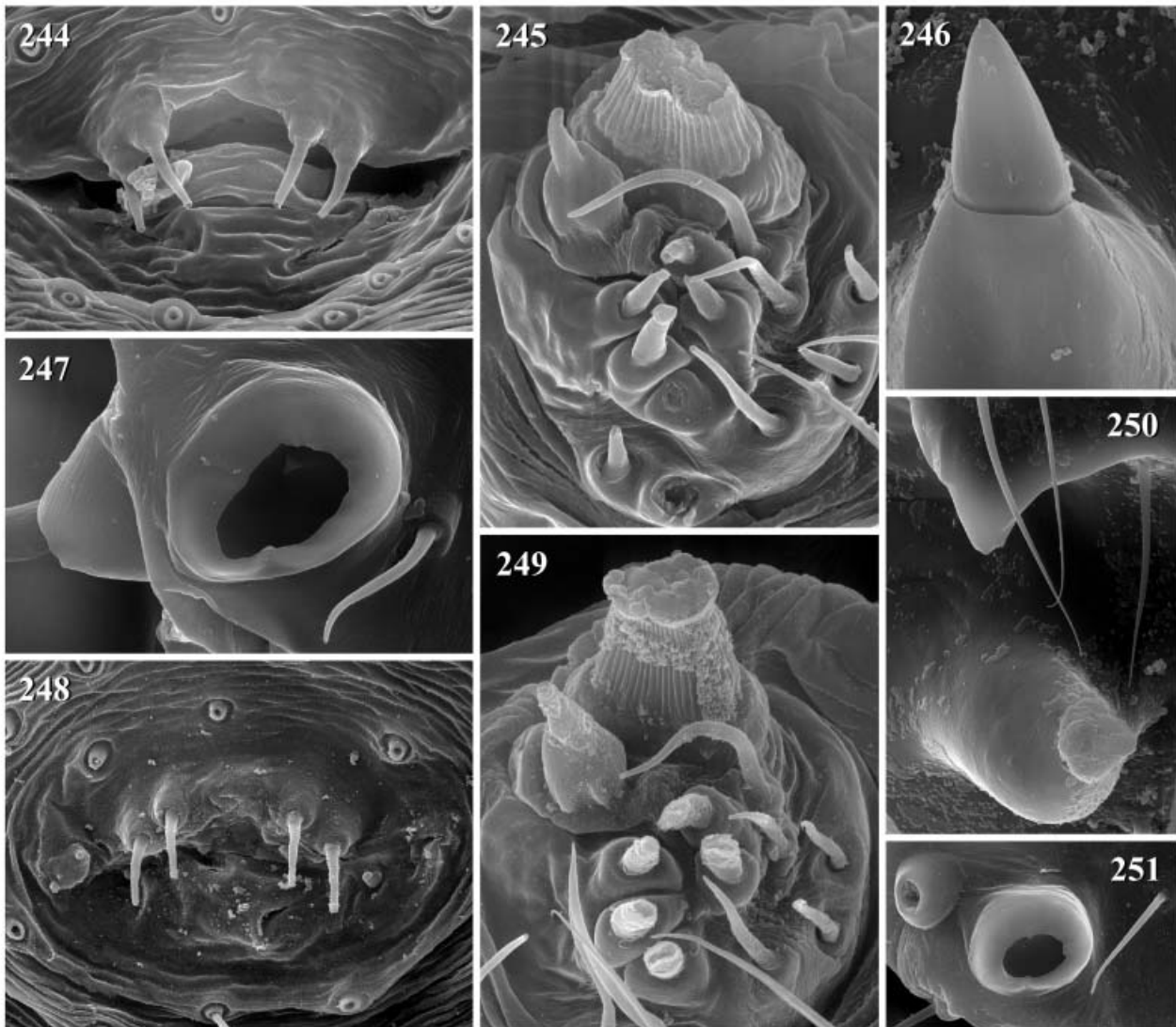
in Figures 252, 253; trochanter with retrolateral apophysis (prominent in dorsal view); femur proximodorsally without apophysis; procursus distally very complex, with up to three hinged structures (Fig. 252). Retrolateral trichobothrium of tibia 1 at 12%.

Variation. One of the males is much paler and the pattern on the carapace very indistinct. Tibia 1 missing in other males.

Female. Unknown.

Distribution. Known from type locality only (Fig. 264).

Material examined. SOUTH AFRICA: EASTERN CAPE: Great Fish River Reserve: type above, together with 2♂ (NCP 96/113).



Figures 244–251. *Spermophora schoemanae* sp. nov. (244–247) and *S. peninsulae* (248–251). 244, 248, Male gonopores with epiandrous spigots. 245, 249, Male ALS. 246, 250, Male cheliceral apophyses with modified hairs. 247, 251, Male palpal tarsal organs.

***SPERMOPHORA SUURBRAAK* SP. NOV.**

(FIGS 30, 256–258)

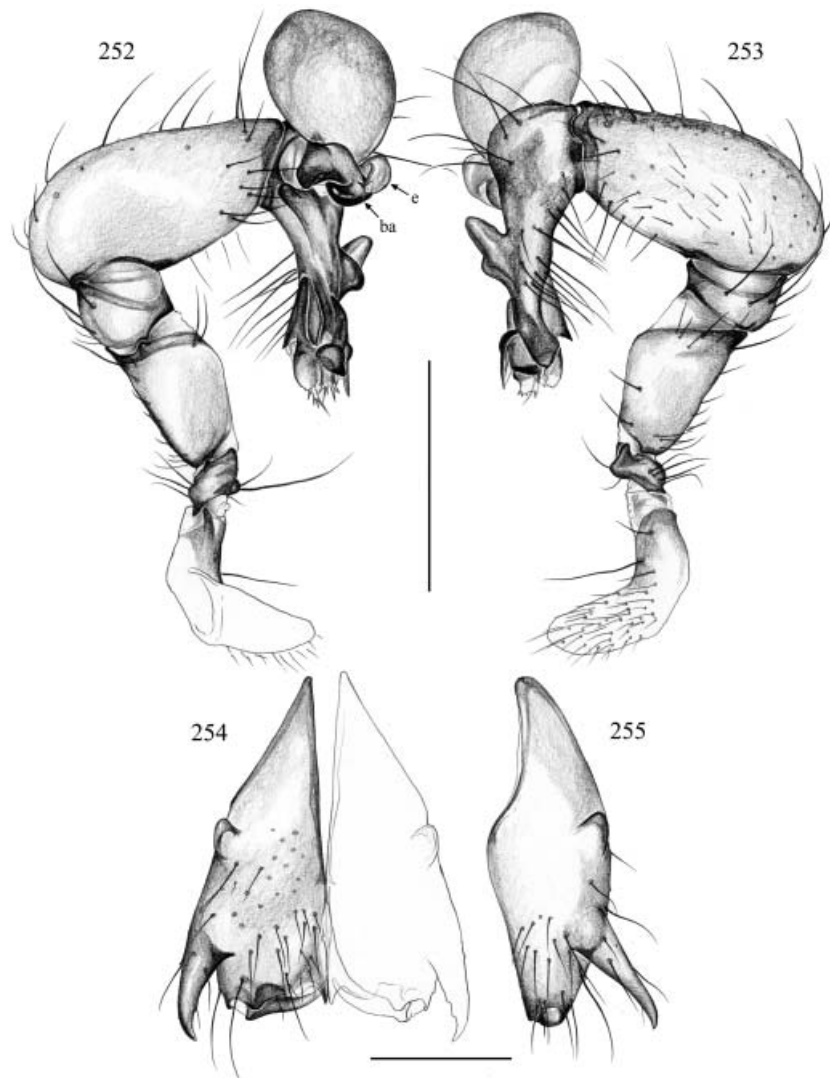
Type. Male holotype from 10 km E of Suurbraak (34°01'S, 20°46'E), Western Cape, South Africa; tall fynbos, pitfall, January 12–18, 1989 (R. Jocqué), in MRAC (169.700).

Etymology. Named after the type locality.

Diagnosis. Medium size species with oval opisthosoma, distinguished from southern African congeners by the shapes of the bulb (single projection, Fig. 257), the procursus (Figs 257, 258), and the male cheliceral apophyses (Fig. 256). The ZFMK has a very close relative from Signal Hill, Cape Town, with minimally dif-

ferent procursus but with the male cheliceral apophyses much wider apart (distance between tips: 150 µm).

Male (holotype). Total length 2.1 (2.3 with clypeus), carapace width 0.9. Leg 1: 16.15 (4.2 + 0.35 + 4.45 + 5.4 + 1.75), tibia 2: 2.9, tibia 3: 2.1, tibia 4 missing; tibia 1 L/d: 50. Habitus as in Figure 30. Carapace pale ochre with median and lateral blackish lines, sternum brown with dark brown margins and many light speckles. Legs ochre-yellow; opisthosoma ochre-grey with blackish pattern also ventrally. Ocular area slightly elevated; distance PME–PME 140 µm; diameter PME 70 µm; no trace of AME. Clypeus unmodified. Sternum wider than long (0.65/0.55). Chelicerae



Figures 252–255. *Spermophora pembai* sp. nov. Left male palp in prolateral (252) and retrolateral (253) views, and male chelicerae in frontal (254) and lateral (255) views. ba: bulbal apophysis, e: embolus. Scale bars = 0.2 mm (254, 255), 0.5 mm (252, 253).

as in Figure 256, with pair of apophyses curved backwards at tips; tips 45 μ m apart. Palps as in Figures 257, 258 (the angle between femur and tibia may not represent the position at rest, but the two segments are flattened at the contact area suggesting that this position is natural at some time); trochanter with short ventral and distinct retrolateral apophysis; patella ventrally almost completely reduced; procurus distally very complex, entire distal part appears hinged; bulb with distinctive embolar division, sclerotized in middle part, but membranous proximally and distally (Figs 257, 258). Retrolateral trichobothrium of tibia 1 at 15%. Tarsus 1 with ~15 pseudosegments, quite distinct distally.

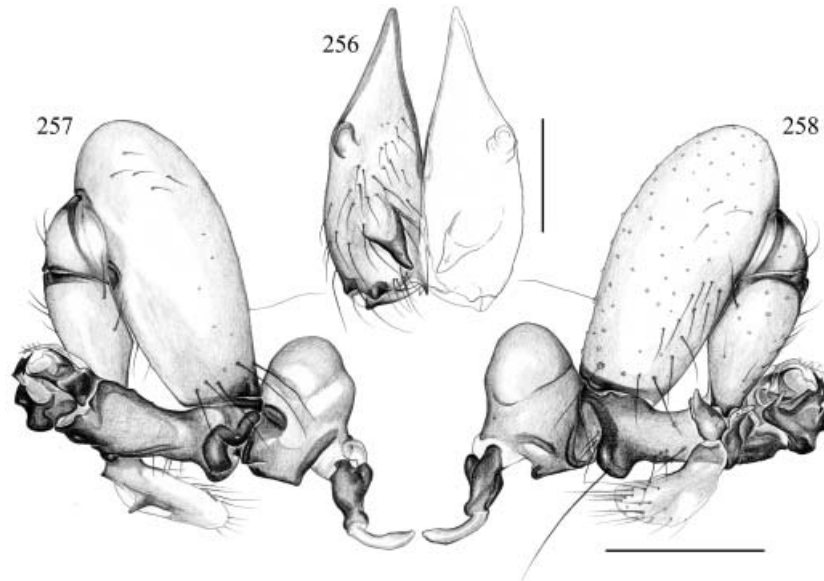
Female. Unknown.

Distribution. Known from type locality only (Fig. 264).

Material examined. SOUTH AFRICA: WESTERN CAPE: 10 km E Suurbraak: type above.

MALE–FEMALE COVARIANCE

Functional studies have shown that in pholcids the male chelicerae contact the female epigynum during copulation (review in Huber & Eberhard, 1997). In some genera, a simple functional correlation between a pair of apophyses on the male chelicerae and a pair of pockets on the female epigynum has been suggested, based on the obvious covariation among species between distances of apophyses and pockets (e.g. Kraus, 1984; Huber, 1999), but in only one study has it



Figures 256–258. *Sperophora suurbraak* sp. nov. Male chelicerae in frontal view (256), and left male palp in prolateral (257) and retrolateral (258) views. Scale bars = 0.2 mm (256), 0.5 mm (257, 258).

been verified by direct observation (Huber, 1994). The present study is the first to quantify this correlation for a larger group of species. Figure 259 shows a scatter diagram, with each of the 19 dots representing one species of *Quamtana*. Both sexes are known in 21 species, but in two of these (*Q. molimo*, *Q. knysna*), I could not see pockets on the epigynum. There is an almost exact correlation between the measures (Pearson's Correlation Coefficient $r = 0.99$; $P < 0.001$), with male measures being slightly higher than female measures. This probably reflects the fact that the basal segments of male pholcid chelicerae are able to perform slight movements against each other (to grip the female), even though they are fused medially (Huber, 2002).

It might be argued that such a correlation could simply reflect size variation among species, with larger species having higher measures. An inspection of the chelicerae illustrated herein shows that this is not the case, and Figure 260 summarizes the data in a scatter diagram. There is no apparent correlation between carapace width as an indicator of body size and distance between the cheliceral apophyses ($r = -0.13$; $P = 0.6$). Moreover, the range of variation is significantly different: 0.45–1.15 mm in carapace width (1 : 2, 6), and 9–338 μm in the distance between the apophyses (1 : 37, 6).

Technically, calculating correlation coefficients for the data above is inappropriate because the data (species) are not independent but linked by a phylogeny (Harvey & Pagel, 1991). However, considering the ease of measurement of the structures involved, and the apparently multiple occurrence of the phenomenon in

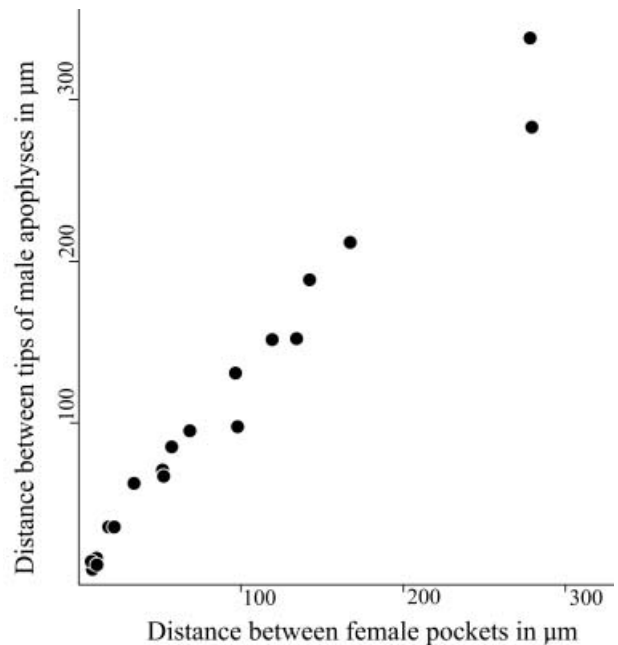


Figure 259. Scatter diagram showing the tight correlation between the distance between the tips of the male cheliceral apophyses and the distance between the pockets on the female epigynum. Each dot represents one species of *Quamtana* gen. nov.

different pholcid genera, correlation analysis is here used as a preliminary descriptive technique to suggest pholcids as a group potentially well suited for the study of male–female coevolution.

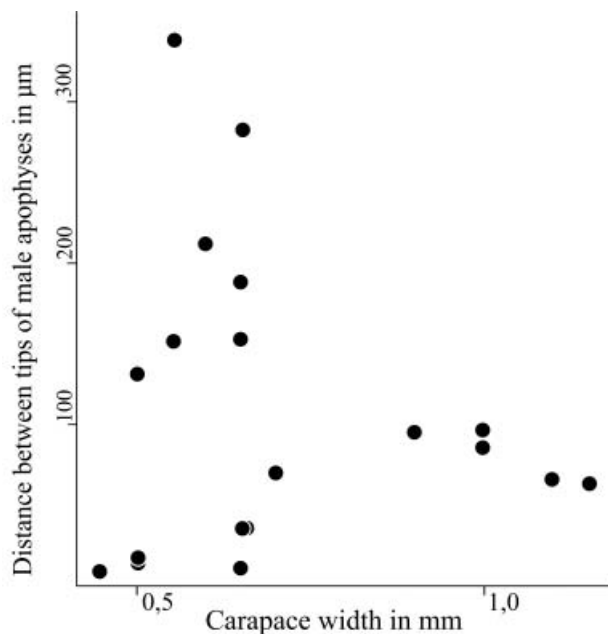


Figure 260. Scatter diagram showing the absence of a correlation between body size (carapace width) and the distance between the male cheliceral apophyses. Each dot represents one species of *Quamtana* gen. nov.

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APPENDIX 1

DATA MATRIX

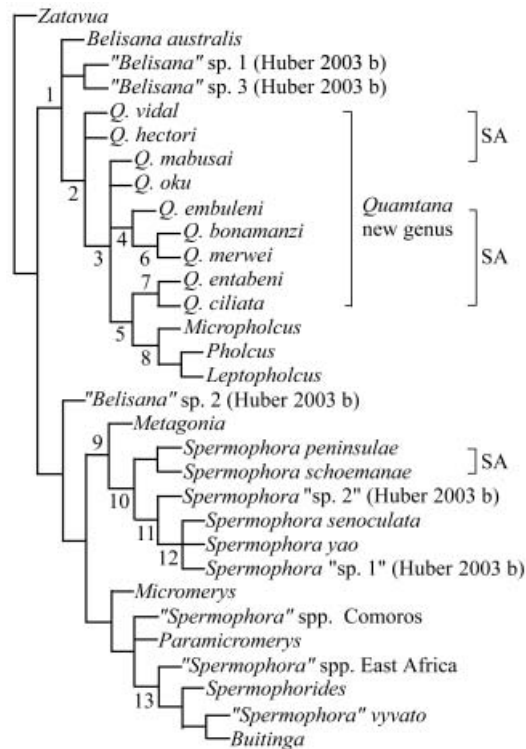
This matrix, containing seven representatives of *Quamtana* gen. nov., was added to the matrix from Huber (2003b).

	10	20	30	40	50	60	
78. <i>Q. merwei</i>	0100010001	1000--0010	0011111110	10-0001001	0010020100	0000001000	1010
79. <i>Q. entabeni</i>	0000010001	1000--0010	0011111110	10-0001001	0010000100	0000001000	1001
80. <i>Q. ciliata</i>	0000010001	1000--0010	0011111110	10-0001001	0010000100	0000001000	1001
81. <i>Q. hectori</i>	1100010001	1000--0010	0011111110	10-0001001	0010000100	0000001000	1000
82. <i>Q. mabusai</i>	0100010001	1000--0010	0011111110	10-0001001	0010000100	0000001000	1000
83. <i>Q. embuleni</i>	0100010001	1000--0010	0011111110	10-0001001	0010100100	0000001000	1010
84. <i>Q. oku</i>	0100010001	1000--0010	0011111110	10-0001001	0010000100	0000001000	1000

APPENDIX 2

CLADOGRAM USING EQUALLY WEIGHTED CHARACTERS

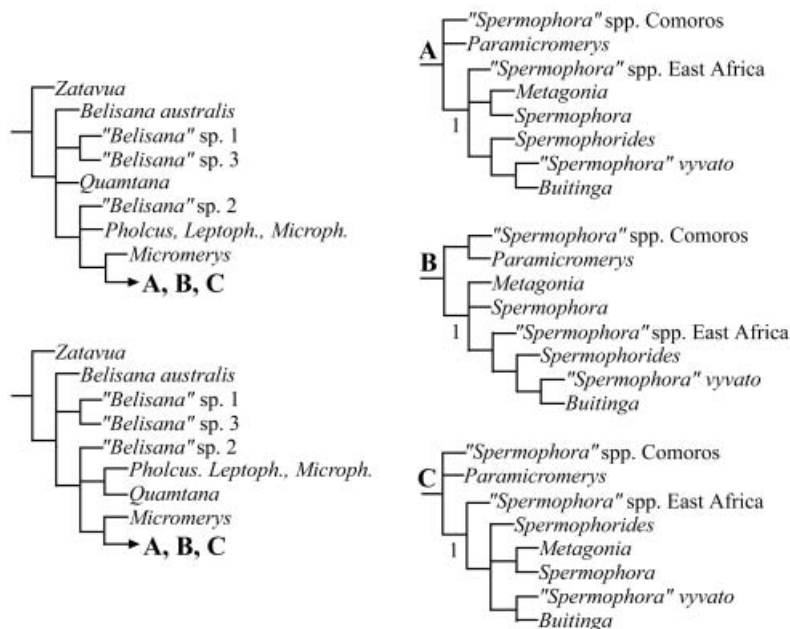
This cladogram shows the resolution of pholcines in the three most parsimonious cladograms found by NONA using equally weighted characters. To simplify the illustration, genera and species groups were used in cases where further branching did not differ from the previous analysis (Huber, 2003b). Southern African taxa treated in this study are indicated on the right (SA).



APPENDIX 3

CLADOGRAMS USING SUCCESSIVE WEIGHTING

These cladograms show the resolution of pholcines in the 18 most parsimonious cladograms found by NONA using successive weighting. As in Appendix 2, genera and species groups were used in cases where further branching did not differ from a previous analysis (Huber, 2003b). On the left side are the two resolutions for the basal taxa within pholcines, on the right side the three solutions for the distal taxa. Combination of basal and distal taxa results in six different resolutions of pholcines.



APPENDIX 4

INDEX OF SPECIFIC NAMES

<i>biena</i> sp. nov.	<i>kabale</i> sp. nov.	<i>mbaba</i> sp. nov.	<i>pembai</i> sp. nov.
<i>bonamanzi</i> sp. nov.	<i>kitahurira</i> sp. nov.	<i>merwei</i> sp. nov.	<i>peninsulae</i> (Lawrence)
<i>ciliata</i> (Lawrence)	<i>knysna</i> sp. nov.	<i>meyeri</i> sp. nov.	<i>schoemanae</i> sp. nov.
<i>embuleni</i> sp. nov.	<i>lajuma</i> sp. nov.	<i>molimo</i> sp. nov.	<i>suurbraak</i> sp. nov.
<i>entabeni</i> sp. nov.	<i>leleupi</i> sp. nov.	<i>nandi</i> sp. nov.	<i>tsui</i> sp. nov.
<i>filmeri</i> sp. nov.	<i>leptopholcica</i> (Strand)	<i>nylsvley</i> sp. nov.	<i>umzinto</i> sp. nov.
<i>gordimerae</i> sp. nov.	<i>lotzi</i> sp. nov.	<i>oku</i> sp. nov.	<i>vidal</i> sp. nov.
<i>hectori</i> sp. nov.	<i>mabusai</i> sp. nov.		

APPENDIX 5

MAPS

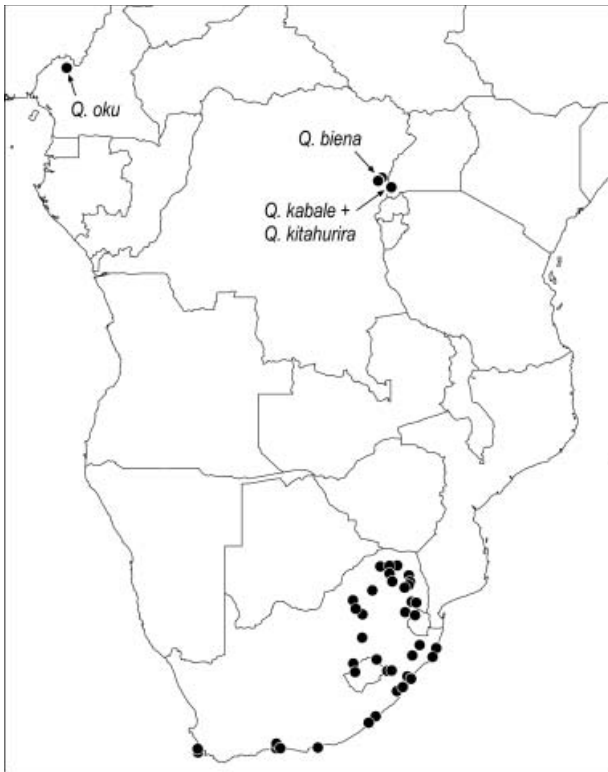


Figure 261. Known distribution of *Quamtana* gen. nov. Only the non-South African species are labelled.

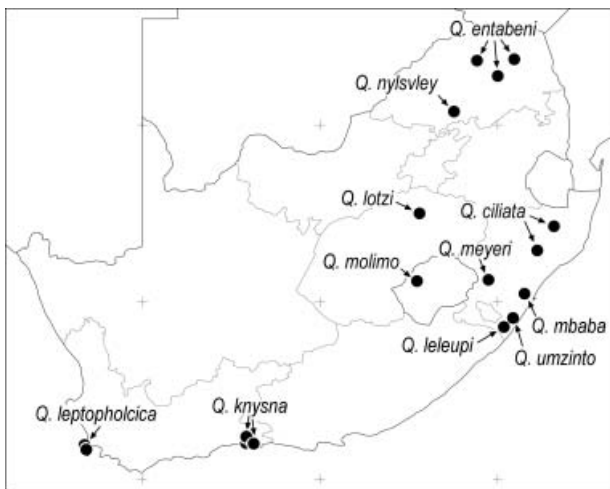


Figure 262. Known distribution of *Quamtana* gen. nov. within South Africa.

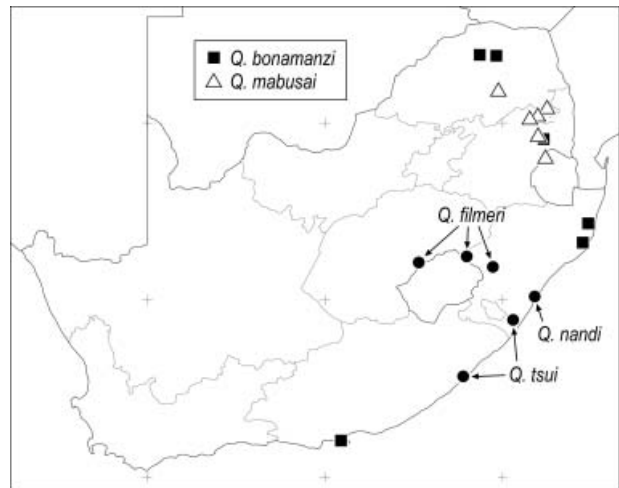


Figure 263. Known distribution of *Quamtana* gen. nov. within South Africa (contd.).

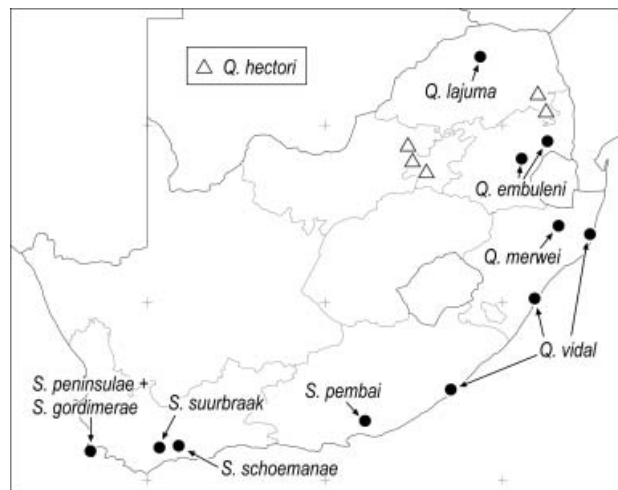


Figure 264. Known distribution of *Quamtana* gen. nov. (contd.) and *Sperophora* Hentz within South Africa.