

## A new African arboreal genus and species of theraphosid spider (Araneae, Theraphosidae, Stromatopelminae) which lacks spermathecae

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### Summary

A new monospecific genus and species of arboreal theraphosid, *Xenodendrophila gabrieli*, is described from mountains near Arusha, northern Tanzania. This new genus is related to the West/Central African genera *Stromatopelma* and *Heteroscodra*, but differs from these in the form of its genitalia, coloration and appendage setation. The new taxon represents the second record of a spermatheca-lacking theraphosid and is described from the female only. The systematic position of *Xenodendrophila*, *Stromatopelma* and *Heteroscodra* is discussed.

### Introduction

The African theraphosid fauna comprises 28 known genera grouped into 5 subfamilies (Smith, 1990; Schmidt, 1993, 1994, 1999; Gallon, 2001, 2002). Of the 28 genera only two are known to be arboreal; *Stromatopelma* Karsch, 1881 and *Heteroscodra* Pocock, 1899 (Smith, 1990; Charpentier, 1992, 1996). These two arboreal genera have recently been placed in their own subfamily Stromatopelminae (Schmidt, 1993). Both of these genera are found mainly in sub-Saharan West Africa (Pocock, 1903; Smith, 1990; Charpentier, 1992, 1996), with *Stromatopelma* also occurring in the south of The Democratic Republic of Congo (Roewer, 1953).

In April 1999 an imported batch of Tanzanian theraphosids intended for the pet trade was found to contain three specimens of a distinctly patterned arboreal species. Two of the specimens died during transit and were passed to the author by Ray Gabriel for identification. The third specimen was maintained in captivity by Ray Gabriel, during which it underwent three moults. Examination of the material by the author showed that the specimens represented a distinctive new genus and species which lacks spermathecae. The new taxon described in this paper adds a third arboreal genus to the African fauna and represents the first record of a member of the Stromatopelminae in East Africa. It is also the first Old-World theraphosid known to lack spermathecae.

### Methods

Methods follow Gallon (2002), except ocular measurements were obtained microscopically using an eyepiece graticule  $\pm 0.01$  mm. All measurements are in mm.

**Abbreviations:** Eyes: AME=anterior median, ALE=anterior lateral, PME=posterior median, PLE=posterior lateral. Leg spines: DPV=distal proventral, DRV=distal retroventral, MPV=medial proventral, MRV=medial retroventral, MPL=medial prolateral,

DMV=distal midventral, DPD=distal prodorsal, DRD=distal retrodorsal, MRD=medial retrodorsal. Spinnerets: DS=distal segment. Collections: BMNH=Natural History Museum, London, United Kingdom.

### Genus *Xenodendrophila* gen. n.

*Type and only species:* *Xenodendrophila gabrieli* gen. et sp. n.

**Etymology:** The generic name is derived from the Greek *Xeno* (strange) pertaining to the unusual female genitalia, *dendro* (tree), and *phila* (loving) alluding to its arboreal habits. Gender feminine.

**Diagnosis:** Differs from all other African theraphosid genera by the absence of spermathecae (Figs. 7–9). It also differs from the two known African arboreal genera (*Heteroscodra* and *Stromatopelma*) by the reduced leg pilosity and scopulation, and by the absence of large, single, dorsal, black leg markings on the tarsi, metatarsi and tibiae (Plates 1–4). Tarsus IV in females of both *Stromatopelma* and *Heteroscodra* is proximally divided by a band of stiffened setae; in *Xenodendrophila* gen. n. there is no such proximal division of the scopula on tarsus IV. The female is further distinguished from that of *Heteroscodra* by the possession of an unthickened leg IV and by the presence of laterally-opposing femoral scopulae on the palp and leg I. *Xenodendrophila* gen. n. differs from all the Harpactirinae Pocock, 1897 genera by the presence of scopulae between the opposing trochanteral and femoral surfaces of the palp and leg I. It further differs from most harpactirine genera by the absence of a retrolateral cheliceral scopula. *Xenodendrophila* gen. n. is distinguished from the Eumenophorinae Pocock, 1897 genera by the absence of robust stridulatory setae on the coxae of the palp and legs I and II. It is readily distinguished from the Selenogyrinae Smith, 1990 genera by the absence of modified stridulatory setae between the chelicerae. The absence of proximal and medial tibial leg spines provides additional distinction from the Old-World ischnocolines.

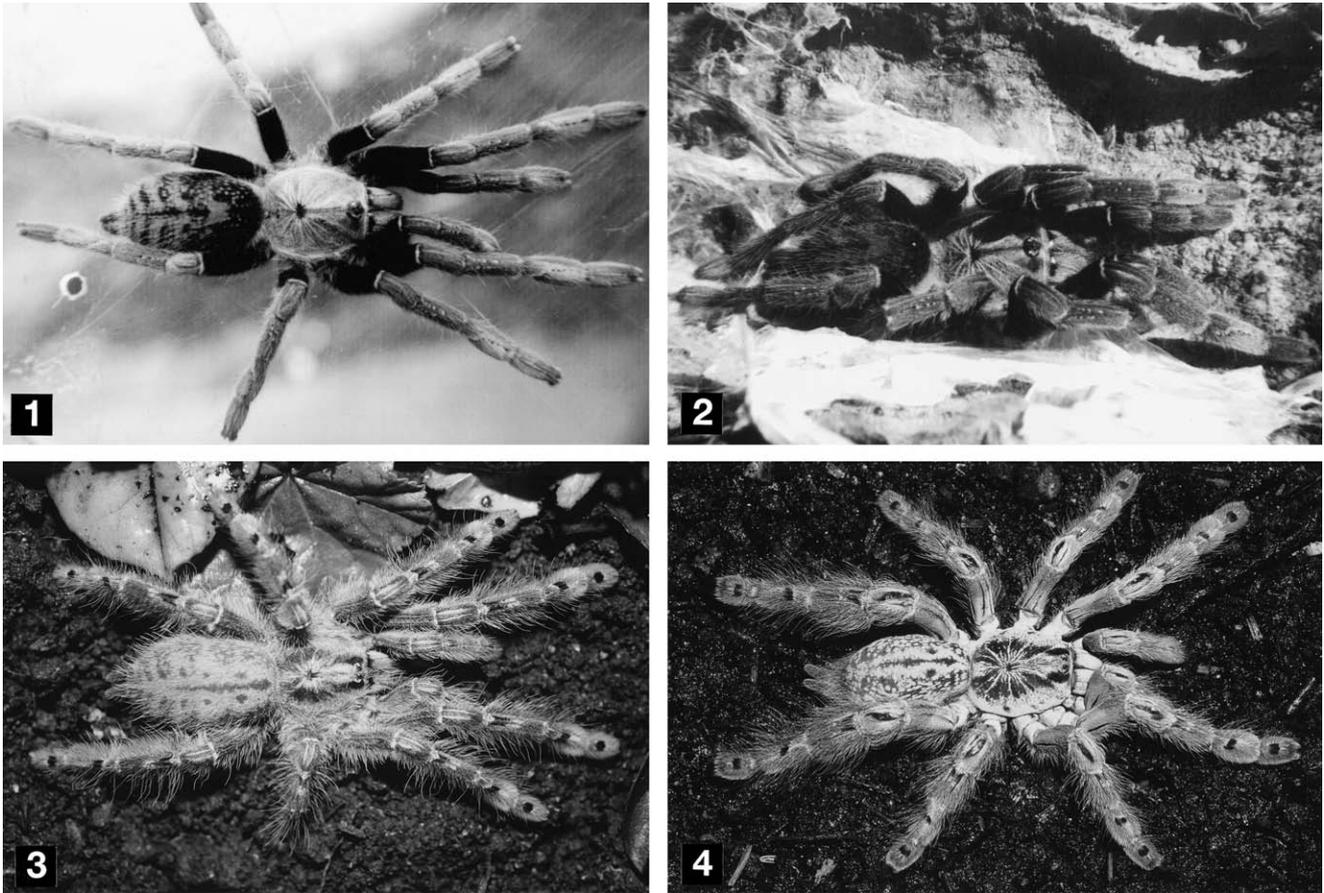
### *Xenodendrophila gabrieli* sp. n. (Plates 1–2, Figs. 1–9)

**Type material:** Holotype ♀ (BMNH), from northern Tanzania, mountains near Arusha, 03°23'S, 36°40'E, c. April 1999 (Joe Beraducci). Found living arboreally beneath peeling tree bark (J. Beraducci pers. comm. with R. Gabriel). Paratypes: 2♀ (BMNH) with same data.

**Etymology:** The specific epithet is a patronym in honour of Mr Ray Gabriel who provided study material of the new taxon.

**Diagnosis:** As for genus.

**Female holotype** (Fig. 1): Total length, including chelicerae but excluding spinnerets, 34.1. Carapace profile low, length 14.4, width 12.2. Abdomen length 14.0, width 7.5. Fovea deep and ovoid. Ocular tubercle length 2.28, width 2.81 (Fig. 2). Clypeus width 0.29. Eye sizes: AME 0.71, ALE 0.75, PME 0.57, PLE 0.83. Sternum with three pairs of oval submarginal sigilla. Labium with 10 cuspules. Maxilla with c. 100 cuspules. Paired labiosternal mounds present on labiosternal



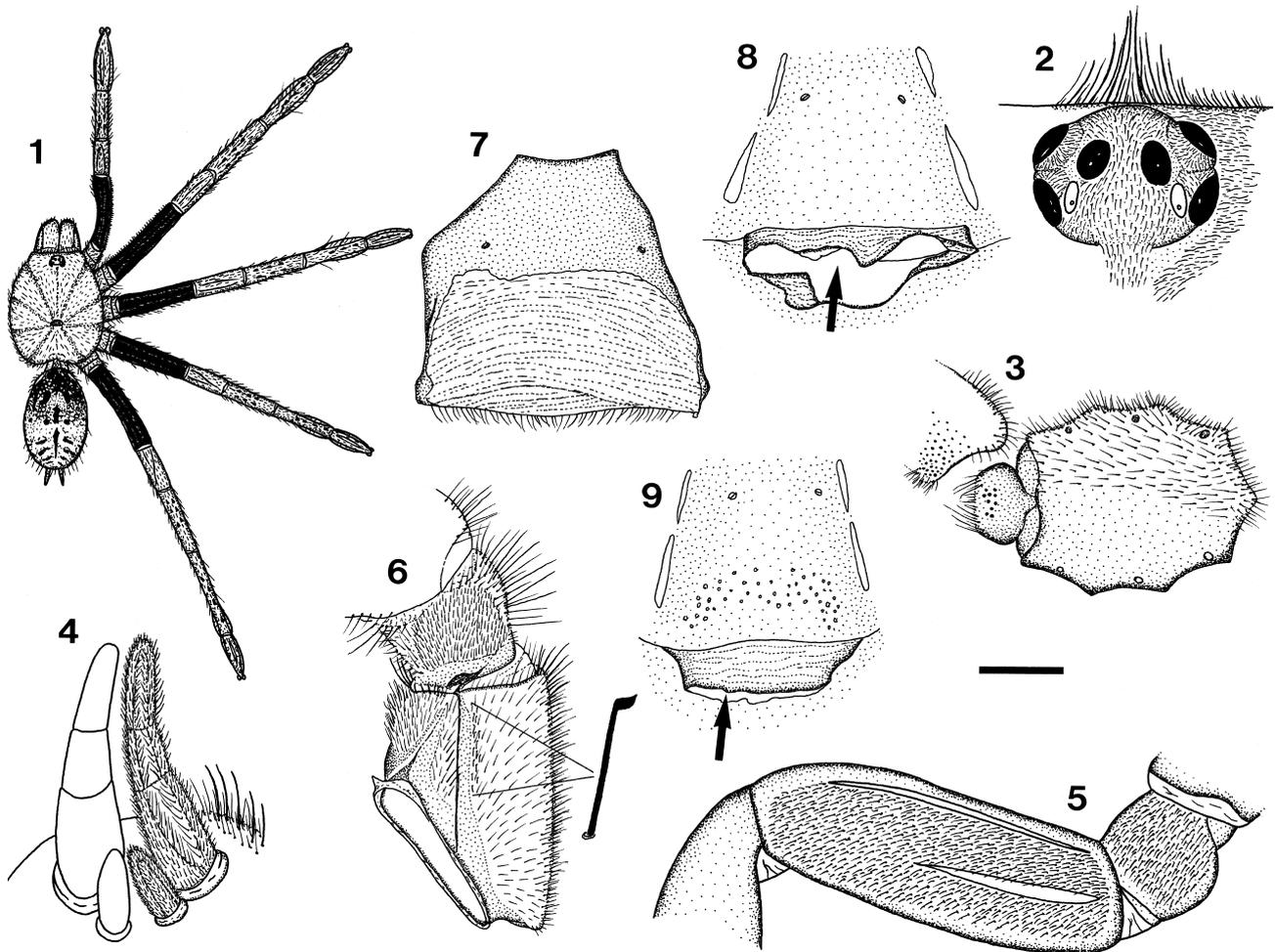
Plates 1–4: **1** *Xenodendrophila gabrieli* sp. n., paratype female (photo courtesy of Ray Gabriel); **2** The same showing darker coloration after three moults in captivity and extensive webbing within retreat (photo courtesy of Ray Gabriel); **3** *Stromatopelma calceatum*, female (photo courtesy of Rick West); **4** *Heteroscodra maculata*, female (photo courtesy of Rick West).

suture (Fig. 3). DS of posterior spinneret digitiform (Fig. 4). Chelicerae with 12 teeth on promargin. Ventral retrolateral surface of chelicerae glabrous. Leg and palp segment lengths in Table 1. Tarsal scopulae: palp and legs I–II integral; legs III–IV divided distally (not by setae),  $\frac{1}{5}$  and  $\frac{1}{4}$  divided respectively. Metatarsal scopulae: legs I–II 100%, integral; leg III 75%, integral; leg IV 50%, bisected longitudinally by band of stiff setae. Tarsal and/or metatarsal scopulae of palps and legs I–II laterally well developed relative to legs III–IV. Scopula of acutely angled setae present on distal prolateral surface of palpal femur; similar scopulae on entire retrolateral surfaces of trochanter and femur of palp (Fig. 5). Opposing scopulae present on prolateral surfaces of trochanter (Fig. 6) and femur of leg I. Scopulae also present on prolateral surface of femur of leg II, but not on trochanter. Other leg segments without such lateral scopulae. Prolateral coxal surface of leg I with

	Fe	Pa	Ti	Mt	Ta
<b>I</b>	11.6	7.1	9.7	8.6	6.9
<b>II</b>	11.3	6.7	8.6	8.3	6.9
<b>III</b>	10.2	6.0	7.4	8.5	6.2
<b>IV</b>	13.0	6.3	10.2	12.1	6.7
<b>Palp</b>	9.3	5.3	6.8	—	8.1

Table 1: *Xenodendrophila gabrieli* sp. n. Lengths of leg and palp segments of female holotype.

discrete area of fine, capitate setae (shaped like moss sporophytes) perpendicular to cuticle (Fig. 6). Similarly positioned patch of capitate setae on prolateral surface of leg II. Capitate setae length 0.21. Remaining coxal surfaces without such setae. These setae are present in other theraphosid subfamilies and are obvious only when viewed in profile. Spination: palp tibia 1MPL, 1DPV; leg I tibia 1DPV; leg II tibia 1DPV; leg III tibia 1DRV (right only), 1DPV, metatarsus 1MRV, 1MPV, 1MPL, 1DRV, 1DMV, 1DPV, 1DPD, 1DRD; leg IV tibia 1DRV, 1DPV, metatarsus 1MPV, 1MRV, 1DRV, 1DMV, 1DPV, 1MRD, 1DPD, 1DRD. Remaining leg segments aspinose. Trichobothria: clavate trichobothria restricted to U-shaped region on apical half of all tarsi (24 on left tarsus I). Filiform trichobothria densely arranged over entire dorsum of tarsi; arranged in single line on metatarsi and double line on tibiae. Individual tibial and metatarsal trichobothria positions correspond with dark flecks on these segments. Trichobothria absent from all other leg segments. Setation: carapace with short uniform pelage not obscuring fovea. Abdomen with short pelage and sparse emergent setae dorsally, becoming denser towards spinnerets. Venter of abdomen without such emergent setae. Sternum, maxillae, coxae and trochanters with uniform covering of short setae without emergent setae. Appendages including dorsum of chelicerae with short pelage of setae and short emergent setae. Coloration: carapace (includ-



Figs. 1–9: *Xenodendrophila gabrieli* sp. n. **1** Holotype female, dorsal view; **2** Ocular tubercle, dorsal view (holotype female); **3** Sternum and labium, ventral view (ditto); **4** Spinnerets, posterior view (ditto); **5** Palp trochanter and femur showing retrolateral scopulae (ditto); **6** Coxa and trochanter I, prolateral view. Note scopula on trochanter. Field of capitate setae on coxa situated between ends of divergent lines; setal shape illustrated at vertex of divergent lines (ditto); **7** Ventral section of transparent uterus externus (dorsal section removed), dorsal view (ditto); **8** Tubular uterus externus, dorsal view, lumen arrowed (small paratype); **9** Tubular uterus externus folded back to show ventral surface, dorsal view, lumen arrowed (exuviae from large paratype). Scale line = 10.8 mm (1), 1.3 mm (2), 2.4 mm (3), 2.1 mm (4), 2.2 mm (5), 2.0 mm (6), 1.0 mm (7–9).

ing ocular tubercle) and dorsum of chelicerae covered with orange-brown setae. Dorsal surface of all legs and palps (including dorsally visible scopulae) similarly coloured except for black femora. Dorsally all tibiae with double row of 3–4 small black flecks. Single row of several small black flecks present dorsally on all metatarsi. No black flecks present on dorsum of tarsi (Fig. 1). Ventral surfaces of sternum, coxae, trochanters and femora of all appendages black/dark brown. Remaining ventrodistal segments of palp and leg I black. Remaining distal segments of legs II–IV charcoal grey with covering of longer orange-brown setae. All tarsal and metatarsal scopulae charcoal grey ventrally. Abdomen dorsally orange-brown with black reticulations confined to anterior and anterior-lateral portions. Remainder of abdomen with black pattern consisting of spots and oblique bars. Venter brown/black, but booklung regions lighter. Spinnerets uniformly charcoal grey. Spermathecae absent (Fig. 7).

*Female paratype (small)*: As holotype except: Total length, including chelicerae but excluding spinnerets, 32.0. Carapace profile low, length 12.6, width 11.5. Abdomen length 14.6, width 10.4. Ocular tubercle length

1.81, width 2.41. Clypeus width 0.23. Eye sizes: AME 0.62, ALE 0.64, PME 0.42, PLE 0.60. Labium with 17 cuspules. Maxilla with *c.* 120 cuspules. Chelicerae with 14 teeth on promargin. Leg and palp segment lengths in Table 2. Tarsal scopulae of palp and legs I–IV integral. Metatarsal scopulae: legs I–II 100%, integral; leg III

Small	Fe	Pa	Ti	Mt	Ta
<b>I</b>	9.8	6.6	7.8	7.0	6.3
<b>II</b>	9.5	5.8	7.1	6.7	5.7
<b>III</b>	8.4	4.9	6.3	7.1	5.7
<b>IV</b>	10.5	5.8	8.6	9.7	5.8
<b>Palp</b>	7.3	4.8	5.3	—	7.4
<b>Large</b>					
<b>I</b>	13.8	8.2	11.1	10.0	7.6
<b>II</b>	13.0	7.8	10.1	9.4	7.5
<b>III</b>	11.5	6.5	8.6	10.2	6.8
<b>IV</b>	14.3	7.0	11.2	13.5	7.0
<b>Palp</b>	10.2	6.3	7.8	—	9.1

Table 2: *Xenodendrophila gabrieli* sp. n. Lengths of leg and palp segments of small and large female paratypes.

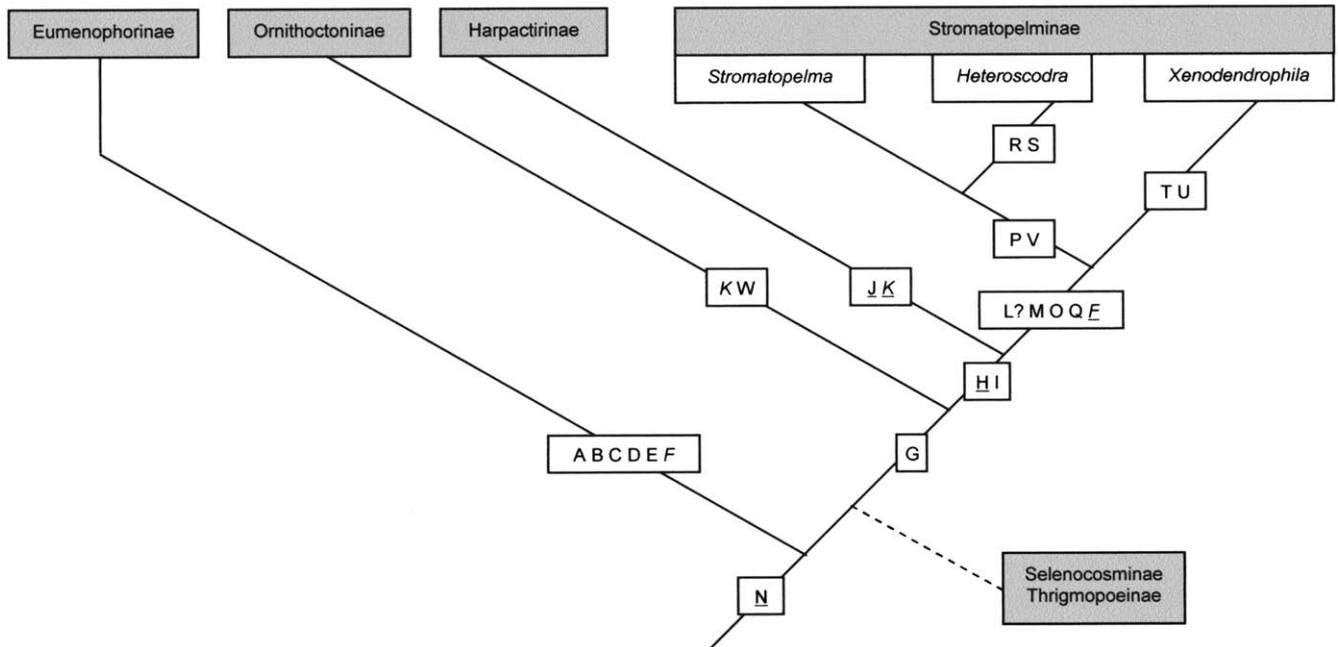


Fig. 10: Partial cladogram of Old-World theraphosid subfamilies. Synapomorphies listed in Table 3. Underlined=synapomorphies with reversals (in part). Italics=homoplastic characters.

66%, integral; leg IV 50%, bisected longitudinally by band of stiff setae. Spination: palp tibia 1MPL, 1DPV; leg I tibia 1DPV (right only); leg II tibia 1DPV (right only); leg III tibia 1DRV (left only), 1DPV (left only), metatarsus 1MRV, 1MPV, 1MPL (left only), 1DRV, 1DMV, 1DPV, 1DPD, 1DRD (left only); leg IV tibia 1DRV, 1DPV, metatarsus 1DRV, 1DMV, 1DPV, 1DPD, 1DRD. Trichobothria: arrangement as in holotype (17 clavate trichobothria on left tarsus I). Spermathecae absent (Fig. 8).

*Female paratype (large)*: As holotype except: Total length, including chelicerae but excluding spinnerets, 42.9. Carapace profile low, length 16.6, width 14.9. Abdomen length 21.6, width 16.4. Ocular tubercle length 2.41, width 2.97. Clypeus width 0.41. Eye sizes: AME 0.78, ALE 0.84, PME 0.58, PLE 0.70. Labium with 13 cuspules. Chelicerae with 14 teeth on promargin. Leg and palp segment lengths in Table 2. Tarsal scopulae: palp and leg I integral; legs II–IV divided distally (not by setae);  $\frac{1}{3}$ ,  $\frac{1}{2}$  and  $\frac{2}{3}$  divided respectively. Spination: palp tibia 1MPL, 1DRV (left only), 1DPV; leg I tibia 1DRV (left only), 1DPV; leg II tibia 1DRV, 1DPV; leg III tibia 1DRV, 1DPV, metatarsus 1MRV, 1MPV, 1MPL (right only), 1DRV, 1DMV, 1DPV, 1DPD, 1DRD; leg IV tibia 1DRV (2 on right), 1DPV, metatarsus 1MRV, 1MPV, 1DRV, 1DMV (2 on right), 1DPV (left only), 1MRD, 1DPD, 1DRD. Trichobothria: arrangement as in holotype (37 clavate trichobothria on left tarsus I). Coloration (Plate 2): As in holotype, but dorsal coloration of palps and legs (patella to tarsus) suffused with charcoal grey. Femora of palps and legs chestnut brown. Dorsum of abdomen more dusky than other specimens, but markings identical. Spermathecae absent (Fig. 9).

*Male*: Unknown.

*Material examined*: Holotype female, two paratype females (BMNH) and three consecutive exuviae from larger paratype female, northern Tanzania, mountains

near Arusha, 03°23'S, 36°40'E, c. April 1999 (Joe Beraducci).

*Distribution*: Known only from mountains near Arusha, northern Tanzania (possibly montane forest habitat).

*Captive behavioural notes*: A living captive (large paratype) was observed to produce an extensive silken labyrinth retreat when housed in a vivarium furnished with cork bark slabs. No burrowing behaviour was observed in this specimen (R. Gabriel, pers. comm.) which is consistent with an arboreal way of life.

#### Discussion (Fig. 10, Table 3)

Raven (1985) produced a cladogram of theraphosid subfamilies. He grouped the Eumenophorinae and the two genera *Stromatopelma* and *Heteroscodra* into a single clade, based on a single synapomorphy—the possession of a retrolateral scopula on the palpal femur. Raven also proposed a single autapomorphy for the Eumenophorinae—the presence of coxal stridulatory setae between the palp and leg I, and between legs I and II. Because such stridulatory setae are absent from both *Stromatopelma* and *Heteroscodra*, Raven left these genera in an unresolved trichotomy with the Eumenophorinae. Raven hypothesised that the eumenophorine-type stridulation organs had been lost (an apomorphic reversal) in *Stromatopelma* and *Heteroscodra*. For these reasons and their possession of labiosternal mounds, Raven placed both genera in the subfamily Eumenophorinae.

Smith (1990) followed Raven's placement and noted the presence of thickened prodorsal setae on the coxae and trochanters of legs I and II in *Heteroscodra* (absent in *Stromatopelma*). He interpreted these setae as vestiges of eumenophorine-type stridulation organs, thereby adding weight to Raven's apomorphic reversal

- A — Abdomen unmarked [marked with herringbone pattern].
- B — Clavate trichobothria extend along dorsal length of tarsus [only distal portion].
- C — Metatarsal IV scopula undivided [divided by band of stiffened setae].
- D — Posterior sternal sigilla medially placed [submarginal].
- E — Robust stridulatory setae between palp & leg I and between leg I & leg II [no stridulatory setae].
- F — Retrolateral scopulae on palpal femur [absent].
- G — Medial metatarsal leg spines (MRD and MPL) on legs III & IV [absent or not in these positions].
- H — Abdomen marked with anteriolateral reticulations [without reticulations].
- I — Egg-sac fixed [mobile cocoon].
- J — Tibial spur is a megaspine on an apophysis [not like this].
- K — Retrolateral cheliceral scopula present [absent].
- L — Male tibial spur absent [present].
- M — Fovea circular and pit-like [slit-like].
- N — Labiosternal mounds present [absent].
- O — Black dorsal leg markings on tibiae, metatarsi and tarsi [absent].
- P — Leg spines absent [present].
- Q — Labial cuspules reduced [normal].
- R — Tibia IV incrassate [normal].
- S — Thickened prodorsal setae on female coxae and trochanters [normal].
- T — Spermathecae absent [spermathecae present].
- U — Black markings on dorsum of tarsi absent [present].
- V — Tarsal and metatarsal scopulae on anterior legs laterally well-developed [normal].
- W — Stridulatory spike setae on maxilla [absent].

Table 3: Synapomorphies shown in Fig. 10. Plesiomorphic character states in square brackets.

hypothesis. However, I disagree with Smith's interpretation of these thickened setae. In female *Heteroscodra* these setae are also present on the coxae and trochanters of legs III and IV (where eumenophorines lack stridulatory setae). In males the trochanteral setae are not thickened and are typical, elongated setae as found in this position amongst other theraphosids (e.g. *Pterinochilus* Pocock, 1897). These observations suggest that these *Heteroscodra* setae are modifications of typical setae, rather than vestiges of eumenophorine-type stridulation organs.

Schmidt (1993) rejected Raven's placement and proposed a new subfamily, *Stromatopelminae*, to accommodate both genera. He felt that the absence of stridulation organs was a significant difference and also noted that the possession of labiosternal mounds was not restricted to the eumenophorines, but occurred in several other distinct subfamilies. He also highlighted the fact that both genera possess laterally developed tarsal and metatarsal scopulae, few labial cuspules, transverse fovea and paired labiosternal mounds, and that males lack tibial spurs on leg I. However, none of these characteristics was specifically identified as synapomorphic for the *stromatopelminae*.

I concur with Schmidt's decision but, like Raven, he is incorrect in inferring that *Heteroscodra* and males of *Stromatopelma* possess retrolateral scopulae on the palpal femora. As a result the significance of this single synapomorphy for grouping *Heteroscodra* and *Stromatopelma* with the *Eumenophorinae* must be questioned. As discussed below, eumenophorines have five significant synapomorphies (Fig. 10, Table 3, characters A–E) which are not found in the *stromatopelminae*. Likewise, the *stromatopelminae* have five significant synapomorphies (characters G, H, M, O, Q) which are not represented in the eumenophorines. Therefore it is more parsimonious to separate the *stromatopelminae* from the eumenophorines, rather than group

them based on a single synapomorphy (character F). It is my opinion that the retrolateral femoral scopula on the palp of female *Stromatopelma* and *Xenodendrophila* gen. n. is homoplastic with respect to the *Eumenophorinae* (contra Raven, 1985) (character F).

Raven (1985) suggested the presence of paired labiosternal mounds was an important synapomorphy for grouping many of the Old-World theraphosid subfamilies (*Thrigmopoeinae* Pocock, 1900, *Ornithotoninae* Pocock, 1895, *Selenocosminae* Simon, 1889 and *Eumenophorinae*) into a clade. He considered those selenocosmine genera without this character to have undergone reversals. Schmidt (1993) highlighted the fact that some *Ischnocolinae* Simon, 1892 taxa also possess labiosternal mounds and questioned the positioning of this synapomorphy in Raven's cladogram. Although most *Harpactirinae* lack labiosternal mounds, some *Pterinochilus* species (e.g. *P. murinus* Pocock, 1897) possess them. In the light of the evidence provided below, which supports the grouping of the *harpactirinae*, *stromatopelminae* and Asian subfamilies, I consider the absence of labiosternal mounds in most *harpactirinae* to be a reversal back to the plesiomorphic state, with the character reappearing in some *Pterinochilus* species (character N).

Pocock (1897) mentioned that eumenophorines have medially placed posterior sternal sigilla. I consider this to be apomorphic and as such, an additional eumenophorine synapomorphy (character D). In contrast, the *stromatopelminae* have submarginal posterior sternal sigilla, which they share symplesiomorphically with the *harpactirinae*. *Stromatopelminae* have a sub-circular, pit-like fovea (considered here to be apomorphic) (character M), which contrasts with the slit-like, plesiomorphic fovea of the *Eumenophorinae*. The arrangement of clavate trichobothria is also different. In eumenophorines these are arranged in a V-shaped region and occur along the entire dorsal length of the

tarsus (character B). By contrast they are arranged in a compact, distal, U/shield-shaped region on the stromatopelmine tarsus (Gallon, 2002). The clavate trichobothria found on the tarsi of Harpactirinae, Ornithohtoninae, Selenocosminae and Thrigmopoeinae are also restricted to the distal region — a characteristic which I consider plesiomorphic.

The metatarsal scopula of leg IV is undivided in the Eumenophorinae (considered apomorphic) (character C), but longitudinally bisected by stiffened setae in the Stromatopelminae (considered plesiomorphic). This plesiomorphic condition is also found in the Harpactirinae and the Asiatic subfamilies Ornithohtoninae, Selenocosminae and Thrigmopoeinae.

The abdominal markings of stromatopelmines consist of bars, spots and reticulations. Raven (1994) considered the “herringbone pattern” found in many theraphosids to be plesiomorphic — a view I share. It is significant to note that this plesiomorphic condition is present in harpactirines, stromatopelmines, ornithohtonines and many selenocosmines. The unmarked abdomens found in some selenocosmines and thrigmopoeines are considered homoplastic. The reticulate abdominal markings found in stromatopelmines and harpactirines bear strong similarities and, as such, are considered autapomorphic (with reversals in some harpactirine taxa) (character H). Eumenophorines apomorphically possess unmarked abdomens (character A).

An additional synapomorphy between the Harpactirinae and Stromatopelminae is the presence of medial, metatarsal spines on legs III and IV (particularly MRD and MPL) (character G). The positioning of these spines in *Xenodendrophila* gen. n. is identical to that found in the harpactirines and ornithohtonines. However, *Stromatopelma* and *Heteroscodra* apomorphically lack leg spines (character P), but reduction in leg spination is a typical feature of strongly arboreal theraphosid taxa, as displayed in the Aviculariinae Simon, 1874, *Poecilotheria* Simon, 1885 and *Psalmopoeus* Pocock, 1895. Eumenophorine legs are aspinose in these positions.

Because the ornithohtonines share the spination noted above with the harpactirines and stromatopelmines they are considered here to be the sister group to these two African subfamilies. The presence of spike setae on the prolateral face of the maxilla represents the autapomorphy for the ornithohtonines (character W). These spike setae act against a row of large, plumose setae on the retrolateral surface of the chelicera. A similar stridulation organ is found in the harpactirine genus *Harpactira* Ausserer, 1871, but this is clearly not homologous. In *Harpactira* the maxillary stridulation setae are large, plumose setae which are clearly derived from the reddened oral-fringe setae. These are structurally different from the highly sclerotised spike setae found in the ornithohtonines. In ornithohtonines the large, plumose setae on the lower retrolateral cheliceral surface are derived from the plumose setae which form the retrolateral cheliceral scopula. In contrast, the analogous setae found in *Harpactira* are not plumose and are clearly derived from the reddened oral-fringe setae.

The Ornithohtoninae and Harpactirinae share the presence of a plumose, retrolateral, cheliceral scopula (character K) and a plumose prolateral scopula on trochanter I. These have been interpreted as homoplastic, largely on the basis that the stromatopelmines show no evidence of such a stridulatory organ. However, the possibility exists that such an organ was lost in the Stromatopelminae.

Morphological evidence for grouping the stromatopelmines and harpactirines is supported by their reproductive behaviour. Most theraphosids (Theraphosinae Thorell, 1870, Aviculariinae, Ischnocolinae *sensu* Smith (1990), Ornithohtoninae, Selenocosminae and most Eumenophorinae) produce mobile, cocoon-type egg-sacs. This widespread behaviour is considered plesiomorphic in theraphosids. However, harpactirines and stromatopelmines produce fixed egg-sacs which they incorporate into their retreat. This almost unique behaviour within theraphosids is considered apomorphic for these taxa (character I). The fixed egg-sacs produced by the eumenophorine *Citharischius* Pocock, 1900 and *Thrigmopoeus* Pocock, 1899 are probably convergent.

The autapomorphies of the Stromatopelminae clade include: retrolateral scopula on the palpal femur (character F); circular pit-like fovea (character M); black dorsal leg markings on the tibiae, metatarsi and tarsi (character O); reduced number of labial cuspules (character Q). I tentatively include the absence of a male tibial spur (character L) as a synapomorphy of the Stromatopelminae, despite the fact that this character state is unknown in *Xenodendrophila* gen. n. Should it transpire that male *Xenodendrophila* gen. n. possess a spur, then its absence in *Stromatopelma* and *Heteroscodra* could be interpreted as a synapomorphy for these two genera to the exclusion of *Xenodendrophila* gen. n.

*Stromatopelma* and *Heteroscodra* form an obvious sister group with *Xenodendrophila* gen. n. as their outgroup. Phenotypically *Stromatopelma* and *Heteroscodra* are similar (Plates 3–4). Both possess radially-patterned carapaces and large, characteristic black markings on the dorsum of their tibiae, metatarsi and tarsi. In addition to these colour similarities the legs and palps of both genera are generously coated with long, emergent setae. By contrast the carapace of *Xenodendrophila* gen. n. is unmarked and the tibiae and metatarsi are marked with only several small black flecks (Plates 1–2). The tarsi of *Xenodendrophila* gen. n. are unmarked and the legs do not have a generous covering of long emergent setae.

The absence of spermathecae in *Xenodendrophila* gen. n. represents a significant autapomorphy of the genus (character T). An additional apomorphy of *Xenodendrophila* gen. n. is the absence of black markings on the tarsi (character U) (considered a reversal). *Stromatopelma* and *Heteroscodra* apomorphically possess laterally expanded tarsal and metatarsal scopulae on legs I–II and the palp (character V). They also lack leg spines — an apomorphic reversal associated with their arboreal existence (character P). *Heteroscodra* apomorphically

possesses an incrassate tibia IV (character R) and females apomorphically have thickened prodorsal setae on the coxae and trochanters (character S). The absence of a retrolateral scopula on the palp femur of *Heteroscodra* is also considered a reversal (character F).

The placement of the Selenocosminae and Thrigmopoeinae has been left unresolved. Since other workers are currently engaged in their taxonomy, a more detailed treatment is best left to them.

The most interesting characteristic of *Xenodendrophila* gen. n. is the absence of spermathecae on the ventral surface of the uterus externus; these are present in all other African Theraphosidae described to date (Smith, 1990). Spermathecae can be discerned in the exuviae of immature female theraphosids from the sixth instar onwards (Hancock & Hancock, 1994). At this stage the wide opening to the uterus externus is obvious, as is the transparent, tubular lining of the uterus externus. In immature males the genital opening is a tiny, buttonhole-like structure which does not possess features which could be mistaken for a uterine lining (Hancock & Hancock, 1994). Immature male exuviae from *Stromatopelma calceatum* (Fabricius, 1793) and *Heteroscodra maculata* Pocock, 1899 (of a similar size to the female *Xenodendrophila* exuviae) were examined during this study to confirm the buttonhole-like form of the gonopore. The absence of spermathecae on the ventral surface of the uterus externus was confirmed by careful dissection of the holotype and paratypes and examination of three consecutive exuviae. In each case the ventral surface of the uterus externus was examined closely for tears, to rule out the unlikely possibility that spermathecae were excised during dissection. In all examples the ventral surface of the uterus externus was found to be intact, thus ruling out both physical damage and teratology as explanations. The discovery of a second theraphosid species which lacks spermathecae on the ventral surface of the uterus externus represents an important finding.

Bertani & Silva Junior (2002) were the first to assemble evidence for the existence of a theraphosid species which lacked spermathecae. Their study of *Sickius longibulbi* Soares & Camargo, 1948 revealed that, in the absence of spermathecae, sperm storage was undertaken by the oviducts and uterus internus. They were able to demonstrate that mated females, which had subsequently moulted, were able to construct fertile egg-sacs — proving beyond doubt that spermathecae were not present or involved in sperm storage in this species.

Parallels can be drawn between the female reproductive system of *Xenodendrophila* and *Sickius*. It is highly likely that sperm storage is also undertaken by the oviducts and uterus internus in *Xenodendrophila*. Live material of both sexes is unavailable at present, thus preventing a more detailed investigation of *Xenodendrophila*.

## Acknowledgements

Thanks are due to Ray Gabriel for providing the author with study material and photographs of the new taxon and for observational notes on a captive specimen. Jason Dunlop and Rogerio Bertani are thanked for their valued comments on earlier drafts of the manuscript. Rick West is thanked for providing photographs of *Stromatopelma calceatum* and *Heteroscodra maculata*. Special thanks go to Rogerio Bertani for discussing his findings on *Sickius longibulbi* before the publication of his work on that species (Bertani & Silva Junior, 2002). Volker von Wirth is thanked for useful discussions regarding the relationships of Asian theraphosid sub-families. Jean-Michel Verdez and Frédéric Cléton are thanked for providing breeding data on *Thrigmopoeus*. Paul Hillyard and Janet Beccaloni (BMNH) are thanked for providing a repository for the type specimens.

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