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THE FIRST GALLIENIELLIDAE (ARANEAE) FROM EASTERN AFRICA

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ABSTRACT. *Toxoniella*, a new genus of Gallieniellidae is described from forest remnants on the Taita Hills in Kenya. The genus is characterized by legs with well developed spination, the male palp with posterior tegular extension not containing the spermduct and the epigyne with a single central frontal ledge, double spermathecae, and cul de sac tubes in front. Two new species, both known from males and females, are recognized: *T. taitensis* and *T. rogoae*. The position of the genus is discussed in the light of the presence of enlarged piriform gland spigots on the ALS in the male and its close relationship to *Drassodella* supported by a number of synapomorphies.

Keywords: Eastern Arc, Kenya, lamelliform hairs, piriform gland spigots

The Gallieniellidae is a small spider family created by Millot (1947) for a single species (*Gallieniella mygaloides* Millot 1947) of remarkable Araneomorphae with spectacularly porrect chelicerae from Madagascar. The family was for the first time defined by Legendre (1967). For quite some time the family was considered to be endemic to the large island even after the revision of Platnick (1984) who added a second genus (*Legendrena* Platnick 1984) and some species from islands in the neighborhood of Madagascar, but belonging to the same zoogeographical area. However, Platnick (1990) expanded the family, mainly on the base of the morphology of the spinnerets and included *Drassodella* Hewitt 1916 from the Cape region in South Africa. At the same occasion more taxa were announced from Australia, which drastically changed the initial endemic status of the family. Recently Goloboff (2000) described another new gallieniellid genus, *Galianoella* Goloboff 2000, from Argentina.

During recent field work in forest remnants of the Taita Hills in Kenya, at the far northern edge of the Eastern Arc Mountains, a number of gnaphosoid spiders were collected in which the females obviously lack the typical enlarged piriform gland spigots (EPGS) of the Gnaphosidae. The ALS have a sclerotized subdistal ring instead and are slightly conical and closely set. However, males appear to have EPGS. The chelicerae of these spiders are slightly porrect, more clearly so in the males and the habitus is very similar to that of *Drassodella*. This combination of characters would indicate that we are dealing with representatives of the Gallieniellidae, a find greatly expanding the range of the family on the African continent.

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METHODS

The following abbreviations are utilised: * (after a number) = spines in a row, ALE = anterior lateral eyes, ALS = anterior lateral spinnerets, AME = anterior median eyes, AW = anterior width (of the MOQ), d = dorsal, disp = dispersed, dw = distal whorl, EPGS = enlarged piriform gland spigots, EM: embolic membrane; F = femur, L = length of the median ocular quadrangle, MA = median apophysis, MOQ = median ocular quadrangle, Mt = metatarsus, P = patella, pl = prolateral, PLE = posterior lateral eyes, PME = posterior median eyes, PW = posterior width (of the MOQ), PS = posterior spinnerets, rl = retrolateral, T = tibia, TE = tegular extension, v = ventral.

The following acronyms are used: AMNH = American Museum of Natural History, New York; MRAC = Musée Royal de l'Afrique

Centrale, Tervuren; NMK = National Museums Kenya, Nairobi.

All measurements are in mm.

TAXONOMY

Toxoniella new genus

Type species.—*Toxoniella taitensis* new species.

Diagnosis.—Specimens of *Toxoniella* have far more spines than representatives of Madagascan Gallieniellidae. Male representatives of *Toxoniella* have an oval tegulum with a posterior extension but lack a tegular central ridge; the embolus as well as the median apophysis and the embolar membrane are short and simple; females are characterized by the epigyne with long cul de sac tubes in front of the spermathecae which are double, each pair consisting of two well separated spheres.

Etymology.—The name is derived from the Greek τοξον which means arch, and refers to the presence of the taxon in the Eastern Arc mountains. The gender is feminine.

Natural history.—All specimens were caught in mountain forest by pitfall traps, sieving litter or hand collecting. Some of these forests are tiny remnants not exceeding a few ha. The elevation distribution ranges from 400–1200 m.

Affinities.—The position of *Toxoniella* is problematic in that the females fit the Gallieniellidae (absence of EPGS) whereas the males should be placed in the Gnaphosidae as they possess these typical spigots. However, the Gallieniellidae have thus far only been defined (Platnick 1990) by the absence of EPGS piriform gland spigots and the presence of a distal sclerotized ring on the ALS, both plesiomorphic characters. In the absence of a sound definition of the Gallieniellidae there are two possibilities for the placement of *Toxoniella* both of which imply that they are in fact intermediate between the Gallieniellidae and the Gnaphosidae. The genus can either be regarded as a derived gallieniellid in which only the males have acquired EPGS or as an ancestral gnaphosid in which the females have not yet acquired EGPS and retained a distal sclerotized ring in females. A third possibility exists that would consider *Toxoniella* a derived gnaphosid in which the EGPS have reversed into a distal sclerotized ring in females. The latter possibility is difficult to maintain for two reasons. The reversal of the EPGS into a previously lost sclerite is a most unlikely evolutionary step and the genus is apparently related to the South African *Drassodella* in which both sexes lack EPGS. This relationship is the main argument to accommodate *Toxoniella* among the gallieniellids. These genera share the dense spination that is absent in the Madagascan members of the family, rows of lamelliform hairs under the tarsal claws (Figs. 18–21), a pair of prolateral abdominal sigilla (see figs. 32, 33 in Jocqué 1999) and frontal cul de sac expansions in the epigyne (Figs. 8, 12). In *Drassodella* these are bladder-like whereas they are clearly longer than wide in *Toxoniella*. Both the genera further possess a posterior extension of the tegulum, not connected with the origin of the embolus as in *Gallieniella*. The main differences in the pair of African continental genera is the absence of a central tegular ridge in *Toxoniella*, present in *Drassodella* and pairs of well separated spermathecae present in the former, absent in the latter, where the spermathecae appear to be constricted.

Description.—Small to medium-sized spiders (3–9) with oval carapace, widest between coxae II and III; narrowed in front to about 0.65 times maximum width. In profile rather flat, thoracic area lower than cephalic one, highest point just behind posterior eyes. Cervical grooves poorly indicated. Color: prosoma, including chelicerae and legs yellowish brown, covered with short, brownish golden setae; abdomen gray with dense cover of brownish golden setae. Eyes in two recurved rows, subcircular and subequal, except PME smaller oval and flat. Clypeus low, slightly more than diameter of ALE, straight with few setae. Chilum single, triangular. Chelicerae only slightly prolonged, extending forward about one fifth of carapace length (the variable individual inclination makes this figure not very relevant). Endites fairly broad, smoothly constricted opposite insertion of trochanters. Sternum shield-shaped with dispersed setae; coxae IV narrowly separated. Labium slightly longer than broad; hardly widened at base. Legs: formula 4123. Spination: fewer spines on anterior leg pairs than on posterior pairs. TI and TII, sometimes PI and PII, in male with ventral rows of long recurved setae. Mt III and IV with poorly developed preening brush. Claws with about 3–7 teeth, more nu-

merous on anterior legs. With two rows of up to 6 lamelliform setae under claws (Figs. 20, 21). No scopulae. Abdomen oval, without scutum in both sexes; frontal part of male abdomen slightly sclerotized. Four dorsal sigilla and one small lateral one on either side. Six spinnerets: ALS in females with sclerotized subdistal ring, slightly conical, closely set; piriform gland spigots well developed but not enlarged (Figs. 15, 16); males with some EPGS (Fig. 17), without sclerotized distal ring. Male palp: tibia with small dorsolateral apophysis. Tegulum with posterior extension, not containing the sperm duct and frontal tapered extension. Embolus, median apophysis and embolar membrane all short and simple. Epigyne with single, wide, frontal ledge and curved lateral grooves; entrance ducts short but with frontal cul de sac tubes in front of double spermathecae.

Distribution.—Only known from the Taita Hills, southeastern Kenya.

Toxoniella taitensis new species
Figs. 1–8, 15–17, 20, 21

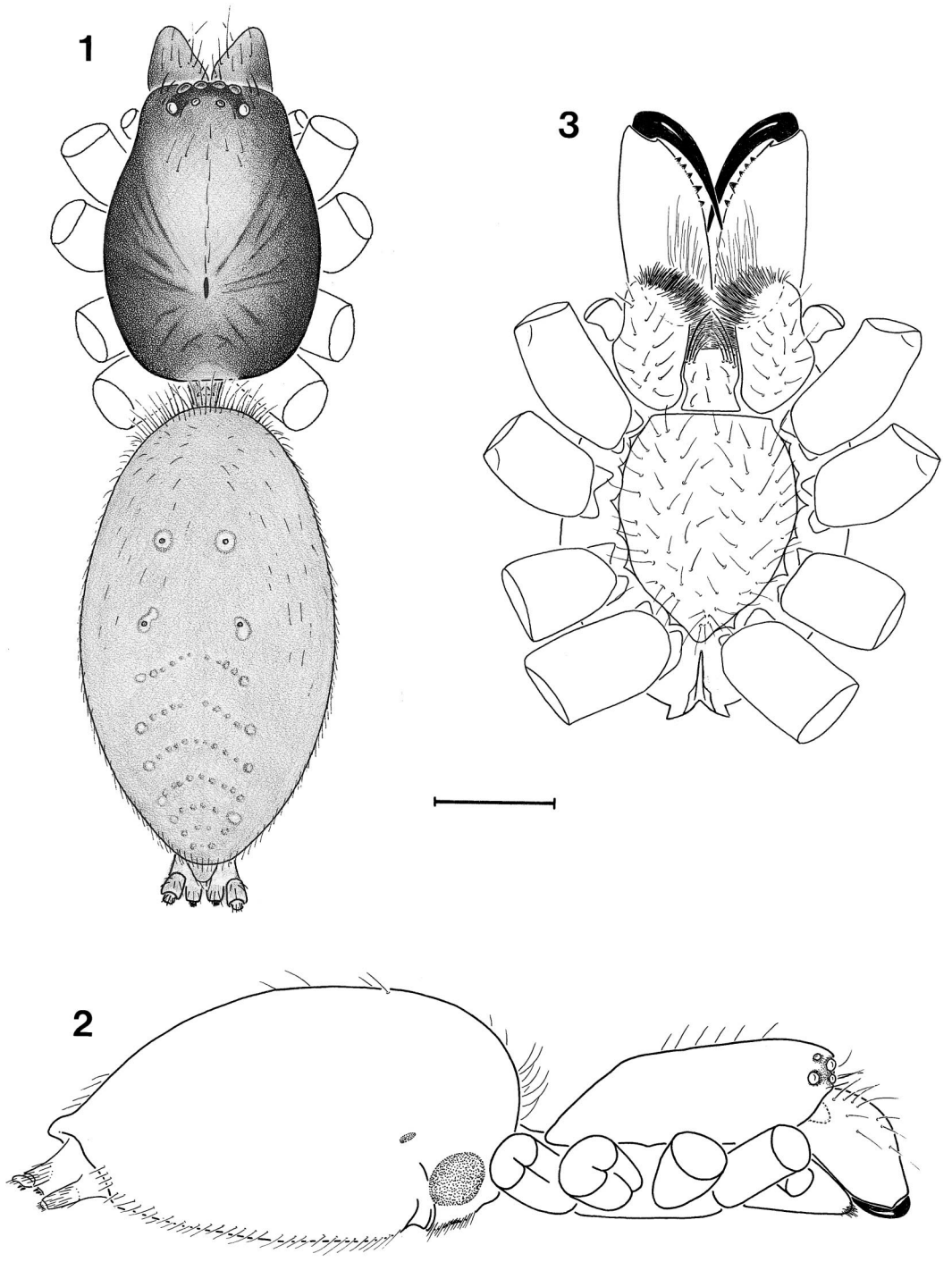
Type material.—Holotype male, Kenya, Taita Hills, Mwachora Forest, 3°24′S 38°22′E, March–April 1999, 1600 m, mountain forest, pitfall, L. Rogo (MRAC 208858, now in NMK). Paratypes: 2 females, Taita Hills, Ronge Forest, 3°21′S 38°25′E, 28 October–13 November 1998, 1350 m, mountain forest, pitfall, L. Rogo (MRAC 208794); 1 ♀1 juvenile: Taita Hills, Ngangao Forest, 3°22′S 38°20′E, 1720 m, mountain forest, pitfall trap, 24 March 2000, R. Jocqué & C. Warui (MRAC 209662); 1 ♂, 1 ♀, as previous (MRAC 209.523); 2 ♂, 2 ♀, Taita Hills, Ngangao Forest, 3°22′S 38°20′E, 1750 m, mountain forest, pitfall trap, 15 July 1998, L. Rogo (MRAC 208887 1 ♂, 1 ♀ in NMK); 4 ♂, 1 ♀, 4 March 1999, further as previous (MRAC 210047, 2 ♂ in AMNH); 1 ♂, 1 juvenile, Tsavo West, Kasigau, 3°49′S 38°40′E, 2–9 December 2000, 1102 m, mountain forest, sieved litter, R. Jocqué (MRAC 209956); 2 ♀, Taita Hills, Vuria Forest, 3°24′S 38°17′E, 28 March 2000, 2100 m, mountain forest, sieved litter, R. Jocqué (MRAC 209552); 1 ♀, Taita Hills, Chawia Forest, 3°22′S 38°20′E, pitfall trap, 13–18 May 1998, L. Rogo (MRAC 208804); 1 ♀, Taita Hills, Yale Forest, 3°39′S 38°33′E, 6 December 1999, 1800 m, mountain forest, winkler extraction of litter, VandenSpiegel & Michiels (NMK).

Etymology.—The species' name refers to the type locality.

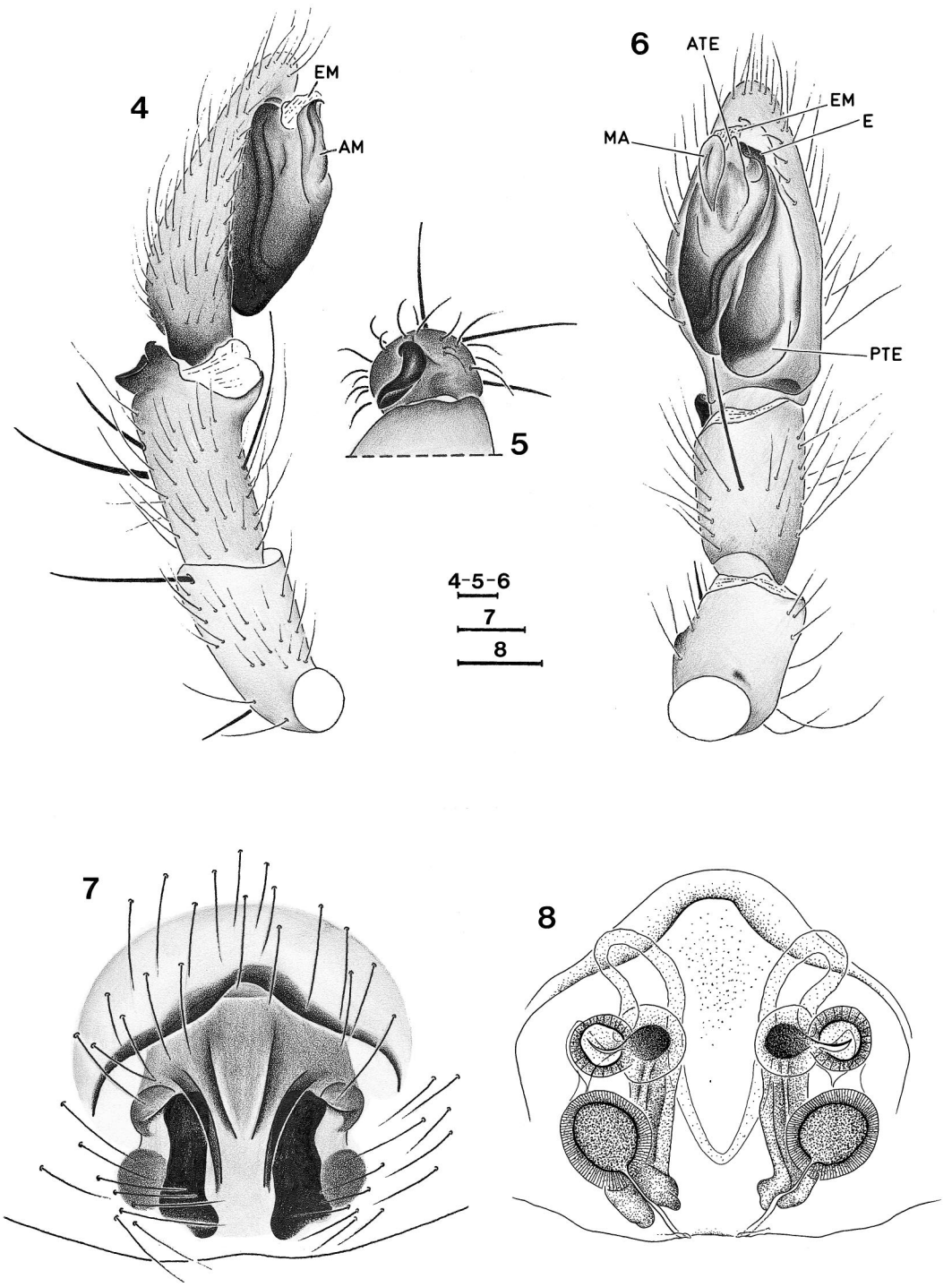
Diagnosis.—The male of this species is recognized by the presence of a frontal, tapered tegular extension between the embolus and the MA and the ridge-shaped frontal apophysis on the tibia. The females are characterized by the epigyne which is as wide as long, has a pronounced anterior ledge with sinuous rim and long cul de sac extension of the copulatory ducts which reach the anterior margin of the epigyne.

Male **(holotype MRAC 208858; range of other males in parentheses).**—Total length 6.39 (4.54–7.38). *Carapace*: 2.70 (2.13–2.98) long, 1.92 (1.49–2.13) wide. Carapace yellowish brown, with very faint darker pattern, paler in front of fovea. *Abdomen*: gray, slightly reddish in front, with dense cover of brownish golden setae. *Eyes*: AME: 0.10; ALE: 0.11; PME: 0.10; PLE: 0.11; AME–AME: 0.05; AME–ALE: 0.02; PME–PME: 0.10; PME–PLE: 0.11; MOQ: AW: 0.22; PW: 0.29; L: 0.26. Clypeus low, slightly less than diameter of ALE. Chilum triangular, 0.11 high, 0.19 wide. *Legs*: Spination: I: F pl1d3* P–T v1–1–2 Mt v2–2–1; II: F pl1d3* P–T v1–1–2 Mt v2–2; III: F pl1d2*rl1 P–T pl2*d2*rl2*v2–2–2 Mt 10disp dw6; IV: F pl1d2*rl1 P v1 T pl2*d1rl2*v2–2–2 Mt 10disp dw6. T, P and F of anterior leg pairs with ventral rows of long curved setae. *Palp* (Figs. 4–6): palpal tibia with dorsolateral apophysis as curved ridge; tegulum with posterior protrusion, not containing sperm duct, with frontal tapered extension between short, curved embolus and elongate, spoon-shaped median apophysis.

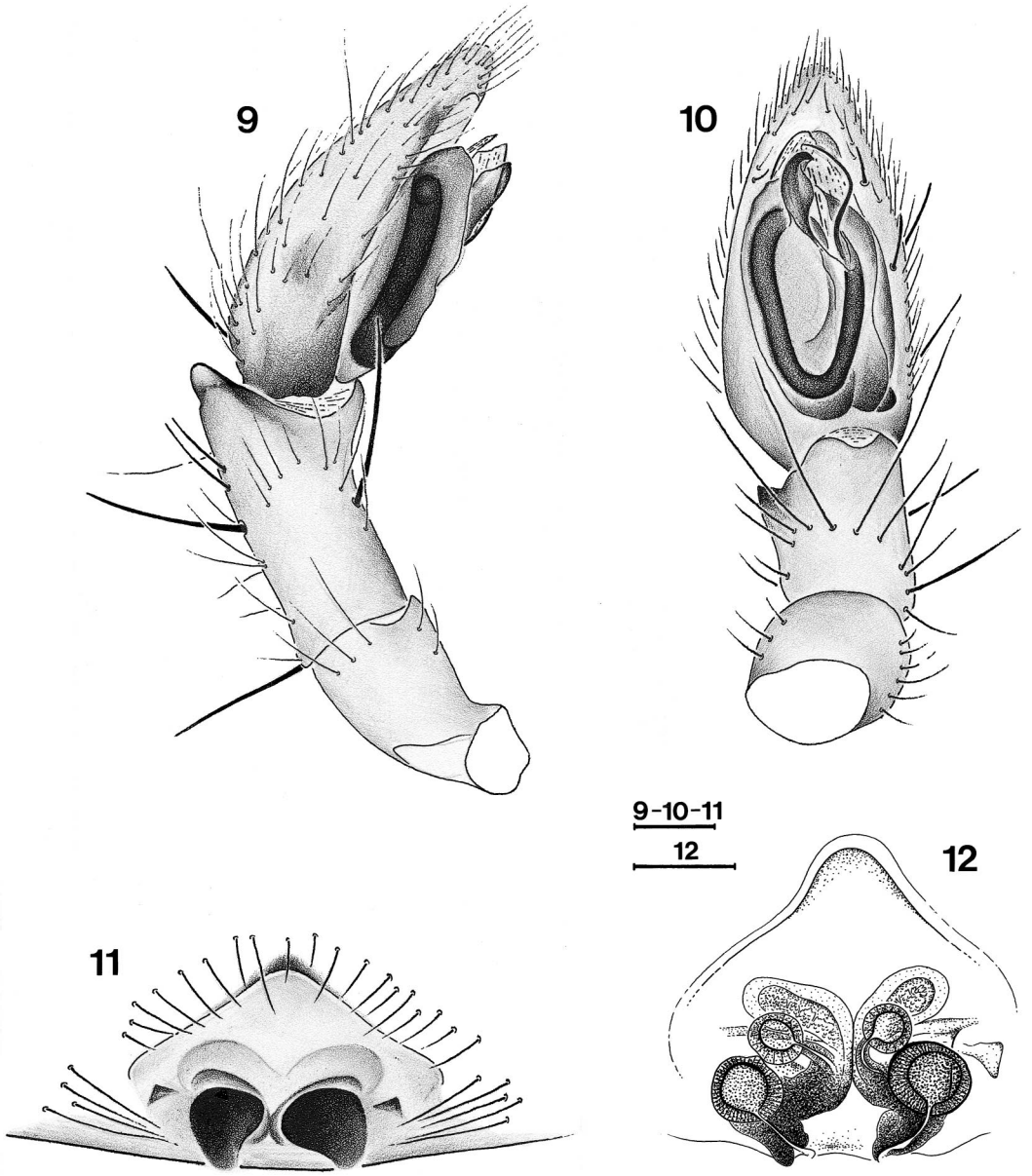
Female **(paratype MRAC 209522, range of other females in parentheses).**—Total length 7.81 (6.60–8.38). *Carapace*: 3.05 (2.49–3.83) long, 2.34 (1.92–2.41) wide. *Carapace* (Figs. 1–3): as in male. Abdomen gray, with dense cover of brownish golden setae. *Eyes*: AME: 0.18; ALE: 0.14; PME: 0.11; PLE: 0.16 AME–AME: 0.05; AME–ALE: 0.04; PME–PME: 0.14; PME–PLE: 0.14; MOQ: AW: 0.34; PW: 0.37; L: 0.34. *Clypeus*: low, half the diameter of ALE. *Chilum*: triangular, much wider than in male and less well delimited. 0.10 high, 0.51 wide. *Legs*: Spination:I: F pl1d2* P—T–Mt v2–1; II: F



Figures 1–3.—Female *Toxoniella taitensis* new species. 1, habitus, dorsal; 2, habitus, lateral; 3, prosoma, ventral view. Scale line: 1 mm.



Figures 4–8.—*Toxoniella taitensis* new species. 4, male palp, retrolateral view; 5, frontal view of tibia; 6, male palp, ventral view; 7, epigyne, ventral view; 8, epigyne, cleared, dorsal view. ATE: anterior tegular extension, E: embolus, EM: embolic membrane, MA: median apophysis, PTE: posterior tegular extension. Scale lines: 0.1 mm.



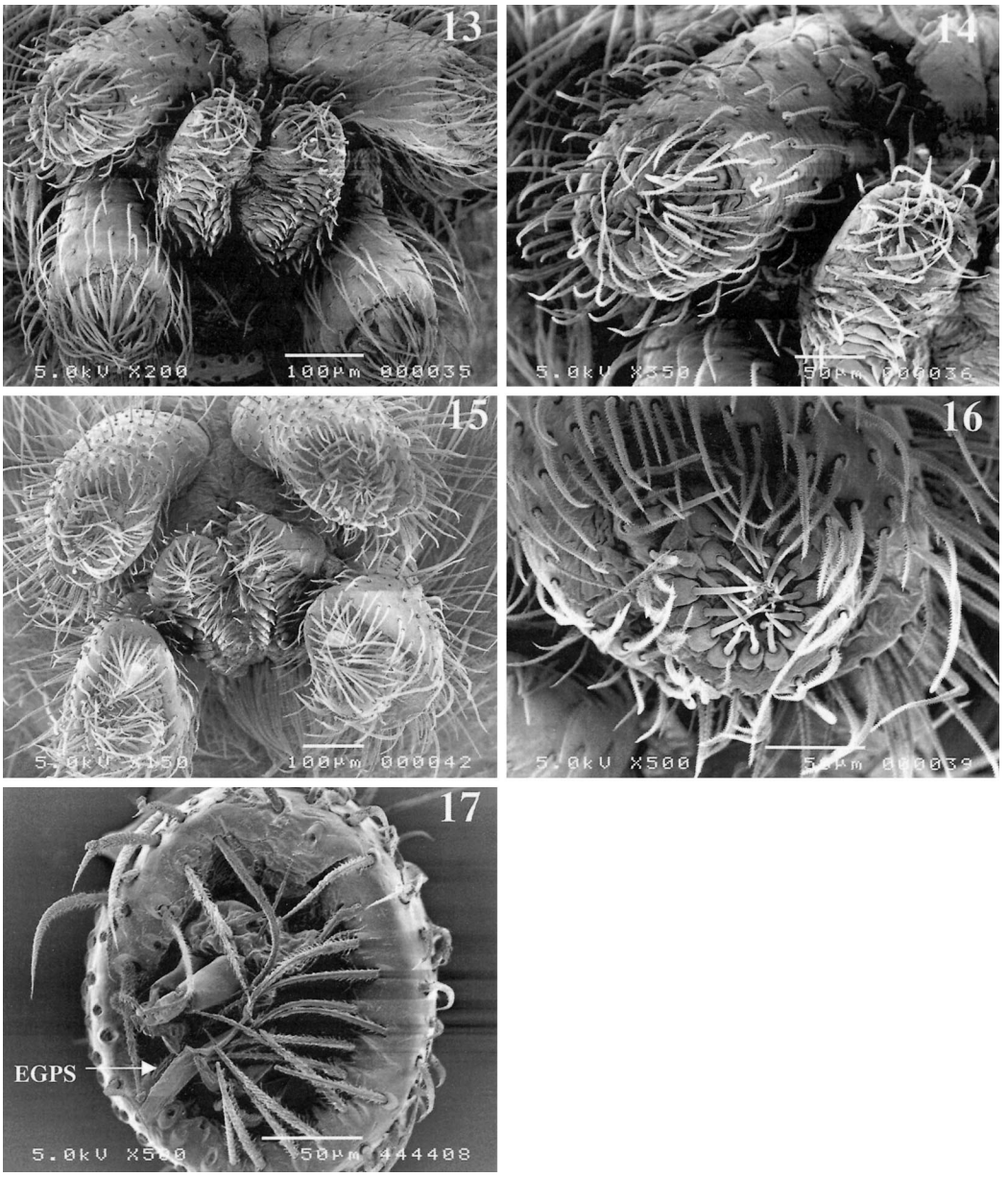
Figures 9–12.—*Toxoniella rogoae* new species. 9, male palp, retrolateral view; 10, male palp, ventral view; 11, epigyne, ventral view; 12, epigyne, cleared, dorsal view. Scale lines: 0.1 mm.

pl1d2* P–T v1 Mt v2–1; III: F pl2*d2*rl2* P–T pl2*d2*rl2*v2–2–2 Mt 10disp dw6; IV: F pl2*d2*rl2* P–T pl2*d2*rl2*v2—2–2 Mt 10disp dw6. *Epigyne* (Figs. 7, 8): with wide sinuous, frontal ledge, central longitudinal groove and widely separated longitudinal entrance openings. Entrance ducts short and parallel, running towards the front, with wide slightly curved cul de sac tubes, reaching anterior margin of epigyne; two well separated globular spermathecae.

Distribution.—Taita Hills, Kenya.

Toxoniella rogoae new species
Figs. 9–12

Type material.—Holotype: Male: Kenya, Taita Hills, Ngangao Forest, 3°22′S 38°20′E, 1750 m, mountain forest, pitfall trap, 15 July

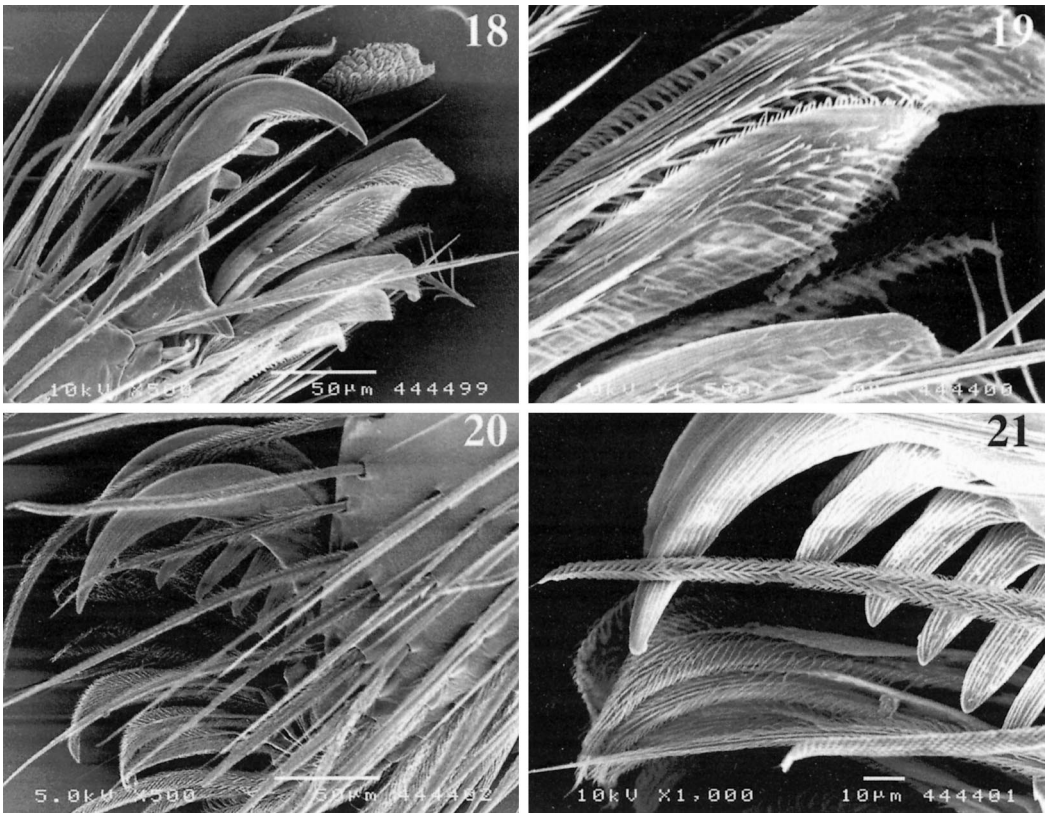


Figures 13–17.—*Drassodella vasivulva* Tucker, female 13, spinnerets; 14, right ALS. *Toxoniella taitensis* new species, female 15, spinnerets; 16, left ALS; 17, male, right ALS showing EPGS (enlarged piriform gland spigots). Scale lines: 100 µm (13, 15) and 50 µm (14, 16, 17).

1998, L. Rogo (MRAC 209914, now in NMK). Paratypes: 1 ♂, 1 ♀: Ngangao Forest, 3°22′S 38°20′E, 1720 m, mountain forest, pitfall trap, 24–26 March 2000, Jocqué & Warui (NMK); 1 ♀: same data as holotype (MRAC 209661); 2 ♂: Ngangao Forest, 24–26 March 2000, 1720 m, pitfalls, Jocqué & Warui (NMK).

Etymology.—The species' name is a patronym in honor of Lucy Rogo (ICIPE) who carried out a pitfall trapping program in the Taita Hills and collected the first Gallieniellidae there.

Diagnosis.—The male of this species is recognized by the short, blunt, dorsolateral tibial apophysis and the embolus with a trans-



Figures 18–21.—*Drassodella vasivulva* Tucker. 18. Lamellate setae under tarsal claws; 19, Idem, detail; *Toxoniella taitensis* new species. 20, Lamellate setae under tarsal claws; 21, Idem, detail. Scale lines: 10 µm (19, 21) and 50 µm (18, 20).

lucent appendage; the female is characterized by the short epigyne in which the cul de sac expansions of the copulatory ducts do not reach the anterior margin.

Male **(holotype).**—Total length 3.20. *Carapace*: 1.63 long, 1.18 wide; brownish yellow. *Abdomen*: gray, slightly brownish in front, with dense cover of brownish golden setae. *Eyes*: AME: 0.06; ALE: 0.10; PME: 0.06; PLE: 0.10; AME–AME: 0.03; AME–ALE: 0.02; PME–PME: 0.06; PME–PLE: 0.07; MOQ: AW: 0.16; PW: 0.19; L: 0.17. *Clypeus*: low, less than half diameter of ALE. *Chilum*: triangular, 0.06 high, 0.16 wide. *Legs:* Spination: I: F d2* P–T–Mt v1; II: F d2* P–T v1 Mt v2–1; III: F pl2d2*rl1 P–T pl2*d1rl2*v1–2–2 Mt 9disp dw5; IV: F pl2d2*rl1 P–T pl2*d1rl2*v1–2–2 Mt 10disp dw5.TI with two, TII with one, ventral rows of three to five long curved setae. *Palp* (Figs. 9, 10): palpal tibia with dorsolateral apophysis which is a blunt, short extension. Tegulum with small posterior extension, not containing sperm duct. Embolus short, sinuous, with hyaline retrolateral appendage; median apophysis short, curved.

Female **(other female in parentheses).**—Total length 3.21 (5.11). *Carapace*: 1.63 (2.20) long, 1.21 (1.59) wide. Carapace and remainder of prosoma brownish yellow. *Abdomen*: oval; gray with dense cover of brownish golden setae. *Eyes*: AME: 0.06; ALE: 0.08; PME: 0.05; PLE: 0.10 AME–AME: 0.02; AME–ALE: 0.02; PME–PME: 0.08; PME–PLE: 0.06; MOQ: AW: 0.14; PW: 0.18; L: 0.14. *Clypeus*: low, 0.6 times the diameter of ALE. *Chilum*: triangular, very poorly delimited. *Legs*: Spination:I: F d2*—P–T v1; II: F d2*–P–T v1; III: F pl2*d2*rl1 P–T pl2*d1rl2*v2–2–2 Mt 8disp dw5; IV: F pl2*d2*rl1 P–T pl2*d1rl2*v2–2–2 Mt8disp dw5. *Epigyne* (Figs. 11, 12): with wide,

strongly recurved, frontal ledge, widely separated oval entrance openings. Entrance ducts short, running towards the front, with wide cul de sac tubes, strongly curved outward, not reaching anterior margin of epigyne; two well separated globular spermathecae.

Distribution.—Taita Hills, Kenya.

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