A revision of the Afrotropical species of the genus *Tibellus* Simon (Araneae: Philodromidae)

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The Afrotropical species of the genus *Tibellus* Simon, 1875, are revised. Of the 10 previously recognised species of long-bodied grss spiders from this region, eight are redescribed and figured. Two species, *T. punctifasciatus* Strand, 1906, and *T. robustus* Simon, 1886, are considered *nomina dubia*. Five new species, *T. cobusi*, *T. gerhardi*, *T. nimbaensis*, *T. somaliensis* and *T. sunetae*, are described and three previously recognised subspecies of *T. vossioni* Simon, 1884, namely *T.* v. *armatus* Lessert, 1928, *T.* v. *flavipes* Caporiacco, 1941, and *T.* v. *minor* Lessert, 1919, are given species status. The genus *Tibellinus* Simon, 1910, is a junior synonym of *Tibellus*. *Tibellinus australis* is transferred to the genus *Tibellus*. The males of *T. armatus* stat. nov. and *T. hollidayi* Lawrence, 1952, are described for the first time. A key to 17 recognised species is given. Distributional data are provided for all species.

Key words: Afrotropical Region, Araneae, Philodromidae, spider taxonomy, *Tibellus*.

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Introduction

Tibellus (also known as long-bodied grass spiders) are small to medium-sized spiders characterised by long, slender bodies and legs. The genus *Tibellus* is widely distributed, with 40 species occurring worldwide.

The genus was erected by Simon (1875) with the Holarctic *Aranea oblonga* Walckenaer, 1802, as type species. Most species of *Tibellus* from the Afrotropical Region were described between 1884 and 1952. Prior to the present study, 10 species were recognised in this region. Simon (1884, 1885, 1907) described three species, *T. vossioni* from Sudan, *T. robustus* from Senegal and *T. seriepunctatus* from Sierra Leone while Strand (1906) described *T. punctifasciatus* from Ethiopia. Lessert (1919) described *T. kibonotensis* and *T. vossioni minor* from Tanzania and in 1928 the subspecies *T. vossioni armatus* from Zaïre. Caporiacco (1939) used an immature specimen from Moyale in Kenya to describe *T. flavipes*, but in 1941, after collecting a male and female in Somalia, considered it a subspecies of *T. vossioni*. Millot (1941) described two species, *T. nigeriensis* from Sudan and *T. septempunctatus* from Guinea. Lawrence (1952) described the first two southern African species, *T. bruneitarsis* and *T. hollidayi*, both from Natal. Finally, Jézéquel (1964) described *T. demangei* from the Ivory Coast.

The present revision is based on all available Afrotropical material (563 specimens) of the genus in southern African, European and American institutions. The availability of series of specimens allowed the assessment of intraspecific morphological variation and the evaluation of previously used diagnostic characters. This resulted in the synonymy of a genus, the description of five new species, the redescription of nine species, and the elevation of three subspecies to species status.

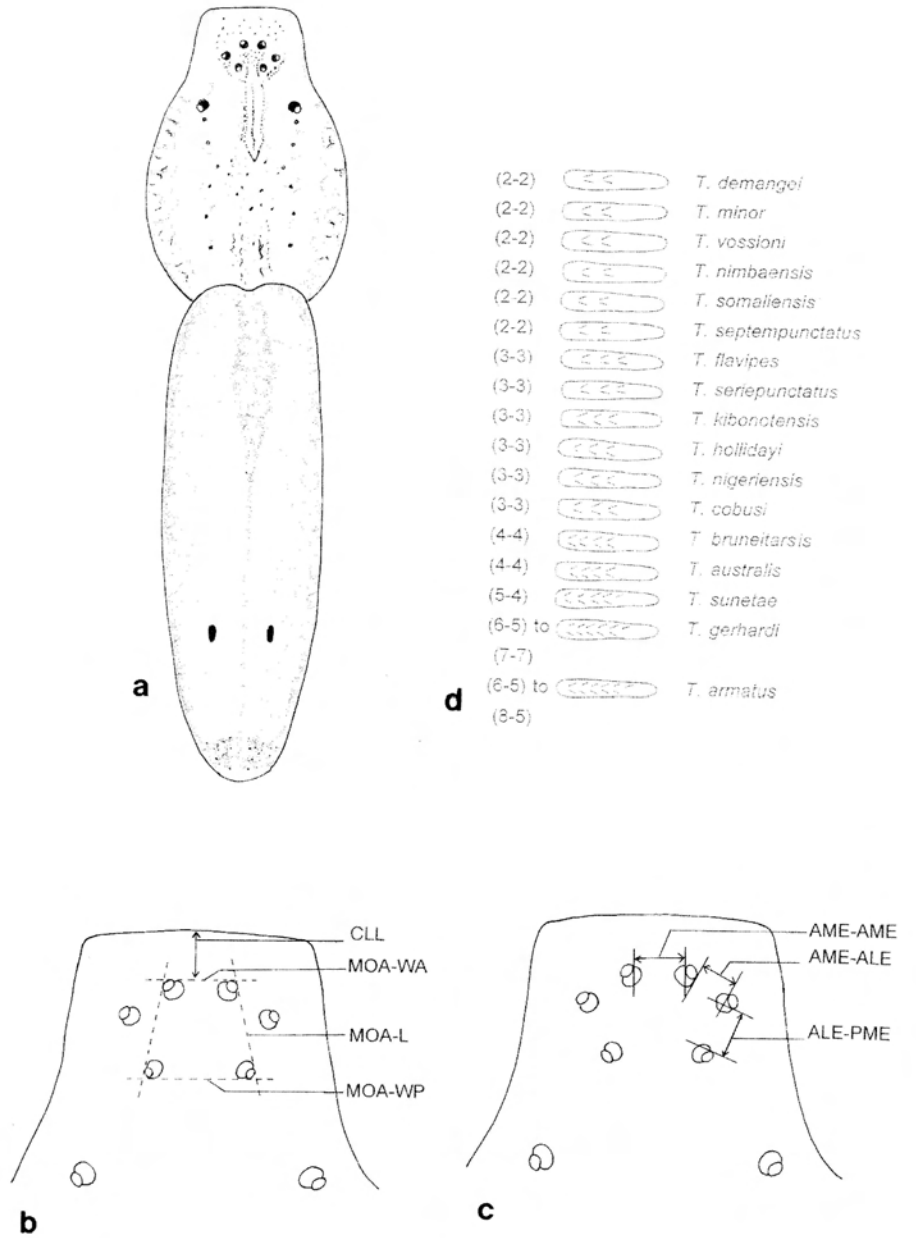

Fig. 1. (a) *Tibellus flavipes* Caporiacco body, dorsal view. (b & c) Median ocular area, dorsal view (MOA), indicating measurements taken. (d) *Tibellus* spp. ventral macrosetae on tibiae I and II.

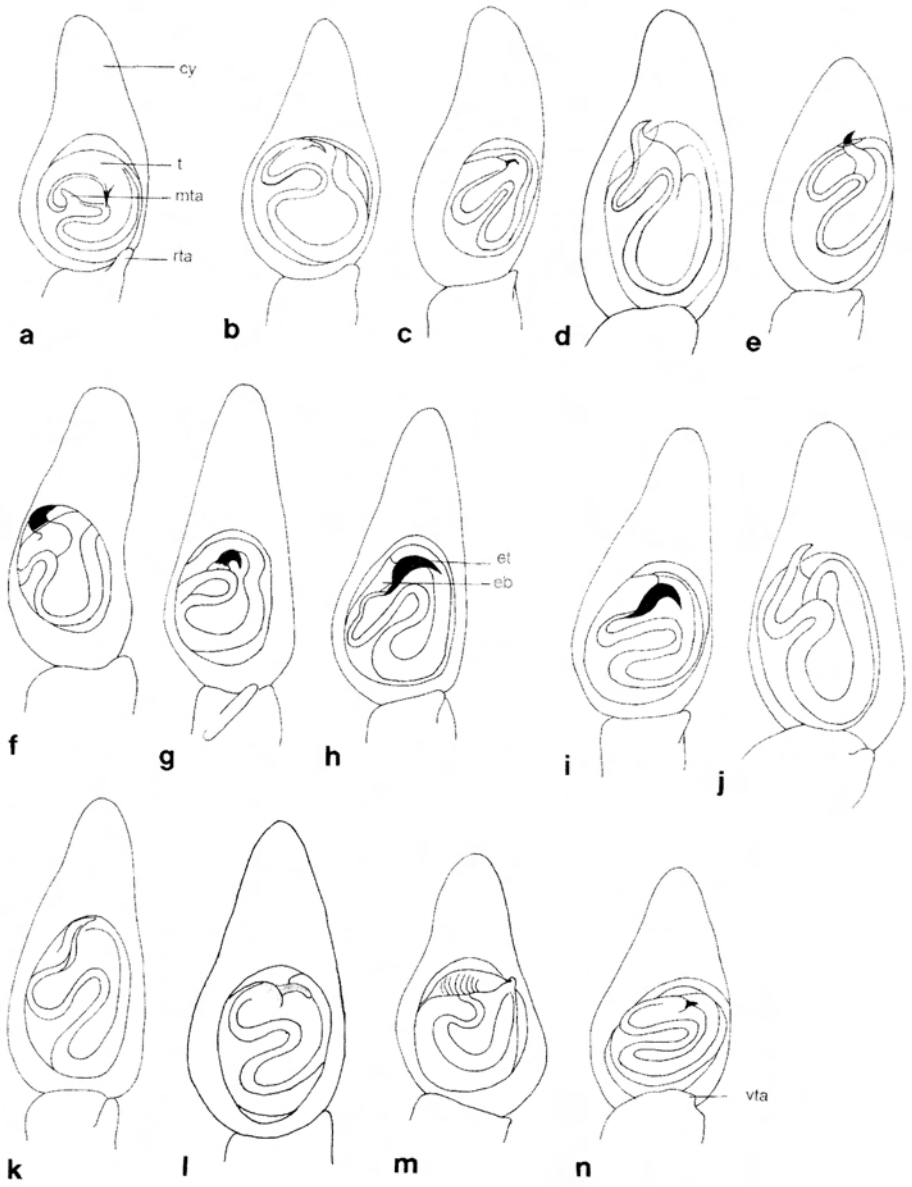

Fig. 2. *Tibellus* spp. left palpi, ventral view. (a) *T. demangei* Millot. (b) *T. nimbaensis* spec. nov. (c) *T. armatus* stat. nov. (d) *T. septempunctatus* Millot. (e) *T. seriepunctatus* Simon. (f) *T. flavipes* stat. nov. (g) *T. sunetae* spec. nov. (h) *T. vossioni* Simon. (i) *T. minor* stat. nov. (j) *T. gerhardi* spec. nov. (k) *T. cobusi* spec. nov. (l) *T. somaliensis* spec. nov. (m) *T. kibonotensis* Lessert. (n) *T. hollidayi* Lawrence. Abbreviations: cy - cymbium; eb - embolus base; et - embolus tip; t - tegulum; mta - median tegular apophysis; rta - retrolateral tibial apophysis; vta - ventral tibial apophysis.

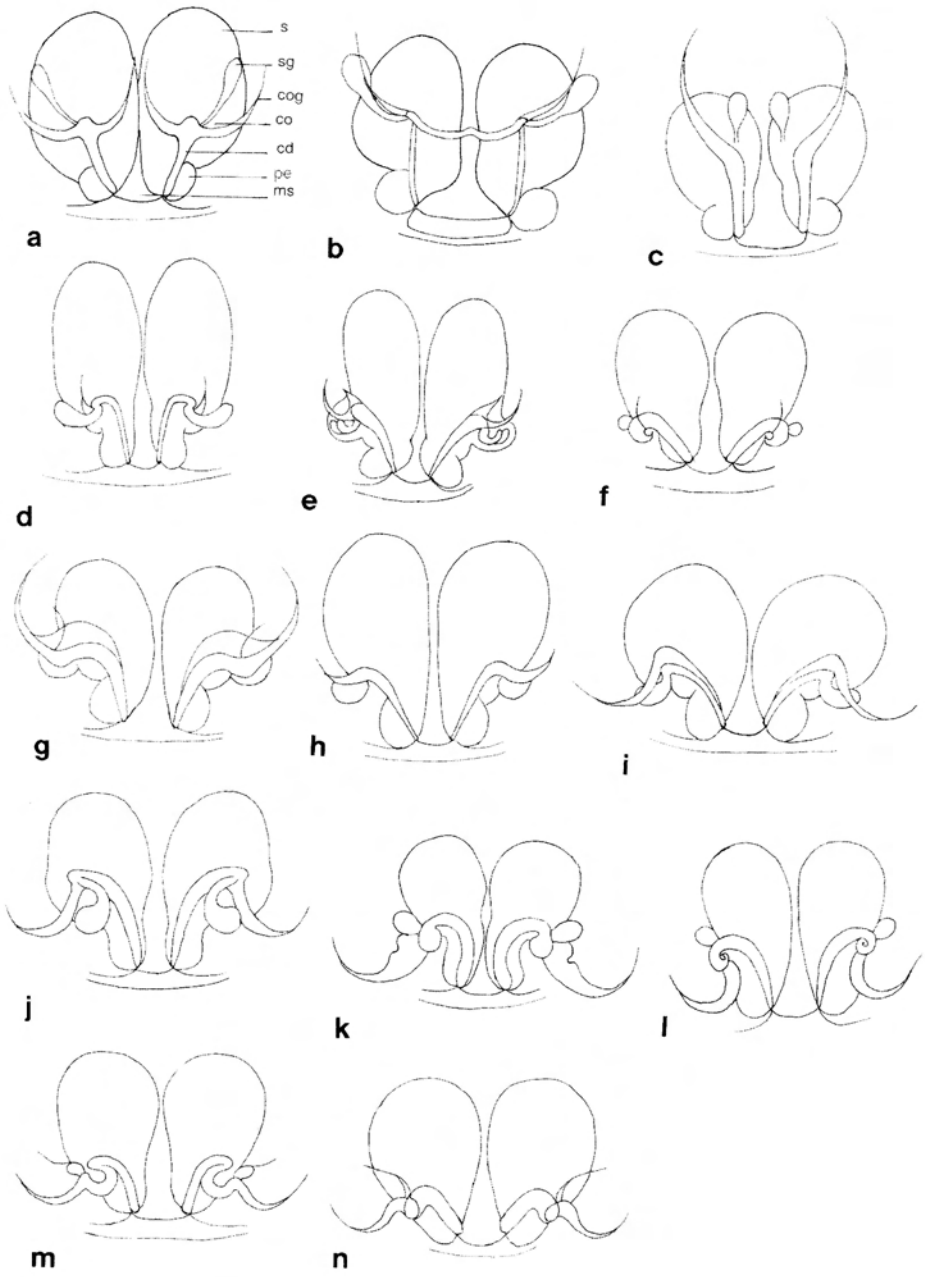

Fig. 3. *Tibellus* spp. female epigyna, dorsal view. (a) *T. hollidayi* Lawrence. (b) *T. nigeriensis* Millot. (c) *T. kibonotensis* Lessert. (d) *T. demangei* Millot. (e) *T. minor* stat. nov. (f) *T. sunetae* spec. nov. (g) *T. somaliensis* spec. nov. (h) *T. nimbaensis* spec. nov. (i) *T. armatus* stat. nov. (j) *T. bruneitarsis* Lawrence (k) *T. flavipes* stat. nov. (l) *T. seriepunctatus* Simon. (m) *T. gerhardi* spec. nov. (n) *T. australis* syn. nov. Abbreviations: cd - copulatory ducts; co - copulatory opening; cog - copulatory opening guide; ms - median septum; s - spermatheca; sg - spermathecal gland.

Format

Measurements

All measurements are in millimetres. Average measurements are given, with observed ranges in parentheses. The following eye measurements were taken (abbreviations in parentheses): shortest distance between anterior median eyes (AME-AME); distance between anterior median and anterior lateral eyes (AME-ALE); distance between anterior lateral and posterior median eyes (ALE-PME) (Fig. 1c); median ocular area length (MOA-L), from outer edge of PME to outer edge of AME (approximate because measurement was taken across a slight curve); width of anterior median ocular area (MOA-WA), measured between outer edges of AME; width of posteromedian ocular area (MOA-WP), measured between outer edges of PME (Fig. 1b); clypeal length (CLL), from anterior edge of AME to anterior edge of clypeus (Fig. 1b).

Total length of body (TL), carapace length (CL) and width (CW) and the outer length of each leg segment are given.

Comparative morphology

The present study is based mainly on alcohol-preserved specimens. Since body colours (especially the browns and blacks) fade rapidly in alcohol, descriptions of natural colour, if available, had to be taken from the literature. Although the colours fade, the patterns are preserved, and in some species the consistent presence or absence of spots on the body and legs were useful taxonomic characters.

The greatest variation in body size was observed in females of *T. hollidayi* in which the largest females are 1,79 times larger than the smallest females. On average, *Tibellus* males are 0,82 times larger than females.

The distance between the anterior eyes, the size of the anterior eyes and the width and length of MOA have been used previously to distinguish between species. Although the basic eye arrangement is invariable between species, the relative sizes of the eyes and the distances between them vary both inter- and intraspecifically. The size and position of the eyes should therefore be used with caution when distinguishing between species.

In the Afrotropical species of *Tibellus* the second leg is always the longest (except in *T. kibonotensis* where the fourth leg of the female is slightly longer than the second leg in 90 % of the specimens examined, while in the males the second leg is slightly longer than the fourth leg in 33 % of the specimens examined). The third leg is always the shortest. Ventral macrosetae are always present on the tibiae of the first two legs but the number of setae varies between species. For example, the number of macrosetae on the first and second tibiae varies from (2-2) in *T. minor* to (8-5) in *T. armatus* (Fig. 1d). All species examined have (2-2) ventral macrosetae on metatarsi I and II except *T. gerhardi* with (3-3).

The shape of the embolus, and the absence or presence, position and shape of the tibial apophyses are of diagnostic value. The latter structure occurs either as a reduced ventral tibial apophysis (vta) (Fig. 2g & n) or as a retrolateral tibial apophysis (rta) (Fig. 2a-c, f, h-l), or it may be absent (Fig. 2d). The fairly elongate tarsal tip is clothed with short spatulate, filiform and plumose setae (Fig. 4e). The tarsus is longer than the tibia in all species. The tegulum varies from round (Fig. 2a, b & m) to oblong (Fig. 2c-l & n). The embolus is composed of a narrow to broad basal part and a tip that varies in shape from straight and sharply pointed (Fig. 2m & n) to claw-like (Fig. 2b-l). It originates from the tegulum either medioanteriorly (Fig. 2a) or anterolaterally (Fig. 2k), or from behind the tegulum (Fig. 2d). Only *T. demangei* possesses a median apophysis (mta) on the tegulum (t) (Fig. 2a).

The epigynum always contains a median septum (ms) with sides that are parallel or diverging. The copulatory ducts (cd) are visible as sclerotised bands bordering the (ms). The (cd) enter posterodorsally into the spermathecae, and the fertilisation ducts (fd) leave the spermathecae above (cd). The shape of the (ms) varies between species, from parallel in *T. kibonotensis* (Fig. 3c) and *T. nigeriensis* (Fig. 3b) to divergent anteriorly (Fig. 3a). The copulatory opening guides (cog) open antero- or posterolaterally. The copulatory opening (co) lies beneath the epigynal structures and only the (cog) are visible. The spermathecae are elongate and rounded with posterior extensions (pe) that vary in shape between species, from gradually sloping in *T. gerhardi* (Fig. 3m) to globular (Fig. 3a-c). A pair of spermathecal glands is present and their position and shape, and the length of their ducts, are of diagnostic value (Fig. 3a).

Abbreviations

Eyes: OAL - length of ocular area; AME - anterior median eyes; PME - posterior median eyes; ALE - anterior lateral eyes.

Genitalia: co - copulatory opening; cd - copulatory ducts; cy - cymbium; eb - embolus base; et - embolus tip; fd - fertilisation ducts; ms - median septum; mta - median tegular apophysis; pe - posterior extension; rta - retrolateral tibial apophysis; s - spermatheca; sg - spermathecal gland; cog - copulatory opening guide; t - tegulum; vta - ventral tibial apophysis.

Institutions: AMNH - American Museum of Natural History, New York, USA (N. Platnick); CAS - California Academy of Science, Golden Gate Park, San

Francisco, USA (W. Pulawski); MNHG - Museum d'Histoire Naturelle, Geneva, Switzerland (B. Hauser); MNHN - Museum National d'Histoire Naturelle, Paris, France (C. Rollard); MRAC - Koninklijk Museum voor Midden-Afrika, Tervuren, Belgium (R. Jocqué); NCA - National Collection of Arachnida, Biosystematics Division, Plant Protection Research Institute, Pretoria, South Africa (A.S. Dippenaar-Schoeman); NM - Natal Museum, Pietermaritzburg, South Africa (P. Croeser); NMB - National Museum, Bloemfontein, South Africa (L. Lotz); NMZ - Natural History Museum of Zimbabwe, Bulawayo, Zimbabwe (†J. Minshull); SAM - South African Museum, Cape Town, South Africa (M. Cochrane); SMN - State Museum, Windhoek, Namibia (E. Griffin); ZMB - Zoologisches Museum, Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (M. Moritz).

Taxonomy

Genus ***Tibellus*** Simon

Tibellus Simon, 1875: 307; 1895: 1065; Levy, 1977: 226; Dondale & Redner, 1978: 96. Type species: *Aranea oblonga* Walckenaer, 1802.

Tibellinus Simon, 1910: 198; Lessert, 1928: 329. Type species: *Tibellinus australis* Simon, 1910, syn. nov.

Diagnosis: body flattened and elongate. Carapace and abdomen longer than wide, both with distinct median longitudinal bands dorsally. Eyes small, grouped closely anteriorly, apart from PLE (Fig. 1a). Posterior eye row strongly recurved, PME distinctly closer to each other than to PLE. MOA-WA always narrower than MOA-WP (Fig. 1b).

Description

Female
Size: total body length 6,7-15,9 mm.

Carapace: much longer than wide, rounded anteriorly and narrower in cephalic area, smoothly convex at lateral margins and flattened dorsally. Colour: fawn to orange-brown; median longitudinal bands dark, extending from PME to posterior edge; two marginal longitudinal bands, wide in posterior two-thirds, narrowing anteriorly and disappearing opposite PLE; bands composed of brownish black spots or lines. Eyes: small, equal to subequal in size, PME slightly smaller than other eyes; eyes arranged in two rows near anterior edge; posterior row strongly recurved, PLE located more posteriorly; anterior row less recurved; AME-AME longer than AME-ALE (except in *T. kibonotensis* where these distances are equal); ALE-AME shorter than ALE-PME (except in *T. kibonotensis* with ALE-AME longer than or equal to ALE-PME); MOA-L shorter than MOA-WP in most species. Setae: long and filiform on chelicerae, clypeus with row of 6-9 setae on the edge. Eyes: eye area with scattered setae that detach readily; lateral margins of carapace with row of medium-sized setae (tips directed anteriorly); with longitudinal row of few scattered setae between median and marginal bands, the three setae behind PME the longest; rest of carapace usually covered with fine adpressed setae. Clypeus: slightly sloping; CLL usually shorter or equal to MOA-WA. Chelicerae with one short and one longer tooth apically on inner margins. Maxillae much longer than labium; labium as long as wide. Sternum covered with translucent to yellow, short to medium-sized filiform setae.

Abdomen: elongate and slender, notched in anterior margin bearing curved, medium-sized as well as long white plumose setae; lateral sides almost parallel, tapering slightly posteriorly; colour of dorsum usually creamy white, mottled in appearance; median longitudinal band consists of a yellow to olive-green lanceolate mark in anterior third of abdomen, extending as a fine black line to posterior edge of abdomen; median band occasionally covered with fine black spots; dorsum with 1-5 pairs of brownish black spots or streaks; short to long setae in 2-6 longitudinal rows on dorsum; rest of area covered with fine filiform adpressed setae. Venter: pale yellow; covered with dense, short, medium-sized and fine filiform setae; a dusky to yellow broad band extending from epigastric

furrow to a short distance anterior to spinnerets. Spinnerets terminal; three pairs, each surrounded by a tuft of long white filiform setae.

Legs: long and slender; leg formula varies from 2143 to 2413, legs I and IV subequal length (except in *T. kibonotensis*). Third leg the shortest. Colour of legs pale yellow to orange-brown, occasionally with brownish black spots, basal spots or streaks on tibiae I and II (e.g. tibiae of *T. flavipes*). All leg segments covered with short setae but medium-sized setae also on femur and tibia; with macrosetae on femur, tibia and metatarsus; tibiae I and II with paired ventral macrosetae (occasionally with one or two unpaired macrosetae) varying in numbers from (2-2) to (8-5) (Fig. 1d) and three macrosetae on pro- and retrolateral sides (except in *T. bruneitarsis*, *T. australis* and *T. flavipes* with two macrosetae); a pair of smaller setae apically on tibiae; metatarsi I and II armed ventrally with (2-2) macrosetae and two macrosetae on pro- and retrolateral sides (except metatarsi I and II of *T. gerhardi* with (3-3) ventral macrosetae); tarsus and metatarsus ventrally with well-developed scopulae composed of spatulate setae that are more dense on metatarsus than on tarsus; tarsus with two claws and well-developed claw tufts; palp with several short filiform setae and macrosetae.

Epigynum: with median septum bordered by sclerotised copulatory ducts tapering towards sides to form the copulatory opening guides (Fig. 3b); with two spermathecae varying slightly in shape, always rounded anteriorly and sloping posteriorly (Fig. 3m), or forming distinct posterior extensions (Fig. 3a); two exterior spermathecal glands present, with long ducts.

Male

Size: smaller than female, total length 4,5-12,4 mm. Male similar to female in shape and colour but legs much longer relative to body length. Tibia of palp shorter than tarsus.

Palp: tibia occasionally with reduced RTA or with a VTA; tegulum oblong, longer than wide in most species (round in *T. demangei*, *T. nimbaensis* and *T. hollidayi*) (Fig. 2a, b & m), distinct looped seminal tube leading to embolus; embolus originating behind, medioanteriorly or anterolaterally of tegulum, tip varying in shape from straight to claw-like.

Juvenile

Similar to adults in general shape, colour and markings. Markings on cephalothorax and legs usually less distinct. Carapace and abdomen always with median longitudinal band.

Relationships: *Tibellus* shares an elongate abdomen with two currently recognised philodromid genera, *Tibellinus* and *Tibitanus*. Simon (1910) described *Tibellinus* on the basis of a single female from the Kalahari, Botswana, and considered it distinct from both *Tibellus* and *Tibitanus* because MOA-L is slightly longer than MOA-WP, MOA-WA is equal in distance to MOA-WP, and tibiae I and II bear (4-4) long ventral macrosetae but not the (2-2) apical setae. As suggested by Lessert (1928), we found that the number of setae on the tibia to varies from (2-2) to (8-5) in *Tibellus* (Fig. 1d), not supporting the generic status of *Tibellinus*. Examination of the syntype of *Tibellinus australis* indicated that it is a synonym of *Tibellus*.

According to Simon (1907), the genus *Tibitanus* (based on a female from Bolama in Guinea Bissau) differs from *Tibellus* as follows: the eyes are subequal in size, MOA-L is slightly longer than MOA-WP, AME-AME is three times further apart than AME-ALE, ALE-AME is shorter than ALE-PME, the clypeus is much narrower, and leg IV is clearly shorter than leg II. Lessert (1928) mentioned that the characters distinguishing *Tibitanus* from *Tibellus* are in part of little value because in *Tibellus kibonotensis*, *T. oblongus*, *T. armatus* and *T. minor* the anterior eyes are also subequal in size and MOA-L is not longer than MOA-WP. Lessert

(1928) considered *Tibitanus* to be different from *Tibellus* only in the distance AME-AME that is three times greater that the distance AME-ALE, and the height of the clypeus, which is much lower. Millot (1941) agreed with Lessert (1928) that the characters used by Simon (1907) to distinguish *Tibitanus* from *Tibellus* are in apart of little value and he therefore stated that *Tibitanus* should be considered a subgenus of *Tibellus*. The type material of *Tibitanus* could not be obtained for the present study but an immature female from Kindia in Guinea (Millot 1941) was examined. In this specimen leg II is clearly shorter than leg IV, the distance between AME is greater than AME-ALE, and the body is decorated with six dorso-longitudinal bands as well as six longitudinal rows of short, thick setae, three characters that are markedly different from those of all Afrotropical species of *Tibellus*. On the strength of these observations, *Tibitanus* is provisionally considered a valid genus.

Natural history: *Tibellus* species are mainly plant-living and thus commonly found on bushes and tall grass. Their elongate (Fig. 1a), straw-coloured bodies with dark, longitudinal lines, as well as their posture, render them inconspicuous on dry grass. All legs except the third pair are long and slender. When at rest they cling to plants while facing downwards. The first two pairs of legs are stretched forward, the fourth pair backwards, while the short third pair is used to cling to the plant, a position from which they pounce upon prey. When disturbed they will run rapidly up or down a grass stem.

Species of *Tibellus* are readily collected with a sweepnet. Rapp (1986) recorded *T. oblongus* mainly from plants around the edges of ponds, lakes and rivers in North America and England, where it prefers a humid environment. Mikulska (1970) recorded *T. oblongus* from coastal sand dunes on the Baltic Coast of Poland.

In the Afrotropical Region, *Tibellus* has been collected mainly from mixed grass and shrubs, but it also occurs in the fynbos biome on the protea species *Leucospermum cordifolium* (Salisb. ex Knight) (Coetzee *et al.* 1990) and *Protea nitida* Mill. (Visser *et al.*, *in prep.*). It occurs in a variety of veld types ranging from open savanna, tambotie veld to subcoastal bush, but rarely in forested areas (see Geographical Distribution). It has also been collected from agricultural crops such as cotton, lucerne, strawberries, citrus and banana trees. In South Africa, several species may occur sympatrically in small grassland areas, for example *T. minor*, *T. gerhardi* and *T. hollidayi* were collected in the Roodeplaat Dam Nature Reserve (Dippenaar-Schoeman *et al.* 1989) over a four-year period.

Little is known about the biology of *Tibellus* species. Studies on *T. oblongus* in Europe, England and North America showed that it overwinters in large numbers as juveniles. When the required photoperiod is reached the juveniles emerge from hibernation, become sexually mature and start to breed, resulting in a mass emergence of young in summer (Mikulska 1970). Only small numbers of sexually mature individuals hibernate in humus or dead grass on the soil surface (Rapp 1984 & 1986). Foelix (1982) reported that the male ties the female down with silk strands before mating takes place.

In southern Africa, adults have been recorded mainly during the warmer months from November to April, the highest numbers occurring in March and April. Immature males and females are found mainly during spring (from October to November) while juveniles are present throughout the year. In captivity, females of *T. hollidayi* produced a rounded, disc-like egg sac, 15 mm in diameter, which was attached to the substrate. Harvester termites, *Hodotermes mossambicus* (Hagen), and *Euphestia cautella* Walker moths were readily taken as prey in captivity.

Geographical distribution: *Tibellus* is a moderately large genus comprising 40 species world-wide. However, the species recognised in the present study are all endemic to

the Afrotropical Region, where the distribution patterns of most species correspond with the grass biome. They occur widely in tropical savanna, while some species such as *T. nigeriensis* (Fig. 14c) and *T. vossioni* (Fig. 14a) have also been recorded from arid grassland. The vegetation of tropical savanna consists of grassland with scattered trees or clumps of trees, including acacias, baobab and euphorbias. It is characterised by a relatively harsh climate with high temperatures in summer, 1000-1500 mm rainfall annually, and a prolonged dry season with regular fires (Odum 1971).

Only two species are known from tropical rainforest in the Afrotropical Region, namely *T. demangei* (Fig. 13d) from the Ivory Coast and *T. minor* from Zaïre (Fig. 14a). The latter species, however, has a wide distribution and is also found in other biomes such as tropical savanna, arid grassland (Namibia and Botswana) and the winter rainfall region in the Cape Province. No species have been recorded from Madagascar.

Key to the Afrotropical species of *Tibellus*

Males

1. Tegulum with median tegular apophysis (Fig. 2a) ..... ***T. demangei* Jézéquel, 1964**
- Tegulum without median tegular apophysis (Fig. 2b) **2**
2. Embolus tip small, spike-shaped (Fig. 2b, e, n) **3**
- Embolus tip larger, not spike-shaped (Fig. 2g) **5**
3. Embolus tip same pale colour as tegulum (Fig. 2b); tibiae I and II with (2-2) ventral macrosetae (Fig. 1d) ..... ***T. nimbaensis* spec. nov.**
- Embolus tip black (Fig. 2c & n); tibiae I and II with more than (2-2) ventral macrosetae (Fig. 1d) **4**
4. Tibiae I and II with (3-3) ventral macrosetae ..... ***T. hollidayi* Lawrence, 1952**
- Tibiae I and II with (5-5) ventral macrosetae ..... ***T. armatus* stat. nov.**
5. Embolus not striated, tip claw-shaped (Fig. 2d-l) **6**
- Embolus striated, tip not claw-shaped (Fig. 2m) ..... ***T. kibonotensis* Lessert, 1919**
6. Embolus tip strongly curved (Fig. 2d-i) **7**
- Embolus tip gradually curved (Fig. 2j-l) **12**
7. Embolus tip protruding from behind tegulum (Fig. 2d-f) **8**
- Embolus tip not protruding from behind tegulum (Fig. 2g-i) **10**
8. Abdomen with seven black spots (Fig. 11e); tibiae I and II with (2-2) ventral macrosetae (Fig. 1d) ..... ***T. septempunctatus* Millot, 1941**
- Abdomen with three or nine large spots; tibiae I and II with (3-3) ventral macrosetae (Fig. 1d) **9**
9. Abdomen with nine large brown spots (Fig. 12d) ..... ***T. seriepunctatus* Simon, 1907**
- Abdomen with three black spots (Fig. 6c) ..... ***T. flavipes* stat. nov.**
10. Ventral tibial apophysis present (Fig. 2g) ..... ***T. sunetae* spec. nov.**
- Ventral tibial apophysis absent (Fig. 2h-m) **11**
11. Embolus tip directed laterally (Fig. 2h); average length of males 11,5 mm. ..... ***T. vossioni* Simon, 1884**
- Embolus tip directed posteriorly (Fig. 2i); average length of males 7,9 mm. ..... ***T. minor* stat. nov.**
12. Embolus tip extending beyond tegulum (Fig. 2j); metatarsi I and II with (3-3) ventral macrosetae; tibiae I and II with more than (5-5) ventral macrosetae (Fig. 1d) ..... ***T. gerhardi* spec. nov.**
- Embolus tip not extending beyond tegulum (Fig. 2k & l); metatarsi I and II with (2-2) ventral macrosetae; tibiae I and II

with fewer than (5-5) ventral macrosetae (Fig. 1d)
..... **13**

13. Embolus tip directed laterally (Fig. 2k); tibiae I and II with (3-3) ventral macrosetae (Fig. 1d)
..... ***T. cobusi* spec. nov.**
- Embolus tip directed anteriorly (Fig. 2l); tibiae I and II with (2-2) ventral macrosetae (Fig. 1d)
..... ***T. somaliensis* spec. nov.**

Females

1. Spermathecal glands situated in anterior half of epigynum (Fig. 3a-c)
..... **2**
- Spermathecal glands situated in posterior half of epigynum (Fig. 3d-n)
..... **4**

2. Median septum V-shaped (Fig. 3a)
..... ***T. hollidayi* Lawrence, 1952**
- Median septum U-shaped (Fig. 3b)
..... **3**

3. Copulatory opening guides lunate, tip reaching edge of spermathecae; spermathecal glands situated anterolaterally (Fig. 3b)
..... ***T. nigeriensis* Millot, 1941**
- Copulatory opening guides cupulate; tip extending beyond edge of spermathecae; spermathecal glands situated anteromedially (Fig. 3c)
..... ***T. kibonotensis* Lessert, 1919**

4. Copulatory opening guides small (Fig. 3d-f).
..... **5**
- Copulatory opening guides medium-sized (Fig. 3h) to large (Fig. 3g)
..... **7**

5. Median septum nearly parallel, U-shaped (Fig. 3d)
..... ***T. demangei* Jézéquel, 1964**
- Median septum not parallel, diverging anteriorly, V-shaped (Fig. 3e & f)
..... **6**

6. Spermathecae with distinct curved posterior extensions (Fig. 3e); tibiae I and II with (2-2) ventral macrosetae (Fig. 1d)
..... ***T. minor* stat. nov.**
- Spermathecae without curved posterior extensions, tapering posteriorly (Fig. 3f); tibiae I and II with (4-4) or more ventral macrosetae (Fig. 1d)
..... ***T. sunetae* spec. nov.**

7. Copulatory opening guides semicircular, extending over anterior half of epigynum; tip of guide reaching anterior edge of spermathecae (Fig. 3g)
..... ***T. somaliensis* spec. nov.**
- Copulatory opening guides semicircular, extending over posterior half of epigynum; tip of guide never reaching anterior edge of spermathecae (Fig. 3h-n)
..... **8**

8. Copulatory opening guides of medium length, slightly curved (Fig. 3h); tibiae I and II with (2-2) ventral macrosetae
..... ***T. nimbaensis* spec. nov.**
- Copulatory opening guides larger, more strongly curved (Fig. 3i-n); tibiae I and II with more than (2-2) ventral macrosetae (Fig. 1d)
..... **9**

9. Spermathecal glands with long ducts (Fig. 3i & j)
..... **10**
- Spermathecal glands without long ducts (Fig. 3k-n)
..... **11**

10. Spermathecae club-shaped with distinctly constricted posterior extensions (Fig. 3i)
..... ***T. armatus* stat. nov.**
- Spermathecae as shown in Fig. 3j
..... ***T. bruneitarsis* Lawrence, 1952**

11. Copulatory opening guides broad at their bases (Fig. 3k)
..... ***T. flavipes* stat. nov.**
- Copulatory opening guides not broad at their bases (Fig. 3l-n)
..... **12**

12. Median band of abdomen bordered by six large brown spots (Fig. 12d)
..... ***T. seriepunctatus* Simon, 1907**
- Median band not bordered by spots (Fig. 4f)
..... **13**

13. Median septum as in Fig. 3m; metatarsi I and II with (3-3) ventral macrosetae
..... ***T. gerhardi* spec. nov.**
- Median septum as in Fig. 3n; metatarsi I and II with (2-2) ventral macrosetae
..... ***T. australis* (Simon, 1910)**

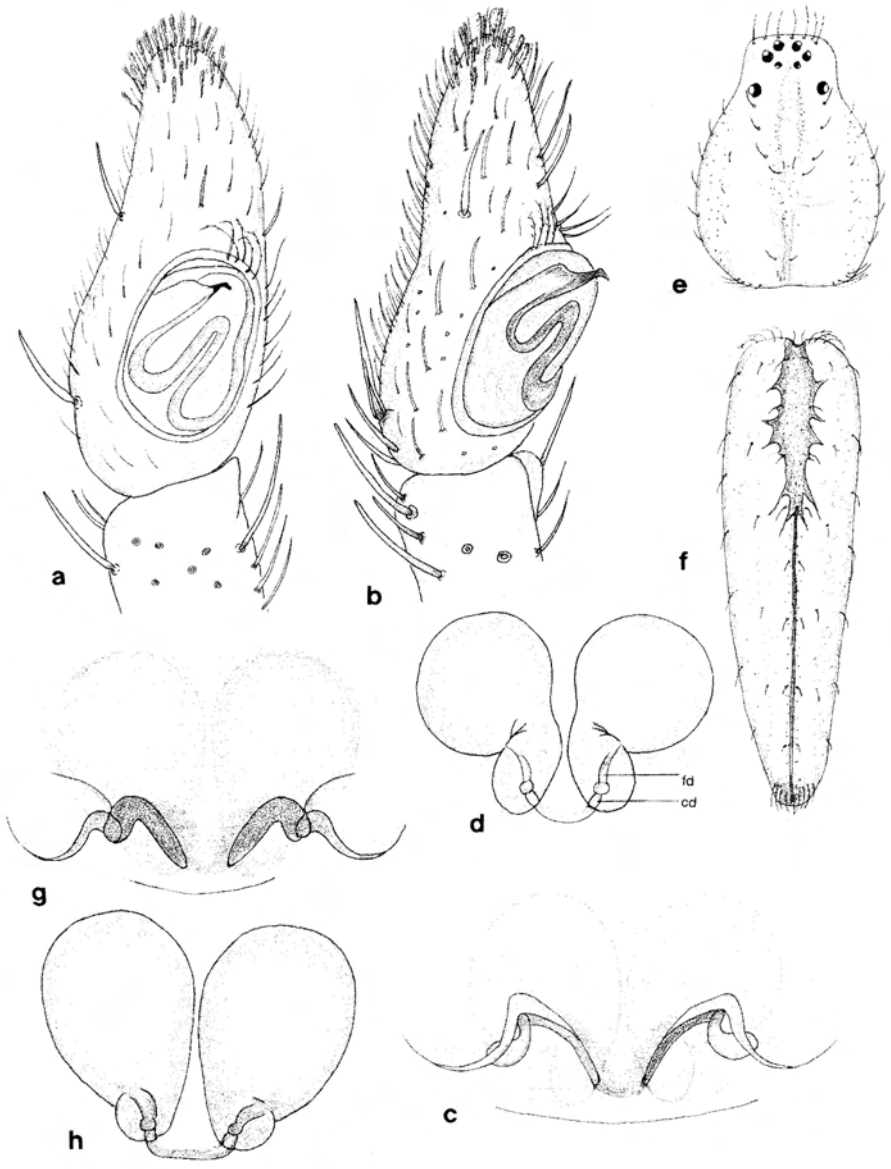

Fig. 4. *T. armatus* stat. nov. (a) Male palp, ventral view. (b) Male palp, ventrolateral view. (c) Epigynum. (d) Spermathecae, dorsal view. *T. australis* Simon. (e) Carapace, dorsal view. (f) Abdomen, dorsal view. (g) Epigynum. (h) Spermathecae, dorsal view. mta - median tegular apophysis; fd - fertilisation ducts.

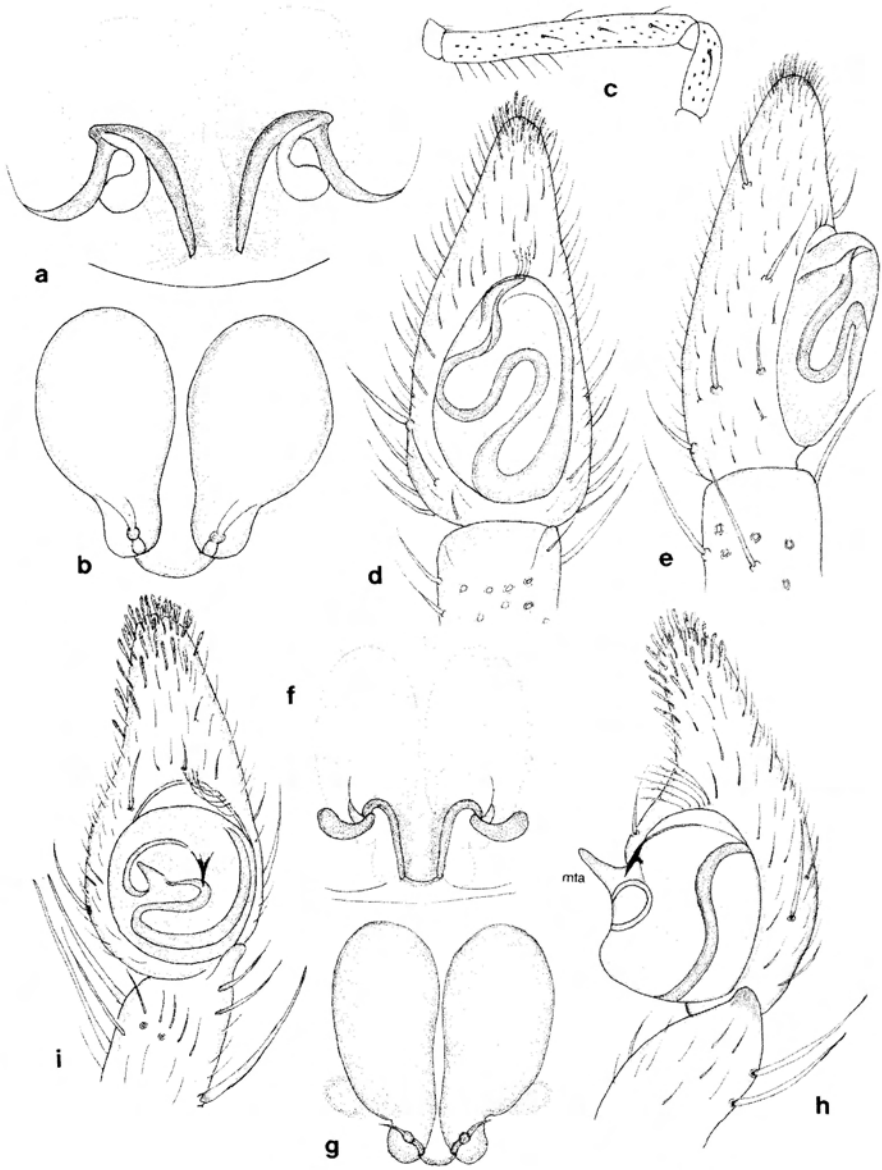

Fig. 5. *T. bruneitarsis* Lawrence. (a) Epigynum. (b) Spermathecae, dorsal view. (c) Femur and patella of leg I. *T. cobusi* spec. nov. (d) Male palp, ventral view. (e) Male palp, lateral view. *T. demangei* Jézéquel. (f) Epigynum. (g) Spermathecae, dorsal view. (h) Male palp, lateral view. (i) Male palp, ventral view.

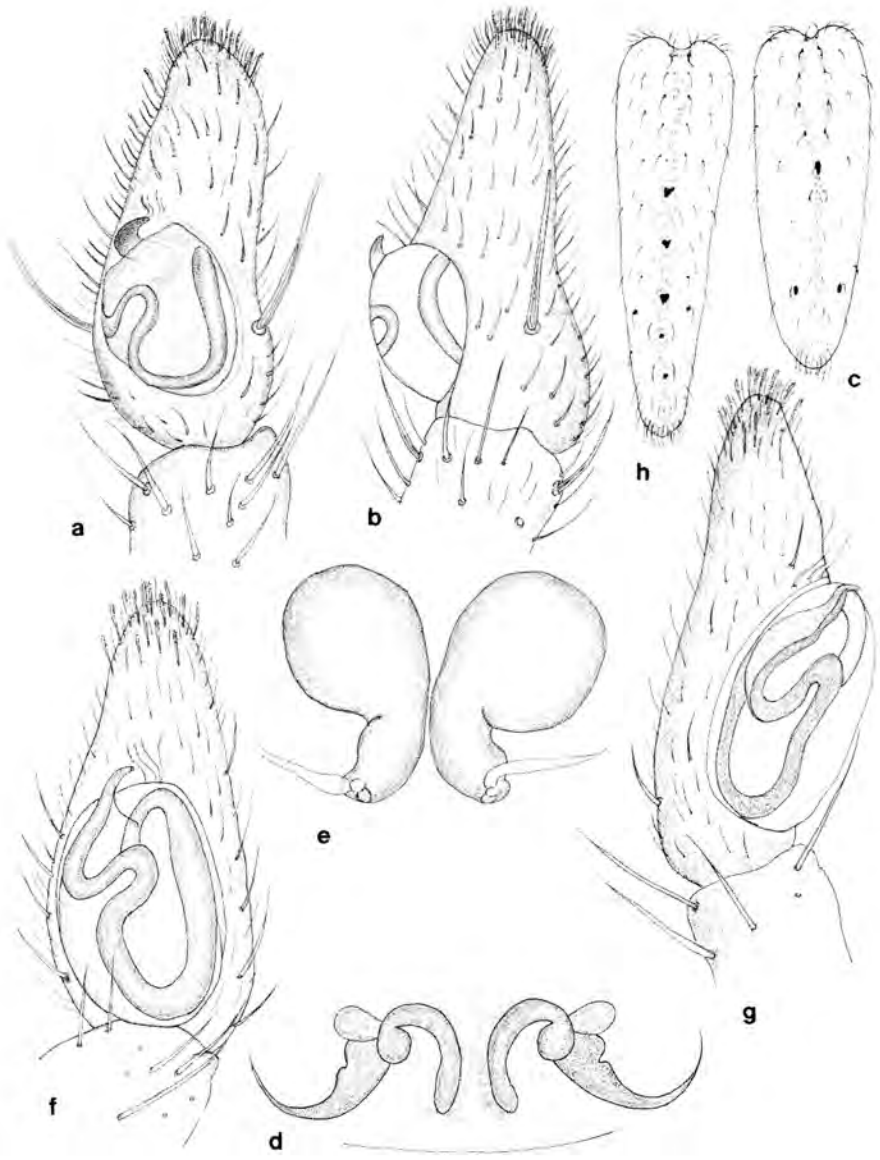

Fig. 6. *T. flavipes* stat. nov. (a) Male palp, ventral view. (b) Male palp, lateral view. (c) Abdomen, dorsal view. (d) Epigynum. (e) Spermathecae, dorsal view. *T. gerhardi* spec. nov. (f) Male palp, ventral view. (g) Male palp, ventrolateral view. (h) Abdomen, dorsal view.

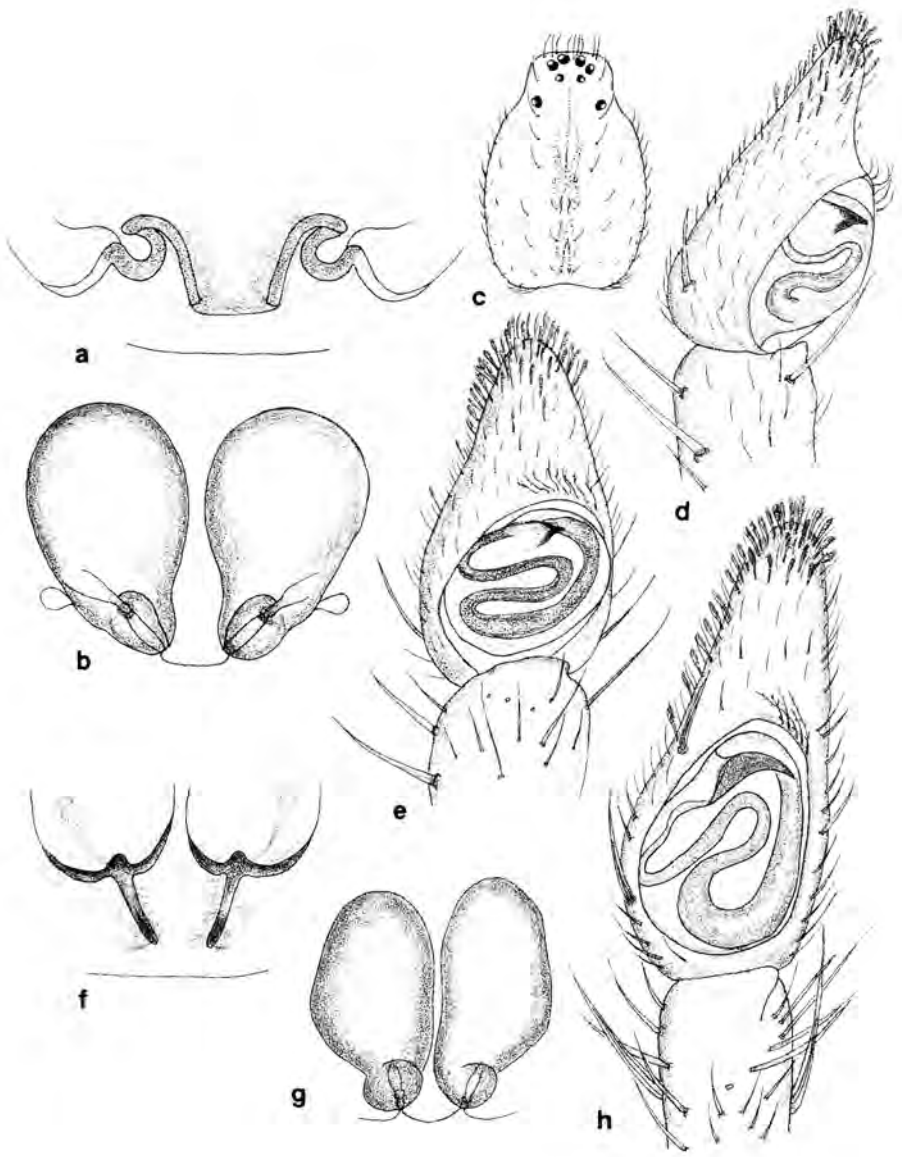

Fig. 7. *T. gerhardi* spec. nov. (a) Epigynum. (b) Spermathecae, dorsal view. (c) Carapace, dorsal view. *T. hollidayi* Lawrence. (d) Male palp, ventrolateral view. (e) Male palp, ventral view. (f) Epigynum. (g) Spermathecae, dorsal view. *T. vossioni* Simon. (h) Male palp, ventral view.

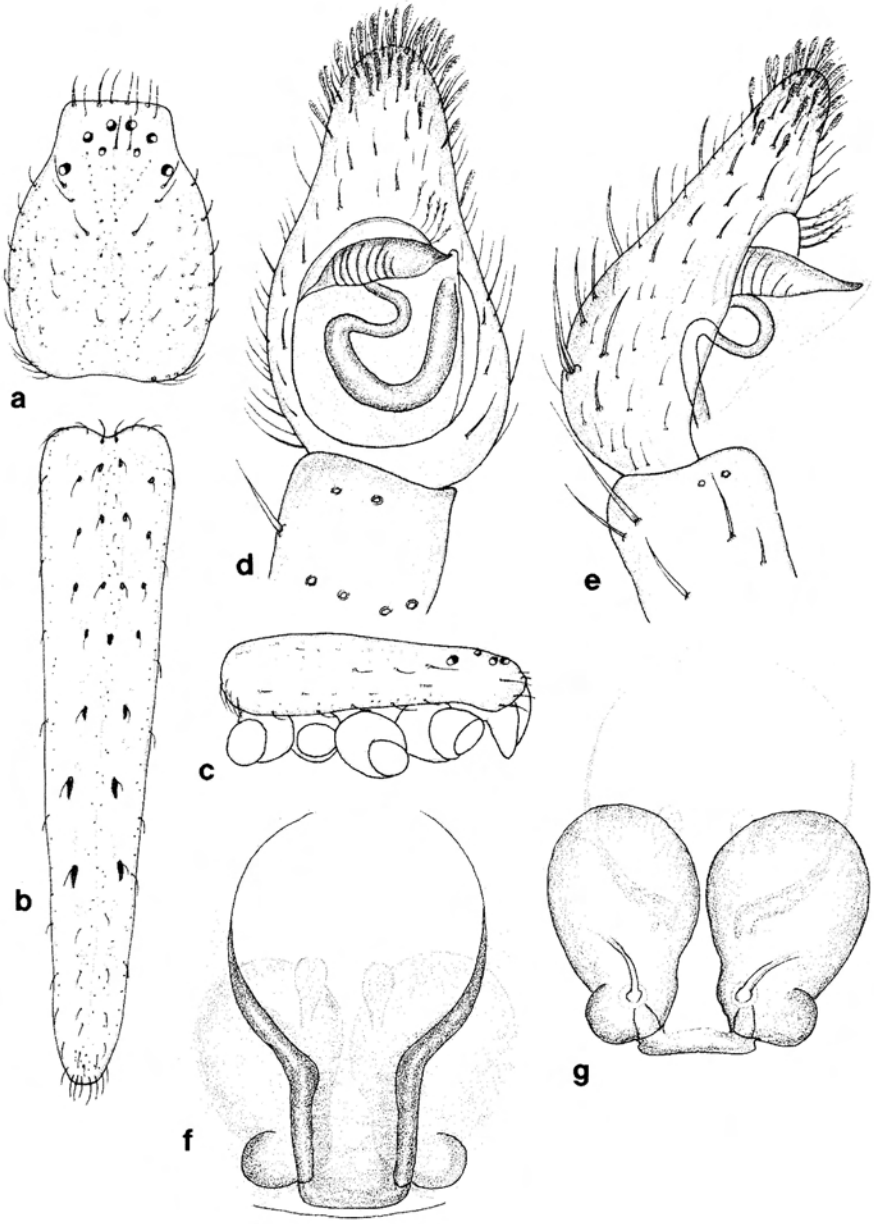

Fig. 8. *T. kibonotensis* Lessert. (a) Carapace, dorsal view. (b) Abdomen, dorsal view. (c) Carapace, lateral view. (d) Male palp, ventral view (e) Male palp, lateral view. (f) Epigynum. (g) Spermathecae, dorsal view.

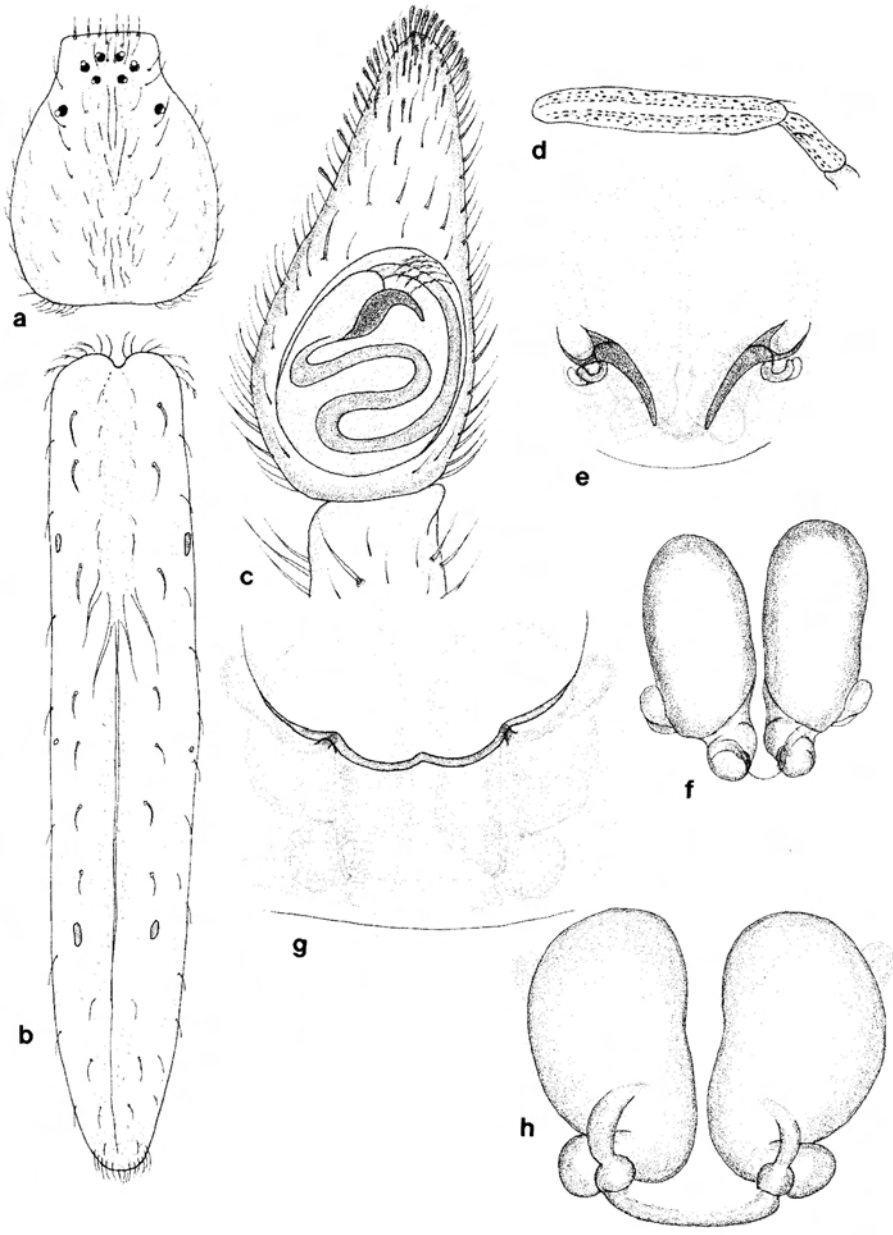

Fig. 9. *T. minor* stat. nov. (a) Carapace, dorsal view. (b) Abdomen, dorsal view. (c) Male palp, ventral view. (d) Femur and patella leg I, dorsal view. (e) Epigynum. (f) Spermathecae, dorsal view. *T. nigeriensis* Millot. (g) Epigynum. (h) Spermathecae, dorsal view.

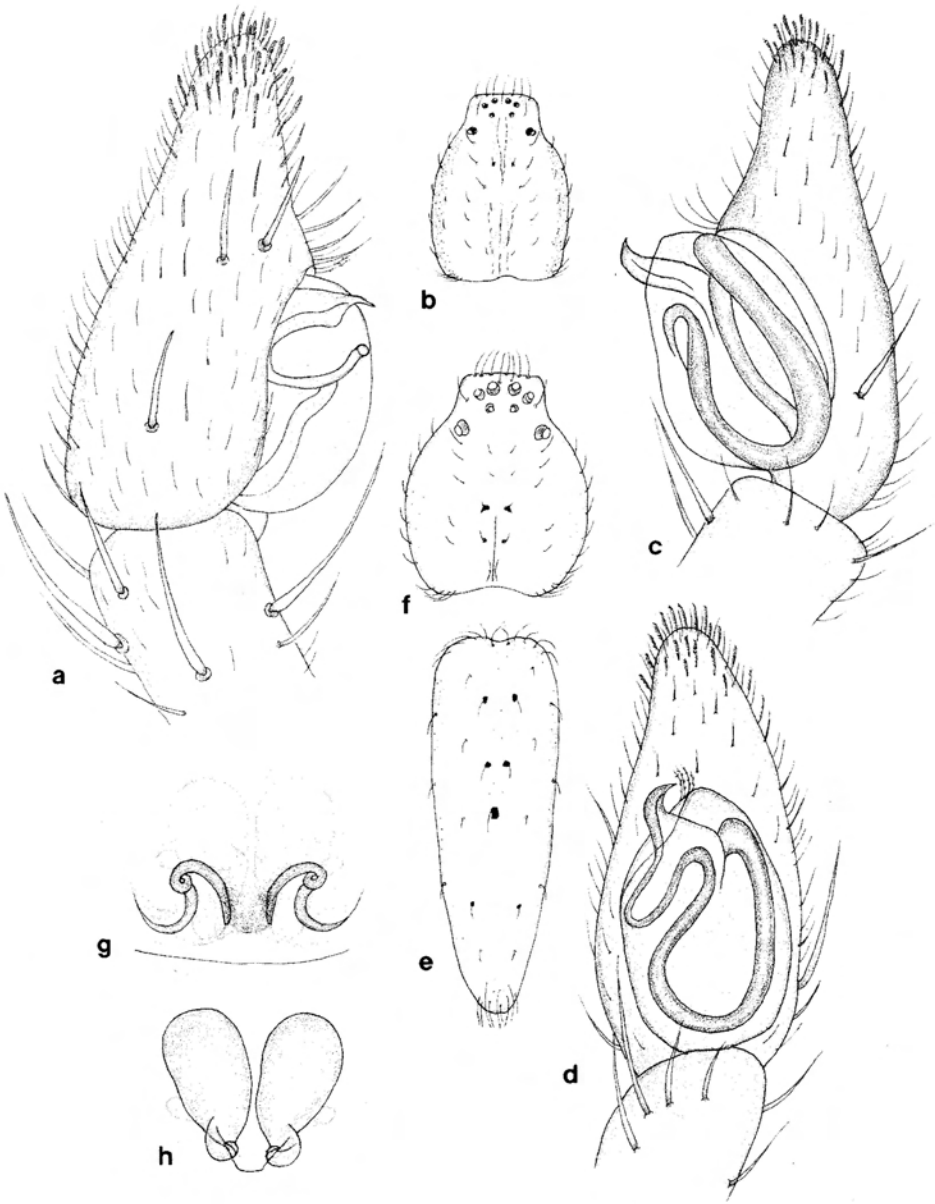

Fig. 11. *T. nimbaensis* spec. nov. (a) Male palp, lateral view. (b) Carapace, dorsal view. *T. septempunctatus* Millot. (c) Male palp, lateral view. (d) Male palp, ventral view. (e) Abdomen, dorsal view. (f) Carapace, dorsal view. *T. seriepunctatus* Simon. (g) Epigynum. (h) Spermathecae, dorsal view.

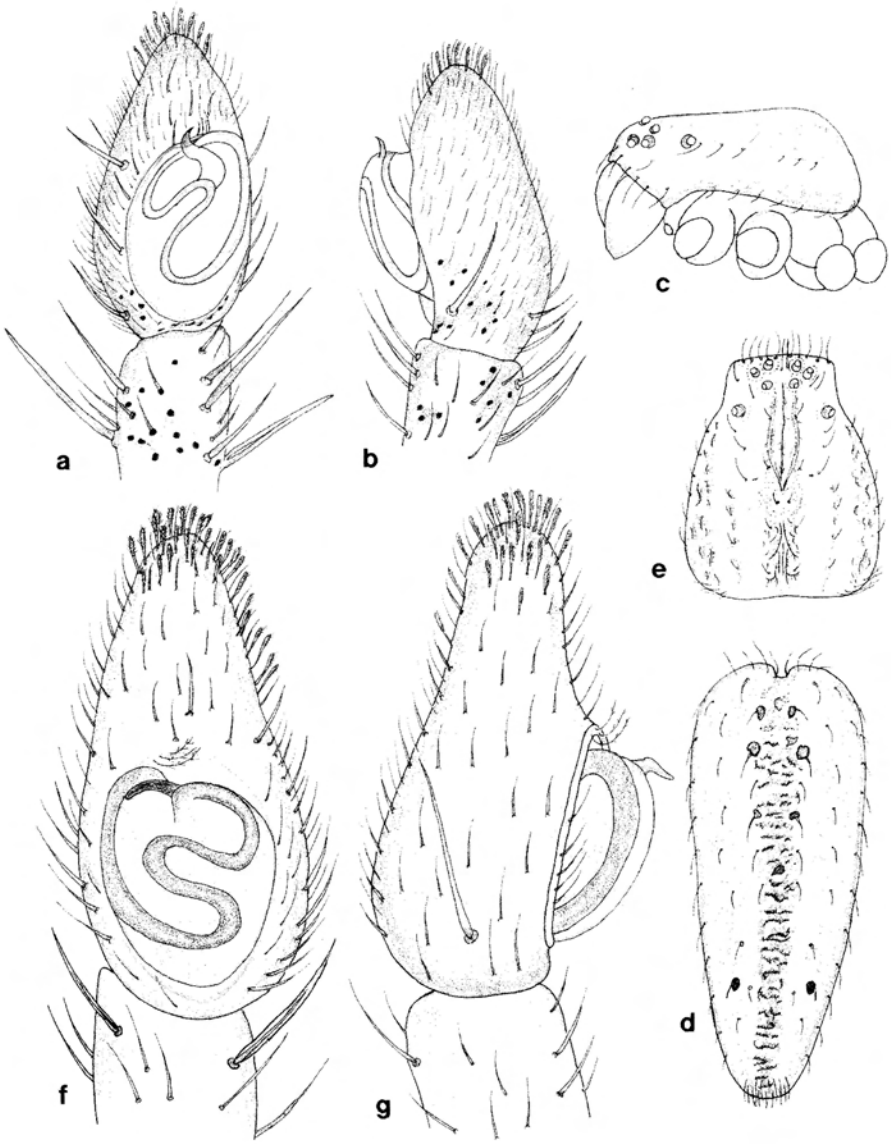

Fig. 12. *T. seriepunctatus* Simon. (a) Male palp, ventrolateral view. (b) Male palp, dorsolateral view. (c) Carapace, lateral view. (d) Abdomen, dorsal view (e) Carapace, dorsal view. *T. somaliensis* spec. nov. (f) Male palp, ventral view (right palp). (g) Male palp, dorsolateral view (right palp).

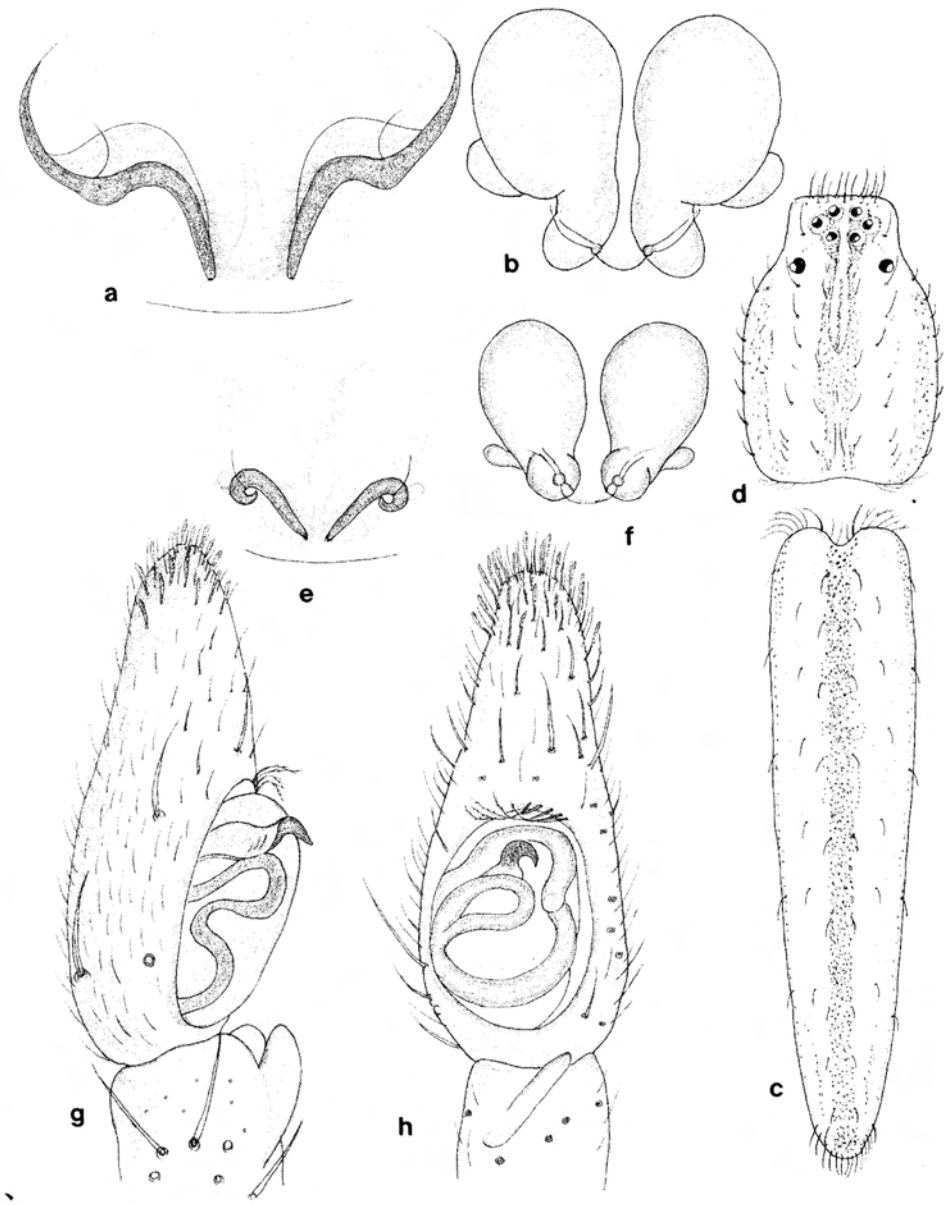

Fig. 13. *T. somaliensis* spec. nov. (a) Epigynum. (b) Spermathecae, dorsal view. *T. sunetae* spec. nov. (c) Abdomen, dorsal view. (d) Carapace, dorsal view. (e) Epigynum. (f) Spermathecae, dorsal view. (g) Male palp, ventrolateral view. (h) Male palp, ventral view.

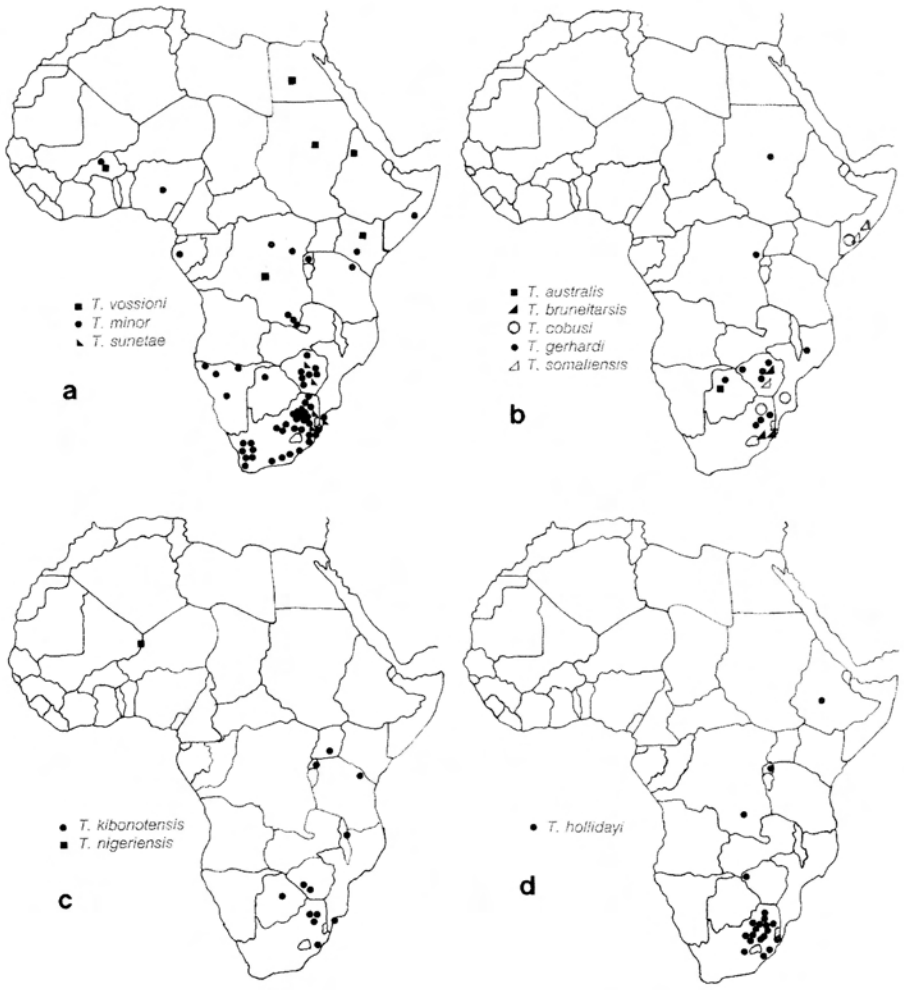

Fig. 14. Known geographical distribution of *Tibellus* spp. (a) *T. vossioni, T. minor* and *T. sunetae.* (b) *T. australis, T. bruneitarsis, T. cobusi, T. gerhardi* and *T. somaliensis.* (c) *T. kibonotensis* and *T. nigeriensis.* (d) *T. hollidayi.*.

Descriptions of species

Tibellus armatus Lessert, stat. nov.
Figs. 4(a-d), 15a.

Tibellus vossioni armatus Lessert, 1928: 329; Millot, 1941: 72.

Type: holotype female: Zaïre, Faradje (5°20′N, 25°90′E), (MNHG - examined).

Remarks: Lessert (1928) described the subspecies *T. vossioni armatus* on the basis of the number of ventral macrosetae (8-5) on tibiae I and II in a single female from Faradje, Zaïre. Examination of the type showed that in addition to the large number of ventral macrosetae, *T. armatus* differs from *T. vossioni* in the shape and size of the embolus and its smaller body length. *Tibellus armatus* is consequently recognised as a distinct species oc-

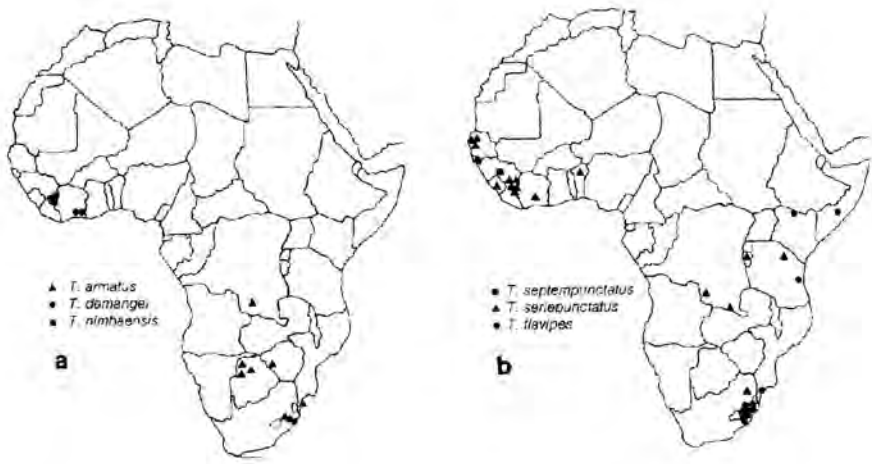

Fig. 15. Known geographical distribution of *Tibellus* spp. (a) *T. armatus, T. demangei* and *T. nimbaensis.* (b) *T. septempunctatus, T. seriepunctatus* and *T. flavipes.*

curring in Central Africa, Botswana, Mozambique and Natal (Fig. 15a).

Diagnosis: male with embolus small, spike-like, dark and slightly expanded at base, tip slightly curved (Fig. 4a & b). Shape of embolus as in *T. demangei* and *T. nimbaensis.* Female with median septum of epigynum diverging anteromedially, copulatory opening guides wide; spermathecae with curved posterior extensions; spermathecal glands with long ducts (Fig. 4c & d). Tibiae I and II with (6-5) to (8-5) ventral macrosetae (Fig. 1d).

Description

Male (described here for first time).
Size (n=7): TL 7,3(6,3-7,7); CL 2,5(2,10-2,7); CW 1,6(1,6-1,7).

Carapace: 1,5 times longer than wide; fawn with distinct median and marginal bands composed of numerous brownish black spots and anteriorly curving setae (setae detach readily). Eyes: area between eyes pale yellow, setae with brown basal spots; MOA-WP < MOA-L. Clypeus and chelicerae pale yellow, with a few brown spots at bases of long setae; CLL < MOA-WA.

Abdomen: dorsum creamy white, mottled in appearance, with longitudinal rows of setae; median and lateral bands covered with numerous brown spots; median band with pale grey lanceolate mark beneath spots in anterior third of abdomen, band extending posteriorly as a fine grey line. Venter: pale yellow with broad median band, mottled greyish white in appearance.

Legs: pale yellow with numerous short and longer brown setae, irregular pale brown basal spots form longitudinal bands on femora and patella; femora I and II with ventral row of filiform setae; tibia I with (8-5) and tibiae II with (5-6) ventral macrosetae as well as (1-3) unpaired macrosetae; leg formula 2143 with legs I and IV subequal in length. Leg measurements (n=5):

	I	II	III	IV
femur	3,90	4,42	2,20	4,28
patella	1,36	1,36	0,71	1,06
tibia	3,80	4,37	1,63	3,41
metatarsus	3,19	3,82	1,39	3,15
tarsus	1,68	2,06	0,73	1,38
Total	13,93	16,03	6,66	13,28

Palp: embolus base slightly expanded; tip dark, slender and slightly curved, originating anterolaterally on tegulum; RTA a short blunt ridge; VTA absent (Fig. 4a & b).

Female
Size (n=8): TL 8,9(7,8-9,6); CL 2,8(2,3-3,9); CW 1,8(1,5-2,0). Female larger than male but legs relatively shorter. In colour and form similar to male but carapace 1,6 times longer than wide, MOA-WP < MOA-L (except two females with MOA-WP = MOA-L); CLL ≤ MOA-WA.

Legs: femur I with ventral row of long erect setae (longer in male); tibiae I and II both with one black streak basally; leg formula 2413, legs I and IV subequal in length. Leg measurements (n=8):

	I	II	III	IV
femur	3,45	3,85	2,01	4,04
patella	1,22	1,30	0,77	1,12
tibia	3,50	3,50	1,43	3,08
metatarsus	2,35	2,48	1,14	2,51
tarsus	1,27	1,41	0,67	1,13
Total	11,79	12,54	6,02	11,88

Epigynum: spermathecae with curved posterior extensions; spermathecal glands with long ducts visible posterolaterally; median septum diverging anterolaterally; copulatory opening guides wide (Fig. 4c & d).

Juvenile
Structurally similar to adults.

Variation: intensity of spots on bands of carapace and abdomen as well as spots on legs vary between individuals. Ventral macrosetae on tibiae I and II of females vary from (6-6) to (7-7) with (1-4) additional macrosetae.

Distribution: Zaïre. New records: South Africa, Mozambique, Zimbabwe and Botswana (Fig. 15a).

Material examined

Zimbabwe: Maleme Rest Camp, Matopos National Park (2028DI), 7.ii.1988, J. Minshull, 1 male, 2 imm. females (NMZ/A5574).

Botswana: Okavango swamps, Xugana lagoon, approximately 19°00'S, 23°00'E, 1978, U. Wilmot, 1 female (NM 11705); Okavango Delta (Baro River), 1.vii.1983, R. Harris, 1 female (NCA 83/362); Okavango Delta, Xugana Island (19°04'S, 23°03'E), 130 km NNW of Maun, 14-26 xi.1979, B.H. Lamoral, juveniles (NM); Moremi Nature Reserve, 7.vii.1983, R. Harris, 1 female, 3 imm. females (NCA 83/286); Savuti Channel, northern Botswana, 2.i.1981, P. Reavell, on grass and wild spinach in *Lonchocarpus* camelthorn veld, 1 imm. female (NCA 92/102).

Mozambique: Nyaka Island, i.1924, R.F. Lawrence, 2 females, 5 imm. females (SAM B6543).

South Africa: Natal, Richards Bay, 10.iv.1980, P. Reavell, subcoastal bush, 1 female (NCA 81/332); Empangeni, 20.xi.1980, grassveld, P. Reavell, 1 female, 5 males, 1 imm. female (NCA 81/90).

Phenology: adults were collected on grass in January, April, July and November.

Tibellus australis (Simon),
Figs. 4(e-h) & 14b.
Tibellinus australis Simon, 1910: 198.

Type: holotype female: Botswana (Kalahari), L. Schultze, (ZMB 20988 - examined).

Remarks: Simon (1910) described *Tibellinus australis* on the basis of a female from the Kalahari and considered the parallel and longer than wide MOA-L, and tibiae I and II with (4-4) ventral macrosetae, diagnostic features of the species.

Examination of eye patterns in *Tibellus* showed that MOA-WA < MOA-WP and that MOA-L varies between species from smaller than to greater than MOA-WP. The ventral macrosetae on tibiae I and II also vary between species from (2-2) to (8-7). *Tibellinus australis* falls within this range of variation, and the structure of the epigynum (Fig. 3n) resembles the epigyna of other *Tibellus* spp.; it is consequently transferred to the genus *Tibellus*.

Diagnosis: male unknown. Female with copulatory opening guides medium-sized, spermathecal glands without ducts, situated posterior to spermathecal organ guides, shape of median septum distinct (Fig. 4g & h). Tibiae I and II with (4-4) ventral macrosetae (Fig. 1d).

Description

Female
Size (n=1): TL 7,0; CL 2,5; CW 1,9. Carapace 1,4 times longer than wide; fawnish yellow in colour; median and marginal bands (Fig. 4e) composed of pale brown lines, small, dark brown spots and setae (setae detach readily). Eye area: yellowish white with MOA-WP > MOA-L; with long setae between eyes and on clypeus (setae detach readily); CLL < MOA-WA. Chelicerae bearing long setae with black basal spots.

Abdomen: dorsum creamy white, mottled in appearance; covered with yellow, fine, adpressed setae, with two rows of larger setae on each side of median band; median band composed of an olive green cardiac mark in anterior third of abdomen, extending as a line to posterior edge (Fig. 4f); median band with numerous dark brown spots and a few scattered small spots laterally. Venter: creamy white, mottled in appearance; median band whitish grey, mottled.

Legs: pale yellow, covered with short and long setae; macrosetae with brown basal spots; femur I with row of long setae ventrally; tibiae I and II with (4-4) ventral macrosetae; leg formula 2413; leg measurements (n=1):

	I	II	III	IV
femur	3,50	3,88	2,38	3,63
patella	1,25	1,25	0,83	1,25
tibia	3,00	3,50	1,93	3,75
metatarsus	3,00	2,87	1,50	2,50
tarsus	1,30	1,55	0,75	1,13
Total	12,05	13,05	7,39	12,26

Epigynum: spermathecae rounded anteriorly, tapering posteriorly; spermathecal glands without ducts posterior to copulatory opening guides; median septum diverging anteriorly, with medium-sized copulatory opening guides posterolaterally (Fig. 4g & h).

Male and Juvenile
Unknown.

Distribution: known only from the type locality (Fig. 14b).

Phenology: unknown.

Tibellus bruneitarsis Lawrence,
Figs. 5(a-c) & 14b.
Tibellus bruneitarsis Lawrence, 1952: 205.

Type: lectotype female and paralectotype female, designated here: South Africa, Umhlali (29°50′S, 31°25′E), (NM 2928-examined).

Diagnosis: female with V-shaped median septum; spermathecal glands with long ducts situated posterolaterally of spermathecae (Fig. 5a & b). Male unknown.

Description

Female
Size (n=4): TL 8,2(8,0-8,3); CL 2,7(2,7-2,8); CW 2,1(2,0-2,2). Carapace: 1,3 times longer than wide; fawnish with dark yellow median and marginal longitudinal bands composed of pale brown setae with small dark brown basal spots and pale brown lines. Eyes: eye area pale yellow with long setae; MOA-WP ≤ MOA-L; with white line between PME and PLE. Clypeus and chelicerae pale yellow with long setae and a few pale brown irregular spots; CLL < MOA-WA. Chelicerae and tarsus of palp dark yellow.

Abdomen: dorsum whitish yellow, covered with pale yellow adpressed setae; median and lateral bands composed of numerous spots and longitudinal rows of long setae. Venter: yellowish white, mottled in appearance with numerous pale yellow setae and a pale yellow median band; with brown spots anterior to spinnerets.

Legs: pale yellow with scattered pale grey streaks on femora I to III, numerous setae dorsally; row of regular, long, erect, ventral setae on femur I (Fig. 5c); tibiae I and II with (4-4) ventral macrosetae; one long and one short black streak basally on tibia I with one or two streaks on distal part; leg formula 2413. Leg measurements (n=3):

	I	II	III	IV
femur	3,42	3,76	2,60	3,90
patella	1,35	1,40	1,00	1,18
tibia	3,00	3,32	1,92	3,07
metatarsus	2,40	2,35	1,65	2,68
tarsus	1,35	1,95	0,88	1,15
Total	11,52	12,78	8,05	11,98

Epigynum: spermathecae oblong, tapering posteriorly; median septum V-shaped, diverging anteriorly to middle of epigynum; copulatory opening guides curving and tapering to sides in posterior half of spermathecae; spermathecal glands with long ducts in posterior half of spermathecae (Fig. 5a & b).

Variation: the abdominal median band is variable, from a lanceolate mark in anterior third of abdomen to a brown spotted band. Brown spots on carapace, abdomen and legs indistinct to distinct.

Male
Unknown.

Juveniles
Structurally similar to females.

Distribution: South Africa, Zimbabwe (new record) (Fig. 14b).

Material examined

Zimbabwe: Humani Ranch store camp, Falcon College (NMZ), 9.iv.1987, 1 imm. female (NMZ/A5956);

South Africa: Natal, Umhlali, x.1940, R.F. Lawrence, 1 imm. female and 2 juveniles (NM 3313); Mtunzini (26°57′S, 31°46′E), Twin streams farm, I. F. Garland, 19-20.i.1984, T. Griswold e.a., 1 female (NM).

Phenology: female was collected in January.

Tibellus cobusi spec. nov.,
Figs. 5(d & e), 14b.

Type: holotype male: South Africa, Potgietersrus, Sterkrivierdam (23°45′S, 29°30′E), xi.1973, L. Smit, (NCA 76/757). Two paratype males: Mozambique, Masiene (23°23′S, 32°21′E), R.F. Lawrence, 1 male (SAM B6502); Somalia: 20 km S Chisimaio (43°N, 00°E), Sar Uanle, G. Messana, pitfall trap on dune facing land, 13.vi.1973, 1 male (MRAC 172.709).

Diagnosis: male with embolus slender, tip slightly curved, directed laterally (Fig. 5d & e), resembling *T. gerhardi* and *T. somaliensis;* MOA-WP < MOA-L, tibiae I and II with (3-3) ventral macrosetae (Fig. 1d). Female unknown.

Description

Male
Size: (n=3): TL 6,2(6,1-6,3); CL 2,4(2,0-2,5); CW 1,8(1,6-1,8). Carapace: 1,3 times longer than wide; fawnish with a brown median band composed of short, brown setae, spots and pale brown lines; marginal bands composed of brown setae and dark brown, irregular spots. Eyes: eye area and clypeus with long pale brown setae directed anteriorly; MOA-WP < MOA-L; clypeus < MOA-WA. Chelicerae with long setae and pale grey irregular spots.

Abdomen: dorsum fawnish white, mottled in appearance; median and lateral bands composed of numerous black spots almost reaching spinnerets; with four longitudinal rows of setae; a few large irregular black spots on lateral sides of abdomen. Venter: fawnish white, mottled in appearance, with numerous pale yellow setae

Legs: pale yellow, covered with short setae and scattered pale brown streaks; bases of tibiae I and II with two long, pale grey streaks and (3-3) ventral macrosetae; bases of macrosetae dark in colour; leg formula 2413.
Leg measurements (n=3)

	I	II	III	IV
femur	4,75	5,00	2,60	4,75
patella	1,40	1,50	0,90	1,05
tibia	4,00	4,85	2,25	3,75
metatarsus	3,40	4,00	2,00	3,50
tarsus	1,75	2,00	0,95	1,40
Total	15,30	17,35	8,70	14,45

Palp: embolus medium-sized, broad at base, curving gradually to tip, directed laterally with tip close to tegulum; originating on anterolateral side of tegulum; RTA a short blunt ridge; VTA absent (Fig. 5d & e).

Female and Juvenile
Unknown.

Distribution: known only from the collecting localities of the type specimens (Fig. 14b).

Phenology: the holotype male was collected in November while one of the paratype males was collected in June (pittraps in dunes, Somalia).

Etymology: this species is named after Cobus, the son of the senior author.

Tibellus demangei Jézéquel,
Figs. 5(f-i) & 15a.
Tibellus demangei Jézéquel, 1964: 1136.

Types: lectotype male and paralectotypes (2 males and 4 females), designated here: Ivory Coast, Lamto, Toumodi (6°12′N, 4°58′W), 1963-1964, (MNHN - examined).

Diagnosis: male with embolus originating anteromedially, tip sharply pointed (Fig. 5h & i). The only *Tibellus* species in Africa with a median tegular apophysis. Female with spermathecae oblong, with posterior extensions, spermathecal glands located posterolaterally, copulatory opening guides short (Fig. 5f & g). Tibiae I and II with (2-2) ventral macrosetae (Fig. 1d).

Description

Male
Size (n=3): TL 9,8(8,9-10,7); CL 3,6(3,5-3,7); CW 2,5(2,5-2,6). Carapace: 1,3 times longer than wide; fawnish yellow with median band composed of brown broken lines, spots and short setae; marginal bands composed of brown irregular spots and short setae. Eyes: eye area yellowish white with scattered setae in between; in 62,5 % MOA-WP > MOA-L, rest with MOA-WP = MOA-L. Clypeus with few setae and CLL < MOA-WA. Chelicerae bearing long setae with black basal spots.

Abdomen: dorsum creamy white, mottled in appearance; four longitudinal rows of setae

extend over abdomen; median band composed of a lanceolate mark in anterior third which is bordered by setae with brown basal spots; rest of median band covered with small black spots, becoming more numerous posteriorly; two large black spots in posterior third of abdomen; lateral bands composed of small brownish black spots. Venter: creamy white, mottled in appearance with a broad, pale yellow median band.

Legs: pale yellow, with pale brown irregular spots; covered with short and longer setae and macrosetae, and irregular dark brown basal spots; tibiae I and II with a longitudinal row of three black streaks distally on prolateral side and (2-2) ventral macrosetae; leg formula 2413. Leg measurements (n=3):

	I	II	III	IV
femur	5,65	7,24	3,48	7,20
patella	1,68	2,22	0,92	1,50
tibia	5,58	6,39	2,56	4,82
metatarsus	4,98	5,58	2,42	5,04
tarsus	2,36	3,44	2,52	2,00
Total	20,25	24,87	11,90	20,56

Palp: embolus originating anteromedially on tegulum, broad at base, tip short, sharply pointed, directed posteriorly (Fig. 5h & i); tegulum circular, with a median apophysis; RTA short and blunt; VTA absent.

Female

Size (n=4): TL 14,7(12,8-15,9); CL 3,6(3,4-3,8); CW 2,7(2,6-2,8). Larger than male but legs slightly shorter. In colour and form similar to male but with a distinct lanceolate mark on abdominal dorsum. Leg measurements (n=4):

	I	II	III	IV
femur	4,59	5,22	4,10	4,84
patella	1,83	1,90	1,41	1,52
tibia	3,86	4,53	2,77	3,98
metatarsus	3,39	3,83	2,49	3,51
tarsus	1,77	2,12	1,22	1,68
Total	15,43	17,60	11,99	15,53

Epigynum: spermathecae oblong, with posterior extensions; spermathecal glands located posterolaterally, opening medially into spermathecae, ducts short; median septum V-shaped, diverging anteriorly; copulatory opening guides short (Fig. 5f & g).

Juvenile

Structurally similar to adults.

Variation: spots on body and legs more conspicuous in females from the Ivory Coast. Lanceolate mark on median band of abdominal dorsum varies from covered with small brown spots that become more numerous towards posterior end of abdomen, to bordered by a pale brown line or a series of large brown spots. Abdomen occasionally with scattered brown spots dorsally.

Distribution: Ivory Coast and South Africa (new record) (Fig. 15a).

Material examined

Ivory Coast: Lamto, Toumodi, 1963-1964, 2 females, 1 imm. male, 1 imm. female, 18 juveniles (MNHN).

South Africa: Natal, Empangeni, 29.xi.1980, P. Reavell, grass, 2 females, 4 imm. females (NCA 81/90).

Phenology: in South Africa, females were collected during November mainly from grass.

Tibellus flavipes Caporiacco, stat. nov., Figs. 6 (a-e) & 15b.

Tibellus flavipes Caporiacco, 1939: 360.

Tibellus vossioni flavipes Caporiacco, 1941: 120.

Type: holotype (immature specimen) from Kenya, Moyale (3°10′N, 39°35′E), (not examined).

Remarks: Caporiacco (1939) based the description of *T. flavipes* on an immature specimen from Moyale, Kenya, and considered its colour, eye-pattern and the number of ventral macrosetae (3-3) on tibiae I and II as diagnostic. In 1941, having examined additional material (a male and female) from southern Borana, Somalia, he recognised *T. flavipes* as a subspecies of *T. vossioni*. He found the male genitalia to be similar in the two species, and that they differ only in the number of ventral macrosetae on tibiae I and II (being (2-2) in *T. vossioni*). The three specimens could not be examined during the present study, but based on the description and drawings of the genitalia of *T. flavipes*, the present material from Somalia, Tanzania, Mozambique and northern Natal closely resemble this species in the shape of the genitalia, number of ventral macrosetae (3-3) on tibiae I and II, and their smaller size. We recognise *T. flavipes* as a distinct species occurring on the eastern parts of the Afrotropical Region, from Somalia southwards to northern Natal. Our decision is given some support by the identification of a female (MRAC 131.179) from Somalia as *T. flavipes* by H. Segers (pers. comm.).

Diagnosis: male with embolus originating anteriorly from behind tegulum, attenuated to form a claw-like tip directed anteriorly (Fig. 6a & b). Female with broad copulatory opening guides, almost reaching epigynal furrow; spermathecae with distinct posterior extensions (Fig. 6d & e). Abdomen with three black spots and tibiae I and II with (3-3) ventral macrosetae (Fig. 1d).

Description

Male

Size (n=10): TL 5,8(4,7-7,0); CL 2,3(2,1-2,8); CW 1,8(1,7-2,1). Carapace: 1,4 times longer than wide; fawnish with a broad, dark median band extending from PME to posterior edge of carapace; band composed of numerous brown spots, longitudinal lines and numerous anteriorly directed brown setae, with longer setae scattered in between; marginal bands composed of brown setae with brown basal spots, irregular pale brown spots scattered in between; area between median and marginal bands covered with numerous translucent to white setae. Eyes: eye area uniformly yellowish brown; eye area and clypeus with numerous long setae directed anteriorly (setae detach readily); CLL = MOA-WA. Chelicerae bearing long filiform setae with brown basal spots.

Abdomen: dorsum creamy white, mottled in appearance; median band composed of a yellow lanceolate mark in anterior third of abdomen formed by brown adpressed plumose setae, bordered by brown spots and setae; cardiac mark visible beneath lanceolate mark; abdomen covered with numerous translucent setae, with long white setae at anterior and posterior edges; lanceolate mark extends posteriorly as a dark brown line composed of small dark brown spots (Fig. 6c); two dark brown streaks in posterior third on both sides of the median line, one dark streak on median band; indistinct lateral bands composed of short brown streaks on sides, with brown, scattered setae between bands. Venter: yellowish white covered with a broad, grey median band.

Legs: yellow, bearing numerous short setae with basal spots, with pale brown, irregular spots between basal spots; femora I and II with one ventral row of regular, long, erect setae; tibiae I and II with (3-3) ventral macrosetae (Fig. 1d); leg formula 2413 (legs I and IV subequal in length). Leg measurements (n=10):

	I	II	III	IV
femur	3,5	4,8	2,8	3,8
patella	1,1	1,5	1,0	1,1
tibia	3,1	4,4	2,0	3,0
metatarsus	2,8	4,0	1,9	3,0
tarsus	1,6	2,0	0,8	1,5
Total	12,1	16,7	8,5	12,4

	I	II	III	IV
femur	2,94	3,32	2,32	3,30
patella	1,19	1,30	0,99	1,21
tibia	2,40	2,78	1,54	2,29
metatarsus	2,09	2,41	1,40	2,21
tarsus	1,14	1,29	0,76	1,01
Total	9,76	11,10	7,01	10,02

Palp: embolus medium-sized, base short and broad, curving and attenuating to form a claw-like tip that curves again to point anteriorly, originating behind tegulum with only tip protruding; RTA a blunt ridge; VTA absent (Fig. 6a & b).

Variation: ventral macrosetae on tibiae I and II vary from (3-3), with two setae on pro- and retrolateral sides, to (2-2) with two setae on pro- and retrolateral sides and one retroventrally.

Female
Size (n=10): TL 7,4(6,2-9,2); CL 2,6(2,0-2,8); CW 1,8(1,6-2,3). In colour and shape similar to male but carapace more dome-shaped and 1,4 times longer than wide; body longer than in male but legs shorter. Eyes: yellowish white with white line connecting PME and PLE.

Abdomen: dorsum creamy white, mottled in appearance; a yellow to olive-green, lanceolate mark in anterior third of abdomen, a cardiac mark visible beneath lanceolate mark (Fig. 6c). The CLL ≤ MOA-WA. Legs: legs I to IV with numerous pale brown to dark brown spots at bases of setae, forming three longitudinal bands on femora and patellae; two dark brown streaks at base of tibiae and occasionally two dark streaks on posterior tibiae. Leg measurements (n=10):

Epigynum: spermathecae with posterior extensions forming a long stem; median septum diverging anteriorly, curving posteriorly to form broad copulatory opening guides that curve and taper laterally, almost touching epigastric furrow; spermathecal glands entering spermathecae laterally (Fig. 6d & e).

Variation: the colour of the carapace varies from pale yellow to yellow-brown, and the spotted appearance of legs varies from pale brown to black. Three dark brown streaks on abdomen vary from large to indistinct in some specimens. Leg formula varies from 2413 to 2143, with a small difference in length between legs I and IV.

Juvenile
Structurally similar to adults.

Distribution: Kenya, Somalia. New records: South Africa, Tanzania, and Mozambique (Fig. 15b).

Material examined

Somalia: Sinandozo, 1946, R. Quighiaro, 1 female (MRAC 131.179).

Tanzania: Dar es Salaam, UDSM Campus, 1970-1971, K.M. Howell, 1 female (MRAC 159.397); Dar es Salaam, iv.1957, N.L.H. Krause, 1 female (CAS).

Mozambique: Nyaka Island, i.1924, R.F. Lawrence, 2 female, 2 males (SAM B6543).

South Africa: Natal: 20 km E of Hluhluwe on Mtubatuba road, 30.iii.1977, A.S. Dippenaar, sweeping mixed grass, 1 male (NCA 77/663); Hluhluwe, 30.iii.1977, A.S. Dippenaar, sweeping tall grass, 1 female, 1

male (NCA 77/668); Hluhluwe Game Reserve, 18.iv 1980, P. Reavell, 1 female, (NCA 82/64); 20 km N of Mtubatuba on Nongoma road, 31.iii.1977, A.S Dippenaar, sweeping grass, 1 female (NCA 77/677); Empangeni, 1.iv.1977, A.S. Dippenaar, sweeping tall grass, 1 male (NCA 81/90); Nyala Game Reserve, 26.iv.1981, P. Reavell, grass veld, 2 female; 1 imm. female (NCA 91/1681); Nyala Game Reserve near Empangeni, 6.xii.1981, grass, P. Reavell, 1 female (NCA 91/775); Nyala Game Reserve, 16.xii.1980, P. Reavell, grassveld, 1 female (NCA 81/70); Empangeni, 11.iv.1981, P. Reavell, grassveld, 3 female (NCA 81/185); Empangeni, University of Zululand, 5.xi.1982, grassveld, P. Reavell, 1 female (NM); Mtunzini, 10.iii.1981, P. Reavell, grassveld, 1 female (NCA 81/194); between Mkuze and Jozini (through Lebombo Mountains), 5.iv.1977, A.S. Dippenaar, sweeping grass, 1 male (NCA 77/736); between Jozini and Ndumu Game Reserve, 4.iv.1977, A.S. Dippenaar, sweeping grass, 2 males, 2 females (NCA 77/711); Ndumu Game Reserve, 16.i.1980, P. Reavell, 1 female (NCA 82/40); Sodwana Bay area (2732DA), 9.v.1981, C. Car, grassland, 1 female (SAM 1166); Enseleni Nature Reserve, 8.iv.1981, P. Reavell, grassveld, 4 females (NCA 81/168); 20 km S of Mkuze, i.iv.1977, A.S. Dippenaar, sweeping grass, 1 female (NCA 77/686).

Phenology: adult spiders were collected from November to May.

Tibellus gerhardi spec. nov.,
Figs. 6(f-h), 7(a-c) & 14b.

Types: holotype male and paratype female: South Africa, Transvaal, Loskopdam (25°27′S, 29°20′E), 9.x.1989, M. Filmer, (NCA 91/777). Paratype male: South Africa, Groblersdal (25°15′S, 29°25′E), 19.iv.1979, A.S. Dippenaar, (NCA 82/39). Paratype female: Mozambique, Maxixe (23°51′S, 35°21′E), i.1936, R.F. Lawrence, (SAM B6607).

Diagnosis: male with embolus slender, base somewhat expanded, tip slightly curved, resembling *T. cobusi* and *T. somaliensis* (Fig. 6f & g). Female with spermathecal glands and copulatory opening guides posterolaterally (Fig. 7a & b). MOA-WP < MOA-L; metatarsi I and II with (3-3) ventral macrosetae, tibiae I and II with more than (5-5) ventral macrosetae (Fig. 1d).

Description

Male
Size (n=2): TL 6,5(6,4-6,5); CL 2,4(2,3-2,5); CW 1,7(1,6-1,8). Carapace: 1,4 times longer than wide, flattened, fawnish, brown median band composed of brown lines and spots (Fig. 7c); marginal bands indistinct. Eyes: eye area pale yellow with long setae; MOA-WP < MOA-L; CLL < MOA-WA; numerous long setae between eyes, on clypeus and chelicerae; clypeus and chelicerae with brown spots at bases of setae, chelicerae with grey irregular markings; CLL < (occasionally =) MOA-WA.

Abdomen: dorsum creamy white, mottled in appearance; numerous long setae on anterior and posterior edge of abdomen; four longitudinal rows of brown setae over length of abdomen; median band same width from anterior to posterior edges, composed of brown spots; a yellow cardiac mark occasionally visible beneath brown spots in anterior third of abdomen; setae with irregular brown spots at bases, one to three large black spots on median longitudinal band in posterior half of abdomen (Fig. 6h), two black spots on both sides of median band in posterior third of abdomen; lateral bands occasionally visible, formed by a row of black streaks. Venter: creamy white, mottled in appearance, covered with numerous translucent setae.

Legs: pale yellow with numerous short setae, small pale brown spots at bases of setae; pale grey, large, irregular spots dorsally on femora and tibiae of all legs; one dark streak basally on tibiae I and II; ventral macrosetae on tibiae I and II vary between (6-5) and (7-7); metatarsi I and II with (3-3) ventral macrosetae; leg formula 2143. Leg measurements of holotype:

	I	II	III	IV
femur	3,70	4,35	2,35	4,05
patella	1,50	1,50	0,95	1,25
tibia	3,50	4,20	1,95	3,40
metatarsus	3,25	3,85	1,55	2,95
tarsus	1,85	2,25	0,95	1,40
Total	13,80	16,15	7,75	13,05

Palp: embolus long and slender, similar in colour to tegulum; base somewhat expanded; tip slightly curved, not close to tegulum but extending beyond tegulum, directed laterally; embolus originating anterolaterally of tegulum; RTA a short blunt ridge with a broad base; VTA absent (Fig. 6f & g).

Female

Size: (*n*=9): TL 10,5(9,2-11,2); CL 3,5(3,0-3,7); CW 2,3(2,0-2,8). In colour and form similar to male but larger in size, legs shorter and body covered with numerous setae. Leg measurements (*n*=9):

	I	II	III	IV
femur	4,22	4,79	2,63	4,67
patella	3,92	4,34	2,09	3,73
tibia	1,70	1,79	1,02	1,51
metatarsus	3,07	3,55	1,51	2,89
tarsus	1,72	1,93	0,87	1,27
Total	14,63	16,40	8,12	14,07

Epigynum: spermathecae pear-shaped; median septum diverging anteriorly, reaching posterior third of spermathecae, bands curving posteriorly and extending to form copulatory opening guides; spermathecal glands located laterally of spermathecae (Fig. 7a & b).

Variation: the distinct black spots on median band of abdomen vary from three to seven. A specimen from Acornhoek (SAM B4391) has dark brown circles around ALE and PME and two broken lines on each side of median band of carapace. A specimen from Zimbabwe (NMZ/A7737) has indistinct bands between the median and marginal bands of carapace.

Juvenile.

Structurally similar to adults.

Distribution: South Africa, Sudan, Zaïre, Botswana, Zimbabwe and Mozambique (Fig. 14b).

Material examined

Sudan: Khartoum, 1 imm. male (MNHN 3773-82); Khor Attar, Werner, 1905, 2 imm. females, 1 imm. male, Reimoser Collection (MRAC).

Zaïre: Kivu, terr. Uvira, Mugesera, R. Kiss, ix.1961, 1 female (MRAC 120056).

Botswana: Okavango Delta, Gibbereca, 138 km NNE of Maun, 14-15.xi.1979, B.H. Lamoral, on margin of terminalia forest, 1 female (NM).

Zimbabwe: Katambora Campsite (1725C4), Falcon College (NMZ), 30.viii.1986, 1 imm. female (NMZ/A4964); Mavuradona Wilderness area (1631A3) near Musengezi River, D.G. Broadley, 5.xi.1989, 1 female (NMZ/A7737); Umzingwane Dam (2028B4), 1.vi.1963, 1 imm. female (NMZ/A6236).

South Africa: Transvaal: Acornhoek, xi.1918, 3 females (SAM 4391); Kaapmuiden, 1-12.xi.1918, 2 females (SAM B4256); Roodeplaat Dam Nature Reserve, 20.iii.1981, M. Stiller, sweeping and beating, 1 imm. female (NCA 81/951); Roodeplaat Dam Nature Reserve, 22.x.1980, M. Stiller, sweeping, 1 female (NCA 81/878).

Phenology: adults were collected in March, April, October and November.

Etymology: the species is named after Gerhard, husband of the senior author.

Tibellus hollidayi Lawrence,
Figs. 7(d-g) & 14d.
Tibellus hollidayi Lawrence, 1952: 204.

Types: lectotype female and two paralectotype females, designated here: South Africa,

Natal, Pietermaritzburg (29°38'S, 30°28'E), ix.1946, R. A. Holliday, (NM 4650 - examined).

Diagnosis: male with embolus tip spike-like, short and straight. Tibia with a short ridge-like VTA broad at base (Fig. 7d & e). Female with copulatory opening guides configured as semicircular extensions medially, median septum V-shaped, diverging anterolaterally (Fig. 7f). Tibiae I and II with (3-3) ventral macrosetae (Fig. 1d).

Description

Male (described here for first time).
Size (n=18): TL 9,1(6,9-11,9); CL 3,3(2,7-3,9); CW 2,4(2,1-2,8).

Carapace: 1,4 times longer than wide; fawn to yellowish brown, clothed with fine adpressed setae; median and marginal bands distinct, composed of yellow adpressed setae and numerous brown setae with dark brown basal spots. Eyes: eye area and clypeus yellow, bearing long setae with basal spots; MOA-WP > MOA-L, CLL > MOA-WA. Chelicerae yellow, darker in basal half, with long setae.

Abdomen: dorsum creamy white, mottled in appearance; covered with numerous dark yellow and translucent, adpressed setae; median band composed of a yellow to olive-green lanceolate mark in anterior third of abdomen; lateral bands composed of a row of brown streaks and pale brown lines; area between bands with two rows of setae on each side; area anterior to spinnerets with numerous setae. Venter: yellow with broad, creamy grey, mottled median band, setae with brown basal spots; area anterior to spinnerets darker in colour.

Legs: yellow, spotted in appearance owing to dark brown spots at base of numerous short setae; femora I and II with a row of long, erect ventral setae; tibiae I and II with (3-3) ventral macrosetae (Fig. 1d); leg formula 2413 (legs I and IV subequal in length). Leg measurements (n=10):

	I	II	III	IV
femur	4,50	5,54	3,21	5,19
patella	1,69	1,93	1,17	1,69
tibia	4,12	5,53	2,42	4,33
metatarsus	3,68	5,27	2,28	4,11
tarsus	2,04	2,73	1,23	1,85
Total	16,03	21,00	10,31	17,17

Palp: embolus small, spike-like, with broad base, originating anteromedially on tegulum, tip dark, short and sharply pointed; RTA absent, VTA a short ridge with a broad base (Fig. 7d & e).

Female
Size (n=10): TL 10,1(8,6-15,0); CL 3,8(2,3-4,3); CW 2,8(2,0-3,7). Female larger than male but legs shorter. In colour and form similar to male. Leg measurements (n=10):

	I	II	III	IV
femur	4,05	5,10	2,93	4,71
patella	1,59	1,90	1,15	1,53
tibia	3,52	4,75	2,03	3,49
metatarsus	2,93	3,86	2,08	3,16
tarsus	1,67	2,19	1,14	1,52
Total	13,76	17,80	9,33	14,41

Epigynum: spermathecae with small posterior extensions; spermathecal glands with long ducts; median septum V-shaped, extending laterally to form two semicircular copulatory opening guides (Fig. 7f & g).

Juvenile
Structurally similar to adults.

Variation: the dorsal median band on abdomen varies from whitish yellow to nearly dark grey, occasionally bordered by a narrow blackish line. The lanceolate mark is occa-

sionally indistinct, covered with numerous yellow, adpressed setae and brown spots. Two small brown spots occasionally present in posterior third of abdomen. Lateral bands vary with numerous brown spots or streaks. Ventral median band varies from pale yellow to dark grey in colour.

Distribution: South Africa. New records: Ethiopia, Zaïre, Rwanda and Zimbabwe (Fig. 14d).

Material examined

Ethiopia: Vallei du Dagota, Mission du Bourg de Bozas de Zeltner, 1902, 1 male (MNHN).

Zaïre: 10 km W of Mitwaba (1570 m) (8°38′S, 27°15′E), 16.i.1985, E.S. Ross & R.E. Leach, 2 juveniles (CAS).

Rwanda: Kabiro, 7.x.1946, R. Verhulst, 1 female, 1 male (MRAC 149.546).

Zimbabwe: Kazuma Forestry Camp (1825B3), Falcon College collection, 14.iv.1988, 1 female (NMZ/A6620).

South Africa. Natal: Ndumu Reserve, 14.i.1980, P. Reavell, imm. male (NCA 86/22); Pietermaritzburg, iii.1952, R. F. Lawrence, 11 females (NM 5887, 4295, 5339); Pietermaritzburg, vi. 1951, 9 females (NM 5472, 5534, 4631); Pietermaritzburg, ii. 1952, A. Lawrence, 1 female (NM 5883). Orange Free State: Hopefield 1381 (28°53′S, 26°10′E), 8.i.1986, sweeping, 2 imm. female (NMB 1330); Rosthof (28°47′S, 26°04′E), 8.i.1986, Museum staff collection, sweeping, 1 imm. female, 4 juveniles (NMB 1335); Philandspan (28°57′S, 26°04′E), 8.i.1986, Museum staff collection, 1 imm. male (NMB 1349); Wurasoord (SE2926Ac), 16.i.1986, Museum staff collection, sweeping, 2 imm. females, 2 imm. males, 3 juveniles (NMB 1380); Rusfontein (SE2926BC); 3.i.1986, Museum staff collection, sweeping, 4 females, 1 male, 1 imm. female, 1 imm. male, 2 juveniles (NMB 1396); Aasvoëlberg (30°18′S, 27°03′E), 26.ii.1986, sweeping, 4 females, 1 male (NMB 1456); Clarence, Adullum, ii.1980, C. Kok & H. van Tonder, grass, 2 females, 1 male (NCA 82/65); Oranjeville, 22.iii.1980, A.S. Dippenaar & N.J. Dippenaar, 2 females (NCA 82/60); Winburg (10 km S), 21.iii.1976, A.S. Dippenaar & N.J. Dippenaar, 1 female (NCA 76/913); Ficksburg, 7.iii.1989, M. Filmer, sweeping grass on rocky mountainside, 2 females, 1 male (NCA 89/1003); Ficksburg, Sentra-East Nature Reserve, 7.iii.1989, M. Filmer, 1 female, 1 male (NCA 89/1004). Transvaal: Swartklip, 26.iii.1978, G. Nel, sweeping grass, 1 female (NCA 78/404); Bourke's Luck, 31.iii.1991, M. Filmer, grass sweep at top of canyon, 2 females, 1 male (NCA 92/514); Four-ways golf-course, Johannesburg, 12.iv.1989, L. Prendini, grass, 1 female (NCA 92/515); Bronkhorstspruit, Onverwacht, 26.ii.1978, A.S. Dippenaar & N.J. Dippenaar, sweeping grass, 2 females, 1 male, 1 imm. female (NCA 78/266), Bronkhorstspruit to Pretoria (old road), 26.iv.1977, A.S. Dippenaar & I. van Rooyen, 1 female (NCA 77/783); Lochvaal, North shore, 27.i.1980, A. Le Roy, sweeping grass, 2 males, 1 juv. (NCA 82/38); Pretoria, 1987, P.S.G. Lombaard, 2 females (NCA 92/513); Heidelberg, Suikerbosrand Nature Reserve, 14.ii.1979, A. Jordaan, & A.S. Dippenaar, 8 females, 2 males, 1 imm. female, 1 juv. (NCA 79/150); Johannesburg, Melville Koppies, 15.ii.87, P. Boxall, 1 female (NCA 87/307); Johannesburg, Norscott Nature Reserve, 7.ii.1987, M. Filmer, grass sweep, 1 female, (NCA 87/399); Sandton, Norscott Koppies, 8.iii.1981, A. le Roy, grass, 1 female (NCA 81/210); Skeerpoort, 22.iii.1980, A. le Roy, 1 female (NCA 82/68); Potchefstroom, Experimental Farm, 17.iii.1981, A.S. Dippenaar, 1 female (NCA 81/52); 30 km from Klerksdorp (Wolmaransstad road), 2.ii.1979, E. Ueckermann, sweeping grass, 1 imm. female (NCA 79/129); Broederstroom, Brooklands Farm, 28.v.1978, A. le Roy, on egg sacs in grass, 8 females, 1 juv. (NCA 78/569); Nylsvlei Nature Reserve, Naboomspruit, 9.xii.1992, A. le Roy, sweeping grass, 2 imm. female (NCA 91/1683); Roodeplaatdam Nature Reserve, 1980-1982, A.S. Dippenaar e.a., males, females & juveniles (NCA 81/793, 81/805, 81/922, 81/938); 82/496, 82,508, 82/742, 89/538, 81/164, 84/182, 84/176, 84/164); Nigel, 21.i.1990, M. Filmer, grass sweep, 1 imm. female (NCA 91/1684). Cape Province: 32 km from Aliwal North on Lady Grey road, 12.iii.1986, E.A. Ueckermann, 1 female (NCA 86/41).

Phenology: specimens were mainly collected from grass with a sweepnet, from December to May. A female was collected in May on her egg sac attached to grass.

Tibellus kibonotensis Lessert
Figs. 8(a-g) & 14c.
Tibellus kibonotensis Lessert, 1919: 164; Caporiacco, 1947: 849; 1949: 450.

Types: lectotype male and paralectotype female, designated here: Tanzania, Kibognoto, a settlement in the south-western foothills of Mt Kilimanjaro, Moshi District (3°12′S, 37° 7′E), (MNHG - examined)

Diagnosis: male with embolus large, obliquely striated (Fig. 8d & e). Female with U-shaped median septum, resembling *T. nigeriensis*, but shape of copulatory opening guides different and spermathecal glands located anteromedially (Fig. 8f & g). Carapace flattened (Fig. 8c), tibiae I and II with (3-3) ventral macrosetae (Fig. 1d).

Description

Male
Size (*n*=3): TL 6,0(5,5-6,1); CL 1,9(1,9-2,1); CW 1,3(1,3-1,5). Carapace: flattened (Fig. 8c) and 1,4 times longer than wide; yellow to fawnish brown; clothed with yellowish brown, adpressed setae; median and marginal bands composed of pale brown, scattered spots, and indistinct short setae (Fig. 8a). Eyes: eye area whitish yellow; MOA-WP > MOA-L and distances AME-AME, ALE-AME and ALE-PME equal. Clypeus and chelicerae in colour similar to carapace, bearing few long setae with basal spots; CLL < MOA-WA.

Abdomen: dorsum pale yellow, covered with fine adpressed setae; median band composed of lanceolate mark in anterior third of abdomen, extending as single line to posterior edge; lanceolate mark bordered by setae and nine evenly spaced black spots; dorsum with a longitudinal row of evenly spaced brown streaks on both sides of median band (Fig. 8b). Venter: pale yellow, mottled in appearance, covered with translucent setae; median band dark.

Legs: pale yellow, covered with numerous short, pale yellow to brown setae, longer setae with brown basal spots scattered in between; femora I and II with a row of long setae ventrally; tibiae I and II with (3-3) ventral macrosetae; leg formula 2413. Leg measurements (*n*=3):

	I	II	III	IV
femur	3.10	3,70	1,75	4,05
patella	0,93	1,08	0,40	0,95
tibia	2,54	3,40	1,20	3,18
metatarsus	2,35	3,00	1,13	2,78
tarsus	1,30	1,60	0,90	1,08
Total	10,22	12,78	5,38	12,04

Palp: embolus large, dark and obliquely striated; base broad, originating anteromedially on tegulum; tip straight, directed laterally, resting on translucent, subtriangular membrane; tibial apophyses absent (Fig. 8d & e).

Female
Size (*n*=9): TL 7,4(5,5-8,9); CL 1,9(1,7-2,8); CW 1,5(1,2-1,9). Female larger than male but legs shorter and leg formula different 4213. In colour and form similar to male but carapace 1,3 times longer than wide and tibiae I and II with (3-3) or (3-4) ventral macrosetae. Leg measurements (*n*=9):

	I	II	III	IV
femur	2,60	3,19	1,70	3,84
patella	1,05	1,12	0,47	0,87
tibia	2,18	2,85	1,23	3,00
metatarsus	1,80	2,32	1,02	2,38
tarsus	1,04	1,26	0,55	1,03
Total	8,67	10,74	4,97	11,12

Epigynum: spermathecae with small posterior extensions; spermathecal glands located anteromedially; median septum U-shaped, diverging anteriorly; copulatory opening

guides large, cupulate, continuing beyond anterior margin of spermathecae (Fig. 8f & g).

Juvenile
Structurally similar to adults but paler in colour.

Variation: median and marginal bands on carapace vary from indistinct (Malawi, Mozambique and Swaziland) to distinct (Zimbabwe, Uganda, Rwanda and Transvaal). Median and lateral bands on abdomen occasionally covered with numerous small brownish black spots.

Distribution: Tanzania. New records: South Africa, Uganda, Rwanda, Zimbabwe, Malawi and Mozambique (Fig. 14c).

Material examined

Uganda: Island Bugaia (0°03′N, 33°16′E), Mukono, ii.1968, E. Vertriest, 1 male (MRAC 134.719).

Rwanda: Kabiro, 7.x.1946, R. Verhulst, 1 female, 1 imm. male (MRAC 149.546).

Zimbabwe: Kazuma Depression (1825B3), 19.iv.1988, Falcon College collection, 1 imm. female (NMZ/A6621); Bulawayo, Hillside Dams (20°10′S, 28°35′E), 24.xi.1979, C.A. Car, 1 female (NMZ/A987); Maleme Rest Camp (2028DI), 4.ii.1987, J. Minshull, 1 female, 8 juveniles (NMZ/A5525).

Malawi: Chinteche (11°50′S, 34°13′E), i-ii.1976, R. Jocqué, 2 female, 1 male (MRAC 147.948), same locality data, 1 male, 1 imm. female (MRAC 148.011), same locality data, 1 female (MRAC 147,995).

Mozambique: Nyaka Island, i.1924, 1 female, 1 imm. male, 1 imm. female, R.F. Lawrence (SAM B6543).

South Africa: Natal, Mtunzini, 10.iii.1981, P. Reavell, grassveld, 1 female (NCA 91/774); Transvaal, road between Pretoria and Bronkhorstspruit, 26.iv.1977, A. S. Dippenaar, sweeping grass, 1 juvenile (NCA 77/783); Waterberg, Klipfontein (24°08′S, 28°18′E), 6.xii.1979, C.A. Car, on grass, 1 female (NMZ/A366).

Phenology: adults were collected mainly on grass from October to April.

Tibellus minor Lessert, stat. nov.
Figs. 9(a-f) & 14a.
Tibellus vossioni minor Lessert, 1919: 161; Millot, 1941: 72; Caporiacco, 1947: 210.
Tibellus vossioni, Lawrence, 1927: 40.

Types: holotype male and paratype female: Tanzania, according to label "Kibonoto, Kilimanjaro". It is likely that Kibonoto is a misspelling of Kibognoto, a settlement in the south-western foothills of Mt. Kilimanjaro, Moshi District (3°12′S, 37°7′E), (MNHG).

Remarks: Lessert (1919) described *T. vossioni minor* on the basis of the shape of the cephalothorax and abdomen, its small size and the short tibia of the male palp. Caporiacco (1947) referred a male and female from Arusha, Tanzania, to *T. vossioni minor*. Examination of the type material of *T. vossioni* as well as the type and other material of *T. vossioni minor*, indicated that the two taxa differ as follows: the tarsal palp of *T. v. minor* is shorter and the embolus is smaller and more curved (Fig. 9c). The total length of *T. v. minor* males is 6,1-9,9 mm while two *T. vossioni* males are 10,5 and 12,4 mm in length. The body and legs of *T. v. minor* have numerous spots that vary in colour from pale grey to brownish black while spots are absent in *T. vossioni*. These differences suggest that the two taxa represent different species.

Diagnosis: male with embolus black, claw-shaped, curving laterally; shape of embolus intermediate between strongly curved embolus of *T. sunetae* and slightly curved embolus of *T. vossioni*. Retrolateral tibial apophysis reduced (Fig. 9c). Female with elongate spermathecae with curved posterior extensions and small copulatory opening guides; small (cog) resembling that of *T. sunetae* (Fig. 9e & f). Tibiae I and II with (2-2) ventral macrosetae (Fig. 1d).

Description

Male

Size (n=10): TL 7,9(6,1-9,9); CL 2,7(2,2-3,3); CW 2,1(1,8-2,5). Carapace 1,3 times longer than wide, sloping gently towards sides; fawn to yellow in colour; median band pale brown, covered with short brown setae, brown spots and a few broken lines extending to posterior edge (Fig. 9a); marginal bands composed of anteriorly directed, short setae with dark basal spots. Eyes: eye area pale yellow; MOA-WP > MOA-L. Clypeus pale yellow; CLL > MOA-WA. Chelicerae bearing long setae with brown basal spots.

Abdomen: dorsum whitish grey, mottled in appearance, with longitudinal rows of setae; median band grey, composed of a lanceolate mark occasionally extending as a single line to posterior edge; two conspicuous brownish black spots or streaks on both sides of median band in posterior third of abdomen, occasionally two spots or streaks in anterior third of abdomen (Fig. 9b); median band occasionally covered with grey to black spots; numerous spots and setae anterior to spinnerets; lateral bands occasionally with streaks or spots as well as numerous black spots. Venter: whitish grey, mottled in appearance; median band indistinct.

Legs: legs I to IV yellowish fawn with numerous short and longer setae and brown macrosetae with brown basal spots; brown spots on femur and patella of all legs arranged in longitudinal rows (Fig. 9d); femora I with a row of long ventral setae; tibiae I and II bearing (2-2) ventral macrosetae with three macrosetae on pro- and retrolateral sides, third macroseta occasionally situated more ventrally (could be mistaken for paired ventral macrosetae), leg formula 2413. Leg measurements (n=10):

	I	II	III	IV
femur	4,49	5,23	3,63	4,99
patella	1,51	4,03	1,67	1,12
tibia	4,03	4,78	2,68	3,55
metatarsus	3,73	4,53	2,58	3,64
tarsus	2,03	2,41	1,27	1,65
Total	15,79	18,62	11,28	15,38

Palp: embolus large, black with broad base originating anterolaterally from tegulum; tip claw-shaped, slightly curved; VTA absent; RTA a short blunt ridge with broad base (Fig. 9c).

Female

Size (n=10): TL 9,6(6,8-11,6); CL 2,9(2,4-3,5); CW 2,2(1,8-2,8). In colour and shape similar to male but size larger and legs shorter. Leg measurements (n=10):

	I	II	III	IV
femur	3,98	4,55	2,52	3,95
patella	1,55	1,62	0,91	1,18
tibia	3,32	4,01	1,76	2,99
metatarsus	2,81	3,40	1,60	4,22
tarsus	1,61	1,85	0,87	1,25
Total	13,27	15,43	7,66	13,59

Epigynum: spermathecae elongate with curved posterior extensions; spermathecal glands located posterolaterally (Fig. 9e); median septum V-shaped, diverging anterolaterally; copulatory opening guides small (Fig. 9e & f).

Variation: colour is polymorphic, varying from as described above to a dark, melanistic colour (Suikerbosrand Nature Reserve, Transvaal, NCA 79/198,). Intermediate forms occur that are completely covered with black spots (immature females from Nyaka Island, Mozambique, SAM 6543).

Juvenile
Similar to adults in colour and shape.

Distribution: Tanzania. New records: South Africa, Upper Volta, Nigeria, Somalia, Gabon, Rwanda, Kenya, Zaïre, Zimbabwe, Botswana, Namibia and Mozambique (Fig. 14a).

Material examined

Upper-Volta: Ouagadouga, 1 male (MNHN).

Nigeria: Central province Jos, 1968, A. Bot Gwong, 1 female (MRAC 135.943).

Gabon: Panga (3°14′S; 10°34′E), Savannah côtière, 31.iii.1986, A. Pauly, 1 female, 1 imm. male, 1 juvenile (MRAC 173.074).

Somalia: Mahaddei Uen, Scebeli River, 23.ix.1968, S.B.S., 1 female (MRAC 173.164).

Rwanda: Cabiro, vii.x.1946, R. Verhulst, 5 females, 2 imm. females, 1 male, 5 imm. males (MRAC 149.546).

Zaïre: Kivu, vallée de la Ruindi (0°48'S; 29°18'E), 10.vii.1972, R.P.M. Lejeune, 1 male, 1 imm. male (MRAC 144.446); Kivu, Uvira (3°25'S; 29°08'E), iii.1962, R. Kiss, 2 females (MRAC 122.095); Kando (10°49'S, 26°07'E), 1 male (MNHG); Wambali, vii.1973, Van der Ryst; Karawa (20°16′N; 20°16′S), Rev. Wallin, 3 imm. female (MRAC); Katanga, Luiswishi, 28 km NE Lubumbashi (1208 m), savannah, 1974, F. Malaisse, 1 female, 1 male (MRAC 145.526, 145.527); Shaba, Luiswishi, ii-iii.1974, F. Malaisse, 1 female, 1 imm. male, 1 imm. female (MRAC 149.148).

Zimbabwe: North of Shabani Runde, tribal trustland (20°05′S, 30°05′E) 21.iv.197†, T. Payne, 1 female (NMZ/A1459); Chitove Rapids (2132A4), Lundi River, Gonarezhou National Park, 22.iv.1985, J. Minshull, 1 female (NMZ/A3398); Humani Ranch, store camp (2032C2), Falcon College collection, 9.iv.1987, 6 females (NMZ/A5956); Harare (1731C3), iv.1984, A. Mkondo, 1 female (NMZ/A2245); Mtilikwe River Bridge (2131A2), outside triangle, 16.iv.1985, J. Minshull, 1 female (NMZ/A2977); South Bank, Lundi River, Tokwe/Lundi weir near low level bridge, 16.iv.1985, J. Minshull, 1 female (NMZ/A3004); Pomongwe Access Road (2028D1), Matopos National Park, 5.ii.1987, J. Minshull, 2 imm. females, 1 male (NMZ/A5574); Sabi West National Parks Camp (2132A4), Gonarezhou National Park, 3.iv.1985, J. Minshull, 1 imm. female (NMZ/A3386); Bulawayo, Matsheumslope, 2.ii.1979, C. Car, 1 male (NMZ/A473); Maleme Rest Camp (2028DI), Matopos National Park, 7-12.ii.1988, J. Minshull, 1 male, 2 imm. females (NMZ/A6320).

Botswana: Okavango Delta, Xugana Island (19°04′S, 23°03′E), 130 km NNW of Main, 14-26.xi.1979, B.H. Lamoral, 2 females, 1 imm. female, juveniles (NM).

Namibia: Andara-Kavango, Okavango River, 1979, M. E. Baddeley, 4 males (MRAC 152.820); Pioneers Park, Windhoek, 13.iv.1977, M.J. Penrith & M.L. Penrith, 1 female (SMN 36361); Bloubokdraai (18°50′S, 16°57′E), 15.ii-13.iii.1987, E.Griffin, preservative pitfall traps, 1 male (SMN 40182); Kunene River, Erikson's Drift, iii.1923, R.F. Lawrence, 1 male (SAM B6151).

Kenya: Nairobi, Karura Forest, 8.xii.1979, P. Reavell, 1 imm. female (NCA 82/98).

Mozambique: Nyaka Island, i. 1924, R.F. Lawrence, 4 imm. female, 1 imm. male (SAM B6543).

South Africa: Bophuthatswana, Pilansberg Nature Park (25°S, 27°E), A. Leroy, 2.iii.1985, sweeping grass, 1 female (NCA 87/452); Barokolala Nature Reserve, 25.iii.1989, M. Filmer, sweeping grass, 1 female (NCA 89/1153). Cape Province: Cape Town, Lions Head, xii.1991, 1 female (SAM C2393) Kookfontein 88, (32°07′S, 18°25′E), Clanwilliam, 21.x.1987, L. N. Lotz, 1 female (NMB 2291); Clanwilliam, 21.x.1987, E. Visagie, sweeping, 1 female (NMB 2290); Rooielsberg, 10.x.1969, W. Schautelbule, 1 female (NCA 93/255); Goodwood, 10.x.1969, W. Schautelbule, 1 female (NCA 93/254); 40 km East of Ceres, foothills of Hexriver mountains (3319BC), 18-19.xi.1981, C. Car, 1 male, 3 imm. males, 2 imm. female (SAM 773, 778, 795, 1474, 1769, 7552); Road between Port Alfred and East London, 1.xii.1977, A.S. Dippenaar, sweeping, 1 male (NCA 77/1195); Addo Elephant Park, 6.xii.1977, A.S. Dippenaar, sweeping grass, 3 females, 1 male (NCA 77/1226); Grootfontein, Vredendal 105, (32°04′S, 18°39′E), 20.x.1987, Museum staff collection, light trap, 1 male (NMB 2226); Malmesbury, Rondeberg 567 (33°24′S, 18°21′E), 25.x.1987, E. Visagie, under plants, 1 imm. female (NMB 2443); Gretna Farm (33°21′S, 26°29′E), 6 km SW of Grahamstown, 29.xii.1981, sweeping grass, P.M.C. Croeser & P.G.Hawkes, 1 male

(NM); Grahamstown, 28.i.1979, P. Croeser, 1 female (NCA 82/148); Ceres, 40 km NE on Touws river Road, A.S. Dippenaar, 18-27.xi.1981, sweeping and beating mixed vegetation, 2 females, 1 male, 8 imm. females, 2 juveniles (NCA 81/1026); Patensie, Otterford Forest Station, xii.1967, *Maccia* vegetation, P. & B. Stuckenburg, 1 male (NM 12473). Natal: Ndumu Reserve, 22.ii.1978, E. van den Berg, 1 male, 7 imm. females, 2 juveniles (NCA 82/66); Westville, Durban, 9.ii.1981, P. Reavell, grassy slope on hill, 1 imm. female, 2 male (NCA 81/107); Empangeni, 20.xi.1980, grass, P. Reavell, 2 female (NCA 81/90); Hluhluwe, 27.ii.1989, M. Filmer, sweeping grass, 1 male (NCA 89/1151); Mkuzi Game Reserve, 21.ii.1989, M. Filmer, sweeping grass, 1 female, 1 male (NCA 89/1152, 91/778); Makatini Flats on road to Sodwana, 3.iv.1977, A.S. Dippenaar, sweep mixed grass, 5 females (NCA 77/610).Transvaal: Rustenburg Nature Reserve, 5.ii.1980-16.iii.1983, A. van den Berg e.a., sweeping, 8 females & 2 imm. females, 1 imm. male (NCA 84/355, 84/411, 84/406); Rustenburg Nature Reserve, 5.ii.1980, M. Stiller, sweeping grass and herbs, 1 female (NCA 80/233); Lindhaven, Roodepoort, 20.i.1979, J. Leroy, sweeping grass, 1 male, (NCA 79/175); Bandolierkop, M. Filmer, 20.iii.1989, sweeping grass, 1 female (NCA 89/1150); Suikerbosrand Nature Reserve, 14.ii. & 4.iii.1979, 14.xi.1979, A. Leroy, sweeping grass, 5 females, 2 imm. females (NCA 79/150, 79/198, 88/43); Wonderboom Nature Reserve, 14.ii.1981, A.S. Dippenaar, 1 male (NCA 87/334); Wonderboom Nature Reserve, 17.iii.1984, Wild Life Society, sweeping, 1 female (NCA 84/433); Roodeplaatdam Nature Reserve, 15.i.1980-1984, A.S. Dippenaar et al., sweeping, females, males (NCA 81/805, 81/793, 84/164, 82/742, 84/176, 83/165, 83/19, 81/816, 81/951, 81/922, 81/938); Oudestadt, Groblersdal, 9.i.1980, M. Stiller, sweeping grass round cotton field, 1 male (NCA 85/272); Norscott Koppies, 8.iii.1981, A. Leroy, 1 female (NCA 81/210); Strydomtunnel, 6 km E on Hoedspruit road, (6 km East on Hoedspruit road), 22.ii.1978, E. van den Berg, sweeping grass, 3 females (NCA 78/241, 78/243); Swartklip, G. Nel, 26.iii.1978, sweeping grass, 1 female (NCA 78/404); Rietondale Research Station, Pretoria, 15.iii.1988, A.S. Dippenaar, 1 female, (NCA 89/122); Orighstad, 22.ii.1978, E. van den Berg, sweeping grass, 1 female (NCA 78/236); Barberspan, 31.i.1987, K. Morgan, front porch of house, 1 male (NCA 87/512); Melville Koppies, Johannesburg, 15.ii.1987, P. Boxall, sweeping grass, 1 male (NCA 87/355); Elandslaagte, Krugersdorp, 12.vi.1098, A. Le Roy, 1 female (NCA 91/773); Elandslaagte, Krugersdorp, 12.vi.1987, A. Leroy, 1 female (NCA 91/773); Limpopo Research Station, 29.iii.1973, A.S. Dippenaar, sweeping mixed grass, 1 female (NCA 76/1793); Loskopdam Nature Reserve, A.S. Dippenaar, 6.iv.1974, sweeping grass and herbs, 1 female (NCA 76/1809); Vaalwater, 17.iii.1991, S. Langton, grass sweep, 1 female (NCA 91/776). Orange Free State: Golden Gate Nature Reserve, E. van den Berg, 6.iv.1974, sweeping, 2 females, 3 males (NCA 81/1124); Ficksburg, 7.iii.1989, M. Filmer, sweeping grass on rocky mountains, 2 females (NCA 89/1154); Wurasroad SE 2926 AC, 16.i.1986, Museum staff collection, sweeping, 1 male, 1 female, 1 juvenile (NMB 1380); Vrede, 29.ii.1992, T.B. Wessels, in house, 1 female (NCA 91/1682); Bloemfontein, Rosthof (28°47′S, 26°47′E), 8.i.1986, Museum staff collection, sweeping, 4 imm. females, 2 imm. males (NMB 1335); Bloemfontein, Philandspan (28°57′S, 26°04′E), 8.i.1986, Museum staff collection, sweeping, 1 imm. female (NMB 1349); Florisbad (SE2826CC), 12.ii.1986, Museum staff collection, sweeping, 1 male (NMB 1446).

Phenology: *Tibellus minor* is common in grassland, and is widely distributed in the Afrotropical Region. Adults were collected from October to April. In captivity one individual preyed on *Euphestia cautella* moths and *Hodotermes mossambicus.*

Tibellus nigeriensis Millot,
Figs. 9(g-h), 10(a-c) & 14c.
Tibellus nigeriensis Millot, 1941: 76.

Type: holotype female: Sudan, Sangha (coordinates unknown), ix.1937, Millot, (MNHN - examined).

Diagnosis: male unknown. Female with copulatory opening guides wide and lunate, median septum U-shaped, extending horizontally across spermathecae (Fig. 9g & h). Shape of median septum resembling *T. kibonotensis* but shape of the copulatory opening guides and position of spermathecal glands differ. Tibiae I and II with (3-3) ventral macrosetae (Fig. 1d).

Description

Female
Size (n=1): TL 16,4; CL 3,9; CW 2,7.

Carapace: 1,4 times longer than wide (Fig. 10b), flattened dorsally; pale yellow to fawn; median and marginal bands distinct, composed of numerous short, pale brown setae with brown basal spots (Fig. 10c). Eyes: eye area clothed with long straw-coloured setae, white band connects ALE and PLE; MOA-WP > MOA-L. Clypeus with long, straw-coloured, setae; CLL > MOA-WA. Chelicerae dark yellow, bearing long, straw-coloured setae with brown basal spots.

Abdomen: dorsum creamy white, mottled in appearance; covered with adpressed, pale yellow setae, larger setae with brown basal spots scattered in between; median band composed of cream to yellow lanceolate mark with veins in anterior third of abdomen extending as a single line to posterior edge; two brown streaks in posterior third of abdomen (Fig. 10a). Venter: yellowish white, mottled in appearance, bearing numerous, pale yellow setae with brown basal spots.

Legs: pale yellow, bearing numerous pale yellow and brown setae with brown basal spots; patellae, tibiae and metatarsi with large brownish black spots occasionally extending as streaks at base of macrosetae; tibiae I and II with (3-3) ventral macrosetae (Fig. 10c); leg formula 2413. Leg measurements (n=1):

	I	II	III	IV
femur	4,75	5,80	3,30	6,00
patella	2,00	2,15	1,00	1,80
tibia	4,30	5,50	2,75	4,75
metatarsus	3,50	4,75	2,05	4,00
tarsus	1,90	2,50	1,35	1,70
Total	16,45	20,70	10,45	18,25

Epigynum: spermathecae elongate with posterior extensions; spermathecal glands with long ducts visible anterolaterally; copulatory opening guides wide, lunate, median septum U-shaped (Fig. 9g & h).

Male and Juvenile
Unknown.

Distribution: known only from the type locality (Fig. 14c).

Phenology: the holotype female was collected in September.

Tibellus nimbaensis spec. nov.,
Figs. 10(d-g), 11(a-b) & 15a.

Types: holotype male: Guinea, Mt. Tô (1600 m) in the Nimba mountain range, Camp I (between 7°45′N and 8°30′W), 20.iv.1942, Lamotte & Roy, (MNHN). Paratypes (2 females): same locality, collected in June 1942 in prairie field by Lamotte & Roy, (MNHN).

Diagnosis: male with embolus small, spike-like, tip slender (Fig. 10d), similar in shape to *T. armatus* but tegulum more circular and palp smaller. Number of macrosetae on tibiae I and II also differ between the two species. Female with copulatory opening guides of medium length, spermathecal glands without ducts (Fig. 10f & g). Tibiae I and II with (2-2) ventral macrosetae (Fig. 1d).

Description

Male
Size (n=1): TL 7,4; CL 2,7; CW 2,0.

Carapace: 1,3 times longer than wide; cream to pale yellow, distinct median and marginal bands composed of pale brown spots, lines and dark setae that curve anteriorly (Fig. 11a). Eyes: eye area pale yellow with greyish black spots; MOA-WP > MOA-L. Clypeus: pale yellow, CLL < MOA-WA. Chelicerae pale yellow with greyish black spots.

Abdomen: dorsum fawnish white, mottled in appearance, with numerous setae more or less

in longitudinal rows (setae detach readily); median and lateral bands formed by pale brown spots (occasionally the faint yellow lanceolate mark visible beneath spots in anterior third of abdomen); one large brown spot on median band and two brown spots on both sides of median band in posterior third of abdomen (Fig. 10e); venter yellowish white, mottled in appearance; median band indistinct.

Legs: cream to pale yellow, bearing numerous short and longer brown setae with pale brown spots scattered in between; femur I with ventral row of erect setae; tibiae I and II with (2-2) ventral macrosetae; leg formula 2413. Leg measurements (n=1):

	I	II	III	IV
femur	2,55	6,50	2,60	4,15
patella	1,10	4,10	0,60	1,01
tibia	3,25	1,50	2,00	3,70
metatarsus	2,65	3,50	1,60	3,00
tarsus	1,50	1,25	0,85	1,60
Total	11,05	16,85	7,65	13,46

Palp: embolus small, spike-like, same colour as tegulum; base slightly expanded; tip slender and slightly angled; originating anteromedially from tegulum; tegulum circular; RTA a blunt ridge, VTA absent (Figs. 10d & 11a).

Female
Size (n=3). TL 9,5(8,6-11,3); CL 2,5(2,3-2,7); CW 1,9(1,8-2,0). Similar to male but slightly larger with shorter legs, darker in colour with numerous brownish black spots on median and lateral bands; leg formula 4213. Leg measurements (n=3):

	I	II	III	IV
femur	3,00	3,55	1,93	3,88
patella	1,13	1,20	0,75	1,00
tibia	2,52	2,85	1,77	2,78
metatarsus	2,10	2,45	1,23	2,42
tarsus	1,30	1,47	0,77	1,53
Total	10,05	11,52	6,45	11,61

Epigynum: spermathecae sloping posteriorly, with posterior extensions; spermathecal glands situated posterolaterally, without ducts; median septum V-shaped, diverging anterolaterally, copulatory opening guides of median length (Fig. 10f & g).

Juvenile
Structurally similar to adults.

Distribution: Guinea (Fig. 15a).

Material examined

Guinea: from the Nimba mountain range (between 7°45'N and 8°35'W) the following localities: Mt. Tô (1600 m), vi.1942, Lamotte & Roy, prairie, 9 imm. females, 7 imm. males (MNHN); Mt. Tô, Camp I, 20.iv.1942, Lamotte & Roy, 1 female, 10 imm. females, 13 imm. males (MNHN); Plateau of Mt. Tô (1640 m), 10.iii.1991, C. Rollard, 1 juvenile (MNHN); Mt. Leclerc (1250 m), 2.iii.1991, C. Rollard, 2 juveniles (MNHN); Mt. Leclerc (1450 m), 23.iii.1991, C. Rollard, on meadows, 3 juveniles (MNHN).

Phenology: known only from mountainous areas (1 250 m - 1 640 m a.s.l.) in Guinea. Adult spiders were collected in April and June and juveniles in March and April.

Etymology: the species is named after the Nimba Mountain range in Guinea where the type material was collected.

Tibellus septempunctatus Millot,
Figs. 11(c-f) & 15b.
Tibellus septempunctatus Millot, 1941: 74.

Type: holotype male: Guinea, Kouroussa (10°40′N, 9°50′W), viii.1938, J. Millot, (MNHN - examined).

Diagnosis: male with embolus broad at base, attenuated to form a claw-like tip originating from behind tegulum; RTA and VTA absent (Fig. 11c & d). Seven black spots on abdomen (Fig. 11e), AME distinctly larger than ALE. Tibiae I and II with (2-2) ventral macrosetae (Fig. 1d). Female unknown.

Description

Male
Size (*n*=1): TL 6,0; CL 2,3; CW 1,9.

Carapace: 1,2 times longer than wide (Fig. 11f); cream to pale yellow with indistinct median and marginal bands; bands composed of numerous pale yellow, short setae that are directed anteriorly; two pairs of pale brown spots in posterior half of carapace, anterior pair more prominent (Fig. 11f). Eyes: eye area yellowish white with a few long setae; MOA-WP > MOA-L; AME distinctly larger than ALE. Clypeus pale yellow with long setae; CLL < MOA-WA. Chelicerae pale yellow.

Abdomen: dorsum creamy white and covered with translucent setae; median and lateral bands indistinct; five large brown spots in anterior third of abdomen, two black spots in posterior third (Fig. 11e). Venter: creamy white, median band indistinct.

Legs: pale yellow, without spots, bases of macrosetae darker yellow; tibiae I and II with (2-2) ventral macrosetae (Fig. 1d); leg formula 2143. Leg measurements (*n*=1), leg III missing:

	I	II	III	IV
femur	3,50	4,25	–	3,80
patella	1,33	1,45	–	1,05
tibia	3,08	3,88	–	2,90
metatarsus	2,80	3,60	–	2,75
tarsus	1,80	2,10	–	1,45
Total	12,51	15,28	–	11,95

Palp: embolus medium-sized, broad at base, originating from behind tegulum, attenuated to form a claw-like tip protruding from behind tegulum; RTA and VTA absent (Fig. 11c & d).

Female and Juvenile
Unknown.

Distribution: known only from type locality (Fig. 15b).

Phenology: the holotype male was collected in August.

Tibellus seriepunctatus Simon,
Figs. 11(g-h), 12(a-e) & 15b.
Tibellus seriepunctatus Simon, 1907: 322; Lessert, 1919: 212; Millot, 1941: 73; Jézéquel, 1964: 1135.

Types: lectotype female and paralectotype female, designated here: Sierra Leone, Freetown (8°30′N, 13°17′W), (MNHN 13629 - examined).

Diagnosis: male with embolus originating from behind tegulum, only the tip protruding; tip slightly curved and directed anteriorly (Fig. 12a & b). Female with median septum V-shaped, copulatory opening guides curve posterolaterally, almost reaching epigastric furrow (Fig. 11g & h). Abdomen with a series of spots bordering median band (Fig. 12d). Tibiae I and II with (3-3) ventral macrosetae (Fig. 1d).

Description

Female
Size (n=6): TL 7,1(6,6-9,0); CL 2,7(2,5-3,3); CW 2,1(1,9-2,8).

Carapace: 1,3 times longer than wide (Fig. 12e), convex and sloping towards sides (Fig. 12c); fawnish yellow in colour, brown median band composed of spots and brown broken lines, marginal bands composed of brown lines, setae and a few spots; area between median and marginal bands covered with numerous white to pale brown adpressed setae. Eyes: eye area with long setae directed anteriorly; eyes circled with small brown spots; MOA-WP > MOA-L. Clypeus with numerous black spots and setae; CLL < MOA-WA. Chelicerae and palpi with numerous spots and setae.

Abdomen: dorsum creamy white, mottled in appearance, covered with numerous translucent setae; median band mottled with brown, with six large brown spots at edge of median band, a brown spot medially on median band in anterior part of abdomen as well as two large black streaks on both sides of median band in posterior third of abdomen (Fig. 12d); lateral bands occasionally present, composed of brown irregular spots and longitudinal rows of setae. Venter: yellow, median band indistinct.

Legs: yellow; legs I to IV bearing numerous setae with basal spots and grey markings; femora I and II with a row of long ventral setae; tibiae I and II with (3-3) ventral macrosetae and a black streak apically; leg formula 2143. Leg measurements (n=5):

	I	II	III	IV
femur	3,03	3,42	2,58	3,29
patella	1,33	1,47	0,95	0,94
tibia	2,59	3,03	2,09	2,29
metatarsus	2,07	2,42	1,53	2,25
tarsus	1,13	1,37	0,70	1,12
Total	10,15	11,71	7,85	9,89

Epigynum: spermathecae medium-sized with distinct posterior extensions; spermathecal glands located mediolaterally, without ducts; median septum V-shaped, diverging anteriorly, ending in a small circular curve; copulatory opening guides curving posterolaterally, almost reaching epigastric furrow (Fig. 11g & h).

Male
Size (n=4): TL 6,4(6,2-6,7); CL 2,7(2,6-2,8); CW 2,3(2,1-2,5). Colour and spotted effect as in female. Carapace 1,2 times longer than wide. Slightly shorter than female but legs slightly longer. Leg formula 2413; metatarsus IV with a third pair of ventral macrosetae apically and a third seta on each side (absent in females). Leg measurements (n=3):

	I	II	III	IV
femur	3,09	3,68	2,54	3,67
patella	1,19	1,51	0,85	1,02
tibia	2,84	3,18	2,02	3,18
metatarsus	2,59	2,86	2,01	2,52
tarsus	1,19	1,53	0,85	1,17
Total	10,90	12,76	8,27	11,56

Palp: embolus medium-sized, originating from behind tegulum, tip protruding on anterolateral side; RTA a reduced blunt ridge; VTA absent. Cymbium hardly attenuated (Fig. 12a & b).

Variation: marginal bands on carapace indistinct in one specimen from Transvaal (NCA 87/236). A specimen from Senegal (MNHN 14095) with numerous spots on legs and median longitudinal band of abdomen with numerous black spots forming short horizontal broken lines (Fig. 12d).

Juvenile
Structurally similar to adults.

Distribution: Sierra Leone, Benin, Congo, Senegal. New records: South Africa, Dahomey, Guinea, Guinea Bissau, Ivory

Coast, Burundi, Tanzania and Zaïre (Fig. 15b).

Material examined

Dahomey: (no exact locality) 1 female (MNHN 21151).

Tanzania: Oldony Sambu, 15 km N. Arusha (1850 m) (3°10′S, 36°50′E), 22.iv. 1957, A. Regnard, 1 female (MRAC 110.696).

Senegal: Dakar (14°45′N, 17°08′W), vii.1937, J. Millot, 1 female (MNHN); Rufisque (14°43′N, 17°14′W), 1 juvenile (MNHN 14095); Dakar Peninsula, vii.1945, E.H. Newcomb, 2 imm. males, 5 juveniles (CAS).

Ivory Coast: Lamto-Toumodi, 1963-1964, 1 female, 5 males (MNHN).

Zaïre: Kisenge, Dilolo (10°41′S; 22°21′E), 1963, A. Regnard, 1 male (MRAC 126055); Shaba, Luiswishi (11°31′S; 27°27′E), xii.1973, F. Malaisse, 1 female (MRAC 148.978) & 1 female (MRAC 148.971) & ii-iii.1974, 3 females (MRAC 149.160); Kiniati-Yasa, i.1953, P.R. Ruelle, 1 female (MRAC 74290).

Guinea Bissau: Buba, 9-11.iv.1989, A. van Harten, 1 male (MRAC 169921).

Guinea: from the following localities in the Nimba mountain range (7°45′N, 8°35′W): Mt. Pierré Richaud (850-1350 m), 23-25.iii.1991, C. Rollard, savanna, 1 male, 3 females, 2 imm. females, 2 juveniles (MNHN); Mt. Leclerc (900-1500 m), 23-24.iii.1991, C. Rollard, on meadows, 2 males, 1 juvenile (MNHN); Mt. Tô (1620 m), on meadows, 12.ii.1991, Allasane, 3 imm. females (MNHN).

Burundi: Urundi, Makumba, 12.xii.1949, H. Laurent, 1 female (MRAC).

South Africa: Transvaal, Lydenburg, 26.xii.1986, M. Filmer, sweeping grass on mountain slope, 1 female (NCA 87/236).

Phenology: adults were collected from December to April and in July.

Tibellus somaliensis spec. nov., Figs. 12(f-g), 13(a-b) & 14b.

Type: holotype male: Somalia, Mogadishu (2°02′N, 45°21′E), Balad, 23.ix.1964, (MRAC 173.161). Paratype male: Zimbabwe, (NMZ/A167). Paratype female. Somalia: 20 km S Chisimaio (0°33′S; 43°33′E), Sar Uanle, collected in pitfall trap on dune facing land on 13.vi.1973 by G. Messana (MRAC 172.709).

Diagnosis: male with embolus slender, tip slightly darker than tegulum, gradually curving and directed anteriorly, RTA reduced, VTA absent (Fig. 12f & g). Female with spermathecae with posterior extensions and large copulatory opening guides semicircular in configuration, extending over anterior half of epigynum; tip of guide extending to anterior edge of spermathecae (Fig. 13a & b). Tibiae I and II with (2-2) ventral macrosetae (Fig. 1d).

Description

Male

Size (n=3): TL 4,6(4,4-5,1); CL 1,8(1,6-1,9); CW 1,5(1,3-1,8). Carapace: 1,3 times longer than wide; fawn with median band composed of two pale brown lines, dark brown spots and pale brown irregular lines; two marginal bands composed of dark brown irregular spots and short straw-coloured setae. Eyes: eye-area pale yellow with long setae directed anteriorly; MOA-WP < MOA-L; CLL = MOA-WA. Chelicerae bearing long setae with brown basal spots.

Abdomen: dorsum creamy white, mottled in appearance; median band composed of a lanceolate mark bordered by a brown line and row of setae extending posteriorly to edge of abdomen, two distinct black spots in posterior third of abdomen. Abdomen covered with fine straw-coloured setae; sides with scattered small spots and two distinct black spots in anterior third of abdomen; venter creamy white with numerous straw-coloured setae.

Legs: fawnish, covered with brown spots and short setae; tibiae I and II with (2-2) ventral macrosetae, with two black streaks at base of tibiae I and II; leg formula 2413 (legs I and

IV subequal in length). Leg measurements of holotype:

	I	II	III	IV
femur	3,33	4,11	2,32	3,90
patella	1,15	1,25	0,72	1,01
tibia	2,97	3,46	1,63	2,83
metatarsus	3,09	3,03	1,57	2,89
tarsus	1,43	1,52	0,91	1,46
Total	11,97	13,37	7,15	12,09

Palp: embolus small, slender, base slightly expanded posteriorly; tip darker in colour than tegulum, gradually curving, directed anteriorly; embolus originating anteromedially of tegulum; VTA absent; RTA reduced (Fig. 12f & g).

Female

Size (n=1): TL 6,7; CL 2,4; 2,0. In colour and form similar to male but body longer, legs shorter and macrosetae on legs longer; abdomen with olive-green lanceolate mark in anterior third and longitudinal rows of long setae. Femora I and II with ventral row of long setae, leg formula 2413 (legs I and IV subequal in length). Leg measurements (n=1):

	I	II	III	IV
femur	3,07	3,57	2,77	3,50
patella	1,35	1,50	1,00	1,13
tibia	2,75	3,25	1,88	2,75
metatarsus	2,13	2,75	2,73	2,50
tarsus	1,13	1,33	0,10	1,03
Total	10,43	12,40	8,48	10,91

Epigynum: spermathecae with curved posterior extensions; median septum diverging anteriorly to form large copulatory opening guides curving anterolaterally. Spermathecal glands visible in ventral view posterior to copulatory opening guides (Fig. 13a & b).

Distribution: Somalia and Zimbabwe (Fig. 14b).

Material examined

Somalia: 20 km S Chisimaio, Sar Uanle, pitfall trap, dune facing land, 20.vi.1973, G. Messana, 1 male (MRAC 172.716).

Phenology: adult spiders were collected in April and November.

Etymology: the species is named after the its country of origin.

Tibellus sunetae spec. nov., Figs. 13(c-h) & 14a.

Types: holotype male and paratype female: South Africa, Natal, Ndumu Reserve (26°80′S, 32°25′E), 14.i.1990, P. Reavell, in dense grass, (NCA 82/50). Paratype male: South Africa, Transvaal, 6 km S of Skukuza (25°01′S; 31°35′E, elevation 365 m), 17.xii.1984, C. Griswold (NM). Paratype female: Zimbabwe, Humani Ranch (2032c2) store camp, 8-13.iv.1987, Falcon College (students collecting), (NMZ/A6026).

Diagnosis: male with embolus strongly curved (Fig. 13h), VTA obliquely bilobed (Fig. 13g). Female with copulatory opening guides small, spermathecal ducts located posterolaterally (Fig. 13e & f). MOA-WP < MOA-L and tibiae I and II with (4-4) or more ventral macrosetae (Fig. 1d).

Description

Male

Size (n=4): TL 6,7(5,8-7,2); CL 2,2(2,1-2,3); CW 1,8(1,7-1,9). Carapace: 1,3 times longer than wide; fawn, covered with pale brown adpressed setae, brown setae scattered in between; median and marginal bands distinct (Fig. 13d); median band composed of dark brown lines, broken lines and spots; marginal bands composed of dark brown spots and lines. Eyes: eye area with brown streaks and lines as well as long setae; MOA-WP

< MOA-L. Clypeus with dark brown streaks and lines and numerous long setae. Chelicerae with irregular spots and streaks.

Abdomen: dorsum creamy white, mottled in appearance; covered with pale brown fine setae, with six longitudinal rows of short setae; median and lateral bands composed of numerous dark brown to black spots; median band same width throughout (Fig. 13c). Venter: creamy white, mottled in appearance; median band indistinct.

Legs: legs I to IV dorsally with numerous pale yellow, fine, adpressed setae, larger setae with brown basal spots and streaks scattered in between; femur I with a row of long setae ventrally; tibia I with (4-4) and tibia II with (5-4) brown ventral macrosetae; tibia I with two dark brown streaks at base; leg formula 2143. Leg measurements (n=2):

	I	II	III	IV
femur	4,65	5,58	2,90	4,70
patella	1,35	1,50	0,83	1,05
tibia	4,38	5,50	2,30	3,85
metatarsus	3,53	4,73	1,85	3,30
tarsus	1,90	1,88	0,88	1,35
Total	15,81	19,19	8,76	14,25

Palp: embolus medium-sized, originating anteromedially from tegulum; tip dark, strongly curved, slightly twisted; RTA absent, VTA an oblique bilobed ridge extending towards retrolateral side (Figs. 13g & h).

Female

Size (n=3): TL 9,0(8,3-10,6); CL 2,7(2,5-2,8); CW 1,9(1,9-2,0). Female larger than male but legs slightly shorter. In colour and form similar to male. Leg measurements (n=3):

	I	II	III	IV
femur	3,85	4,40	2,60	4,00
patella	1,43	1,48	0,95	1,13
tibia	3,53	4,08	1,96	3,08
metatarsus	2,70	3,28	1,65	2,68
tarsus	1,48	1,78	0,83	1,23
Total	12,99	15,02	7,99	12,12

Epigynum: spermathecae taper posteriorly, with small posterior extensions; spermathecal glands without posterolateral ducts; copulatory opening guides small; median septum V-shaped, diverging anterolaterally (Fig. 13d & e).

Juvenile

Carapace yellow, without spots. Abdomen creamy white, mottled in appearance. Legs spotted.

Variation: in some females, brown irregular spots on femora I and II forming two longitudinal lines on dorsal sides. Tibiae I and II occasionally with more than two basal streaks.

Distribution: South Africa, Mozambique and Zimbabwe (Fig. 14a).

Material examined

Zimbabwe: Humani Ranch (2032c2), store camp, Falcon College (student collection), 7.iv.1987, 1 female, 14 juveniles (NMZ/A5914); Chiredzi (21°03′S, 31°40′E), S. Higgins, 19.i.1980, 1 male (NMZ/A810);

Mozambique: Nyaka Island, i.1924, R.F. Lawrence, 1 male (SAM B6543).

Phenology: adults found mainly on grass from December to April.

Etymology: this species is named after Sunet, the daughter of the first author.

Tibellus vossioni Simon,
Figs. 7h & 14a.

Tibellus vossioni, Simon, 1884: 10; 1901: 23; 1906: 1167; Pavesi 1897: 171; Lessert, 1919: 161; Berland 1922: 61; Millot 1941: 72; Caporiacco, 1947: 210; Lawrence, 1927: 40 (= *T. minor*).

Type: holotype male: Sudan, Khartoum (15°33′N, 32°35′E), (MNHN 5827 - examined).

Diagnosis: male with embolus fairly large and black, tip only slightly curved; tibia with reduced RTA (Fig. 7h). Tibiae I and II with (2-2) ventral macrosetae (Fig. 1d). Although Pavesi (1897) referred to a female, the female was never described and no females are present in the museum collections.

Description

Male
Size (*n*=2): TL 11,5(10,5-12,4); CL 4,0(3,8-4,2); CW 2,9(2,8-2,9). Carapace: 1,4 times longer than wide; cream to pale yellow in colour, covered with pale yellow setae; median band pale brown, covered with short brown setae with tips directed anteriorly; median band composed of pale brown lines and spots; marginal bands indistinct and composed of short setae with dark basal spots, tips directed anteriorly; with a row of setae in area between bands. Eyes: eye area pale yellow, covered with long setae with dark yellow basal spots; MOA-WP > MOA-L. Clypeus pale yellow, bearing long setae with dark yellow basal spots; CLL > MOA-WA. Chelicerae bearing long setae with brown basal spots.

Abdomen: dorsum whitish grey, mottled in appearance; covered with brown, adpressed setae and six longitudinal rows of medium-sized setae; median band with a pale grey lanceolate mark in anterior third of abdomen and two black spots laterally; numerous setae and pale black spots some distance anterior to spinnerets. Venter: whitish grey, mottled in appearance; median band indistinct.

Legs: legs I to IV fawn to pale yellow, bearing numerous setae and brown macrosetae with brown basal spots; tibiae I and II with (2-2) ventral macrosetae; leg formula 2413. Leg measurements (*n*=2):

	I	II	III	IV
femur	6,03	6,88	4,33	6,73
patella	2,08	2,15	1,28	1,68
tibia	5,55	6,60	3,53	5,10
metatarsus	5,08	6,23	3,33	5,23
tarsus	2,63	3,20	1,73	2,35
Total	21,37	25,06	14,20	21,09

Palp: embolus large and dark, with a broad base; tip only slightly curved; VTA absent; RTA a short blunt ridge with a broad base (Fig. 7h).

Female and Juvenile
Unknown.

Distribution: Sudan, Upper-Volta, Ethiopia, Egypt, Zaïre, (Fig. 14a).

Material examined

Upper-Volta: Ouagadouga, 1 male (MNHN).

Phenology: unknown.

Nomina Dubia

Tibellus punctifasciatus Strand
Tibellus punctifasciatus Strand, 1906: 628; 1907: 141; 1908: 41.

Strand (1906) based the description of the species on a female from Ginir-Daua, Ethiopia. The type could not be traced and the description does not allow recognition of the species.

Tibellus robustus Simon
Tibellus robustus Simon, 1885: 366.

Simon (1885) based the description of the species on a juvenile specimen. The description does not allow recognition of the species.

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References

BERLAND, L. 1922. Araignées. Pp. 43-90. *In*: *Voyage de M. le Baron de Rothschild en Ethiopie et en Afrique orientale anglaise (1904-1905).* Paris: Résultats scientifiques. Animaux articulés. 1re Partie.

CAPORIACCO, L. DI. 1939. Arachnida. *In*: Missione biologica nel paese dei Borana. *Raccolti zoologische, Roma* 3: 303-385.

CAPORIACCO, L. DI. 1941. Arachnida. *In*: Missione Biologica Sagan-Omo 12. *Zoologia* 6: 1-159.

CAPORIACCO, L. DI. 1947. Arachnidi raccolti nella regione dei Laghi Etiopici della Fossa Galla. *Memoire della Reale Academia d'Italia. Classe di scienze fisiche matematiche e naturali, Roma* 11: 846-885.

CAPORIACCO, L. DI. 1949. Arachnida della Colonia del Kenya raccolti da Toschi e Meneghetti negli anni 1944-1946. *Commentationes Pontificiae Academiae Scientiarum* 13: 309-492

COETZEE, J.H., A.S. DIPPENAAR-SCHOEMAN AND A. VAN DEN BERG. 1990. Spider assemblages on five proteaceous plants in the fynbos biome of South Africa. *Phytophylactica* 22: 443-447.

DIPPENAAR-SCHOEMAN, A.S., A.M. VAN DEN BERG AND A. VAN DEN BERG. 1989. Species composition and relative seasonal abundance of spiders from the field and tree layers of the Roodeplaat Dam Nature Reserve. *Koedoe* 32: 25-38.

DONDALE, C.D. AND J.H. REDNER. 1978. The crab spiders of Canada and Alaska. Araneae: Philodromidae and Thomisidae. Canada: *Research Branch, Department of Agriculture* 1663.

FOELIX, R.F. 1982. *Biology of spiders.* Cambridge: Harvard University Press.

JÉZÉQUEL, J.F. 1964. Araignées de la Savane de Singrobo (Côte d'Ivoire). 3. Thomisidae. *Bulletin de l'Institut francais d'Afrique Noire* 26: 1103-1143.

LAWRENCE, R.F. 1927. Contributions to a knowledge of the fauna of South-West Africa. VII. Arachnida (Part 2). *Annals of the South African Museum* 25: 1-75.

LAWRENCE, R.F. 1952. New spiders from the Eastern half of South Africa. *Annals of the Natal Museum* 12: 183-226.

LESSERT, R. DE. 1919. Araignées du Kilimandjaro et du Mérou (suite) 3. Thomisidae. *Revue suisse de zoologie* 27: 99-234.

LESSERT, R. DE. 1928. Araignées du Congo recueillies au cours de l'expédition organisée par l'American Museum (1909-1915). Deuxieme partie. *Revue suisse de zoologie* 35: 303-352.

LEVY, G. 1977. The philodromid spiders of Israel (Araneae: Philodromidae). *Israel Journal of Zoology* 26: 193-229.

MIKULSKA, I. 1970. Some observations on the biology of the spider *Tibellus oblongus* (Walckenaer) (Araneae). *Bulletin of the British Arachnological Society* 1: 113-116.

MILLOT, J. 1941. Les Araignees de l'Afrique occidentale Francaise. Thomisides. *Mémoirs de l'Académie des sciences de l'Institut de France* 65: 1-82.

ODUM, E.P. 1971. *Fundamentals of ecology.* Philadelphia: Saunders.

PAVESI, P. 1897. Study sugli Arachnidi africani. 9. Arachnidi Somali e Galla raccolti da Don Eugenio dei Principi Rispoli. *Annali del Museo civico di storia naturale di Genova* 38: 151-188.

RAPP, W.F. 1984. Some observations on the biology of *Tibellus oblongus* (Araneae: Philodromidae). *American Arachnology* 30: 13.

RAPP, W.F. 1986. *Tibellus oblongus* (Walckenaer) - A second look. Actas X Congress International Arachnology, Jaca Espana 1: 257-258.

SIMON, E. 1875. Les Arachnides de France. 2. Paris: 1-350.

SIMON, E. 1884. Arachnides recueillis à Khartoum (Soudan égyptien) par M. Vossion, vice-consul de France et appartenant au Muséum de Paris. *Bulletin de la Société zoologique de France* 9: 1-28.

SIMON, E. 1885. Etudes arachnologiques. 18e Mémoire. 26. Matériaux pour servir à la faune des Arachnides du Sénégal. (Suivi d'un appendice intitulé: descriptions de plusieurs esp nouvelles). *Annales de la Société entomologique de France* 6: 345-396.

SIMON, E. 1895. Histoire naturelle des Araignées. T.1. fasc.4 Paris: 761-1084.

SIMON, E. 1901. Etude sur les Arachnides recueillis au cours de la Mission de Bonchamps à travers l'Ethiopie, de Djibouti au Nil blanc (1897-1898). *Annales de la Société entomologique de France* 70: 18-26.

SIMON, E. 1906. Ergebnisse der mit Subvention aus der Erbschaft Treitl internommenen zoologischen Forschungsreise Dr. F. Werner's nach dem ägyptischen Sudan und Nord-Uganda. 7.

Araneida. *Sitzungsberichte der kaiserliches Akademie der Wissenschaften Wien* 115: 1159-1176.

SIMON, E. 1907. Arachnides recueillis par L. Fea sur la côte occidentale d'Afrique 1re partie. *Annali del Museo civico di storia naturale di Genova* 43: 218-323.

SIMON, E. 1910. Arachnoidea. Araneae. *In*: Schultze, L. Zoologische und anthropologische Ergebnisse einer Forschungsreise im westlichen und Zentralen südafrika. *Denkschriften der medicinisch-naturwissenschaftlichen Gesellschaft zu Jena* 16: 175-218.

STRAND, E. 1906. Diagnosen nordafrikanischer, hauptsächlich von Carlo Freiherr von Erlanger gesammelter Spinnen. *Zoologischer Anzeiger* 30: 604-637.

STRAND, E. 1907. Nordafrikanische, hauptsächlich von Carlo Freiherr von Erlanger gesammelte. *Jahrbücher des nassauischen Vereins für Naturkunde* 60: 103-147.

STRAND, E. 1908. Verzeichnis der von Oscar Neumann in Süd- Aethiopien gesammelten Spinnen. *Archiv für Naturgeschichte* 74: 13-66.

WALCKENAER, C.A. 1802. Faune parisienne. Insectes. Histoire abrégée des Insectes des environs de Paris vol. 2. Paris.