2011. The Journal of Arachnology 39:482–489

New species and new records of jumping spiders (Araneae: Salticidae: Heliophaninae) from the Lake Victoria area

Wanda Wesołowska: Institute of Zoology, Wrocław University, Sienkiewicza 21, 50-335 Wrocław, Poland. E-mail: tomwes@biol.uni.wroc.pl

Abstract. Four new species of salticids from the neighborhood of Lake Victoria in eastern Africa are described: *Heliophanus jacksoni*, *Icius mbitaensis*, *Pseudicius athleta* and *Pseudicius roberti. Icius steeleae* Logunov 2004 is recorded for the first time in Uganda.

Keywords: Jumping spiders, new species, Afrotropical Region

Although studies of Afrotropical jumping spiders have been intense in recent years, the diversity of salticids of most parts of this region is still poorly known. Over 70 species of salticids are known from Kenya (Platnick 2011; Prószyński 2011). This number looks quite impressive, but the western part of this country remains almost completely unstudied. Robert Jackson and his team collected numerous salticids during a long-term behavioral survey of jumping spiders conducted on the northeastern shore of Lake Victoria in Kenya. A few of these species have been formally described; e.g., *Myrmarachne melanotarsa* Wesołowska & Salm 2002, *Evarcha culicivora* Wesołowska & Jackson 2003 and *Menemerus tropicus* Wesołowska 2007. Descriptions of four additional Kenyan salticids from this collection are given in the present paper. The behavior of two of those species was studied by Jackson (1986); they were reported provisionally as *Pseudicius* sp. 1 (in the present paper *Pseudicius athleta*) and *Pseudicius* sp. 2 (now *Icius mbitaensis*). These are unusual colonial salticids, which live in large interspecific aggregations within the web complexes of araneids (Jackson 1986).

Occasionally spiders were also collected by the same team on the north shore of Lake Victoria in Uganda. This collection yielded records of four new species for this country; including the earlier described *Parajotus cinereus* Wesołowska 2004 and *Ugandinella formicula* Wesołowska 2006. This increases the total number of species known form Uganda from eleven (Prószyński 2011) to thirteen.

METHODS

Specimens were examined in a dish with 75% ethanol. Descriptions of colors pertain to wet specimens. The drawings were made with the aid of a reticular eyepiece attached to a Nikon SMZ stereomicroscope. The epigynes and the male pedipalps were removed for study. The epigynes were macerated in hot 5% KOH for a few minutes, and cleared in eugenol. After drawings, the genitalia were placed in micro-vials with ethanol and put into the vials containing the specimens from which they been removed. All measurements are given in millimeters. Digital photos were taken of each salticid species using a Nikon Coolpix 8400 mounted on a Nikon SMZ stereomicroscope. The extended focal range images were stacked using CombineZM image stacking software (http://www.hadleyweb.pwp.blueyonder.co.uk) to increase the depth of field. Figures were prepared in Photoshop 7.0.

Voucher specimens have been deposited in the Florida State Collection of Arthropods, Gainesville, Florida, USA (FSCA) and the Royal Museum for Central Africa, Tervuren, Belgium (MRAC).

TAXONOMY

Heliophanus (Helafricanus) jacksoni new species
Figs. 1–6

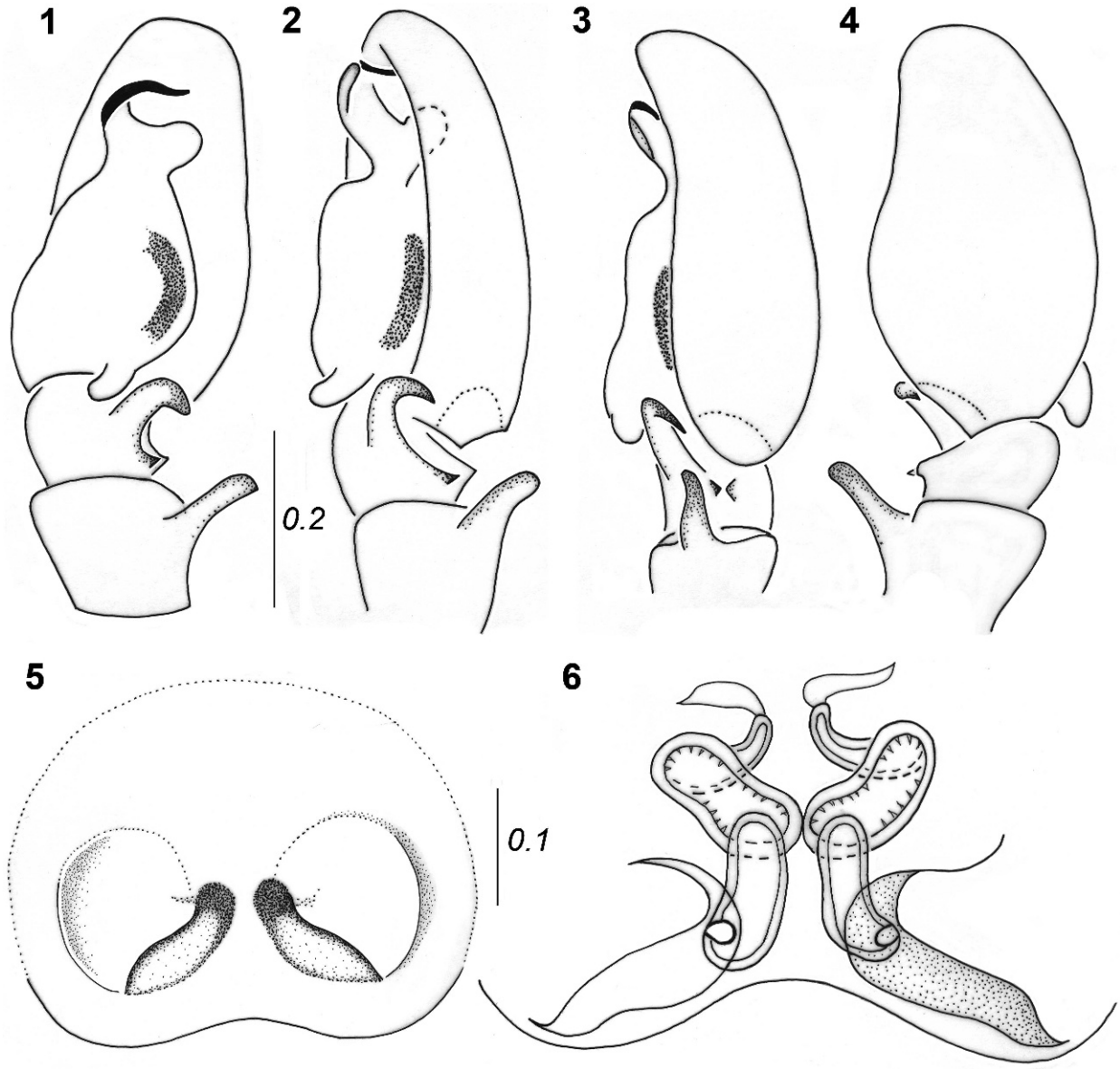
Type material.—Male holotype, KENYA: Mbita Point, shore of Lake Victoria (0°25′S, 34°13′E, 1150 m), December 2002, leg. R. Jackson (FSCA, K 191/02); 3 male and 2 female paratypes: same data as holotype, (FSCA); 1 male and 1 female paratypes: same data as holotype (MRAC); 1 male and 5 female paratypes: same locality, December 1997 (FSCA); male paratype: same locality, tree trunk, January 2003 (FSCA).

Diagnosis.—This species is closely related to *Heliophanus xanthopes* Wesołowska 2003 from Ethiopia. The male is distinguishable by the blunt patellar apophysis of the palp (pointed in *H. xanthopes*), more curved embolus and larger lobe at base of embolus (compare Fig. 1 herein with fig. 138 in Wesołowska 2003). The female has characteristic weakly sclerotized epigyne with translucent atria enveloping gonopores.

Etymology.—This species is named after Robert Jackson, collector of the type material and expert in behavior of salticids.

Description.—Measurements (male/female) [in mm]. Cephalothorax: length 1.3–1.6/1.6–1.8, width 1.0–1.2/1.3–1.4, height 0.5–0.6/0.6. Abdomen: length 1.2–1.5/2.5–3.1, width 0.9–1.1/1.9–2.1. Eye field: length 0.5–0.6/0.6–0.7, anterior width 0.8–1.0/1.0–1.1, posterior width 0.9–1.1/1.1–1.2.

Male. Small, dark colored spider. Carapace dark brown, eye field trapezoid, iridescent, pitted. Long brown bristles near eyes, minute setae on thoracic part. Mouthparts and sternum brown. Abdomen oval, dark brown, venter brownish gray. White hairs form thin median light line extending along thoracic part of carapace and abdomen. Legs yellow, contrasting with dark body, bearing brown hairs and spines. Pedipalps brown. Patellar apophysis straight, with blunt tip. Tibia with three apophyses, largest of them hooked, placed ventrally at distal end of tibia; two others very short. Cymbium with small retrolateral depression at base, corresponding to longest tibial apophysis (Figs. 1–4). Embolus bent



Figures 1–6.—*Heliophanus jacksoni* sp. n. 1. Palpal organ, ventral aspect; 2. Palpal organ, ventrolateral aspect; 3. Palpal organ, lateral aspect; 4. Palpal organ, dorsal aspect; 5. Epigyne; 6. Internal structure of epigyne.

toward bulb, bulb with large rounded lobe near base of embolus (Figs. 1, 2).

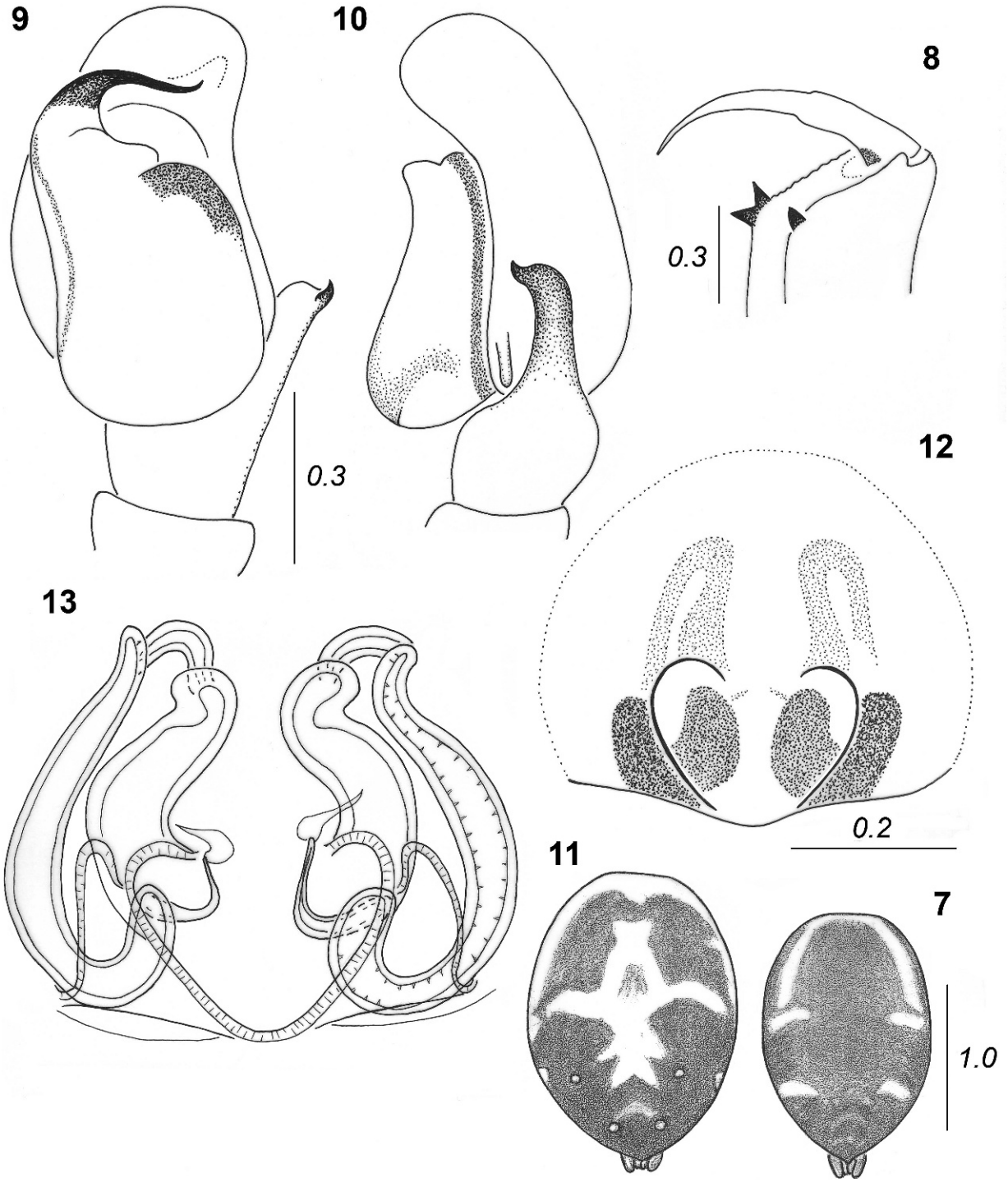
Female. Slightly larger and lighter colored than male. Carapace oval, brown, eye field slightly darker, eyes surrounded by black rings. Some long bristles near eyes, a few white scales at eyes of first row, short grayish hairs on carapace. Chelicerae light brown, sternum darker, endites and labium dark yellow. Abdomen ovoid, dark brownish with lighter median belt composed of five pairs of lighter spots. Thin light band on anterior margin spreading to sides, venter light, tinged with gray or with broad dark streak. Spinnerets beige. Legs yellow, sometimes with brownish rings on both ends of segments. Epigyne weakly sclerotized, with two very shallow round depressions (Fig. 5). Gonopores placed in deep, heavily sclerotized, inner posterior part of the atria, seminal ducts short (Fig. 6).

Distribution.—Known only from the type locality.

Remarks.—This species belongs to the *crudeni* species group (Wesołowska 1986).

Icius mbitaensis new species
Figs. 7–13, 33

Type material.—Male holotype, KENYA: Mbita Point, shore of Lake Victoria (0°25′S, 34°13′E, 1150 m), December 1998, leg. R. Jackson (FSCA, K 10/98): 1 male and 7 female paratypes, same data as holotype (FSCA); female paratype, same locality, February 1996 (FSCA); 4 female paratypes, same locality, February 1998 (FSCA); 3 female paratypes, same locality, January 1998 (FSCA); male paratype, same locality, May 2001 (FSCA); 2 male paratypes, same locality, January 2003 (FSCA); 2 male and 6 female paratypes, same locality, January 2003 (MRAC).



Figures 7–13.—*Icius mbitaensis* sp. n. 7. Abdominal pattern of male; 8. Cheliceral dentition of male; 9. Palpal organ, ventral aspect; 10. Palpal organ, lateral aspect; 11. Abdominal pattern of female; 12. Epigyne; 13. Internal structure of epigyne.

Diagnosis.—This species is closely related to *Icius steeleae* Logunov 2004. The male differs in having a shorter tibial apophysis of palp (in the latter species apophysis is extremely long, equal to bulb length), smaller cymbial tutaculum (ear-shaped apophysis), and longer, curved embolus (compare Figs. 9, 10 with Figs. 14, 15). The female has epigynal pocket as long as epigynal depression (clearly shorter in *I. steeleae*), longer seminal ducts, and longer and thinner spermathecae (compare Figs. 12, 13 with Figs. 18–20).

Etymology.—Named after the type locality.

Description.—Measurements (male/female). Cephalothorax: length 2.1–2.2/2.0, width 1.6/1.6, height 0.6/0.6. Abdomen: length 2.3/2.2–2.7, width 1.3/1.4–1.5. Eye field: length 0.9/0.9, anterior width 1.2/1.2, posterior width 1.3/1.3.

Male. Small, elongated spider with flat body (Fig. 33). Carapace oval, flattened, brown with slightly darker iridescent pitted eye field, eyes surrounded with black area, some long brown bristles at first row of eyes. Thoracic part of carapace clothed in translucent hairs, white hairs form thin line along lateral carapace margins. Chelicerae dark brown, unidentate (Fig. 8). Labium and endites dark brown, sternum lighter. Abdomen ovoid, brownish gray, sometimes with light lateral streaks extending from anterior edge to its middle and with traces of two pairs of transverse patches (Fig. 7). Dorsal surface of abdomen covered with short translucent hairs and brown bristles. Venter light, tinged with gray. Spinnerets brownish. Legs yellow, first pair brown, longer and stouter than others. Pedipalps brown, their femora slightly swollen, tibial apophysis wide with curved pointed tip, bulb oval, embolus bent toward bulb (Figs. 8, 9). Cymbium with small retrolateral tutaculum at base.

Female. Similar to male. Carapace covered with dense short gray hairs, with wide white streaks along lateral margins extending to clypeus. Abdomen brown, in some specimens reddish brown anteriorly, sometimes with light pattern composed of light band on anterior margin extending to sides, large median patch and two pairs of small rounded spots in posterior part (Fig. 11). First leg not stouter than others. Epigyne with heart-shaped depression and large pockets at epigastric fold to either side of depression (Fig. 12). Internal structure as in Fig. 13, spermathecae very long and thin.

Distribution.—Known only from the type locality.

Natural history.—The species (= *Pseudicius* sp. 2 in Jackson 1986) lives communally in large interspecific nest aggregations within the web complexes of araneids. The males perform vibratory courtship at nests and visual courtship away from them. They cohabit with subadult females in nests and mate with them when they are mature (Jackson 1986).

Icius steeleae Logunov 2004
Figs. 14–20, 34

Icius steeleae Logunov 2004:86.

Material examined.—UGANDA; Entebbe (0°04′N, 32°28′E), 14 males, 27 females, 4 imm., January 1996, leg. R. Jackson (FSCA); same data, 1 male, 1 female (MRAC); same locality, February 1996, 5 males, 7 females, 2 imm., February 1996; Mweya, E shore of Lake Edward (0°12′S, 29°52′E), in vegetation 1 male, 2 females, January 1996, leg. R. Jackson (FSCA).

Diagnosis.—see under *I. mbitaensis*.

Redescription.—Measurements (male/female). Cephalothorax: length 2.0/1.9, width 1.4/1.4, height 0.6/0.6. Abdomen: length 2.2/2.4, width 1.2/1.5. Eye field: length 0.9/0.9, anterior width 1.1/1.2, posterior width 1.2/1.3.

Male. General appearance as in Fig. 34. Carapace oval, flattened, dark brown, eyes surrounded with black rings. Eye field with metallic luster, pitted. Short translucent and grayish hairs cover carapace, longer brown bristles near eyes, thin line formed with white hairs along lateral margins of carapace. Clypeus not expressed. Anterior median eyes fringed with orange fawn scales. Mouthparts and sternum brown, endites with large lateral lobes. Abdomen oval, yellowish fawn, venter light with two thin darker lines. Delicate hairs on abdominal dorsum. Spinnerets light brown. First pair of legs slightly longer and thicker than others, brown with lighter distal segments. Other legs yellow. Spines and leg hairs brown. Pedipalps with swollen femur (Fig. 16). Tibial apophysis very long and wide, cymbium with big retrolateral tutaculum at base (Figs. 14, 15).

Female. Similar to male, coloration slightly lighter. White streaks along carapace margins broader. Sternum with dark patch in center, endites with whitish chewing margins. Abdomen yellow with delicate brownish pattern (Fig. 17). Legs yellow. Some specimens darker colored, with whole body brown. Epigyne strongly sclerotized, with heart-shaped central depression and clearly visible big lateral pockets (Figs. 18, 19). Internal structure as in Fig. 20, accessory glands small, spermathecae elongated.

Distribution.—The species hitherto known only from western Sudan, for the first time recorded in Uganda.

Pseudicius athleta new species
Figs. 21–26, 32

Type material.—Male holotype, UGANDA: Entebbe (0°04′N, 32°28′E), January 1996, leg. R. Jackson (FSCA, U196/96): 6 male and 4 female paratypes (FSCA): 4 male and 1 female paratypes, same locality, December 1997 (MRAC); 8 male and 2 female paratypes, KENYA: Mbita Point, shore of Lake Victoria (0°25′S, 34°13′E, 1150 m), January 1998 leg. R. Jackson (FSCA).

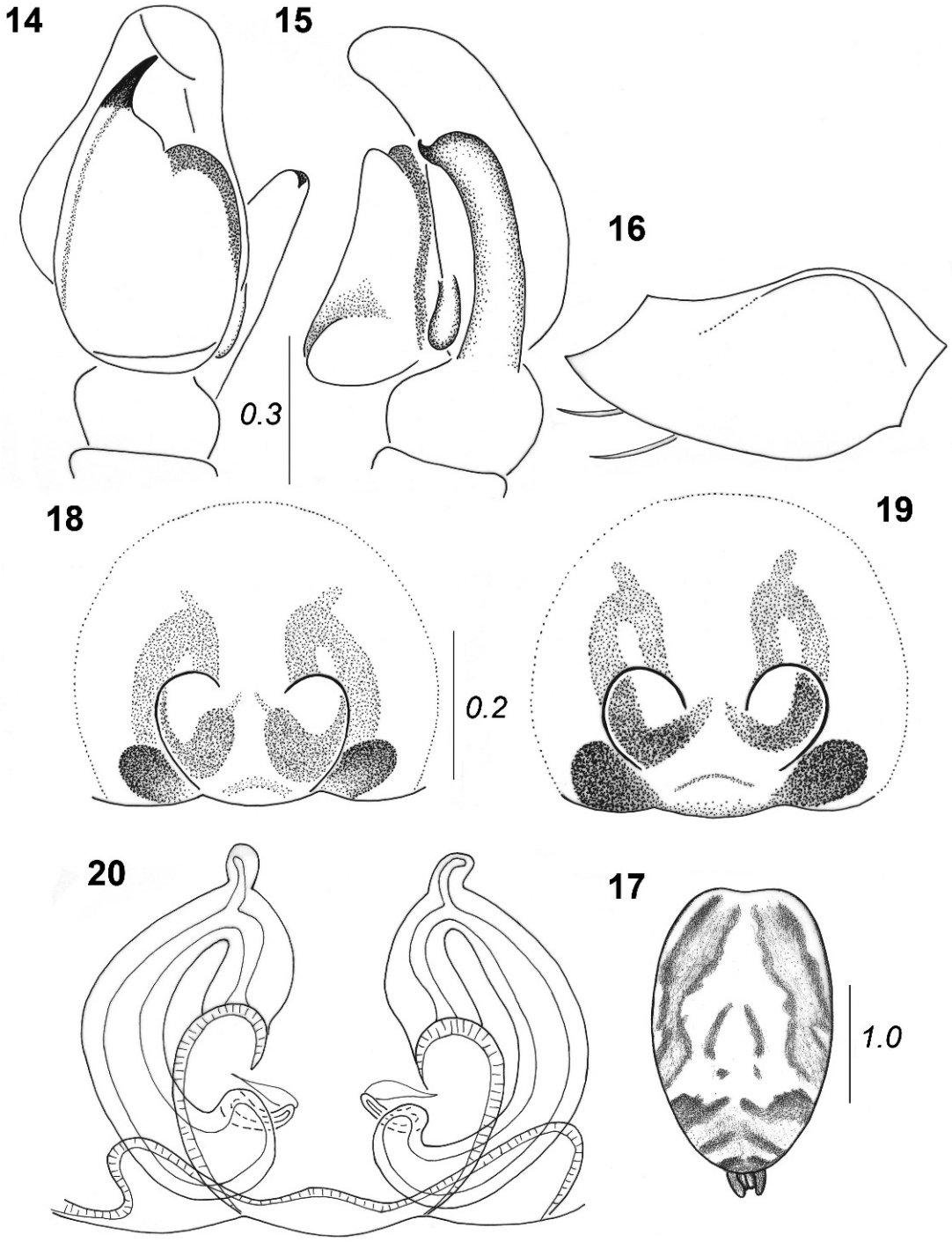
Diagnosis.—The male is distinguishable by having a very thick first pair of legs with extremely swollen tibiae. The male palpal organ resembles that of male *Pseudicius delesserti* Caporiacco 1941 from Ethiopia, but differs from it by the thinner, more delicate embolus and the shape of tibial apophysis, which has an additional proximal tooth (compare Fig. 15 herein with figure on p. 50 in Prószyński 1987). The female is distinctive, in having a unique form of epigyne with posteriorly placed copulatory openings and very narrow spermathecae.

Etymology.—From Latin, *athleta*; the specific name is a noun in apposition, an allusion to extremely swollen (''muscular'') tibia of the first leg.

Description.—Measurements (male/female). Cephalothorax: length 1.8–2.2/1.9–2.2, width 1.3–1.5/1.3–1.5, height 0.6/0.6. Abdomen: length 2.4–2.8/2.2–2.8, width 1.4–1.7/1.4–1.8. Eye field: length 0.7–0.8/0.8–0.9, anterior width 0.9–1.0/0.9–1.0, posterior width 1.0–1.1/1.0–1.1.

Male. Small spider, shape of body typical for the genus, slender and flat, with powerful first pair of legs (Fig. 32). Carapace elongated, strongly flattened, dark brown with black eye field, clothed in delicate grayish white hairs, very long brown bristles near eyes. White hairs form thin median line on eye field and thoracic part, and bands along lateral margins of carapace. Mouthparts dark brown, sternum slightly lighter. Stridulatory apparatus present, composed of a row of long setae on tubercles under lateral eyes and a row of short setae on prolateral surface of first femur apically. Abdomen elongated, dorsum with wide brownish fawn median streak, sides light with two or three pairs of diagonal marginal dark patches, venter yellow. Brown and white hairs cover dorsal surface of abdomen. Spinnerets gray. First pair of legs longer than others, thick, with extremely swollen tibiae (Fig. 21). Single short thick spine on prolateral surface of tibia apically and two pairs of short ventral spines on metatarsus. First leg brown, others yellow or light brownish. Leg hairs brown, some of them very long. Pedipalps as in Figs 22, 23, tibia short, apophysis furcated with additional proximal tooth.

Female. Similar to male. Abdomen lighter, grayish beige with faint darker herring-bone pattern and traces of three



Figures 14–20.—*Icius steeleae* Logunov. 14. Palpal organ, ventral aspect; 15. Palpal organ, lateral aspect; 16. Palpal femur; 17. Abdominal pattern of female; 18, 19. Epigyne; 20. Internal structure of epigyne.

pairs of diagonal marginal patches, pair of small round white spots surrounded by black flanges posteriorly. First pair of legs not as thick as in male, but their tibiae also swollen. Epigyne with gonopores placed posteriorly (Fig. 24), seminal ducts coiled, accessory glands large, spermathecae narrow, tubuliform (Fig. 25).

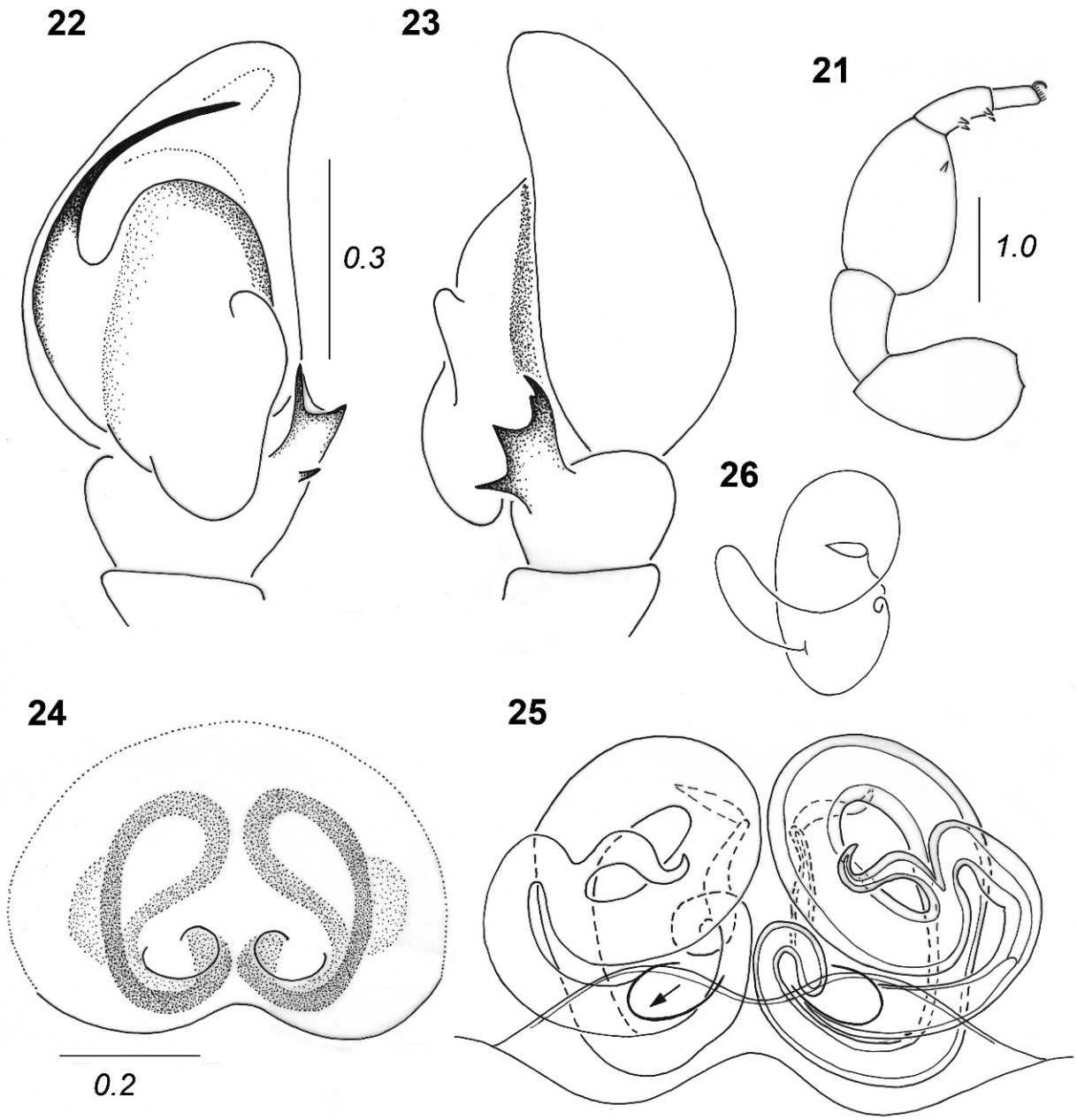
Distribution.—Kenya and Uganda.

Natural history.—Courtship and sociality of this species has been studied by Jackson (1986); the species was provisionally determined only to generic level and reported as *Pseudicius* sp. 1. Its social and mating behavior are as in *Icius mbitaensis* (see above).

Remarks.—The species belongs to the *cinctus* group of species (Prószyński 2003).

Pseudicius roberti new species
Figs. 27–31, 35

Type material.—Male holotype, KENYA: Mbita Point, E shore of Lake Victoria, (0°25′S, 34°13′E, 1150 m), February



Figures 21–26.—*Pseudicius athleta* sp. n. 21. First leg, prolateral aspect; 22. Palpal organ, ventral aspect; 23. Palpal organ, lateral aspect; 24. Epigyne; 25. Internal structure of epigyne; 26. Diagrammatic course of seminal duct.

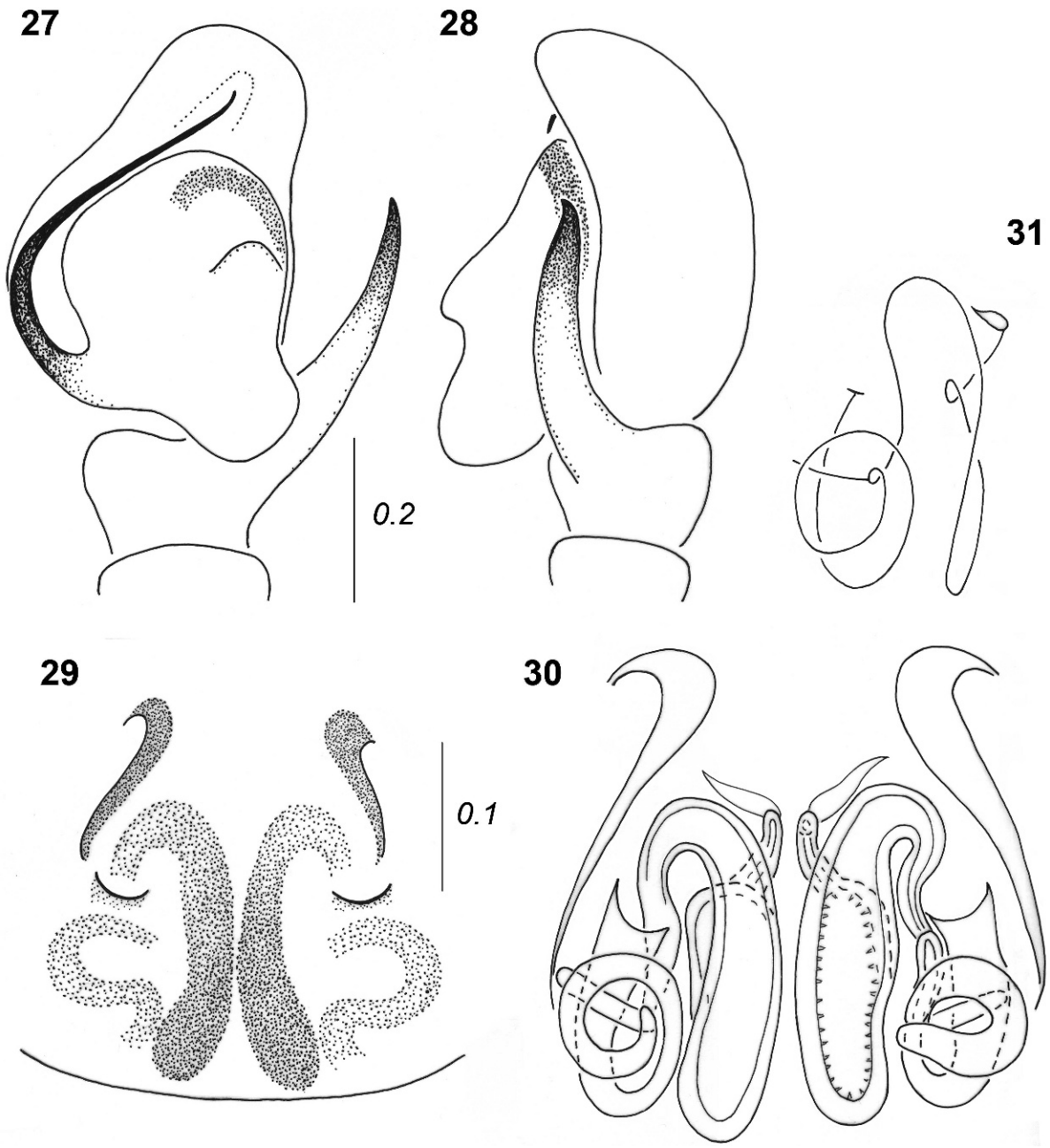
1998, leg. R. Jackson (FSCA, K815/98); 1 male and 3 female paratypes, same data as holotype (FSCA); 1 male and 3 female paratypes, same locality, January 1998 (FSCA); 11 male and 13 female paratypes, same locality, December 1997 (FSCA); 1 male and 1 female paratypes, same locality, January 2003 (MRAC).

Diagnosis.—The male of this species resembles the male of *Pseudicius eximius* Wesołowska & Russell-Smith 2000 from Tanzania, but bulb and embolus are shorter, base of embolus is placed further from posterior lobe of bulb (compare Fig. 27 herein with fig. 248 in Wesołowska & Russell-Smith 2000). The female has epigyne typical for members of the *tamaricis* group of species, but seminal ducts are narrower and shorter than in other species.

Etymology.—This species is dedicated to Robert Jackson, eminent explorer of spider behavior and collector of type specimens.

Description.—Measurements (male/female). Cephalothorax: length 1.4–1.5/1.5–1.6, width 1.0–1.1/1.1–1.2, height 0.4/0.4. Abdomen: length 1.7–1.8/1.9–2.4, width 1.1–1.2/1.2–1.4. Eye field: length 0.6/0.6, anterior width 0.8–0.9/0.8–0.9, posterior width 0.9–1.0/0.9–1.0.

Male. Very small, slender spider. Body elongated and flattened. Carapace oval, flat, dark brown with black eye field.



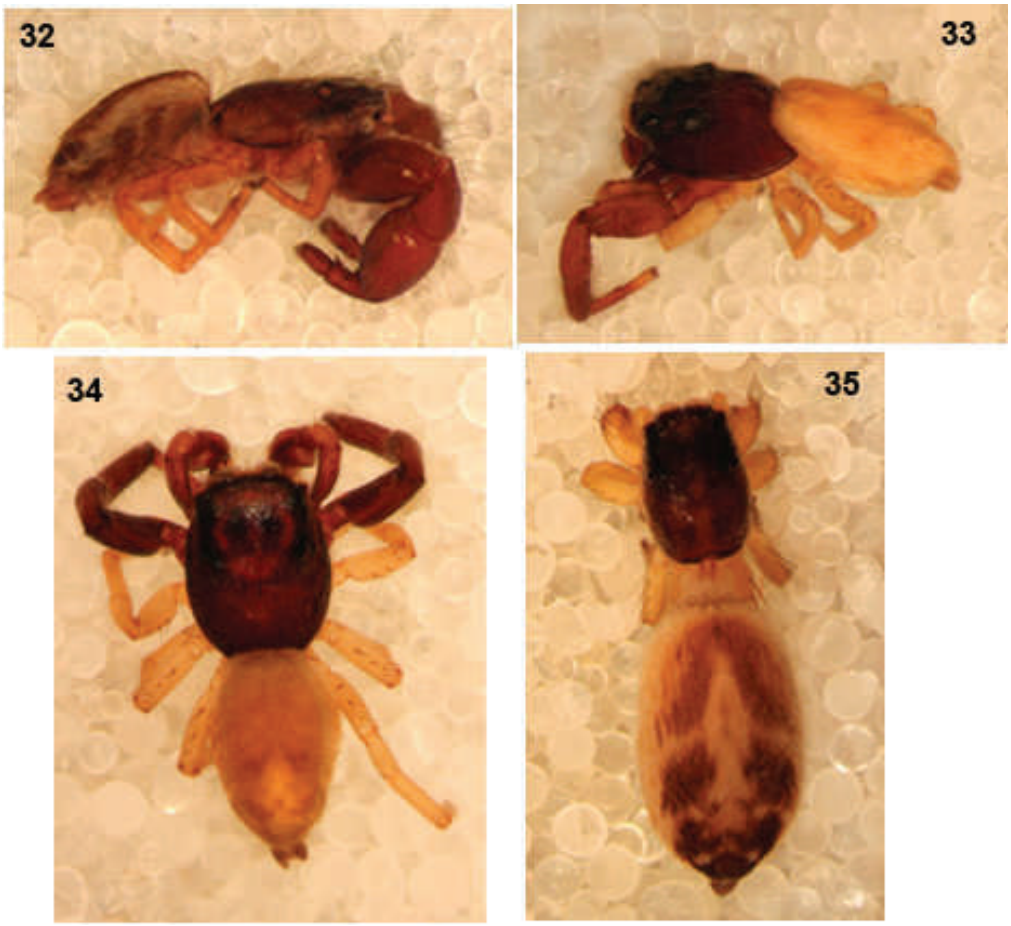
Figures 27–31.—*Pseudicius roberti* sp. n. 27. Palpal organ, ventral aspect; 28. Palpal organ, lateral aspect; 29. Epigyne; 30. Internal structure of epigyne; 31. Diagrammatic course of seminal duct.

Ocular area slightly pitted, with luster. White hairs cover carapace, denser on eye field anteriorly, also form thin median line on thoracic part and two bands along lateral margins of carapace. Anterior eyes surrounded with white scales, some brown bristles near eyes. Stridulatory apparatus present (the leg-carapace type). Mouthparts light brown, sternum dark yellow. Abdomen elongated, blackish brown with white pattern composed of two pairs of transverse submarginal patches and few faint posterior chevrons, in some specimens light bands on sides in anterior half of abdomen. Abdominal dorsum clothed in brown hairs, denser anteriorly. Venter light. Spinnerets light brown. Legs yellow, first pair stouter and longer than other, brown, with slightly swollen tibiae. Tibia with two short spines on prolateral surface, metatarsus with two pairs of ventral spines. Pedipalps light brown. Tibial apophysis very long (Figs. 27, 28).

Female. Similar to male. Abdomen with additional pair of small rounded spots at posterior margin (Fig. 35), in some specimens abdomen dark, without patches, only with two lighter lateral bands in anterior part. Epigyne with two anterior widely separated pockets (Fig. 29). Internal structure of epigyne as in Fig. 30, seminal ducts coiled, long accessory glands leading into the ducts, spermathecae large, elongated.

Distribution.—Known only from the type locality.

Remarks.—The species is members of the *tamaricis* group of species (Prószyński 2003).



Figures 32–35.—32. Male of *Pseudicius athleta*, lateral aspect; 33. Male of *Icius mbitaensis*, lateral aspect; 34. Male of *Icius steeleae*, dorsal aspect; 35. Female of *Pseudicius roberti*, dorsal view.

ACKNOWLEDGMENTS

My thanks go to Robert R. Jackson and G.B. Edwards for providing specimens for study. Dmitri Logunov and G.B. Edwards are acknowledged for their valuable comments on the earlier draft of the manuscript and linguistic help.

LITERATURE CITED

Jackson, R.R. 1986. Communal jumping spiders (Araneae: Salticidae) from Kenya: interspecific nest complexes, cohabitation with web-building spiders, and intraspecific interactions. New Zealand Journal of Zoology 13:13–26.

Logunov, D.V. 2004. Taxonomic notes on a collection of jumping spiders from Sudan (Araneae, Salticidae). Bulletin of the British Arachnological Society 13:86–90.

Platnick, N.I. 2011. The World Spider Catalog. Version 12. American Museum of Natural History, New York. Online at <http://research.amnh.org/iz/spiders/catalog>

Prószyński, J. 1987. Atlas rysunków diagnostycznych mniej znanych Salticidae. Wyższa Szkoła Pedagogiczno Rolnicza, Siedlce.

Prószyński, J. 2003. Salticidae (Araneae) of the Old World and Pacific Islands in several US collections. Annales Zoologici, Warszawa 44:87–163.

Prószyński, J. 2011. Salticidae (Araneae) of the World. Museum and Institute of Zoology, Polish Academy of Sciences, Online at <http://www.gsd-salt.miiz.waw.pl/salticidae.php>

Wesołowska, W. 1986. A revision of the genus *Heliophanus* C.L. Koch, 1833. Annales Zoologici, Warszawa 40:1–254.

Wesołowska, W. 2003. New data on African *Heliophanus* species with descriptions of new species (Araneae: Salticidae). Genus 14:249–294.

Wesołowska, W. & A. Russell-Smith. 2000. Jumping spiders from Mkomazi Game Reserve in Tanzania (Araneae: Salticidae). Tropical Zoology 13:11–127.

Manuscript received 29 July 2011, revised 23 September 2011.