Redescription of the poorly known genus *Ikuma* Lawrence, with synonymy and description of a new species from Namibia (Araneae, Palpimanidae)

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Abstract

The spider genus *Ikuma* Lawrence, 1938, endemic to Namibia, is rediagnosed and redescribed based on the characters both species originally included in the genus and of the newly described *I. larseni* sp. nov. A new synonymy is proposed: *I. squamata* Lawrence, 1938, described from a sole female is recognized a junior synonym of the type species *I. spiculosa* (Lawrence, 1927), based on a single juvenile. The currently described *I. larseni* sp. nov. differs from the generotype in the eye arrangement, structure of the abdominal scuta, and details of the colouration. The copulatory organs of both males and females belonging to *Ikuma* are studied, described and depicted for the first time. The previously known genus range confined to the far north of Namibia extends to the mid-western part of this country.

Keywords

Afrotropic, Aranei, Namibia, Palpimaninae, spider, taxonomy
Introduction

The small spider genus *Ikuma* was established by Lawrence (1938) to encompass two species: *I. spiculosa* (Lawrence, 1927) (transferred from *Palpimanus* Dufour, 1820) and *I. squamata* Lawrence, 1938. The genus was not diagnosed in detail, only briefly compared in the character of the body pubescence and of the eye arrangement with *Palpimanus* and *Diaphorocellus* Simon, 1893 (sub *Iheringia* Keyserling, 1891). The type species, *I. spiculosa*, has originally been recognised as based on a juvenile. The only known specimen of *I. squamata*, when described, was claimed to be an adult female; however, no evidence of this statement has been provided.

Many decades have passed since its description, and both the genus concept and the key generic characters of *Ikuma* have continued to be unclear. Platnick (1981) briefly reviewed the Palpimaninae and considered that this subfamily could be divided into two groups, each probably of the genus rank. Both these groups could be delimited by possessing an entire or divided abdominal scutum in the females. The species with an entire abdominal sclerite in the females he has undoubtedly assigned to *Palpimanus*. The question as to whether all of the remaining species also form a monophyletic group (for which, in his opinion, the name *Ikuma* would be available), Platnick intended to consider in a subsequent study which, however, has never been conducted and published.

The reason for Platnick (1981) considering the difference between *Palpimanus* and *Ikuma* as based chiefly on the aforenoted criterion remains uncertain. Lawrence (1938), when establishing *Ikuma*, did not textually describe the abdominal sclerites in *Ikuma*, and Platnick himself had not noted any of the two known species of *Ikuma* within the studied material. Nevertheless, this assumption was then mentioned by Dippenaar-Schoeman and Jocqué (1997), who cited the mentioned review, refraining from their own comments. Until now, *Ikuma* has been thus treated as a once described and then completely forgotten taxon with dubious characters.

The present attempt to find criteria for reliably distinguishing between the genera of Palpimaninae was triggered by two interdependent events. First, among the studied palpimanids from Namibia, we have revealed a few palpimanine spiders that looked completely different to *Palpimanus* spp. On the other hand, by our request we have received a fortunate opportunity to look, albeit remotely, at the holotype of *Ikuma spiculosa*. As a result, we identified the noted specimens as certainly belonging to *Ikuma* and representing a yet-undescribed species. The type series of this new congener is diagnosed, described and illustrated herein.

Materials and methods

Used museum acronyms

| Acronym | Name                                      |
|---------|-------------------------------------------|
| DNMNH   | Ditsong National Museum of Natural History, Pretoria, South Africa; |
| KZNM    | KwaZulu-Natal Museum, Pietermaritzburg, South Africa; |
| MNB     | Museum für Naturkunde, Berlin, Germany;  |
Comparative material used in this study

*Palpimanus* Dufour, 1820: males and females of *P. gibbulus* Dufour, 1820 from La Palma, Mallorca (NHML), *P. schmitzi* Kulczyński, 1909 and *P. simoni* Kulczyński, 1909 from different localities in Israel (SMNH); the types of *P. namaquensis* Simon, 1910 from South Africa (MNB 13859) and *P. nubilus* Simon, 1910 from Namibia (MNB 13860).

*Diaphorocellus* Simon, 1893: the types of *D. isalo* Zonstein & Marusik, 2020 (RMCA ARA 200305) and *D. jocquei* Zonstein & Marusik, 2020 (RMCA ARA 201275), all from Madagascar; males and females of *D. biplagiatus* Simon, 1893 from Beaufort-West, South Africa (NCA 2008/4675) and *D. rufus* (Tullgren, 1910) from Mkomazi, Tanzania (RMCA ARA 215487).

Photographs were taken using an Olympus SZX16 stereomicroscope with a Canon EOS 7D (Turku) or Canon EOS 80D (Tel Aviv) camera and prepared using the Helicon Focus 7.6.2 Pro software (http://www.heliconsoft.com). Measurements were taken through the above-mentioned stereomicroscope to an accuracy of 0.01 mm. All measurements are given in millimetres. The maximum length of the clypeus along the midline was measured from the anterior edge to the perpendicular line connecting the anterior edge of both AME; the smaller lateral clypeus length, measured from the anterior edge of ALE and the closest point of the anterior clypeus edge, follows the maximum clypeus length, being enclosed in brackets. The length of the sternum was measured along a straight line between the posterior tip of the sternum and the hindmost part of the labium. Lengths of leg and palp segments were measured on the dorsal side, with lengths of every measured segment from the midpoint of the anterior margin to the midpoint of the posterior margin.

Illustrations of the dissected vulva, placed into a small Petri dish filled with a 85% lactic acid, were made after cleaning the object in 10% potassium hydroxide aqueous solution for several hours and exposing it for a few minutes in an alcohol solution of Chlorazol Black.

Abbreviations

- **AER**: anterior eye row;
- **ALE**: anterior lateral eye;
- **AME**: anterior median eye;
- **CL**: carapace length;
- **CW**: carapace width;
CyL  clypeus length;
MOQ  median ocular quadrangle;
PER  posterior eye row;
PME  median lateral eye;
PLE  posterior lateral eye;
TL   total body length in dorsal view.

Other abbreviations used are encoded in the text and in the captions.

**Taxonomy**

**Family Palpimanidae Thorell, 1870**

**Note.** Since Platnick (1975), the family is considered consisting of three subfamilies: the mostly Paleotropical Chediminae Simon, 1893, the purely Neotropical Otiothopinae Platnick, 1975, and the nominative subfamily Palpimaninae. The distributional peculiarities of the latter subfamily are considered below.

**Subfamily Palpimaninae**

**Notes.** This subfamily differs from the Otiothopinae by possessing accessory terminal sclerites in the male bulb (which are absent in the males belonging to the latter subfamily; see Platnick 1975). The Palpimaninae can be distinguished from the Chediminae in having eight eyes with widely spaced ALE and PLE vs. two, six or eight eyes with contiguous or lacking ALE and PLE in the chedimine spiders (Zonstein and Marusik 2017). The subfamily is distributed in the Old World, where its range is limited to the Mediterranean, Sahara-Sind region (including Middle East, Gujarat and Central Asia), and the mainland Sub-Saharan Africa. The record of *Palpimanus argentinus* Mello-Leitão, 1927 in South America, based only on the types, has not been confirmed by later field studies, and may refer either to a sole introduced species (Platnick 1975) or, even more likely, to the incorrectly interpreted collection data (Zonstein and Marusik 2017). The Palpimaninae are divided between two sharply uneven groups of the genus rank: a species-rich *Palpimanus* Dufour, 1820, with 38 named species distributed throughout the entire subfamily range (WSC 2022), and a small Namibian genus *Ikuma* Lawrence, 1938, embracing only two species.

**Genus *Ikuma* Lawrence, 1938**

*Ikuma* Lawrence, 1938: 217.
Type species. *Palpimanus spiculosus* Lawrence, 1927, by original designation.

Emended diagnosis. *Ikuma* (I.) well differs from *Palpimanus* (P.) in the shape of the carapace (anteriorly narrowed, ovoidal and gently elevated from the edges to the domed central part in I. vs. round-oval and steeply edged in P.), in the clypeus (inclined in I., vertical in P.), and in the shape of the sternum (longer and visually narrower, ending posteriorly behind coxae IV in I. vs. shorter, looking subrounded, and ending posteriorly at the axes of coxae IV in P.). The whitish adpressed pubescence on the dorsal and lateral surface of the carapace is much longer and denser in I. (where it is present also on the dorsal abdomen) than in P. (where a similar pubescence is much shorter and sparser, and confined only to the carapace). The embolus is small, fragile and membranous in I. vs. relatively large, branched and with partially sclerotized structures in P. The adult females of these genera can be distinguished by the structure of the endogyne, either possessing (P.) or lacking (I.) heavily sclerotized parts.

Redescription. Medium-sized to large palpimanids with carapace length ranging 4.4–5.8 in adult specimens. Dorsal body (both carapace and abdomen) densely covered with pale adpressed pubescence (Figs 1, 2); most sclerotized parts (carapace, chelicerae, sternum and abdominal scuta) finely granulated, as in Figs 1–4, 5A, B. Carapace (Figs 1C, 3A, B) narrowed anteriorly, ovoidal, with raised central part gently sloping toward edges and elevated hump between eye group and thoracic fovea. Short T-shaped thoracic fovea deeply excavated, foveal sulci poorly discernible. Clypeus moderately long. Eight eyes (Figs 1C, 3); AME largest, other eyes relatively smaller and subequal in size. AER recurved; PER nearly straight and noticeably wider than AER; both rows form wide trapezoidal figure. MOQ slightly wider than long. Chilum inconspicuous. Chelicerae about twice longer than clypeus; stridulatory ridges absent; cheliceral fang serrated; cheliceral furrow armed with several (5–6 in *Ikuma larseni* sp. nov.) peg teeth. Maxillae triangular. Labium long and narrow, notched anteriorly (Fig. 4B). Sternum densely granulated, covered with fine short hairs and extending backward between coxae IV (Figs 1D, 4A, D).

Palps short, legs I–IV moderately long. Leg formula: 4132. Leg I robust, with considerably swollen and laterally flattened femur, with patella longer that tibia, and tarsus longer than metatarsus (Figs 1B, 2B, D). Tibia and metatarsus I with wide and dense prolateral scopula. Leg tarsi II–IV relatively short; two tarsal claws narrow and provided with several short teeth. Claw tufts well-developed (as in Fig. 7A).

Abdomen fusiform, in unsclerotised part with contrasting dorsal pattern or uniformly pale coloured. Abdominal scuta conforming a rather short pedicel tube; dorsal portion of scutum narrow, small and narrowly separated from both pedicel tube and large scoop-like ventral portion. Small spinneret group set on low mound (see Fig. 7B). AMS small, cylindrical, two-segmented; PMS and PLS reduced to a few sessile spigots in females and absent in males.

Composition. *Ikuma* includes two species: *I. spiculosa* (Lawrence, 1927) and *I. larseni* sp. nov.

Distribution. The genus is currently known only from Namibia.
*Ikuma spiculosa* (Lawrence, 1927)

**Fig. 1**

*Palpimanus spiculosus* Lawrence, 1927: 23 (j).

*Ikuma spiculosa*: Lawrence 1938: 217.

*Ikuma squamata* Lawrence, 1938: 217, fig. 3 (j), syn. nov.

**Types.** *Palpimanus spiculosus*: **Holotype:** juvenile, Namibia, Oshikoto Region, Namutoni, 18°48.5'S, 16°56.5'E, 1100 m, unspecified collector, most seemingly G.C. Shortridge (see Thomas 1926), 29.viii.1923 (SAM-ENW-B006293), seen from the full-colour and high-resolution macro-photographs kindly provided by N. Larsen.

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**Figure 1.** *Ikuma spiculosa*, immature holotype specimen SAM-ENW-B006293 **A, B** spider in dorsal and lateral view, respectively **C** carapace, dorsal **D** body, ventral. Scale bars: 1 mm.
Ikuma squamata: **Holotype:** juvenile (or subadult specimen), the same collection data as the preceding but Ikuma (Ekuma) River Valley, approximately 18°34’S, 16°00’E, 1100 m, further details uncertain, presumably deposited in the Transvaal Museum (currently DNMNH); however, it was not found there.

**Diagnosis.** There are a number of significant differences between *Ikuma spiculosa* and *I. larseni* sp. nov. It concerns the coloration of the abdomen (contrastingly bicolorous vs. uniformly pale), position of the appressed pubescence on the carapace (mostly subcentral vs. sublateral), and the relative length of interdistance AME-AME (longer than AME-ALE vs. shorter than AME-ALE).

**Description (based on seemingly non-adult specimens).** The species was in fairly sufficient details described by Lawrence (1927, 1938). See also Fig 1.

**Distribution.** Oshikoto Region in northern Namibia.

**Notes.** The aerial distance between the type localities of *Ikuma spiculosa* and *I. squamata*, Namutoni and Ikuma River, is less than 100 km. Both are situated at the same elevation, and they adjoin the same saline depression Etosha Pan. The holotype specimens of the two species do not differ in the peculiarities and details of their pubescence and overall colouration. Judging from the original descriptions, these types can be distinguished only by their size (TL 3.6 in *I. spiculosa* vs. 5.5 in *I. squamata*). Applied to the difference in the body size between these specimens and the type series of *I. larseni* sp. nov. (TL 10.7–12.1), it may simply indicate that these non-adult specimens can be, respectively, a younger and an elder instars belonging to the same species. Hence, *Palpimanus spiculosus* Lawrence, 1927 is considered here a senior synonym of *Ikuma squamata* Lawrence, 1938, syn. nov.

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**Ikuma larseni** sp. nov.

https://zoobank.org/1F29B626-F711-4AE9-84A1-AC15B19E42CE

Figs 2‒8

**Etymology.** The specific name is a patronym after Norman Larsen (Cape Town, South Africa) who kindly provided us with the macro-photographs of the preceding *Ikuma* species.

**Types.** **Holotype** ♀, Namibia, Erongo Region, Namib-Naukluft National Park, Gobabeb, 23°34’S, 15°03’E, 8–9.ii.1969, B. Lamoral (NMSA-SPI-26895). **Paratypes:** 1♀, same collection data but 14.iv.1969, E. Holm (NMSA-SPI-26881); 1♀, same collection data but 14.iii.1970, no collector’s name indicated (NMSA-SPI-11682); 1♀, same collection data but 1–29.ii.1972, B. Lamoral (NMSA-SPI-11210); 1♂, same collection data but Narras Valley 10 km W Gobabeb, 570 m (1700 feet), 2.x.1984, C. Griswold (NMSA-SPI-26894).

**Diagnosis.** *Ikuma larseni* sp. nov. can be distinguished from *I. spiculosa* by the colouration and pubescence (carapace with densest pubescence along margins vs. in subcentral part of the carapace); the new species has a uniformly pale abdomen vs. bicolorous in *I. spiculosa* (Fig. 2A, C cf. Fig. 1). The interdistance AME-AME is longer than AME-ALE in *I. larseni* sp. nov. and shorter in *I. spiculosa*. Since characters of
I. spiculosa seem to be based on the juvenile or subadult specimens, the comparison of the copulatory organs remains impossible.

**Description. Female.** NMSA-SPI-26895 (holotype).

**Habitus:** as in Fig. 2A, B. **Colour in alcohol:** carapace and chelicerae dark carmine red; maxillae, coxae I–IV and abdominal scuta light to intensely orange; palp and legs I–IV from femora to tarsi pale yellowish orange (leg I slightly darker than legs II–IV, with more noticeable difference between corresponding tibiae and metatarsi); sternum, labium and pedicel tube medium carmine red; abdomen very pale yellowish orange, dorsally with large slightly darker oval median marking; spinnerets yellowish white. Carapace and abdomen laterally covered with dense flattened and adpressed whitish pubescence. **Measurements:** TL 11.15, CL 4.81, CW 3.22, CyL 0.56 (0.43), Femur I L/W 2.29 (3.41/1.49). **Carapace:** with moderately coarse granulations (Fig. 3A). **Eyes**
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(Fig. 3B, C): AME 0.27, ALE 0.16, PME 0.13, PLE 0.13; AME-AME 0.16, AME-ALE 0.11, AME–PME 0.20, ALE-PLE 0.41, PLE-PME 0.18, PME-PME 0.31. **Mouthparts**: labium with slightly notched anterior edge (Ln; Fig. 4B). **Legs** I–IV: tarsi with paired claw tufts of dense long setae and multipectinate paired claws each armed with 8–10 teeth (Fig. 7A). **Abdominal sclerites**: short pedicel tube (Pt) widely funnel-shaped (Figs 4C, 5A, B); small hexagonal dorsal shield (Ds) clearly separated from

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**Figure 3.** *Ikuma larseni* sp.n., holotype female NMSA-SPI-26895 (**A, C, D**) and paratype male NMSA-SPI-26894 (**B, E**). **A, B** carapace in dorsal view. **C, E** eye group, clypeus and chelicerae, dorsal. **D** same, lateral. Scale bars: 1 mm (**A, D**); 0.5 mm (**B, C, E**).
and not fused with lateral sclerotized extensions (Le; Fig. 5A); epigastral plate (Eg) in intact specimen (before dissection) uniformly coloured, posterior part slightly concave; postgaster with one thin bow-shaped scutum (Fig. 4C); posterior edge nearly straight. Spinnerets as shown in Fig. 7B.

Figure 4. *Ikuma larseni* sp.n., holotype female NMSA-SPI-26895 (A, C, D) and paratype male NMSA-SPI-26894 (B, E) A, B cephalothorax and basal abdomen in ventral view C chelicerae, labium and maxillae, ventral D, E pedicel and abdominal scuta, ventral. Abbreviations: Eg epigastral plate; Le lateral extensions of scutum; Ln labial notch; Ps postgastral scuta. Scale bars: 1 mm (A, D); 0.5 mm (B, C, E).
**Figure 5.** *Ikuma larseni* sp.n., paratype female NMSA-SPI-26881 A, B dissected, macerated and Chlorazol-tinted abdominal scuta in dorsal and ventral view, respectively C–F structures of endogyne, dorsal (inside). Abbreviations: Ds dorsal scutum; Eg epigastral plate; Ft fine threads; Gg grape shaped glands; La lateral apophyse of endogynal fold; Le lateral extensions of scutum; Pt petiolar tube; Rf basolateral fold of endogyne; Rs membranous sac like part of receptacle. Scale bars: 0.5 mm (A, B); 0.25 mm (C, D); 0.1 mm (E, F).

**Copulatory organs:** as in Figs 5C–F, 6. Endogyne weakly sclerotized (unlike partially heavy-sclerotized one in *Palpimanus* spp.); main supporting structure, wide trapezoidal endogynal fold (Rf), carries two lateral apophyses (La); membranous sacs of receptacles (Rs) bell-shaped, about as long as wide, each receptacle accompanied by brushes of fine threads (Ft) and approximately 7–8 grape-shaped glands (Gg), glands with stalks about as long as head, pore glands indiscernible (seems absent).
Figure 6. *Ikuma larseni* sp.n., paratype female NMSA-SPI-26881 A–D structures of endogyne, close up dorsal (inside) view. Abbreviations: *Eg* epigastral plate; *Ft* fine threads; *Gg* grape shaped glands; *La* lateral apophyse of endogynal fold; *Rf* basolateral fold of endogyne; *Rs* membranous sac like part of receptacle. Scale bars: 0.1 mm.

Figure 7. *Ikuma larseni* sp.n., holotype female NMSA-SPI-26895 (A, B) and paratype male NMSA-SPI-26894 (C, D) A tarsus IV in retrolateral view B spinnerets, ventral C entire leg II, retrolateral D pal-pal segments from patella to cymbium, retrolateral. Scale bars: 0.5 mm (A, D); 0.25 mm (B); 1 mm (C).
**Leg measurements:** female NMSA-SPI-26895 (male NMSA-SPI-26894 in brackets):

|     | Femur  | Patella | Tibia  | Metatarsus | Tarsus  | Total   |
|-----|--------|---------|--------|------------|---------|---------|
| Palp| 1.09 (1.18) | 0.45 (0.51) | 0.85 (0.77) | –          | 0.65 (0.78) | 3.04 (3.24) |
| Leg I| 3.41 (4.23) | 3.03 (3.62) | 2.72 (3.16) | 1.41 (1.57) | 1.55 (1.74) | 12.12 (14.32) |
| Leg II| 2.68 (3.37) | 1.61 (2.01) | 1.93 (2.35) | 1.29 (1.50) | 0.88 (0.97) | 8.39 (10.20) |
| Leg III| 2.98 (3.42) | 1.59 (1.93) | 2.06 (2.42) | 1.75 (1.81) | 0.95 (1.46) | 9.33 (11.04) |
| Leg IV| 4.28 (4.48) | 1.99 (2.28) | 3.11 (3.32) | 2.39 (2.87) | 1.10 (1.52) | 12.87 (14.47) |
**Male.** NMSA-SPI-26894 (paratype).

**Habitus:** as in Fig. 2C, D. **Colour in alcohol:** as in female, but coxae I–IV evenly orange and tarsus I pale yellow, much lighter than metatarsus I. **Measurements:** TL 12.37, CL 5.78, CW 3.95, CyL 0.29, Femur I L/W 1.91 (4.23/2.21). **Carapace:** longer, with slightly coarser granulations than in female (Fig. 3D). **Eyes** (Fig. 3E): AME 0.28, ALE 0.18, PME 0.15, PLE 0.14; AME-AME 0.22, AME-ALE 0.12, AME-PME 0.34, ALE-PLE 0.46, PLE-PME 0.22, PME-PME 0.35. **Mouthparts:** as in female (see Fig. 4B). **Legs** I–IV: metatarsi and tarsi armed with long ventral bristles as in female (Fig. 7C); claw tufts and dentition as in female. **Abdominal sclerites:** epigastral scutum with clearly darkened book-lungs; postgaster with two large long subtriangular scuta (distinguishable in form from the corresponding scuta in other palpimanids), and two pairs of dot-like scuta (see Fig. 4E).

**Copulatory organs:** Palp as shown in Figs 7D, 8. Femur nearly 3 times longer than wide, 1.5 times longer than cymbium and tibia, 2.3 times longer than patella; patella elongate, 1.5 times longer than wide; tibia elongate, not swollen, length/maximal width ratio ca. 1.6, subequal in length to cymbium, covered with dense and long whitish setae; cymbium about twice longer than wide; bulb droplet-shaped; tegulum as wide as long, lacking any processes (apophyses), retrolateral part of tegulum membranous; embolic division with 2 outgrowths: slightly bent spine-like chitinized embolic process (Ep), sigmoid in anterior view (see Fig. 8A), and membranous embolus (Em).

**Variation.** In paratype females, the length of the carapace varies from 4.4 to 5.6 mm.

**Habitat.** According to the collecting data, the specimens were obtained by sand sifting.

**Distribution.** Known only from the type locality.

**Note.** Since the only available male of *Ikuma larseni* sp. nov. was found partially damaged (probably when collected), we preferred to designate one of the better preserved females as the holotype.

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