ON THE CYPHOPHTHALMI (ARACHNIDA, OPILIONES) TYPES FROM THE MUSEO CIVICO DI STORIA NATURALE "GIACOMO DORIA"

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Abstract. The Museo Civico di Storia Naturale "Giacomo Doria," Genoa, hosts one of the most important historical collections of the Opiliones suborder Cyphophthalmi, including all the known specimens for the type species of the genera *Leptopsalis* (Stylocellidae), *Miopsalis* (Stylocellidae), and *Parogovia* (Neogoveidae), as well as several other types in the families Ogoveidae and Stylocellidae (it is unclear whether specimens in Pettalidae and Sironidae constitute types). These specimens were recently made available to us for study, and given their importance, we discuss and illustrate them here. Study of this collection allows confirmation of the validity of *Leptopsalis*, considered a synonym of *Stylocellus* for more than a century, and of *Miopsalis*, considered a nomen dubium in the most recent catalogue of the group. It furthermore helps to clarify the identity of several other species in the family Stylocellidae. Here we formally resurrect the genera *Miopsalis* Thorell, 1890, and *Leptopsalis* Thorell, 1882, and transfer several species to these genera: *M. collinsi* (Shear, 1993) comb. nov.; *M. gryllospeca* (Shear, 1993) comb. nov.; *M. lionota* (Pocock, 1897) comb. nov.; *M. sabah* (Shear, 1993) comb. nov.; *M. silhavyi* (Rambla, 1991) comb. nov.; *M. tarumpitao* (Shear, 1993) comb. nov.; *L. dumoga* (Shear, 1993) comb. nov.; *L. hillyardi* (Shear, 1993) comb. nov.; *L. javana* Thorell, 1882; *L. lydekkeri* (Clouse & Giribet, 2007) comb. nov.; *L. modesta* (Hansen & Sørensen, 1904) comb. nov.; *L. novaguinea* (Clouse & Giribet, 2007) comb. nov.; *L. ramblae* (Giribet, 2002) comb. nov.; *L. sulcata* (Hansen & Sørensen, 1904) comb. nov.; *L. tambusisi* (Shear, 1993) comb. nov.; *L. thorellii* (Hansen & Sørensen, 1904) comb. nov.; *L. weberii* (Hansen & Sørensen, 1904) comb. nov.

Key words: Neogoveidae, Ogoveidae, Sironidae, Stylocellidae, Museum collections

INTRODUCTION

One of the worst impediments of taxonomy is, along with the loss of expertise (e.g., Rodman and Cody, 2003), the dependence on type specimens that are not properly described or documented; hence the importance of well-funded museums to ensure that collections are properly maintained and specimens are made available to the scientific community (Suarez and Tsutsui, 2004). But proper cataloguing and revisionary taxonomy often require examinations of large numbers of type specimens scattered in institutions around the world. These are usually in museums and university collections but are sometimes in private collections that may not be up to curatorial standards, especially after the researcher passes away and the collection burdens surviving family members. Many important collections have been lost this way, including some of the Opiliones collections of interest to us, most prominently the collection of Julio A. Rosas Costa, with his Cyphophthalmi types (Rosas Costa, 1950) becoming lost to science for the time being. Unfortunately, as exemplified by the arachnid order Opiliones, many types are often simply unavailable.

Here we study a collection of the harvestman suborder Cyphophthalmi and document the specimens deposited at the Museo Civico di Storia Naturale "Giacomo Doria," Genoa, Italy (MCSN), which we had not examined until recently. The importance of this collection is without parallel in many respects, as it includes types and nontypes of many of the earliest cyphophthalmid species.

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Types of the suborder Cyphophthalmi are deposited in approximately 30 museums around the world (Giribet, 2000). A visit to half of these museums would allow one to study around 85% of the known species (a large number of recently described species are deposited in the collection of Ivo Karaman, University of Novi Sad, Serbia, but they are not available for study to the broader community). In terms of historical collections, many of the oldest types are deposited at The Natural History Museum, London, which includes 15 primary types, although their collections are not especially large. The Muséum national d'Histoire naturelle, Paris, includes numerous types (mostly from Christian Juberthie and most New Caledonian species), as well as a large general collection. The American Museum of Natural History, New York, includes 15 types and one of the largest general collections of Cyphophthalmi, with nearly all families represented. Currently, the largest collection in terms of diversity and including representatives of all families is that of the Museum of Comparative Zoology, Harvard University, with ca. 800 lots, most of it recently collected, DNA-grade specimens. It also contains more types than any other institution, although few are "historical" types. Te Papa Tongarewa, Wellington, with 26 types, and the Canterbury Museum, Christchurch, with 11 types, are indispensable visits for those studying the New Zealand fauna. The size of the MCSN collection is small compared with these other collections; however, its importance lies in the species available there, including the primary (and only) types of six species, in addition to a few other specimens, including additional type specimens. Among them are the type species for two of the five currently recognized genera in the family Stylocellidae, including the only described specimens in the yet-monotypic genus *Miopsalis* Thorell, 1890 (Clouse et al., 2009; Clouse and Giribet, 2010). The featured species are: *Parogovia sironoides* Hansen, 1921; *Ogovea nasuta* (Hansen, 1921); *Miopsalis pulicaria* Thorell, 1890; *Leptopsalis beccarii* Thorell, 1882; *Leptopsalis javana* Thorell, 1882; *Leptopsalis thorellii* (Hansen and Sørensen, 1904); and *Leptopsalis weberii* (Hansen and Sørensen, 1904).

The MCSN collection is of exceptional importance due to several factors. First is the fact that the prolific Swedish arachnologist Tord Tamerlan Teodor Thorell studied arachnology with Giacomo Doria at the MCSN. In addition to describing more than 1,000 spider species from 1850 to 1900, Thorell described two stylocellid genera (*Leptopsalis* Thorell, 1882 and *Miopsalis* Thorell, 1890) and three stylocellid species, types of which are deposited at MCSN. Although *Leptopsalis* was synonymized with *Stylocellus* Westwood, 1874 by Thorell himself (1890b), and has remained in synonymy for more than a century, a clade containing the type species was recently found to be sufficiently distinct from the type species of *Stylocellus* for them to be kept in separate genera (Clouse and Giribet, 2010; Clouse et al., 2009, 2011). *Leptopsalis* was thus informally revalidated by Clouse et al. (2009: 525), and the genus has been used in subsequent papers on stylocellid (Clouse et al., 2011) and cyphophthalmid (Giribet et al., 2011) phylogenetics. *Miopsalis* is currently a nomen dubium (Giribet, 2000), although it has recently been postulated to be the identity of a distinct clade that diversified mostly in Borneo (Clouse and Giribet, 2010; Clouse et al., 2009, 2011; Giribet et al., 2011). However, the identity of this clade as the genus *Miopsalis* was based on its inclusion of small species that closely match the description of *M. pulicaria*, but it could not be confirmed without examination of the type (and sole known specimen) of this species.

Second, the great Italian explorer Leonardo Fea became an assistant at the MCSN, and his expeditions to the Gulf of Guinea yielded important specimens, including the type species of the genus *Parogovia* Hansen, 1921 and the second species of the genus *Ogovea* Hansen & Sørensen, 1921. Finally, the collection also received specimens from Eugène Simon and Gustav Joseph, including specimens of

the type species of the genera *Cyphophthalmus* Joseph, 1868 and *Parasiro* Hansen & Sørensen, 1904, and it acquired some other specimens of Hansen and Sørensen's species, including a juvenile of *Purcellia illustrans* Hansen & Sørensen, 1904. Few museums had, by the beginning of the 20th century, a collection as complete as the one of the MCSN. By 1921, 19 species of Cyphophthalmi had been described, and the MCSN had 10 of these represented in its collection, including eight or more types. By that time the British Museum of Natural History, London (later to become The Natural History Museum), the largest museum of natural history in the world, had only types of seven cyphophthalmid species, some of these being type series shared with the MCSN. In spite of this importance, the MCSN collection of Cyphophthalmi has not been documented using modern imaging techniques, so here we provide high-resolution images of the most important specimens and discuss long-standing questions about their morphology and taxonomy.

MATERIALS AND METHODS

Specimens were cleaned in a Branson 200 Ultrasonic cleaner and imaged under a Leica MX12.5 stereomicroscope, PLAN 0.5x, with images taken at different planes with a JVC 3-CCD digital camera KY-F75U and integrated with the software Auto-Montage Pro version 5.02.0096 from Syncroscopy.

Data provided for each specimen are a transcription of the specimen label. Modern localities and additional data are provided in the discussion of the specimens.

Abbreviations:

AMNH: American Museum of Natural History, New York, United States.
BMNH: The Natural History Museum, London, United Kingdom.
MCSN: Museo Civico di Storia Naturale "Giacomo Doria," Genoa, Italy.
MCZ: Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, United States.
MNHN: Muséum national d'Histoire naturelle, Paris, France.
ZMUC: Zoologisk Museum, Statens Naturhistoriske Museum, Københavns Universitet, Copenhagen, Denmark.

ANNOTATED TAXONOMIC SECTION

Family Neogoveidae:

Parogovia sironoides Hansen, 1921
Figures 1–3

Specimen in good condition with some appendages detached (Fig. 1):

Parogovia sironoides Hansen, 1921
Type: Male
Island of Fernando Poo: Punta Frailes
leg. L. Fea, X–XI 1901

Specimen in poor condition, with white residue on exterior (Fig. 2):

Parogovia sironoides Hansen, 1921
Type: Female
Island of Fernando Poo: Basilè (400–600 m)
leg. L. Fea, VIII–IX 1901

The latter specimen above originally labeled incorrectly as male.

Detached appendages: basichelicerite, distal cheliceral segments, palp, leg I, leg IV (Fig. 3):

Parogovia sironoides Hansen, 1921
Type: Male
Five detached parts

Genitalia (spermatopositor and ovipositor), not photographed:

Parogovia sironoides Hansen, 1921
Type: Female, male
Penis and ovopositor slide
Mounted by G. Legg, 1986

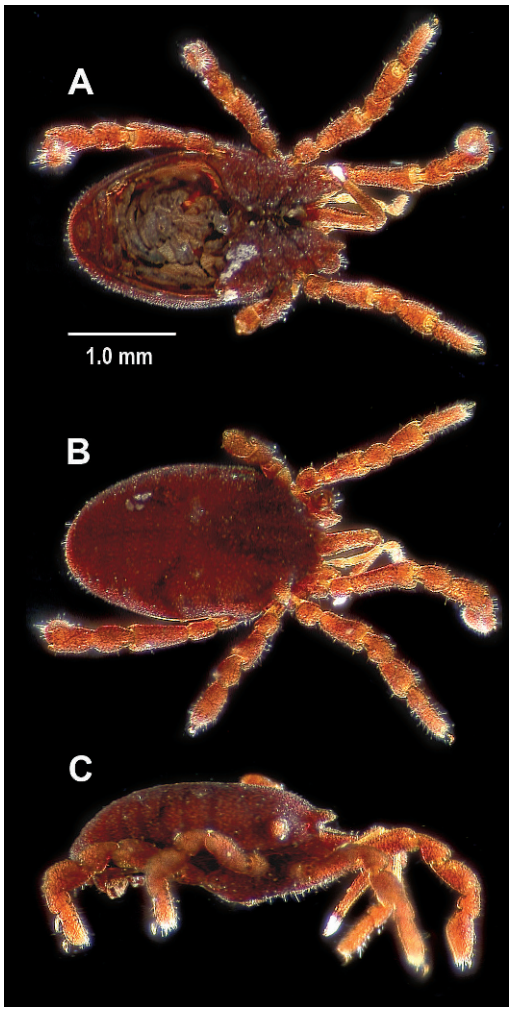

Figure 1. *Parogovia sironoides* Hansen, 1921, male paralectotype in ventral (A), dorsal (B), and lateral (C) views.

Parogovia sironoides, the type species of the genus *Parogovia* Hansen, 1921, was described on the basis of two specimens from Bioko (formerly Fernando Poo), Equatorial Guinea, one male from Punta Frailes collected by Leonardo Fea in October–November 1901, and one female from Basilé, collected by Leonardo Fea in August–September 1901, at an altitude of 400–600 m. The male was profusely illustrated by Hansen (1921: pl. IV, fig. 2a–l). The type material, including a preparation of the

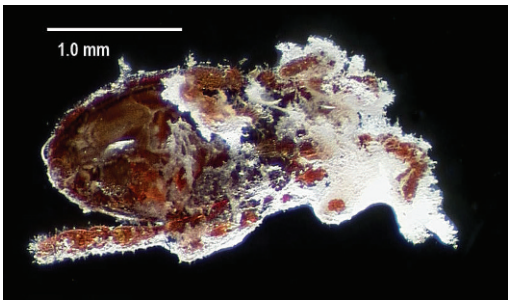

Figure 2. *Parogovia sironoides* Hansen, 1921, female paralectotype in ventral view.

spermatopositor and ovipositor, was studied by Gerald Legg in 1986 (Legg, 1990).

Punta Frailes, the locality of one of the syntypes, is of unknown identity; it is not found on current maps of Bioko, it is not known to local biologists interviewed by G.G., and it was not seen in a study of old maps of the former Spanish Colony of Fernando Poo. This is, however, one of the localities surveyed by the Italian explorer Leonardo Fea during his collecting trip to the Gulf of Guinea and Portuguese West Africa, and it is the type locality of several other species of arthropods and vertebrates. Basilé refers to Pico Basilé (Mt. Basilé), formerly Pico de Santa Isabel, the highest mountain on the island of Bioko, with an altitude of 3,011 m. It is the summit of the largest and highest of three overlapping basaltic shield volcanoes that form the

Figure 3. *Parogovia sironoides* Hansen, 1921, detached appendages of lectotype male. From top to bottom, left to right: chelicera, distal articles; chelicera, basal article; palp; leg I; leg IV.

island. From the summit, Mt. Cameroon can be seen to the northeast. Bioko was formed along the Cameroon line, a major northeast-trending geologic fault that runs from the Atlantic Ocean into Cameroon. This line includes other volcanic islands in the Gulf of Guinea such as the island territory of Annobón, the island nation of São Tomé and Príncipe, and the massive stratovolcano of Mt. Cameroon, the latter of which also has one or more undescribed species of *Parogovia* (authors' unpublished data).

Specimens identified as *Parogovia sironoides* (erroneously spelled *Paragovia sironoides* in earlier publications) from Río Campo, Continental Region of Equatorial Guinea, have been used in several taxonomic and phylogenetic studies of Cyphophthalmi and Opiliones (Giribet and Boyer, 2002; Giribet and Prieto, 2003; de Bivort and Giribet, 2004; Boyer et al., 2005; Schwendinger and Giribet, 2005). Collections of *Parogovia* specimens in the Continental Region and on Pico Basilé in 2003 led us to correct this possible misidentification and to refer to the continental specimens as *P.* cf. *sironoides*, while we apply the name *P. sironoides* for the specimens collected on Pico Basilé (Boyer et al., 2007; Boyer and Giribet, 2007; Clouse and Giribet, 2007; Giribet et al., 2010, 2011). Additional collecting in Cameroon in 2009 and subsequent phylogenetic analysis show that these are two distinct species, and that they are not even sister species (Giribet et al., 2011). This can now be confirmed by the study of the type material from MCSN.

Family Ogoveidae:

Ogovea nasuta (Hansen, 1921)
Figures 4–6

Three specimens in optimal condition (Figs. 4–6):

Ogovia nasuta Hansen, 1921
Types: Female, male, juvenile
Island of Fernando Poo: Musola (400–500 m)
leg. L. Fea, I-1902

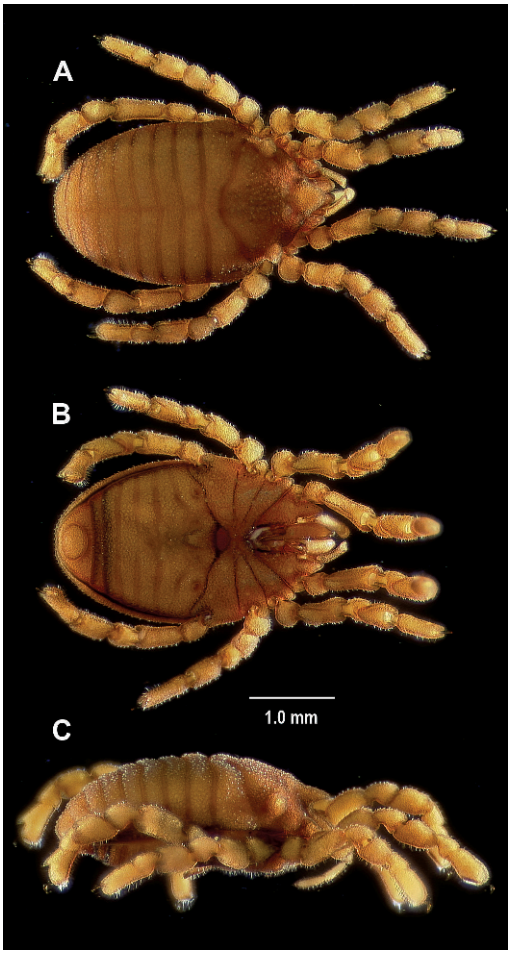

Figure 4. *Ogovea nasuta* (Hansen, 1921), male lectotype in dorsal (A), ventral (B), and lateral (C) views.

Disarticulated specimen, not photographed:

Ogovia nasuta Hansen, 1921
Types
Detached parts for figures

Ogovea nasuta, originally spelled *Ogovia nasuta* Hansen, 1921, was described on the basis of three males, one female, and one juvenile syntype from Bioko, in Equatorial Guinea, at an altitude of 400–500 m, near Musola, collected by Leonardo Fea in January 1902 (Hansen, 1921). One male and one juvenile were illustrated by Hansen

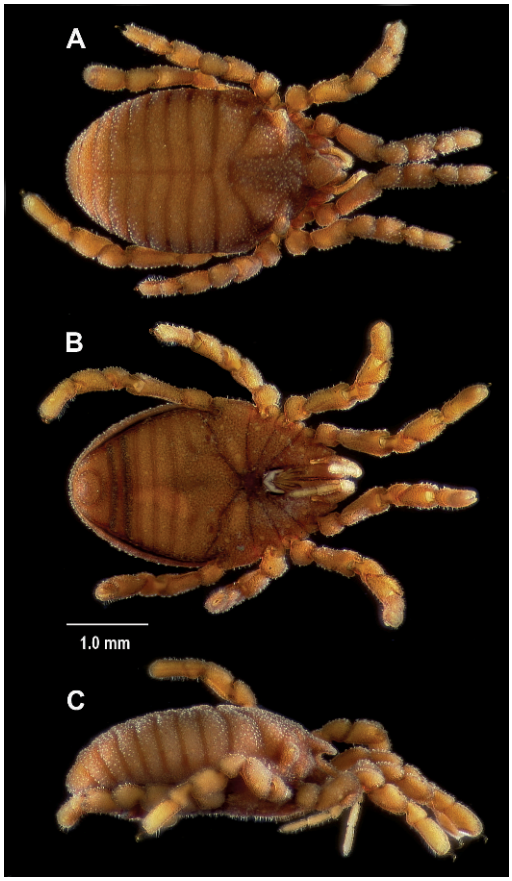

Figure 5. *Ogovea nasuta* (Hansen, 1921), female paralectotype in dorsal (A), ventral (B), and lateral (C) views.

(1921: pl. IV, fig. 1a–f). Three intact specimens and the detached appendages used for the original figures are deposited in the MCSN. Another disassembled male, the spermatopositor of which was studied by W. A. Shear, was deposited at the ZMUC (Shear, 1980; Giribet and Prieto, 2003).

Here we designate the male deposited at the MCSN as the lectotype of *Ogovia nasuta* Hansen, 1921, all other syntypes becoming paralectotypes.

Family Pettalidae:

Purcellia illustrans Hansen & Sørensen, 1904

The MCSN collection also includes an immature female specimen of *Purcellia*

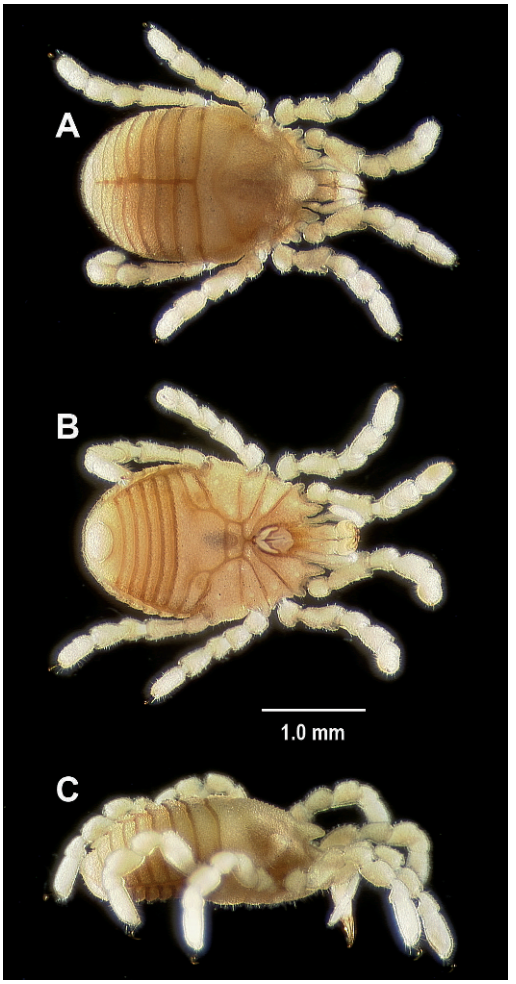

Figure 6. *Ogovea nasuta* (Hansen, 1921), juvenile paralectotype in dorsal (A), ventral (B), and lateral (C) views.

illustrans Hansen & Sørensen, 1904, collected by Purcell on Table Mountain, Cape Town; it may form part of the type series of the species and was determined by H. J. Hansen and W. Sørensen. Other specimens of the type series are deposited at the Zoological Museum, University of Copenhagen and at The Natural History Museum, London (BMNH 10.9.19.1-6).

Purcellia illustrans Hansen & Sørensen, 1904
Female juvenile
Caput Bonae Spei

Purcell all leg.
Det. H.J.H. & W.S.

Family Sironidae:

Parasiro corsicus (Simon, 1872)

The prolific French arachnologist (and ornithologist) Eugène Simon described *Cyphophthalmus corsicus*, a species later designated the type of the genus *Parasiro* Hansen & Sørensen, 1904, from the coast of Porto-Vecchio, Corsica (Simon, 1872). Simon did not specify the number of specimens he examined, but Hansen and Sørensen (1904) studied two males and two females, currently deposited at the ZMUC. Sixteen additional specimens are deposited at the MNHN (10 males, 6 females) and one female specimen is deposited at the AMNH. An additional two specimens (male and female) from the Simon collection are deposited at the BMNH (BMNH 02.11. 18.89). The specimens deposited at the MCSN were identified by Simon in 1880, and therefore it is unlikely that they belong to the type series. It is also unclear which of the listed specimens are syntypes.

One male and one female:

Siro corsicus
Corsica
Det. Simon, 1880–N. 338

The above female specimen was attached to the cotton stopper. It is not conspecific with the male but belongs to a smaller species (photograph not shown).

Cyphophthalmus duricorius Joseph, 1868

Cyphophthalmus duricorius Joseph, 1868 was the second cyphophthalmid species described, after *Siro rubens* Latreille, 1802 (see Kury, 2010). The holdings of the MCSN collection include two vials with specimens of *C. duricorius* from Joseph's collection, examined both by Hansen and Sørensen and by Simon.

Siro duricorius Male
Carniola=Kranjska
Leg. et det. Joseph
Det. H.J.H. & W.S.

Siro duricorius Female
Carniola=Kranjska
Det. Simon, 1880–N. 170

Family Stylocellidae:

Miopsalis pulicaria Thorell, 1890
Figures 7, 8

Miopsalis pulicaria was described by Thorell (1890a) on the basis of a single female specimen from Pulo Pinang (Penang Island), West Malaysia. The specimen was collected by Lamberto Loria and Leonardo Fea in February 1889. Before the great expedition of L. Loria to New Guinea, he met L. Fea in Pulo Pinang, who was returning from his expedition to Myanmar; both went for a hike and collected arachnids at an altitude between 2,000 and 2,600 "English" feet (609 to 792 m) on Penang Hill (Thorell, 1890a). Among the 49 arachnids collected, 8 were Opiliones, including *M. pulicaria*.

The genus *Miopsalis* was used by Roewer (1916, 1923) for his Japanese species *Miopsalis sauteri* Roewer, 1916, for which Juberthie (1970) erected the monotypic genus *Suzukielus* Juberthie, 1970.

Shear (1993), in his monumental study of Stylocellidae describing 11 new species, reports a blind female of an undescribed species from Borneo that "may shed light on the somewhat mysterious name *Miopsalis pulicaria*," and in his catalogue of Cyphophthalmi species Giribet (2000) considered *Miopsalis* Thorell, 1890 a nomen dubium. In different molecular phylogenetic analyses of Stylocellidae, the name *Miopsalis* has been associated with small, blind stylocellids that group with most of the species on Borneo (including some of the largest Cyphophthalmi known), starting with what we called a "Borneo + *Miopsalis* clade"(Clouse and Giribet, 2007). However, we later concluded (Clouse and Giribet, 2010: 1116) that *Miopsalis* "is both poorly understood and has little chance of remaining a valid name in the future." In the latter

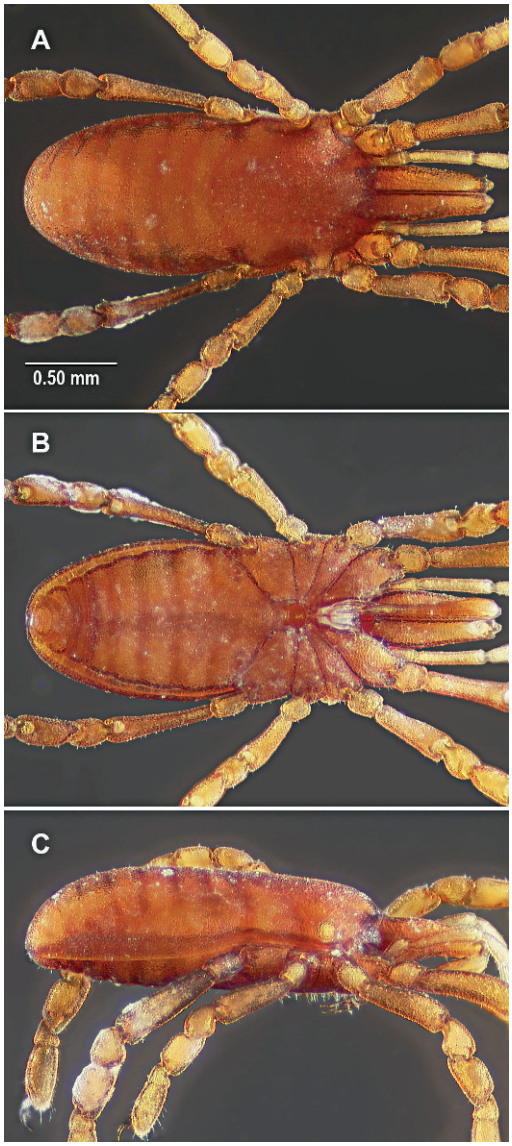

Figure 7. *Miopsalis pulicaria* Thorell, 1890, female holotype in dorsal (A), ventral (B), and lateral (C) views.

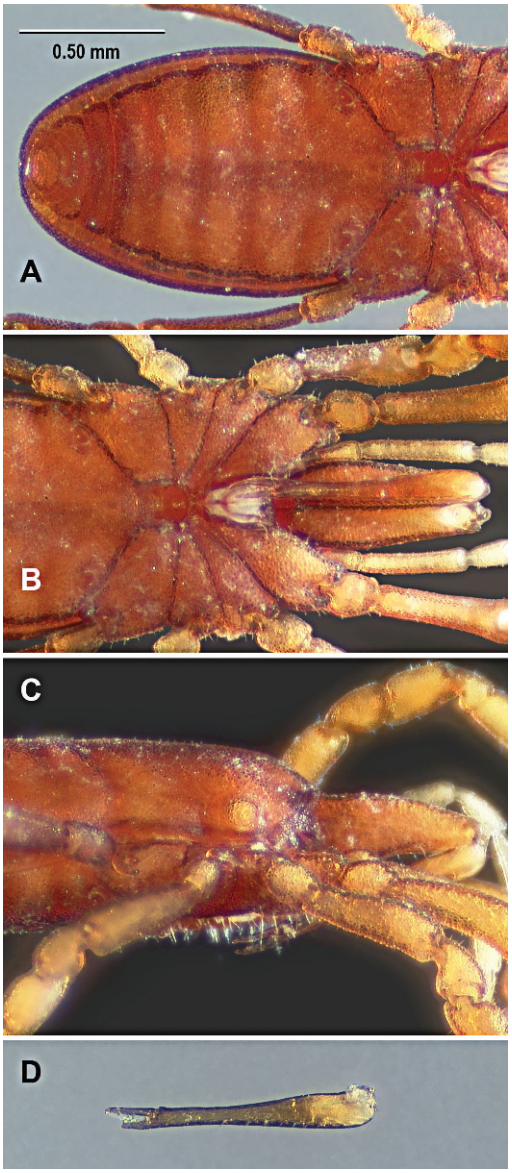

Figure 8. *Miopsalis pulicaria* Thorell, 1890, female holotype: ventral posterior (A), ventral anterior (B), lateral anterior part of body (C), and disarticulated distal part of left chelicera (D).

paper we again recovered a clade of predominantly Bornean species, called "clade B," which also included tiny species from Sumatra, Peninsular Malaysia, and Borneo. This clade was also corroborated in an analysis that incorporated morphological characters and type specimens for which molecular data were unavailable (Clouse et al., 2009), but *Miopsalis pulicaria* was not included in that study, since at that time the specimen was not available, and its description lacks illustrations and detailed measurements. In follow-up studies, after receiving the *Miopsalis* specimen from

MCSN, we have used the name *Miopsalis* for the mostly Bornean clade, currently recognized as one of five stylocellid genera (Clouse et al., 2011; Giribet et al., 2011). However, no formal taxonomic action has been taken with respect to *Miopsalis*, and the MCSN specimen is the only one so far known for this species. Now that we have been able to examine the type specimen for the genus, we can tell that many details of its shape closely resemble an even smaller, also blind species that has been collected from Gunung Mulu, in Sarawak, on Borneo. Under the monikers "*Miopsalis* 101513" (Clouse and Giribet, 2007) and "Borneo sp. 15" (Clouse and Giribet, 2010), this Sarawak species was found to be a member of the mostly Bornean clade, and thus we would consider *M. pulicaria* as also belonging to this clade, thus confirming earlier suspicions about the taxonomic identity of the Bornean clade.

Here we formally transfer the most stable and unequivocal members of the Bornean clade to *Miopsalis*, which thus includes: *Miopsalis pulicaria* Thorell, 1890, the type species; *M. collinsi* (Shear, 1993) comb. nov.; *M. gryllospeca* (Shear, 1993) comb. nov.; *M. lionota* (Pocock, 1897) comb. nov.; *M. sabah* (Shear, 1993) comb. nov.; *M. silhavyi* (Rambla, 1991) comb. nov.; and *M. tarumpitao* (Shear, 1993) comb. nov., in addition to several undescribed species (Clouse, 2010; Clouse and Giribet, 2007, 2010; Clouse et al., 2009, 2011).

Specimen photographed (Figs. 7, 8):

Miopsalis pulicaria Thorell 1890
Type: Female
Pulo Pinang
Leg. L. Loria and L. Fea, 1889

Leptopsalis beccarii Thorell, 1882
Figures 9–12

The genus *Leptopsalis* Thorell, 1882, and the species *L. beccarii* Thorell, 1882, were described by Thorell (1882) on the basis of specimens from Sumatra. The MCSN collection has two specimens identified as "*Probably type series*" from Mt. Singalang (current spelling: Singgalang), a male (Fig. 9) and a female (Fig. 10). These were collected by Odoardo Beccari on Sumatra in July 1878, during the famous expedition on which he discovered the titan arum (*Amorphophallus titanum*), the largest unbranched inflorescence. Also collected on this expedition and deposited in the MCSN collection is a female that later became the type of *Stylocellus thorellii* Hansen & Sørensen, 1904. In addition, the MCSN

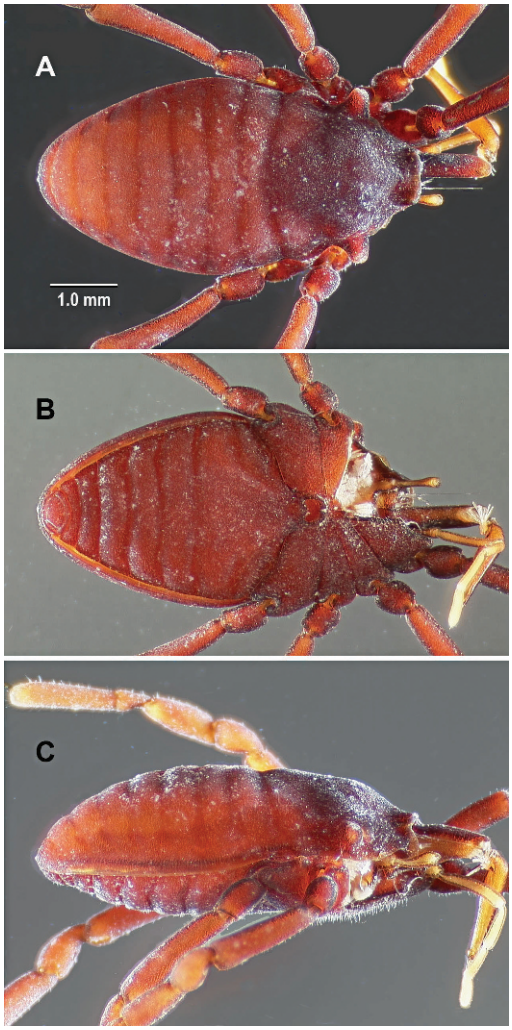

Figure 9. *Leptopsalis beccarii* Thorell, 1882, male lectotype, showing dorsal (A), ventral (B), and lateral (C) views.

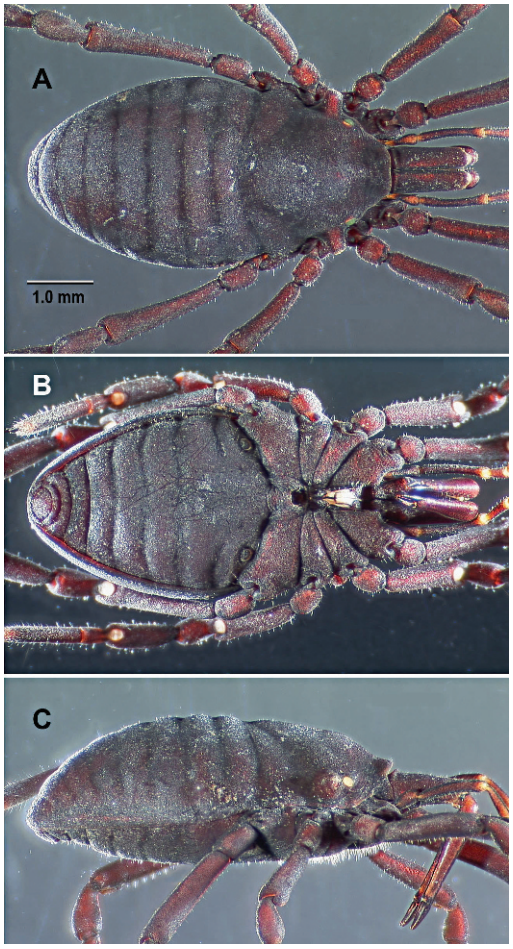

Figure 10. *Leptopsalis beccarii* Thorell, 1882, female paralectotype, showing dorsal (A), ventral (B), and lateral (C) views.

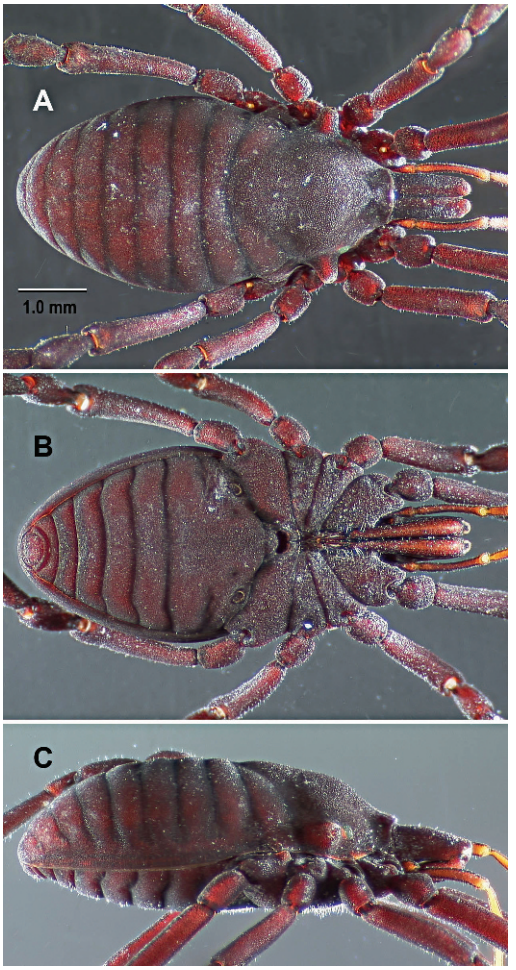

Figure 11. *Leptopsalis beccarii* Thorell, 1882, first male paralectotype, showing dorsal (A), ventral (B), and lateral (C) views.

has four male specimens identified as "*Cotypes*" (Figs. 11, 12), which were also collected by O. Beccari on Sumatra, but no date or specific locality is given; they appear to belong to *L. beccarii*.

Here we designate the male deposited at the MCSN (Fig. 9) and previously designated as *Probably type series* as the lectotype of *L. beccarii* Thorell, 1882, all other specimens in the MCSN (the female also designated previously as *Probably type series* and the four males identified previously as *Cotypes*) becoming paralectotypes.

Leptopsalis beccarii is the type species of the genus, although this species was soon synonymized with *Stylocellus sumatranus* Westwood, 1874 by Thorell (1890b). Later, Hansen and Sørensen (1904) recognized both species as valid, although they maintained the synonymy of *Leptopsalis* with *Stylocellus*, as did Roewer (1923) and Rosas Costa (1950). Giribet's (2000) catalogue, before examining either type, also left *L. beccarii* in synonymy with *S. sumatranus*, following Thorell (1890b), but the distinction between the species was recognized soon thereafter (Giribet, 2002). A molecular and continuous morphological phylogenetic analysis including *S. sumatranus* (but without

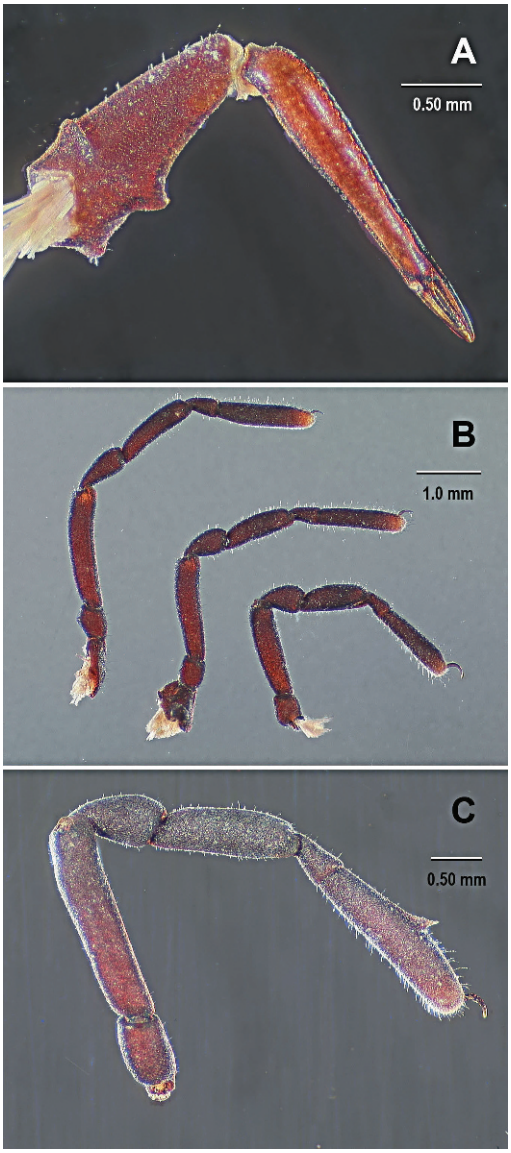

Figure 12. *Leptopsalis beccarii* Thorell, 1882, second male paralectotype: disarticulated right chelicera (A), right legs I–III (B, left to right, respectively), and right leg IV (C).

molecular data for this species) suggests that it branches out before the split between *Miopsalis* and *Leptopsalis*, although its exact position is uncertain, and it shares key characters with members of the genera *Meghalaya* and *Fangensis* (Clouse et al., 2009). It is possible that *Stylocellus* remains restricted to the type species of the genus. In contrast, our phylogenetic analysis shows that a large clade of stylocellids originating on Borneo and diversifying on the Thai–Malay Peninsula, Sumatra, Java, Sulawesi, and New Guinea includes several large Sumatran species closely resembling the type of *Leptopsalis* (Clouse and Giribet, 2007; Clouse, 2010; Clouse and Giribet, 2010; Clouse et al., 2009, 2011), and we formally resurrect this genus here and transfer the most stable members of this clade to *Leptopsalis*. These include *L. beccarii* Thorell, 1882, the type species; *L. dumoga* (Shear, 1993) comb. nov.; *L. hillyardi* (Shear, 1993) comb. nov.; *L. javana* Thorell, 1882; *L. lydekkeri* (Clouse & Giribet, 2007) comb. nov.; *L. modesta* (Hansen & Sørensen, 1904) comb. nov.; *L. novaguinea* (Clouse & Giribet, 2007) comb. nov.; *L. ramblae* (Giribet, 2002) comb. nov.; *L. sulcata* (Hansen & Sørensen, 1904) comb. nov.; *L. tambusisi* (Shear, 1993) comb. nov.; *L. thorellii* (Hansen & Sørensen, 1904) comb. nov.; and *L. weberii* (Hansen & Sørensen, 1904) comb. nov.

One male and one female specimens photographed (Figs. 9, 10):

Leptopsalis beccarii Thorell, 1882
Probably type series
Sumatra, Mt. Singalang
leg. O. Beccari VII-1878

Two male specimens whole, one photographed (Fig. 11). Two male specimens dissected, one with legs and chelicerae available, photographed (Fig. 12):

Leptopsalis beccarii Thorell, 1882
Cotypes
Sumatra
leg. O. Beccari

A male specimen collected by Elio Modigliani in Sipora Island (off the coast of Sumatra) in 1891 was erroneously identified by Carl Friedrich Roewer as *L. beccarii* in 1935 (at that time recombined in

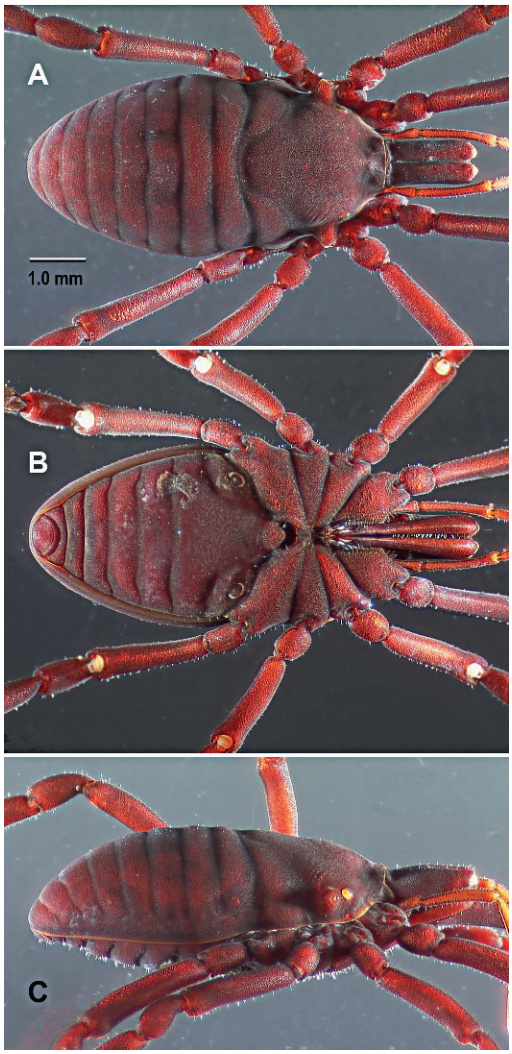

Figure 13. An undescribed male from Sipora Island (near Sumatra), collected in 1891, showing dorsal (A), ventral (B), and lateral (C) views.

Stylocellus). It is clearly affiliated with other large Sumatran *Leptopsalis*, of which we have seen several undescribed species, but it is distinctly larger than the lectotype of *L. beccarii*. Specimen photographed (Fig. 13):

Stylocellus beccarii Hansen & Sør.
Mentawei: Sereinu
Leg. E. Modigliani, 1891
Det. Roewer, 1935–N. 10202

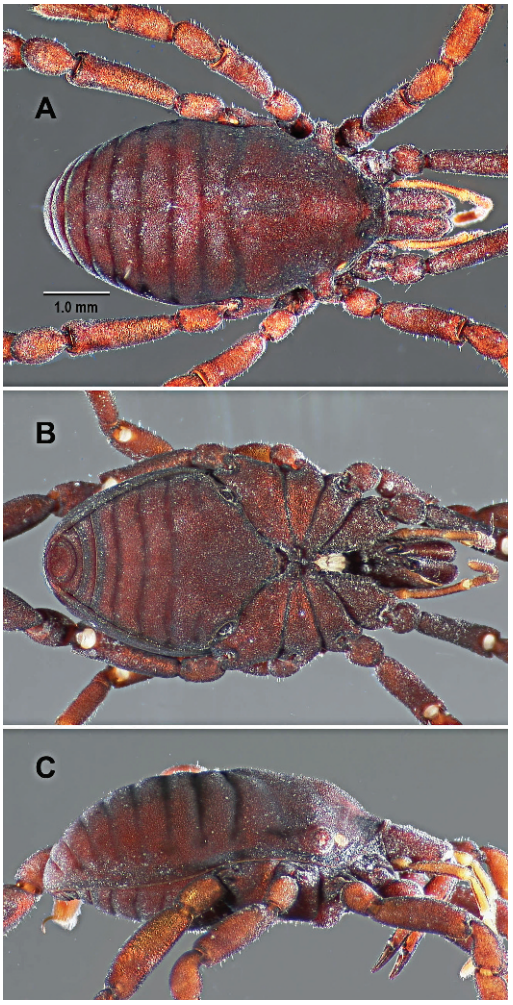

Figure 14. *Leptopsalis javana* Thorell, 1882, male holotype in dorsal (A), ventral (B), and lateral (C) views.

Leptopsalis javana Thorell, 1882
Figures 14, 15

Leptopsalis javana was described by Thorell (1882) along with *L. beccarii* on the basis of a single male specimen from Tcibodas (Cibodas), Java, collected by Odoardo Beccari.

We collected what appears to be *L. javana* at the Cibodas Botanical Garden, at the base of Gunung Gedé-Pangrango N.P., in Java. This was included in recent studies of stylocellid phylogenetics as "Java sp. 10"

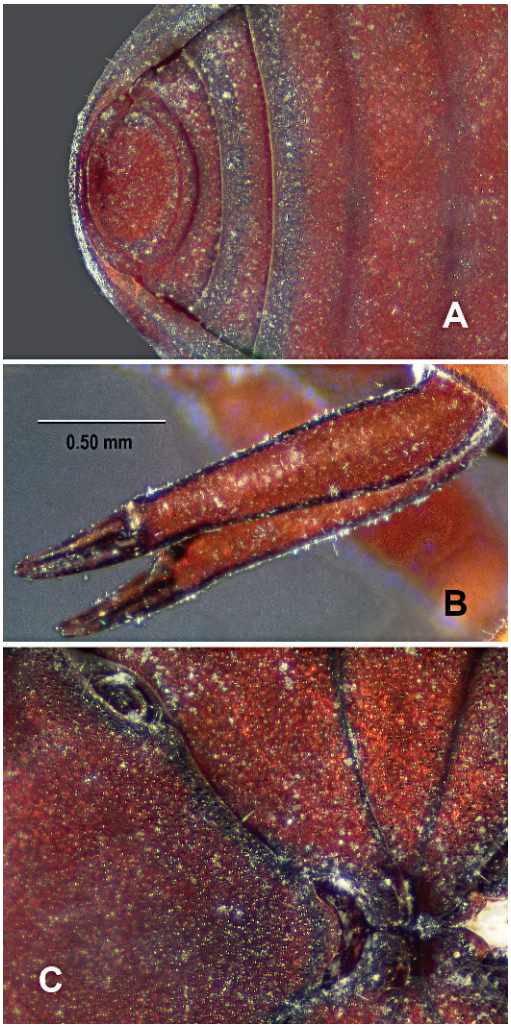

Figure 15. *Leptopsalis javana* Thorell, 1882, male holotype: detailed views of the anal plate and surrounding ventral posterior region (A), distal parts of chelicerae, lateral view (B), and gonostome (C).

(Clouse et al., 2009; Clouse and Giribet, 2010). A BMNH specimen from Tcibodas that we have examined is identified as *Stylocellus javanus* but appears to be misidentified; it is actually more similar to other large species found in western Java and recently included in our molecular phylogenetic analyses.

Male specimen photographed (Figs. 14, 15):

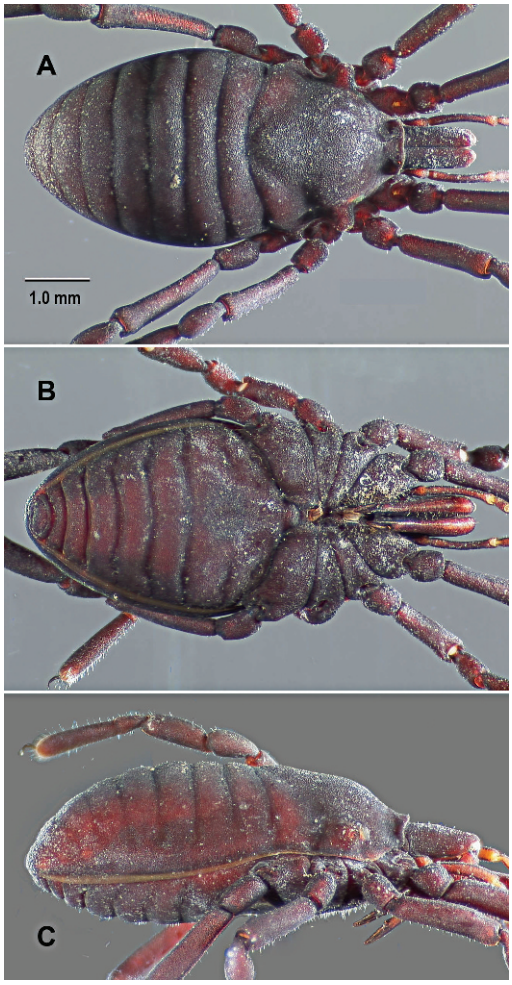

Figure 16. *Leptopsalis thorellii* (Hansen & Sørensen, 1904), female holotype in dorsal (A), ventral (B), and lateral (C) views.

Leptopsalis javana Thorell, 1882
Type
Giava, Tcibodas
leg. O. Beccari, X-1874

Leptopsalis thorellii (Hansen & Sørensen, 1904)
Figures 16, 17

Stylocellus thorellii was described by Hansen and Sørensen (1904) on the basis of a single female specimen from Mt. Singalang (current spelling: Singgalang), Sumatra, Indonesia. It was also originally

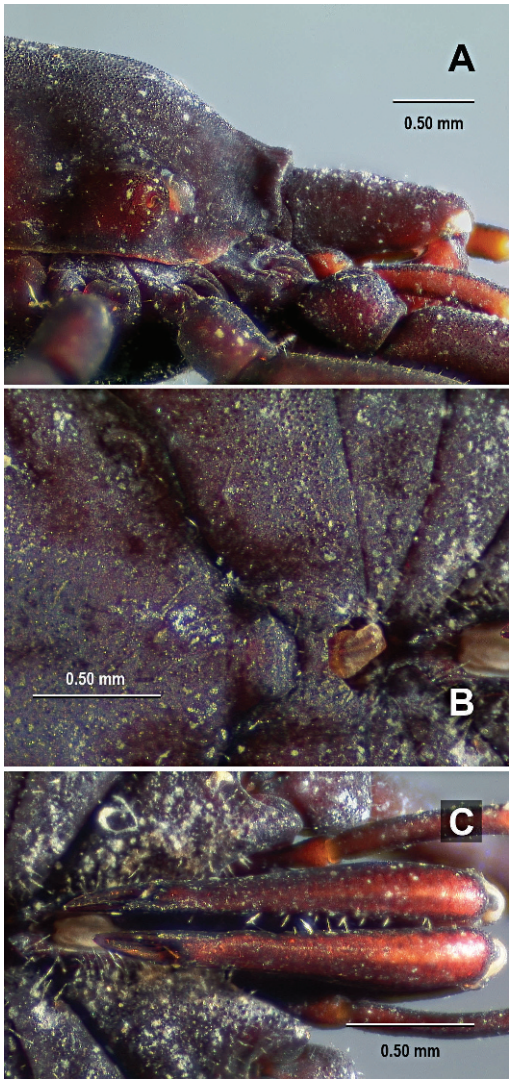

Figure 17. *Leptopsalis thorellii* (Hansen & Sørensen, 1904), female holotype: detailed views of the anterior lateral region (A), gonostome (B), and chelicerae (C).

included in the type series that was used for the description of the very similar *L. beccarii* (1882), although phylogenetically these two species have been recovered in different *Leptopsalis* clades (Clouse et al., 2009), highlighting the uncertainties of morphological characters in this large genus.

Stylocellus thorellii Hansen & Sør., 1904
Type: Female holotype

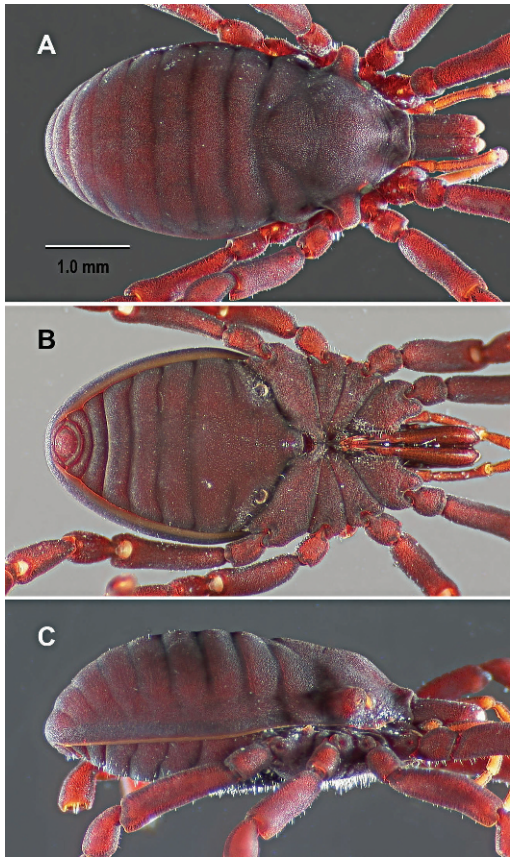

Figure 18. *Leptopsalis* cf. *weberii* (Hansen & Sørensen, 1904), male in dorsal (A), ventral (B), and lateral (C) views.

Sumatra, Mt. Singalang
leg. O. Beccari, VIII-1878
(*Stylocellus beccarii Thor. partim*)

Leptopsalis cf. *weberii* (Hansen & Sørensen, 1904)
Figures 18, 19

Stylocellus weberii was described by Hansen and Sørensen (1904) on the basis of a single male specimen collected by Max Weber at Manindjau (Lake Maninjau), Sumatera Barat, Sumatra, Indonesia. The MCSN contains one male and two females from a different locality on Sumatra, identified as *S. weberii*, although these specimens have not been contrasted with the

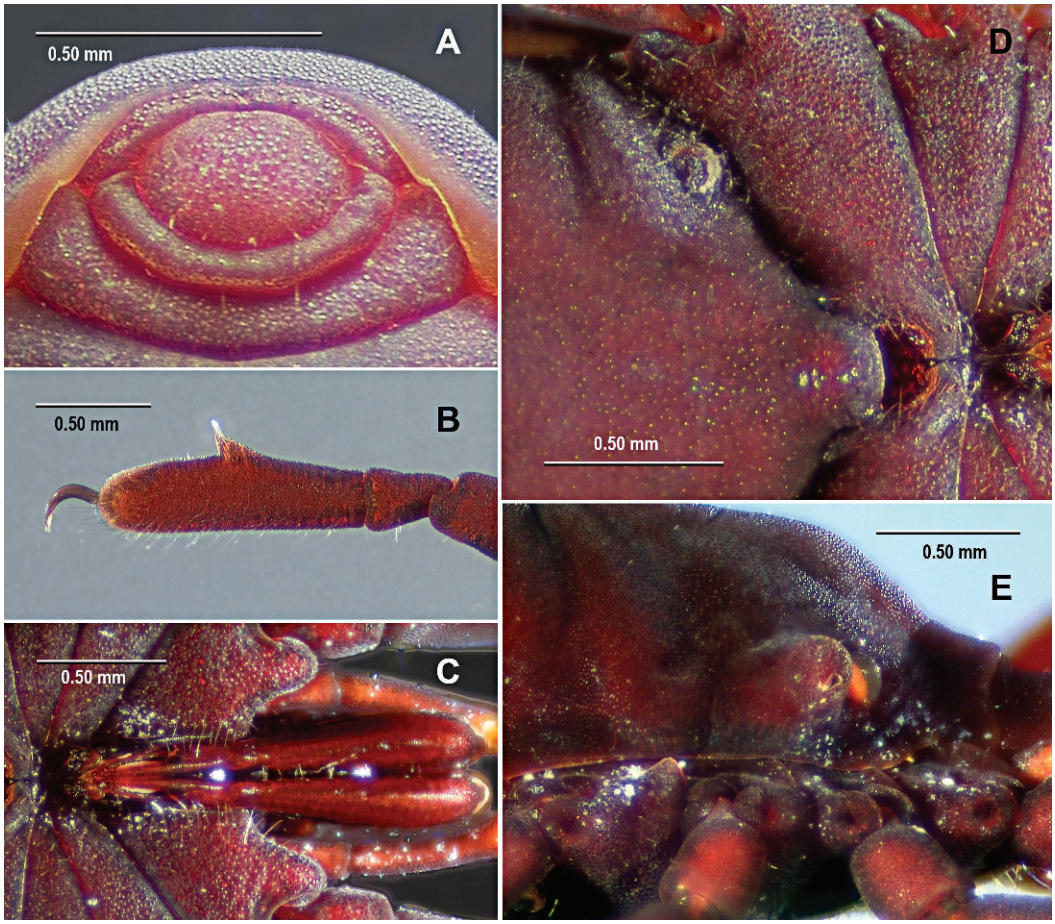

Figure 19. *Leptopsalis* cf. *weberii* (Hansen & Sørensen, 1904), male showing detailed views of the anal plate (A), tarsus IV (B), chelicerae (C), gonostome (D), and lateral anterior part of body (E).

type specimen from Maninjau, supposedly deposited in the Zoological Museum Amsterdam (Giribet, 2000).

Specimen photographed (Figs. 18, 19):

Stylocellus weberi Hansen & Sør.
One male, two females
leg. E. Modigliani, 1891
Sumatra: Pangherang
Det: Roewer, 1935–N. 10201

FINAL REMARKS

We provide here bibliographic and taxonomic details as well as high-definition photographs of important type specimens in the Opiliones suborder Cyphophthalmi deposited in the MCSN. These specimens are of special importance due to their constituting the type species of three genera (in the families Neogoveidae and Stylocellidae), having primary types of five species, and being among the oldest cyphophthalmid specimens known. The study of this material allows us to confirm the validity of the genus *Miopsalis*, considered a nomen dubium in the most recent catalogue of Cyphophthalmi, and confidently re-erect the genus *Leptopsalis*, in synonymy with *Stylocellus* for over a century. Several

described species are here assigned to both genera. Finally, this article aims at showing the importance of natural history collections for continuing the painstaking task of describing and documenting the biological diversity of our planet and how this work cannot progress in many taxonomic groups until type specimens are made available to the community.

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