The Goblin Spider Genus Ischnothyreus (Araneae, Oonopidae) in the New World

Authors: Platnick, Norman I., Berniker, Lily, and Kranz-Baltensperger, Yvonne

Source: American Museum Novitates, 2012(3759) : 1-32

Published By: American Museum of Natural History

URL: https://doi.org/10.1206/3759.2

AMERICAN MUSEUM NOVITATES

Number 3759, 32 pp. September 21, 2012

The Goblin Spider Genus *Ischnothyreus* (Araneae, Oonopidae) in the New World

NORMAN I. PLATNICK,[1] LILY BERNIKER,[1] AND YVONNE KRANZ-BALTENSPERGER[2]

ABSTRACT

Although originally described from St. Vincent in the Lesser Antilles, the goblin spider genus *Ischnothyreus* Simon appears to be an Old World taxon that is represented in the New World only by two presumably introduced, pantropical, synanthropic species: *I. peltifer* (Simon) and *I. velox* Jackson. Two specific names based on New World specimens (*I. barrowsi* Chamberlin and Ivie from Florida, and *I. indressus* Chickering from the Lesser Antilles) are placed as junior synonyms of *I. velox*, which is newly recorded from Mexico, Panama, Jamaica, Hispaniola, Venezuela, Brazil, Madagascar, the Philippines, the Marshall Islands, Hawaii, the Marquesas Islands, and New Caledonia. A third species, *I. browni* Chickering, that is supposedly from Costa Rica was apparently based on mislabeled specimens that are actually from the Philippines. The type specimens of *I. browni* resemble those of the Seychelle species *Ischnothyrella jivani* (Benoit) in that the dorsal abdominal scutum of males is extremely weak and that of females is either greatly reduced or entirely lost. Both species nevertheless share the synapomorphies of *Ischnothyreus*, and the generic name *Ischnothyrella* Saaristo is therefore placed as a junior synonym of *Ischnothyreus*.

INTRODUCTION

Simon (1891), in the first paper dealing with the generic-level diversity of New World oonopids, described a total of eight new genera, each based on a species collected on the tiny

[1] Division of Invertebrate Zoology, American Museum of Natural History.
[2] Natural History Museum Bern, Switzerland.

 ISSN 0003-0082

island of St. Vincent in the Lesser Antilles. In three of those cases, the relevant type species have since been shown to be pantropical taxa that are probably of Old World origin, rather than native to St. Vincent: *Pelicinus* Simon (see Platnick et al., 2012b), *Opopaea* Simon (see Platnick and Dupérré, 2009), and *Triaeris* Simon (see Platnick et al., 2012c). In the present paper we argue that the same is true for a fourth genus, described initially as *Ischnaspis* Simon, a preoccupied name that was quickly replaced by *Ischnothyreus* Simon (1893a).

Simon (1891), when describing the type species, *Ischnaspis peltifer* Simon, on the basis of females from St. Vincent, already considered the species to be widespread, citing additional females from Sierra Leone and the Philippines. Simon (1893a: fig. 264) later added Sri Lanka to the list as well, supplying an illustration of a Sri Lankan male that he associated with *I. peltifer*. That male was misidentified, and belongs to a different genus, *Camptoscaphiella* Caporiacco (see Baehr and Ubick, 2010). The actual male of *I. peltifer* was first described, misplaced as a species of *Dysderina* Simon, by Bryant (1942), and it was first correctly associated with *I. peltifer* by Chickering (1968).

Although Simon's females from Sierra Leone and the Philippines were also misidentified, workers since Simon's time have followed his lead, and have recorded *I. peltifer* from a wide variety of both Old and New World localities. However, Saaristo (2001) demonstrated that some of those far-flung records actually refer to a second species, *Ischnothyreus velox* Jackson (1908), which was originally described on the basis of specimens taken in British greenhouses; Saaristo (2001) showed clearly that *I. velox* occurs also at least in the Seychelles, and that both species have been found in British greenhouses.

Our studies suggest that both of the species treated by Saaristo are actually widely distributed, pantropical, synanthropic taxa that have also been introduced into buildings in temperate areas of the northern hemisphere; *I. peltifer* has been taken even in Canada (in the African Pavilion of the Toronto Metropolitan Zoo)! The two species are sometimes even sympatric, and both have been collected in Florida, Mexico, Panama, Jamaica, St. Vincent, Venezuela, Brazil, Madagascar, Seychelles, and Hawaii.

Interestingly, Simon (1896) had already concluded that there is more than one widespread species of *Ischnothyreus*, as he reported that specimens of *Ischnothyreus lymphaseus* Simon (1893b), originally described from Sri Lanka, had been taken in the greenhouses of the Muséum National d'Histoire Naturelle in Paris. The basis for that conclusion is uncertain; the only vial currently in the Simon collection containing material said to be from those greenhouses includes three females only, and *I. lymphaseus* was described (and remains known only) from a single male. There is an additional vial in the Simon collection, labeled only with that species name, which includes one male and one female; whether that pair of specimens is from Sri Lanka, France, or somewhere else is unknown. Simon may have used that pair to match the sexes, but he seems subsequently to have realized that his identification of the Paris greenhouse specimens was incorrect; after studying the apparently conspecific specimens from British greenhouses sent to him by Jackson, Simon agreed that they represented a new species (which Jackson then described as *I. velox*), rather than *I. lymphaseus*.

New World *Ischnothyreus* have been studied seriously only by Chickering (1968), who confined his attention to collections from Central America and the West Indies; he later

(Chickering, 1969) examined a few specimens from Florida as well. In addition to noting many new records for *I. peltifer*, Chickering (1968) described two new species. One, *I. indressus* from the Lesser Antilles, is placed below as a junior synonym of *I. velox*, but the second, *I. browni*, is more problematic. It was based on two males and one female that Chickering (1968: 83) indicated were "believed to have been collected by Dr. W.L. Brown, Cornell University, in Costa Rica, Río Toro Amarillo, near Guapiles, Heredia, March 1966." Chickering (1968: 84) also noted that "Because of some confusion in sorting there seems to be a slight uncertainty about the type locality…."

Costa Rican oonopids have since been thoroughly collected by Carlos Víquez and his colleagues, but we have found no additional specimens of *I. browni* from Costa Rica or anywhere else in the New World. We therefore suspected that the type specimens are actually from somewhere in the Old World instead. Our searches of available collections of *Ischnothyreus* from the Old World revealed apparently conspecific specimens from the Philippines.

It is conceivable that the types of *I. browni* were an accidental introduction from the Philippines, and were actually captured in Costa Rica. However, given the confusion mentioned by Chickering, it seems far more likely that his specimens are actually from the Philippines, and were simply mislabeled during the sorting process. Until and unless additional specimens of *I. browni* are found in the New World, we regard the Costa Rican record of the species as spurious.

The type specimens of *I. browni* are notable for their lightly sclerotized abdomens (figs. 152, 153, 155). Chickering (1968: 83) described the males as having abdominal scuta "which are hardly discernible with borders very indefinite; dorsal scutum appears to reach only a little more than half way from base to posterior end"; he similarly (1968: 84) indicated that the female has the "dorsal scutum hardly discernible; ventral and epigastric scuta clearly visible." Chickering's specimens may be teneral (i.e., collected shortly after their final molt, before the dorsal scutum had time to become fully sclerotized). We have seen similarly teneral males of other *Ischnothyreus* species in which the dorsal scutum is scarcely detectable, even though the palps are well sclerotized; given that the palps are so heavily sclerotized, it isn't surprising that sclerotization of the dorsal scutum may lag behind that of the palps. In the case of older specimens in collections, one often cannot tell whether they are teneral or merely bleached from overexposure to light, and of course some specimens may be both teneral and bleached, making them exceedingly difficult to study.

Nevertheless, the appearance of Chickering's specimens of *I. browni* is strikingly similar to that of the Seychelle specimens originally described as *Ischnothyreus jivani* by Benoit (1979). In his subsequent review of the Seychelle oonopids, Saaristo (2001) established a new genus, *Ischnothyrella*, to contain only *I. jivani*. This monotypic genus was based primarily on the supposed absence of visible abdominal scuta, although Saaristo also cited minor differences in leg spination, as well as male and female genitalic features that are unique to the type species and hence uninformative about its relationships. The types of *I. jivani* are badly bleached, and it is possible that they may be teneral as well, so Saaristo's claim that the abdominal scuta are entirely absent is suspect, and needs to be checked against freshly collected specimens.

In any case, though, as with numerous other monotypic genera erected by Saaristo, he seems here to have been so overimpressed by species-level autapomorphies (such as the puta-

tive loss of the dorsal scutum) that he promoted a relatively autapomorphic species to an unreasonably high level, thereby rendering the group to which it actually belongs (*Ischnothyreus*, in this case) paraphyletic. Just as in the similar examples detailed in Platnick et al. (2011) for *Brignolia* Dumitresco and Georgesco and in Platnick et al. (2012a) for *Orchestina* Simon, Saaristo provided no putative synapomorphies uniting all the relevant species other than *I. jivani* and hence supporting the placement of that species as the sister group of all the others. We know of no such characters; Saaristo's artificial, monotypic genus is therefore positively misleading phylogenetically, and is here placed in synonymy. *Ischnothyreus* species actually vary widely in the extent of the dorsal abdominal scutum; although it is usually small, covering only about half of the abdominal length and width, it can be much larger (covering almost the entire dorsum; see Kranz-Baltensperger, 2011: figs. 8A, 8C, 30A, 30C) or much smaller (reduced to just a narrow strip over the cardiac area), and may possibly be lost entirely (at least in some females).

As thus relimited, *Ischnothyreus* is defined by obvious synapomorphies: the heavily sclerotized, "burnt" palps of males (figs. 77, 82), which are associated with an elaborate, internal skeletomuscular system (figs. 43–45; Dumitresco and Georgesco, 1983: pl. 17, figs. 4, 5) situated within the anterior portion of the concomitantly elevated carapace (fig. 2). These highly elaborated endosternites are typically visible through the cuticle of the carapace (fig. 79). The palps are also held in a characteristic and diagnostic resting position, twisted retrolaterally so as to lie flat at the sides of the endites and sternum (fig. 81). So far as we are aware, similarly "burnt" palps occur only in the genus *Brignolia*, but those palps are differently constructed, with a distinct dorsal depression that does not occur in *Ischnothyreus*. Females of the genus *Triaeris* also resemble those of *Ischnothyreus* in having hypertrophied posterior genitalic elements that occupy most of the postepigastric scutum and involve external modifications of that scutum, but they do not have the highly "squiggled" ducts found in most species of *Ischnothyreus*. As argued elsewhere (Platnick et al., 2011, 2012c), *Brignolia* appears to be more closely related to *Opopaea* than to *Ischnothyreus*, and *Triaeris* appears to be more closely related to *Zyngoonops* Benoit than to *Ischnothyreus*.

We suspect that, as suggested by Ubick and Griswold (2011), *Ischnothyreus* is actually more closely related to the Asian genus *Camptoscaphiella* and the Malagasy genus *Malagiella* Ubick and Griswold (2011) than to either *Brignolia* or *Triaeris*. Serious consideration of that hypothesis must await study of the many undescribed Old World species of *Ischnothyreus*, but there do seem to be potential female genitalic synapomorphies uniting these genera. Baehr and Ubick (2010: 6) reported a slit-shaped external copulatory opening, situated near the anterior margin of the postepigastric scutum, in female *Camptoscaphiella*; a similar slit occurs also at least in *I. peltifer* (compare figs. 72, 73 with Baehr and Ubick, 2010: fig. 150). However, within *Camptoscaphiella*, the presence of that slit-shaped opening has been confirmed by scanning electron microscopy only in the females of *Camptoscaphiella paquini* Ubick, a Chinese species that differs significantly from its congeners in that the female genitalic ducts resemble those of *Ischnothyreus* in being highly "squiggled." It is possible, however, that both genera actually show a similar range of female genitalic structures, as we have seen undescribed *Ischnothyreus* species

(from Africa and Sulawesi) in which the posterior genitalic ducts of females appear (at least superficially) to be nearly straight.

In at least two species of the similar genus *Malagiella*, the external copulatory opening is rounded rather than slit shaped (Ubick and Griswold, 2011: figs. 11, 177), and is seemingly not accompanied by the longitudinal row of pores along the midline that is found in at least some species of *Ischnothyreus* (figs. 73, 74) and *Camptoscaphiella*. Interestingly, though, *Malagiella* species show similar variation in female posterior genitalic duct arrangements, ranging from nearly straight to very sinuous (Ubick and Griswold, 2011: map 4), and in *I. velox* the external copulatory opening is rounded (fig. 132) rather than slit shaped. Nevertheless, female genitalic structure (i.e., the longitudinal row of pores accompanying the copulatory opening) may actually support the monophyly of *Ischnothyreus* plus *Camptoscaphiella*, whereas the male palps instead clearly support the monophyly of *Camptoscaphiella* plus *Malagiella*, which are united by a greatly enlarged palpal patella (Baehr and Ubick, 2010: figs. 161, 164; Ubick and Griswold, 2011: figs. 7, 85–87) that does not occur in any of the species of *Ischnothyreus*. The grouping of *Camptoscaphiella* plus *Malagiella* is also supported by the presence of protrusions at the anterolateral corners of the sternum of males (Ubick and Griswold, 2011: figs. 1, 7) that do not occur in *Ischnothyreus*. However, the third possibility, grouping *Ischnothyreus* plus *Malagiella*, as opposed to *Camptoscaphiella*, may be supported by a different character, an elongated distal tooth on the claws of leg IV of females that gives those claws a bifid appearance (fig. 59; cf. Ubick and Griswold, 2011: figs. 9, 10).

Some other unusual characters seem too variable to help provide a solution. For example, the males of at least *I. peltifer* seem to show no trace of either the epigastric furrow or a groove connecting the posterior spiracles (fig. 15), and thus resemble those of at least some species of *Malagiella* (cf. Ubick and Griswold, 2011: fig. 34). However, the males of *I. velox* have a distinct groove (fig. 107), as in at least some species of *Camptoscaphiella* (cf. Baehr and Ubick, 2010: figs. 48, 49); in both genera, it seems uncertain whether this groove represents the epigastric furrow, a groove connecting the posterior spiracles, or perhaps even a fusion of both. Similarly, males of all *Malagiella* species, and all but two *Camptoscaphiella* species, have the dorsal scutum fused to the epigastric scutum, but this character varies widely within *Ischnothyreus*; only about half of the males described by Kranz-Baltensperger (2011, 2012) have those scuta fused.

Thus, we can only concur with Ubick and Griswold (2011: 7) that these three genera constitute a monophyletic group, the "*Ischnothyreus* complex." A fourth genus, *Aprusia* Simon, from Sri Lanka and southern India, seems also to belong to this group, sharing a similar eye arrangement, leg spination pattern, and abdominal scutum configuration, but both the male and female genitalic conformation suggest that *Aprusia* is less closely related to *Ischnothyreus* than are *Camptoscaphiella* and *Malagiella* (see Grismado et al., 2011).

Our methods follow those of Platnick and Dupérré (2009); all measurements are in mm. A detailed description is provided for the type species, and only differences from that species are mentioned in the other descriptions. High-resolution versions of the images, many additional images of the pantropical species, a sortable version of the geocoded locality data, and a distribution map for each species will be available on the goblin spider Planetary Biodiversity Inventory (PBI) project's website (http://research.amnh.org/oonopidae).

COLLECTIONS EXAMINED

AMNH	American Museum of Natural History, New York, NY
BMNH	Natural History Museum, London, England
BSC	Centro Oriental de Ecosistemas y Biodiversidad, Santiago de Cuba
CAS	California Academy of Sciences, San Francisco, CA
CDU	Collection of Darrell Ubick, San Francisco, CA
CKH	Collection of Karl-Hinrich Kielhorn, Berlin, Germany
CMD	Collection of Michaël Dierkens, Lyon, France
CNC	Canadian National Collection, Ottawa, Canada
FMNH	Field Museum of Natural History, Chicago, IL
FSCA	Florida State Collection of Arthropods, Gainesville, FL
ICN	Instituto de Ciencias Naturales, Universidad Nacional, Bogotá, Colombia
INBIO	Instituto Nacional de Biodiversidad, Santo Domingo, Costa Rica
KBIN	Koninklijk Belgisch Instituut voor Natuurwetenschappen, Brussels, Belgium
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge, MA
MIUP	Museo de Invertebrados, Universidad de Panamá
MNH	Museo Nacional de Historia Natural, Havana, Cuba
MNHN	Muséum National d'Histoire Naturelle, Paris, France
MPEG	Museu Paraense Emílio Goeldi, Belém, Brazil
MRAC	Musée Royal de l'Afrique Centrale, Tervuren, Belgium
TMM	Texas Memorial Museum, Lubbock, TX
ZMUT	Zoological Museum, University of Turku, Finland

Ischnothyreus Simon

Ischnaspis Simon, 1891: 562 (type species by monotypy *Ischnaspis peltifer* Simon); preoccupied in the Hemiptera by *Ischnaspis* Douglas, 1887.

Ischnothyreus Simon, 1893a: 298 (replacement name for *Ischnaspis* Simon).

Ischnothyrella Saaristo, 2001: 348 (type species by original designation *Ischnothyreus jivani* Benoit). NEW SYNONYMY.

Diagnosis: Specimens of *Ischnothyreus* resemble those of *Camptoscaphiella* and *Malagiella* in having long, strong spines on the anterior femora, tibiae, and metatarsi (figs. 77, 91), nearly contiguous eyes arranged in an almost circular pattern (fig. 4), an external copulatory opening on the postepigastric scutum of females (fig. 73), and (usually) a reduced dorsal scutum (figs. 76, 90). Males of *Ischnothyreus* are easily separated from those of *Camptoscaphiella* and *Malagiella* by their heavily sclerotized, "burnt" palps (figs. 77, 82, 104), which do not have the enlarged patellae characteristic of those two genera. Indeed, males are likely to be confused only with those of *Brignolia*, which also have heavily sclerotized, "burnt" palps but which lack leg spines and have flatter, more heavily sclerotized abdomens (see Platnick et al., 2011: figs. 6, 8). Most females of *Ischnothyreus* can be separated from those of *Malagiella*, and all those of *Camptoscaphiella* except *C. paquini*, by the highly "squiggled" posterior genitalic ducts (figs.

75, 96), but some undescribed species of *Ischnothyreus* have ducts that appear nearly straight, and we have not yet found any characters that will reliably separate such females. Females of *Ischnothyreus* could also be confused with those of *Triaeris*, which also have the bulk of the genitalia occupying the postepigastric scutum and often including somewhat sinuous posterior ducts, but which differ from members of *Ischnothyreus* in having a greatly elongated, spinose patella on leg I (see Platnick et al., 2012c).

Description: See Saaristo (2001: 345); a full description will not be possible until the many undescribed Old World species are studied in detail.

Distribution: *Ischnothyreus* appears to be natively an Old World group. Numerous endemic species occur from West Africa to Yemen (Saaristo and van Harten, 2006), Nepal (Burger, 2010), China (Tong and Li, 2008), Malaysia (Kranz-Baltensperger, 2012), Japan, the Philippines, the Marshall Islands, and Borneo (Kranz-Baltensperger, 2011) and, to the south, from Angola, Comoros, Madagascar, and Seychelles east to Australia (Edward and Harvey, 2009), Fiji, and the Cook Islands. However, as detailed below, two of the Old World species have apparently attained pantropical distributions.

Synonymy: The male of *I. jivani* has the "burnt" palps, the associated skeletomuscular elements inside the carapace, the elevated carapace, and the retrolaterally twisted palpal resting position that are apparently synapomorphic for *Ischnothyreus*; removal of that species to a separate genus apparently renders *Ischnothyreus* paraphyletic, and is therefore unacceptable.

Ischnothyreus peltifer (Simon)

Figures 1–99

Ischnaspis peltifer Simon, 1891: 562 (four female syntypes from St. Vincent, in BMNH, one female syntype from St. Vincent, in MNHN; examined).

Ischnothyreus peltifer: Simon, 1893a: 298 (not male, fig. 264, = *Camptoscaphiella simoni* Baehr). – Petrunkevitch, 1929: 66, figs. 51, 52. – Chickering, 1951: 219, fig. 7. – Chickering, 1968: 80, figs. 1–10. – Dumitresco and Georgesco, 1983: 96, pl. 17, figs. 1–9, pl. 18, figs. 1–4. – Saaristo, 2001: 345, figs. 146A, 147A–C, 148A–B, 149, 150, 152–154, 155A, 156, 157A–B. – Saaristo and van Harten, 2006: 135, figs. 15a–b, 16a–c, 17. – Platnick et al., 2012a: 12, figs. 16–20, 22, 23, 25 (not figs. 21, 24, = *I. velox*).

Dysderina antillana Bryant, 1942: 324, figs. 1, 7 (male holotype from Christiansted, St. Croix, Virgin Islands, in MCZ; examined). First synonymized by Chickering, 1968: 80.

Ischnothyreus velox (misidentification): Bristowe, 1948: 890 (in part, male, fig. 1). – Locket and Millidge, 1951: 76 (in part, male, fig. 38E).

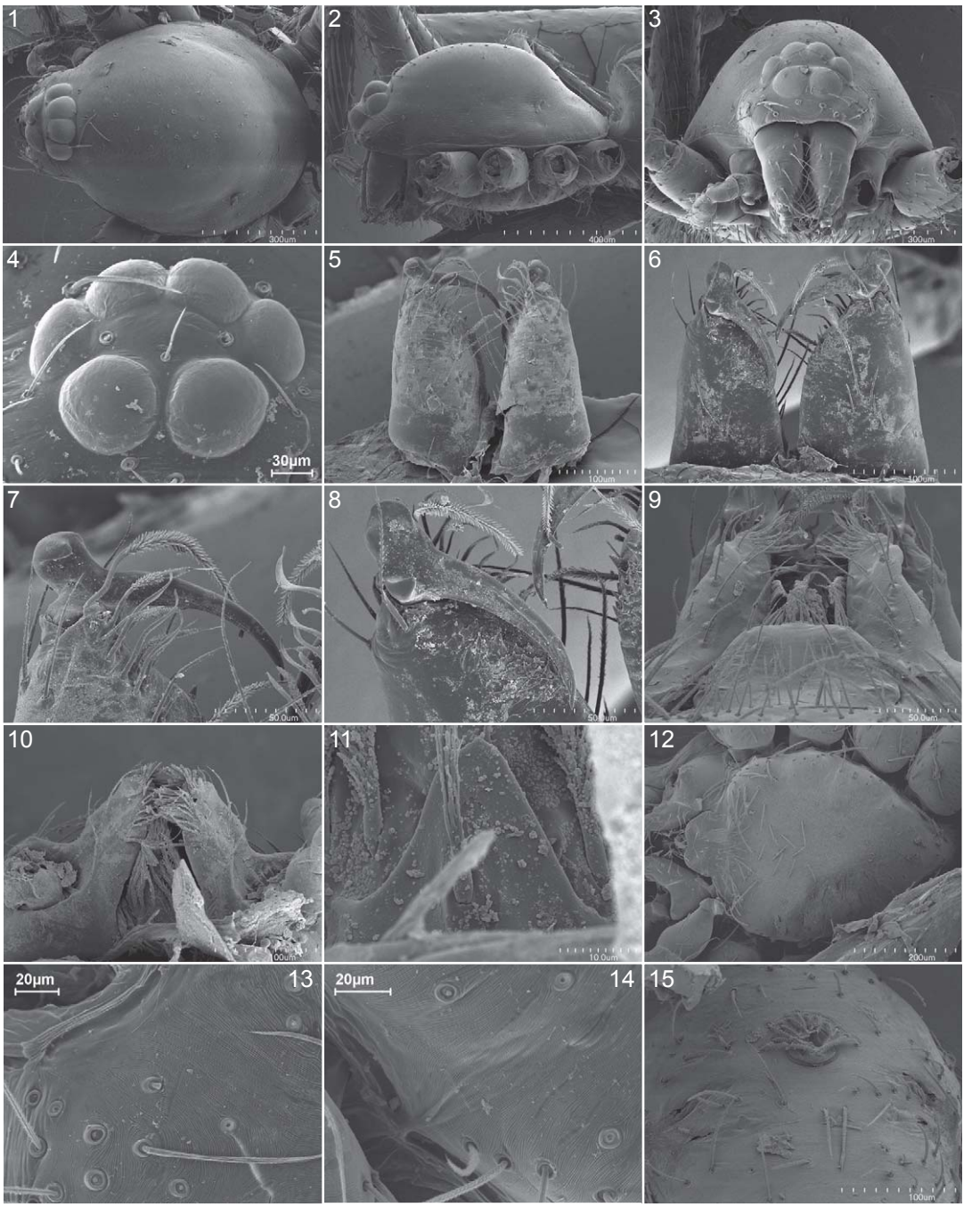
Ischnothyreus omus Suman, 1965: 226, figs. 1–8 (male holotype from Kailua, Oahu, Hawaii, in Bishop Museum; not examined). – Chen and Zhang, 1991: 63, figs. 54.1–5 (*I. onus*, lapsus). – Song, Zhu, and Chen, 1999: 69, figs. 28I–K. – Ono, 2009: 103, figs. 25– 31. First synonymized by Saaristo, 2001: 345 (*I. omosus*, lapsus).

Ischnothyreus formosus Brignoli, 1974: 80, figs. 12–18 (male holotype from Akau, Taiwan, in Zoological Museum, Hamburg; not examined). – Song, 1987: 91, fig. 55. – Chen and Zhang, 1991: 62, figs. 53.1–7. – Song, Zhu, and Chen, 1999: 69, figs. 28F–H. First synonymized by Saaristo, 2001: 345.

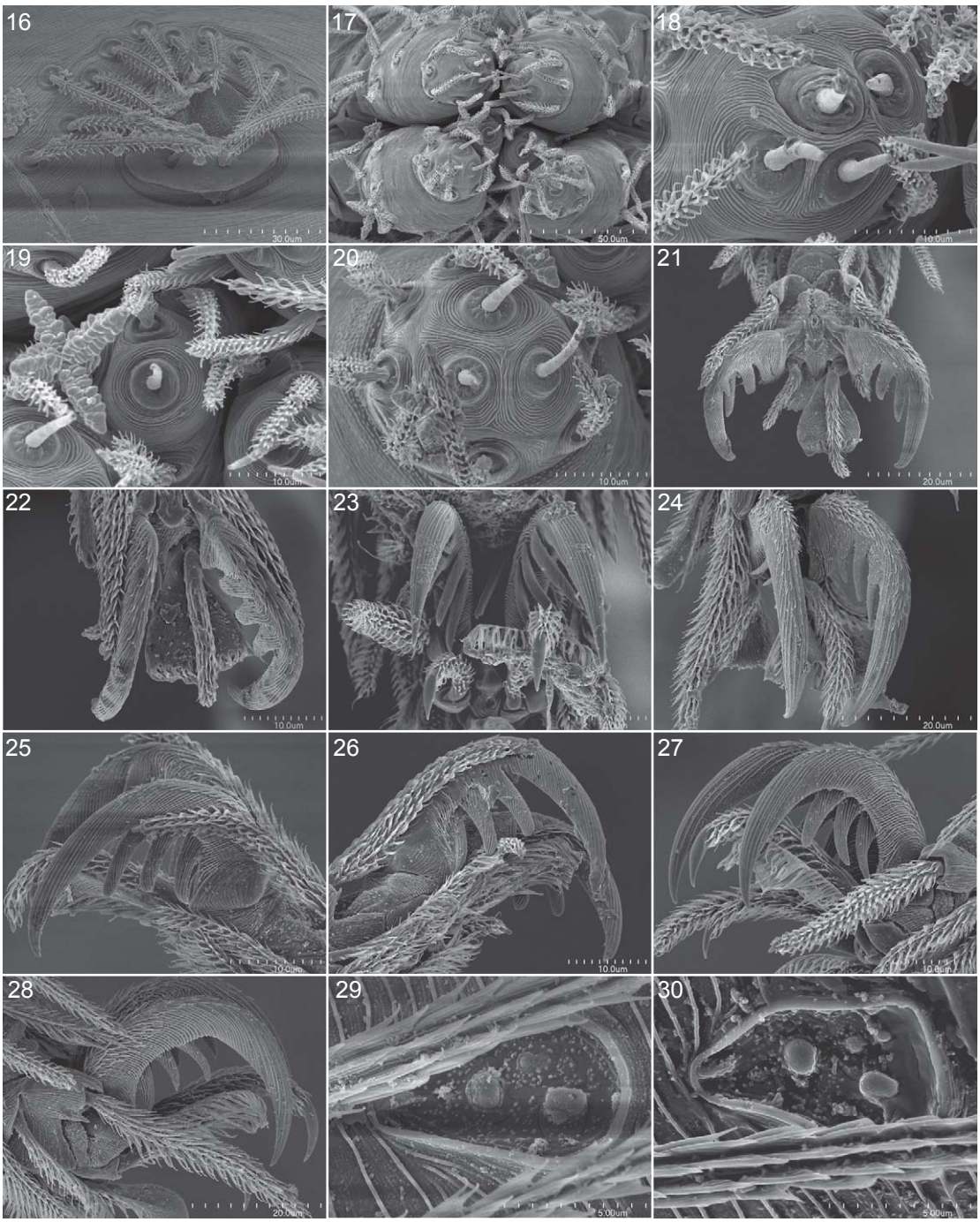
Ischnothyreus sechellorum Benoit, 1979: 208, figs. 7A–E (female holotype from Mahe, Sechelles, in MRAC; examined). First synonymized by Saaristo, 1999: 3.

Diagnosis: Males can easily be separated from those of *I. velox* by the large protuberance on the base of the cheliceral fang (figs. 5–8, 83), females by the narrow, posteriorly situated, sinuous ridge on the postepigastric scutum (fig. 72).

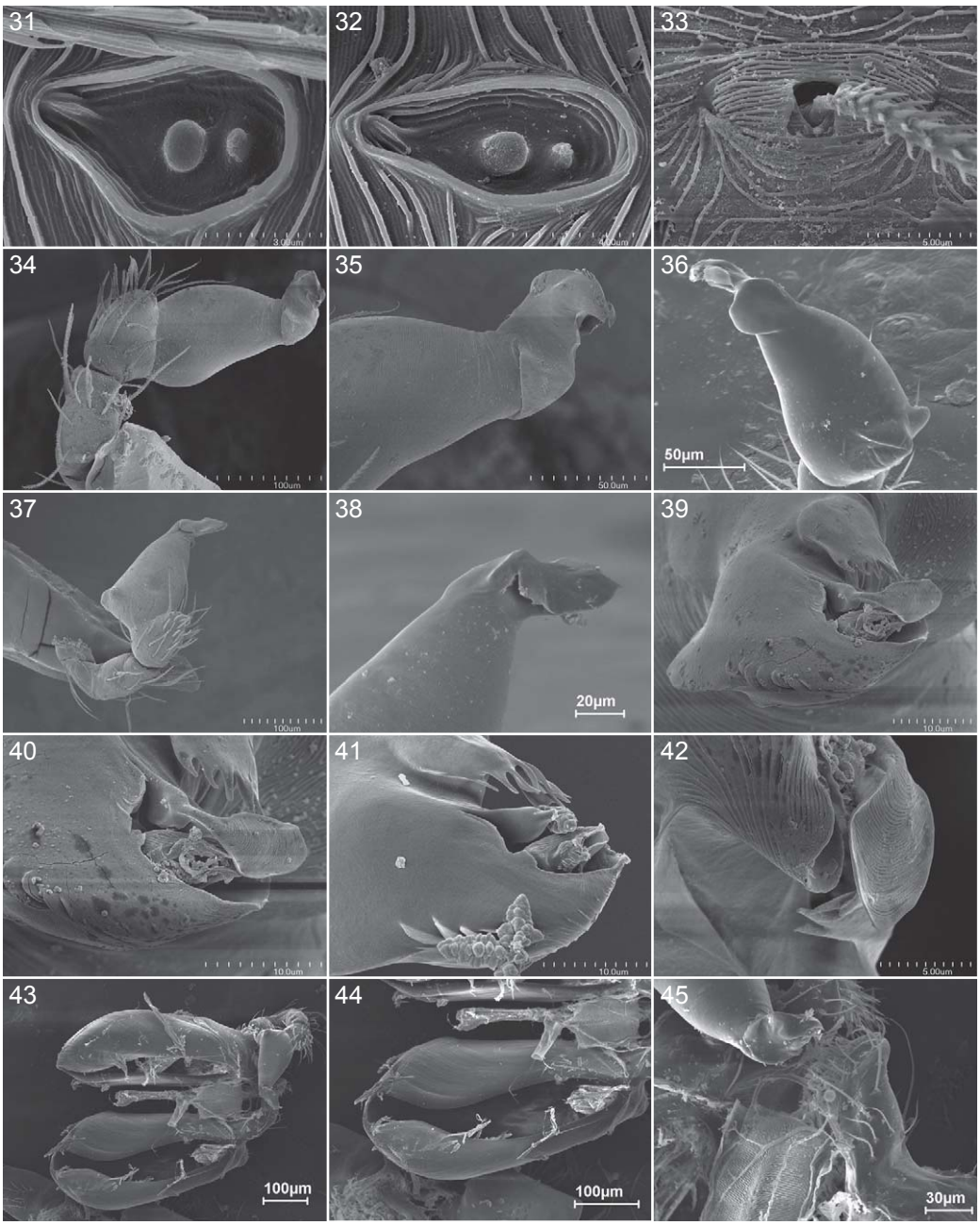
Male (PBI_OON 16071, figs. 1–45, 76–87): Total length 1.48. **Cephalothorax:** Carapace olive green, with dark brown egg-shaped patches behind eyes, ovoid in dorsal view (fig. 1), pars cephalica strongly elevated in lateral view (fig. 2), anteriorly narrowed to 0.49 times its maximum width or less, with rounded posterolateral corners, posterolateral edge without pits, posterior margin not bulging below posterior rim, anterolateral corners with slightly sclerotized triangular projections, posterolateral surface without spikes, surface of elevated portion of pars cephalica smooth, sides reticulate, thorax without depressions, fovea absent, without radiating rows of pits; lateral margin straight, smooth, without denticles; plumose setae near posterior margin of pars thoracica absent; nonmarginal pars cephalica setae light, needlelike, scattered; nonmarginal pars thoracica setae absent; marginal setae light, needlelike. Clypeus margin unmodified, straight in front view, vertical in lateral view, high, ALE separated from edge of carapace by their radius or more (fig. 3), median projection absent; setae light, needlelike. Chilum absent. Eyes six, well developed, ALE largest, ALE circular, PME oval, PLE oval; posterior eye row procurved from both above and front; ALE separated by less than their radius, ALE-PLE separated by less than ALE radius, PME touching throughout most of their length, PLE-PME touching (fig. 4). Sternum slightly longer than wide (fig. 12), pale orange, uniform, not fused to carapace, median concavity absent, without radial furrows between coxae I–II, II–III, III–IV, radial furrow opposite coxae III absent, surface smooth, without pits, microsculpture absent, sickle-shaped structures absent, anterior margin with continuous transverse groove, posterior margin not extending posteriorly of coxae IV, anterior corner unmodified, lateral margin with infracoxal grooves and anterior and posterior openings (figs. 13, 14), distance between coxae approximately equal, extensions of precoxal triangles present, lateral margins unmodified, without posterior hump; setae scattered, light, needlelike, more abundant on anterior half, originating from surface, without hair tufts. Chelicerae, endites and labium pale orange. Chelicerae straight, anterior face unmodified; with one tooth on both promargin and retromargin (figs. 5, 6); fangs without toothlike projections, directed posteriorly, shape normal, with prominent basal process (figs. 7, 8), tip unmodified; setae light, needlelike, evenly scattered; paturon inner margin with scattered setae, distal region unmodified, posterior surface unmodified, promargin unmodified, inner margin with many medial denticles, laminate groove absent. Labium rectangular, fused to sternum, anterior margin indented at middle, same as sternum in sclerotization; with six or more setae on anterior margin, subdistal portion with unmodified setae (fig. 9). Endites distally excavated, serrula absent (fig. 10), anteromedian tip with one strong, tooth-shaped projection, posteromedian part unmodified, same as sternum in sclerotization. Labrum with triangular projection (fig. 11); palps connected to complexly modified endosternite (figs. 43–45). **Abdomen:** ovoid, without long posterior extension, rounded posteriorly, interscutal membrane rows of small sclerotized platelets absent posteriorly; dorsum soft portions white, without color pattern. Book lung covers large, elliptical, without setae, anterolateral edge unmodified. Posterior spiracles not connected by groove. Pedicel



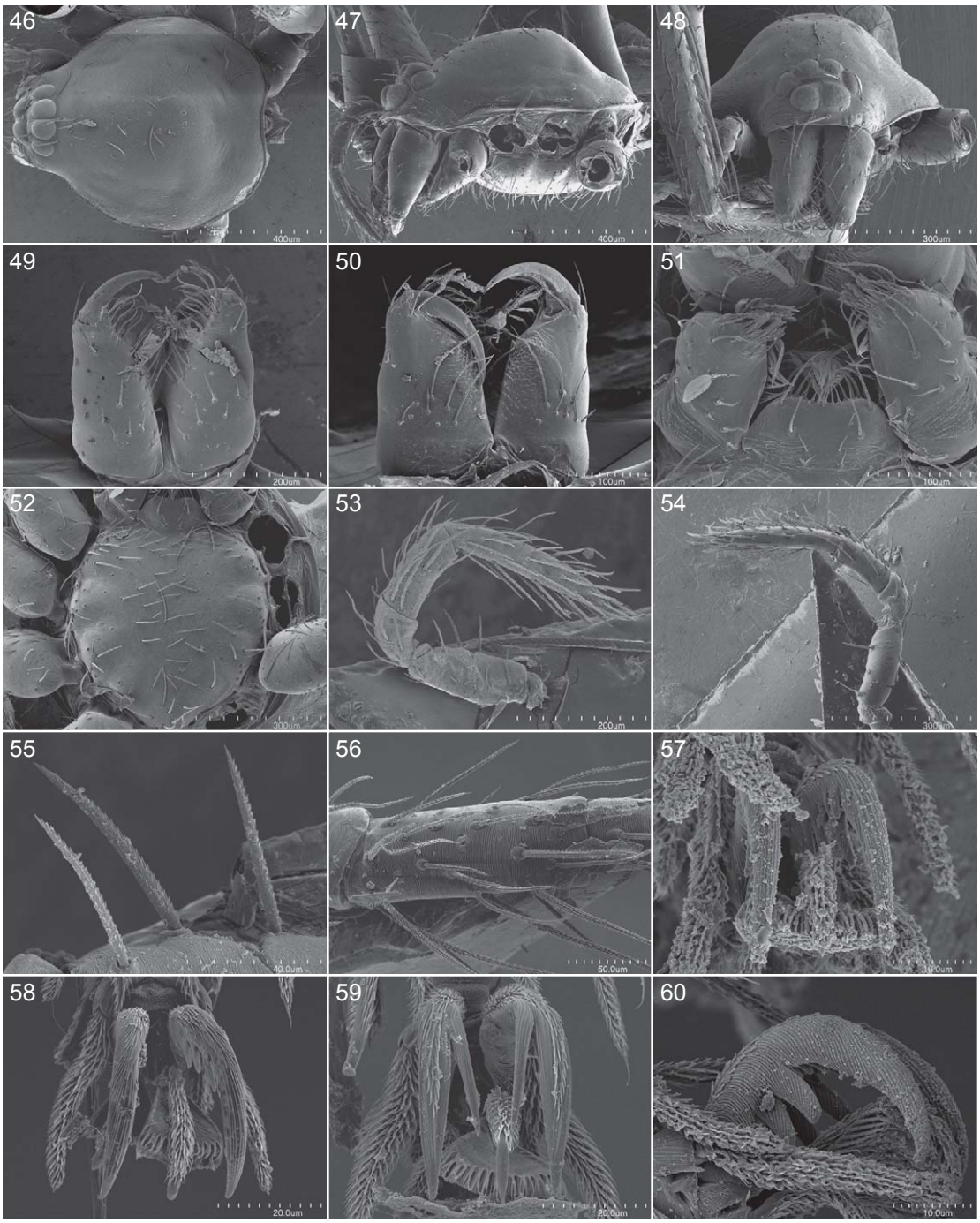
FIGURES 1–15. *Ischnothyreus peltifer* (Simon), male. **1.** Carapace, dorsal view. **2.** Same, lateral view. **3.** Same, anterior view. **4.** Eyes, anterior view. **5.** Chelicerae, anterior view. **6.** Same, posterior view. **7.** Fang, anterior view. **8.** Same, posterior view. **9.** Labium and endites, ventral view. **10.** Labrum and endites, dorsal view. **11.** Labral projection, dorsal view. **12.** Sternum, ventral view. **13.** Anterolateral corner of sternum, ventral view. **14.** Side of sternum, oblique lateral view. **15.** Epigastric scutum, ventral view (4, 13, 14 courtesy of Alexandre Bonaldo).



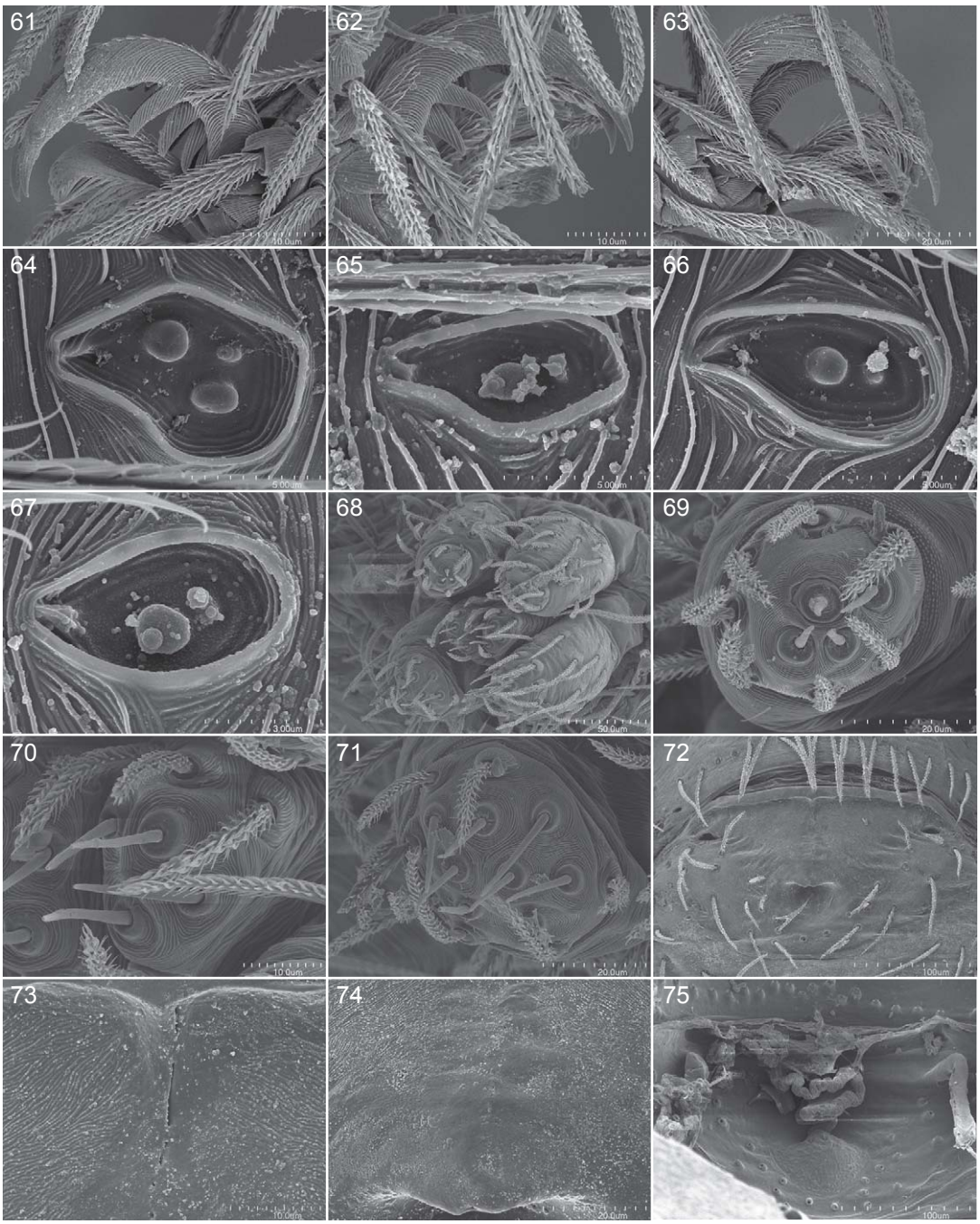
FIGURES 16–30. *Ischnothyreus peltifer* (Simon), male. **16.** Sperm pore, ventral view. **17.** Spinnerets, apical view. **18.** Anterior lateral spinneret, same. **19.** Posterior median spinneret, same. **20.** Posterior lateral spinneret, same. **21.** Claws of leg I, apical view. **22.** Same, leg II. **23.** Same, leg III. **24.** Same, leg IV. **25.** Claws of leg I, lateral view. **26.** Same, leg II. **27.** Same, leg III. **28.** Same, leg IV. **29.** Tarsal organ from leg I, dorsal view. **30.** Same, leg II.



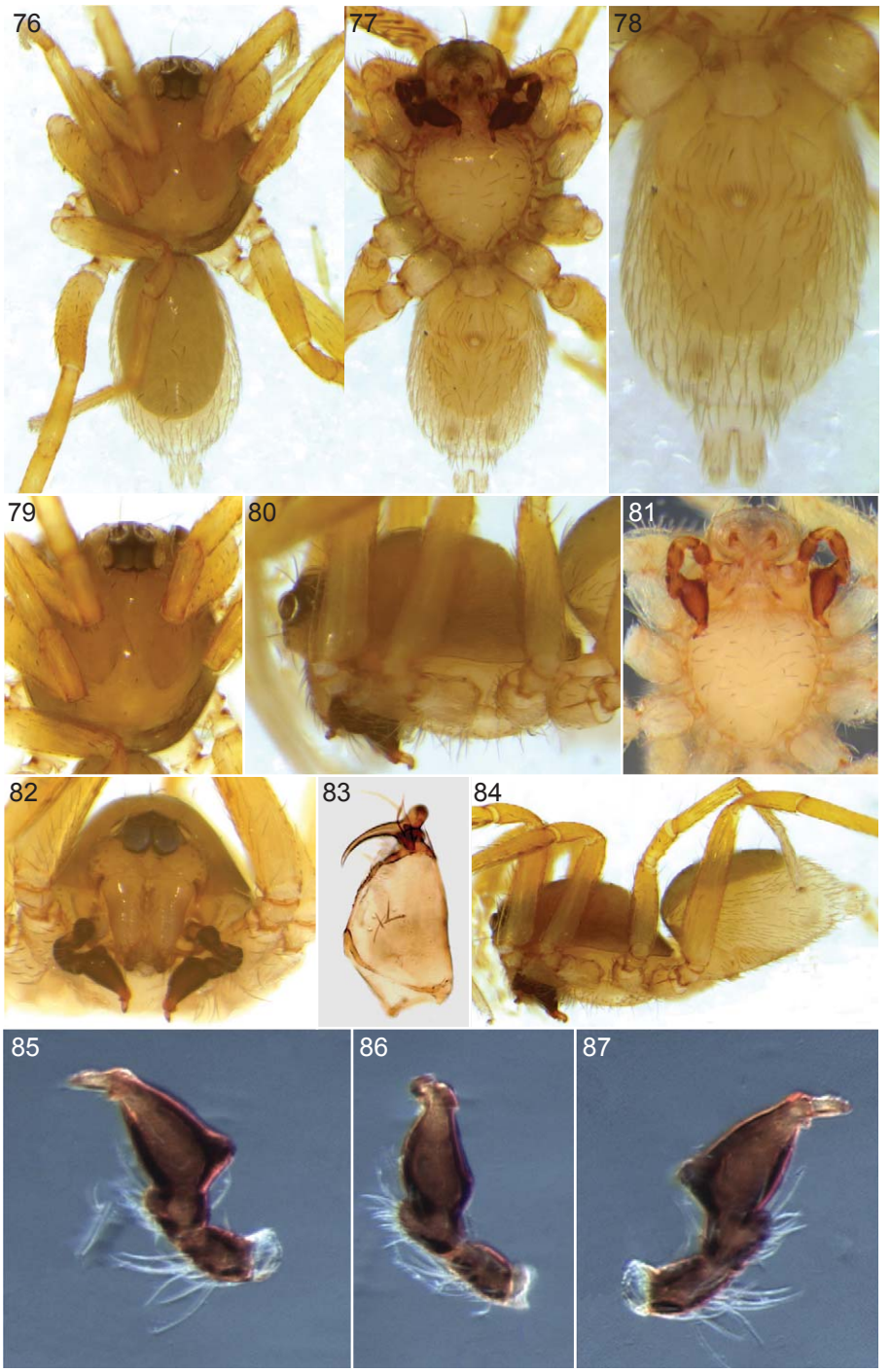
FIGURES 31–45. *Ischnothyreus peltifer* (Simon), male. **31.** Tarsal organ from leg III, dorsal view. **32.** Same, leg IV. **33.** Trichobothrial base from metatarsus I, dorsal view. **34.** Left palp, prolateral view. **35.** Left palpal bulb, prolateral view. **36.** Same, ventral view. **37.** Left palp, retrolateral view. **38.** Left palpal bulb, same. **39.** Tip of palpal bulb, distal view. **40.** Terminal sclerites of palpal bulb, distal view. **41.** Same, oblique view, tip of leaf-shaped sclerite broken off. **42.** Embolar opening, apical view. **43.** Right palp and associated endoskeletal elements, ventral view. **44.** Left half of endoskeletal elements, same. **45.** Middle portion of endoskeletal elements, same (36, 38, 43–45 courtesy of Alexandre Bonaldo).



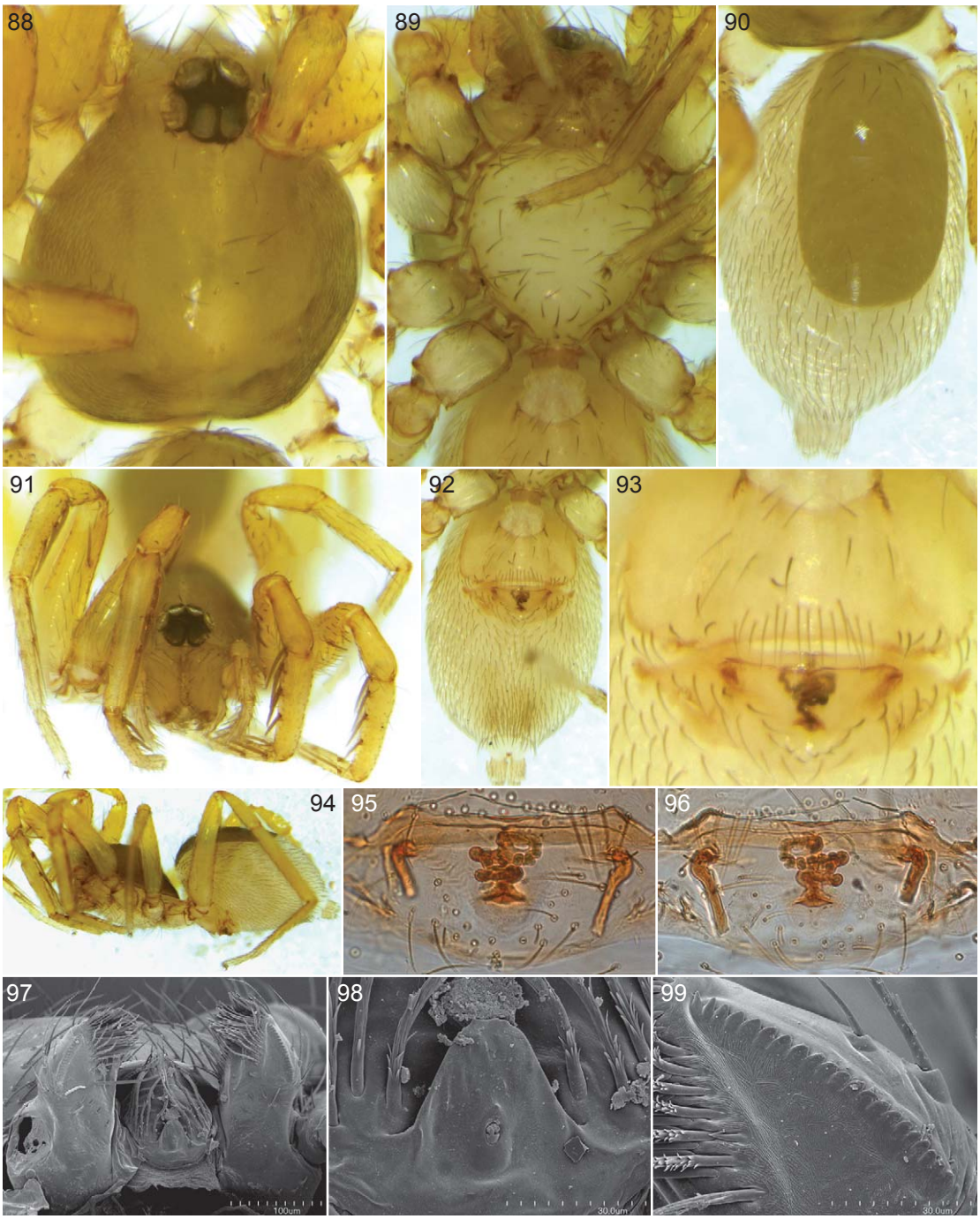
FIGURES 46–60. *Ischnothyreus peltifer* (Simon), female. **46.** Carapace, dorsal view. **47.** Same, lateral view. **48.** Same, anterior view. **49.** Chelicerae, anterior view. **50.** Same, posterior view. **51.** Labium and endites, ventral view. **52.** Sternum, ventral view. **53.** Palp, prolateral view. **54.** Same, retrolateral view. **55.** Spines on palpal femur, lateral view. **56.** Palpal tibia, dorsal view. **57.** Claws of leg II, apical view. **58.** Same, leg III. **59.** Same, leg IV. **60.** Claws of leg I, lateral view.



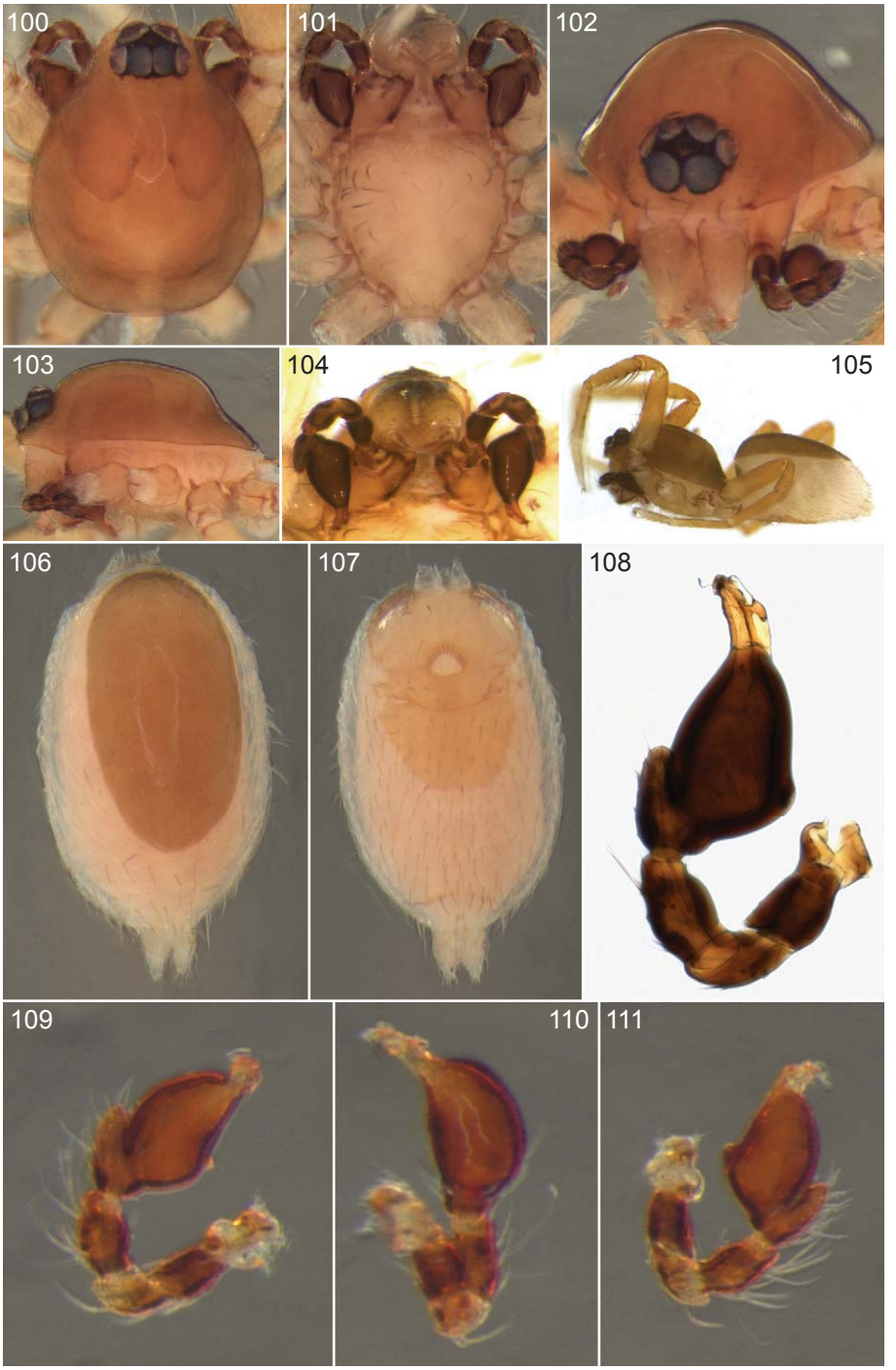
FIGURES 61–75. *Ischnothyreus peltifer* (Simon), female. **61.** Claws of leg II, lateral view. **62.** Same, leg III. **63.** Same, leg IV. **64.** Tarsal organ from leg II, dorsal view. **65.** Same, leg III. **66.** Same, leg IV. **67.** Same, palp. **68.** Spinnerets, apical view. **69.** Anterior lateral spinneret, same. **70.** Posterior median spinneret, same. **71.** Posterior lateral spinneret, same. **72.** Postepigastric scutum, ventral view. **73.** Anteromedian portion of postepigastric scutum, same. **74.** Median portion of postepigastric scutum, same. **75.** Genitalia, dorsal view.



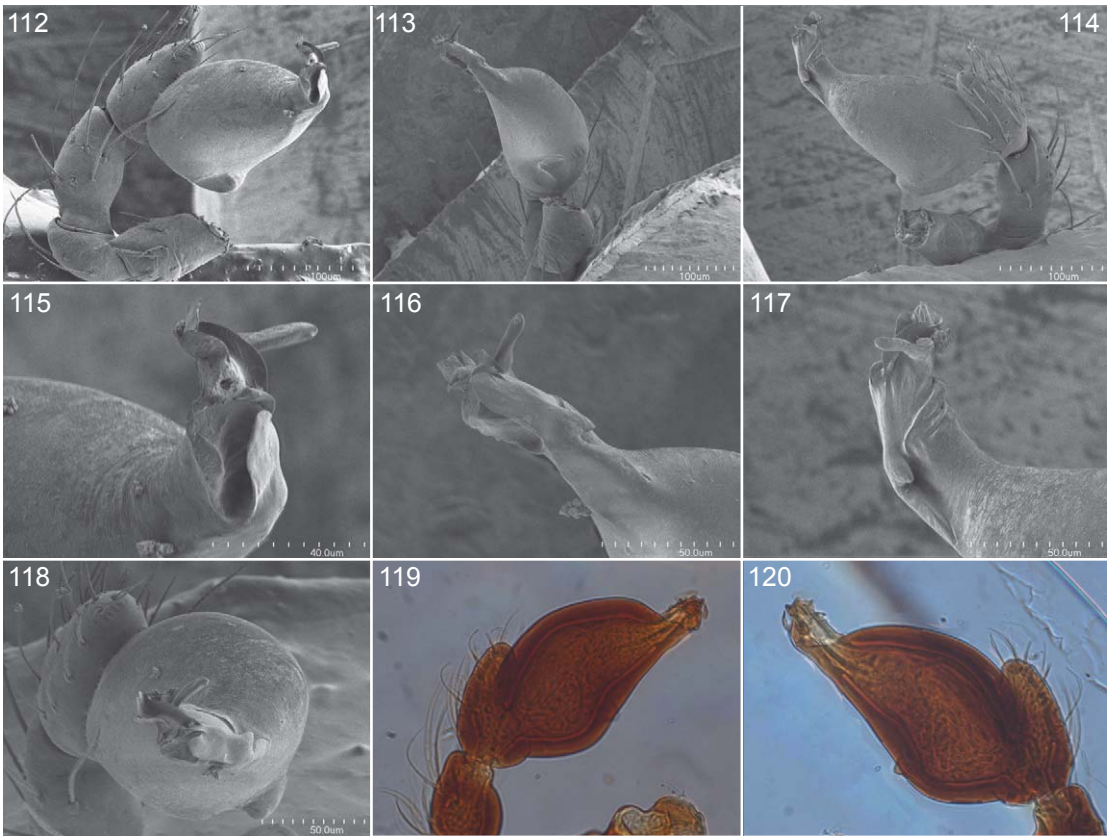
FIGURES 76–87. *Ischnothyreus peltifer* (Simon), male. **76.** Habitus, dorsal view. **77.** Same, ventral view. **78.** Abdomen, ventral view. **79.** Carapace, dorsal view. **80.** Same, lateral view. **81.** Cephalothorax, ventral view. **82.** Carapace, anterior view. **83.** Chelicera, posterior view. **84.** Habitus, lateral view. **85.** Left palp, prolateral view. **86.** Same, ventral view. **87.** Same, retrolateral view.



FIGURES 88–99. *Ischnothyreus peltifer* (Simon), female. **88.** Carapace, dorsal view. **89.** Cephalothorax, ventral view. **90.** Abdomen, dorsal view. **91.** Carapace, anterior view. **92.** Abdomen, ventral view. **93.** Genitalic region, ventral view. **94.** Habitus, lateral view. **95.** Genitalia, ventral view. **96.** Same, dorsal view. **97.** Labrum and endites, dorsal view. **98.** Labral projection, dorsal view. **99.** Serrula, dorsal view.

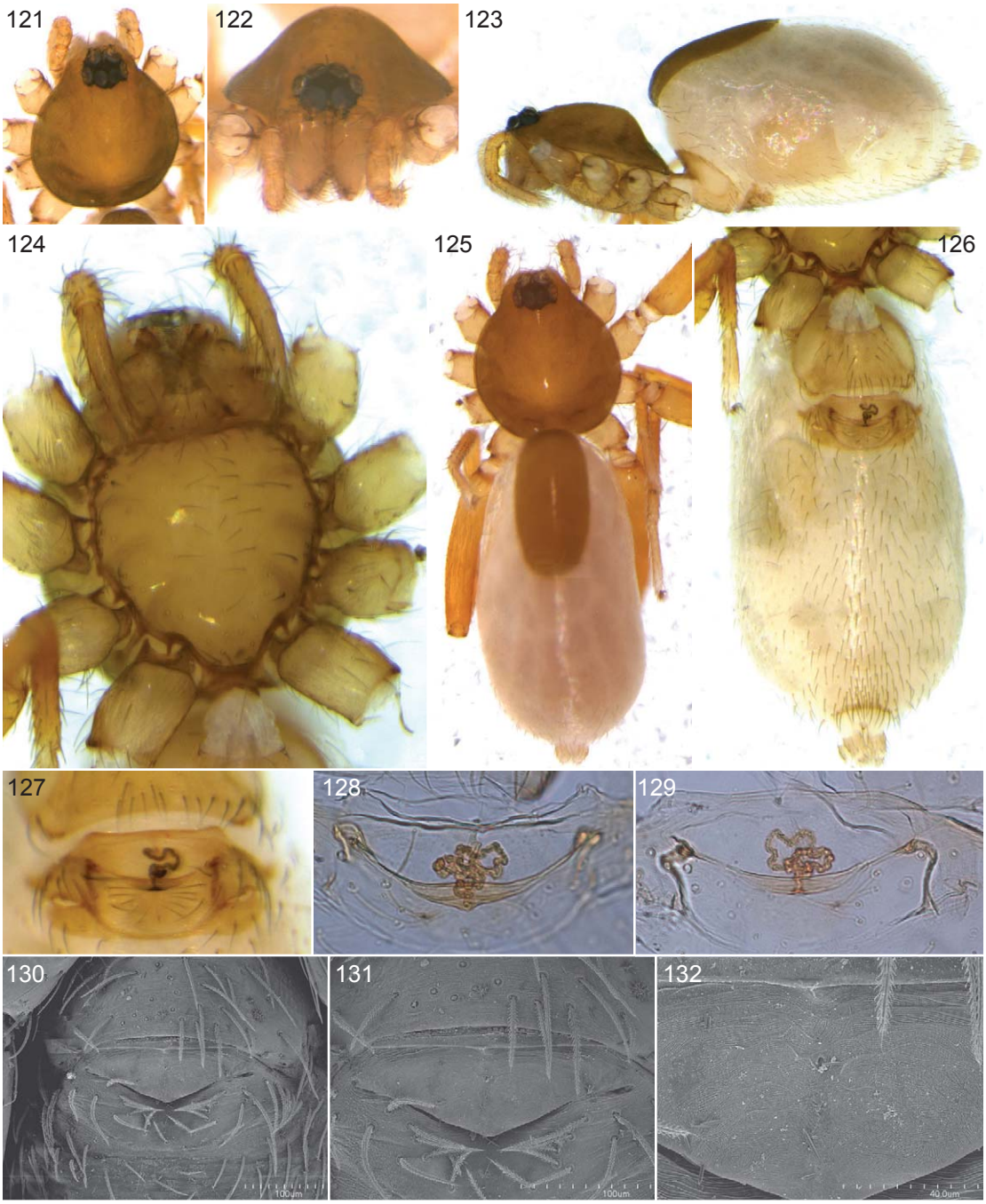


FIGURES 100–111. *Ischnothyreus velox* Jackson, male. **100.** Carapace, dorsal view. **101.** Sternum, ventral view. **102.** Carapace, anterior view. **103.** Same, lateral view. **104.** Mouthparts, ventral view. **105.** Habitus, lateral view. **106.** Abdomen, dorsal view. **107.** Same, ventral view. **108, 109.** Left palp, prolateral view. **110.** Same, ventral view. **111.** Same, retrolateral view.



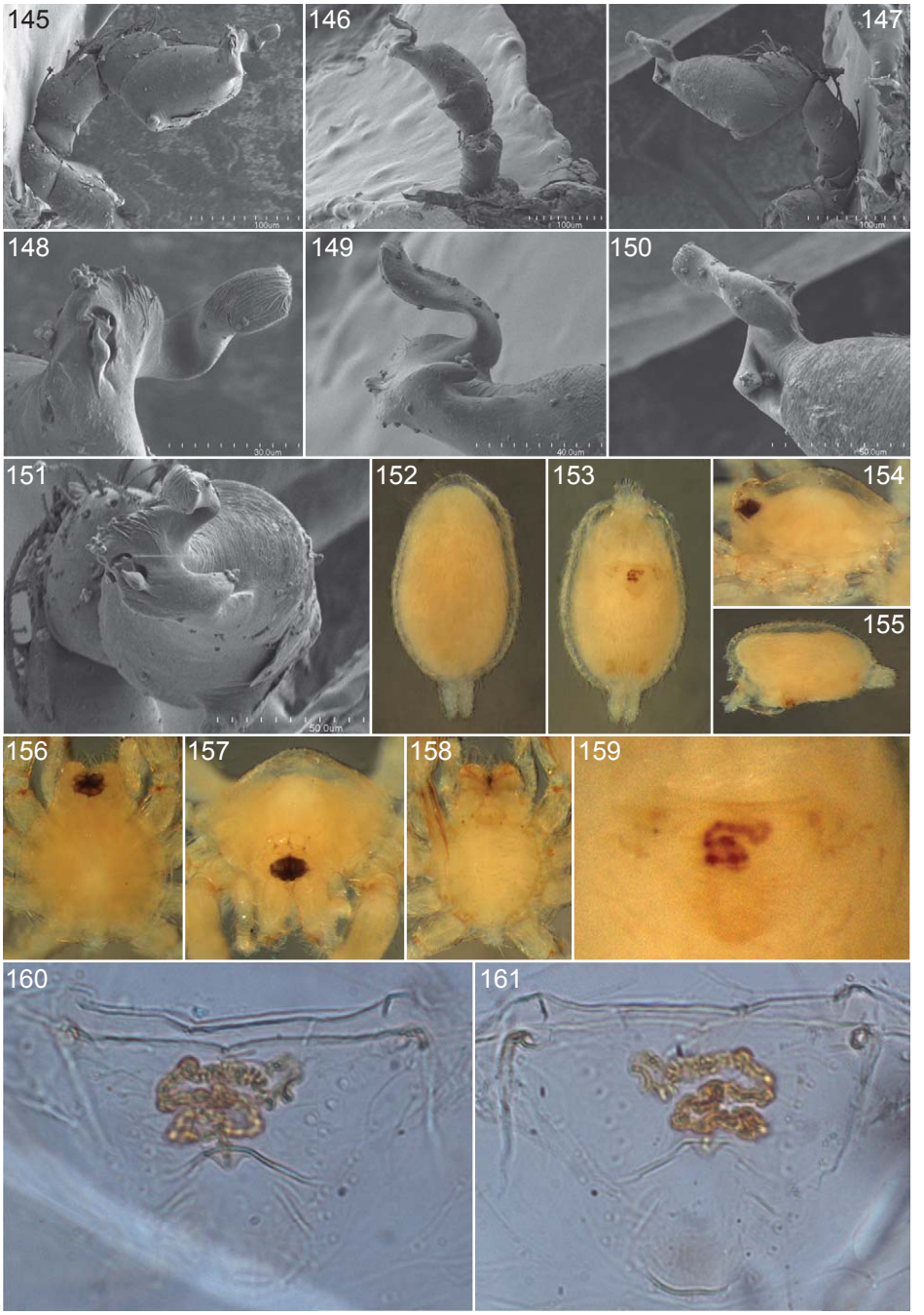
FIGURES 112–120. *Ischnothyreus velox* Jackson, male. **112, 119.** Left palp, prolateral view. **113.** Same, ventral view. **114, 120.** Same, retrolateral view. **115.** Left embolus, prolateral view. **116.** Same, ventral view. **117.** Same, retrolateral view. **118.** Same, distal view.

tube short, unmodified, scutopedicel region unmodified, scutum extending far dorsal of pedicel, plumose setae, matted setae on anterior ventral abdomen in pedicel area, cuticular outgrowths near pedicel all absent. Dorsal scutum weakly sclerotized, olive green, without color pattern, covering 1/2 to 3/4 of abdomen, more than 1/2 to most of abdomen width, fused to epigastric scutum, middle surface smooth, sides smooth, anterior half without projecting denticles. Epigastric scutum weakly sclerotized, surrounding pedicel, not protruding, small lateral sclerites absent. Postepigastric scutum weakly sclerotized, pale orange, short, almost rectangular, covering about 2/3 of abdominal length, fused to epigastric scutum, anterior margin unmodified, without posteriorly directed lateral apodemes. Spinneret scutum present, incomplete ring. Dorsal, epigastric, postepigastric setae light, needlelike; epigastric setae not basally enlarged; spinneret scutum with fringe of needlelike setae; dense patch of setae anterior to spinnerets absent; interscutal membrane with setae. Colulus present, very small, bearing two hairs. Spinnerets (fig. 17): ALS with one major ampullate gland spigot and three piriform gland spigots (fig. 18); PMS with single spigot (fig. 19); PLS with three spigots (fig. 20). **Legs:** pale orange, without color pattern; femur IV not thickened, same size as femora I–III, patella plus



FIGURES 121–132. *Ischnothyreus velox* Jackson, female. **121.** Carapace, dorsal view. **122.** Same, anterior view. **123.** Habitus, lateral view. **124.** Sternum, ventral view. **125.** Habitus, dorsal view. **126.** Abdomen, ventral view. **127, 128, 130.** Genitalia, ventral view. **129.** Same, dorsal view. **131.** Postepigastric scutum, ventral view. **132.** Copulatory opening, ventral view.

FIGURES 133–144. *Ischnothyreus browni* Chickering, male. **133.** Carapace, dorsal view. **134.** Same, lateral view. **135.** Same, anterior view. **136.** Sternum, ventral view. **137.** Abdomen, dorsal view. **138.** Same, ventral view. **139.** Same, lateral view. **140, 142.** Left palp, prolateral view. **141, 144**. Same, retrolateral view. **143.** Same, ventral view.



FIGURES 145–161. *Ischnothyreus browni* Chickering, male (145–151) and female (152–161). **145.** Left palp, prolateral view. **146.** Same, ventral view. **147.** Same, retrolateral view. **148.** Left embolus, prolateral view. **149.** Same, ventral view. **150.** Same, retrolateral view. **151.** Same, distal view. **152.** Abdomen, dorsal view. **153.** Same, ventral view. **154.** Carapace, lateral view. **155.** Abdomen, lateral view. **156.** Carapace, dorsal view. **157.** Same, anterior view. **158.** Sternum, ventral view. **159, 160.** Genitalia, ventral view. **161.** Same, dorsal view.

tibia I shorter than carapace, tibia I unmodified, tibia IV specialized hairs on ventral apex absent, tibia IV ventral scopula absent, metatarsi I, II mesoapical comb absent, metatarsi III, IV weak ventral scopula absent, tarsi III, IV with "false claws" (figs. 23, 27, 28). Leg spination (only surfaces bearing spines listed, all spines longer than segment width): femora: I p0-1-1; II p0-0-1; tibiae I, II v4-2-2; metatarsi I, II v2-2-0. Tarsal proclaws and retroclaws inner face striate, with zero teeth on lateral surface, three teeth on median surface (figs. 21–28); inferior claw absent. Trichobothria: tibia each with three, metatarsi each with one; hood covered by numerous low, closely spaced ridges (fig. 33). Tarsal organ with three receptors on legs I, II, two receptors on legs III, IV, palps (figs. 29–32). **Genitalia:** Epigastric region with sperm pore large, triangular with rounded angles (figs. 15, 16), situated in front of anterior spiracles, unmodified; epigastric furrow apparently absent (fig. 15). Palp slightly reduced in size, strongly sclerotized, right and left palps symmetrical, proximal segments almost black; trochanter normal size, with ventral projection; femur normal size, one to two times as long as trochanter, without posteriorly rounded lateral dilation, attaching to patella basally; patella about as long as femur, not enlarged, without prolateral row of ridges, setae unmodified; tibia with three trichobothria; cymbium almost black, ovoid in dorsal view, fused with bulb but with clearly defined seam between, not extending beyond distal tip of bulb, plumose setae, stout setae, distal patch of setae all absent; bulb almost black, 1–1.5 times as long as cymbium, stout, gradually tapering apically, obtusely bent before apex (figs. 34, 35), middle part with two protuberances on ventral side (fig. 36); embolus light, prolateral excavation absent, set off from bulb by ventral collar, tip with multiple, complex processes (figs. 37–42).

Female (PBI_OON 16071, figs. 46–75, 88–99): Total length 1.70. As in male except as noted. Carapace without any pattern, broadly oval in dorsal view (fig. 46), pars cephalica slightly elevated in lateral view (figs. 47, 48). Sternum anterior margin unmodified (fig. 52). Fangs directed medially, without prominent basal process (figs. 49, 50). Labium anterior margin not indented at middle. Endites distally not excavated, serrula present in single row (figs. 51, 97, 99), anteromedian tip unmodified; labral projection rounded (fig. 98). Palpal claw absent (figs. 53, 54); femur with three spiniform setae ventrally (fig. 55); patella without prolateral row of ridges; tibia with three trichobothria (fig. 56); tarsus unmodified. Dorsal scutum between 1/4 and 1/2 abdomen width, not fused to epigastric scutum. Epigastric scutum slightly protruding, small lateral sclerites present (fig. 93), without lateral joints. Postepigastric scutum widely hexagonal, covering about 1/3 of abdominal length, not fused to epigastric scutum, with short, posteriorly directed lateral apodemes. Spinnerets (fig. 68): ALS as in male (fig. 69); PMS with four spigots (fig. 70); PLS with seven spigots (fig. 71). Leg spination: femora: I p0-1-1; II p0-0-1; tibiae I, II v4-2-2; metatarsi I, II v2-2-0. Tarsal organs (figs. 64–67) and claws (figs. 57–63) as in male except claws of leg IV with elongated distal tooth, tip therefore appearing bifid (fig. 59). Posterior margin of epigastric scutum with transverse row of large setae. Postepigastric scutum with narrow, sinuous, elevated ridge at about two-thirds its length (fig. 72); narrow, slit-shaped copulatory opening situated on midline near anterior edge of postepigastric scutum (fig. 73), followed posteriorly by series of tiny pores (fig. 74). Posterior genitalic tube originating at middle of anterior edge of postepigastric scutum, squiggled, ending at level of external ridge (fig. 75); anterior receptaculum small, T-shaped.

Material Examined: NORTH AMERICA: **Canada:** *Ontario:* African Pavilion, Toronto Metropolitan Zoo, Mar. 17, 1987 (J. Swann, CNC PBI_OON 38143), 3♂, 2♀. **United States:** *Florida:* Alachua Co.: San Felasco State Park, Gainesville, Sept. 24, 2007, leaf litter (X. Wang, AMNH PBI_OON 31070), 1♂; Univ. of Florida campus, Gainesville, Sept. 24, 2007, leaf litter (X. Wang, AMNH PBI_OON 31071), 3♂, 1♀. Collier Co.: Collier-Seminole State Park, Apr. 1, 1985, leaf litter (W. Maddison, MCZ 70476, PBI_OON 26768), 1♂, 2♀. Lee Co.: Fort Myers, 26°38′N, 81°50′W, Mar. 18, 1954 (W. Ivie, AMNH PBI_OON 1025), 2♀. Martin Co.: Bluefield, Aug. 4, 1983, on casuarina (K. Hibbard, FSCA PBI_OON 21194), 1♀. Miami-Dade Co.: Deering Estate Park, SW 167 St., SW 72 Ave., Miami, Nov. 15, 1985, hammock forest litter (S. Peck, AMNH PBI_OON 1971), 1♂, Feb. 21–June 1, 1986, young hammock forest, malaise flight intercept trap (S., J. Peck, AMNH PBI_OON 1040), 2♂, 1♀, June 1–Aug. 25, 1986, same (S., J. Peck, AMNH PBI_OON 1038), 11♂, 9♀, July 26–Dec. 11, 1986, old hammock, malaise flight intercept trap (S., J. Peck, AMNH PBI_OON 1032), 1♀; Grossman Hammock, Chekika State Recreation Area, 50 km SW Miami, Nov. 15, 1985–Feb. 24, 1986, malaise flight intercept traps (S., J. Peck, AMNH PBI_OON 1026), 2♀; Homestead, Mar. 12–25, 1968, avocado grove (A. Chickering, MCZ 68268, PBI_OON 27430), 1♂, 5♀; Long Pine Key, Everglades National Park, May 28–June 8, 1986, pinelands, malaise flight intercept traps (S., J. Peck, AMNH PBI_OON 1034, 1041), 2♂, 2♀, June 8–Dec. 9, 1986, same (S., J. Peck, AMNH PBI_OON 1972, 1973), 3♂, 15♀, Aug. 28–Sept. 5, 1986, same (S., J. Peck, AMNH PBI_OON 1036), 1♂, 1♀; Royal Palm Hammock, Everglades National Park, July 1981, malaise trough (S. Peck, CNC PBI_OON 38144), 3♂, 2♀, Nov. 1, 1984–Mar. 3, 1985, hammock forest, malaise flight intercept traps (S., J. Peck, AMNH PBI_OON 1039), 1♂, 6♀, May 2–Aug. 2, 1985, same (S., J. Peck, AMNH PBI_OON 1027), 1♂, 2♀, Dec. 9, 1986, forest litter (S. Peck, Klimaszweski, AMNH PBI_OON 158), 1♀. Palm Beach Co.: 5 mi S Lake Harbor on Miami Canal, Aug. 18, 1978, pitfall, sugarcane field (C. Adams, CNC PBI_OON 38140), 1♀, Oct. 20, 1978, same (CNC PBI_OON 38139), 1♀. Saint Lucie Co.: Bluefield, Aug. 24, 1983, on casuarina (K. Hibbard, FSCA PBI_OON 21195), 2♀; Indrio, Aug. 17, 1983, on cenchrus (K. Hibbard, FSCA PBI_OON 21193), 1♀; White City, Aug. 11, 1983, on casuarina (K. Hibbard, FSCA PBI_OON 21196), 1♂, 1♀, Sept. 27, 1983, on casuarina (K. Hibbard, FSCA PBI_OON 21192), 2♀. **Mexico:** *Quintana Roo:* Cozumel, July 14, 1951 (L. Stannard, AMNH PBI_OON 1968), 2♀. *Tabasco:* Parque La Venta, Villahermosa, 18°00′N, 92°53′W, Aug. 13, 1966 (J., W. Ivie, AMNH PBI_OON 160, 1385, 1967, 1970), 9♂, 6♀; Peje Lagartero, 18°03′N, 93°10′W, Aug. 14, 1966 (J., W. Ivie, AMNH PBI_OON 135), 2♂, 2♀; Villahermosa, Apr. 3, 1969 (AMNH PBI_OON 1969), 1♀. *Veracruz:* 7 mi W Coatzacoalcos, 18°08′N, 94°30′W, Aug. 31, 1964 (J., W. Ivie, AMNH PBI_OON 168, 187), 4♂; 10 mi W Coatzacoalcos, 18°08′N, 94°32′W, Aug. 15, 1966 (J., W. Ivie, AMNH PBI_OON 132), 1♂, 2♀. *Yucatán:* Mérida. Feb. 2, 1939 (AMNH PBI_OON 1012), 1♀. CENTRAL AMERICA: **Belize:** *Belize:* Burrell Boom, July 28, 1972, Berlese (C. Goodnight, AMNH PBI_OON 1016), 1♀. **Costa Rica:** *Alajuela:* Monterrey de Upala, Jan. 10–12, 2009, elev. 50 m (A. Solis, C. Víquez, R. Guries, INBIO PBI_OON 49460), 1♂; Muelle, San Carlos, Nov. 7, 2007, in termite nest (C. Víquez, INBIO PBI_OON 49459), 1♀; Upala, Montecristo, 10°54′22″N, 84°58′09″W (INBIO PBI_OON 49451, 49453, 49455, 49456, 49461, 49462), 4♂, 6♀, Apr. 13–June 8, 2007, humus, elev. 60 m (C. Víquez, INBIO PBI_OON 26369, 26371, 26372, 26374, 26375, 36979), 5♂, 3♀, 10.9668°N, 85.04363°W, Aug. 12–19, 2007, cacao farm (C. Víquez, INBIO PBI_OON 49457), 3♀, Aug. 15–17, 2009, cacao (A. Solis, C. Víquez, R. Guries, INBIO PBI_OON 49458), 1♂. *Cartago:* Turrialba, 9°58′N, 83°38′W, July 25–Aug. 15, 1965 (A. Chickering, MCZ 68267, PBI_OON 26769), 19♂, 90♀, Feb. 17, 1981, banana stem (A. Young, AMNH PBI_OON 49442), 1♀. *Heredia:* La Selva, 10.422159°N, 84.001525°W, Berlese, Aug. 9–15, 2010 (INBIO 99380, PBI_OON 49454), 1♀; Llorente de Flores, Feb. 4–Mar. 17, 2007, coffee plantation, leaf litter (C. Víquez, INBIO PBI_OON 29680, 29682, 49463), 3♂, 3♀; Parque Municipal Nacimiento, 9°58′57″N, 84°10′28″W, Jan. 27–28, 2010, humus, elev. 950 m (C. Víquez, B. Hernandez, A. Solis, INBIO PBI_OON 49452), 1♂, 2♀; San Joaquín, July 6, 1997, humus (C. Víquez, INBIO PBI_OON 26368), 2♂, 10.006214°N, 84.153652°W, Sept. 8, 2007, garden humus, elev. 1050 m (C. Víquez, INBIO PBI_OON 26370), 2♂, 1♀; San Lorenzo, road to San Pedro, Río

Secundo bridge, 10°01′13″N, 84°08′46″W, Feb. 24, 2007, Berlese, elev. 1090 m (C. Víquez, INBIO PBI_OON 29681), 1♂; Santa Bárbara, San Juan, 10.02153°N, 84.16626°W, May 18, 2008, Berlese, coffee plantation, elev. 1065 m (C. Víquez, INBIO PBI_OON 31119), 1♂. *Limón:* Parque Nacional Tortuguero, Apr. 17–23, 1983, wet second growth forest (D. Ubick, CDU PBI_OON 35943), 1♂. *Puntarenas:* Sendero Río Madrigal, Estación La Leona, Península de Osa, Apr. 4, 2002, humus, secondary forest (A. Azofeifa, INBIO PBI_OON 26373), 1♀. **Panama:** *Colón:* Frijoles, Jan. 25, 1958 (A. Chickering, MCZ 71371, PBI_OON 27254), 2♂, 5♀; Gamboa, July 24, 1954 (A. Chickering, MCZ 71394, PBI_OON 27246), 1♀, Jan. 1958 (A. Chickering, MCZ 71392, PBI_OON 27249), 18♂, 47♀, Feb.–Mar. 1958 (A. Chickering, MCZ 71393, PBI_OON 27241), 1♂, 1♀; Gatún, Jan. 30, 1954 (A. Chickering, MCZ 71381, PBI_OON 27270), 2♀, Feb. 15, 1958 (A. Chickering, MCZ 71383, PBI_OON 27271), 38♂, 98♀, Feb. 27, 1958 (A. Chickering, MCZ 71384, PBI_OON 27262), 17♂, 56♀, Mar. 6, 1958 (A. Chickering, MCZ 71382, PBI_OON 27272), 20♂, 85♀; Pipeline Road, Gamboa, Aug. 7, 1983, jungle, elev. 10 m (J., F. Murphy, AMNH PBI_OON 1548), 2♀. *Los Santos:* Tonosí, Aug. 12, 2003, fallen trunks (R. Mirando, A. Santos, MIUP PBI_OON 37745), 1♀. *Panamá:* Arraijan, July 6, 1950 (A. Chickering, MCZ 71375, PBI_OON 27268), 1♀; Balboa, May 1964 (A. Chickering, MCZ 71391; PBI_OON 27244), 13♂, 54♀; Barro Colorado Island, July 30, 1954 (A. Chickering, MCZ 71395, PBI_OON 27251), 1♀, May 18, 1964 (A. Chickering, MCZ 71396, PBI_OON 27264), 1♀; Chilibre, July 27, 1939 (A. Chickering, MCZ 71374; PBI_OON 27247), 1♀; Chilibrillo Cave, near Chilibre, Feb. 7, 1959, drift along stream in cave (H. Dybas, FMNH 33657, PBI_OON 10159), 1♀; Coccoli, Jan. 13, 1958 (A. Chickering, MCZ 71372, PBI_OON 27261), 4♀; Corozal, July 10, 1954 (A. Chickering, MCZ 71400, PBI_OON 27256), 1♂, 9♀, Dec. 23, 1957–Jan. 4, 1958 (A. Chickering, MCZ 71398, PBI_OON 27260), 3♂, 8♀, May 25, 1964 (A. Chickering, MCZ 71399, PBI_OON 27255), 5♂, 9♀; Diablo, Dec. 19, 1957 (A. Chickering, MCZ 71373, PBI_OON 27267), 18♀; Forest Preserve, July 1939 (A. Chickering, MCZ 71390, PBI_OON 27257), 1♀, July 23, 1950 (A. Chickering, MCZ 71389, PBI_OON 27258), 1♀, July 28, 1954 (A. Chickering, MCZ 71388, PBI_OON 27243) 5♀, Dec. 24, 1957 (A. Chickering, MCZ 71386, PBI_OON 27252), 3♀, Feb. 14, 1958 (A. Chickering, MCZ 71387, PBI_OON 27240), 2♂; Madden Dam, Feb. 12, 1958 (A. Chickering, MCZ 71385, PBI_OON 27250), 1♀; 2 mi N Paraíso, Jan. 21, 1958 (A. Chickering, MCZ 68264, PBI_OON 27259), 1♂, 1♀; Parque Metropolitano, near canopy crane, 8.99483°N, 79.54366°W, Dec. 30, 2007, sifting rainforest litter (M. Draney et al., FMNH 34885, PBI_OON 10598), 1♀; Pedro Miguel, Aug. 1954 (A. Chickering, MCZ 71401, PBI_OON 27248), 11♂, 36♀, Dec. 26, 1957 (A. Chickering, MCZ 71397, PBI_OON 27263), 10♂, 17♀, Jan.–Mar. 1958 (A. Chickering, MCZ 71402, PBI_OON 27245), 3♂, 17♀; Summit, July–Aug. 1950 (A. Chickering, MCZ 71380, PBI_OON 27253), 3♂, 9♀, Aug. 17, 1954 (A. Chickering, MCZ 71379, PBI_OON 27265), 2♂, 13♀; Summit Gardens, July–Aug. 1954 (A. Chickering, MCZ 71377, PBI_OON 27242), 6♂, 36♀, Dec. 12, 1957 (A. Chickering, MCZ 71378, PBI_OON 27266), 6♂, 20♀, May 13, 1964 (A. Chickering, MCZ 71376, PBI_OON 27269), 3♂. WEST INDIES: **Cuba:** *Camagüey:* Hoyo de Bonet, Sierra de Cubitas, Feb. 2009 (Y. Martínez, MNH PBI_OON 49444), 1♂, 5♀, Sept. 2009 (Y. Martínez, MNH PBI_OON 49445), 1♀. *Cienfuegos:* Soledad, Aug. 1–11, 1934 (P. Darlington, MCZ 71320, PBI_OON 27427), 1♀. *Guantánamo:* Valle del Río Jojo, 20°07′35″N, 74°28′42″W, May 11, 2010, litter (N. Platnick, A. Pérez, A. Sánchez, G. Alayón, AMNH PBI_OON 49448), 1♀. *Holguín:* Bahía de Taco, Moa, Nov. 9, 2004, under rock (A. Sánchez, BSC PBI_OON 49446), 1♀. *La Habana:* Havana, June 12 (Baker, MCZ 66705, PBI_OON 27421), 1♀. *Santiago de Cuba:* Arroyo Grovert, 10 km NE Caney, 1995, leaf and log litter, elev. 300 m (S. Peck, AMNH PBI_OON 49443), 1♀; Reserva Ecológica Siboney-Juticí, 19°57′39″N, 75°42′52″W, May 5, 2010, dry litter, elev. 30 m (N. Platnick, A. Sánchez, A. Pérez, G. Alayón, AMNH PBI_OON 49447), 1♂; Río Bacanao tributary, Mata Yegua, 2 km NE El Escandel, 20°05′34″N, 75°41′49″W, May 10, 2010 (N. Platnick, A. Sánchez, A. Pérez, G. Alayón, AMNH PBI_OON 49449), 3♂, 4♀. **Jamaica:** *Clarendon*: 2.5 mi N May Pen, Nov. 10, 1963 (A. Chickering, MCZ 65630, PBI_OON 27296), 1♀; Salt River, Nov. 24, 1963 (A. Chickering, MCZ 68262, PBI_OON 27297), 3♀. *Kingston:* Kingston, Aug. 27–29, 1934 (P. Darlington, MCZ 42624, PBI_OON 27282), 2♀. *Portland:* Port Maria,

Dec. 31, 1951, under litter (C. Perraton, MCZ 66523, PBI_OON 27278), 1♀. *St. Andrew:* no specific locality, May 5, 1956 (C. Hoff, MCZ 65094, PBI_OON 27289), 3♂; Hermitage Rd., Nov. 28, 1963 (A. Chickering, MCZ 71328, PBI_OON 27284), 1♂, 3♀; Hope Gardens, Nov. 1963 (A. Chickering, MCZ 71330, PBI_OON 27279), 9♂, 38♀, Dec. 1963 (A. Chickering, MCZ 71331, 27293), 10♂, 76♀; Liguanea, Oct.15, 1957 (A. Chickering, MCZ 71329, PBI_OON 27294), 1♀, Dec. 1963 (A. Chickering, MCZ 71327, PBI_OON 27276), 2♂, 4♀; Mona, Nov. 11, 1957, pasture (A. Chickering, MCZ 71332, PBI_OON 27288), 1♀, Nov. 1963 (A. Chickering, MCZ 71336, PBI_OON 27287), 4♂, 6♀, Dec. 1963 (A. Chickering, MCZ 71326, PBI_OON 27290), 1♀; Red Hills Road, Oct. 28, 1957 (A. Chickering, MCZ 71340, PBI_OON 27280), 1♀; Richards Reservoir, Nov. 1957 (A. Chickering, MCZ 71333, PBI_OON 27292), 1♀, Dec. 18, 1963 (A. Chickering, MCZ 71335, PBI_OON 27283), 1♂, 2♀; Stony Hill, Oct. 18, 1957 (A. Chickering, MCZ 71334, 71337, PBI_OON 27274, 27281), 2♂, 1♀. *St. Ann:* Ferry, Claremont, June 19, 1954 (A. Chickering, MCZ 65909, PBI_OON 27273), 1♀. *Saint Catherine*: 3 mi. E Old Harbour, Oct. 21, 1957 (A. Chickering, MCZ 71138, PBI_OON 27295), 3♀; School of Agriculture, Nov. 23, 1957 (A. Chickering, MCZ 32461, PBI_OON 27291), 1♀. *St. Thomas:* 6 mi NE Bath, Dec. 10, 1957 (A. Chickering, MCZ 66522, PBI_OON 27286), 1♀; Roselle Falls, Oct.–Nov. 1957 (A. Chickering, MCZ 71339, PBI_OON 27275), 1♂, 6♀. **Puerto Rico:** *Fajardo*: Isleta Marina, Isla Obispo, Nov. 7, 1964 (H. Heatwole, F. McKenzie, AMNH PBI_OON 1954), 1♂. *Guayama:* Punta Pozuela, Dec. 25, 1985 (V., B. Roth, CAS 26297, PBI_OON 2587), 1♀. *Lajas:* Laguna Cartagena, Valle de Lajas, Jan. 8, 1964 (A. Chickering, MCZ 71370, PBI_OON 27391), 2♂, 3♀. *Loíza:* 15 km E San Juan, Jan. 26, 1964 (A. Chickering, MCZ 71368, PBI_OON 27380), 1♀. *Maricao:* El Vivero, Jan. 9, 1964 (A. Chickering, MCZ 71365, PBI_OON 27383), 1♂; Montañas de Uroyan, Rt. 108, km 12–22, Jan. 12, 1964 (A. Chickering, MCZ 71369, PBI_OON 27392), 3♂, 2♀. *Mayagüez:* 3 mi S Mayagüez on road to Hormigueros, Jan. 8, 1964 (A. Chickering, MCZ 71361, PBI_OON 27379), 1♂, 14♀; 5 km E Mayagüez on Route 106, Jan. 1964 (A. Chickering, MCZ 71363, PBI_OON 27381), 5♂, 22♀; woods near Nuclear Center, Jan. 1964 (A. Chickering, MCZ 71366, PBI_OON 27386), 4♂, 19♀; University campus, Jan. 1964 (A. Chickering, MCZ 71359, PBI_OON 27384), 16♂, 42♀; 5 km N University campus, Jan. 5, 1964 (A. Chickering, MCZ 71362, PBI_OON 27387), 1♂, 2♀; University farm, E campus, Jan. 1964 (A. Chickering, MCZ 71360, PBI_OON 27385), 3♂, 3♀; University farm, N campus, Jan. 1964 (A. Chickering, MCZ 71357, PBI_OON 27393), 3♂, 11♀, Feb. 1964 (A. Chickering, MCZ 71358, PBI_OON 27382), 7♂, 27♀, Feb. 2, 1964 (A. Chickering, MCZ 68265, PBI_OON 27389), 1♂, 1♀. *Río Grande*: El Yunque Biological Station, Jan. 25, 1964, elev. 2100 ft (A. Chickering, MCZ 71364, PBI_OON 27390), 1♂, 2♀. *San Germán*: Port Grilo, Feb. 23–Apr. 4, 1955 (A. Nadler, AMNH PBI_OON 1975), 1♀. *San Juan:* Rio Piedras, Dos Pinos, Sept. 21, 1963, under boards (E. Nelson, MCZ 71367, PBI_OON 27388), 1♀; between Toa Alta and Toa Baha, ca. 17.5 km from San Juan, forest (AMNH PBI_OON 1955), 1♀ (details from Petrunkevitch, 1929). **Virgin Islands:** *St. Croix:* no specific locality, Sept. 1966 (A. Chickering, MCZ 71351, PBI_OON 27410), 13♂, 16♀; Christiansted (Beatty, MCZ PBI_OON 49466), 1♂ (holotype); Frederiksted, Mar. 1964 (A. Chickering, MCZ 71341, PBI_OON 27425), 7♂, 10♀; vicinity of King's Hill, Mar. 1964 (A. Chickering, MCZ 71347, PBI_OON 27405), 1♂, 9♀; Lavaetz Gardens, Mar. 24, 1964 (A. Chickering, MCZ 71349, PBI_OON 27416), 1♂, 8♀. *St. John:* no specific locality, Feb. 1964 (A. Chickering, MCZ 71348, PBI_OON 27407), 1♂, 2♀, Mar. 1964 (A. Chickering, MCZ 71350, PBI_OON 27406), 1♀, July 1966 (A. Chickering, MCZ 71346, PBI_OON 27413), 4♂, 10♀. *St. Thomas:* no specific locality, Feb. 1964 (A. Chickering, MCZ 71352, PBI_OON 27420), 4♂, 2♀, July 27, 1966 (A. Chickering, MCZ 71353, PBI_OON 27403), 1♂, 18♀, Aug. 1966 (A. Chickering, MCZ 71319, PBI_OON 27424), 26♂, 52♀; High School grounds, Feb. 22, 1964 (A. Chickering, MCZ 71189, PBI_OON 27404), 4♀, Mar. 10–11, 1964 (A. Chickering, MCZ 71354, PBI_OON 27402), 25♂, 43♀. *Tortola:* no specific locality, July 30–Aug. 5, 1966 (A. Chickering, MCZ 71190, PBI_OON 27414), 20♀. **Leeward Islands:** *St. Kitts:* no specific locality, Sept.14–22, 1966 (A. Chickering, MCZ 68261, PBI_OON 27417), 1♀. **Windward Islands:** *Barbados:* Turners Hall Woods, Feb. 23, 1979, Berlese, termite nest (S. Peck, AMNH PBI_OON 1236), 1♂, same (FMNH PBI_OON 49468), 1♂. *St. Lucia:* no specific locality, Oct.5–13, 1966 (A.

Chickering, MCZ 71316, PBI_OON 27412), 2♂, 26♀. *St. Vincent:* no specific locality (MNHN 5728, PBI_OON 32322), 1♀ (syntype), Oct. 15–24, 1966 (A. Chickering, MCZ 71355, 71356, PBI_OON 27418, 27419), 4♂, 15♀. Richmond Estate, leeward open valley near sea level, webs under rotting banana flowers (BMNH PBI_OON 32324), 4♀ (syntypes). **Trinidad and Tobago:** *Trinidad:* no specific locality (N. Weber, MCZ 71342, PBI_OON 27409), 2♂. Arima: Simla, Arima Valley, Apr. 10–22, 1964 (A. Chickering, MCZ 71343, PBI_OON 27426), 10♂, 27♀, Apr. 23–27, 1964 (A. Chickering, MCZ 67071, PBI_OON 27422), 11♂, 20♀. St. Andrew: Salybia, Feb. 1972 (J. Cooke, AMNH PBI_OON 49450), 7♀. St. George: Curepe, Nov. 21–Dec. 11, 1977, pan trap (W. Mason, CNC PBI_OON 38142), 1♀; Curepe, Santa Margareta, Sept. 26–Oct. 26, 1974, yellow pan trap (N. Beg, AMNH PBI_OON 37072), 2♀; Saint Augustine, Nov. 16, 1943–Feb. 23, 1944 (Strickland, AMNH PBI_OON 1956), 1♂; St. Augustine, University Campus, Apr. 1–6, 1964 (A. Chickering, MCZ 71344, PBI_OON 27408), 10♂, 20♀, Apr. 7–9, 1964 (A. Chickering, MCZ 71345, PBI_OON 27411), 14♂, 39♀. SOUTH AMERICA: **Colombia:** *Amazonas:* Leticia, June 18, 1965, grass at night (P. Craig, J. Robb, CDU PBI_OON 35946), 2♀. *Cauca:* Poblado, Parque Nacional Gorgona, July 5, 2003, elev. 5 m (A. Rico et al., ICN 2510, PBI_OON 49469), 1♀. *Tolima:* Espinal, Granja los Marañones, 4°09′10″N, 74°53′19″W, July 2004, cotton field, elev. 320 m (L. Gomez, C. Perafan, ICN 4098, PBI_OON 49470), 1♀. **Venezuela:** *Portuguesa:* Guanare, Sept. 10–13, 1957 (B. Malkin, CAS 26296, PBI_OON 2586), 1♀. *Sucre:* 6 km SE Río Caribe, July 24, 1987, soil and litter, gallery forest (S., J. Peck, AMNH PBI_OON 1957), 1♂. **Brazil:** *Pará:* Bosque Rodrigues Alves, 1°25′49.0″S, 48°27′22.3″W (J. Barreiros, MPEG 10478, 10479, PBI_OON 40726, 40727), 2♀; Ilha de Cotijuba, Belém, 1°14′S, 48°35′W, Nov. 2004 (MPEG 10271, PBI_OON 40724), 1♀; Mata, Várzea, Belém, Oct. 2005 (L. Macambira, MPEG 10709, PBI_OON 40692), 1♂, 2♀. **Galapagos Islands:** *Pinta:* no specific locality, July 18, 1977, sweeping, beating, dry perennial grass, elev. 400 m (W. Reeder, TMM PBI_OON 49471), 2♀. *Santa Cruz:* no specific locality, May 7, 1980, turning rocks and downed wood, fern zone, elev. 150 m (W. Reeder, TMM 57847, PBI_OON 36930), 1♀; Bellavista, Feb. 3–8, 1989, banana traps (S. Peck, Sinclair, KBIN PBI_OON 49504), 1♀, Apr. 10–30, 1996, pitfall trap, guava forest. elev. 350 m (S. Peck, KBIN PBI_OON 49497), 2♀; near Bellavista, Apr. 9, 1981 (Y. Lubin, MCZ 71323, PBI_OON 27429), 1♀; 2 km N Bellavista, May 14–July 13, 1985, flight intercept trap, guava thicket, elev. 360 m (S., J. Peck, KBIN PBI_OON 49501, 49502, 49514), 5♂, 12♀; Caseta Occidente, Feb. 11–Mar. 18, 1982, elev. 170 m (L. Baert, J. Maelfait, KBIN PBI_OON 49484, 49488), 1♂, 8♀; Caseta Tortuga, Feb. 19, 1988, elev. 180 m (L. Baert, J. Maelfait, K. Desender, KBIN PBI_OON 49483), 1♂; El Carmen farm, Mar. 10–21, 1998, elev. 350 m (L. Baert, J. Maelfait, K. Desender, KBIN PBI_OON 49503), 2♂, 4♀; Hornemann farm, Bellavista, Apr. 3, 1975, screening litter at base of bamboo, elev. 200 m (W. Reeder, TMM 59909, PBI_OON 36931), 2♂, 3♀; Los Gemelos, Feb. 12–Apr. 2, 1986–1988, scalesia, pampa, elev. 580–600 m (L. Baert, J. Maelfait, K. Desender, KBIN PBI_OON 49474. 49477, 49479–48481, 49490, 49498, 49512, 49515, 49519), 82♂, 128♀; Media Luna, June 21–July 21, 1992, elev. 600 m (J. Palacios, KBIN PBI_OON 49506), 1♂, 3♀, Apr. 10–30, 1996, pitfall, miconia, elev. 575 m (S. Peck, KBIN 49499), 1♂, 2♀; Media Luna trail, Mar. 10, 1982, elev. 200–250 m (L. Baert, J. Maelfait, KBIN PBI_OON 49489), 2♀; Feb. 15–Apr. 4, 1986–2000, transition zone, elev. 350 m (L. Baert, J. Maelfait, K. Desender, KBIN PBI_OON 49486, 49487, 49491, 49505, 49513), 7♂, 8♀, Feb. 15–Apr. 2, 1986–1989, miconia, elev. 500–550 m (L. Baert, J. Maelfait, K. Desender, KBIN PBI_OON 49473, 49493, 49507, 49517), 15♂, 30♀; northern transect, Feb. 12–Apr. 2, 1988, elev. 400–560 m (L. Baert, J. Maelfait, K. Desender, KBIN PBI_OON 49478, 49510, 49516), 4♂, 7♀; 5 km N Puerto Ayora, May 1–30, 1991, malaise-flight intercept trap, elev. 110 m (S., J. Peck, KBIN PBI_OON 49496), 1♀; 4 km E Santa Rosa, Apr. 10–May 4, 1996, pitfall trap, elev. 350 m (S. Peck, KBIN PBI_OON 49500), 1♂; 10 km N Santa Rosa, Mar. 1–30, 1992, elev. 500 m (S. Peck, KBIN PBI_OON 49508), 1♀; southern transect, Feb. 15–Mar. 25, 1986, elev. 140–500 m (L. Baert, J. Maelfait, K. Desender, KBIN PBI_OON 49475, 49476, 49482, 49485, 49492, 49494, 49495), 7♂, 12♀; southern transect, E Santa Rosa, Mar. 30–Apr. 10, 1996, elev. 350 m (L. Baert, K. Desender, P. Verdijck, KBIN PBI_OON 49509), 1♀; southern transect, N Santa Rosa, Apr. 3, 2000, elev. 500 m (L. Baert, J. Maelfait, K. Desender KBIN PBI_OON 49511), 1♀. OLD

WORLD: **Equatorial Guinea:** Micomeseng, July 18–27, 1989, pitfall, swamp with ferns near river (M. Alderweireldt, MRAC 169997, PBI_OON 29241), 1♂. **Gabon:** *Estuaire:* Ntoum, July 1985, forest litter (A. Pauly, MRAC 220031, PBI_OON 28807), 1♀. **Comoros:** *Anjouan:* Domoni, road to Tatinga bridge, May 19, 2003, litter, forest remnants (R. Jocqué, D. Van den Spiegel, MRAC 213420, PBI_OON 29284), 1♂; Mutsamudu, May 20, 2003, mango litter, hospital garden (R. Jocqué, D. Van den Spiegel, MRAC 213152, PBI_OON 29281), 1♀. *Mayotte:* Coconi, campus of DAF, July 18–Aug. 2, 1998, Winkler, sifting litter (R. Jocqué, MRAC 208204, 208268, 208316, PBI_OON 28806, 29234, 29333), 4♀. *Mohéli:* Hoani, May 23, 2003, sifting litter on road (R. Jocqué, D. Van den Spiegel, MRAC 213155, PBI_OON 29285), 1♀. **Madagascar:** *Antsiranana:*Lokobe Forest, Nosy Be, 13°24′58″S, 48°18′26″E, Aug. 11–14, 1992 (V., B. Roth, CAS 30882, PBI_OON 3371), 1♀. *Fianarantsoa:* Ranomafana town, 21°14.9′S, 47°27.7′E, Apr. 30, 1998, on tree bark (C. Griswold et al., CAS 29564, PBI_OON 3369), 1♀. *Toamasina:* Foulpointe, Sept.–Dec. 1993 (A. Pauly, MRAC 177947, 200227, 200344, 200380, 220052, 220054, 220086, PBI_OON 9768, 9779–9781, 9787, 9789, 9790), 5♂, 5♀, July–Sept. 1994 (A. Pauly, MRAC 220055–220057, 220085, PBI_OON 9766, 9769. 9770, 9774), 1♂, 3♀; Île Sainte-Marie, east beach (R. Legendre, MNHN PBI_OON 36330), 1♀. *Toliara:* Forêt Classee Tsikongambarika, Ivolo forest, Andily, ca. Fort Dauphin, 24°56′13.5″S, 46°55′58.4″E, Mar. 13, 2003, Ludd tree trunks, litter, elev. 20 m (D. Andriamalala et al., CAS 15863, PBI_OON 3370), 1♀. **Seychelles:** no specific locality, Jan. 23–Feb. 5, 1977 (A. Rundle, AMNH PBI_OON 1556, 1558, 1559), 3♀. *Mahé:* Baie Lazare, June 26, 1972, border of beach (P. Benoit, J. Van Mol, MRAC 143253, 146758, PBI_OON 49522, 49523), 2♂, 2♀ (holotype, allotype, paratypes); Dugand, June 25, 1972 (P. Benoit, J. Van Mol, MRAC 143182, PBI_OON 49524), 1♂. *Praslin:* Fond Ferdinand, July 24, 1972, lodoicea forest (P. Benoit, J. Van Mol, MRAC 143397, PBI_OON 49525), 1♂. *Silhouette:* Anse Lacars-Anse Paptes, Jan. 12, 1999 (M. Saaristo, ZMUT 1233, PBI_OON 16071), 2♂, 2♀. **Mascarene Islands:** *La Réunion:* St. Philippe, Mare-Longue Forest, May 27, 2009 (M. Dierkens, CMD PBI_OON 49472), 1♂. **China:** *Hong Kong:* New Territories, Mai Po, Feb. 27, 1988, mangroves, elev. 5 m (J., F. Murphy, AMNH PBI_OON 1549), 1♀. **Singapore:** Kranji, July 7, 1992, mangroves, elev. 1 m (J., F. Murphy, AMNH PBI_OON 31308), 2♀; University, Jan. 22, 1986, water tanks, elev. 40 m (J., F. Murphy, AMNH PBI_OON 31306), 2♀. **Caroline Islands:** *Palau Islands:* Koror Island, Mar. 15, 1973, compost near biology lab (AMNH PBI_OON 38558), 1♀, Apr. 3, 1973, litter, taro patch (AMNH PBI_OON 38601), 1♀, Mar. 26–May 9, 1973, litter, taro patch (J. Beatty, J. Berry, AMNH PBI_OON 37430, 38614), 3♂, 3♀; Malakal Island, Apr. 17, 1973, around grass roots in field (AMNH PBI_OON 38552), 2♀. **Hawaii:** *Hawaii:* Iliahi St., Hilo, Feb. 1, 1995, litter (J. Berry, AMNH PBI_OON 38603), 1♀; Isaac Hale Beach Park, Puna District, Feb. 24, 1995, pandanus litter (J., E. Berry, AMNH PBI_OON 38374), 1♀; 1 mi W Mackenzie State Park, Route 137, Puna District, Jan. 31, 1997, casuarina litter (J., E. Berry, AMNH PBI_OON 37438), 1♂, 3♀; Naalehu, Route 11, mile marker 61, Kau District, Feb. 7, 1997, litter along driveway (J. Berry, AMNH PBI_OON 38542), 1♂, 2♀, same, mile marker 66, Feb. 8, 1997, forest litter on hill, elev. 1000–1100 ft (J., E. Berry, AMNH PBI_OON 38373, 38378), 1♂, 5♀. *Kauai:* Haena State Park, Jan. 15, 1998, litter, almond/ficus forest (J., E. Berry, AMNH PBI_OON 37439), 4♂, 3♀; Kahili Mountain, 5 mi N Koloa, Jan. 11, 1998, mixed forest, elev. 920 ft (J., E. Berry, AMNH PBI_OON 38375), 1♂; Makaha Ridge Road, Jan. 23, 1998, pine forest litter, elev. 2000 ft (J., E. Berry, AMNH PBI_OON 38376), 2♀; Moloaa Beach, Kuaehu Point, Jan. 11, 1988 (J. Berry, AMNH PBI_OON 38543), 1♀; National Tropical Botanical Garden, Lawai, Jan. 21, 1998, litter (J. Berry, AMNH PBI_OON 38616), 3♀, Feb. 4, 1998, litter on bank beside stream at waterfall and pool (J. Berry, AMNH PBI_OON 37763), 1♀. *Oahu:* Wahiawa (H. Hagan, ex MCZ 71324, PBI_OON 96), 1♀.

Distribution: Pantropical, and also introduced in north temperate buildings; sometimes sympatric with *I. velox*. However, not all the published records of the species are accurate. For example, the specimens from St. Helena described by Benoit (1977: 41, figs. 15a–c), including his invalid "♂ allotype," belong neither to *I. peltifer* nor *I. velox*.

Ischnothyreus velox Jackson

Figures 100–132

Ischnothyreus peltifer (misidentification): Simon, 1891: 562 (in part, females from the Philippines only). – Platnick et al., 2012a: 12, figs. 21, 24 only (in part, tarsal organ scans of male from Amazonas, Brazil).

Ischnothyreus lymphaseus (misidentification): Simon, 1896: 92 (females from greenhouses of MNHN only).

Ischnothyreus velox Jackson, 1908: 51, pl. 4, figs. 9–13 (lectotype male from greenhouse in Chester, England, in BMNH, examined and designated by Saaristo, 2001: 347). – O. P.-Cambridge, 1908: 165, pl. A, figs. 1–6. – Bristowe, 1948: 890, figs. 15–20 (not fig. 1). – Locket and Millidge, 1951: 76, fig. 38C (not fig. 38E). – Heimer and Nentwig, 1991: 50, fig. 107. – Saaristo, 2001: 347, figs. 146B, 151, 155B. – El-Hennawy, 2008: 27, figs. 9–16.

Ischnothyreus barrowsi Chamberlin and Ivie, 1935: 9, pl. II, fig. 7 (female holotype from Marco Island, Collier Co., Florida, in AMNH; examined). NEW SYNONYMY.

Dysderina antillana (misidentification): Bryant, 1948: 340 (female, Hispaniola).

Ischnothyreus indressus Chickering, 1968: 84, figs. 13–20 (male holotype from Nevis, Leeward Islands, in MCZ; examined). NEW SYNONYMY.

Diagnosis: Males differ from those of *I. peltifer* in lacking a protuberance on the base of the fang (fig. 104); their palps differ from those of *I. peltifer* and instead resemble those of *I. lymphaseus*, from Sri Lanka, in having a rounded bulb (in that species, the embolus is shorter and bears a longer distal extension than in *I. velox*); males also have a larger sperm pore than do those of *I. peltifer* (fig. 107). Females of *I. lymphaseus* are unknown, but those of *I. velox* have a distinctively procurved ridge occupying most of the width of the postepigastric scutum (figs. 127–132).

Male (PBI_OON 16072, figs. 100–120): Total length 1.55. As in male of *I. peltifer* except as noted. Carapace pale orange, broadly oval in dorsal view, anterolateral corners without extension or projections, nonmarginal pars thoracica setae light, needlelike. Sternum yellow. Fangs directed medially, without prominent basal process. Dorsal scutum pale orange, not fused to epigastric scutum. Spinnerets not scanned. Leg spination: femora: I p0-0-2; II p0-0-1; tibiae I, II v4-2-2; metatarsi I, II v2-2-0. Tarsal claws, tarsal organs not scanned. Palp with proximal segments, cymbium, bulb all brown; bulb more than twice as long as cymbium, rounded, with one protuberance on ventral side; embolus clearly delimited, with ventral T-shaped extension within translucent ventral flange, apex with long, narrow extension.

Female (PBI_OON 16072, figs. 121–132): Total length 2.11. As in female of *I. peltifer* except as noted. Carapace with lateral reticulations covering almost whole carapace, only uppermost part smooth. Palpal tibia with at least two trichobothria. Pedicel scutum not extending far dorsal of pedicel. Dorsal scutum covering less than half of abdomen length. Leg spination: femora: I p0-1-1; II p0-0-1; tibiae I, II v4-2-2; metatarsi I, II v2-2-0. Postepigastric scutum with boat-shaped transverse ridge situated at about half of scutum length, occupying most of scutum width; posterior genitalic tube narrow, squiggled, terminating at level of transverse ridge.

Material Examined: NORTH AMERICA: **United States:** *Florida:* Collier Co.: Marco Island, Jan. 9, 1930 (W. Barrows, AMNH PBI_OON 49465), 1♀ (holotype). **Mexico:** *Nayarit:* San Blas, Aug. 7, 1960, mangrove swamp (AMNH PBI_OON 1951), 1♀. *Tabasco:* Parque La Venta, Villahermosa,

18°00′N, 92°56′W, Aug. 13, 1966 (J., W. Ivie, AMNH PBI_OON 1952), 1♀. *Yucatán:* Cueva de Tecoh, Mérida, Oct. 6, 1974 (J. Reddell, D. McKenzie, AMNH PBI_OON 1949), 1♂. CENTRAL AMERICA: **Panama:** *Colón:* Gatún, Feb. 27, 1958 (A. Chickering, ex MCZ 71384, PBI_OON 37504), 1♀. *Panamá:* vicinity of Pedro Miguel, Aug. 1954 (A. Chickering, ex MCZ 71401, PBI_OON 9117), 1♂. WEST INDIES: **Jamaica:** *Kingston:* Institute Gardens, Kingston, Nov. 7, 1949 (Bengry, MCZ 66521, PBI_OON 27285, 1♀. *St. Andrew:* Mona, Dec. 1963 (A. Chickering, ex MCZ 71326, PBI_OON 43567), 1♀. *St. Catherine:* School of Agriculture, Nov. 23, 1957 (A. Chickering, ex MCZ 32461, PBI_OON 36963), 1♀; 1.5 mi E Spanishtown, Oct. 10, 1957 (A. Chickering, MCZ 71325, PBI_OON 27277), 1♀. **Hispaniola:** *Haiti:* Port-au-Prince, Sept. 1–5, 1934 (P. Darlington, MCZ PBI_OON 49467), 1♀. **Virgin Islands:** *St. Thomas:* Charlotte Amalie, Feb. 14, 1964, grass and weed litter (A. Chickering, MCZ 66845, PBI_OON 27431), 1♂. **Leeward Islands:** *Nevis:* no specific locality, Sept. 24–29, 1966 (A. Chickering, MCZ 66709, 66710, PBI_OON 27433, 27434, 49464), 1♂, 5♀ (holotype, paratypes). **Windward Islands:** *St. Vincent:* no specific locality, Oct. 15–24, 1966 (A. Chickering, MCZ 66708, PBI_OON 27432), 3♂. SOUTH AMERICA: **Venezuela:** *Portuguesa:* Guanare, Sept. 10–17, 1957 (B. Malkin, AMNH PBI_OON 1958), 2♂, 1♀. **Brazil:** *Amazonas:* Base de Operações Geólogo Pedro de Moura, Urucu River, Coari, 4°52′07.6″S, 65°15′53.6″W, July 11–20, 2003 (A. Bonaldo, J. Dias, D. Guimarães, MPEG 10212, 10214, PBI_OON 40693, 40725), 1♂, 1♀. OLD WORLD: **France:** *Île-de-France:* Paris, greenhouses of MNHN, 1896–1899 (MNHN 5741, PBI_OON 32316), 3♀ (N.B.: an additional vial, MNHN 5739, PBI_OON 32318 contains 1♂ and 1♀ of this species but lacks locality data). **Germany:** *Berlin:* Tiergarten, Zoo-Aquarium, 52°30′22″N, 13°20′29″E, May 15, 2009, sifted, elev. 37 m (K. Kielhorn, CKH PBI_OON 32560), 2♀. *Brandenburg:* Dahme-Spreewald, Brand, Tropical Islands Dome, 52°2′20″N, 13°44′55″E, Mar. 14, 2010, sifted, elev. 78 m (K. Kielhorn, CKH PBI_OON 32561), 1♀, Dec. 8, 2011, same (K. Kielhorn, CKH PBI_OON 32562), 2♂. **Madagascar:** *Toamasina:* Maroantsetra, Oct. 1946, under trunk (J. Millot, MNHN PBI_OON 36358), 1♀. **Seychelles:** *Sillhouette:* La Passe, Jan. 8, 1999, lumber pile (M. Saaristo, J. Gerlach, AMNH PBI_OON 1974), 1♂, 2♀, same (ZMUT 1239, PBI_OON 16072), 1♂, 1♀. **Philippines:** *National Capital Region:* Manila (MNHN 5735, PBI_OON 32323), 2♀. **Marshall Islands:** *Eniwetok Atoll:* Japtan Island, 11°26′N, 162°23′E, July 20, 1968, pitfalls, scaveola/messerschmidia (AMNH PBI_OON 38602), 1♂, 1♀, July 20–22, 1968, messerschmidia litter (AMNH PBI_OON 38557, 38621), 2♂, 5♀, July 22, 1968, under oil barrels (AMNH PBI_OON 38579), 1♂, 2♀, Aug. 7, 1968, under trash (J. Beatty, AMNH PBI_OON 38578), 1♂; Muti Island, June 22, 1968, pisonia forest litter (AMNH PBI_OON 38618), 1♀; Parry Island, June 29, 1968, litter, ipomoea/sedge community (J. Berry, AMNH PBI_OON 37445), 2♂, 1♀. *Kwajalein Atoll:* Kwajalein Islet, July 20, 1969, garbage heap (AMNH PBI_OON 38613), 1♀; Roi-Namur Island, July 9, 1968, scaveola/messerschmidia/pandanus litter (AMNH PBI_OON 38619), 1♀, July 10, 1968, litter at base of coconut tree (AMNH PBI_OON 38594), 1♂, 3♀; July 22, 1969, coconut trash litter (AMNH PBI_OON 38555), 1♂, same, wedelia thicket litter (AMNH PBI_OON 38582), 1♂. **Hawaii:** *Kauai:* Makahuena Point, near Poipu, Jan. 18, 1998, casuarina litter (J., E. Berry, J. Beatty, AMNH PBI_OON 37751), 1♀. *Oahu:* Pupukea Beach Park, Waimea, Jan. 10, 1988, beach rubble (J. Berry, AMNH PBI_OON 38549), 1♀; Wahiawa (H. Hagan, MCZ 71324, PBI_OON 26770), 1♂, 1♀. **Marquesas Islands:** *Hivaoa:* Atuona, near harbor, Feb. 11, 1987, grass, litter (J., E. Berry, AMNH PBI_OON 37752), 1♀. *Nuku Hiva:* Hakaui Bay, Jan. 25, 1987, forest litter on sand near ocean (J. Berry, AMNH PBI_OON 37750), 2♀; sea cove next W Taiohae, Jan. 30, 1987, litter (J., E. Berry, AMNH PBI_OON 38377), 1♀; Taipivai village, Jan. 27, 1987, litter (AMNH PBI_OON 37753), 1♀. **New Caledonia:** Ouen Toro, Noumea, Sept. 3, 1990, dry forest, elev. 125 m (N. Platnick, R. Raven, P. Goloboff, AMNH PBI_OON 1960), 1♂, 1♀.

Distribution: Pantropical (although not yet recorded from Africa south of Egypt), and introduced in European greenhouses; sometimes sympatric with *I. peltifer*.

Synonymy: Chamberlin and Ivie's female holotype of *I. barrowsi* was placed in *I. peltifer* by Chickering (1969: 146) but actually belongs to *I. velox* instead. Chickering apparently did not consider the possibility that *I. indressus* could be a widespread species.

Ischnothyreus browni Chickering
Figures 133–161

Ischnothyreus browni Chickering, 1968: 83, figs. 11, 12 (male holotype plus one male and one female paratypes putatively from Costa Rica, probably mislabeled, in MCZ 66707, PBI_OON 49520, 49521; examined).

Diagnosis: Males resemble those of *I. aculeatus* (Simon), from the Philippines, but can be distinguished by the distally enlarged, protruding projection on the male embolus (figs. 143, 149); females differ from those of *I. aculeatus* in having relatively short posterior genitalic ducts (figs. 159–161).

Male (PBI_OON 35514, figs. 133–151): Total length 1.14. As in male of *I. peltifer* except as noted. Carapace pale orange, broadly oval in dorsal view. Sternal setae evenly scattered. Fangs without prominent basal process. Labium anterior margin not indented at middle. Dorsal scutum yellow, extremely weak, covering about half of abdomen length, between 1/4 and 1/2 of abdomen width, not fused to epigastric scutum. Postepigastric scutum yellow, covering about 1/3 of abdomen length. Spinneret scutum absent. Spinnerets not scanned. Leg spination: femora I, II p0-0-2; tibiae I, II v4-2-2; metatarsi I, II v2-2-0. Tarsal claws, tarsal organs not scanned; trichobothria not examined. Palp with proximal segments, cymbium, bulb all brown; tibial trichobothria not examined; bulb more than twice as long as cymbium, not bent before apex, with one protuberance on ventral side; embolus light, with distinctive dorsal process, process wider at tip than at origin.

Female (PBI_OON 49521, figs. 152–161). Total length 1.36. As in female of *I. peltifer* except as noted. Carapace yellow, ovoid in dorsal view. Sternum yellow. Palpal femur with spiniform setae. Pedicel scutum not extending far dorsal of pedicel. Dorsal scutum, if present, with limits not detectable in this faded, possibly teneral specimen; epigastric scutum so weakly sclerotized that its limits are unclear. Postepigastric scutum very weakly sclerotized, apparently longer at middle than at sides. Leg spination: femora: I p0-1-2; II p0-0-2; tibiae I, II v4-2-2; metatarsi I, II v2-2-0. Tarsal claws, tarsal organs not scanned; trichobothria not examined. Postepigastric scutum probably with narrow transverse ridge at about half its length; squiggled posterior duct with three transverse portions.

Material Examined: **Philippines:** *Luzon:* Laguna Prov.: 4 km SE Los Baños, Apr. 8, 1977, Berlese, forest litter (L. Watrous, AMNH PBI_OON 1966), 1♂; Malaboo Camp, Mount Makiling, 3.46 km SSW Los Baños, 14°08.220′N, 121°12.352′E. May 10, 2011, miniwinkler, forest litter, elev. 675 m (H. Wood et al., CAS 43645, PBI_OON 35514), 1♂; Mount Makiling, 4 km SE Los Baños, Apr. 9, 1977, Berlese, mixed hardwood litter (L. Watrous, AMNH PBI_OON 1965), 1♂.

Distribution: Known with certainty only from Luzon Island in the Philippines; as indicated above, we regard the Costa Rican type locality as spurious.

ACKNOWLEDGMENTS

This study is part of the oonopid PBI project supported by the U.S. National Science Foundation (grant DEB-0613754) and organizations in several other countries. The assistance of the many participants in that project is immensely appreciated. As always, we thank the many curators of collections that have supplied specimens: Giraldo Alayón (MNH), Léon Baert (KBIN), Janet Beccaloni (BMNH), Alexandre Bonaldo (MPEG), Michaël Dierkens (CMD), Charles Dondale (CNC), G.B. Edwards (FSCA), Eduardo Florez (ICN), Gonzalo Giribet and Laura Leibensperger (MCZ), Charles Griswold and Darrell Ubick (CAS), Rudy Jocqué (MRAC), Karl-Hinrich Kielhorn (CKH), Seppo Koponen (ZMUT), Diomedes Quintero (MIUP), James Reddell (TMM), Christine Rollard (MNHN), Alexander Sánchez (BSC), Petra Sierwald (FMNH), and Carlos Víquez (INBIO). We also thank Alexandre Bonaldo for providing several of his scanning electron micrographs, Steve Thurston for composing the plates, and Barbara Baehr and Darrell Ubick for their very helpful reviews of the manuscript.

REFERENCES

Baehr, B.C., and D. Ubick. 2010. A review of the Asian goblin spider genus *Camptoscaphiella* (Araneae: Oonopidae). American Museum Novitates 3697: 1–65.

Benoit, P.L.G. 1977. Fam. Oonopidae et Tetrablemmidae. *In* La faune terrestre de l'île de Sainte-Hélène IV. Musée Royal de l'Afrique Centrale Tervuren Belgique Annales Série in Octavo Sciences Zoologiques 220: 31–44.

Benoit, P.L.G. 1979. Contributions à l'étude de la faune terrestre des îles granitiques de l'archipel des Séchelles (Mission P.L.G. Benoit–J.J. Van Mol 1972). Oonopidae (Araneae). Revue de Zoologie Africaine 93: 185–222.

Brignoli, P.M. 1974. On some Oonopidae from Japan and Formosa (Araneae). Acta Arachnologica 25: 73–85.

Bristowe, W.S. 1948. Notes on the structure and systematic position of oonopid spiders based on an examination of the British species. Proceedings of the Zoological Society of London 118: 878–891.

Bryant, E.B. 1942. Notes on the spiders of the Virgin Islands. Bulletin of the Museum of Comparative Zoology 89: 317–366.

Bryant, E.B. 1948. The spiders of Hispaniola. Bulletin of the Museum of Comparative Zoology 100: 331–459.

Burger, M. 2010. Goblin spiders without distinct receptacula seminis (Arachnida: Araneae: Oonopidae). Journal of Morphology 271: 1110–1118.

Cambridge, O. P.-. 1908. On some new and rare British Arachnida, noted and observed in 1907. Proceedings of the Dorset Natural History and Antiquarian Field Club 29: 161–184.

Chamberlin, R.V., and W. Ivie. 1935. Miscellaneous new American spiders. Bulletin of the University of Utah 26 (4): 1–79.

Chen, Z.F., and Z.H. Zhang. 1991. Fauna of Zhejiang: Araneida. Hangzhou: Zhejiang Science and Technology Publishing House, 356 pp.

Chickering, A.M. 1951. The Oonopidae of Panama. Bulletin of the Museum of Comparative Zoology 106: 207–245.

Chickering, A.M. 1968. The genus *Ischnothyreus* (Araneae, Oonopidae) in Central America and the West Indies. Psyche 75: 77–86.

Chickering, A.M. 1969. The family Oonopidae (Araneae) in Florida. Psyche 76: 144–162.

Dumitresco, M., and M. Georgesco. 1983. Sur les Oonopidae (Araneae) de Cuba. Résultats des Expéditions Biospéologiques Cubano-Roumaines à Cuba 4: 65–114.

Edward, K.L., and M.S. Harvey. 2009. A new species of *Ischnothyreus* (Araneae: Oonopidae) from monsoon rainforest of northern Australia. Records of the Western Australian Museum 25: 287–293.

El-Hennawy, H.K. 2008. Review of the Oonopidae of Egypt (Arachnida: Araneae). Serket 11: 23–36.

Grismado, C.J., C. Deeleman, and B. Baehr. 2011. The goblin spider genus *Aprusia* Simon, 1893 (Araneae: Oonopidae). American Museum Novitates 3706: 1–21.

Heimer, S., and W. Nentwig. 1991. Spinnen Mitteleuropas: ein Bestimmungsbuch. Verlag Paul Parey, Berlin, 543 pp.

Jackson, A.R. 1908. On some rare arachnids captured during 1907. Transactions of the Natural History Society of Northumberland, Durham, and Newcastle-upon-Tyne, new series 3: 49–78.

Kranz-Baltensperger, Y. 2011. The oonopid spider genus *Ischnothyreus* in Borneo (Oonopidae, Araneae). Zootaxa 2939: 1–49.

Kranz-Baltensperger, Y. 2012. Three new species of the oonopid spider genus *Ischnothyreus* (Araneae: Oonopidae) from Tioman Island (Malaysia). Zootaxa 3161: 37–47.

Locket, G.H., and A.F. Millidge. 1951. British spiders. London: Ray Society, 1: 1–310.

Ono, H. 2009. The spiders of Japan with keys to the families and genera and illustrations of the species. Kanagawa: Tokai University Press, 739 pp.

Petrunkevitch, A. 1929. The spiders of Porto Rico, part one. Transactions of the Connecticut Academy of Arts and Sciences 30: 1–158.

Platnick, N.I., et al. 2012a. Tarsal organ morphology and the phylogeny of goblin spiders (Araneae, Oonopidae), with notes on basal genera. American Museum Novitates 3736: 1–52.

Platnick, N.I., and N. Dupérré. 2009. The goblin spider genera *Opopaea* and *Epectris* (Araneae, Oonopidae) in the New World. American Museum Novitates 3649: 1–43.

Platnick, N.I., N. Dupérré, R. Ott, B.C. Baehr, and Y. Kranz-Baltensperger. 2012b. The goblin spider genus *Pelicinus* (Araneae, Oonopidae), part 1. American Museum Novitates 3741: 1–43.

Platnick, N.I., N. Dupérré, R. Ott, and Y. Kranz-Baltensperger. 2011. The goblin spider genus *Brignolia* (Araneae, Oonopidae). Bulletin of the American Museum of Natural History 349: 1–131.

Platnick, N.I., N. Dupérré, D. Ubick, and W. Fannes. 2012c. Got males?: The enigmatic goblin spider genus *Triaeris* (Araneae, Oonopidae). American Museum Novitates 3756: 1–36.

Saaristo, M.I. 1999. An arachnological excursion to the granitic Seychelles, 1–26 January 1999. Arachnid species lists for Silhouette, Cousine & Mahé. Phelsuma 7 (Suppl. A): 1–12.

Saaristo, M.I. 2001. Dwarf hunting spiders or Oonopidae (Arachnida, Araneae) of the Seychelles. Insect Systematics and Evolution 32: 307–358.

Saaristo, M.I., and A. van Harten. 2006. The oonopid spiders (Araneae: Oonopidae) of mainland Yemen. Fauna of Arabia 21: 127–157.

Simon, E. 1891. On the spiders of the island of St. Vincent. –Part 1. Proceedings of the Zoological Society of London 1891: 549–575.

Simon, E. 1893a. Histoire naturelle des araignées. Paris: Roret, 1: 257–488.

Simon, E. 1893b. Études arachnologiques. 25^{e} Mémoire (1). XL. Descriptions d'espèces et de genres nouveaux de l'ordre des Araneae. Annales de la Société Entomologique de France 62: 299–330.

Simon, E. 1896. Arachnides. *In* A. Dollfus, Recherches zoologiques dans les serres du Muséum de Paris. Feuille des Jeunes Naturalistes 26: 92–93.

Song, D.X. 1987. Spiders from agricultural regions of China. Beijing: Agriculture Publishing House, 376 pp.

Song, D.X., M.S. Zhu, and J. Chen. 1999. The spiders of China. Shijiazhuang: Hebei Science and Technology Publishing House, 640 pp.

Suman, T.W. 1965. Spiders of the family Oonopidae in Hawaii. Pacific Insects 7: 225–242.

Tong, Y.F., and S.Q. Li. 2008. The oonopid spiders (Araneae, Oonopidae) from Hainan Island, China. Raffles Bulletin of Zoology 56: 55–66.

Ubick, D., and C.E. Griswold. 2011. The Malagasy goblin spiders of the new genus *Malagiella* (Araneae, Oonopidae). Bulletin of the American Museum of Natural History 356: 1–86.

Complete lists of all issues of *Novitates* and *Bulletin* are available on the web (http://digitallibrary.amnh.org/dspace). Inquire about ordering printed copies via e-mail from scipubs@amnh.org or via standard mail from:

American Museum of Natural History—Scientific Publications
Central Park West at 79th Street
New York, NY 10024

♾ This paper meets the requirements of ANSI/NISO Z39.48-1992 (permanence of paper).