



Morphology, Systematics, Evolution

Two New Species and New Records of Sepsidae from the Brazilian Amazon

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Subject Editor: Jason Byrd

Received 16 February 2022; Editorial decision 14 April 2022.

Abstract

The dipteran fauna from the Brazilian Amazon remains poorly known, including that of forensic interest, such as the Sepsidae. The sepsid fauna of two secondary forests in the eastern Amazon was surveyed utilizing rotting bovine lung and feces (humans, bovines, and monkeys). We obtained 17 sepsid species in six genera, most of them on bovine dung and rotting bovine lung. Two new species are described herein: *Archiseopsis bosque* sp. nov. and *Archiseopsis verae* sp. nov. The genus *Palaeoseopsis* Duda, 1926 and the species *Archiseopsis polychaeta* (Ozerov, 1993), *Archiseopsis diversiformis* (Ozerov, 1993), *Microseopsis mitis* (Curran, 1927), *Meroplioseopsis sexsetosa* Duda, 1926, and *Palaeoseopsis* cf. *golovastik* Ozerov, 2004 are newly recorded from the Brazilian Amazon.

Key words: Acalypttratae, ant-like scavenger flies, ensign flies, Neotropical Region, Sciomyzoidea, true fly

Sepsidae is a small family of Acalypttratae, Diptera belonging to the superfamily Sciomyzoidea (Ozerov 2005, 2021, Silva 2016, Silva and Pollet 2020), with 385 described species, classified in 38 genera, distributed in all biogeographic regions, except Antarctica (Borkent et al. 2018, Silva and Pollet 2020). For the Neotropical region, 10 genera and 45 species have been recorded (Borkent et al. 2018, Silva and Pollet 2020), 21 of which, in 10 genera, are known to occur in Brazil (Ozerov 2005, Silva 2021).

Sepsids are small to medium-sized flies (2–22 mm of length), usually black, brown or orange in coloration, with spherical head, hyaline wing (an apical black spot is present in some species) and a characteristic ant-like body shape, which is present in almost all genera and particularly for all Neotropical genera (Pont and Meier 2002, Ozerov 2005, 2021, Silva and Pollet 2020). Identification at specific level of sepsids is based mainly on features of male terminalia and setation and shape of fore femur and/or tibia of male specimens (Silva 2010, Ozerov 2021).

Adults and larvae of sepsids are usually found in dung of large- and medium-sized mammals (e.g., hoofed mammals, dogs, monkeys), but some species prefer feces of aquatic birds (e.g., waterfowls) (Pont and Meier 2002, Silva 2010, Ozerov 2021). They are also common around and on carcasses of large vertebrates (Ozerov 2021),

including human corpses; for this reason, they are among the dipteran families with forensic importance (Carvalho and Mello-Patiu 2008, Oleksakova et al. 2016).

The taxonomy of the sepsids, particularly of Neotropical fauna, is relatively well established, and many of its genera have been revised and/or taxonomically studied in the last 30 yr (Ozerov 1992, 1993, 1994, 1998, 2000, 2004; Silva 1990, 1991, 1993, 2010, 2020). These works contain good figures of the terminalia and fore leg of most of the species that allow reliably specific identification. In addition, there is a website, Sepsidnet (2022), with many high-quality photographs and illustrations from different sources (including those present in the original description or redescrptions) for each valid sepsid species, that is very useful in species determination as well.

As Sepsidae is a not so species-rich family and considering that it is a well-studied taxon, the fauna of a given region can be easily sampled and identified. Despite this, the sepsid fauna of the Brazilian Amazon region, which harbors one of the most biodiverse forests of the world, remains poorly known. Until now, only 4 genera (*Archiseopsis* Silva, 1993, *Microseopsis* Silva, 1993, *Palaeosepsioides* Ozerov, 1992, and *Pseudopalaeoseopsis* Ozerov, 1992) and 12 species have been recorded for this region (Ozerov 2005). In addition, there are few studies about the substrates visited by the adults and there is no

information about the species that feed on vertebrate carrion in this region.

In this paper, we provide a list of sepsid species collected on different substrates in two secondary forests from the Brazilian Amazon, two of which are described herein and five are new occurrences for the Brazilian Amazon. These results are part of a large study on species of Diptera that act in the decomposition of vertebrate carcasses and feces in reminiscent tropical rainforests.

Material and Methods

The specimens analyzed in this study were collected in two places in the state of Pará, in the Brazilian Amazon: 1) Bosque Rodrigues Alves (BRA) Botanical Garden (1°25'45.6"S 48°27'23.1"W), a forested urban park of about 150,000 m² (38 acres) located in the urban center of city of Belém; 2) A secondary forest (0°51'60.0"S 47°39'28.1"W) located on the margin of Marapanim River, in the Village of Calafate, municipality of Magalhães Barata.

Human, tufted capuchin monkey (*Sapajus apella* L.), and cattle (*Bos taurus* L.) feces were utilized as bait to attract the sepsids. Monkey feces were obtained from caged specimens in the BRA and bovine feces from the Universidade Rural da Amazônia (UFRA), Belém, Pará, Brazil. In addition, we also utilized rotting bovine lung in BRA to attract sepsids, as part of a forensic study in forested urban parks in the Brazilian Amazon.

Small amounts of feces and bovine lung (about 100 g) were placed under square pieces of plastic, about 1 m above the ground, in shaded places in several points along the trails in the two sampled areas. The bovine lung was left to rot for 48 h inside a closed plastic box before placement. The three kinds of baits were placed about 50 m apart from each other along a trail and they were left out for 6 consecutive hours during the daytime. The sepsids were collected by hand utilizing 45 ml conical centrifuge plastic tubes and preserved in 70% alcohol. Then, they were mounted on pinned card triangles and deposited in the entomological collections of the Museu Paraense Emílio Goeldi (MPEG), Belém, state of Pará, Brazil, and the Instituto Nacional de Pesquisas da Amazônia (INPA), Manaus, state of Amazonas, Brazil.

The collected specimens were identified to genus level with the key from Silva (2010) and to species by comparison with the figures available at the Sepsidnet (2022) website and original descriptions

and/or redescrptions (when available). The terminology of external morphology follows Cumming and Wood (2009), and the classification utilized follows Ozerov (2005) and the Sepsidnet (2022) site.

Terminalia were removed from the abdomen with micro pins, treated with hot 85% lactic acid for about 10 min, and mounted on temporary slides in glycerin. After study, they were preserved in microvials with glycerin and pinned beneath their source specimens. The male terminalia and foreleg were drawn using a drawing tube (*camera lucida*) attached to a Leica DM 1000 light microscope. Drawings were processed using Adobe Photoshop and Inkscape.

Specimen label data of type-specimens are quoted verbatim and a forward slash line (/) is used to separate lines on a label. Additional information is given in square brackets ([]).

This paper and the nomenclatural act(s) it contains have been registered in Zoobank (www.zoobank.org), official register of the International Commission on Zoological Nomenclature. The LSID (Life Science Identifier) number of the publication is: urn:lsid:zoobank.org:pub:31AFEF18-7203-4DCA-9F9E-2566F7876343

Results

A total of 1005 male specimens, belonging to 17 sepsid species in 6 genera, were collected (Table 1). Most of the species were collected on bovine dung and rotting bovine lung (Table 1). Only one species was collected on brown capuchin monkey feces (Table 1). The genus *Palaeosepsis* Duda, 1926 is a new record from the Brazilian Amazon, five species were recorded for the first time for the Brazilian Amazon, and two species were identified as new to science and are described here.

New Species

Archiseopsis bosque sp. nov. (Figs. 1, 2)

(urn:lsid:zoobank.org:act:2E978C18-B54D-48AA-8C74-B9AAFC5698F)

Type material.

HOLOTYPE: 1 male (MPEG): Belém, Pará, Brasil [= Brazil]/ Bosq. [= Bosque] Rodrigues Alves, 30.IX.2021/ 1°25'45.6"S 48°27'23.1"W/ R.F.O. Nascimento [collector], fezes bovina [= bovine dung].

Table 1. Specimens of Sepsidae collected on dung and rotting bovine lung in two secondary forests from the Brazilian Amazon

Species	Bait	Number
<i>Archiseopsis armata</i> (Schiner, 1868)	Bovine dung, rotting bovine lung	60
<i>Archiseopsis bosque</i> sp. nov.	Bovine dung	34
<i>Archiseopsis discolor</i> (Bigot, 1857)	Bovine dung, rotting bovine lung	357
<i>Archiseopsis diversiformis</i> (Ozerov, 1993)	Human feces	1
<i>Archiseopsis ecalcarata</i> (Thomson, 1869)	Bovine dung	231
<i>Archiseopsis excavata</i> (Duda, 1926)	Bovine dung, rotting bovine lung	44
<i>Archiseopsis pusio</i> (Schiner, 1868)	Bovine dung	51
<i>Archiseopsis polychaeta</i> (Ozerov, 1993)	Human feces, rotting bovine lung	68
<i>Archiseopsis verae</i> sp. nov.	Bovine dung	1
<i>Meropliosepsis sexsetosa</i> Duda, 1926	Capuchin monkey dung	3
<i>Microsepsis armilata</i> (Melander & Spuler, 1917)	Bovine dung, rotting bovine lung	54
<i>Microsepsis furcata</i> (Melander & Spuler, 1917)	Bovine dung	34
<i>Microsepsis mitis</i> (Curran, 1927)	Bovine dung	37
<i>Palaeosepsis</i> cf. <i>golovastik</i> Ozerov, 2004	Human feces	2
<i>Palaeosepsioides erythromyrmus</i> (Silva, 1991)	Bovine dung	2
<i>Pseudopalaeosepsis mirifica</i> (Silva, 1993)	Bovine dung	6
<i>Pseudopalaeosepsis muricata</i> (Silva, 1993)	Bovine dung, rotting bovine lung	20
Total		1005

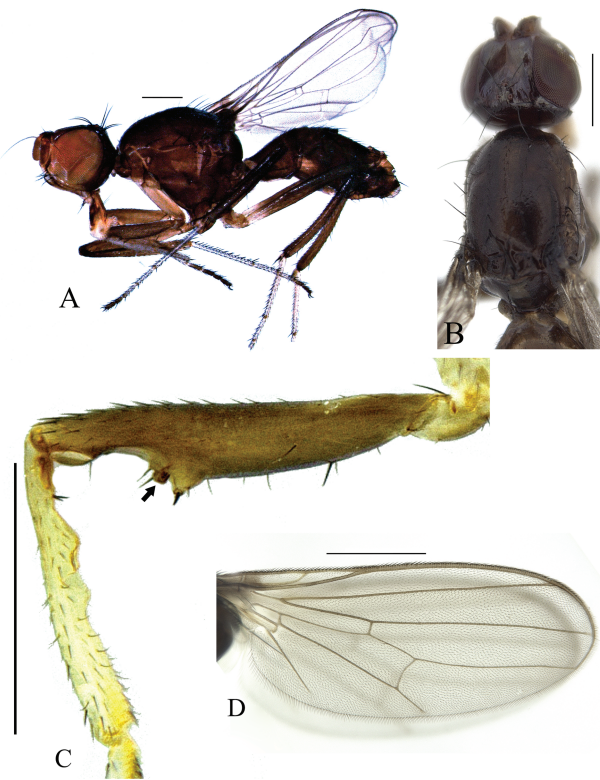


Fig. 1. *Archisepsis bosque* sp. nov., paratype male. (A) Habitus, right lateral view. (B) Head and thorax, dorsal view. (C) Fore leg, left lateral view; black arrow showing quadrate protrusion of ventral margin of femur. (D) Right wing, dorsal view. Scale bars: A = 0.4 mm; B, C, D = 500 μ m.

PARATYPES. 33 males (20 in MPEG, 13 in INPA), 30 with same data as holotype and one labeled as follow: Magalhães Barata, PA [= state of Pará], Brasil [= Brazil]/ Vila de [= Village of] Calafate, 10.X.2021/ 0°51'60.0"S 47°39'28.1"W/ R.F.O. Nascimento [collector], fezes bovina [= bovine dung].

Description of adult male.

Body length: 3.0–3.5 mm; wing length: 1.5–2.0 mm ($n = 34$).

Diagnosis.

Posteroventral surface of fore femur of male with a chitinized quadrate protrusion (Figs. 1C, 2A–B). Ventral surface of basal portion of fore femur of male with two prominent humps (Figs. 1C, 2A–B). Ventral surface of apical portion of fore femur of male curved (Figs. 1C, 2B). Sternite 5 of male broadened, with posterolateral corner tapered (Fig. 2C). Basal process of surstylus clubbed, with a median rounded process on the inner margin (Fig. 2E).

Color

(Fig. 1). Frons blackish brown in posterior half and light brown in anterior half; face and gena yellowish brown; postcranium with occiput dark brown; postgena yellowish brown; thorax and abdomen dark brown. *Legs:* fore coxa light yellow; mid and hind coxae yellowish brown; fore femur light brown; mid and hind femora light brown with basal one fifth light yellow; fore tibia light yellow, mid and hind tibiae dark brown; all tarsi yellowish brown.

Pruinescence.

Frons, face and gena shiny. Postcranium whitish pruinose, shiny only along eye. Scutum whitish pruinose. Proepisternum, anepisternum

and anepimeron shiny. Katepisternum shiny, but with a large grayish pruinose dorsal stripe. Proepimeron, katepimeron, meron and metepisternum thinly grayish pruinose. Metepimeron shiny. Katatergite and anatergite grayish pruinose. Mediotergite shiny. Scutellum grayish pruinose. Abdomen shiny.

Head.

Somewhat flattened dorsoventrally; eye rounded. First flagellomere elongate, ellipsoid in lateral view, approximately 1.5 times as long as wide, blunt apically. Arista bare. *Chaetotaxy:* ocellar setae long, postocellar setae latero-clinate, inner and outer vertical setae present; fronto-orbital seta absent; three larger vibrissae smoothly medio-clinate; occipital sclerite with several setulae; postgena with a row of fine setae along lower margin.

Thorax.

Postpronotal lobe and scutum with scattered setulae. *Chaetotaxy:* one postpronotal, two notopleurals, one supra-alar, one postalar, 0 + 2 dorsocentral setae. Anepisternum with a row of setae on posterior half and with one long seta near posterior margin. Scutellum with well-developed apical seta; basal seta short.

Legs.

Fore coxa elongated and simple, with one dorsal seta apically. Fore femur with ventral margin of distal portion with a prominent conical protrusion bearing a short and stout pointed apical seta, a quadrate pigmented protrusion on posteroventral surface and a curved apical ventral margin (Figs. 1C, 2A–B). Fore tibia with two triangular humps in the ventral margin of basal half (Figs. 1C, 2A–B). Mid coxa with a row of setulae in upper half. Mid femur without thick setae. Mid tibia with one thick median lateral seta on anterior face, one posteroventral seta and two apical setae in ventral surface. Hind femur without major setae. Hind tibia without osmeterium.

Wing.

Hyaline, without dark spot near apex (Fig. 1D). Basal costal cell and membrane area posterior to stem vein completely blackish (Fig. 1D). Alula entirely covered with microtrichia. Halter white.

Abdomen.

Tergites 2–5 each with longer marginal setae. Sternites 3 and 4 with many long setae; sternite 4 not modified; sternite 5 wider than long, broadened, with posterolateral corner elongate and tapered (Fig. 2C); sternite 7 + 8 present, almost T-shaped (Fig. 2C). *Terminalia.* Epandrium dark brown, with long and short setae restricted to posterodorsal margin (Figs. 2D–E). Cercus well-developed, higher than wide, with a row of four long setae and with a well-developed rounded membranous lip on posterior margin (Fig. 2D–E). Surstylus, in lateral view, elongate and tapering toward the apex, bearing some scattered tiny setae laterally and with long setae along posterior margin (Fig. 2D). Basal process of surstylus, in posterior view, clubbed, with a median rounded process in the inner margin (Figs. 2D–E).

Remarks.

Archisepsis bosque sp. nov. shares with *A. discolor* (Bigot, 1857), *A. pleuralis* (Coquillett, 1904) and *A. polychaeta* (Ozerov, 1993) basal process of surstylus bearing a rounded process in the proximal half. It differs from *A. polychaeta* in having fore femur black and wing without apical black spot. In *A. polychaeta* the fore leg is fully yellow and the wing has an apical spot. The new species differs from *A. pleuralis* mainly in having pleuron black (mostly yellow in

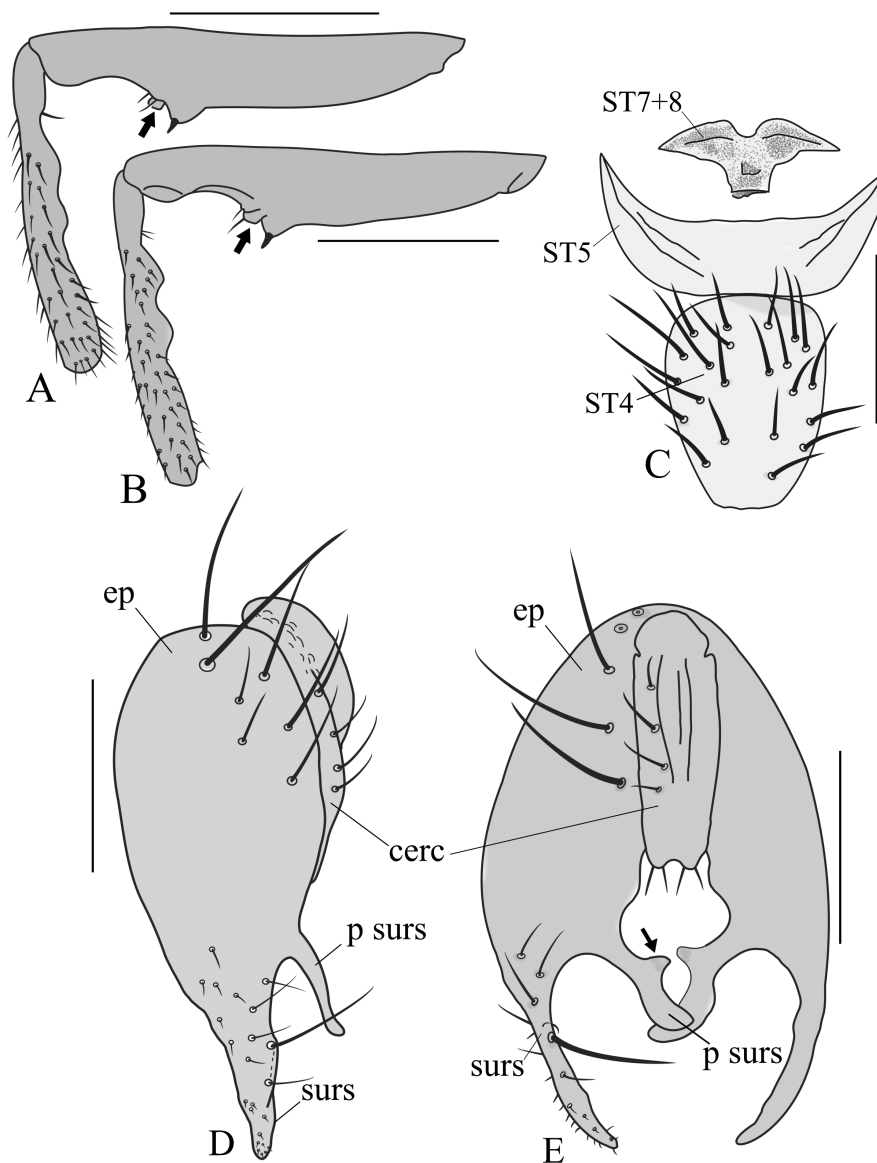


Fig. 2. *Archisepsis bosque* sp. nov., paratype male. (A) Fore leg, right lateral view; black arrow showing quadrate protrusion of ventral margin of femur (most of setation of femur omitted). (B) Fore leg, left lateral view; black arrow showing quadrate protrusion of ventral margin of femur (most of setation of femur omitted). (C) Last abdominal sternites, ventral view. (D) Terminalia, right lateral view. (E) Terminalia, posterior view; black arrow showing rounded process on the inner margin of basal process of surstylus (setation omitted on the right side). Abbreviations: cerc = cercus, ep = epandrium, p surs = basal process of surstylus, ST = sternite, surs = surstylus. Scale bars: A, B = 250 μ m; C = 500 μ m, D, E = 200 μ m.

A. pleuralis). *Archisepsis bosque* sp. nov. is morphologically similar to *A. discolor*, from which differs in having femur with one prominent quadrate protrusion, on the posteroventral margin before the apical curved ventral apical margin; sternite 5 broadened and a T-shaped sternite 7 + 8. In *A. discolor*, the apical ventral surface lacks a quadrate protrusion; sternite 5 is narrowed and sternite 7 + 8 is almost rectangular (Ozerov 1993).

Female.

Unknown.

Distribution.

NEOTROPICAL—Brazil (Pará).

Etymology.

The species is named after the type-locality, the Bosque Rodrigues Alves Botanical Garden, one of the most famous urban parks of the city of Belém, which is affectionately known only as Bosque. The name is a noun in the nominative singular standing in apposition.

Archisepsis verae sp. nov. (Figs. 3, 4)

(urn:lsid:zoobank.org:act:B00F18E1-064D-426D-8FB1-9B8A637645F8)

Type material.

HOLOTYPE: 1 male (MPEG): Magalhães Barata, PA [= state of Pará], Brasil [= Brazil]/ Vila de [= Village of] Calafate, 10.X.2021/

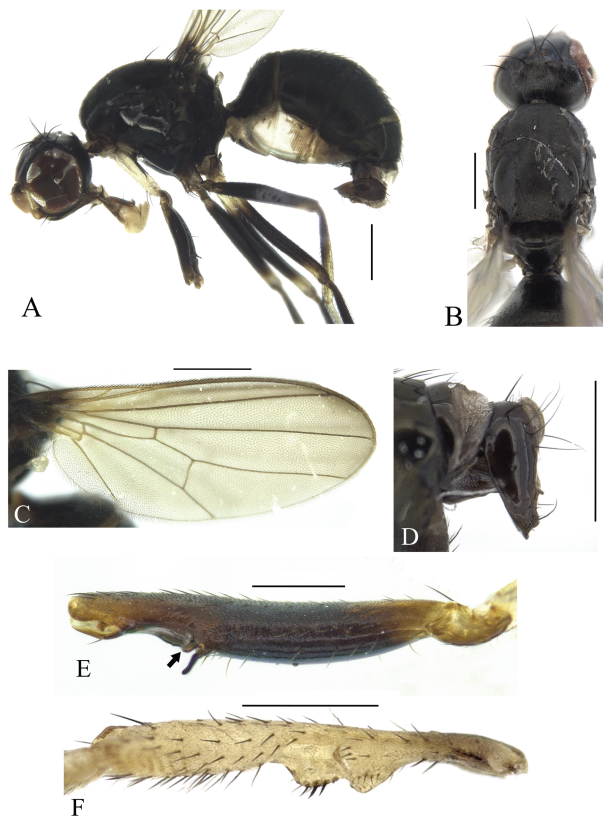


Fig. 3. *Archiseopsis verae* sp. nov., holotype male. (A) Habitus, right lateral view. (B) Head and thorax, dorsal view. (C) Right wing, dorsal view. (D) Terminalia, right lateral view. (E) Fore femur, left lateral view; black arrow showing the glossiform projection on ventral surface of femur; (F) Fore tibia, left lateral view. Scale bars: A, B, C, D, E = 500 μ m; F = 200 μ m.

0°51'60.0"S 47°39'28.1"W/ R.F.O. Nascimento [collector], fezes bovina [= bovine dung].

Diagnosis.

Fore femur with a protrusion bearing an elongated, thin and sinuous modified black setae and with a glossiform projection on ventral surface (Figs. 3E, 4A–B). Surstylus, in lateral view, broadened but then abruptly narrowed at a right angle into a thin short stylus apically (Figs. 3D, 4D). Sternite 7 separated from sternite 8, represented by a tiny narrowed plate (Fig. 4C).

Description of adult male.

Body length: 3.5 mm; wing length: 2.0 mm ($n = 1$).

Color

(Fig. 3). Frons black in posterior half and light brown in anterior half; face and gena light brown; postcranium, postgena, thorax and abdomen blackish brown. *Legs*: fore coxa light yellow; mid and hind coxae light brown; fore femur shining black, yellowish brown apically; mid and hind femora light brown with basal one-fifth light yellow; fore tibia light yellow; mid and hind tibiae shining black with yellowish basal portion; all tarsi yellowish.

Pruinescence.

Frons shiny. Face and gena sub shiny. Postcranium thinly whitish pruinose. Scutum slightly whitish pruinose. Proepisternum,

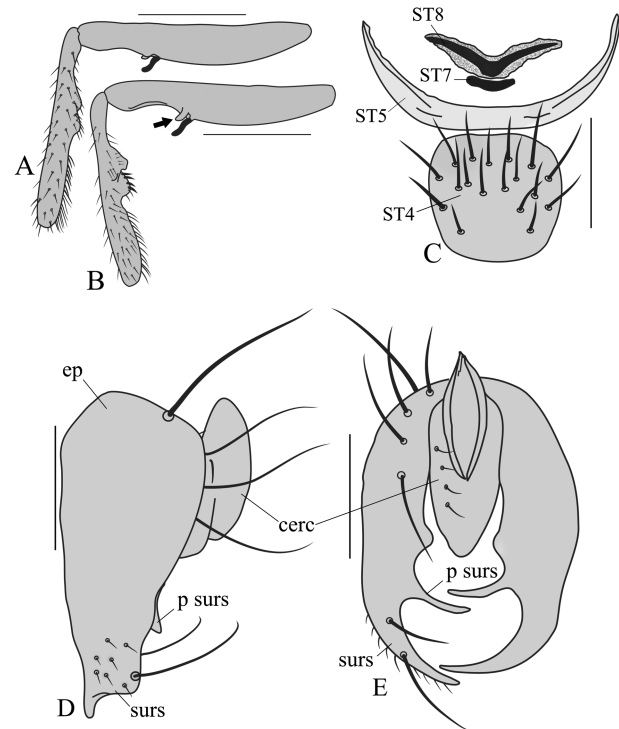


Fig. 4. *Archiseopsis verae* sp. nov., holotype male. (A) Fore leg, right lateral view (most of setation of femur omitted). (B) Fore leg, left lateral view; black arrow showing the glossiform projection on ventral surface of femur (most of setation of femur omitted). (C) Last abdominal sternites, ventral view. (D) Terminalia, right lateral view. (E) Terminalia, posterior view (setation omitted on the right side). Abbreviations: cerc = cercus, ep = epanthrium, p surs = basal process of surstylus, ST = sternite, surs = surstylus. Scale bars: A, B, C = 250 μ m; D, E = 200 μ m.

anepisternum and anepimeron shiny. Katepisternum shiny, but with a large grayish pruinose dorsal stripe. Proepimeron, katepimeron, meron and metepisternum grayish pruinose. Metepimeron shiny. Katatergite and anatergite grayish pruinose. Mediotergite shiny. Scutellum grayish pruinose. Abdomen sub shiny.

Head.

Somewhat flattened dorsoventrally; eye rounded. First flagellomere elongate, ellipsoid in lateral view, blunt apically. Arista bare. *Chaetotaxy*: ocellar setae long, postocellar setae latero-clinate, inner and outer vertical setae present; fronto-orbital seta absent; two larger vibrissae smoothly medio-clinate; occipital sclerite with several setulae; postgena with a row of fine setae along lower margin.

Thorax.

Postpronotal lobe and scutum with scattered setulae. *Chaetotaxy*: one postpronotal, two notopleurals, one supra-alar setae, one postalar seta, and 0 + 2 dorsocentral setae. Anepisternum with a row of setae on posterior half and with a long seta near posterior margin. Scutellum with well-developed apical setae; basal setae short.

Legs.

Fore coxa elongated and simple, with one dorsal seta apically. Fore femur with a protrusion bearing an elongated, thin and waved modified black setae, with rounded tip; followed by prominent light brown glossiform projection in posteroventral surface and a curved apical ventral margin (Figs. 3E, 4A–B). Fore tibia with two distinct

humps in the ventral margin of proximal half; posterior hump with a row of thick and pointed setae dorsally in posterior face; region before humps narrowed with ventral margin slight curved (Figs. 3F, 4A–B). Mid coxa with a row of setulae in upper half. Mid femur without thick setae. Mid tibia with one posteroventral seta and two apical setae in ventral surface. Hind femur without major setae. Hind tibia without osmeterium.

Wing.

Wing with dark spot near apex (Fig. 3C). Basal costal cell and membrane area posterior to stem vein completely blackish (Fig. 3C). Alula entirely covered with microtrichia. Halter white.

Abdomen.

Tergites 2–5 each with long marginal setae. Sternites 3 and 4 bearing many long setae; sternite 4 not modified (Fig. 4C); sternite 5 ‘crescent moon-shaped’, widened and narrowed, with posterolateral corner elongate and tapered (Fig. 4C); sternite 7 apparently not fused with sternite 8, represented by a tiny narrowed sclerotized plate (Fig. 4C); sternite 8 much-widened V-shaped (Fig. 4C). *Terminalia*. Epanthrium dark brown, with long setae restricted to posterodorsal margin (Figs. 3D, 4D–E). Cercus well-developed, higher than wide, with a row of four long setae and with a well-developed membranous lip on posterior margin (Figs. 3D, 4D–E). Surstylus, in lateral view, broadened but then abruptly narrowed at a right angle into a thin short stylus apically, covered with some small pointed setae and with two long setae on lateral margin (Figs. 3D, 4D). Surstylus, in posterior view, elongated and tapering distally (Fig. 4E). Basal process of surstylus elongated and thin, slightly curved (Fig. 4E).

Female.

Unknown.

Remarks.

Archiseopsis verae sp. nov. differs from all other described species of *Archiseopsis* in having surstylus, in lateral view, broadened but then abruptly narrowed at a right angle into a thin short stylus apically. In most of the known species of *Archiseopsis*, the surstylus laterally is elongate and tapers gently distally. In *Archiseopsis pleuralis*, the surstylus is also short and broadened in lateral view, but it differs

from *A. verae* sp. nov. in having pleuron partially yellowish; basal process of surstylus with a basal process and a V-shaped sternite 5 of male. In *A. verae* sp. nov. the pleuron is fully black; the basal process of surstylus is elongate and thin, lacking a process and sternite 5 of male is “crescent moon-shaped”.

Distribution.

NEOTROPICAL—Brazil (Pará).

Etymology.

The species is named after Dr. Vera Silva (UNESP- Universidade Estadual Paulista) for her contribution to our knowledge of the taxonomy of Neotropical Sepsidae. The species name is a noun in the genitive case.

New Records

Archiseopsis polychaeta (Ozerov, 1993) Examined material.

Brazil. *Pará*: Belém, Bosque Rodrigues Alves Botanical Garden, 1°25'45.6"S 48°27'23.1"W, 27.VIII.2021-13.IX.2021, leg. R. F. O. Nascimento, human feces (65 males, MPEG); same data, but rotting bovine lung (3 males, MPEG).

Archiseopsis diversiformis (Ozerov, 1993) Examined material.

Brazil. *Pará*: Belém, Bosque Rodrigues Alves Botanical Garden, 1°25'45.6"S 48°27'23.1"W, 13.IX.2021, leg. R. F. O. Nascimento, human feces (1 male, MPEG).

Microsepsis mitis (Curran, 1927) Examined material.

Brazil. *Pará*: Belém, Bosque Rodrigues Alves Botanical Garden, 1°25'45.6"S 48°27'23.1"W, 27.VIII.2021-13.IX.2021, leg. R. F. O. Nascimento, bovine dung (37 males, MPEG).

Meropliosepsis sexsetosa Duda, 1926 Examined material.

Brazil. *Pará*: Magalhães Barata, Calafate Village, 0°51'60.0"S 47°39'28.1"W, 10.X.2021, leg. R. F. O. Nascimento, capuchin monkey dung (3 males, MPEG).

Palaeosepsis cf. *golovastik* Ozerov, 2004 Examined material.

Brazil. *Pará*: Belém, Bosque Rodrigues Alves Botanical Garden, 1°25'45.6"S 48°27'23.1"W, 27.VIII.2021-13.IX.2021, leg. R. F. O. Nascimento, human feces (2 males, MPEG).

Key to the species of *Archiseopsis* (males only)

- | | |
|---|-----------------------|
| 1. Fore femur fully yellow | 2 |
| - Fore femur predominately dull colored (brown or black) | 7 |
| 2. Pleuron predominately yellow | <i>A. pleuralis</i> |
| - Pleuron predominately dull colored (brown or black) | 3 |
| 3. Wing with an apical spot | 4 |
| - Wing without an apical spot | 5 |
| 4. Postpronotal lobe yellowish brown or light brown. Wing with a large diffuse spot along apical margin of cell r_{2+3} , between the veins R_{2+3} and R_{4+5} | <i>A. polychaeta</i> |
| - Postpronotal lobe dark brown. Wing with a small well-delimited pre-apical spot on the tip of vein R_{2+3} | <i>A. peruana</i> |
| 5. Fore femur without a hump bearing a modified seta (short seta with rounded tip) on the ventral surface. Fore tibia without a hump on the ventral surface. Basal process of surstylus absent | <i>A. bolivica</i> |
| - Fore femur with a hump with a modified seta (short seta with rounded tip) on the ventral surface. Fore tibia with a hump on the ventral surface. Basal process of surstylus present | 6 |
| 6. Ventral surface of fore femur with a prominent glossiform projection posterior to hump with modified seta. Basal process of surstylus well-developed with about the same length of surstylus | <i>A. pusio</i> |
| - Ventral surface of fore femur without a glossiform projection posterior to hump with modified seta. Basal process of surstylus small with about half of the length of surstylus | <i>A. alcalcarata</i> |

- | | |
|--|-------------------------|
| 7. Wing with an apical spot | 8 |
| - Wing without an apical spot | 11 |
| 8. Modified setae of ventral surface of fore femur sinuous. Surstylus, in lateral view, broadened but then abruptly narrowed at a right angle into a thin short stylus apically | <i>A. verae</i> |
| - Modified setae of ventral surface of fore femur almost straight or slight arched. Surstylus, in lateral view, tapering toward the apex | 9 |
| 9. Tip of arm of sternite 5 laterally directed. Sternite 7 + 8 triangular | <i>A. umbrifer</i> |
| - Tip of arm of sternite 5 posteriorly directed. Sternite 7 + 8 U-shaped | 10 |
| 10. Projection adjacent to modified setae of ventral hump of fore femur glossiform | <i>A. diversiformis</i> |
| - Projection adjacent to modified setae of ventral hump of fore femur clavate | <i>A. armata</i> |
| 11. Sternite 5 not-modified, almost quadrate. Surstylus very long, clearly longer than epandrium, clubbed in lateral view | <i>A. priapus</i> |
| - Sternite 5 modified, crescent moon-shaped. Surstylus short, with the same length or shorter epandrium, tapering distally in lateral view | 12 |
| 12. Apical portion of mid tibia dark-brown with a yellow band. Sternite 4 modified, wider than high, with a row of many long and fine setae along lateral margin. Basal process of surstylus represented by a small hump bearing some small and fine setae | <i>A. hirsutissima</i> |
| - Apical portion of mid tibia fully dark-brown or yellow, without band. Sternite 4 not-modified, higher than wide, without a row of setae along lateral margin. Basal process of surstylus elongate, without setae apically | 13 |
| 13. Basal process of surstylus pin-shaped, without a median rounded process in the inner margin | <i>A. excavata</i> |
| - Basal process of surstylus clubbed, with a median rounded process in the inner margin | 14 |
| 14. Fore femur with one prominent quadrate protrusion on the posteroventral margin adjacent to hump with modified setae. Sternite 5 broadened. Sternite 7 + 8 T-shaped | <i>A. bosque</i> |
| - Fore femur without prominent quadrate protrusion on the posteroventral margin adjacent to hump with modified setae. Sternite 5 narrowed. Sternite 7 + 8 almost rectangular | <i>A. discolor</i> |

Discussion

The new records of a genus, five species, and two new species from two anthropized forests demonstrate that the Sepsidae fauna of the Brazilian Amazon is still poorly known. Our inventory should be considered preliminary, and new species and new distribution records are expected when additional areas, from different interfluves in the Amazonian region, are properly sampled.

The presence of a new species (*A. bosque* sp. nov.) in a small urban park (Bosque Rodrigues Alves Botanical Garden) shows the importance of forested places inside urbanized areas in the maintenance of biodiversity, including undescribed species, as previously observed by other authors (Foddai et al. 2003, Feinberg et al. 2014, Ang et al. 2017).

Archiseopsis polychaeta has been recorded from Central America (Honduras, Panama and Costa Rica) to northern South America (Peru, Venezuela) (Ozerov 2005). There are records for Brazil, but the states and districts where it has been found are unknown. Therefore, this is a new record for the Brazilian Amazon.

Archiseopsis diversiformis has been recorded from Mexico (Jalisco) to Argentina, but in Brazil, there are only records from the state of Mato Grosso (Ozerov 2005). Therefore, this represents a new record from the state of Pará.

Microseopsis mitis is widely distributed from Mexico (Chiapas) to Argentina, but in Brazil, it has been recorded only from the state of Rio de Janeiro (Ozerov 2005). Therefore, this is a new record from the Brazilian Amazon and the state of Pará.

Meropliseopsis sexsetosa has been recorded from Central America (Costa Rica), Caribbean Islands (Dominican Republic), northern South America, and southern Brazil. However, there are no records from the state of Pará, since there are only records for the Brazilian states of Mato Grosso, Mato Grosso do Sul, and Rio de Janeiro.

The two analyzed specimens of *Palaeoseopsis* cf. *golovastik* are very similar to the type specimen from Ecuador, differing in the shape of male sternite 4. A detailed comparative morphological and

genetic study will be necessary to determine whether the specimens from northern Brazil belong to a new species or represent an intraspecific regional variation. This genus comprises six described species, two of which (*P. dentata* (Becker, 1919) and *P. maculata* (Duda, 1926)) have been recorded from Brazil, but only from the south (Minas Gerais, Rio de Janeiro, Santa Catarina, São Paulo) (Ozerov 2005). Therefore, this is a new record of the genus for the Brazilian Amazon. The analyzed specimens were collected only on human feces (Table 1).

Most of the species and specimens of sepsid were collected on bovine dung, but some species were collected only on a given kind of bait. For example, *P. cf. golovastik* and *A. diversiformis* were collected only on human feces and *M. sexsetosa* on monkey dung, which are new records of species for the Brazilian Amazon (Table 1). These results demonstrate the importance of utilizing different types of baits in ecological and inventory studies on Sepsidae.

Acknowledgments

We thank the Higher Education Personnel Improvement Coordination (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES)) for a fellowship (grant number 88887.485325/2020-00) to the first author. We are grateful to Luzia Ferreira, Paulo Galvão, and Caroline Souza for their hospitality and good lodging in Calafate Village and to Alexandre Mesquita and Naiara Raiol Torres for allowing this research in the Bosque Rodrigues Alves Botanical Garden. We also thank Dr. William L. Overal (MPEG) for reviewing the English. We are grateful to Dr. Yuchen Ang (National University of Singapore) for valuable suggestion.

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