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Alepia viatrix sp. nov. (Diptera: Psychodidae), a new species of a Neotropical genus found on the Azores Archipelago (Portugal)

SANTIAGO JAUME-SCHINKEL[1*], GUNNAR MIKALSEN KVIFTE[2],
RUUD VAN DER WEELE[3] & XIMO MENGUAL[1,4]

[1]*Zoologisches Forschungsmuseum Alexander Koenig, Leibniz-Institut zur Analyse des Biodiversitätswandels, Adenauerallee 160, D-53113 Bonn, Germany.*
[2]*Department of Biosciences and Aquaculture, Nord University, P.O. Box 2501, 7729 Steinkjer, Norway.*
gunnar.mikalsen-kvifte@nord.no; https://orcid.org/0000-0002-3210-5857
[3]*Kloosterlaan, 6, Zoelmond NL 4111 LG Netherlands.*
rvanderweele@gmail.com; https://orcid.org/0000-0003-4373-1818
[4] *x.mengual@leibniz-zfmk.de; https://orcid.org/0000-0002-6185-9404*
[*]*Corresponding author.* *santijaumes@hotmail.com; s.jaume@leibniz-zfmk.de; https://orcid.org/0000-0002-3502-9407*

Abstract

A new species of the Neotropical genus *Alepia* Enderlein, 1937 is described from the Azores Archipelago based on morphological characters and DNA barcodes from male and female specimens. Images of the new species as well as a discussion of the origin of this species are also provided. Moreover, we include an identification key for the adult male Psychodidae species recorded on the Azores Archipelago and comment on each species present on these islands. This is the first record of the genus *Alepia* from Azores.

Key words: morphology, taxonomy, DNA barcode, integrative taxonomy, new taxa

Introduction

Located in the northern Atlantic Ocean, about 1,500 km from the European mainland, the nine islands of the Azores Archipelago were uninhabited prior to its discovery by Portuguese navigators in the fifteenth century (Santos *et al.* 2003). Since then, the native flora and fauna have suffered alterations, mainly by deforestation, to the point that the native laurel forest only covers 2–5% of its original area (Gaspar *et al.* 2008; Norder *et al.* 2020; Arteaga *et al.* 2020). Alongside with the changes in land use, the introduction of exotic species has threatened the native wildlife (Martins 1993; Silva *et al*. 2008; Borges *et al*. 2017; Arteaga *et al*. 2020).

Studies assessing the arthropod fauna in the islands have shown that the archipelago supports more than 2,300 species; however, 42% of these species are considered introduced and only 12% are endemic to the islands (Rego *et al*. 2015; Arteaga *et al.* 2020). Furthermore, a high number of these endemic species are considered by the IUCN in one of their conservation categories as Critically Endangered, Endangered or Vulnerable (Borges *et al.* 2019; IUCN 2020; Arteaga *et al.* 2020). Nowadays, the dipteran fauna of the Archipelago comprises around 400 Diptera species with 52 endemisms (Diaz *et al.* 2005a, 2005b). The first mention regarding the Diptera fauna of the islands was published in 1861 (Drouet 1861), followed by Séguy (1936), Frey (1945), Carlsson (1963), Nielsen (1963, 1964, 1966a, 1966b), Theowald (1977), Rojo *et al.* (1997), Wagner *et al.* (2002), Diaz *et al.* (2005a, 2005b), and Borges *et al.* (2010).

Only six species have been reported for the family Psychodidae, namely *Clogmia albipunctata* (Williston, 1893), *Paramormia ustulata* (Haliday *in* Walker, 1856), *Philosepedon humeralis* (Meigen, 1818), *Psychoda albipennis* Zetterstedt, 1850, *Psychoda cinerea* Banks, 1894, and *Psychoda alternata* Say, 1824 (Wagner *et al.* 2002; Diaz *et al.* 2005a). *Psychoda severini* Tonnoir, 1922, originally described from Belgium, has been cited from three different islands of the Azores (Wagner *et al.* 2002; Diaz *et al.* 2005a), but Ježek (1983) considered it a synonym of *Psychoda albipennis*. All the mentioned species have a broad distribution in Europe, and no endemic taxon of Psychodidae has been described from Azores.

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In the present work a new psychodid species is described based on morphological characters of male and female specimens. The new taxon belongs to the Neotropical genus *Alepia* Enderlein, 1937 and represents the first record of this genus in the Azores Archipelago and the second from the Palaearctic Region. We provide detailed images of male and female, as well as DNA barcodes (5′-end of the cytochrome *c* oxidase subunit 1 or COI) for the new species and an identification key to the adult males of the species present on the Azores. Finally, we comment on each species of Psychodidae occurring in the Archipelago.

Materials and methods

Study Area. Samplings were conducted in two botanical gardens in the Islands of Faial and Terceira. Jardim Botânico do Faial is located in Horta (Faial) (N 38°33'3.13", W 28°38'21.72") and the Jardim Duque da Terceira in Angra do Heroismo (Terceira) (N 38°39'9.10", W 27°13'8.44"). For more detailed information regarding the study area please refer to Arteaga *et al.* (2020).

Sampling of specimens. Specimens were collected with a passive flight interception traps termed Sea, Land and Air Malaise (SLAM) traps set up simultaneously at both gardens for six months (April 2017–September 2017) (see Arteaga *et al.* 2020 for more details). The collecting jars with propylene glycol as killing/preserving method were checked and emptied monthly during this period.

Study of the collected material and terminology. The specimens were cleared using NaOH 10%, dissected and permanently mounted using Euparal (Waldeck GmbH & Co. KG, Division Chroma, Havixbecker Straße, Münster) as mounting medium, following the procedure described by Ibáñez-Bernal (2005), additional specimens remain stored in ethanol 96 %. Specimens were observed using a Leica M205 C stereoscope and a Zeiss Axio Scope A1. Drawings were performed with a microscope Nikon Eclipse E600 with the aid of a drawing tube Nikon Y-IDT. Photographs were taken with a scanning electron microscope Zeiss Gemini Sigma 300 VP SEM.

Species closely related to the species herein described were compared using available literature (Durán-Luz *et al*. 2018; Wagner & Svensson 2006) and with the aid of digital photographs and personal communication with Rüdiger Wagner during 2021.

We use the terminology as in Durán-Luz *et al.* (2018). In the material examined section, at the beginning of each record the holding institution is stated and at the end of each record, between square brackets ([]), the unique identifier or number is given. The abbreviations used for collections and their equivalents are given below:

FCAA: Faculdade de Ciências Agrárias e do Ambiente, Universidade dos Açores, Angra do Heroísmo, Azores, Portugal.
RPC: Ruud van der Weele Personal Collection, Zoelmond, the Netherlands.
ZFMK: Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany.

In the description of type labels, the contents of each label are enclosed in double quotation marks (" "), italics denote handwriting, and the individual lines of data are separated by a double forward slash (//). We provide for each specimen a single transcription for the labels; but, the male or female symbols (#m or #f) in the first label line ("PSYCHODIDAE … //) are different for each specimen.

Results

***Alepia viatrix* sp. nov.**
(Figures 1–16)

Differential diagnosis. This species is closely related to *Alepia vaga* Wagner & Svensson, 2006 but it differs as follows: gonostyli hook-shaped in *A. viatrix* **sp. nov.** (gonostyli elongate, spoon-like, not hook-shaped in *A. vaga* (Wagner, pers. comm. 2021)). Epandrium approximately 3.5 times longer than its width in *Alepia viatrix* **sp. nov.** (the epandrium is approximately 2.6 times longer than its width in *A. vaga*). Tunica with apical margin resembling the edge on an axe without the handle in *Alepia viatrix* **sp. nov.** (tunica with apical margin rounded in *A. vaga*).

Gonocoxites approximately 2.8 times longer than its maximum width in *Alepia viatrix* **sp. nov.** (gonocoxites are approximately 3.8 times longer than its maximum width in *A. vaga*).

The new species is also similar to *Alepia clavicula* Durán-Luz, Ibáñez-Bernal & Sandoval-Ruiz 2018, but it differs as follows: eye separated by 0.9 facet diameters in *A. viatrix* **sp. nov.** (less than 0.5 facet diameter in *A. clavicula*), gonostyli lateral branch with strongly sclerotized protuberance near mid of gonostyli (near apex of gonostyli in *A. clavicula*), mesal branch of gonostyli strongly curved, almost hook-shaped in *A. viatrix* **sp. nov.** (banana-shaped in *A. clavicula*), hypoproct narrow and long in *A. viatrix* **sp. nov.** (broader and shorter in *A. clavicula*), and surstyli with one apical tenaculum in *A. viatrix* **sp. nov.** (apical tenaculum absent in *A. clavicula*).

Type Locality. PORTUGAL: Azores Archipelago, Terceira Island, Duque da Terceira Garden, Angra do Heroismo (38.652528, -27.21901).

Description.

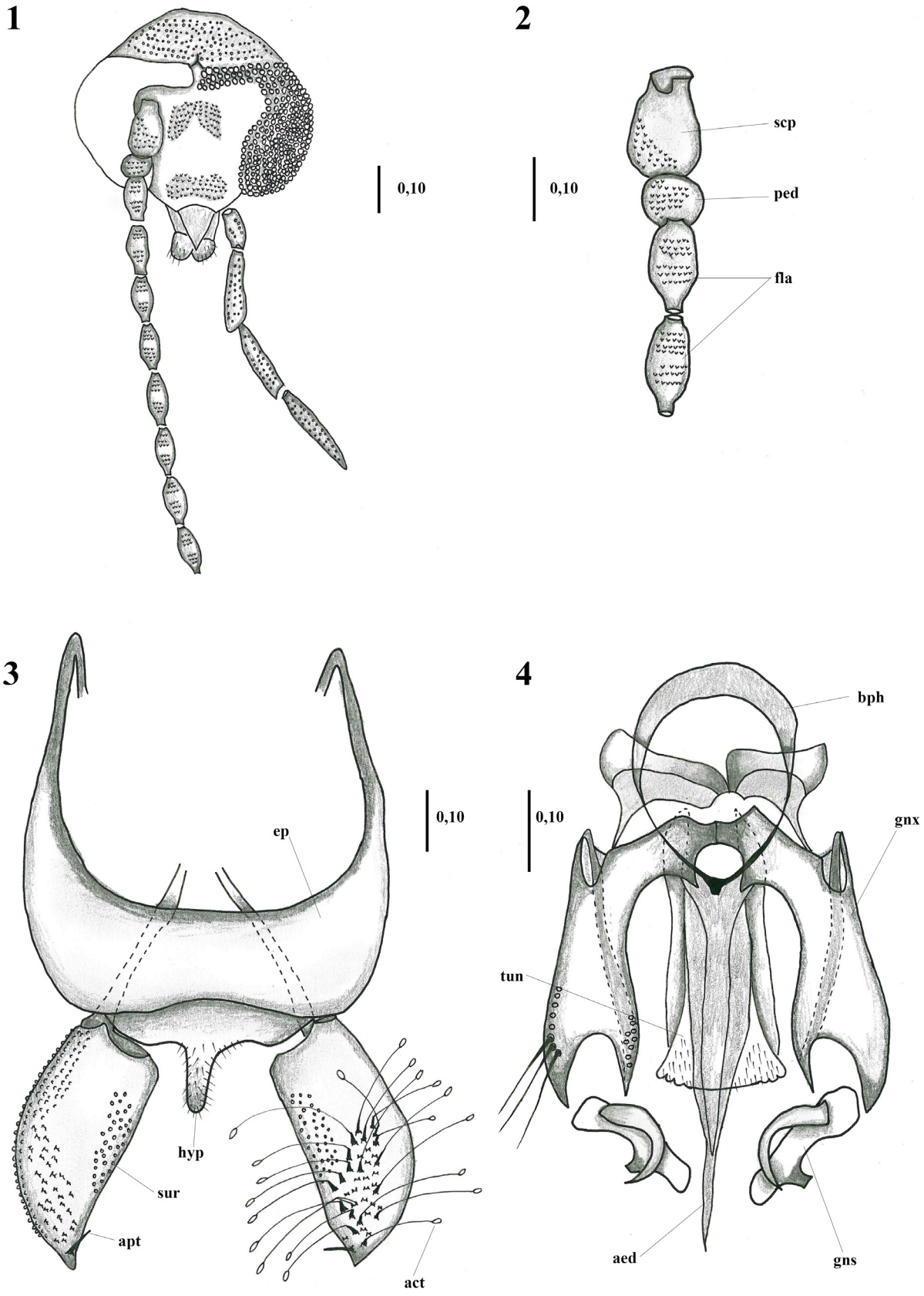
Male. Head (Fig. 1) wider than long; eye bridge with three facet rows, getting narrow towards mid; eyes separated by 0.9 facet diameters; interocular suture as an inverted "Y"; frontal path of alveoli with ventral margin bilobed; palpus reaching the level of flagellomere 7 (as in Fig. 1); proportion of palpal segments 1.0–2.0–2.0–2.46. Labium with an inverted short "Y" sclerite, with two isolated spiniform setae near the labium base; labella bulbous, each labellum with setae. Antenna with scape 1.7 times the length of pedicel, cylindrical; pedicel spherical; flagellomeres with rows of verticilar alveoli on basal and mid sections, without differentiated ascoids, however, on Scanning Electron Microscope (SEM) images, there is a clear appreciation of a structure that appears to be homologous to the "multiparous sensilla basiconica" proposed by Faucheux & Gibernau (2011) (Fig. 16, indicated by red arrow); apical flagellomeres missing in examined specimens.

Wing (fig. 10) length 2.35 its width, mean length 2.82 ± 0.12 mm (N=4), mean width 1.3 ± 0.3 mm (N=4); with setae on the costal area; wing membrane with dark spots on all vein apices, on basal R_{2+3} and R_5, in the radial fork of R_{2+3} and M_{1+2}, and some spots along the length of all veins (as in Fig. 10).

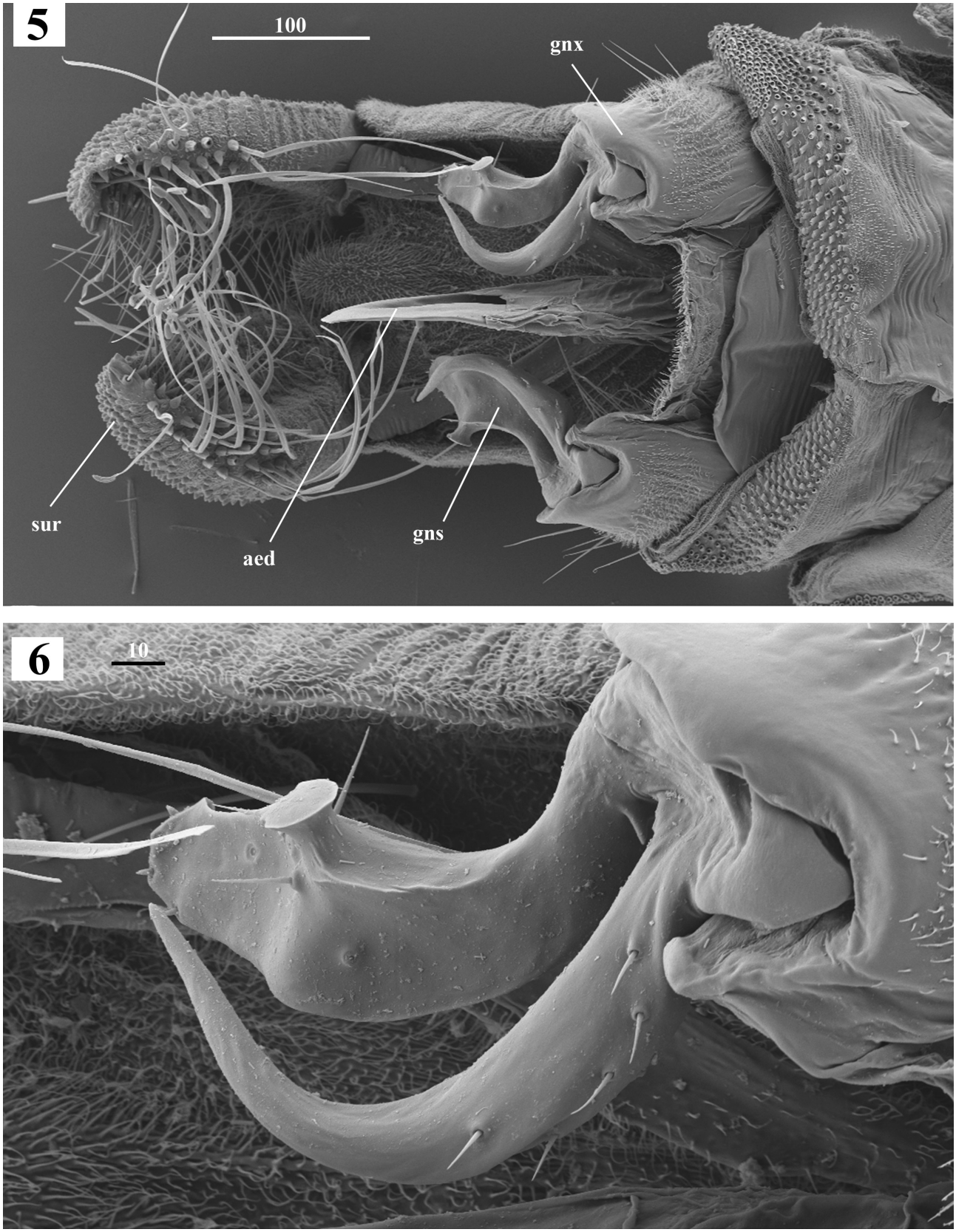
Abdomen without patches of specialized setae. Terminalia (Figs 3–9): Gonocoxites with anterior condyles plate-like, fused in the middle with a strong sclerotized inverted "U" shape, with basal and distal margins pointed; gonocoxite with 8–10 long setae on external margin and 9–11 short setae (about half the length of external) on the apical-half of interior margin. Gonostylus shorter than gonocoxite, bifurcate with the two branches originating from its base, the lateral branch with a curvature near the middle from which a strongly sclerotized protuberance originates, apex rounded, the mesal branch strongly curved, almost hook-like (Figs 4–6). Surstily about two times as long as the epandrium medially, drop-shaped and pointed at apex, with one short retinaculum at apex and 35–40 long and capitate accessory retinacula, tips with corrugates stripes (Figs 3, 5, 7–9). Aedeagus with basiphallus narrow, shape as an inverted "U"; distiphallus long, exceeding the level of the gonostyli apex; aedeagal sheath membranous, covering three-fourths of distiphallus, hard to see in dorso-ventral view; distiphallus covered ventrally over the basal two-thirds with an axe-shaped tunica, with small setae denser on the distal portion. Epandrium wider than long, with apical margin concave near midline, without foramen (Fig. 3). Hypoproct elongated, pilose. Epiproct pilose, curved margin.

Female. Same as male, except for the following characteristics. The proportion of palpal segments 1.0–1.9–1.9–2.46.Wing mean length 2.76 ± 0.01 mm (N=3), mean width 1.03 ± 0.06 mm (N=3). Wing length is 2.66 times its width. Subgenital plate short, with anterior margin U-shaped with a group of four setae on anterior margin as in the upper margin of the "U" and a group of long setae on anterolateral margin, lateral margin waisted in the middle; small setae present on the surface. Cerci long, 2.0 times the length of the subgenital plate. The genital chamber (fig. 12-15) is surrounded by membranous tissue; symmetrical;with , outer margins serrated; with two long sclerotized projections arising from the center of the genital chamber and prolonging in direction of the cerci (fig. 13), about two times the length of the genital chamber. When viewed in dorsal view (fig. 14) it resembles an X, the bottom part in Figure 14 represents the frontal section of the genital chamber (when viewed in frontal view (fig. 13)). In lateral view (Fig. 15) there are two semi-sclerotized plates, about 3 times longer than the genital chamber height, both plates are concave and almost connecting in the middle (as in Fig. 14); the two sclerotized projections arise from the center of these plates and connect on the inside of the structure (not clearly visible)

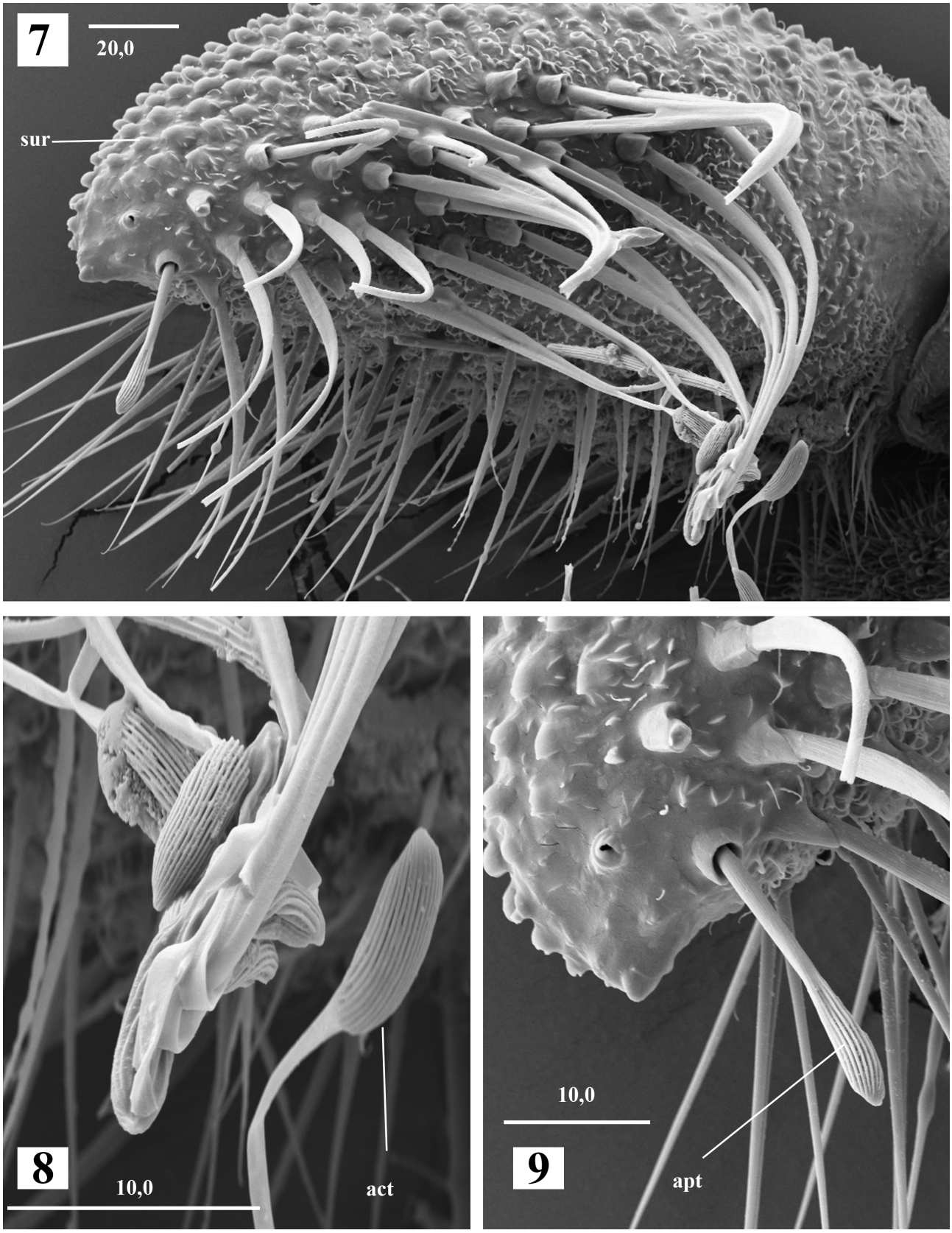
Examined material. *Holotype*, male, slide mounted (on the slide: head, left-wing, terminal segments of abdomen and genitalia; thorax, right wing and legs removed for DNA analysis), deposited in the ZFMK with the following labels: "PORTUGAL, Azores Archipelago, // Terceira, Angra do Heroismo, // Jardim Duque da Terceira,



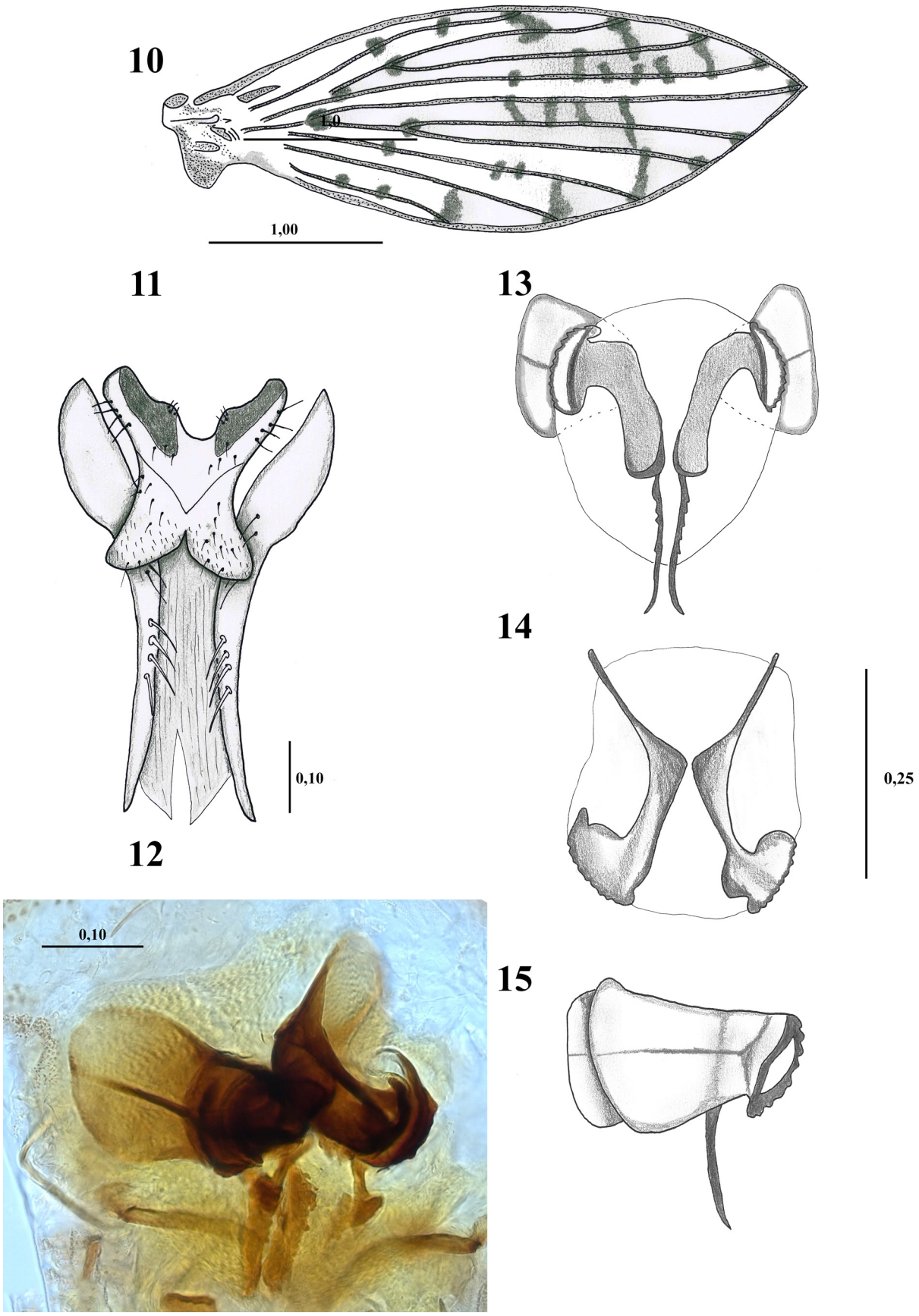
FIGURES 1–4. Male *Alepia viatrix* **sp. nov. 1.** Head, frontal view. **2.** Scape, pedicel and first and second flagellomeres. **3.** Epandrium and surstyli. **4.** Gonocoxites, gonostyli, tunica, aedeagal complex. Scales in mm. Abbreviations: **ep:** epandrium, **hyp:** hypoproct, **act:** accessory tenacula, **apt:** apical tanculum, **sur:** surstylus, **gnx:** gonocoxite, **gns:** gonostylus, **tun:** tunica, **aed:** aedeagus, **scp:** scape, **ped:** pedicel, **fla:** flagellomeres, **bph:** basiphallus



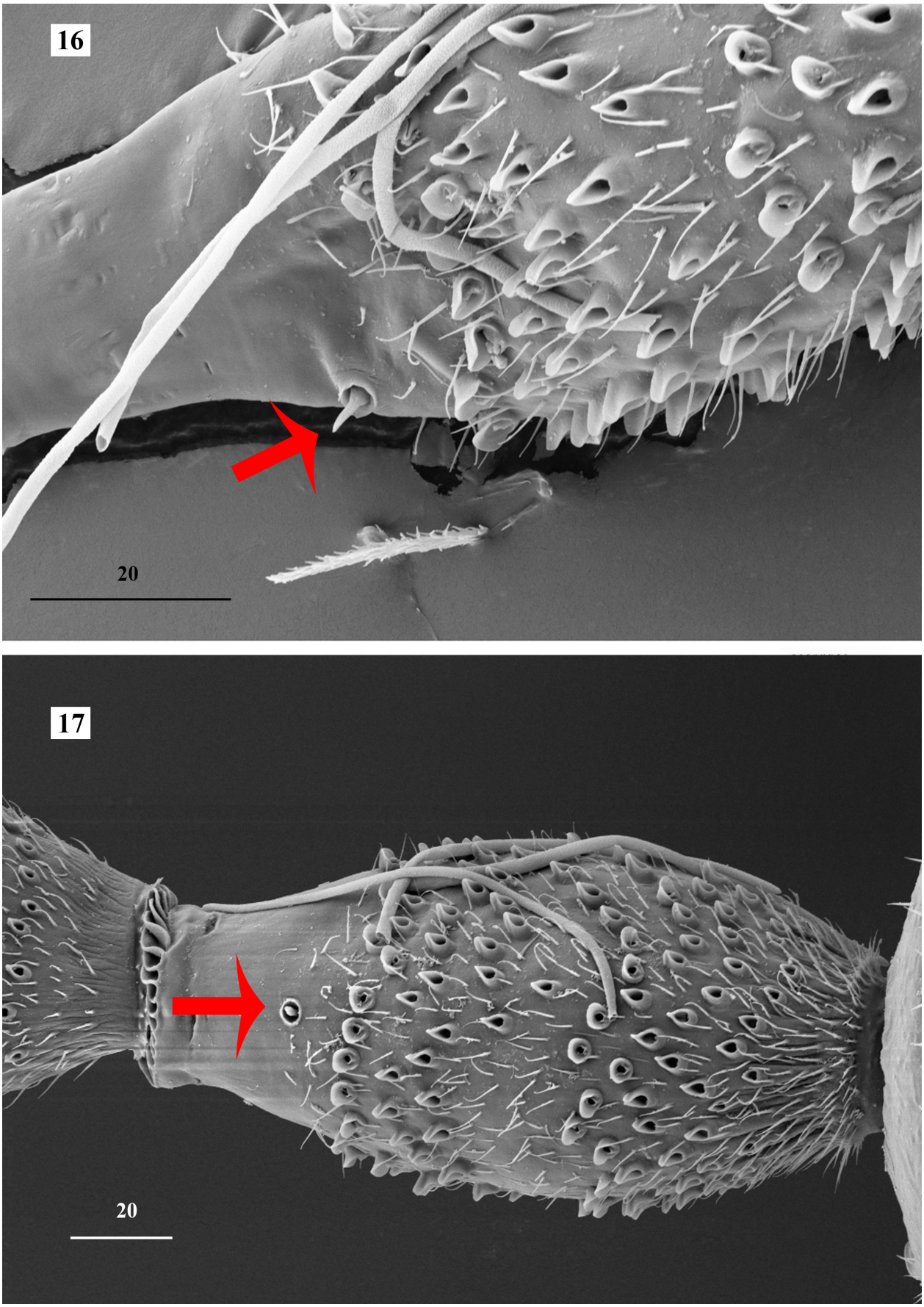
FIGURES 5–6. Male *Alepia viatrix* **sp. nov. 5.** Male genitalia, dorsal view. **6.** Gonostylus, dorsal view. Scales in μm. Abbreviations: **aed:** aedeagus, **sur:** surstylus, **gnx:** gonocoxite, **gns:** gonostylus,



FIGURES 7–9. Male *Alepia viatrix* **sp. nov. 7.** Surstylus, dorso-lateral view. **8.** Tip of accessory tenacula on Surstyli. **9.** Apex of surstylus showing apical tenacula. Scales in μm. Abbreviations: **act:** accessory tenacula, **apt:** apical tanculum, **sur:** surstylus.



FIGURES 10–15. Female *Alepia viatrix* **sp. nov. 10.** Wing. **11.** Subgenital plate and cerci. **12.** Genital chamber picture of slide in front-lateral view**13.** Genital chamber in frontal view. **14.** Genital chamber in dorsal view **15.** Genital chamber in lateral view. Scales in mm.



FIGURES 16–17. Male *Alepia viatrix* **sp. nov.** Antennal flagellomeres, red arrow pointing to the antennal sensilla. Scales in μm.

// 38.652528, -27.21901. // 21.IV.2017 // SLAM TRAP // Leg. Borges Viera, Paulo A." "PSYCHODIDAE ♂ // Alepia // viatrix // Jaume-Schinkel, Santiago; Kvifte, M. Gunnar; Van der Weele, Ruud; // Mengual, Ximo // Det. Jaume-Schinkel, S. 2021" "HOLOTYPE" [red] "ZFMK-DIP-00081588" [barcode].

Paratypes. 1 ♂ 1 ♀, slide mounted as Holotype, same label information [FCCA; ZFMK-DIP-00081589, ZFMK-DIP-00081374]; 1 ♂ 1 ♀, slide mounted as Holotype, same label information [ZFMK; ZFMK-DIP-00081377, ZFMK-DIP-00081590]; 1 ♂ 1♀, slide mounted as Holotype, same label information [RPC; ZFMK-DIP-00081376, ZFMK-DIP-00081375]; 1 ♂ 1 ♀, stored in ethanol, same label information [ZFMK; ZFMK-DIP-00081413, ZFMK-DIP-00081414; 8 ♂ 10 ♀ 1 undetermined sex, stored in ethanol, same label information [ZFMK; ZFMK-DIP-00081415, ZFMK-DIP-00081416, ZFMK-DIP-00081417, ZFMK-DIP-00081418, ZFMK-DIP-00081419, ZFMK-DIP-00081420, ZFMK-DIP-00081421, ZFMK-DIP-00081422, ZFMK-DIP-00081423, ZFMK-DIP-00081424, ZFMK-DIP-00081425, ZFMK-DIP-00081426, ZFMK-DIP-00081427, ZFMK-DIP-00081428, ZFMK-DIP-00081429, ZFMK-DIP-00081430, ZFMK-DIP-00081431, ZFMK-DIP-00081980, ZFMK-DIP-00081981]; 3 ♂ 5 ♀, stored in ethanol, same label information except date: ... 17-V-2017… [ZFMK; ZFMK-DIP-00081432, ZFMK-DIP-00081433, ZFMK-DIP-00081434, ZFMK-DIP-00081435, ZFMK-DIP-00081436, ZFMK-DIP-00081437, ZFMK-DIP-00081438, ZFMK-DIP-00081439].

Notes. The paratypes ZFMK-DIP-00081435 and ZFMK-DIP-00081414 lack one wing; in ZFMK-DIP-00081434 the head is missing, and the specimen ZFMK-DIP-00081981 lacks the terminal portion of the abdomen (including genitalia).

Etymology. From Latin *viator* (feminine *viatrix*), meaning traveler, pilgrim. It refers to the fact that this Neotropical genus seems to be traveling around the world due to human activity. The species epithet is to be treated as a noun in apposition.

Genetics. We successfully sequenced three specimens (ZFMK-DIP-00081588, ZFMK-DIP-00081589 and ZFMK-DIP-00081590). The COI sequences are 658 bp long and the sequence of ZFMK-DIP-00081590 differs 5.7% from the other two sequences, which are identical. The GenBank accession numbers are [OK345509; OK345510; OK345511].

Remarks. *Alepia* is considered one of the most diverse Neotropical psychodid genera (Quate & Brown 2004, Duran-Luz *et al.* 2018). Including the herein newly described species, this genus has 57 described species, 38 occurring in South America, 12 in Central America, four in the West Indies, and three in North America. Two of the North American species were collected in the wild in Mexico, suggesting it is the native northernmost record of this genus in America, while the other species was reared from a bromeliad in Florida, where different species of bromeliads are imported from the tropics as decoration. Thus, this *Alepia* from Florida is very likely an exotic species in North America (Duran-Luz *et al*, 2018; Wagner & Hribar, 2004).

The new species described here is not the first described *Alepia* species found outside the New World. Wagner & Svensson (2006) described *Alepia vaga* from Sweden based on male and female specimens that emerged from a bromeliad (*Neoregelia* sp.) imported from Brazil. Earlier, Wagner & Hribar (2004) described *A. symmetrica* Wagner & Hribar, 2004 in the Florida Keys, which is believed to have been introduced by the commercialization of decorative bromeliads coming from the Neotropics. According to Arteaga *et al.* (2020) (Supplementary Material 1) the type locality of *Alepia viatrix* **sp. nov.**, the botanical garden Duque da Terceira, has two bromeliads that are native to Brazil, namely *Aechmea fasciata* (Lindl.) Baker, and *Neoregelia carolinae* (Beer) L.B.Sm., which prompt us to believe that *Alepia viatrix* **sp. nov.** came from Brazil in one of this bromeliad species, becoming the third report of species from this genus that "traveled" abroad with the help of human activities.

Clogmia albipunctata (Williston, 1893)

Psychoda albipunctata Williston, 1893: 113. Type locality: Cuba, La Havana

Remarks. Widespread, almost cosmopolitan species (Kvifte *et al.*, 2016). Reported from São Miguel Island in Azores, the present study makes a new report for Terceira Island.

Material examined: 1 ♀, stored in ethanol, PORTUGAL, Azores Archipelago, Terceira, Angra do Heroismo, Jardim Duque da Terceira, 38.652528, -27.21901. 21.IV.2017. SLAM TRAP. Leg. Borges Viera, Paulo A. [ZFMK; ZFMK-DIP-00081684]; 2 ♀, stored in ethanol, same label information except date: …19-V-2017… [ZFMK; ZFMK-DIP-00081685, ZFMK-DIP-00081686]**.**

Paramormia ustulata (Haliday in Walker, 1856)

Pericoma ustulata Haliday in Walker, 1856: 258. Type locality: Ireland

Remarks. This species' authorship is commonly referred to as *P. ustulata* (Walker), but the authorship corresponds to Haliday. Widespread species in the Holarctic region, for distribution see Ježek & Yaðci (2005) and Kvifte *et al.* (2016). In the Azores it has been recorded from São Miguel and Santa Maria islands.

Material examined. None.

Philosepedon humeralis (Meigen, 1818)

Psychoda humeralis Meigen, 1818: 106. Type Locality: Germany.

Remarks. Despite being included in the catalogs by Diaz *et al.* (2005a) and Wagner *et al.* (2002), Wagner *et al.* (2002) stated that the occurrence of this species is highly improbable, and it was mentioned that it is probably an undescribed endemism. Subsequently, Wagner (2004) did not include the Azores in the distribution of this species in the Fauna Europea online catalog. On the contrary, Diaz *et al.* (2005a) did include this species in the Azores catalog. We refer to this species here because it has been mentioned in the literature; however, we did not examine any material and further studies are required to confirm its presence. Reported from São Miguel Island in Azores.

Material examined. None.

Psychoda (Logima) albipennis Zetterstedt, 1850

Psychoda albipennis Zetterstedt, 1850: 3708. Type Locality: Norway, Oslo, Tøyen.

Remarks. This species is considered a species complex, with at least two species present in Europe (Kvifte *et al.* 2013). The taxonomy of this complex is difficult and in need of a revision. See comments by Kvifte *et al.* (2013) where synonyms and potential new synonyms are discussed. This species is widespread in Europe and has been cited as *P. severini* from the islands of Faial, Pico, São Miguel and Terceira in the Azores Archipelago.

Material examined. 3 ♂ slide mounted, PORTUGAL, Azores Archipelago, Terceira, Angra do Heroismo, Jardim Duque da Terceira, 38.652528, -27.21901. 21.IV.2017. SLAM TRAP. Leg. Borges Viera, Paulo A. [ZFMK; ZFMK-DIP-00082101, ZFMK-DIP-00082102, ZFMK-DIP-00081687].

Psychoda (*Tinearia*) *alternata* Say, 1824

Psychoda alternata Say, 1824: 358. Type Locality: United States of America, Pennsylvania, Philadelphia.

Remarks. The subgenus *Tinearia* has been treated as a separate genus, but for the ease of recognizing *Psychoda* as a monophyletic unit, it is considered a subgenus here (see discussion by Kvifte *et al.* 2016). Cosmopolitan distribution, highly synanthropic species, for distribution and complete synonymy see Ibañez-Bernal (2008). In the Azores it has been reported from Faial and São Miguel islands, this is the first report for Terceira Island.

Material examined. 4 ♂, stored in ethanol, PORTUGAL, Azores Archipelago, Terceira, Angra do Heroismo, Jardim Duque da Terceira, 38.652528, -27.21901. 21.IV.2017. SLAM TRAP. Leg. Borges Viera, Paulo A. [ZFMK; ZFMK-DIP-00081680, ZFMK-DIP-00081681, ZFMK-DIP-00081682, ZFMK-DIP-00081683].

Psychoda (*Psychodocha*) *cinerea* Banks, 1894

Psychoda cinerea Banks, 1894: 331. Type Locality: United States of America, New York, Sea Cliff.

Remarks. Widespread species, for a complete discussion on this species, see Ježek (1990) and Ibañez-Bernal (2008). This taxon has been reported from Flores, Faial, São Miguel and Santa Maria islands in Azores.

Material examined. None.

Key for adult males of Psychodidae species on the Azores Archipelago

1. Antenna with flagellomeres barrel-shaped (Fig. 1); flagellomeres without distinguishable ascoids (Fig. 1). Surstyli with one apical tenaculum and a set of additional tenacula (Figs 3, 5, 7–8). . . . . ***Alepia viatrix* sp. nov.**

- Antenna with flagellomeres with basal bulb and distal neck; flagellomeres with distinguishable ascoids, Y-shaped, bifurcated or surrounding flagellomere (see Kvifte & Wagner (2017): 609, figs. 5, 12–16). Surstyli with a single apical tenaculum, two tenacula or multiple different tenacula, IF single tenaculum NOT with additional tenacula. **2**

2. Flagellomeres carrying ascoids with both anterior and posterior branches (see Kvifte & Wagner (2017): 609, fig. 13); terminal flagellomeres diminutive and pearl-shaped. Surstyli carrying one or two tenacula. **4**

- Flagellomeres carrying a single curved branch, or not carrying any posterior branches; terminal flagellomeres not diminutive and not pearl-shaped. Surstyli with three or more tenacula **3**

3. Femora without a ventral row of spines. Wing vein R_5 terminates at the wing apex. Antennal ascoids bifurcate, paired on flagellomeres (see Ibáñez-Bernal (2008): 119, figs 55–56). Tenacula distally knife-shaped; distiphallus as a loop and basiphallus straight and thin (see Ibáñez-Bernal (2008): 119, figs 54–60; see also Vaillant (1971): 7, fig. 20 as *Telmatoscopus albipunctatus*) . . . . . ***Clogmia albipunctata* (Williston)**

- Femora with a ventral row of spines. Wing vein R_5 terminates posterior to the wing apex. Ascoids digitate, encircling flagellomeres in a single row (see Kvifte & Wagner 2017: 609, fig. 14). Tenacula is apically crowned. Aedeagus with distally two separate phallomeres. (see Vaillant (1972): plate VIII, figs 5–10 as *Duckhousiella ustulata*). . . . . ***Paramormia ustulata* (Walker)**

4. Surstyli with two tenacula. Ascoids with anterior branches leaf-like. (see Withers (1989): 63, fig. 89; see also Vaillant (1974): 111, figs 233–239) . . . . . ***Philosepedon humeralis* (Meigen)**

- Surstyli with only one tenaculum. Ascoids with anterior branches digitiform and not leaf-like 5

5. Dark markings at the apex of wing veins. Ascoids are usually shorter than the length of antennal flagellomere. (see Ibáñez-Bernal (2008): 121, figs 69, 71–72; see also Withers (1989): 73, fig. 135). . . . . ***Psychoda alternata* Say**

- Wing hyaline, without dark markings on the apex of veins. Ascoids are usually longer than the length of antennal flagellomere (see Ibáñez-Bernal (2008): 125, figs. 95–96). 6

6. Antennae with 14 flagellomeres. Pre-apical flagellomere equal in size to apical, without a lateral spine. Surstyli is shorter than epandrium with obvious narrowing prior to tenacula. (see Ibáñez-Bernal (2008): 125, fig. 99; see also Withers (1989): 73, fig. 136). . . . . ***Psychoda cinerea* Banks**

- Antennae with 12 flagellomeres. Pre-apical flagellomere is about twice as long as apical, with a lateral spine. Surstyli longer than epandrium. (see Ježek (1983): 215, figs 1–10 as *Logima albipennis*; see also Tonnoir (1922): 79, fig. 11g as *Psychoda severini*) . . . . . ***Psychoda albipennis* Zetterstedt**

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