

Definition of the superfamilies Diopsidea and Sciomyzoidea (Insecta: Diptera).

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The adults of the Ptychopteridae are found most often from late spring through to autumn in shaded, moist environs. Presumably, adults feed little, if at all. Two generations occur per year. The superfamily Diopsoidea is a small but diverse cosmopolitan superfamily of Acalyprate Cyclorrhapha, especially prevalent in the tropics. Sciomyzoidea is a superfamily of Acalypratae flies. The Ropalomeridae are classified within the superfamily Sciomyzoidea. The Acalypratae or Acalyprata is a subsection of the Schizophora, which is a section of the order Diptera, the true flies. In various contexts, the Acalypratae also are referred to informally as the acalyprate muscoids, or acalyprates, as opposed to the Calypratae [1-2].

Family Ptychopteridae

Larvae: The larvae are aquatic to semi-aquatic, living in the upper layers of mud, and can be found in marshy habitats where they feed on small organic particles. The larvae are eucephalous and are distinguished by the long caudal respiratory siphon they possess. At the time of hatching, they grow rapidly.

Superficially similar in appearance to other Ptychopteroidea families, they lack the ocelli of the Trichoceridae, the five-branched radial vein of the Tanyderidae, and the two anal veins that reach the wing margins of the Tipulidae [1-3].

The family Ptychopteridae is by a relatively long, lustrous black body, often with a yellow pattern on the thorax and/or abdomen. The antennae are filiform, and the wings, legs, and abdomen are also elongated. Wing with dark markings and longitudinal folds distinct between Rs and M, and between CuA2 and A1 (Figure 1) [1-3].

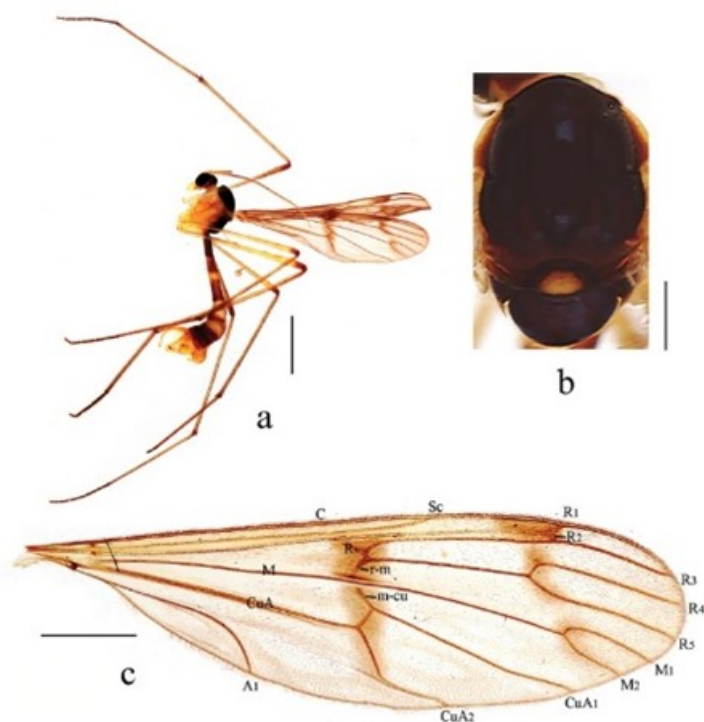


Figure 1 *Ptychopterianmushana* sp. nov. **a** habitus of male, lateral view **b** thorax, dorsal view **c** wing

Source: <https://zookeys.pensoft.net/article/67779/>

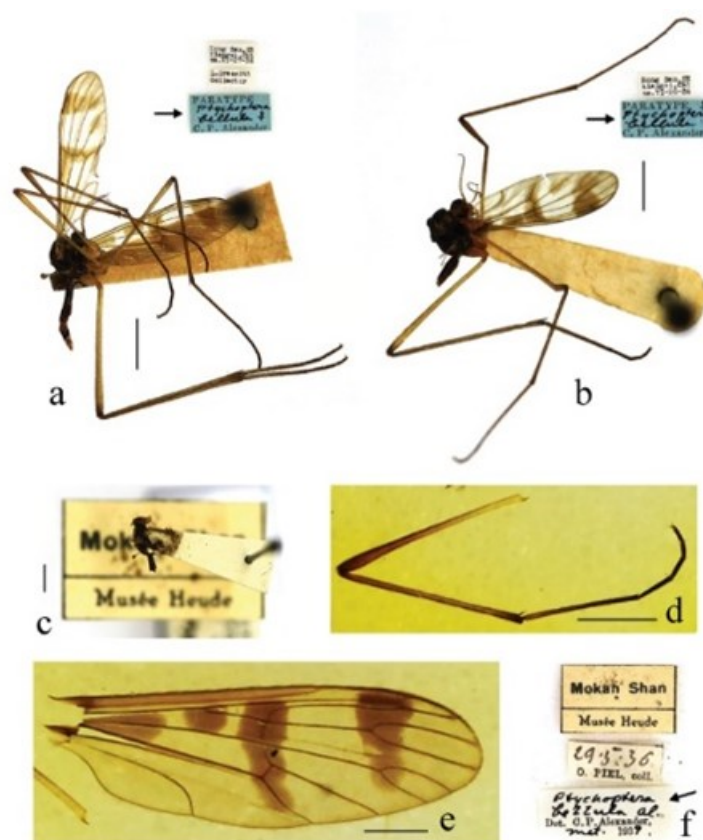


Figure 2 *Ptychoptera bellula* Alexander, 1937 **a** habitus of one paratype, lateral view **b** habitus of the other paratype, lateral view **c–f** one female identified by Alexander (**c** habitus of female, lateral view **d** one leg **e** wing **f** collection and identification labels)

Source: <https://zookeys.pensoft.net/article/67779/>

Egg: *Ptychoptera albimana* Fabricius, 1787 (Palearctic) has an average of 554 eggs laid. The shape is slightly arched, curiously ornamented, and measures approximately Duration is reported at 7 days [3-5]. **Larvae:** The larvae are aquatic to semi-aquatic, living in the upper layers of mud, and can be found in marshy habitats where they feed on small organic particles. The larvae are eucephalous and are distinguished by the long caudal respiratory siphon they possess. At the time of hatching, they grow rapidly. **Pupae:** Have a single, very elongated spiracular horn that protrudes from their thoraxes. In *Ptychoptera*, the right horn is elongated. The times reported in this stage vary from 5 to 12 days (Figure 3) [3-5].

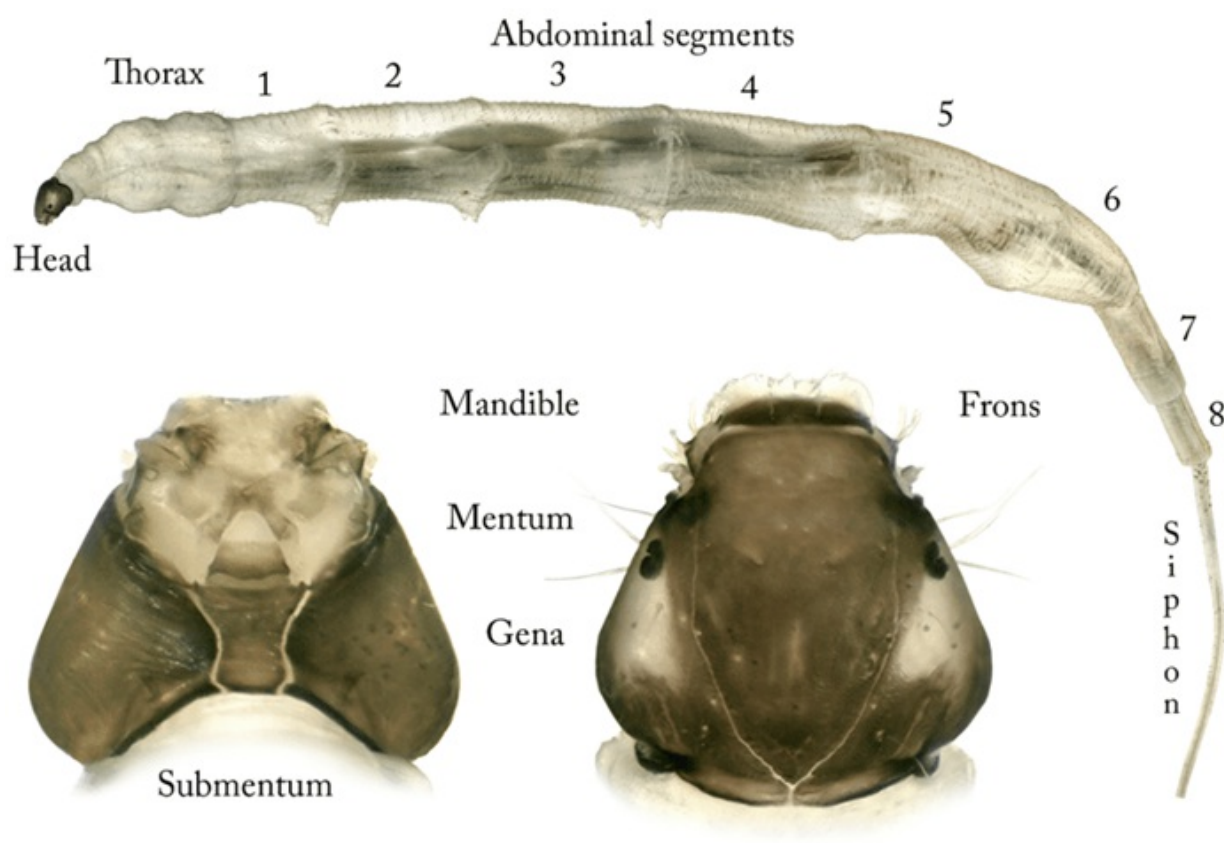


Figure 3 Larval habitus and head capsule of *Ptychoptera minuta* Tonnoir, 1919

Source: https://www.researchgate.net/figure/Larval-habitus-and-head-capsule-of-Ptychoptera-minuta_fig1_353958473

Infraorder Ptychopteromorpha Wood & Borkent, 1986, **Superfamily Ptychopteroidea** Osten Sacken, 1862.

Ptychopteridae Osten Sacken, 1862.

sg. *Parapterychoptera* Tonnoir, 1919.

Ptychoptera Meigen, 1803 sg.

Ptychoptera lacustris Meigen, 1830.

Ptychoptera paludosa Meigen, 1804 sg.

sg. *Ptychoptera* Meigen, 1803.

Ptychoptera albimana (Fabricius, 1787).

Ptychoptera contaminata (Linnaeus, 1758).

Ptychoptera hugoi Tjeder, 1968.

Ptychoptera minuta Tonnoir, 1919.

Ptychoptera scutellaris Meigen, 1818.

Ptychoptera albimana (Fabricius, 1787).

Distribution: Portugal: Bragança, Bragança, Espinhosela (Parque Natural de Montesinho), Portugal: Bragança, Vimioso, Alago, Campo de Víboras e Uva (Vale de Alago). The area is a permanent pasture crossed by a small stream on whose margins it is possible to find *Populus* sp., *Salix* sp., and *Rubus* sp. among other plants. Further up the hill the dominant tree species is *Quercus pyrenaica* Willd (Fagaceae) [5-7].

Ptychoptera albimana is a common and widespread species that was already known from several European countries: Austria, Belgium, Bosnia and Herzegovina, British islands, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, Kaliningrad Region (Russia), Lithuania, Norway, Poland, Slovakia, Slovenia, Spain, Sweden, Switzerland, The Netherlands, Ukraine and Yugoslavia. It is also present in the Nearctic [5-12].

Order Diptera

Asilidae: *Araripogon axelrodi* Grimaldi, 1990

Tabanidae: *Cratotabanus stonemyomorphus* Martins-Neto and Kucera-Santos, 1994.

Ptychopteridae: *Eopterychoptera braziliana* Krzeminski, Kania and Lukashevich, 2015.

Psychodidae: *Megapsychoda araripina* Azar and Nel, 2002

Tipulidae: *Cratotipula latialata* Ribeiro and Martins-Neto, 1999, *Okrenomyia araripensis* Ribeiro and Krzeminski, 2000, *Leptotarsus grimaldii* Ribeiro and Lukashenich, 2014, *Leptotarsus martinsnetoi* Ribeiro and Lukashenich, 2014, *Leptotarsus cretaceous* Ribeiro and Lukashenich, 2014 [11-12].

Family Ropalomeridae

Sciomyzoidea is a superfamily of Acalypttratae flies. The Ropalomeridae are classified within the superfamily Sciomyzoidea, forming a group with Coelopidae, Dryomyzidae, Helcomyzidae, Helosciomyzidae, Heterocheilidae, Huttoninidae, Natalimyzidae, Phaeomyiidae, Sciomyzidae and Sepsidae (Figure 4) [13].

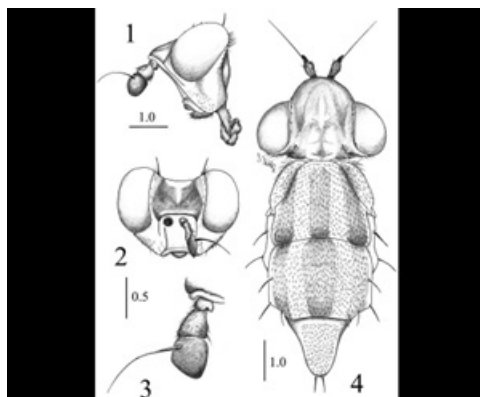


Figure 4 *Willistoniella* Mik, 1895. figs. 1 – 4. *Acrocephalomyia zumbadoi* sp. nov. Holotype 3. 1) Head, lateral view; 2) Head, frontal view (right antenna not drawn); 3) Antenna, lateral view; 4) Head and thorax, dorsal view, showing chaetotaxy and dorsal pattern

Source: The new *Acrocephalomyia* Ibáñez-Bernal & Hernández-Ortiz, 2012, and a new species of *Ropalomera* Wiedemann, 1824 from Costa Rica, with additional records for other Mesoamerican species (Diptera:

Small tropical family of medium sized, brown or gray flies, with strong hind legs. The family Ropalomeridae (Insecta: Diptera) includes robust flies measuring 6-12 mm in length, with protruding eyes, a face with a median carina or central tubercle, flattened and enlarged palps; femurs, especially the hind ones, enlarged, with strong ventral setae and posterior tibia are generally laterally flattened and curved (Figure 5) [14-15].

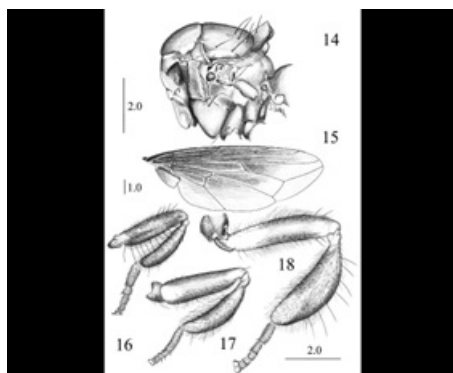


Figure 5 figs. 14 – 18. *Ropalomera aterrima* sp. nov. Holotype P. 14) Thorax, lateral view; 15) Wing; 16) Front leg, posterior view; 17) Mid leg, anterior view; 18) Hind leg, anterior view

Source: The new *Acrocephalomyia* Ibáñez-Bernal & Hernández-Ortiz, 2012, and a new species of *Ropalomera*

Wiedemann, 1824 from Costa Rica, with additional records for other Mesoamerican species (Diptera: Ropalomeridae)

Little is known about the biology of the species in the family. The egg and larva of *Ropalomera stictica* Wiedemann, 1830 illustrated the puparium of *Ropalomera clavipes* (Fabricius, 1805). The puparium of *Willistoniella pleuropunctata* (Wiedemann, 1824). Subsequently, the eggs of these species. Knowledge about the biology and ecology of the family is scarce. The larvae of some species have been found in decaying plant matter or the resins of some trees. The Ropalomeridae are saprophytic, feeding mainly on rotting fruits [15-16]

The larval stages of Ropalomeridae feed on decaying vegetable matter. The adults of some species of Ropalomeridae are found in decaying plant matter or in the resins of some trees are saprophytes, feeding mainly on rotten fruits. Ropalomeridae flies currently comprise 31 species that are distributed across nine genera. It is mainly neotropical, occurring from the south of the United States of America to the north of Argentina [16-17].

In Brazil, 28 species were recorded in six genera. the family comprises 35 species in nine Genus: *Acrocephalomyia* Ibáñez-Bernal & Hernández-Ortiz, 2012; *Apophorhynchus* Williston, 1895; *Dactylissa* Fischer, 1932; *Kroeberia* Lindner, 1930; *Lenkokroeberia* Prado, 1966; *Mexicoa* Steyskal, 1947; *Rhytidops*, Lindner, 1930; *Ropalomera* Wiedemann, 1824, and *Willistoniella* Mik, 1895 [17-18].

Rhopalomera femorata (Fabricius, 1805). *Dictya femorata* Fabricius, 1805. *Rhopalomera xanthops* Williston, 1895. *Rhopalomera* sp. (Van Der Wulp 1898). Distribution: Mexico, Guatemala, Nicaragua (Masaya, Chontales), Brazil, Bolivia, Paraguay, Argentina. *Ropalomera* sp. Distribution: Nicaragua (Managua). Collected on: Malvaceae: *Gossypium* [17-18].

Willistoniella pleuropunctata (Wiedemann, 1824). *Rhopalomera pleuropunctata* Wiedemann, 1824 [Rhopalomyia]. *Rhopalomera vittifrons* Rondani, 1848. *Rhopalomera substitute* Walker, 1857. Distribution: Mexico, Nicaragua (Maes & Téllez, 1988) (Managua), Panama, Trinidad, Argentina. Collected on: Malvaceae: *Gossypium* [17-18].

List of species of Ropalomeridae in the State of Mato Grosso do Sul.

Dactylissa Fischer, 1932, *digiticornis* Fischer, 1932. Type locality: Brazil, Mato Grosso (Mato Grosso do Sul), Fazenda Murtinho. Neotropical Distribution: Brazil [Guanabara (Rio de Janeiro), Mato Grosso (Mato Grosso do Sul), Paraguay (Villarica)].

Kroeberia Lindner, 1930. *Chryserea* Prado, 1966. Type locality: Brazil, Mato Grosso (Mato Grosso do Sul), salobra, male; São Paulo, Araçatuba, female. Neotropical Distribution: Brazil.

Ropalomera Wiedemann, 1824. *clavipes* (Fabricius, 1805). Type locality: South America. Neotropical Distribution: Guyana, Suriname, Ecuador, Brazil, Bolivia, Paraguay, *distincta* Prado, 1966. Type locality: Brazil, Mato Grosso (Mato Grosso do Sul), Fazenda Murtinho. Neotropical Distribution: Brazil, *femorata* (Fabricius, 1805). Type locality: South America. Neotropical distribution: southern Brazil, Mexico (Yucatán), Bolivia, Paraguay, and Argentina (Misiones), *glabrata* Prado, 1966. Distribution: Brazil. Guimaraes, Prado, 1966. Type locality: Brazil, Mato Grosso (Mato Grosso do Sul), Três Lagoas, Fazenda Floresta. Neotropical Distribution: Brazil.

Willistoniella Mik, 1895

pleuropunctata (Wiedemann, 1824). Type locality: "South America". Neotropical Distribution: Brazil, Mato Grosso (Mato Grosso do Sul, Três Lagoas, Fazenda Floresta), southern South America to northern Argentina, southern Mexico to Panama, Trindade [19].

Family Somatiidae

The superfamily Diopsoidea is a small but diverse cosmopolitan superfamily of Acalyptrate Cyclorrapha, especially prevalent in the tropics. Some flux exists in the family constituency of this group, with the Strongylophthalmyiidae and Tanypezidae formerly being in this group but now in the Nerioidea. These small yellow and black flies are found in very particular places. It is a small, completely Neotropical family, composed of 7 described species, all of them from the *Somatia* Schiner, 1868 [20-21].

The differences between the species are not very clear if we look at the external structure and color characteristics, but they are very evident when examining the genitalia of the males. The Somatiidae are particular in the following characteristics: the costal margin and the apex of the wing are dark (the rest of the wing is light), the legs, head, thorax, and abdomen are mostly yellow, but the thorax has thick, incomplete black bands and the abdomen has rows of dark spots. The scutellum is dark. The edge of the antenna is feathery (Figures 6) [21-23].



Figure 6 figs. 71–77. *Somatia aestiva* (Fabricius, 1805) (Somatiidae); 71: female dorsal; 72: same, lateral; 73: head, anterolateral; 74: female head, anterior; 75: same, dorsal; 76: head, posterior; 77: lateral

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The larvae of this family are unknown. Adults are found in humid forests and have only been found in abundance in nectaries of wild granadillas of the genus *Passiflora* L. (Passifloraceae) and in some other plants. Adults are occasionally caught by netting understory vegetation and are sometimes caught in Malaise traps. Where it is easiest to observe and collect them is while they are feeding on nectaries, where they can be captured using the vacuum cleaner. Somatiidae

generally keep their wings extended while perched or while walking [25-26].

Only three species: *Somatia aestiva* (Fabricius, 1805), *Somatia schildi* Steyskal 1968, and *Somatia sophiston* have been recorded for Costa Rica. These flies were originally placed in the family Psilidae. There probably aren't many new species for Costa Rica, maybe 5; Most of the undescribed species are found in the foothills of the Andes surrounding the Amazon basin [26-28].

Species in the genus include: *Somatia australis* Steyskal, 1958, *Somatia carrerai*, sp. nov., *Somatia lanei* Papavero, 1964, *Somatia papaveroi* sp. nov, and *Somatia sophiston* Steyskal, 1958 [29].

Familia Tanyderidae

Adult head and thorax: Short bristles between the ommatidia. Dichoptic females. Antenna with 22 to 25 flagellomeres 22 in females. Mouthparts moderately elongated. Mandibles and maxillae are wider with oblique and apically truncated leaves. Wing venation: Usually Rs forked on R5 and R2+3+4, the origin of R5 is very close to the origin of R2+3 and sometimes, they arise beyond these. They have only one complete anal vein, pose a good head developed, and are in their life cycle pigmented. Legs: Simple claws, arolium, empodium, and pulvini absent. Abdomen: Cercus of the female orange, of the two segments, basicercus, and disticercus are relatively long and elongated. They have only one complete anal vein, pose a good head developed, it has two wings, and are in their life cycle pigmented (Figures 7-8) [30-33].

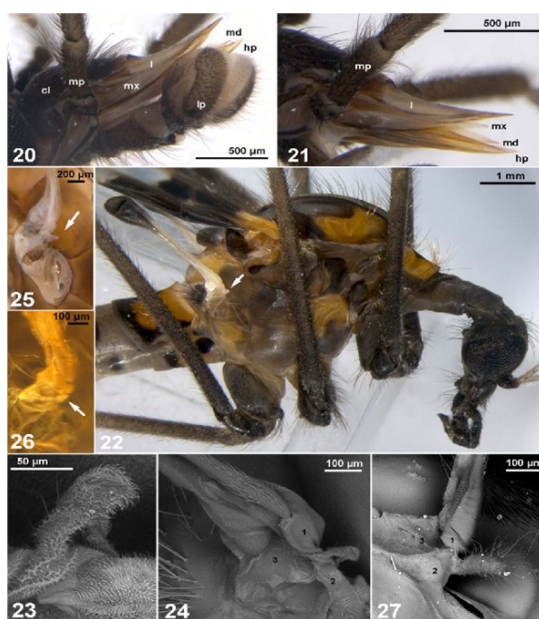


Figure 7 figs 20–27. Details of adult: 20–24 — *Tanyderus pictus* Philippi, 1865; 25 — *Araucoderus gloriosus* Alexander, 1920; 26 — *Macrochile spectrum* Loew 1850; 27 — *Ptychoptera handlirschi* (Czizek, 1919); 20–21 — female #4, mouthparts; 22–24 — female #5: 22 — head and thorax laterally; 23 — rudimentary prehalter; 24–27 — base of halter with (rudimentary) prehalter; 23–24, 27 — SEM, uncoated, BSE; arrow, rudimentary prehalter; homologous parts numbered

Source: <https://api.semanticscholar.org/CorpusID:3971191>

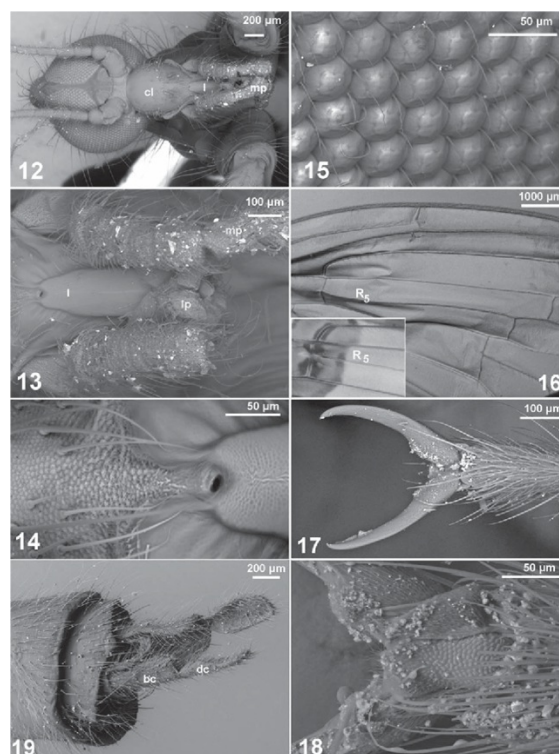


Figure 8 *Tanyderus pictus* Philippi, 1865

Source: <https://api.semanticscholar.org/CorpusID:3971191>

The species of the Tanyderidae seems to be present in the summer season in adult form, specifically between January and March, so this stage is the most ideal for the reproduction of adults. Adults are generally found during the day in riparian vegetation and swarm during the evening near the river surface, preferably mountainous. These types of habitat requirements cause the species to be considered a habitat specialist and bioindicator of quality (Figure 9) [33-34].

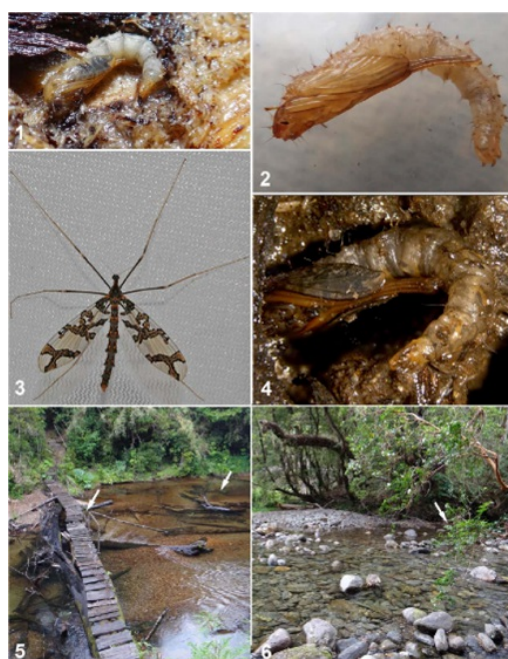


FIGURE 9. 1-6: Life stages of *Tanyderus pictus* and their habitats. 1 — female pupa #2 in situ (Aldrich, 1901, 2015); 2 — female pupa #1 in situ (Aldrich, 1901, 2015); 3 — female pupa #3 in situ (Aldrich, 1901, 2015); 4 — female pupa #4 in situ (Aldrich, 1901, 2015); 5 — female pupa #5 in situ (Aldrich, 1901, 2015); 6 — female pupa #6 in situ (Aldrich, 1901, 2015).

Figure 9 figs 1–6. Live *Tanyderus pictus* Philippi, 1865 and their habitats: 1 — female pupa #2 in situ (Alerce Andino, 17.01.2015); 2 — freshly moulted male pupa #3 (Coastal Larch, 25.01.2015); 3–4 — female #5 (photographs by R. Rakitov) and its pupa (Alerce Costero, reared from larvae in laboratory, 19.03 and 18.03.2015); 5 — Lenca River, Andean Larch; 6 — a tributary of Chaihuin River, Larch Coast; arrows, location of finds of larvae and pupae

Source: <https://api.semanticscholar.org/CorpusID:3971191>

Crato Member, Hemicephalous larvae, Ptychoptera

Hemicephalous larvae. Pincer-shaped jaws, horizontal arrangement with respect to the head. Disk spiracular with 6 or more lobes. The larvae usually forage for dead wood, submerged in the rivers in which it is present. The wood can be in different states of decomposition and larvae can be found whether or not they are present in the bark. In addition, they can lodge between the cavities left by dead branches. This species is xylophagous. They preferably live in rivers with a lot of dead wood in their beds, where the larvae are able to develop and transform into pupae; as well as It is also possible to find them among the river sands protected by the rocky bottom, or on the banks of the river. They are found in pools of still water and are tolerant to pollution (Figure 10) [34-36].



Figure 10 Pupae Family Ptychopteridae Male pupa of *Tanyderus pictus* Philippi, 1865 (Alerce Costero): 28–29 - habitus ventrally and laterally; 30 — tergites I–II dorsally; 31–32 - cauda dorsally and ventrally; 33 - wing sheath. Rice. 28–33. Pupa of a male *T. pictus* #3 (Alerce Costero): 28–29 — general view from below and from the side; 30 — tergites I–II from above; 31–32 — the end of the abdomen above and below; 33 — wing cover

Source: https://www.researchgate.net/figure/33-Male-pupa-of-T-pictus-3-Alerce-Costero-28-29-habitus-ventrally-and-laterally_fig5_299398203

This distribution starts from the northern area to the southernmost known record. However, its effective distribution is more limited than the distribution because it only uses pristine estuaries and rivers of native forest. Little is known about the biology of the family. Adults are mostly collected in forests and the larvae are mostly aquatic [35-37].

The Tanyderidae have an amphitropical distribution with great diversity in the southern hemisphere. The Tanyderidae are a small family that only includes 38 species distributed worldwide in 10 genera. Of these, 3 of them are monotypic and known from South America, all from temperate zones and described for Chile: *Tanyderus* Philippi, 1865, *Neoderus* Alexander, 1927 and *Araucoderus* Alexander, 1929.

Genus *Araucoderus*: *Araucoderus gloriosus* (Alexander 1920). Chile.

Genus *Neoderus*: *Neoderus chonos* Madriz, sp. nov. Chile.

Genus *Neoderus patagonicus* (Alexander, 1913). Chile.

Genus *Tanyderus*: *Tanyderus pictus* Philippi 1865. Chile, Concepcion [36-38].

Tanyderus pictus Philippi, 1865

Adult head and thorax: Short bristles between the ommatidia. Dichoptic females, interocular distance about twice the ommatidia size; Antenna with 22 to 25 flagellomeres (22 in females). Mouthparts moderately elongated. *Tanyderus pictus* is distributed from the Bío Bío Region to the Los Lagos region.

However, its effective distribution is narrower than the distribution obtained by the minimum convex polygon, because it only uses pristine streams and rivers of native forest. Recently, thanks to the Chilean flower flies citizen science project, this species was rediscovered in the Bío (Bío) region, after more than a century of no specimens being found in said region. Distribution, localities where populations existed, and decreased quality of life [39].

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