



Two new species of the subgenus *Acanthohelea* of *Stilobezzia* from Brazilian Amazonia (Diptera: Ceratopogonidae)

CARLA G. CAZORLA & GUSTAVO R. SPINELLI

División Entomología, Museo de La Plata, Paseo del Bosque s/n, B1900FWA La Plata, Argentina and Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Argentina. E-mail: carlacazorla@fcnym.unlp.edu.ar

The predaceous genus *Stilobezzia* Kieffer is a large, diverse group of Ceratopogonidae that is worldwide in distribution except for Antarctica and some islands (Borkent 2014). Adult females are important predators on other small insects, and the immature stages are found in a wide variety of aquatic and semiaquatic habitats, including streams, lakes and pond margins, puddles, swamps, rice fields, rock pools, and tree holes (de Meillon and Wirth 1991; Cazorla *et al.* 2006).

Four subgenera are included within the genus, *Stilobezzia* Kieffer, *Acanthohelea* Kieffer, *Debenhamia* Wirth & Grogan and *Eukraiohelea* Ingram & Macfie. Currently, the cosmopolitan *Stilobezzia* (*Acanthohelea*) is represented in the Neotropical Region by 37 species (Borkent, 2015; Cazorla & Spinelli 2015).

Recently, the examination of a large collection of species of the genus *Stilobezzia* from the state of Rondônia in Brazil, resulted in the finding of two new species of *Stilobezzia* (*Acanthohelea*) which are herein described and illustrated.

Material and methods

Slide mounted specimens were examined and measured with a compound microscope. Photomicrographs were taken with a digital camera Leica DFC290, through a Leica DM1000 microscope.

Terms of structures follows those in the Manual of Central America Diptera (Brown *et al.* 2009). Aedeagus X longer than basal breadth refers to the ratio between the aedeagus length (distance from the convergent tips of the two aedeagal sclerites to an imaginary line between the sclerites bases) and the basal breadth (distance between sclerites bases); stem refers to main body of the parameres. Acronyms used in the figures are: AS, aedeagal sclerites and P, parameres.

Type series of the new species is deposited in the collection of the U.S. National Museum of Natural History, Washington, D.C. (USNM).

Results

Stilobezzia (*Acanthohelea*) *longiradix* n. sp. (Figs. 1–11)

Diagnosis. Male: the only Neotropical species of *Stilobezzia* (*Acanthohelea*) with inner margin of gonocoxite bearing a mesal, conspicuous, curved projection with sclerotized tip which is directed anteriorly. Female: the only Neotropical species of *Stilobezzia* (*Acanthohelea*) with distal pair of slender spines on tarsomere 4 of all legs.

Male. Head (Fig. 1). Dark brown. Antennal flagellum dark brown; plume brown, well developed; antennal ratio 1.13. Palpus dark brown; segment 3 long, with subapical, rounded sensory pit; palpal ratio 2.50.

Thorax. Uniformly dark brown, scutellum with 6 large setae. Legs yellowish brown; coxae dark brown, hind leg darker except tarsomeres paler; hind tibial comb with 8 spines; basal spine on tarsomere 1 of mid leg; prothoracic tarsal ratio 1.70; mesothoracic tarsal ratio 2.21, metathoracic tarsal ratio 1.86. Wing (Fig. 2) length 1.55 mm, width 0.48 mm, costal ratio 0.77; membrane slightly infuscated; second radial cell 3.30 X longer than first; cubital fork at same level of base of r-m crossvein; macrotrichia on costa, vein R₁, abundant on distal narrow margin of cell r₃, few on margin of cell m₁. Halter pale brown.

Abdomen. Dark brown. Genitalia (Figs. 3–4): tergite 9 extending to 0.90 of gonocoxites length, narrowing progressively distad, posterior margin rounded; sternite 9 7.5 X broader than long, posteromedian excavation concave, deep; sternite 10 wide, produced beyond base of cerci; cerci stout, subparallel. Gonocoxite (Fig. 5) 1.70 X longer than greatest breadth, inner margin with conspicuous, stout, curved, directed anteriorly projection with sclerotized tip;

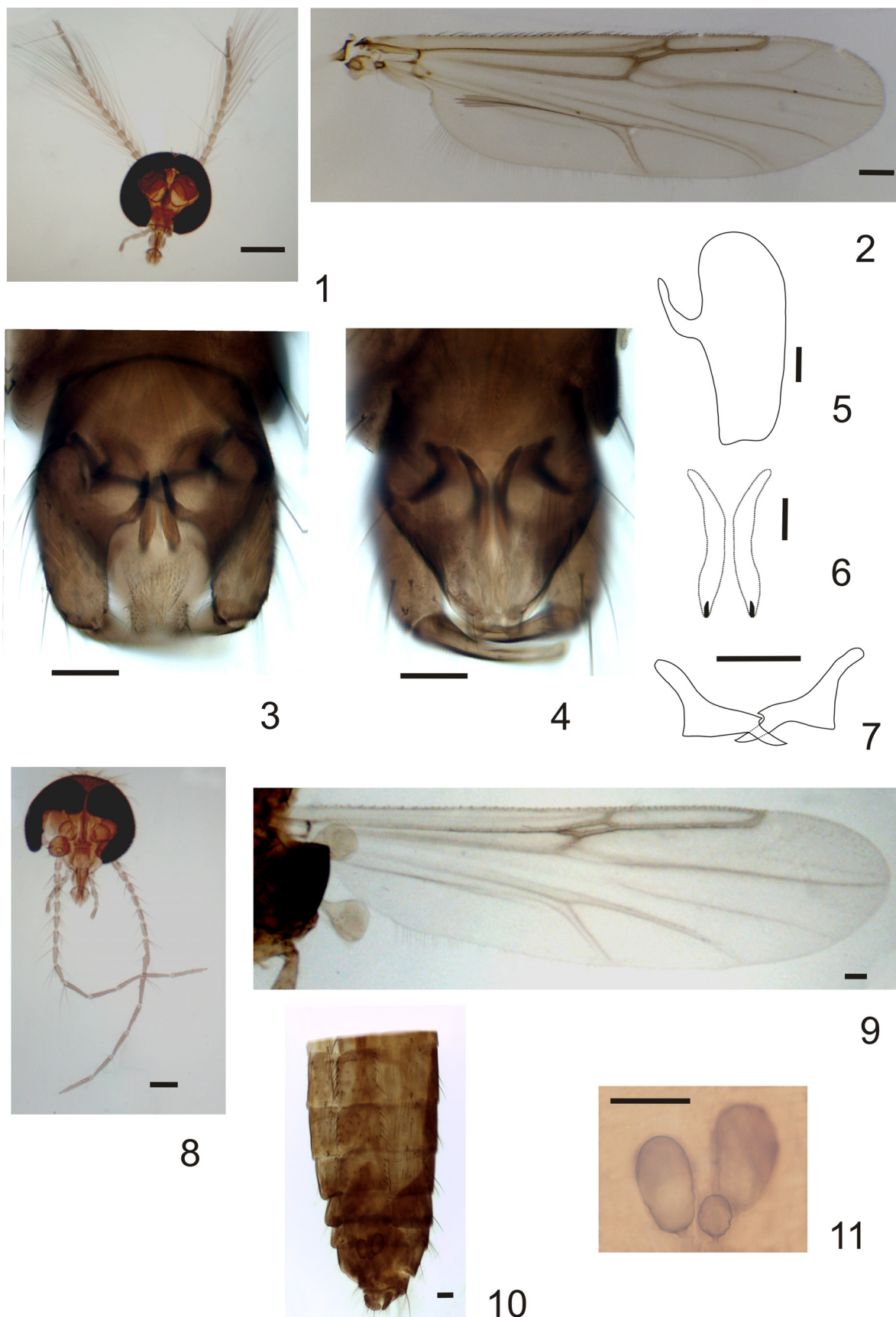


FIGURE 1–11. *Stilobezzia (Acanthohelea) longiradix* sp. n., 1–7 male; 8–11 female; 1—head (dorsal view), 2—wing, 3—genitalia (ventral view), 4— genitalia (dorsal view), 5— scheme of gonocoxite, 6— scheme of parameres, 7— scheme of aedeagus, 8—head, 9—wing, 10— abdomen (ventral view), 11—spermathecae. Scale bars: 0,05 mm.

gonostylus slightly shorter than gonocoxite, nearly straight, tip blunt. Parameres (Fig. 6) separated, subparallel, articulated to slender basal apodemes; stem reaching 1/2 the length of gonocoxites, slightly curved, rod-like, tip curved ventrally. Aedeagus (Fig. 7) 0.45 longer than basal breadth, composed by two sinuous, convergent sclerites, each with mesolateral triangular lobe, subapical short pointed projection, tip pointed.

Female. Similar to male, with the following notable differences:

Head (Fig. 8). Antennal flagellum dark brown, base of flagellomeres slightly paler; antennal ratio 1.16; palpal ratio 2.90. Mandible with 7 coarse teeth.

Thorax. Tarsomere 4 of all legs with distal pair of slender spines; prothoracic tarsal ratio 2.42; mesothoracic tarsal ratio 2.70; metathoracic tarsal ratio 2.10. Wing (Fig. 9) length 1.60 mm, width 0.44 mm, costal ratio 0.76; second radial cell 4 X longer than first; cubital fork slightly distal to base of r-m crossvein; macrotrichia on costa, veins R_1 , R_2 , R_3 , abundant on distal 1/3 of cells r_3 and apex of m_1 .

Abdomen. (Fig. 10). Genitalia: sternite 8 apparently rounded, posteromedian excavation U-shaped, sternite 10 with 4 pairs of setae; cerci short, rounded; two subequal, ovoid, spermathecae (Fig. 11) with wide, short necks, measuring 7.00 by 4.20 μm and 6.40 by 3.60 μm , plus a rudimentary third spermatheca.

Distribution. Brazil (Rondônia).

Types. Holotype male labeled, Brazil, Rondônia 62 km SW Ariquemes vic. Rancho Grande, 1-V-1992, U. Schmitz, UV light trap; allotype female same data except 12-IX-1992.

Etymology. The species name *longiradix* refers to the long, curved and conspicuous projection present on inner mesal margin of gonocoxite.

Discussion. *Stilobezzia (Acanthohelea) longiradix* is similar to the Neotropical species *Stilobezzia (A.) paranaense* Cazorla & Spinelli from Paraguay and northeastern Argentina. However, the protuberance on the gonocoxite of the male of the latter species is shorter and directed anteromesally, and the female of *S. (A.) paranaense* has a yellowish scutum with only four setae.

***Stilobezzia (Acanthohelea) tarsispinosa* n. sp. (Figs. 12–22)**

Diagnosis. Male: the only Neotropical species of *Stilobezzia (Acanthohelea)* with inner margin of gonocoxite bearing a mesal, short, leaf-shaped projection. Female: the only Neotropical species of *Stilobezzia (Acanthohelea)* with 2 pairs of spines on tarsomere 5 of fore leg, 3 pairs on mid leg and 1 pair on hind leg.

Male. Head (Fig. 12). Golden brown. Antennal flagellum brown, flagellomeres 11–13 elongate, dark brown; plume dark brown, dense; antennal ratio 0.95–1.02 (0.98, n= 3). Palpus dark brown; segment 3 swollen with subapical rounded pit; palpal ratio 2.00–2.14 (2.08, n= 3).

Thorax. Uniformly dark brown, scutellum with 4 large setae. Legs brown, distal apex of hind femur darker, apex of hind tibia paler, tarsomeres paler; hind tibial comb with 7 spines; prothoracic tarsal ratio 2.00–2.10 (2.07, n= 3) mesothoracic tarsal ratio 2.27–2.30 (2.28, n= 3), metathoracic tarsal ratio 1.80–2.20 (2.03, n= 3). Wing (Fig. 13) length 1.19–1.34 (1.26, n= 3) mm, width 0.40–0.45 (0.43, n= 3) mm, costal ratio 0.73–0.75 (0.74, n= 3); membrane slightly infuscated; second radial cell 2.33–2.67 (2.48, n= 3) X longer than first; cubital fork at level of base of r-m crossvein; macrotrichia on costa, vein R_1 , sparse on distal margin of cell r_3 . Halter pale brown.

Abdomen. Dark brown, hairy. Genitalia (Figs. 14–15): tergite 9 extending to apex of gonocoxites, narrowing progressively distad, posterior margin rounded; sternite 9 2.70 X broader than long, with convex posteromedian projection; sternite 10 not clearly distinguishable; cerci slender, curved, divergent. Gonocoxite stout, 1.32 X longer than greatest breadth, inner margin with mesal, short, leaf-shaped projection; gonostylus shorter than gonocoxite, stout, curved, tip blunt. Parameres separated, stout, articulated to sclerotized basal apodemes by two lateral projections; basal portion of stem stout, distal portion swollen with lateral, sclerotized, pointed projection. Aedeagus 0.62 longer than basal breadth, composed by two stout, sinuous sclerites, each with basal portion sclerotized, curved; main portion swollen mesally; distal portion with pointed teeth.

Female. Similar to male, with the following notable sexual differences:

Head (Fig. 16). Antennal flagellum dark brown, base of flagellomeres paler; antennal ratio 1.18–1.19 (1.18, n= 2); palpal ratio 2.37–2.50 (2.43, n= 2). Mandible with 6 coarse teeth.

Thorax. Two pairs of spines on tarsomere 5 of fore leg, 3 pairs on mid leg, 1 pair on hind leg (Figs. 17–19); claws of hind legs slightly shorter; prothoracic tarsal ratio 2.10–2.22 (2.16, n= 2), mesothoracic tarsal ratio 2.45–2.50 (2.47, n= 2), metathoracic tarsal ratio 2.30–2.40 (2.35, n= 2). Wing (Fig. 20) length 1.40–1.49 (1.44, n= 2) mm, width 0.52–0.56 (0.54, n= 2) mm, costal ratio 0.77–0.79 (0.78, n= 2); second radial cell 2.10–2.44 (2.27, n= 2) X longer than first; scarce macrotrichia on costa, R_1 , R_2 , R_3 , narrow distal margin of cells r_3 . Halter pale brown.

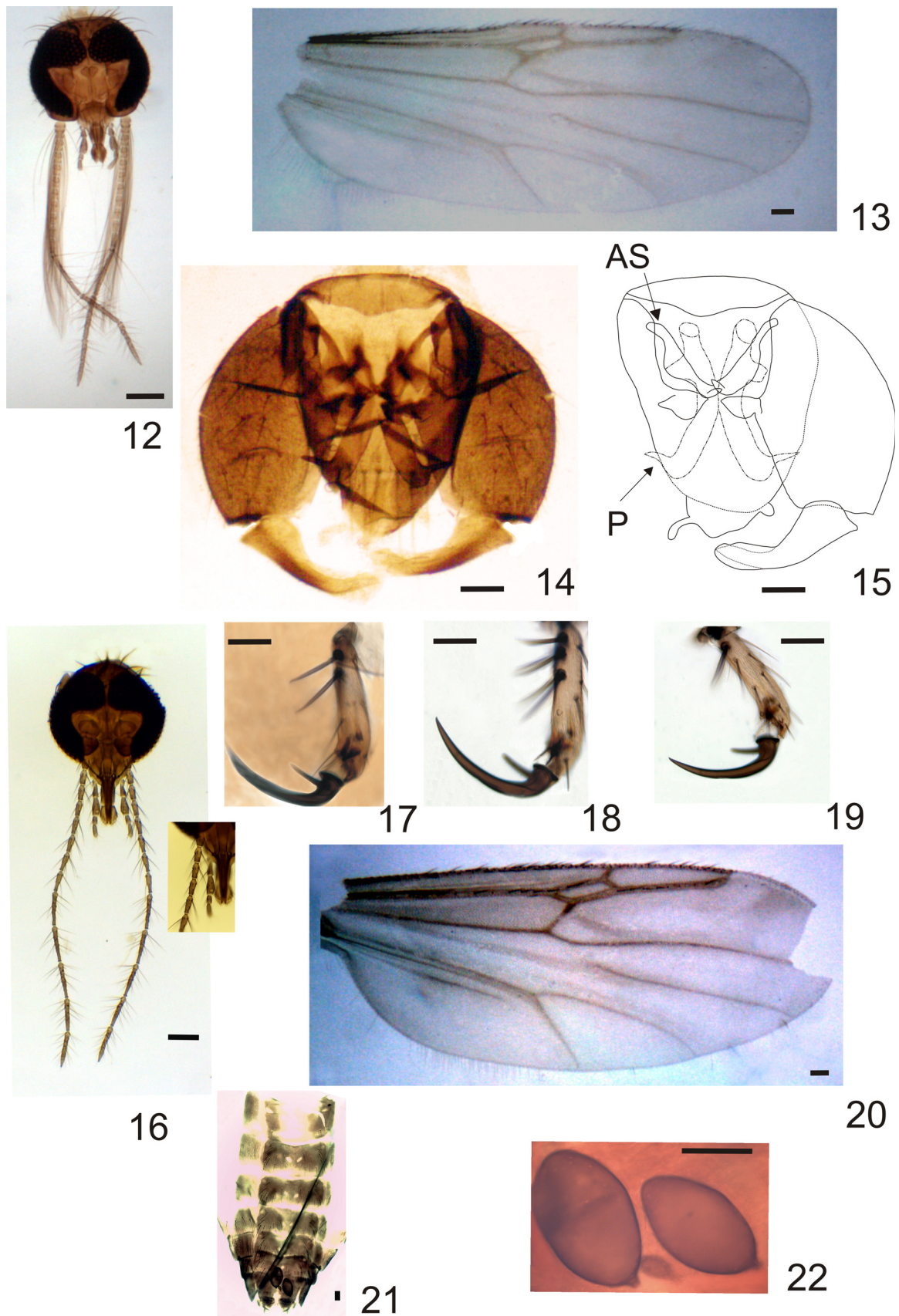


FIGURE 12–22. *Stilobezzia (Acanthohelea) tarsispinosa* sp. n., 12–15 male; 16–22 female; 12—head, 13—wing, 14—genitalia (ventral view), 15— genitalia scheme, 16—head, 17— tarsomere 5 of foreleg, 18—tarsomere 5 of midleg, 19—tarsomere 5 of hindleg, 20—wing, 21—abdomen (ventral view), 22 —spermathecae. Scale bars: 0,05 mm.

Abdomen. (Fig. 21). Dark brown; tergites with two small mesal pale spots; sternite 10, cerci, pale yellowish.

Genitalia sternite 8 with anterior margin straight, lateral margins convergent distally, posteromedian excavation V-shaped; sternite 10 with 4 pairs of setae, cerci small; two ovoid spermathecae (Fig. 22) with wide, short necks, measuring 11.40–11.80 (11.60, n = 2) by 6.30–7.00 (6.60, n = 2) μm and 10.30–10.70 (10.50, n = 2) by 5.50–5.90 (5.70, n = 2) μm ; plus a small rudimentary third spermatheca.

Distribution. Brazil (Rondônia).

Types. Holotype male labeled, Brazil, Rondônia 62 km SW Ariquemes vic. Rancho Grande, 25-IX-1992, U. Schmitz, UV light trap; allotype female, same data except 20-IX-1992; paratypes 2 males, same data as holotype, 1 female, same data as allotype.

Etymology. The species name *tarsispinosa* refers to the presence in the female of spines on the tarsomeres 5 of all legs.

Discussion. *Stilobezzia* (*A.*) *tarsispinosa* resembles *Stilobezzia* (*A.*) *atrishopogon* Lane & Forattini by the coloration of the thorax, the number of scutellar setae and the scarce wing macrotrichia. However, the male of *S.* (*A.*) *atrishopogon* is readily distinguished from this new species by the presence of two distal projections on the parameres, while the female has the abdomen entirely dark brown and the spermathecae are smaller.

Acknowledgments

This work was funded by the Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Argentina. Our gratitude to Dr. Pablo Marino, for the critical review of the manuscript.

References

- Borkent, A. (2014) The Pupae of the Biting Midges of the World (Diptera: Ceratopogonidae), With a Generic Key and Analysis of the Phylogenetic Relationships Between Genera. *Zootaxa*, 3879 (1), 1–327.
<http://dx.doi.org/10.11646/zootaxa.3879.1.1>
- Borkent, A. (2015) World Species of Biting Midges (Diptera: Ceratopogonidae). Available from: <http://www.inhs.illinois.edu/files/1114/2384/5200/CeratopogonidaeCatalog.pdf> (accessed 30 September 2015)
- Brown, B.V., Borkent, A., Cumming, J.M., Wood, D.M., Woodley, N.E. & Zumbado, M.A. (2009) *Manual of Central American Diptera. Vol. 1*. NRC Research Press, Ottawa, Ontario, 714 pp.
- Cazorla, C.G., Diaz, F. & Ronderos, M.M. (2006) Redescription of pupa and adult of *Stilobezzia fiebrigi* Kieffer 1917 (Diptera: Ceratopogonidae). *Transactions of the American Entomological Society*, 132, 111–119.
[http://dx.doi.org/10.3157/0002-8320\(2006\)132\[111:ROPAAO\]2.0.CO;2](http://dx.doi.org/10.3157/0002-8320(2006)132[111:ROPAAO]2.0.CO;2)
- Cazorla, C.G. & Spinelli, G.R. (2015) A revision of the Patagonian predaceous midges of the subgenus *Acanthohelea* of *Stilobezzia* excluding the *S.* (*A.*) *edwardsi* group. *Journal of Natural History*, 49 (3 & 4), 155–209.
<http://dx.doi.org/10.1080/00222933.2014.939728>
- de Meillon, B. & Wirth, W.W. (1991) The genera and subgenera (excluding *Culicoides*) of the Afrotropical Biting Midges (Diptera: Ceratopogonidae). *Annals of the Natal Museum*, 32, 27–147.