Zootaxa 3753 (2): 187–195
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.3753.2.8
http://zoobank.org/urn:lsid:zoobank.org:pub:3161924A-23A6-4FB7-83FD-8614D4C36D85

Two new Larainae species from Guayana region, Venezuela (Coleoptera: Elmidae)

KRISTÍNA LAŠŠOVÁ[1], FEDOR ČIAMPOR Jr & ZUZANA ČIAMPOROVÁ-ZAŤOVIČOVÁ
Institute of Zoology, Slovak Academy of Sciences, Dúbravská cesta 9, SK-84506, Bratislava, Slovakia.
E-mail: kristina.lassova@savba.sk, f.ciampor@savba.sk, zuzana.zatovicova@savba.sk
[1]Corresponding author

Abstract

Two new species of the subfamily Larainae (Insecta: Coleoptera: Elmidae), *Hexanchorus angeli* **n. sp.** and *Hypsilara autanai* **n. sp.**, are described from Guyana region in Venezuela. We provide habitus photographs, detail drawings of both male and female genitalia, and description of morphological features important for discrimination of the new species. Molecular differences within genera were measured using 816bp fragment of mtDNA gene for cytochrome oxidase c subunit I. Sequence divergences among species are discussed.

Key words: Coleoptera, Larainae, Elmidae, *Hexanchorus*, *Hypsilara*, Venezuela, DNA

Introduction

The Elmidae fauna in Venezuela is very rich regarding number of species and also the density of the beetles in the streams. Although large areas have already been destroyed by deforestation, Venezuela still provides various preserved aquatic biotopes, which together with its tropical climate predetermine this country to be home of vast number of elmid species. They occur not only in lowlands, but also in the specific habitats like table mountains (Aubrecht *et al.* 2012). The Guyana region, with its bizarre isolated flat-topped table mountains is known for its huge diversity and high level of endemism. This concerns also aquatic insects (e.g. Čiampor Jr *et al.* 2013, Kodada *et al.* 2012, Kodada & Jäch 1999, Derka 2002, Derka *et al.* 2009). However, contrasting with an expected high diversity, only some 61 species of Elmidae are recorded from whole Venezuela (Segura *et al.* 2013).

The Larainae, which are characteristic by semiaquatic life cycle, form smaller subfamily of Elmidae with 28 described genera. Ovipositing and larvae development takes place in the water, while adults occur often above the water line on partly submerged wood or in spray zones of waterfalls and cascades.

The genus *Hexanchorus* was described by Sharp (1882). Spangler & Staines (2003) described three new species, based on the revision of older museum material, and the most recent work including description of new species of *Hexanchorus* is Maier 2013, raising the number of species to nineteen. Now, the genus is known throughout the whole Central and South America, from Mexico to Argentina. Except the new species described herein, six other *Hexanchorus* species occur in Venezuela (Maier 2013).

The genus *Hypsilara* was described only recently (Maier & Spangler 2011). Currently, the genus includes two species found only in Venezuela (Čiampor Jr *et al.* 2013).

In this paper we describe two new species, *Hexanchorus angeli* **n. sp.** and *Hypsilara autanai* **n. sp.**, and we also provide comparison with related congeneric species based on morphological and molecular characters.

Material and methods

Specimens prepared for the study were cleaned and examined under a Leica M205C stereomicroscope with a Planapo 1.0 lens, by using diffuse lighting at magnifications up to 160×. Male genitalia and pregenital segments

Accepted by Floyd Shockley: 28 Nov. 2013; published: 6 Jan. 2014

Acknowledgements

We wish to thank Ján Kodada and Tomáš Derka for valuable comments on the manuscript. The anonymous reviewers are thanked for their comments. This study was supported by the Slovak Research and Development Agency, Project No. APVV-0213-10 and the project implementation: Development and application of the innovative diagnostic approach for the molecular identification of animals (ITMS: 26240220049) supported by the Research & Development Operational Programme funded by the ERDF.

References

Aubrecht R., Barrio-Amorós C.L., Breure A.S.H., Brewer-Carías C., Derka T., Fuentes-Ramos O.A., Gregor M., Kodada J., Kovác'ik L'., Lánczos T., Lee N.M., Lis'c'ák P., Schlo?gl J., S'mída B. & Vlc'ek L. (2012) V*enezuelan tepuis: their caves and biota*. Acta Geologica Slovaca–Monograph, Comenius University, Bratislava, pp. 168.

Čiampor, F. Jr., Laššová, K. & Čiamporová-Zaťovičová, Z. (2013) *Hypsilara breweri* n.sp. from Venezuela: description of new species with notes on the morphology and phylogenetic relationships of the genus (Coleoptera: Elmidae: Larainae). *Zootaxa*, 3635 (5), 591–597.
http://dx.doi.org/10.11646/zootaxa.3635.5.10

Derka, T. (2002) *Massartella devani*, a new mayfly species from Venezuela's Highlands (Ephemeroptera: Leptophlebiidae: Atalophlebiinae). *Aquatic Insects*, 24, 309–316.
http://dx.doi.org/10.1076/aqin.24.4.309.8241

Derka, T., Svitok, M. & Schlo?gl, J. (2009) *Massartella hirsuta* sp. nov. (Ephemeroptera: Leptophlebiidae: Atalophlebiinae) and new data on mayflies of Guayana Highlands. *Aquatic Insects*, 31, Suppl. 1, 83–94.
http://dx.doi.org/10.1080/01650420902811992

Hebert, P.D.N., Ratnasingham, S. & deWaard, J.R. (2003) Barcoding animal life: cytochrome c oxidase subunit 1 divergences among closely related species. *Proceedings of the Royal Society London B Biological Sciences*, 270, 96–99.
http://dx.doi.org/10.1098/rsbl.2003.0025

Jäch, M.A. & Kodada, J. (2010) Elmidae Species Listing. *In*: Hallan, J. (Ed.), *Biology Catalog*. Available from: http://insects.tamu.edu/research/collection/hallan/test/Arthropoda/Insects/Coleoptera/Family/Coleoptera1.htm (accessed 30 July 2013)

Kodada, J., Derka, T. & Čiampor, F. Jr. (2012) Description of *Jolyelmis spangleri* a new species from Churí-tepui (Chimantá Massif, Venezuela), with a description of the larva of *J. spangleri* and *J. reitmaieri* (Insecta: Coleoptera: Elmidae). *Zootaxa*, 3223, 1–23.

Kodada, J. & Jäch, M.A. (1999) *Roraima carinata* gen. et sp. nov. and *Neblinagena doylei* sp. nov., two Larainae from Mount Roraima, Venezuela (Coleoptera: Elmidae). *Entomological Problems*, 30 (1), 13–29.

Kodada, J. & Jäch, M.A. (2005) Elmidae Curtis 1830. *In:* Beutel, R.G. & Leschen, R.A.B. (Eds.), *Handbuch der Zoologie, Coleoptera, Beetles. Vol. 1. Morphology and Systematics.* Walter de Gruyter, Berlin–New York, pp. 471–496.

Maier, C.A. (2013) A Revision of the Larainae (Coleoptera: Elmidae) of Venezuela, with description of nine new species. *ZooKeys*, 329, 33–91.
http://dx.doi.org/10.3897/zookeys.329.4961

Maier, C.A. & Spangler, P.J. (2011) *Hypsilara royi* gen. n. and sp. n. (Coleoptera, Elmidae, Larainae) from Southern Venezuela, with a revised key to Larainae of the Western Hemisphere. *ZooKeys*, 116, 25–36.
http://dx.doi.org/10.3897/zookeys.116.1347

Segura, M.O., Passis, M.I.S., Fonseca-Gessner, A.A. & Froehlich, C.G. (2013) Elmidae Curtis, 1830 (Coleoptera, Polyphaga, Byrrhoidea) of the Neotropical region. *Zootaxa*, 3731 (1), 1–57.
http://dx.doi.org/10.11646/zootaxa.3731.1.1

Sharp, D. (1882) Parnidae. *In*: Godman, F.D. & Salivan, O. (Eds.), Biologia Centrali-Americana. *Insecta, Coleoptera*, 1 (2), pp. 119–144.

Simon, C., Frati, F., Beckenbach, A., Crespi, B., Liu, H. & Flook, P. (1994) Evolution, weight- ing, and phylogenetic utility of mitochondrial gene sequences and a compilation of conserved polymerase chain reaction primers. *Annals of the Entomological Society of America*, 87, 651–701.

Spangler, P.J. & Staines, C.L. (2003) Three new species of *Hexanchorus* Sharp, 1882 (Coleoptera: Elmidae: Larainae) from South America. *Insecta Mundi*, 17, 45–48.

Tamura, K., Peterson, D., Peterson, N., Stecher, G., Nei, M. & Kumar, S. (2011) MEGA5: Molecular Evolutionary Genetics Analysis using Maximum Likelihood, Evolutionary Distance, and Maximum Parsimony Methods. *Molecular Biology and Evolution*, 28, 2731–2739.
http://dx.doi.org/10.1093/molbev/msr121