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## ***Hexanchorus bifurcatus* sp. nov., a new tepui riffle beetle (Coleoptera: Elmidae: Larainae) from Tafelberg, Suriname**

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### **Abstract**

Here we present the first published record of a laraine elmid from Suriname, which represents a new species – *Hexanchorus bifurcatus* sp. nov. Specimens were collected from the summit of Tafelberg, a table mountain near the Wilhelmina Range of Suriname. This species can be distinguished from all other *Hexanchorus* by the bifurcate elytral apices and median projection of the third abdominal ventrite of the female, as well as the distinctive male genitalia. Habitus photos, illustrations of the genitalia, a distribution map, notes on habitat, and comparative diagnoses are provided.

**Key words:** Aquatic insects, Guiana Shield, South America, Table Mountain, Neotropical Region, water beetle

### **Introduction**

The Elmidae, or “riffle beetles” are a family of aquatic beetles common in running water habitats throughout the world. Traditionally, they are classified into two subfamilies: Elminae and Larainae. The habits of Elminae are most typical of the family, as they are restricted to riffle habitats among the benthos in fast-flowing streams. Conversely, the Larainae are abundant on water-splashed rocks and detritus at or just beyond the water’s edge. As adults, the laraines are agile fliers and move between aquatic and terrestrial habitats with great ease, carrying with them a silvery air bubble under a thin film of water (Kodada & Jäch 2005). While laraines are often locally abundant, their unique habitat preferences preclude them from typical benthic samples and thus, they are rare in collections.

Fifty-three species of Larainae distributed among 11 genera are known from the Neotropical Region. *Hexanchorus* Sharp, 1882 is the largest of these, with twenty described species, ranging from Mexico south to northern Argentina (Laššová *et al.*, 2014, Segura *et al.* 2013).

A recent expedition to Tafelberg Tepui in Suriname has yielded a distinctive undescribed species of *Hexanchorus*, the first recorded species in the genus from Suriname. Tafelberg is the easternmost table mountain in the Guiana Shield Region, and at 1026 m in elevation, it is one of the highest mountains in Suriname (Maguire 1945). The table mountains, or tepuis, are a series of monolithic sandstone mountains, reaching up out of the rainforest in northern South America in Venezuela, Brazil, Guyana, and Suriname and include the more famous Cerro de Neblina, Auyantepui, and Roraima in Venezuela.

The table mountains have extraordinarily high biodiversity, and recent expeditions to the region have yielded a large number of new species of water beetle, many of which are endemic to their respective massifs (Spangler & Faitoute 1991, Spangler 1981). Indeed, among the laraine Elmidae, there are four known species that are putatively endemic to various mountains in the Guiana Shield. Spangler (1985) described *Neblinagena prima* from Cerro de Neblina and some years later, Kodada & Jäch (1999) described the appropriately named species *Roraima carinata*, along with a second species of *Neblinagena*, *Neblinagena doylei*, from Mount Roraima, a tepui that straddles the border between Venezuela, Guyana, and Brazil. The genus *Hypsilara* was also thought to be restricted to Cerro de Neblina (*Hypsilara royi* Maier & Spangler, 2011), though recent studies have revealed several non-tepui endemic species of *Hypsilara* in eastern Venezuela (e.g., *Hypsilara breweri* Čiampor *et al.*, 2013 and *H. autanai* Laššová *et al.*, 2014).



**FIGURE 8.** Habitat of *Hexanchorus bifurcatus* n. sp. on Tafelberg Tepui, Suriname. Riffle in Augustus Creek, including close-up of rock-scrubbing.

## Discussion

This species appears to be most closely related to *H. angeli* and *H. homaeotarsoides*. This group is united by the aedeagal morphology and the median projection of the third ventrite of the female, as well as geographic proximity to the preceding species in the Guiana Shield region (Fig. 1). Even though there are minimal differences in genitalic morphology between *H. angeli* and *H. bifurcatus*, the unique feature of the female elytral apices unites all specimens in the Tafelberg population and is consistent across the entire series. Additionally, the isolated nature of the habitat of both *H. angeli* and *H. bifurcatus* supports the idea that these are two separate, non-interbreeding populations of *Hexanchorus* in entirely distinct watershed areas.

The sheer number of new species from the region reinforces the idea that this area is poorly collected, and it warrants further collecting effort for Elmidae and other aquatic Coleoptera.

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## References

- 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: Larinae). *Zootaxa*, 3635 (5), 591–597.  
<http://dx.doi.org/10.11646/zootaxa.3635.5.10>
- Kodada, J. & Jäch, M.A. (1999) *Roraima carinata* gen. et sp.nov. and *Neblinagena doylei* sp. nov., two Larinae from Mount Roraima, Venezuela (Coleoptera: Elmidae). *Entomological Problems*, 30 (1), 13–30.
- Kodada, J. & Jäch, M.A. (2005) Elmidae Curtis, 1830. In: Beutel, R.G., Leschen, R.A.B. (Eds.), *Handbook of Zoology. Vol. IV. Arthropoda: Insecta. Part 38. Coleoptera, Beetles*. Walter de Gruyter, Berlin, Germany, pp. 471–496.
- Laššová, K., Čiampor, F. Jr. & Čiamporová-Zaťovičová, Z. (2014) Two new Larinae species from Guayana region, Venezuela (Coleoptera: Elmidae). *Zootaxa*, 3753 (2), 187–195.  
<http://dx.doi.org/10.11646/zootaxa.3753.2.8>
- Maguire, B. (1945) Notes on the Geology and Geography of Tafelberg, Suriname. *Geographical Review*, 35 (4), 563–579.

- <http://dx.doi.org/10.2307/210796>
- 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>
- 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>
- Segura, M.O., Passos, 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>
- Spangler, P.J. (1981) New and interesting water beetles from Mt. Roraima and Ptari?tepui, Venezuela (Coleoptera: Dytiscidae and Hydrophilidae). *Aquatic Insects*, 3 (1), 1–11.  
<http://dx.doi.org/10.1080/01650428109361037>
- Spangler, P.J. (1985) A new genus and species of riffle beetle, *Neblinagena prima*, from the Venezuelan tepui, Cerro de la Neblina (Coleoptera, Elmidae, Larainae). *Proceedings of the Entomological Society of Washington*, 87 (3), 538–544.
- Spangler, P.J. & Faitoute, R.A. (1991) A New Genus and Species of Neotropical Water Beetle, *Jolyelmis auyana*, from a Venezuelan Tepui (Coleoptera: Elmidae). *Proceedings of the Biological Society of Washington*, 104 (2), 322–327.
- Spangler, P.J. & Santiago, S. (1992) The Aquatic Beetle Subfamily Larainae (Coleoptera: Elmidae) in Mexico, Central America, and the West Indies. *Smithsonian Contributions to Zoology*, No. 528, 1–74.  
<http://dx.doi.org/10.5479/si.00810282.528>
- Spangler, P.J. & Staines, C.L. (2003) Three new species of *Hexanchorus* Sharp, 1882 (Coleoptera: Elmidae: Larainae) from South America. *Insecta Mundi*, 17 (1–2), 45–48.
- Zander, R.H. (1997) On Mounting Delicate Bryophytes in Glycerol. *The Bryologist*, 100 (3), 380–382.  
[http://dx.doi.org/10.1639/0007-2745\(1997\)100\[380:omdbig\]2.0.co;2](http://dx.doi.org/10.1639/0007-2745(1997)100[380:omdbig]2.0.co;2)