



## The genus *Astylosternus* in the Upper Guinea rainforests, West Africa, with the description of a new species (Amphibia: Anura: Arthroleptidae)

MARK-OLIVER RÖDEL<sup>1</sup>, MICHAEL F. BAREJ<sup>1</sup>, ANNIKA HILLERS<sup>1,2</sup>, ADAM D. LEACHÉ<sup>3</sup>, N'GORAN G. KOUAMÉ<sup>4</sup>, CALEB OFORI-BOATENG<sup>5</sup>, N. EMMANUEL ASSEMIAN<sup>4</sup>, BLAYDA TOHÉ<sup>6</sup>, JOHANNES PENNER<sup>1</sup>, MAREIKE HIRSCHFELD<sup>1</sup>, JOSEPH DOUMBIA<sup>7</sup>, LEGRAND NONO GONWOUO<sup>8</sup>, JOACHIM NOPPER<sup>9</sup>, CHRISTIAN BREDE<sup>10</sup>, RAUL DIAZ<sup>11</sup>, MATTHEW K. FUJITA<sup>3</sup>, MARLON GIL<sup>12</sup>, GABRIEL H. SEGNIAGBETO<sup>13</sup>, RAFFAEL ERNST<sup>14</sup> & LAURA SANDBERGER<sup>1</sup>

<sup>1</sup>Museum für Naturkunde, Leibniz Institute for Research on Evolution and Biodiversity at the Humboldt University Berlin, Herpetology, Invalidenstr. 43, 10115 Berlin, Germany. E-mail: mo.roedel@mfn-berlin.de.

<sup>2</sup>Across the River Project, Royal Society for the Protection of Birds, 164 Dama Road, Kenema, Sierra Leone.

<sup>3</sup>Department of Biology & Burke Museum, University of Washington, Seattle, WA 98195, USA.

<sup>4</sup>University of Abobo-Adjamé, URES-Daloa, Department of Biology and Animal Physiology, Daloa, BP 150, Côte d'Ivoire.

<sup>5</sup>Department of Wildlife and Range Management, Faculty of Renewable Natural Resources, Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.

<sup>6</sup>Université d'Abobo-Adjamé, Laboratoire d'Environnement et Biologie Aquatique, UFR-SGE, 02 BP 801, Abidjan 02, Côte d'Ivoire.

<sup>7</sup>ONG Sylvatrop Guinée, BP 4720 Conakry, Guinée.

<sup>8</sup>University of Yaoundé I, Faculty of Science, Laboratory of Zoology, P.O. Box 812, Yaoundé, Cameroon.

<sup>9</sup>Ecology & Conservation, Biocenter Grindel, Universität Hamburg, Martin-Luther-King-Platz 3, 20146 Hamburg, Germany.

<sup>10</sup>Medizinische Klinik und Poliklinik II, Zentrum für Experimentelle Molekulare Medizin, ZEMM - Zinklesweg 10, 97078 Würzburg, Germany.

<sup>11</sup>Natural History Museum & Biodiversity Research Center, University of Kansas, Dyche Hall, 1345 Jayhawk Blvd 66045-7561, USA.

<sup>12</sup>Humboldt State University, Department of Wildlife Management, Arcata CA 95521, USA.

<sup>13</sup>Département de Zoologie et de Biologie Animale, Faculté des Sciences, Université de Lomé, BP 1515, Lomé, Togo.

<sup>14</sup>Museum für Tierkunde, Senckenberg Natural History Collections Dresden, A.B. Meyer Building, Germany.

### Abstract

*Astylosternus laticephalus* **sp. nov.** Rödel, Hillers, Leaché, Kouamé, Ofori-Boateng, Diaz & Sandberger is described from eastern Ivory Coast and western and central Ghana, and compared to *Astylosternus occidentalis* Parker, 1931 from the western part of the Upper Guinea forest zone (western Ivory Coast, Liberia, Guinea and Sierra Leone). Based on a comprehensive sample, including specimens from the entire range, the latter species is re-described. The new species is characterized by a body shape typical for frogs of the genus *Astylosternus*, but has an exceptionally broad head, i.e. broader than in *A. occidentalis*. The basic dorsal pattern of *A. laticephalus* **sp. nov.** consists of a brownish to brownish red colouration with distinct red dots (red dots are only rarely present in *A. occidentalis*). The new species has bicoloured eyes with the lower part of the iris being grey, the upper third of the iris is orange to red (*A. occidentalis* always has a uniform greyish iris). Males of the new species lack spines on the throat, belly (always present in *A. occidentalis* males), and a layer of black nuptial skin in the pectoral region (present in male *A. occidentalis* from western Guinea). *Astylosternus laticephalus* **sp. nov.** differs from *A. occidentalis* by a mean pairwise genetic distance of 3.2% in the investigated part of the mitochondrial 16S rRNA gene. Genetic divergence to the morphologically most similar Central African species, *A. diadematus*, was 11.9%. We briefly discuss the phylogenetic position of West African *Astylosternus*, hint on the possibility that the genus might be paraphyletic and discuss the biogeography of West African *Astylosternus*, in particular with respect to forest cover fluctuations in the past.

**Key words:** Arthroleptidae; *Astylosternus laticephalus* **sp. nov.**; *Astylosternus occidentalis*; biodiversity hotspot; biogeography; Ghana; Ivory Coast.