ISSN 1809-127X (online edition)

Open Access | Freely available at *www.checklist.org.br*

Check List
Journal of species lists and distribution

NOTES ON GEOGRAPHIC DISTRIBUTION

Pisces, Siluriformes, Doradidae, *Astrodoras* Bleeker, 1862: First record in the Colombian Amazon

Camilo Andrés Roa-Fuentes [1*], Juan Carlos Alonso [2], Alexander Alfonso [3] and Mark Sabaj Pérez [4]

1 Universidade Estadual Paulista, Instituto de Biociências, Letras e Ciências Exatas, Departamento de Zoologia e Botânica, Pós-graduação em Biologia Animal. Rua Cristóvão Colombo, 2265, Jardim Nazareth. CEP 15054-000. São José do Rio Preto, SP, Brazil.
2 Instituto Amazónico de Investigaciones Científicas – SINCHI. Avenida Vásquez Cobo entre calles 15 y 16. Leticia, Colombia.
3 Parque Nacional Natural Amacayacu. Carrera 9, 6-100, Piso 2 Apto. 201. Leticia, Colombia.
4 Academy of Natural Sciences of Philadelphia. 1900 Benjamin Franklin Parkway. Philadelphia, PA 19103, USA.
* Corresponding author. E-mail: *camilo.roa@gmail.com*

ABSTRACT: This note presents the first record of the genus *Astrodoras* Bleeker, 1862 (Siluriformes, Doradidae) in the Colombian Amazon (Amacayacu National Park). The single species described for the genus is *A. asterifrons* (Kner, 1853), reported only from the Amazon River basin in Brazil and Bolivia. The Colombian specimens are characterized by a gas (swim) bladder that is different from that of *A. asterifrons*, indicating that they represent a distinct and undescribed species of *Astrodoras*.

The family Doradidae comprises a group of South American tropical catfishes characterized principally by the presence of: i) a series of bony scutes along the side of the body, each of which has a robust, backward-directed, medial thom and sometimes with smaller spines and serrations, ii) a well-developed cephalic shield, iii) a subterminal mouth, iv) a large, exposed posterior cleithral process, v) strongly serrated dorsal- and pectoral- fin spines, and vi) a ventrally-flattened body (Eigenmann 1925; Sabaj and Ferraris 2003). Doradidae is diagnosed among Siluriformes by uniquely having an infranuchal scute, a bony laminar expansion of the ligament between the posterior nuchal plate and first rib (Birindelli *et al.* 2008).

The taxonomic history of the family dates back to Linnaeus (1758). The first comprehensive taxonomic revision by Eigenmann (1925) recognized 68 species in 26 genera. More recently Sabaj and Ferraris (2003) recognized 72 valid species belonging to 30 genera from a total of 127 nominal species and 41 genera proposed for the family. Taxonomic studies over the past six years and recent exploration of remote river systems have added one new subfamily, one new genus and 16 new species of doradis (Sabaj 2005; Sousa and Rapp Py-Daniel 2005; Birindelli *et al.* 2007, 2008; Higuchi *et al.* 2007; Piorski *et al.* 2008; Sabaj-Pérez and Birindelli 2008; Sabaj *et al.* 2008; Birindelli and Sousa 2010), including one fossil (Sabaj -Pérez *et al.* 2007). A total of 43 species and 19 genera belonging to the family Doradidae have been recorded in the Colombian Amazon (Maldonado-Ocampo *et al.* 2008), but there has been no previous report of the genus *Astrodoras* Bleeker, 1862 in Colombia.

Kner (1853) proposed the new species *Doras asterifrons* on the basis of its gas bladder morphology, and later Kner (1855) provided a more detailed description of the species based on specimens from "Barra do Rio negro" [Manaus, Brazil] and "R. Guaporé" [tributary to rio Madeira forming border between Bolivia and Brazil]. Bleeker (1862) transferred species *asterifrons* to his new genus *Astrodoras*, distinguished in part by having dorsal spine serrated anteriorly and edentulous laterally and posteriorly. Eigenmann (1925) further distinguished *Astrodoras* by a number of characteristics including: greatest width 2.6 times in length, caudal fulcra (= procurrent caudal-fin rays) laminate, covering almost half of the upper and lower surfaces of the peduncle, preorbital (= infraorbital one) with posterior edge erect and bearing about ten spines, gas bladder with posterior (= terminal) diverticulum small and short or forked to its base with laterally turned horns. Higuchi *et al.* (2007) grouped *Astrodoras* with *Amblydoras*, *Anadoras*, *Hypodoras*, *Merodoras*, *Physopyxis* and *Scorpiodoras* into a new monophyletic subfamily Astrodoradinae diagnosed by having: infraorbital one serrated (except in *Anadoras*) and participating in the orbital margin (except in *Physopyxis*), four to seven pleural ribs; spinous posterior cleithral process (except in *Anadoras*); and posteroinferior portion of the coracoid exposed. Other distinguishing features of Astrodoradinae, but more widespread in Doradidae, include: simple barbels, nuchal foramina absent, and gas bladder with abbreviated cordiform shape (Higuchi *et al.* 2007).

Astrodoras asterifrons has been reported from: Jutahy [Jutaí]; Teffé [Tefé]; Manaus; Porto do Moz; Serpa; Santarém; Maciél, Guaporé River; San Joaquín; and Cupai River in Brazil (Eigenmann 1925; Sabaj and Ferraris 2003). The genus *Astrodoras* remains monotypic, however, Sabaj Pérez and Sousa (*personal communication*) recognize two additional undescribed species from the Brazilian Amazon.

The specimens of *Astrodoras* reported here (Figure 1) were captured in Amacayacu National Park, one of the 55 protected areas that make up the Colombian system of National Parks (Parques Nacionales Naturales de Colombia 2005). Declared in 1975, it is located in the so-called Colombian "trapezius", in the municipalities of Leticia and Puerto Nariño (Figure 2). Collections were made using

stationary gill nets (8 - 15 m length; 25, 37, 50 mm mesh). The specimens were collected between 17:00 – 20:00 h in Lago Julio, a lentic oxbow (locally referred to as a "madre vieja" [=old mother] or "tipisca") associated with the lower reach of Amacayacu Creek (Figure 3) and in littoral habitat in Matamatá Creek. The water was visually characterized as intermediate between whitewater/blackwater, with suspended solids ≥ 87 mg L^{-1}, soft water (calcium ≤ 1.5 mg L^{-1}), and dissolved organic nitrogen ≤ 0.36 mg L^{-1}. The bottom was composed of fine organic material and leaf litter over a clay substrate. The specimens were preserved in 10 % formalin solution and laboratory conserved in 70 % ethanol; they are deposited in Colección Ictiológica de la Amazonia Colombiana (CIACOL) of the Instituto Amazónico de investigaciones Científicas – SINCHI.

Collected material.

Astrodoras sp.: CIACOL 418, 5 specimens. Locality: Río Matamatá, Parque Nacional Natural Amacayacu, Municipality of Leticia, Amazonas, Colombia (3°48'49" S, 70°15'06" W), 154 m. Oct 17, 2008. Colectors: Aricari, G., A. Ferreira and C. Roa-Fuentes (Figures 1A and 1B).

Astrodoras sp.: CIACOL 419, 1 specimen. Locality: Lago Julio, río Amacayacu, Parque Nacional Natural Amacayacu, Municipality of Leticia, Amazonas, Colombia (3°47'38" S, 70°18'31" W), 64 m. Oct 11, 2008. Colectors: Aricari, G., G. Vela and C. Roa-Fuentes.

Astrodoras sp.: CIACOL 438, 2 specimens. Locality: Río Matamatá, Parque Nacional Natural Amacayacu, Municipality of Leticia, Amazonas, Colombia (3°48'49" S, 70°15'06" W), 154 m. Oct 18, 2008. Colectors: Aricari, G., A. Ferreira and C. Roa-Fuentes (Figure 1C).

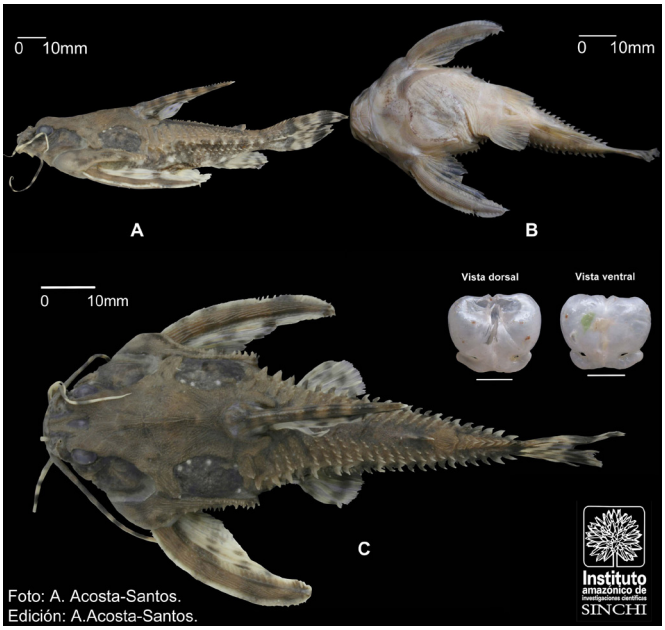

Figure 1. Lateral (A), Ventral (B), and Dorsal (C) Views of specimens *Astrodoras* sp. captured in Amacayacu National Park, Colombian Amazon, with inset depicting dorsal (left) and ventral (right) views of disembodied gas bladder (A and B: CIACOL 419; C: CIACOL 418).

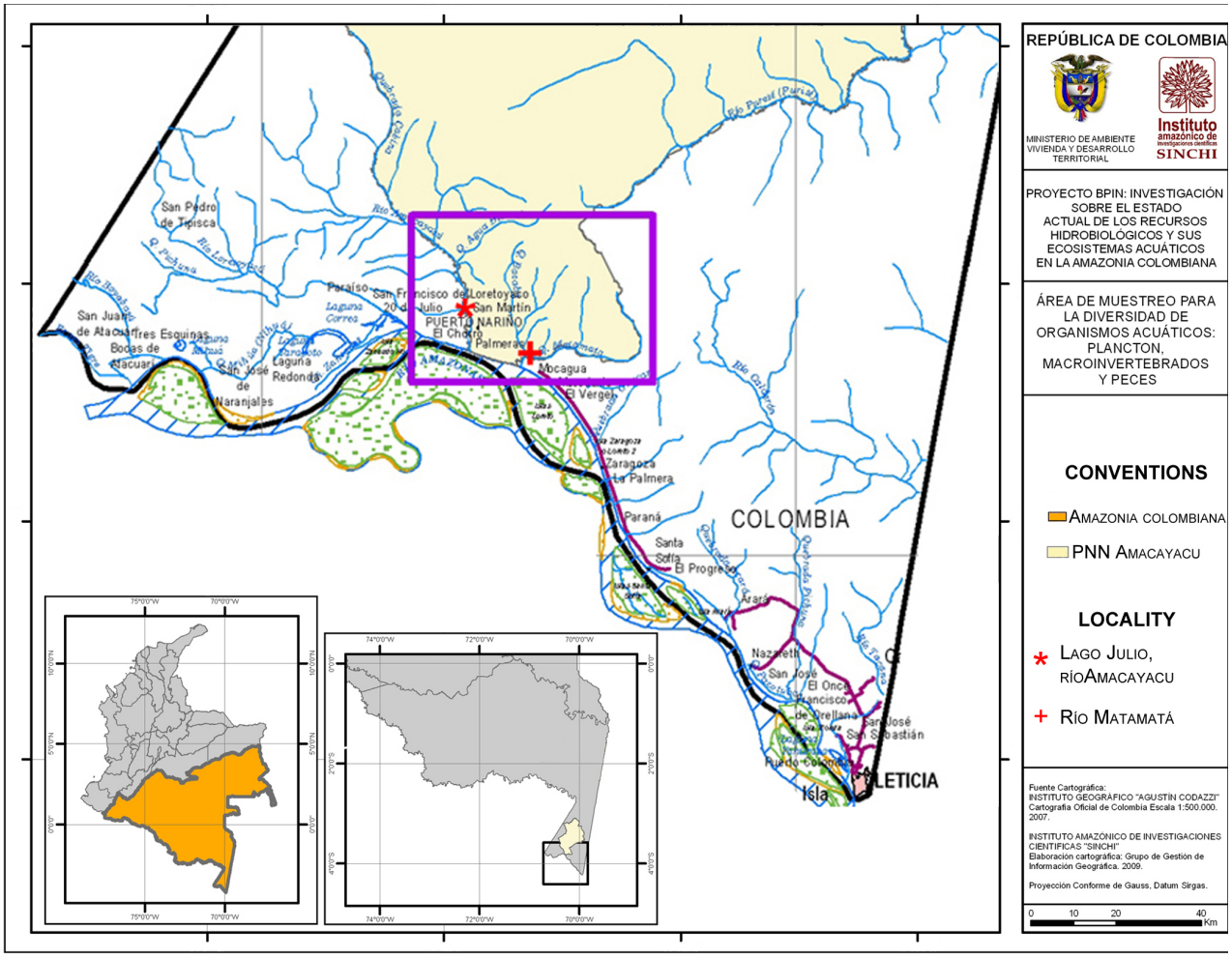

Figure 2. Detailed maps showing capture localities for *Astrodoras* sp. reported here from the Colombian Amazon. The pink area represents the 293,000 hectares of Amacayacu National Park.

Kner's (1853) description of *A. asterifrons* was accompanied by an illustration of the gas bladder showing a simple posterior (terminal) diverticulum. Eigenmann (1925) recognized variation in the external morphology of gas bladders he examined in specimens captured in Jutahy [Jutaí] and Santarém, Brazil. Specimens from Jutahy [Jutaí] had a gas bladder characterized by a pair of posterior diverticula with laterally divergent "sausage-shaped" horns (similar to the Colombian specimens in Figure 1C); while those from Santarém had a short, simple posterior diverticulum (similar to the one illustrated by Kner). Based on this and other morphological differences currently under study by Sabaj Pérez and Sousa (*personal communication*), specimens having a gas bladder with paired posterior diverticula, including those captured in Amacayacu National Park, belong to a new and undescribed species of *Astrodoras*.

Figure 3. Locality where *Astrodoras* sp. (CIACOL 419) was captured in the Amacayacu National Park, Colombia. Photo by C. Roa-Fuentes.

Acknowledgments: We are grateful to the marine biologist Astrid Acosta-Santos for the photographs; to the Geographic Information Group of SINCHI Institute for the cartography; to the researchers Marcela Nuñez and Edwin Agudelo of the Amazon Ecosystems Group of SINCHI Institute for their support and enthusiasm; to Gabriel Aricari, Grobert Vela and Alexander Ferreira for their collaboration in capturing the specimens; and to the staff and communities of Amacayacu National Park for their interest in the investigation of the environmental status of the protected area. The authors thank Sara Bennett for helping with the translation and clarification of the English manuscript. CARF receives a scholarship from Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq).

Literature Cited

Birindelli, J.L.O. and L.M. Sousa. 2010. New species of the thorny catfish genus *Leptodoras* (Siluriformes: Doradidae) from Rio Fresco, Xingu Basin, Brazil. *Copeia* (2): 292–299.

Birindelli, J.L.O., M.H. Sabaj and D.C. Taphorn. 2007. New species of *Rhynchodoras* from the Río Orinoco, Venezuela, with comments on the genus (Siluriformes: Doradidae). *Copeia* (3): 672–684.

Birindelli, J.L.O., L.M. Sousa and M.H. Sabaj. 2008. New species of thorny catfish, genus *Leptodoras* Boulenger (Siluriformes: Doradidae), from Tapajós and Xingu basins, Brazil. *Neotropical Ichthyology* 6(3): 465-480.

Eigenmann, C.H. 1925. A review of the Doradidae, a family of South American Nematognathi, or catfishes. *Transactions of the American Philosophical Society* 22(5): 280-365, pls.1-27.

Higuchi, H., J.L.O. Birindelli, L.M. Sousa and H.A. Britski. 2007. *Merodoras nheco*, new genus and species from Rio Paraguay basin, Brazil (Siluriformes, Doradidae), and nomination of the new subfamily Astrodoradinae. *Zootaxa* 1446: 31-42.

Kner, R. 1853. Über einige Sexual-Unterschiede bei der Gattung *Callichthys* und die Schwimmblase bei *Doras* C. Val. *Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften* 11: 138-146.

Kner, R. 1855. Ichthyologische Beiträge [Subtitles I-III]. *Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften. Mathematisch-Naturwissenschaftliche Classe* 17: 92–162, Pls. 1-6.

Linnaeus, C. 1758. *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata*. Stockholm: Holmiae. 824 p.

Maldonado-Ocampo, J.A., R.P. Vari and J.S. Usma. 2008. Checklist of the freshwater fishes of Colombia. *Biota Colombiana* 9(2): 143-237.

Parques Nacionales Naturales de Colombia. 2005. *Sistema de Parques Nacionales Naturales de Colombia: a través de sus planes de manejo.* Bogotá: Ministerio de Ambiente, Vivienda y Desarrollo Territorial. 285 p.

Piorski, N.M., J.C. Garavello, M. Arce and M.H. Sabaj. 2008. *Platydoras brachylecis*, a new species of thorny catfish (Siluriformes: Doradidae) from northeastern Brazil. *Neotropical Ichthyology* 6(3): 481-494.

Sabaj, M.H. 2005. Taxonomic assessment of *Leptodoras* (Siluriformes: Doradidae) with descriptions of three new species. *Neotropical Ichthyology* 3(4): 637-678.

Sabaj, M.H. and C.J. Ferraris. 2003. Doradidae (Thorny catfishes); p. 456-469. *In*: R.E. Reis, S.O. Kullander and C.J. Ferraris, Jr. (eds.). *Checklist of the Freshwater Fishes of South and Central America*. Porto Alegre: Edipucrs.

Sabaj, M.H., D.C. Taphorn and O.E. Castillo. 2008. Two new species of Thicklip Thornycats, genus *Rhinodoras* (Teleostei: Siluriformes: Doradidae). *Copeia* (1): 209-226.

Sabaj-Pérez, M.H., O.A. Aguilera and J.G. Lundberg. 2007. Fossil catfishes of the families Doradidae and Pimelodidae (Teleostei: Siluriformes) from the Miocene Urumaco Formation of Venezuela. *Proceedings of the Academy of Natural Sciences of Philadelphia* 156: 157-194.

Sabaj-Pérez, M.H. and J.L.O. Birindelli. 2008. Taxonomic revision of extant *Doras* Lacepède, 1803 (Siluriformes: Doradidae) with descriptions of three new species. *Proceedings of the Academy of Natural Sciences of Philadelphia* 157: 189-233.

Sousa, L.M. and L.H. Rapp Py-Daniel. 2005. Description of two new species of *Physopyxis* and redescription of *P. lyra* (Siluriformes: Doradidae). *Neotropical Ichthyology* 3(4): 625-636.

Received: August 2010
Revised: August 2010
Accepted: September 2010
Published online: October 2010
Editorial responsibility: Javier A. Maldonado