



<http://dx.doi.org/10.11646/zootaxa.3745.2.6>

<http://zoobank.org/urn:lsid:zoobank.org:pub:DB087293-2619-4E18-B856-8BB60409C716>

Two new endemic species of *Ameiva* (Squamata: Teiidae) from the dry forest of northwestern Peru and additional information on *Ameiva concolor* Ruthven, 1924

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Abstract

We describe two new species of *Ameiva* Meyer, 1795 from the dry forest of the Northern Peruvian Andes. The new species *Ameiva nodam* **sp. nov.** and *Ameiva aggerecusans* **sp. nov.** share a divided frontal plate and are differentiated from each other and from their congeners based on genetic (12S and 16S rRNA genes) and morphological characteristics. *A. nodam* **sp. nov.** has dilated postbrachials, a maximum known snout-vent length of 101 mm, 10 longitudinal rows of ventral plates, 86–113 midbody granules, 25–35 lamellae under the fourth toe, and a color pattern with 5 longitudinal yellow stripes on the dorsum. *Ameiva aggerecusans* **sp. nov.** has not or only hardly dilated postbrachials, a maximum known snout-vent length of 99.3 mm, 10–12 longitudinal rows of ventral plates, 73–92 midbody granules, 31–39 lamellae under the fourth toe, and the females and juveniles of the species normally exhibit a cream-colored vertebral stripe on a dark dorsum ground color. We provide information on the intraspecific variation and distribution of *A. concolor*. Furthermore, we provide information on the environmental niches of the taxa and test for niche conservatism.

Key words: *Ameiva bifrontata concolor*, Andes, reptiles, 12S rRNA, 16S rRNA, phylogenetic relationship, molecular analysis, phylogenetic analysis, Marañón valley, niche overlap, niche comparison, niche equivalency, niche similarity, ecological niche model

Introduction

According to the most recent revision of teiid lizards (Harvey *et al.* 2012), 28 species of whiptail lizards are currently recognized as belonging to the genus *Ameiva* Meyer, 1795, including two Caribbean species that are considered as being already extinct: *A. cineracea* Barbour & Noble, 1915; and *A. major* Duméril & Bibron, 1839 (Groombridge 1993; Hower & Hedges 2003; Lorvelec *et al.* 2007). The distribution of 18 of the extant species (*Ameiva alboguttata* Boulenger, 1896; *A. atrata* Garman, 1887; *A. auberi* Cocteau, 1838; *A. chrysolaeama* Cope, 1868; *A. corax* Censky & Paulson, 1992; *A. corvina* Cope, 1861; *A. dorsalis* Gray, 1838; *A. erythrocephala* Daudin, 1802; *A. exsul* Cope, 1862; *A. fuscata* Garman, 1887; *A. griswoldi* Barbour, 1916; *A. lineolata* Duméril & Bibron, 1839; *A. maynardi* Garman, 1888; *A. plei* Duméril & Bibron, 1839; *A. pluvianotata* Garman, 1887; *A. polops* Cope, 1862; *A. taeniura* Cope, 1862; *A. wetmorei* Stejneger, 1913) is restricted to various Caribbean islands. Four species (*A. ameiva* (Linnaeus, 1758); *A. pantherina* Ugueto & Harvey, 2011; *A. parecis* (Colli, Costa, Garda, Kopp, Mesquita, Péres, Valdujo, Vieira & Wiederhecker, 2003); *A. provitae* Garcia-Perez, 1995) are restricted to South America and another four species (*A. atrigularis* Garman, 1887; *A. bifrontata* Cope, 1862; *A. concolor* Ruthven, 1924a; *A. praesignis* (Baird & Girard 1852)) occur as well in South as in Middle America (Barbour & Noble 1915; Burt & Burt 1930; Schwartz & Klinikowski 1966; Echternacht 1970, 1971, 1976, 1977; Peters & Donoso-Barros 1970, 1986; Censky & Paulson 1992; Garcia-Pérez 1995; Hower & Hedges 2003; Ugueto & Harvey 2011; Harvey *et al.* 2012).

Region of Cajamarca, between 500–800 m elevation (Särkinen *et al.* 2011); *Inca spiza watkinsi*, an endemic sparrow, restricted to the low elevations at 350 and 900 m in the dry forest from the northern portion of the Marañón river, in the basins of Huancabamba, Chinchipe, Tabaconas, and Utcubamba (García-Bravo 2011); *Phyllodactylus johnwrighti* that is restricted to the dry forest of the low portion of the Huancabamba basin (Dixon & Huey 1970); and *P. delsolari*, *P. thompsoni*, and *Phyllopezus marañonensis*, restricted to the southern portion of the upper Marañón basin between Balsas and the Laguna de Pías (Koch & Beraún 2011). In the last years four hydroelectric projects are driven by the Peruvian government and the regional government of Amazonas (Cumba 4, Pongo de Rentema, Chadín 2 and La Balsa) (Q & V Ingenieros SAC 2007). All of these projects involve the construction of big dams which inundate big extensions of dry forest, and fragment the habitats of many endemic species with localized ranges, creating barriers for the genetic pool of these species. The habitat of *Ameiva nodam* **sp. nov.** is threatened by two of these four projects. Cumba 4 (825MW) will have a 185 m high wall, with a reservoir of around 37.50 km², and Pongo de Rentema will dam the rivers Marañón, Chinchipe and Utcubamba (García-Bravo 2011). The habitat of *Ameiva aggerescusans* **sp. nov.** is threatened by the projects Cumba 4 and Chadín 2 and the habitat of *A. concolor* and other endemic reptiles like *Phyllopezus marañonensis*, *Phyllodactylus delsolari* and *P. thompsoni* are threatened by the projects Chadín 2 and La Balsa that have projected dams with high walls and big reservoirs.

The potential for the discovery of additional endemic, undescribed species in the Marañón region is high and with respect to the serious threats of their world unique habitat due to the dam construction activities concerted effort to characterize the composition and conservation status of the herpetofauna and the respective biological needs of each species should be undertaken at the earliest possible opportunity. As representing a biodiversity hotspot (Särkinen *et al.* 2011) authorities should seriously consider the dry forest of the Marañón valley for protection.

Acknowledgments

We are indebted to RAFAEL BROWN (KU), PATRICK CAMPBELL (BM), ROSS MACCULLOCH (ROM), JOSÉ ROSADO (MCZ), for allowing access to their museum collections. JAKOB HALLERMANN (ZMH), ANDREAS SCHMITZ (MHNG), GUNTHER KÖHLER (SMF), MICHAEL FRANZEN (ZSM) and FRANK TILLACK (ZMB) we thank for the loan of material from their collections and RAFFAEL ERNST (SNSD) we thank for providing tissue samples. GREG SCHNEIDER (UMMZ) kindly sent photographs of the holotype of *Ameiva bifrontata concolor*. We are indebted to JESUS CORDOVA and CESAR AGUILAR for allowing access to the collection of the Museo de Historia Natural de la Universidad Nacional Mayor de San Marcos (MUSM), Lima, Peru, and for the permanent loan of material. We are very grateful to the Deutscher Akademischer Austauschdienst (DAAD), the Alexander Koenig Stiftung (AKS) and the Alexander Koenig Gesellschaft (AKG) for financial support. The Ministerio de Agricultura, Peru kindly provided collecting (071-2007-INRENA-IFFS-DCB, 0020-2009-AG-DGFFS-DGEFFS, 0424-2010-AG-DGFFS-DGEFFS) and export permits (0017799-AG-INRENA, 001829-AG-DGFFS, 003983-AG-DGFFS). ALFREDO BERAÚN, ANTONIO GARCIA BRAVO, ERICK HOYOS GRANDA, JORGE NOVOA COVA and MANUEL PALACIOS PANTA assisted during the field work and contributed greatly to the success of the field trips.

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APPENDIX I. Specimens examined.

- Ameiva concolor*—PERU: Cajamarca: Paipoy, Rio Crisnejas: 24 km from Marañón (1067 m a.s.l.), male holotype UMMZ 59192 (examined by photographs).
- La Libertad: Bambamarca: Calemar (07°33'08.8"S, 077°42'35.9"W, 1125 m a.s.l.), CORBIDI 07662, ZFMK 91789; (07°32'S, 077°43', 1108–1126 m a.s.l.) CORBIDI 07661, 07663, ZFMK 91790–91; Tayabamba: Chagual (07°49'51.7"S, 077°38'35.5"W, 1360 m a.s.l.), CORBIDI 07659–60, ZFMK 91787; Pías (07°53'54.4"S, 077°34'45.0"W, 1720 m a.s.l.), ZFMK 91788.
- Ameiva bifrontata divisa*—COLOMBIA: near Baranquilla, ZMH 09545–9.