

Amphibia, Anura, Bufonidae, *Rhinella manu* Chaparro, Pramuk and Gluesenkamp, 2007; *Rhinella tacana* Padial, Reichle, McDiarmid and de la Riva, 2006: Distribution extension and country record from southern Peru

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ABSTRACT: As a result of several surveys on the montane forests of southern Peru, we provide new distribution data for two arboreal toads (Anura: Bufonidae). An important distribution extension for *Rhinella manu*, outside of Manu National Park (Cusco department, Peru), location of the type locality, and the first record for *Rhinella tacana* in Peru, extending the distribution of both species by about 235 and 582 km (airline), respectively, are given herein.

Arboreal toads from the genus *Rhinella* Fitzinger, 1826 became known when Duellman and Toft (1979) described *Rhinella nesiotis* from Cordillera del Sira in the Peruvian central Andes. After many years another arboreal toads were described: *Rhinella arborescandens* (Duellman and Schulte, 1992) from northern Peru, *Rhinella tacana* (Padial, Reichle, McDiarmid, and De la Riva, 2006) from northern Bolivia, *Rhinella yanachaga* (Lehr, Pramuk, Hedges, and Córdova, 2007) from Peruvian Central Andes and *Rhinella manu* Chaparro, Pramuk, and Gluesenkamp, 2007 from Peruvian southern Andes. Each one of these species is formerly known from a single locality and all inhabit mountain and cloud forests between 1500 to 2800 m a.s.l. (Duellman and Schulte 1992; Padial *et al.* 2006; Chaparro *et al.* 2007; Lehr *et al.* 2007). Currently, the distribution range of four of them (*R. arborescandens*, *R. nesiotis*, *R. manu* and *R. yanachaga*) are restricted to Peru; only *R. tacana* is endemic to Bolivia. The distributions of these species are probably poorly known and research in these areas are necessary to complete the information about their range of distribution. Several surveys carried out in montane forest in southern Peru (permit number 0581-2011-AG-DGFFS-DGEFFS) resulted in a new country record and new localities for two arboreal toads: *R. tacana* and *R. manu*, data are presented below. Measurements of the collected series (Centro de Ornitología y Biodiversidad = CORBIDI) of *R. tacana* are showed in Table 1.

One male (CORBIDI 09602) of *Rhinella manu* (Figure 1 A-B) was collected in a survey of the montane forests in Aendoshiari Native Community, Urubamba River Basin (12°49'3.28" S, 73°05'24.0" W, at 2,696 m a.s.l.), La Convencion Province, Cusco Department Peru on 24 August, 2011 by Germán Chávez, Diego Vásquez and Elvis Meza. The specimen has a visible tympanic membrane in contact with the parotid gland, a concave internarial area, webbing on feet well developed, webbing on hands and feet fleshy, tarsal fold absent, small keratinous spines on dorsal surface of body, dorsum gray and belly

reddish gray, all characteristics of this species (Chaparro *et al.* 2007). Remarkably, the coloration in life on flanks in CORBIDI 09602 is red and not dark like the color mentioned in the description of the holotype and the iris is reddish with fine black reticulations with a yellowish spot on the upper half. Until now *Rhinella manu* was restricted to a single locality inside Manu National Park, Cusco, Peru (Chaparro *et al.* 2007). With this record, we add a new range of distribution of *R. manu*, which is found in Kosñipata valley (type locality) and Urubamba River Basin (new locality), extending the known distribution by 235 km (airline) at northwestern from Kosñipata, which is outside of Manu National Park. The specimen was encountered on leaves, 30 cm above the ground between 19:00 h and 20:00 h, inside of a patch in a primary forest (Figure 2A). Other anuran species in the area include the marsupial frog *Gastrotheca nebulanastes* Duellman, Catenazzi and Blackburn, 2011 (Hemiphractidae) and the rain frog *Pristimantis rhabdolaemus* (Duellman, 1978) (Craugastoridae). Surrounding areas are strongly affected by deforestation which are used for agriculture and wood exploitation.

Eight adult males (CORBIDI 08116-18, 081120-21, 08123-25) and two adult females (CORBIDI 08119, 08122) of *Rhinella tacana* were collected in a survey of the montane forest in Poyentimari Native Community, Urubamba River Basin (12°12'47" S, 73°00'33" W, at 1,080 m a.s.l.), La Convencion Province, Cusco Region, Peru on 25 November, 2010 by Germán Chávez, Diego Vásquez and Elvis Meza (Figure 1 C-D). The specimens have a distinct and oval tympanum not in contact with the parotid gland, canthus rostralis sharp, enlarged and elevated red warts, a dorsolateral row of elevated warts, webbing on hands and feet fleshy, dorsum pale brown, belly cream with brown reticulations, iris olive green and lack of tarsal fold, all characteristics of the species (Padial *et al.* 2006). Furthermore, fine black reticulations are present in the iris and are not in contact with the

pupils. *Rhinella tacana* was restricted to Serranía Eslabon, in Madidi National Park, Bolivia (Padial *et al.* 2006), the distribution range is extended by 582 km (airline) at northwestern from the original distribution. Specimens were found on leaves, 30 cm above the ground, close to a stream in a primary forest (Figure 2B), between 20:15 h and 20:30 h, and were sympatric with *Ameerega macero* (Rodríguez and Myers, 1993) (Dendrobatidae), *Atelopus loettersi* De la Riva, Castroviejo-Fisher, Chaparro, Boistel and Padial, 2011 (Bufonidae), *Hyalinobatrachium bergeri* (Cannatella, 1980) (Centrolenidae) and *Pristimantis reichlei* Padial and De la Riva, 2009 (Craugastoridae).

The range of distribution presented in this study, involve important data for conservation of both arboreal toads. *Rhinella manu* originally on his type locality was found inside of a natural protected area (Manu National Park) and is considered by the IUCN red list as Vulnerable because its extent of occurrence is calculated to be less than 20,000 km² (Chaparro 2008). The present study extends the range of extension, not exceeding the 20,000 km². However, a medium sized distribution range suggests that *R. manu* could be occurring in other locations between Urubamba River Basin and Kosñipata Valley. The

new locality for *R. manu* is close to Apurimac River Valley, a place where the senior author has carried out several field surveys between 2010 and 2011, resulting that the qualitative richness of anurans from that valley is similar, also the altitude which is similar to the montane forests in Aendoshiari Native Community. Then it would be not a surprise if *R. manu* is found in the Apurimac River Valley. Nevertheless, more field work efforts are necessary to confirm this hypothesis. In the case of *R. tacana*, this is the first country record for Peru. We also mention that exist other new records for Urubamba River Basin (Chávez, unpublished data), however this information is not available for publication because of work contract policies. The IUCN redlist categorize *R. tacana* as Data Deficient (DD), although the information available could be major if all data about anuran records from Peru are publish. Despite this, we think the records presented here are an important contribution to the knowledge of both species of arboreal toads, and probably in a near future will be used as a tool for their conservation. As a consequence, more field work efforts in southern Peru which include montane forests could offer better clues about the distribution and conservation of these species.



FIGURE 1. A. Dorsal and B. Ventral views of *Rhinella manu* (CORBIDI 09602, SVL 30.6 mm); C. Dorsal and D. Ventral views of *Rhinella tacana* (CORBIDI 08119, SVL 33.4 mm).



FIGURE 2. Habitats of A. *Rhinella manu* in Aendoshiari Native Community and B. *Rhinella tacana* in Poyentimari Native Community, Cusco department, Peru.

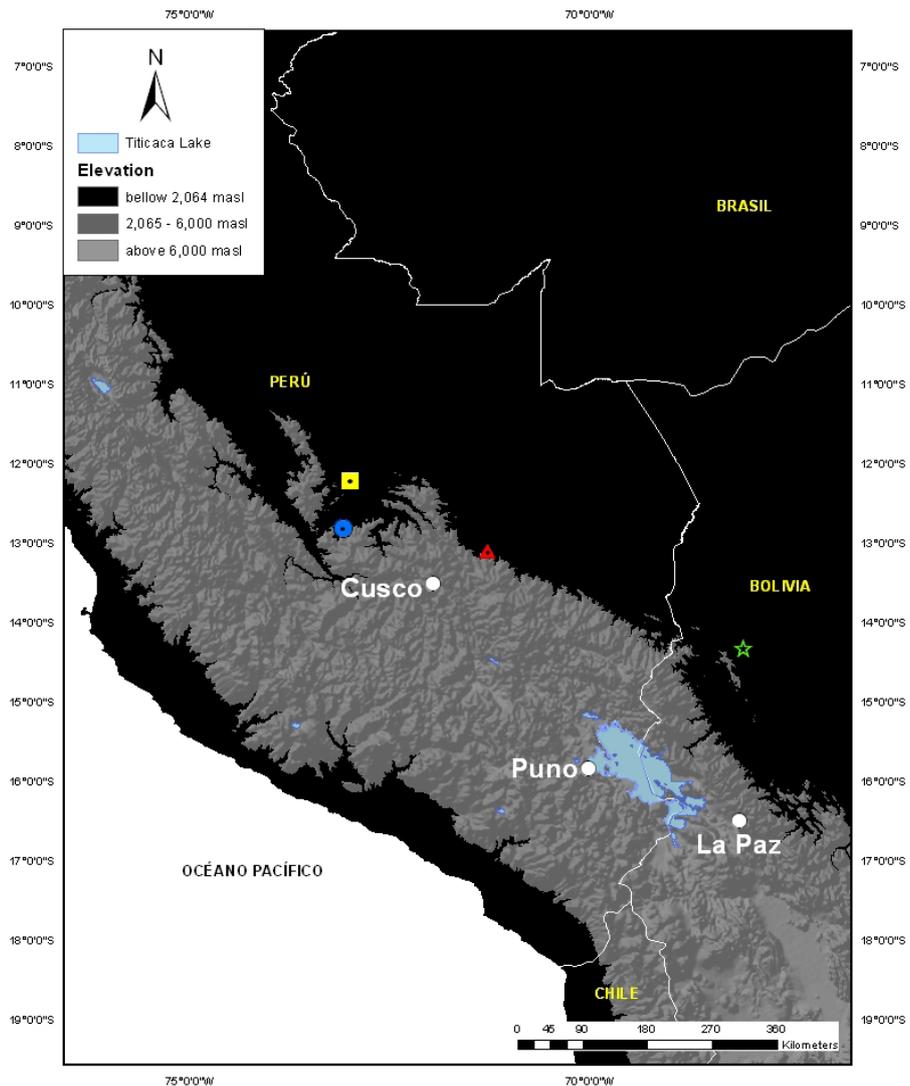


FIGURE 3. Map of southern Peru and western Bolivia showing the type localities of *Rhinella manu* (red triangle) and *Rhinella tacana* (green star) and the new localities for *R. manu* (blue circle) and *R. tacana* (yellow square).

TABLE 1. Measurements (in mm) of the specimens of *Rhinella tacana* collected in Poyentimari Native community, Cusco department, Peru. SVL = snout-vent length; HL = head length (from posterior margin of the lower jaw to tip of snout); HW = head width; EW = upper eyelid width; ED = eye diameter (measured horizontally); IOD = interorbital distance (distance between upper eyelids); IND = distance between narines; TYH = tympanic membrane height; TYL = tympanic membrane length; TL = tibia length; TH = thigh length; FL = food length.

	MALES (N=8)	FEMALES (N=2)
SVL	16.89 - 27.96 (21.98 ± 3.6)	25.18 - 30.79 (27.98 ± 3.96)
HL	6.11 - 8.49 (7.24 ± 0.88)	8.96 - 9.86 (9.41 ± 0.63)
HW	6.31 - 8.36 (7.21 ± 0.72)	8.74 - 9.52 (9.13 ± 0.55)
EW	1.52 - 2.26 (1.80 ± 0.27)	2.49 - 2.56 (2.52 ± 0.04)
ED	2.03 - 3.00 (2.51 ± 0.30)	3.14 - 3.32 (3.23 ± 0.12)
IOD	2.93 - 3.97 (3.48 ± 0.39)	4.18 - 4.49 (4.33 ± 0.21)
IND	1.38 - 2.07 (1.78 ± 0.26)	2.22 - 2.35 (2.28 ± 0.09)
TYH	1.1 - 2.1 (1.57 ± 0.34)	1.71 - 2.02 (1.86 ± 0.21)
TYL	0.89 - 1.86 (1.30 ± 0.28)	1.65 - 1.72 (1.68 ± 0.04)
TL	7.21 - 10.34 (9.06 ± 1.33)	10.87 - 12.99 (11.93 ± 1.49)
TH	7.66 - 10.69 (9.54 ± 1.33)	11.17 - 13.12 (12.14 ± 1.37)
FL	7.49 - 12.41 (9.44 ± 1.74)	11.68 - 13.80 (12.74 ± 1.49)
HW/HL	0.95 - 1.04 (0.99 ± 0.02)	0.96 - 0.97 (0.97 ± 0.00)
HW/SVL	0.29 - 0.37 (0.33 ± 0.02)	0.30 - 0.34 (0.32 ± 0.02)
HL/SVL	0.30 - 0.36 (0.33 ± 0.02)	0.32 - 0.35 (0.33 ± 0.02)
TL/SVL	0.36 - 0.43 (0.41 ± 0.02)	0.42 - 0.43 (0.42 ± 0.00)
FL/SVL	0.39 - 0.44 (0.42 ± 0.01)	0.44 - 0.46 (0.45 ± 0.01)

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