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A new locality for the Critically Endangered *Atelopus peruensis* (Anura: Bufonidae) in an inter-Andean valley from Áncash, Peru

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On a global scale, amphibians are the most endangered vertebrate group with nearly 41% of species threatened with extinction (Luedtke et al. 2023). Among them, harlequin toads from the genus *Atelopus* are considered one of the most imperiled genera, with approximately 93% of the species under some IUCN threat category (Lötters et al. 2023). The genus is endemic to the Neotropical region, where its species have undergone drastic population declines mainly due to chytridiomycosis, a disease caused by the fungus *Batrachochytrium dendrobatidis* (*Bd*) (La Marca et al. 2005, Catenazzi & von May 2014, Scheele et al. 2019). Montane *Atelopus* species are highly susceptible to *Bd* infection (Lips et al. 2008, Lötters et al. 2023).

Additionally, because of their ecology and life history traits such as high site fidelity, small home ranges and a strong association with streams (Dole & Durant 1964, Starrett 1967, Crump 1986, Lindquist & Hetherington 1998, Luger et al. 2009), they are susceptible to different anthropogenic threats such as agricultural expansion or mining, which cause the loss or degradation of their habitat (Valencia & Marin da Fonte 2021). Furthermore, climate change may become an important driver of further declines in the near future and exacerbate other threats affecting *Atelopus* populations, including infectious diseases and habitat degradation (Lötters et al. 2023, Luedtke et al. 2023). Overall, *Atelopus* species constitute a high-risk group that requires special attention in conservation planning (Lötters et al. 2023).

In Peru, the genus *Atelopus* is represented by 21 described species mainly distributed in montane and premontane habitats (Lötters et al. 2025, Frost 2026). Of these, nine species are currently classified as Critically Endangered (CR), four as Endangered (EN), one as Vulnerable (VU), one as Near Threatened (NT), two as Least Concern, three as Data Deficient (DD) and one has not yet been evaluated (IUCN, 2025). The species with the largest distribution and broadest elevational range (from 2600 m a.s.l. up to 4300 m a.s.l), *A. peruensis* Gray & Cannatella, 1985, is classified as Critically Endangered (Possibly Extinct) (IUCN SSC Amphibian Specialist Group 2018).

Atelopus peruensis has been reported from inter Andean valleys in northern Peru. The type locality corresponds to Abra Comulica – probably misspelled from Abra Comullca – approximately 54 km southwest of the city of Celendín (Gray & Cannatella 1985) (Fig. 1). There, it inhabits subpuna areas covered with scattered bunch grass or "ichu" and *Baccharis* spp. (Gray & Cannatella, 1985). Historical records from Áncash Department are available from museum collections such as the University of Kansas (KU), National Museum of Natural History of the Smithsonian Institution (NMNH) – accessible online through the Global Biodiversity Information Facility (GBIF Occurrence, https://doi.org/10.15468/dl.s7sqhb, accessed 3 February 2026) – and Museo de Historia Natural, Universidad Nacional Mayor de San Marcos (MUSM, Appendix) (Fig. 1). It has been recorded inside Huascarán National Park and is also suggested to

occur in Calipuy National Reserve and Calipuy National Sanctuary (IUCN SSC Amphibian Specialist Group. 2018); however, precise georeferenced locality data are lacking.

Although once relatively common, *A. peruensis* has not been recorded since 1998 in Cajamarca and Celendín provinces (Cajamarca Department), despite increased sampling efforts (von May et al. 2008, Lötters et al. 2005). Likewise, sampling conducted in Áncash Department between 2002 and 2007 failed to locate individuals (von May et al. 2008). Nonetheless, the species was recorded in Áncash Department in 2012 (Lötters et al. 2023), although precise locality data for this record are not available.

As well as in other *Atelopus* species in Peru, *Bd* infection is considered a likely driver of the abrupt population decline in *A. peruensis* (Lötters et al. 2005, Catenazzi & von May 2014). In 1999, the fungus was detected on the skin of recently deceased and dying individuals of *A. patazensis* Venegas, Catenazzi, Siu-Ting & Carrillo, 2008 (Venegas et al. 2008). Venegas et al. (2008) suggested its presence could explain the severe population reduction in other species like *A. peruensis* and *A. pachydermus* (Schmidt, 1857).

After 12 years since its last confirmed record, on 23 November 2024 at approximately 19:00 h, an individual of *A. peruensis* was located next to an irrigation canal in Atojpampa, Huayllán District, Pomabamba Province, Áncash Department, Peru. Subsequently, on 18 January 2026 at approximately 17:50 h, a second individual was traced near the site of the first observation. Both encounters occurred at around 2900 m a.s.l. (exact coordinates are not provided to protect the population). The observations occurred shortly after heavy rain and individuals were actively moving along the canal. The new locality is located approximately 220 km SE from the type locality and 55 km

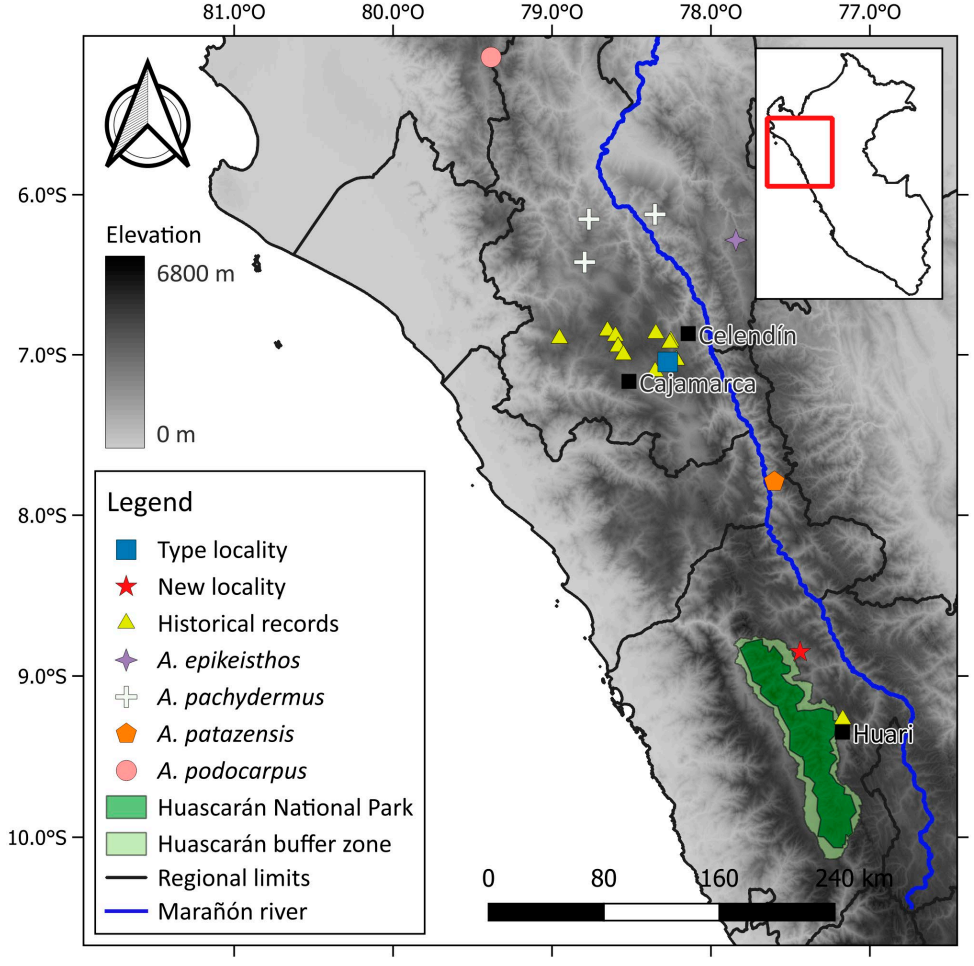

Figure 1. Distribution of *Atelopus peruensis* and morphologically similar species in northern Peru. Yellow triangles indicate historical records of *Atelopus peruensis* (1969–1994) obtained from GBIF, including specimens from KU and NMNH. The blue square represents the type locality and the red star shows the newly reported locality in Atojpampa, Áncash Department. A purple four-point star indicates the type locality of *A. epikeisthos*. White crosses indicate known localities of *A. pachydermus*, including its type locality. The orange pentagon indicates the type locality of *A. patazensis*. A pink circle indicates the known Peruvian locality for *A. podocarpus*. Black squares indicate cities mentioned in the literature near historical records for reference. The extent of Huascarán National Park and its buffer zone, as well as Marañón River are shown for context.

NW from the southernmost historical record, near Huari (Fig. 1). No individuals were collected.

Both individuals matched the descriptions of *A. peruensis* in the literature (Gray & Cannatella, 1985) and were consistent with specimens examined from the herpetological collection of MUSM (Appendix). Moreover, no other species of *Atelopus* has been recorded from the Áncash Department, which makes the identification more reliable. In both individuals, the dorsum was green with irregular black markings and white dots on the flanks (Fig. 2). Even though the green coloration is less evident in the second specimen (Fig. 2), this color pattern is absent in other morphologically similar species from northern Peru like *A. eusebiodiazi* Venegas, Catenazzi, Siu-Ting & Carrillo, 2008, *A. patazensis*, *A. pachydermus*, *A. podocarpus* Coloma, Duellman, Almendáriz, Ron, Terán-Valdez & Guayasamin, 2010 and *A. epikeisthos* Lötters, Schulte & Duellman, 2005. For both individuals, the dorsal view from the snout was subacuminate (truncate in *A. patazensis*, rounded in *A. epikeisthos* and acuminate in *A. eusebiodiazi*, *A. pachydermus* and *A. podocarpus*). In addition, a wide dark stripe is present extended from the temporal region through the axilla to the inguinal region (absent in *A. epikeisthos*, *A. patazensis*, *A. podocarpus* and *A. eusebiodiazi*, and may be present – but without white dots – in *A. pachydermus*). The ventral sides were bright yellow (orange in *A. patazensis*, yellowish tan in *A. epikeisthos* and white – occasionally red or orange – in *A. pachydermus*) (Fig. 2).

The second individual of *Atelopus peruensis* presents a pattern that could superficially resemble *A. patazensis*. In fact, the distance between the newly reported locality is geographically closer to the type locality *of A patazensis* than to the type locality of *A. peruensis* (Fig. 1). However, after examining the holotype and paratopotypes of *A. patazensis* deposited at MUSM (Appendix), the second individual presents diagnostic characteristics consistent with *A. peruensis* rather than *A. patazensis*. In particular, none of the examined specimens of *A. patazensis* possesses a dark band on the flanks as wide as observed in *A. peruensis*, nor a band extending from the temporal region to the inguinal region. Furthermore, white dots on the flanks are absent in *A. patazensis* whereas the combination of a wide dark band and white dots on the flanks is characteristic of *A. peruensis*.

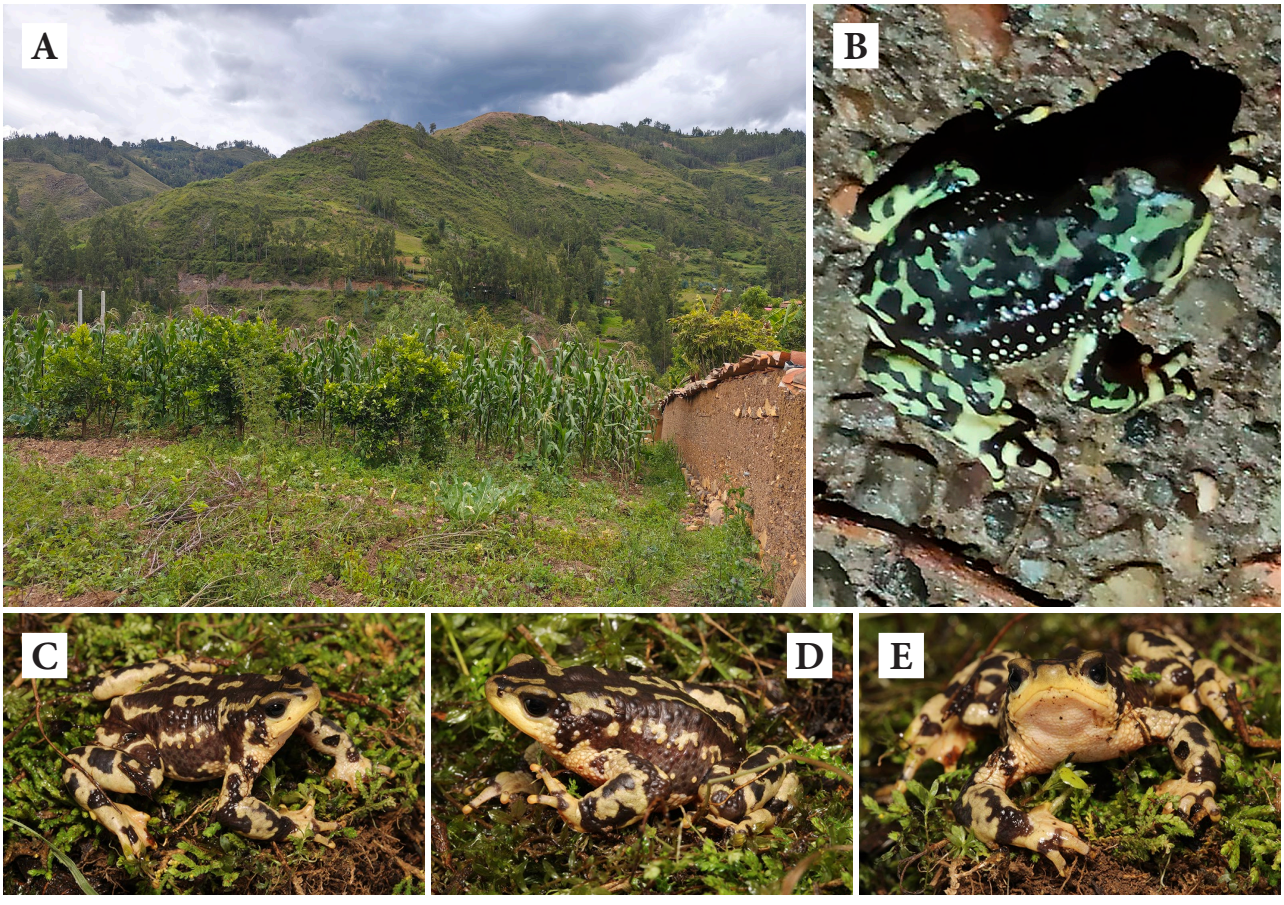

Figure 2. General view of the surrounding landscape of Atojpampa, Huayllán District, Pomabamba Province, Áncash Department (A). Dorsolateral view of *Atelopus peruensis* recorded on 23 November 2024 (B). Dorsolateral views of the right (C) and left (D) sides, and frontal view (E) of *A. peruensis* recorded on 18 January 2026. Photographs by José Escudero Guerrero (A), Haydee Guerrero Flores (B) and Carlos Vilca Alzamora (C, D, E).

Although the coloration of the second individual differs slightly from that of the type series of *A. peruensis*, variation in coloration and pattern is common in amphibians (Duellman & Trueb 1994, Wells 2007). These differences may occur across populations or even within individuals due to physiological color change or other ecological and evolutionary processes (Duellman & Trueb 1994, Wells 2007, Rudh & Qvarnström 2013). In addition, the Marañón River valley represents a well-known biogeographic barrier in northern Peru that separates Andean taxa occurring on different cordilleras in the Central Andes (Weigend 2002, Winger & Bates 2015). This geographic separation further supports that the individuals reported here correspond to *A. peruensis* rather than *A. patazensis*, as the Marañón River valley may act as an important geographic barrier for Andean amphibians (Fig. 1). Nevertheless, genetic data would be desirable to clarify the taxonomic status of populations from the Áncash Department.

Current threats for the newly discovered population of *Atelopus peruensis* still require a more detailed assessment. However, chytridiomycosis (*Bd*) as well as habitat loss and degradation might be the most relevant factors, similarly to other *Atelopus* species in Peru (von May et al. 2008, Aguilar et al. 2010, Catenazzi & von May 2014). Notably, the new records from Atojpampa ocurred near irrigation canals which cross streets, housing and agricultural areas. This highly modified habitat is an unexpected setting for a Critically Endangered species, raising hope that the species might be at least partially tolerant to anthropogenic impact. Small-scale agriculture, mainly corn and alfalfa cultivated for guinea pig farming is practiced in Atojpampa. Livestock farming is less common, but present. *Eucalyptus* plantations are widespread and have replaced native tree species such as *Polylepis* to some extent. However, according to locals, the use of pesticides in the area is minimal to almost non-existent, a practice that could allow the persistence of the species in the surrounding landscape. These observations suggest this population may tolerate habitat modification involving small-scale agriculture to a certain degree.

None of the currently known localities of *Atelopus peruensis* are located inside protected areas. Developing conservation plans for the species and implementing the recommendations proposed in the *Atelopus* Conservation Action Plan, ACAP (Valencia & Marin Da Fonte 2021), as well as updating information in official documents like Libro Rojo de Fauna Silvestre (SERFOR, 2018) should be considered high priority by national institutions such as Servicio Nacional Forestal y de Fauna Silvestre (SERFOR) and Ministerio del Ambiente (MINAM). Research aimed at population dynamics, *Bd* prevalence, and other ecological aspects like habitat preference is essential to build a robust framework to subsequently develop both in-situ and ex-situ conservation action (La Marca et al. 2005, Lötters et al. 2007, Lewis et al. 2019). Involving the local community through workshops and environmental education for different age groups should be considered for the long-term conservation of *A. peruensis* (Lötters et al. 2005, Lötters 2007, Aguilar et al. 2010, Valencia & Marin da Fonte 2021). Finally, the proximity of this new record to Huascarán National Park and its buffer zone (less than 6 km) suggests *A. peruensis* may still occur within this protected area (Fig. 1). Therefore, targeted sampling efforts inside park boundaries and its buffer zone are strongly recommended. The discovery of this population raises hope for the persistence and conservation of this emblematic species in Peru and highlights the importance of extended surveys in these poorly explored Andean regions.

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Appendix

Examined specimens from the MUSM Herpetology Department

Atelopus peruensis: Peru: Cajamarca Department: Celendín Province: Celendín District: MUSM 1913–1919 (paratopotypes), Cajamarca Department: San Miguel Province: Hacienda Taulis: MUSM 13602–13603, Cajamarca Department: Cajamarca Province: Cumbemayo: MUSM 13813–13816, Cajamarca Department: Cajabamba Province: Cachachi District: MUSM 17785, 17791–17793, Cajamarca Department: Cajamarca Province: 20 km NE from La Encañada: Cordillera Kunulka MUSM 1904–1912, Cajamarca Department: 28 km NW from Cajamarca: MUSM 6013–6018, Cajamarca Department: Santa Cruz Province: Quebrada Ojos: MUSM 38304, Áncash Department: Corongo Province: Yanac District: MUSM 13604–13606, Áncash Department: Antonio Raimondi Province: Aczo District: Yuracyacu: Molino de Lunahuatun: MUSM 1920–1929, Áncash Department: Antonio Raimondi Province: MUSM 5680, Áncash Department: Huari Province: Charco MUSM 6596–6610.

Atelopus patazensis: Peru: La Libertad Department: Pataz Province: Pataz District: Quebrada Los Alisos: MUSM 15893–15896, 21183–21185, 23108, 7475, 7476 (holotype and paratopotypes).