NEW ELEUTHERODACTYLINE FROGS (LEPTODACTYLIDAE: *PRISTIMANTIS, PHRYNOPUS*) FROM PERU

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ABSTRACT. Four new species of *Pristimantis* and three new species of *Phrynopus* are described from Peru. Two of the new species of *Pristimantis* are assigned to the *orestes* species Group, one to the *conspicillatus* Group, and one to the *unistrigatus* Group. Three of the new species of *Pristimantis* were obtained from the Cordillera de Vilcabamba in southern Peru, which is known for high biological diversity and endemism. One of the new species from the Vilcabamba region belongs to the *orestes* species Group and is separated by approximately 600 km (straight-line) from proximate known species of the group (*Pristimantis cordovae*) in northern Peru. This new species is the only one of *Pristimantis* attaining an elevation of 3,350 m in southern Peru. Two of the new species of *Phrynopus* are from central Peru, lack a tympanum, and have previously been confused with *P. montium*; the third species of *Phrynopus* is described from the Departamento de Ayacucho in southern Peru. *Pristimantis pharangobates* is excluded from the synonymy of *P. rhabdolaemus* and considered to be a valid species. Currently, 126 species of eleutherodactyline frogs (*Oreobates, Pristimantis, Phrynopus,* and *Phyllonastes*) are known from Peru, representing about 30% of the Peruvian anuran fauna.

RESUMEN. Cuatro especies nuevas de *Pristimantis* y tres especies nuevas de *Phrynopus* se describen para Perú. Dos de las nuevas especies de *Pristimantis* se asignan al Grupo de especies *orestes,* uno al Grupo *conspicillatus,* y uno al Grupo *unistrigatus.* Tres de las nuevas especies de *Pristimantis* fueron obtenidos de la Cordillera de Vilcabamba al sur de Perú que es conocida por su alta diversidad biológica y endemismo. Una de las especies nuevas de la región de Vilcabamba pertenece al Grupo de especies *orestes* y está separada por aproximadamente 600 Km. (línea aérea) de la especie más próxima y conocida del grupo al norte de Perú (*Pristimantis cordovae*). Esta especie nueva es la única especie de *Pristimantis* que alcanza una elevación de 3,350 m al sur de Perú. Dos de las nuevas especies de *Phrynopus* son del Perú central, carecen de tímpano y han sido previamente confundidas con *P. montium*; la tercera especie de *Phrynopus* se describe para el Departamento de Ayacucho al sur de Perú. *Pristimantis pharangobates* se excluye de la sinonímia de *P. rhabdolaemus* y es considerada como especie válida. Actualmente, 126 especies de ranas eleutherodactylinas (*Oreobates, Pristimantis, Phrynopus,* y *Phyllonastes*) se conocen para Perú y representan alrededor del 30% de la fauna de anuros peruana.

INTRODUCTION

During the last decade, numerous expeditions to remote Andean regions in Peru assessed the anuran diversity in cloud forests and puna habitats. Fieldwork resulted in the discovery of 32 new species of *Pristimantis* (formerly *Eleutherodactylus*) (Duellman and Hedges, 2005; Duellman and Lehr, 2007; Duellman et al., 2006; Duellman and Pramuk, 1999; Lehr, 2005; Lehr et al., 2004a, 2006, 2007), one *Phyllonastes* (Lehr et al., 2004b), and 11 *Phrynopus* (Duellman, 2000; Lehr, 2001, 2006; Lehr and Aguilar, 2002, 2003; Lehr et al., 2000, 2002, 2005). Other publications focused on the validity of some species of *Phrynopus* and their generic assignment; this led to new combinations and synonymies (Lehr, 2005, 2006; Lehr and Aguilar, 2006; Lehr et al., 2005) and the discovery of a new genus of microhylid (Lehr, 2006). Currently, 126 species of eleutherodactyline frogs (*Oreobates, Pristimantis, Phrynopus,* and *Phyllonastes*) are known from Peru, which is about 30% of the Peruvian anuran fauna (406, updated from AmphibiaWeb, 2006).

During a research project on eleuther-

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odactyline frogs from Peru, major herpetological collections in the USA, Germany, and Peru were visited. Examination of the material revealed numerous new species, several of which have been described (Duellman and Lehr, 2007). Four new species of *Pristimantis* and three new species of *Phrynopus* are described herein.

MATERIALS AND METHODS

Taxonomy of *Eleutherodactylus* follows Heinicke et al. (2007), whose recent phylogenetic studies of *Eleutherodactylus* led to the recognition of three clades: a Caribbean clade (*Eleutherodactylus*), a Middle American clade (*Craugastor*), and a major South American clade (*Pristimantis*). Familial placement of *Phrynopus* and *Pristimantis* will be changed in the near future (Duellman, personal communication); therefore, I hesitate in following Frost et al. (2006). For general critics concerning Frost et al. (2006), see Wiens (2007), or with respect to *Eleutherodactylus,* see Duellman and Lehr (2007). Because of morphological similarities between *Phrynopus* and *Pristimantis,* the format for the description follows that of Lynch and Duellman (1997) for *Pristimantis,* except that the term "dentigerous processes of vomers" is used instead of "vomerine odontophores" (Duellman et al., 2006). Forefeet and hind feet of *Phrynopus* specimens were x-rayed to verify generic placement (terminal phalanges T-shaped in *Pristimantis* compared with knob-shaped in *Phrynopus*). I follow the definition of conditions of the tympanum by Lynch and Duellman (1997). Specimens were dissected to determine the sex and maturity, and the otic region was dissected to determine the condition of the tympanic annulus. Measurements taken with digital calipers and rounded to the nearest 0.1 mm are: snout–vent length (SVL), tibia length (TL), foot length (FL, distance from proximal margin of inner metatarsal tubercle to tip of toe IV), head length (HL, from angle of jaw to tip of snout), head width (HW, at level of angle of jaw), eye diameter (ED), tympanum diameter (TY), interorbital distance (IOD), upper eyelid width (EW), internarial distance (IND), and eye–nostril distance (E–N, straight-line distance between anterior corner of orbit and posterior margin of external nares). Comparative lengths of toes III and V were determined by adpressing both toes against toe IV; lengths of forelimb toes (fingers) I and II were determined by adpressing the fingers against each other. All drawings were made by the author with the use of a stereomicroscope with drawing tube attachment. Photographs taken by P. Lehr were used for descriptions of coloration in life. Global Gazetteer Version 2.1 (Falling Rain Genomics, Inc.) was used to georeference the locality of Rapi. Specimens collected by the author were preserved by injecting a mixture of (5:1,000) 40% formalin and 96% ethanol and were stored in 70% ethanol and deposited in the herpetological collections at the Museo de Historia Natural Universidad Nacional Mayor de San Marcos (MHNSM) in Lima, Peru, and at the Museum für Tierkunde Dresden (MTD), Germany. Codes for other museum collections are those of Leviton et al. (1985). For specimens examined, see the Appendix.

RESULTS

Pristimantis chimu sp. nov.
Map 1, Figures 1–2

Holotype. MCZ 136071 (Fig. 1), an adult female, from 2–3 km NW (straight-line) El Pargo (Llama-Huambos Road) 3,000–3,100 m, Departamento de Cajamarca, Peru, collected by J. P. Cadle on 12 August 1994.

Paratypes. Fifteen adult females (MCZ 136060–72, 136074–76), two adult males (MCZ 136073, 136077) all collected with the holotype by J. P. Cadle on 12 August 1994.

Diagnosis. A member of the *Pristimantis orestes* Group having the following combination of characters: (1) skin on dor-

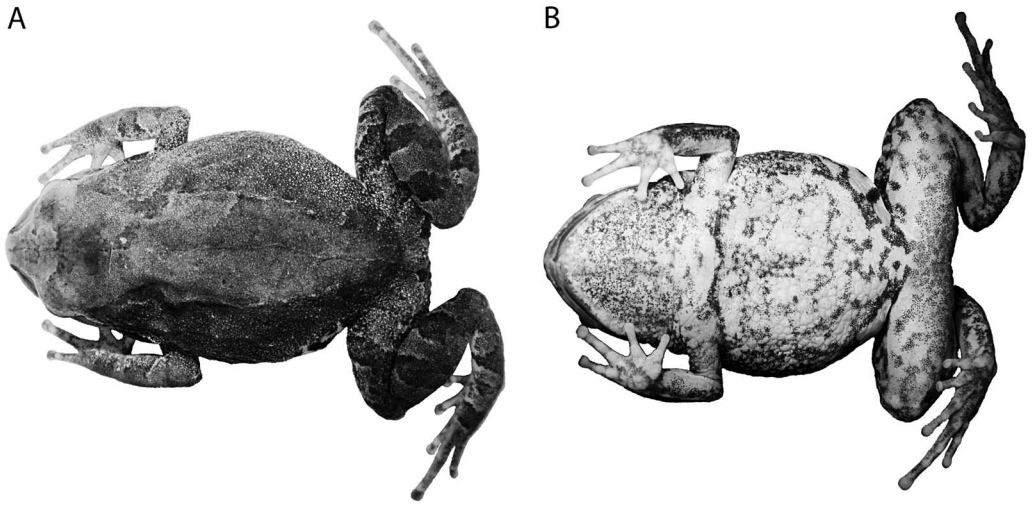


Figure 1. Dorsal (A) and ventral (B) views of *Pristimantis chimu* (MCZ 136071, holotype, SVL 24.6 mm).

sum shagreen with small scattered tubercles; weak, discontinuous dorsolateral fold present; skin on venter areolate; discoidal fold present; (2) tympanic membrane and tympanic annulus present; upper and posterolateral margin slightly concealed by supratympanic fold; (3) snout moderate, rounded in dorsal and lateral views; (4) upper eyelid with small tubercles; upper eyelid width narrower than IOD; low cranial crests present; (5) dentigerous processes of vomers prominent, ovoid, narrowly separated; each process bearing 4–7 teeth; (6) males lacking vocal sac, vocal slits, and nuptial pads; (7) finger I shorter than finger II; discs on outer fingers narrow, rounded; (8) fingers with narrow lateral fringes; (9) ulnar tubercles coalesced into short fold; tarsal tubercles present; (10) heel with small tubercles; inner tarsal fold present; (11) inner metatarsal tubercle elongate, narrow, twice the size of ovoid outer metatarsal tubercle, elevated, slightly conical in lateral view; diffuse, low supernumerary plantar tubercles present; (12) toes with narrow lateral fringes; toe webbing absent; toe V slightly longer than toe III; toe discs slightly larger than discs on fingers, rounded; (13) in ethanol, dorsum pale grayish brown with diffuse brown flecks; venter tan and dark brown mottled; groin white with dark brown blotches; iris dark gray; (14) SVL in females 22.6–25.7 mm (n = 16), in males 19.4–20.5 mm (n = 2).

Pristimantis chimu is readily distinguished from the other 12 species (except for *P. seorsus*) currently assigned to the *P. orestes* Group (Duellman et al., 2006; Lehr and Duellman, 2007; this paper) by having weakly developed cranial crests. *Pristimantis chimu* and *P. seorsus* both have low cranial crests, but *P. chimu* differs by having prominent dentigerous processes of vomers (minute in *P. seorsus*) and the tympanum distinct externally (tympanum visible beneath skin in *P. seorsus*). Three other species (*P. cordovae, P. ventriguttatus,* and *P. vidua*) of the *P. orestes* Group have dorsolateral folds and dentigerous processes of vomers. *Pristimantis chimu* differs from them by having vocal slits in males. Furthermore, *P. chimu* differs from *P. cordovae* in having finger and toe discs rounded (emarginate in *P. cordovae*), venter mottled tan and brown (brown with tan blotches and spots in *P. ventriguttatus*), and groin white with dark brown blotches (no white and dark brown). Besides *P. chimu* and *P. ventri-*

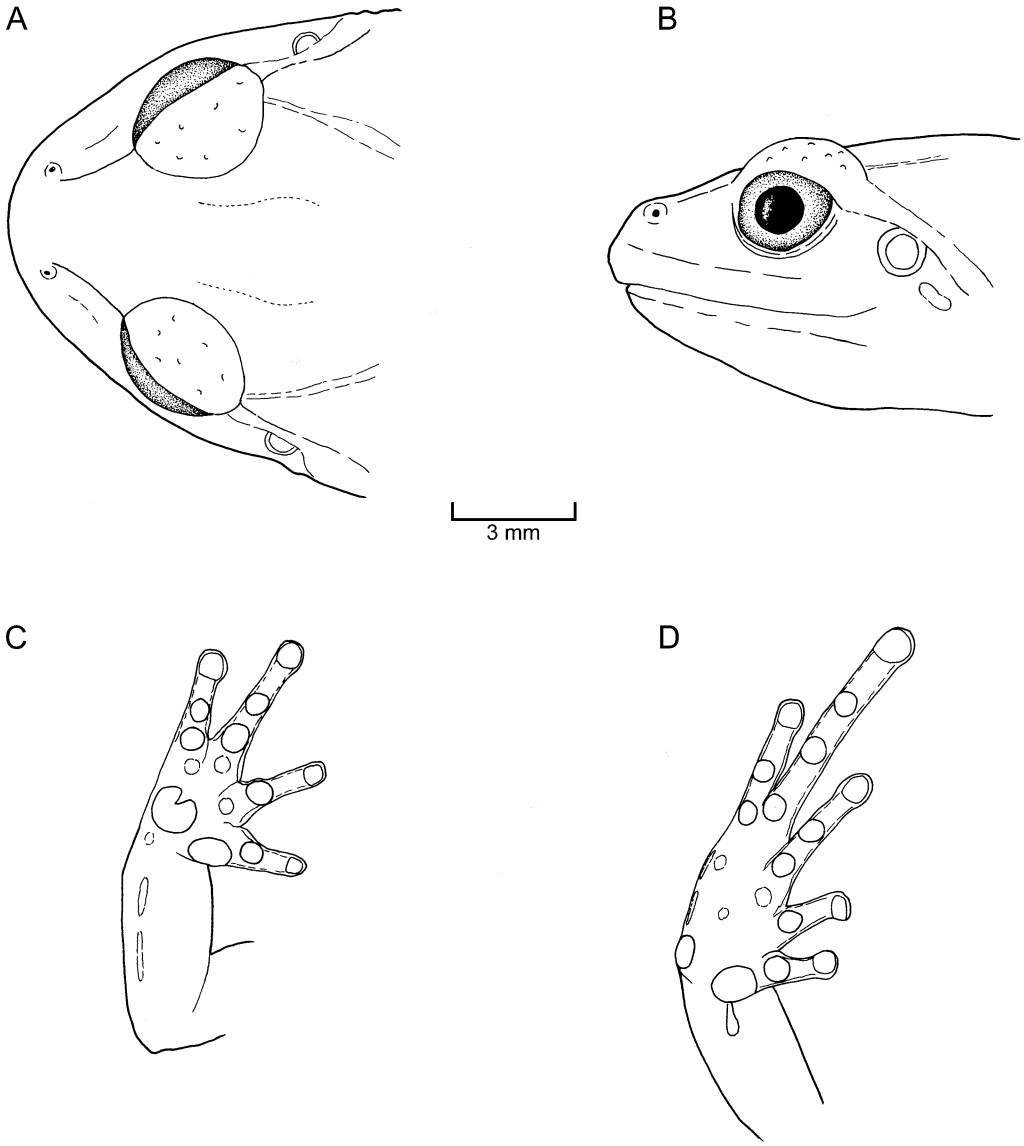
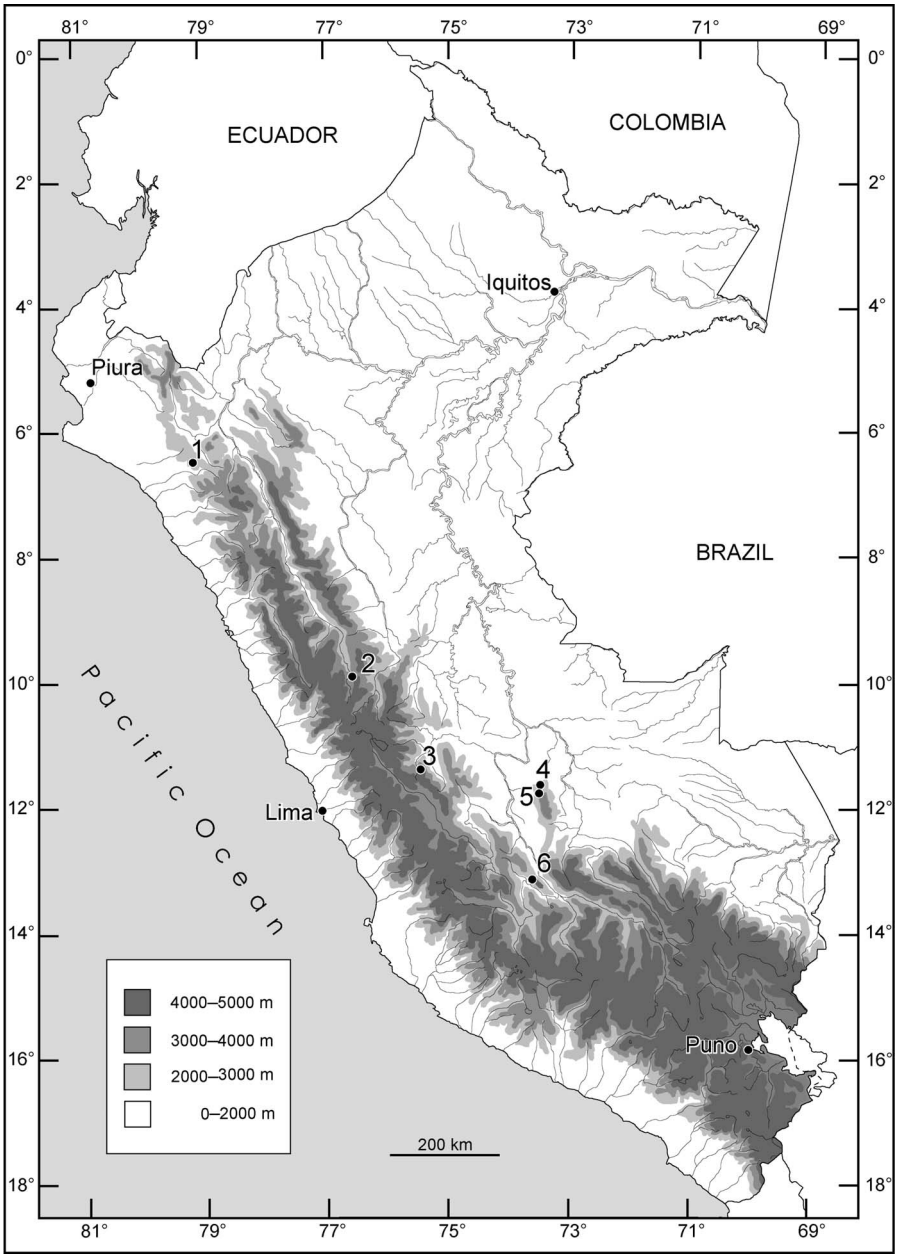


Figure 2. Dorsal (A) and lateral (B) views of head and ventral views of forefoot (C) and hind foot (D) of *Pristimantis chimu* (MCZ 136071).

guttatus, two other species of the *P. orestes* Group (*P. pinguis* and *P. simonsii*) are known from the Cordillera Occidental in Departamento de Cajamarca. *Pristimantis chimu, P. pinguis,* and *P. simonsii* are the only species of the *orestes* Group having the ulnar tubercles coalesced into a low fold. *Pristimantis chimu* differs from all in being smaller (maximum SVL to 25.7 mm vs. 29.8 mm in *P. pinguis* [Duellman and Pramuk, 1999], 33.3 mm in *P. simonsii*). Furthermore, *P. chimu* has a tympanum (absent in *P. simonsii*), discs with discernable circumferential groves (not discern-



Map 1. Type localities of the new species: 1 = *Pristimantis chimu,* 2 = *Phrynopus kotosh,* 3 = *Pristimantis oblivius,* 4 = *Pristimantis tanyrhynchus,* 5 = *Pristimantis seorsus* and *Pristimantis vilcabambae,* 6 = *Phrynopus ayacucho.* See text for further details on distribution.

able in *P. simonsii*), and narrow discs (broad in *P. pinguis*).

Description of the Holotype. Head slightly narrower than body and slightly wider than long; head width 37.4% of SVL; head length 33.3% of SVL; low cranial crest along lateral and posterior edges of frontoparietal; snout moderate, rounded in dorsal and lateral views (Figs. 2A, B); eye diameter 109.1% of eye–nostril distance; nostrils slightly protuberant, directed laterally; canthus rostralis nearly straight in dorsal view, angular in profile; loreal region weakly concave; lips rounded; upper eyelid bearing small tubercles; upper eyelid width 64.5% of IOD; weak postocular folds present; narrow, long supratympanic fold extending from posterior edge of upper eyelid diagonally to insertion of forelimb; tympanic annulus round, its upper and posterolateral part obscured by supratympanic fold, tympanum diameter 37.5% of eye diameter, tympanum–eye distance about 1.5× tympanum diameter; postrictal tubercles coalesced into a short ridge on both sides of head. Choanae small, ovoid, not concealed by palatal shelf of maxilla; dentigerous processes of vomers prominent, ovoid, narrowly separated medially, situated posteromedial to choanae, each process bearing approximately 10 teeth in a clump; tongue 1.8× as long as wide (7.2 mm long; 4.0 mm wide), slightly notched posteriorly, posterior two-thirds free.

Skin on dorsum shagreen with small scattered tubercles, more densely at its posterior end; weak dorsolateral fold present, discontinuous toward its posterior end; skin on flanks tuberculate, tubercles coalesced into an irregularly shaped ridge on each side of body extending from area above forelimb insertion to mid of body; skin on thighs, belly, chest, and throat areolate, skin on other ventral surfaces smooth; discoidal fold weak, more prominent as thoracic fold; cloacal sheath short; cloacal region laterally and ventrally encircled by slightly larger tubercles. Ulnar tubercles coalesced into slightly discontinuous fold, covering two-thirds of outer edge of each forelimb; palmar tubercles low, outer palmar tubercle bifid, approximately 2× the size of ovoid, inner palmar tubercle; subarticular tubercles well defined, round in ventral and lateral views; supernumerary tubercles at base of fingers round, low, approximately half size of subarticular tubercles; fingers with weak lateral fringes, most prominent on basis of fingers; finger I shorter than finger II; discs on fingers narrow, slightly larger than digit proximal to it; discs round weakly truncate; ventral pads of fingers well defined by circumferential grooves (Fig. 2C).

Hind limbs relatively short, tibia length 37.0% of SVL; foot length 37.0% of SVL; upper and posterior surfaces of hind limbs tuberculate; anterior and ventral surfaces of thighs areolate; no distinct tubercles on heel or on outer surface of tarsus; short tuberclelike tarsal fold; inner metatarsal tubercle elevated, ovoid, twice the size of ovoid outer metatarsal tubercle; few, diffuse plantar supernumerary tubercles; subarticular tubercles well defined, round in ventral view, subconical in lateral view; toes with narrow lateral fringes; outer surface of both feet with a discontinuous ridge; basal webbing absent; discs about equal to those on fingers, most prominent on toe IV; discs round, weakly truncate; toes having ventral pads well defined by circumferential grooves; relative lengths of toes: $1 < 2 < 3 < 5 < 4$ (Fig. 2D); toe V slightly longer than toe III (disc on toe III and on toe V not reaching distal subarticular tubercle on toe IV).

Measurements (in mm) of holotype: SVL 24.6; tibia length 9.1; foot length 9.1; head length 8.2; head width 9.2; eye diameter 2.4; tympanum diameter 0.9; IOD 3.1; upper eyelid width 2.0; internarial distance 2.1; eye–nostril distance 2.2.

Coloration of Holotype in Preservative. Dorsum grayish brown; head dorsally pale gray with an irregularly shaped dark brown interorbital stripe; dorsolateral folds pale gray; lower forelimb with diffuse dark brown blotches; hind limbs with three in-

TABLE 1. MEASUREMENTS (MM) AND PROPORTIONS OF ADULT *PRISTIMANTIS CHIMU* AND *P. SEORSUS*; RANGE (MEAN ± 1 SD).

Character	*P. chimu*				*P. seorsus*		
	Females (n = 16)		Males (n = 2)		Female (n = 1)	Males (n = 3)	
SVL	22.6–25.7	(24.4 ± 0.9)	19.4–20.5	(20.0 ± 0.5)	20.9	17.6–19.4	(18.4 ± 0.8)
TL	9.1–9.9	(9.5 ± 0.2)	8.0–9.1	(8.6 ± 0.5)	9.1	7.9–8.0	(7.9 ± 0.0)
FL	8.8–10.0	(9.4 ± 0.4)	7.1–8.1	(7.6 ± 0.5)	9.3	7.8–8.4	(8.1 ± 0.2)
HL	8.1–10.2	(9.1 ± 0.6)	7.5–8.2	(7.9 ± 0.4)	8.3	7.0–7.7	(7.4 ± 0.3)
HW	8.8–10.7	(9.6 ± 0.5)	7.5–8.1	(7.8 ± 0.3)	9.1	7.3–7.6	(7.5 ± 0.1)
ED	2.0–2.5	(2.3 ± 0.2)	1.9–2.2	(2.1 ± 0.2)	2.2	1.9–2.0	(2.0 ± 0.0)
TY	0.8–1.3	(1.0 ± 0.1)	0.8–0.9	(0.9 ± 0.0)	—	—	
IOD	2.8–3.4	(3.0 ± 0.2)	2.5–2.6	(2.6 ± 0.1)	2.7	2.3–2.8	(2.5 ± 0.2)
EW	1.7–2.1	(2.0 ± 0.1)	1.8–1.8	(1.8 ± 0.0)	1.9	1.5–2.0	(1.7 ± 0.2)
IND	2.0–2.4	(2.2 ± 0.1)	1.8–1.9	(1.9 ± 0.0)	1.9	1.7–1.9	(1.8 ± 0.1)
E–N	2.0–2.4	(2.2 ± 0.1)	1.9–2.1	(2.0 ± 0.1)	2.3	1.8–1.9	(1.9 ± 0.0)
TL/SVL	0.37–0.42		0.41–0.44		0.44	0.41–0.45	
FL/SVL	0.37–0.41		0.37–0.40		0.44	0.43–0.47	
HL/SVL	0.33–0.40		0.39–0.40		0.40	0.40–0.41	
HW/SVL	0.37–0.42		0.39–0.40		0.44	0.39–0.41	
HW/HL	1.00–1.12		0.99–1.00		1.10	0.99–1.04	
E–N/ED	0.84–1.05		0.95–1.00		1.05	0.95	
EW/IOD	0.59–0.71		0.69–0.72		0.70	0.54–0.87	
TY/ED	0.38–0.57		0.41–0.42		—	—	

distinct, irregularly shaped dark brown transverse bars; dark brown canthal stripe; dark brown supratympanic fold bordered with a white stripe on each side; flanks colored as dorsum; axilla white; groin and anterior surfaces of thighs white with dark brown blotches; posterior surfaces of thighs brown with diffuse white mottling; concealed surface of shank, and inner half of tarsus white with dark brown blotches; ventral surfaces tan and brown mottled; iris dark gray.

Coloration of Holotype in Life. Unknown.

Variation. Dorsal coloration varies from gray to dark brown or gray with dark brown blotches. Six specimens (MCZ 136060, 136062–64, 136066–67) have narrow, tan middorsal stripes and a longitudinal tan stripe on the posterior surface of thighs. The coloration consisting of white and dark brown blotches in the groin is variable. Fifteen specimens have a white groin with dark brown blotches, whereas three specimens (MCZ 136064, 136074, 136076) have a dark brown groin with white blotches. All specimens have the ulnar tubercles coalesced into a fold. Dentigerous processes of vomers bear 5–10 teeth each. All specimens have low cranial crests; these are best developed in two females (MCZ 136071, 136075). See Table 1 for measurements and proportions.

Etymology. The specific name *chimu* refers to the pre-Colombian culture Chimú (A.D. 1250–1470); the Chimú people inhabited coastal areas and regions in the Cordillera Occidental in northern Peru.

Distribution and Ecology. Pristimantis chimu is known only from the type locality (Map 1). Nothing is known about its ecology.

Pristimantis seorsus sp. nov.
Map 1, Figures 3–4

Holotype. AMNH 153054 (Fig. 3), an adult female, from Cordillera de Vilcabamba, CI/RAP Expedition Camp One (11°39′36″S, 73°40′22″), 3,350 m, Provincia de Satipo, Departamento de Junín, Peru, collected by L. O. Rodríguez on 10 June 1997.

Paratypes. One female (AMNH 153055), two adult males (AMNH 153052–53) all col-

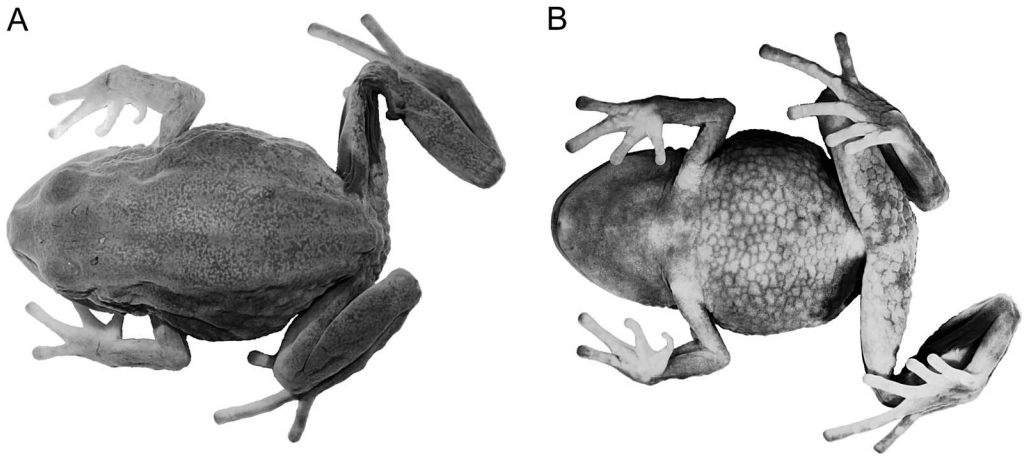


Figure 3. Dorsal (A) and ventral (B) views of *Pristimantis seorsus* (AMNH 153054, holotype, SVL 20.9 mm).

lected with the holotype by L. O. Rodríguez on 10 June 1997.

Diagnosis. A member of the *P. orestes* Group having the following combination of characters: (1) skin on dorsum shagreen with small tubercles; dorsolateral ridges forming discontinuous dorsolateral fold; skin on venter coarsely areolate; weak discoidal fold present; (2) tympanic membrane absent, tympanic annulus visible beneath skin; (3) snout moderate, with a horizontal keel at its tip; snout broadly rounded in dorsal view, rounded in lateral view; (4) upper eyelid with a short, longitudinal ridge at its posterior end contacting discontinuous dorsolateral fold; upper eyelid width narrower than IOD; low cranial crests present; (5) dentigerous processes of vomers minute, oblique, embedded in mucosa of mouth; (6) males with small vocal sac; vocal slits and nuptial pads absent; (7) finger I shorter than finger II; discs on outer fingers narrow, truncate; (8) fingers with broad lateral fringes; (9) ulnar with tubercles or short fold; outer tarsal tubercles forming ridges; (10) heel with a conical tubercle; long, inner tarsal fold present; (11) inner metatarsal tubercle ovoid, six times the size of elongate, narrow outer metatarsal tubercle; distinct supernumerary plantar tubercles present; (12) toes with broad lateral fringes; basal toe webbing present; toe V slightly longer than toe III; toe discs narrow, truncate, about the same size as discs on fingers; (13) in ethanol, dorsum pale grayish brown and dark gray mottled; venter tan and gray mottled; groin black with white blotches; (14) SVL in single female 20.9 mm, in males 17.6–19.4 mm (n = 3).

Pristimantis seorsus is the only species of *Pristimantis* currently known to occur above an elevation of 3,000 m in southern Peru. It is the southernmost member of the *P. orestes* Group and the only one known from the Cordillera Oriental; it is separated by approximately 600 km (straight-line) from proximate known species of the group (*Pristimantis cordovae*) in northern Peru. *Pristimantis seorsus* differs from all other members of the *P. orestes* Group in having a horizontal keel on the tip of the snout, a short, longitudinal ridge at the posterior end of the upper eyelid continuous with the dorsolateral fold, low cranial crests (except for *P. chimu*), and black groin with white blotches and black surfaces of posterior thighs and concealed surfaces of shanks. Four other species of the *P. orestes* Group have dorsolateral folds and dentigerous processes of vomers; these are *P. chimu, P. cordovae, P. ventriguttatus,* and *P. vidua. Pristimantis seorsus* differs from all of these, except

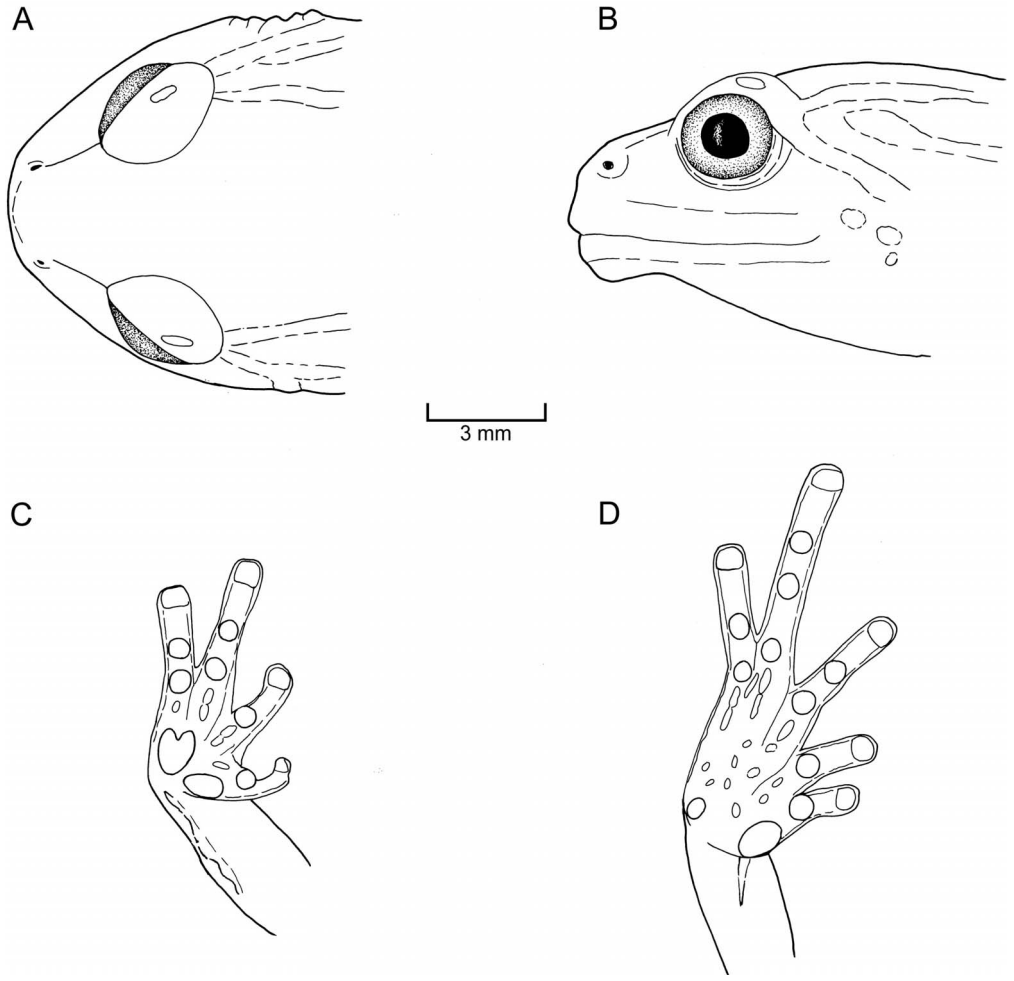


Figure 4. Dorsal (A) and lateral (B) views of head and ventral views of forefoot (C) and hind foot (D) of *Pristimantis seorsus* (AMNH 153054).

P. chimu, by males lacking vocal slits. *Pristimantis seorsus* and *P. chimu* both have low cranial crests, but *P. seorsus* differs by having minute dentigerous processes of vomers (prominent in *P. chimu*), and the tympanum visible beneath skin (tympanum distinct externally in *P. chimu*). *Pristimantis seorsus* shares with *P. chimu, P. pinguis,* and *P. simonsii* the presence of a low ulnar fold. *Pristimantis seorsus* differs from all of these by being smaller (SVL to 20.9 mm vs. 25.7 mm in *P. chimu,* 29.8 mm in *P. pinguis* [Duellman and Pramuk, 1999], 33.3 mm in *P. simonsii*).

Description of the Holotype. Head as broad as body, wider than long; head width 43.5% of SVL; head length 39.7% of SVL; low cranial crests present laterally on frontoparietal; snout moderate with a horizontal keel at its terminal end; snout broadly rounded in dorsal view, rounded in lateral view (Figs. 4A, B); eye diameter 95.7% of eye–nostril distance; nostrils slightly protuberant, directed laterally; canthus ros-

tralis straight in dorsal view, angular in profile; loreal region concave; lips rounded; upper eyelid bearing short, longitudinal ridge at its posterior end contacting dorsolateral fold; upper eyelid width 70.4% of IOD; narrow, long supratympanic fold extending from posterior edge of upper eyelid diagonally to insertion of forelimb; tympanic annulus visible beneath skin; two enlarged, conical postrictal tubercles present on both sides of head. Choanae small, ovoid, not concealed by palatal shelf of maxilla; dentigerous processes of vomers minute, oblique, narrowly separated medially, embedded in mucosa of mouth posteromedial to choanae; tongue 1.3× as long as wide (5.2 mm long; 3.9 mm wide), slightly notched posteriorly, posterior half free.

Skin on dorsum shagreen with small tubercles; dorsolateral ridges forming discontinuous dorsolateral fold; skin on flanks tuberculate, tubercles coalesced into a irregularly shaped ridge on each side of body extending from area above forelimb insertion to mid of body; skin on belly and thighs coarsely areolate, skin on other ventral surfaces weakly areolate; discoidal fold weak, more prominent as thoracic fold; cloacal sheath short; distinct tubercles in cloacal region absent. Ulnar tubercles coalesced into slightly discontinuous fold (more continuous on left forelimb) covering two-thirds of outer edge of each forelimb; palmar tubercles low, outer palmar tubercle bifid, approximately 2× the size of ovoid, inner palmar tubercle; subarticular tubercles well defined, round in ventral and lateral views; supernumerary palmar tubercles elongate, coalesced to short ridges, approximately one-third the size of subarticular tubercles; fingers with broad lateral fringes, most prominent basally between fingers; outer fringe of finger IV continuing to proximal edge of palm; finger I shorter than finger II; discs on fingers narrow, slightly larger than digit proximal to it; discs weakly truncate; ventral pads of fingers with weak circumferential grooves (Fig. 4C).

Hind limbs slender, tibia length 43.5% of SVL; foot length 44.5% of SVL; upper and posterior surfaces of hind limbs tuberculate; anterior surfaces of thighs weakly areolate, posterior surfaces areolate; one enlarged, conical tubercle on heel; outer surface of tarsus with a long ridge; tarsal fold long, covering two-thirds of tarsus; inner metatarsal tubercle ovoid, six times the size of elongate, narrow outer metatarsal tubercle; subarticular tubercles well defined, round in ventral view, subconical in lateral view; plantar supernumerary tubercles distinct, ovoid or coalesced to short ridges; toes with broad lateral fringes; outer fringe of toe V continuing to proximal edge of plantar; basal webbing present; discs about equal to those on fingers; discs truncate; toes having ventral pads weakly defined by circumferential grooves; relative lengths of toes: $1 < 2 < 3 < 5 < 4$ (Fig. 4D); toe V slightly longer than toe III (disc on toe III and on toe V not reaching distal subarticular tubercle on toe IV).

Measurements (in mm) of holotype: SVL 20.9; tibia length 9.1; foot length 9.3; head length 8.3; head width 9.1; eye diameter 2.2; IOD 2.7; upper eyelid width 1.9; internarial distance 1.9; eye–nostril distance 2.3.

Coloration of Holotype in Preservative. Dorsum pale grayish brown and dark gray mottled; forefeet and hind feet cream; inner fingers (I–III) and inner toes (I–III) predominately cream, outer fingers and toes colored as dorsum; forelimbs and hindlimbs colored as dorsum without bars; diffuse, grayish-brown canthal stripe present; upper lip tan without bars; supratympanic stripe absent; flanks colored as dorsum; axilla black; left groin black, right groin black with a white and a pale pink blotch; anterior surfaces of thighs black; posterior surfaces of thighs and concealed surfaces of shank black; throat tan and brown mottled; chest, belly, and thighs tan and gray mottled; forefeet cream; hind feet tan and gray mottled; iris dark gray.

Coloration of Holotype in Life. Unknown.

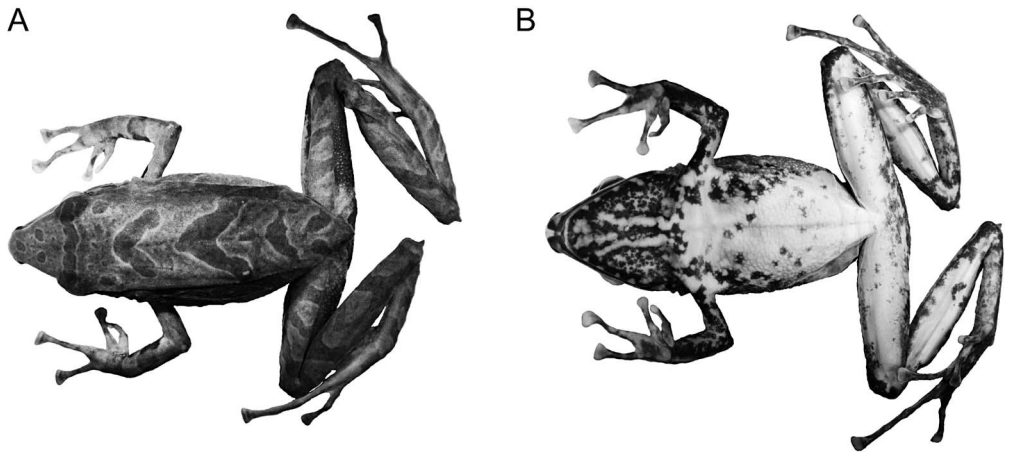


Figure 5. Dorsal (A) and ventral (B) views of *Pristimantis tanyrhynchus* (AMNH 153049, holotype, SVL 31.4 mm).

Variation. All specimens are colored like the holotype. Coloration of the groin varies in the amount of black ground color and white or pink blotches. In two of the paratypes (AMNH 153052, 153055) the blotches in the groin are pale pink, indicating that they may have been red in life. See Table 1 for measurements and proportions.

Etymology. The specific name *seorsus* is a Latin adjective meaning apart, separate. It refers to the disjunct distribution of this species with other members of the *P. orestes* Group.

Distribution and Ecology. Pristimantis seorsus is known only from the type locality (Map 1). Nothing is known about its ecology. Vegetation at the type locality consisting of pajonales, mixed-species forest, and *Polylepis* forest and was described in detail by Boyle (2001). The herpetofaunal diversity (mostly unidentified at the species level) was described by Rodríguez (2001) and Rodríguez and Rivera (2001).

Pristimantis tanyrhynchus sp. nov.
Map 1, Figures 5–6

Holotype. AMNH 153049 (Fig. 5), an adult female from Cordillera de Vilcabamba, CI/RAP Expedition Camp Two (11°33′35″S, 73°38′28″W), 2,050 m, Provincia de Satipo, Departamento de Junín, Peru, collected by L. O. Rodríguez on 26 June 1997.

Paratypes. Four males (AMNH 153047–48 obtained on 22 June 1997, AMNH 153050 obtained on 23 June 1997, AMNH 153051 obtained on 23 June 1997), all collected at the type locality by L. O. Rodríguez.

Diagnosis. A member of the *Pristimantis conspicillatus* Group having the following combination of characters: (1) skin on dorsum shagreen; prominent dorsolateral fold present; skin on venter coarsely areolate; discoidal fold present; (2) tympanic annulus and membrane present; (3) snout long, subacuminate in dorsal view, protruding in lateral view; (4) upper eyelid without tubercles; upper eyelid width much narrower than IOD; cranial crests absent; (5) dentigerous processes of vomers absent; (6) males with vocal sac, vocal slits, and nuptial pads; (7) finger I shorter than finger II; discs on outer fingers broad, truncate; (8) fingers with lateral fringes; (9) outer surfaces of ulnar and tarsus with a long fold; (10) heel with a large, conical tubercle; short, inner tarsal fold present; (11) inner metatarsal tubercle ovoid, four times the size of ovoid outer metatarsal tubercle; distinct supernumerary plantar tubercles present; (12) toes with lateral fringes; basal toe webbing pres-

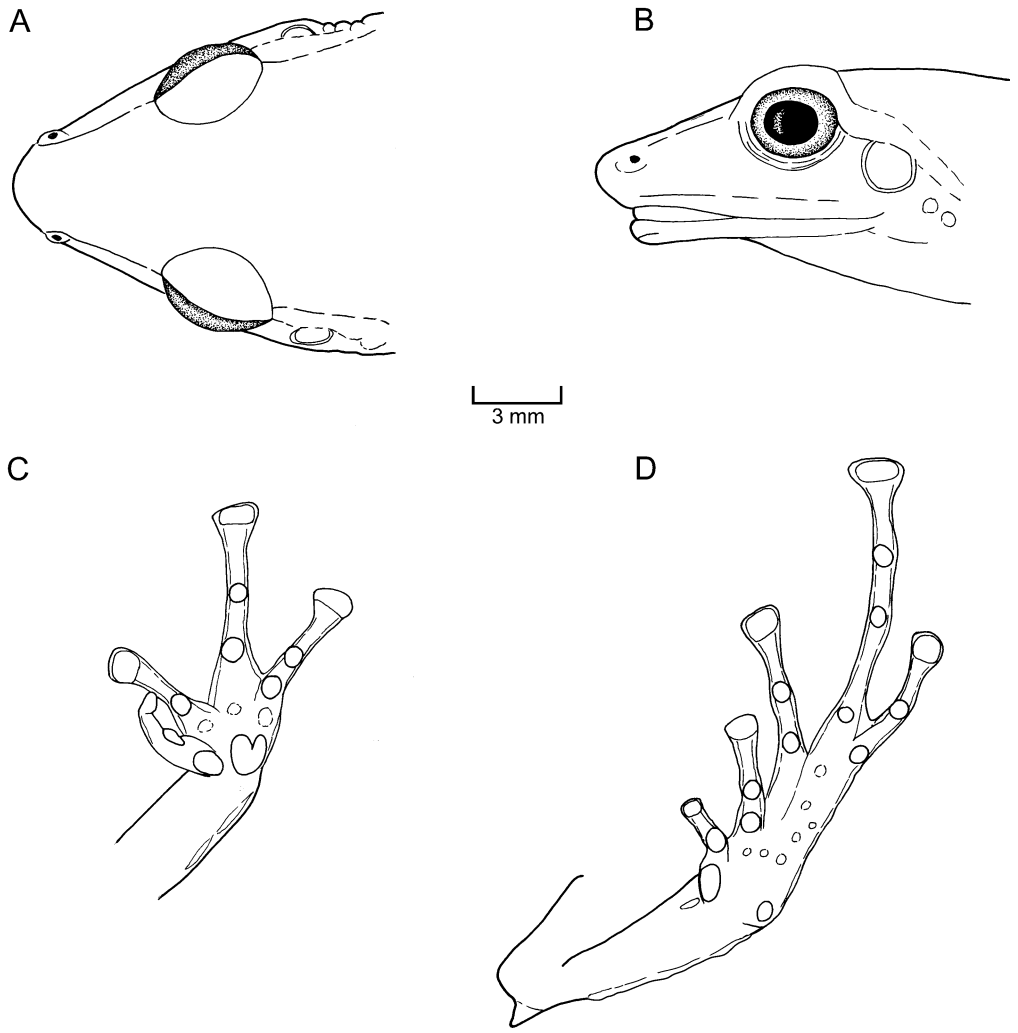


Figure 6. Dorsal (A) and lateral (B) views of head and ventral views of forefoot (C) and hind foot (D) of *Pristimantis tanyrhynchus* (AMNH 153049).

ent; toe V slightly longer than toe III; toe discs broad, truncate, about the same size as discs on fingers; (13) in ethanol, dorsum brown with dark brown interorbital bar and dark brown chevrons; venter tan with dark brown flecks more dense on throat; (14) SVL in single female 31.4 mm, in four males 20.8–23.6 mm.

Pristimantis tanyrhynchus (*Eleutherodactylus* cf. *rhabdolaemus* according to Rodríguez [2001] and Rodríguez and Rivera [2001]) differs from other members of the *P. conspicillatus* Group in having a long, protruding snout with nearly vertical sides; large conical heel tubercles; prominent dorsolateral folds; and dentigerous processes of vomers absent. *Pristimantis tanyrhynchus* is like *P. lanthanites* in having conical tubercles on the heels, but it is smaller than *P. lanthanites* (SVL 31.4 mm vs. 45.4 mm), has a coarsely areolate venter (smooth in *P. lanthanites*), lacks den-

Figure 7. Dorsal views of (A) *Pristimantis rhabdolaemus* (KU 175083, SVL 28.9 mm, female) and (B) *P. pharangobates* (KU 173246, SVL 26.1 mm, female).

tigerous processes of vomers (prominent in *P. lanthanites*), and has a dark brown throat with cream blotches and usually two cream midventral stripes (dark brown with single white midventral stripe in *P. lanthanites*). Furthermore, *P. tanyrhynchus* is known from the eastern Andes in southern Peru at an elevation of 2,050 m, whereas *P. lanthanites* is known from the Amazon Basin from northern Peru to southern Colombia from elevations of 1,500 m in the Andes of northern Peru and Ecuador. Among other Andean members of the *P. conspicillatus* Group with relatively long snouts and a dorsal pattern consisting of dark brown chevrons on the back, *P. tanyrhynchus* is most similar to *P. rhabdolaemus.* Lynch and McDiarmid (1987) synonymized *P. pharangobates* with *P. rhabdolaemus. Pristimantis pharangobates* and *P. rhabdolaemus* are superficially similar, but differ in size of scapular tubercles, shape of snout, size of heel tubercles, shape of subarticular tubercles, and shape of dorsal chevrons (Fig. 7, Table 2). Herein I recognize *P. pharangobates* as a distinct species. Although not mentioned in the original descriptions, both species have fingers and toes with narrow lateral fringes.

Pristimantis tanyrhynchus differs from *P. rhabdolaemus* by the following characters (characters for *P. rhabdolaemus* in parentheses, also see Table 2): males have

TABLE 2. SELECTED CHARACTERS AND CHARACTER CONDITIONS OF *PRISTIMANTIS* SPECIES SIMILAR TO *P. TANYRHYNCHUS*. INFORMATION WAS TAKEN FROM ORIGINAL SPECIES DESCRIPTIONS (DUELLMAN, 1978A, B; LEHR ET AL., 2006; LYNCH, 1975) AND SPECIMENS EXAMINED.

Character	*P. tanyrhynchus*	*P. lanthanites*	*P. ornatus*	*P. pharangobates*	*P. rhabdolaemus*
SVL females (mm)	31.4	27.5–45.4	20.7–27.3	27.8–29.5	28.6–31.7
SVL males (mm)	20.8–23.6	21.7–27.9	16.7–20.5	21.4–25.4	21.3–24.0
Skin on dorsum	shagreen	finely tuberculate with scattered larger tubercles	finely shagreen with small scattered tubercles	shagreen	shagreen
Skin on venter	coarsely areolate	smooth	smooth	areolate	areolate
Dorsolateral folds	present	present	present	present	present
Male characters present	vocal slits, vocal sac, nuptial pads	vocal slits, nuptial pads	vocal slits	vocal slits, vocal sac	vocal slits, vocal sac
Shape of snout	subacuminate in dorsal view, protruding in lateral view	subacuminate in dorsal view, rounded in lateral view	subacuminate in dorsal view, rounded in lateral view	acuminate in dorsal view, rounded in lateral view	narrowly rounded in dorsal view, rounded in lateral view
Dentigerous processes of vomers	absent	present (prominent, oblique)	present (small, oblique)	present (small, oblique) or absent	present (small, oblique)
Inner tarsal folds	present	absent	absent	present	present
Heel tubercles	present (large, conical)	present (moderate, conical)	absent	present (small, low: broader than high)	present (small, distinct: higher than broad)
Lateral fringes	present	absent	absent	present	present
Supernumerary plantar tubercles	many, diffuse	few, distinct	few, distinct	few, distinct	many, diffuse
Subarticular tubercles on toes	subconical in lateral view	conical in lateral view	subconical in lateral view	low, round in lateral view	conical in lateral view
Scapular tubercles	absent	present (large)	absent	present (small) or indistinct	present (large)
Dorsal pattern	chevrons broad	chevrons broad, difficult to distinguish from surrounding pattern	chevrons interrupted, "washed out"	chevrons narrow	chevrons broad
Coloration of throat	cream and dark brown mottled with two midventral cream stripes	gray with white flecks and a broad medial white stripe	whitish gray with grayish-brown blotches	cream with dark brown streaks	cream with dark brown streaks

weak nuptial pads on thumb (absent); snout long, subacuminate in dorsal view, protruding in lateral view, its sides nearly vertical (snout slightly shorter, narrowly rounded in dorsal view, rounded in lateral view, its sides diagonal); dentigerous processes of vomers absent (present), heel tubercles large, conical (small, rounded); subarticular tubercles subconical (conical); scapular tubercles absent (present). *Pristimantis tanyrhynchus* differs from *P. pharangobates* by males having weak nuptial pads (absent); the snout protruding in lateral view (rounded); dentigerous processes of vomers absent (usually present); large, conical tubercles on heels (small, low); chevrons on back broad (narrow); scapular tubercles absent (present). *Pristimantis tanyrhynchus* differs from *P. ornatus* in being larger (SVL to 31.4 mm vs. 27.3 mm in *P. ornatus*), in having a coarsely areolate venter (smooth in *P. ornatus*), and in having an inner tarsal fold (absent in *P. ornatus*).

Description of the Holotype. Head narrower than body, longer than wide; head width 31.8% of SVL; head length 37.6% of SVL; cranial crests absent; snout long with its sides nearly vertical, subacuminate in dorsal view, protruding well anteriad to margin of lower jaw in lateral view (Figs. 6A, B); eye diameter 76.2% of eye–nostril distance; nostrils posteriorly slightly protuberant, directed laterally and protruding beyond upper jaw in dorsal view; canthus rostralis sharp, straight in dorsal view, angular in profile; loreal region concave; lips rounded; upper eyelid without tubercles, width 52.4% of IOD; narrow, weak supratympanic fold extending from posterior edge of upper eyelid diagonally to insertion of forelimb; tympanic annulus and membrane present, its upper and posterior margin concealed by supratympanic fold; two enlarged, conical postrictal tubercles present on both sides of head. Choanae small, triangular, not concealed by palatal shelf of maxilla; dentigerous processes of vomers absent; tongue 1.2× as long as wide (5.9 mm long; 4.8 mm wide), slightly notched posteriorly, posterior one-third free.

Skin on dorsum shagreen with small tubercles on posterior half of body; long dorsolateral folds present toward its end, more like a row of tubercles; skin on flanks tuberculate; skin on belly and thighs coarsely areolate; skin on other ventral surfaces weakly areolate; discoidal fold prominent; cloacal sheath short; distinct tubercles in cloacal region absent. Ulnar tubercles forming discontinuous fold on outer edge of left forelimb, on right forelimb three low, elongate tubercles present; palmar tubercles low, outer palmar tubercle bifid, approximately 3× the size of ovoid, inner palmar tubercle; subarticular tubercles well defined, ovoid in ventral view, subconical in lateral view; few supernumerary palmar tubercles, ovoid, low, approximately half size of subarticular tubercles; fingers with lateral fringes, most prominent basally between fingers; outer fringe of finger IV continuing to mid of outer edge of palm; finger I shorter than finger II; discs on fingers broadly expanded, approximately 3× the size of digit proximal to it, most prominent on finger III and IV; discs truncate; ventral pads of fingers well defined by circumferential grooves (Fig. 6C).

Hind limbs long, slender, tibia length 58.0% of SVL; foot length 50.3% of SVL; upper surfaces of hind limbs shagreen with small tubercles; anterior surfaces of thighs smooth, posterior surfaces weakly areolate; heel with small tubercles and one large, conical tubercle; outer surface of tarsus with a long, discontinuous ridge; inner tarsal fold short, tuberclelike; inner metatarsal tubercle ovoid, four times the size of round outer metatarsal tubercle; subarticular tubercles well defined, ovoid in ventral view, subconical in lateral view; plantar supernumerary tubercles many, diffuse; toes with broad lateral fringes; outer fringe of toe V continuing to proximal edge of plantar; basal webbing present, most prominent between toes IV and V; discs slightly smaller than those on fin-

gers; discs truncate; toes having ventral pads well defined by circumferential grooves; relative lengths of toes: 1 < 2 < 3 < 5 < 4 (Fig. 6D); toe V slightly longer than toe III (disc on toe III and on toe V not reaching distal subarticular tubercle on toe IV).

Measurements (in mm) of holotype: SVL 31.4; tibia length 18.2; foot length 15.8; head length 11.8; head width 10.0; eye diameter 3.2; tympanum diameter 1.5; IOD 4.2; upper eyelid width 2.2; internarial distance 3.0; eye–nostril distance 4.2.

Coloration of Holotype in Preservative. Dorsum brown with three dark brown blotches on snout, narrow dark brown interorbital bar, one broad, dark brown chevron on scapula and a second on back followed by single dark brown blotch and an interrupted chevron on posterior end of body, all dark brown chevrons/blotches surrounded with narrow tan lines; forelimbs tan with two brown bars on lower forelimb; forefeet tan; upper and lower limbs tan, each with three narrow brown bars; dark brown canthal and supratympanic stripe present; upper lip tan without bars, its lower margin dark brown; sides of head grayish tan; flanks colored as dorsum with three brown diagonal stripes; groin cream bordered above with dark brown flecks; upper half of anterior surfaces of thighs grayish tan, its lower half cream, both separated by a dark brown longitudinal stripe; posterior surfaces of thighs brown with cream spots and flecks; concealed surfaces of shanks colored as anterior surface of thighs; throat dark brown with cream flecks and two midventral stripes, ventral surface of lower jaw dark brown with cream spots; chest cream with dark brown flecks, belly, forelimbs, and hindlimbs cream with dark brown flecks; hind feet and forefeet grayish brown; iris dark gray.

Coloration of Holotype in Life. Unknown.

Variation. All specimens have a large conical tubercle on the heel. One specimen (AMNH 153050) has cream dorsolateral folds. Two specimens (AMNH 153047, 153051) are tan with gray chevrons, bars, and blotches. One specimen (AMNH 153048) has a tan dorsum mottled with gray and no evident chevrons. Three specimens (AMNH 153048–50) have dark brown throats with cream blotches, two large, cream blotches on chin and two midventral cream stripes, whereas two (AMNH 153047, 153051) have ventral surfaces predominately tan with throat pattern barely visible. See Table 3 for measurements and proportions.

Etymology. The specific name *tanyrhynchus* is derived from the Greek adjective *tany* meaning long and the Greek noun *rhynchos* meaning snout; *rhynchus* is the Latinized noun. The name refers to the long snout of this species.

Distribution and Ecology. Pristimantis tanyrhynchus is known only from the type locality (Map 1). Nothing is known about its ecology. Vegetation at Camp Two consists of tall cloud forest (18–20 m) with a high number of epiphytes, terrestrial Araceae, ferns, and orchids (Rodríguez, 2001). For comments on herpetofaunal diversity, see paragraph on distribution and ecology of *P. seorsus.*

Pristimantis vilcabambae sp. nov.
Map 1, Figures 8–9

Holotype. AMNH 153057 (Fig. 8), an adult female, from Cordillera de Vilcabamba, CI/RAP Expedition Camp Two (11°33′35″S, 73°38′28″W), 2,050 m, Provincia de Satipo, Departamento de Junín, Peru, collected by L. O. Rodríguez on 24 June 1997.

Paratypes. Three males (AMNH 153058–60, obtained on 21 June 1997), one juvenile (AMNH 1530613, obtained on 22 June 1997), all collected with the holotype by L. O. Rodríguez 1997.

Diagnosis. A member of the *Pristimantis unistrigatus* Group having the following combination of characters: (1) skin on dorsum shagreen with few conical tubercles; dorsolateral fold absent; skin on venter areolate; weak discoidal fold present; (2)

TABLE 3. MEASUREMENTS (MM) AND PROPORTIONS OF ADULT *PRISTIMANTIS TANYRHYNCHUS* AND *P. VILCABAMBAE*; RANGE (MEAN ± 1 SD).

	P. tanyrhynchus			*P. vilcabambae*		
Character	Female (n = 1)	Males (n = 4)		Female (n = 1)	Males (n = 3)	
SVL	31.4	20.8–23.6	(21.9 ± 1.1)	22.1	13.5–14.5	(13.9 ± 0.4)
TL	18.2	12.1–13.3	(12.6 ± 0.5)	10.4	7.6–8.5	(8.0 ± 0.4)
FL	15.8	10.0–11.6	(10.6 ± 0.6)	9.1	5.8–6.0	(5.9 ± 0.1)
HL	11.8	7.7–9.3	(8.4 ± 0.7)	8.8	5.6–5.9	(5.8 ± 0.1)
HW	10.0	7.0–8.2	(7.4 ± 0.5)	8.1	5.1–5.8	(5.3 ± 0.3)
ED	3.2	2.0–2.4	(2.3 ± 0.2)	2.5	1.7–2.4	(2.0 ± 0.3)
TY	1.5	1.0–1.3	(1.1 ± 0.1)	—	—	
IOD	4.2	2.8–3.1	(2.9 ± 0.1)	2.5	1.8–2.0	(1.9 ± 0.1)
EW	2.2	1.5–2.1	(1.8 ± 0.2)	2.2	1.0–1.6	(1.3 ± 0.2)
IND	3.0	2.3–2.4	(2.4 ± 0.0)	2.0	1.3–1.5	(1.4 ± 0.1)
E–N	4.2	3.0–3.2	(3.1 ± 0.1)	2.7	1.8–1.9	(1.9 ± 0.0)
TL/SVL	0.58	0.54–0.60		0.47	0.55–0.62	
FL/SVL	0.50	0.45–0.51		0.41	0.40–0.44	
HL/SVL	0.38	0.37–0.42		0.40	0.41–0.43	
HW/SVL	0.32	0.33–0.35		0.37	0.37–0.40	
HW/HL	0.85	0.80–0.93		0.92	0.86–0.98	
E–N/ED	1.31	1.25–1.50		1.08	0.79–1.12	
EW/IOD	0.52	0.52–0.68		0.88	0.50–0.84	
TY/ED	0.47	0.42–0.55		—	—	

tympanic membrane and annulus absent; (3) snout moderate with a small conical tubercle at its tip; snout rounded in dorsal and lateral views; (4) upper eyelid with two conical tubercles; upper eyelid slightly narrower than IOD; cranial crests absent; (5) dentigerous processes of vomers small, in an oblique row, narrowly separated; (6) males without vocal sac, vocal slits, and nuptial pads; (7) finger I shorter than finger II; discs on outer fingers broad, rounded; (8) fingers with lateral fringes; (9) ulnar and tarsal tubercles present; (10) heel with a small, conical tubercle; inner tarsal fold short, tuberclelike; (11) inner metatarsal tubercle ovoid, six times the size of ovoid outer metatarsal tubercle; prominent supernumerary plantar tubercles present; (12) toes with lateral fringes; basal toe webbing present; toe V much longer than

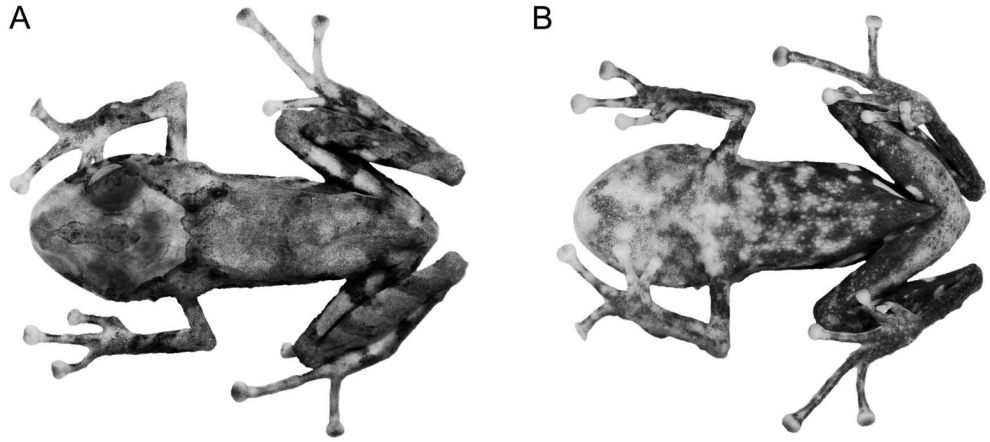


Figure 8. Dorsal (A) and ventral (B) views of *Pristimantis vilcabambae* (AMNH 153057, holotype, SVL 22.1 mm).

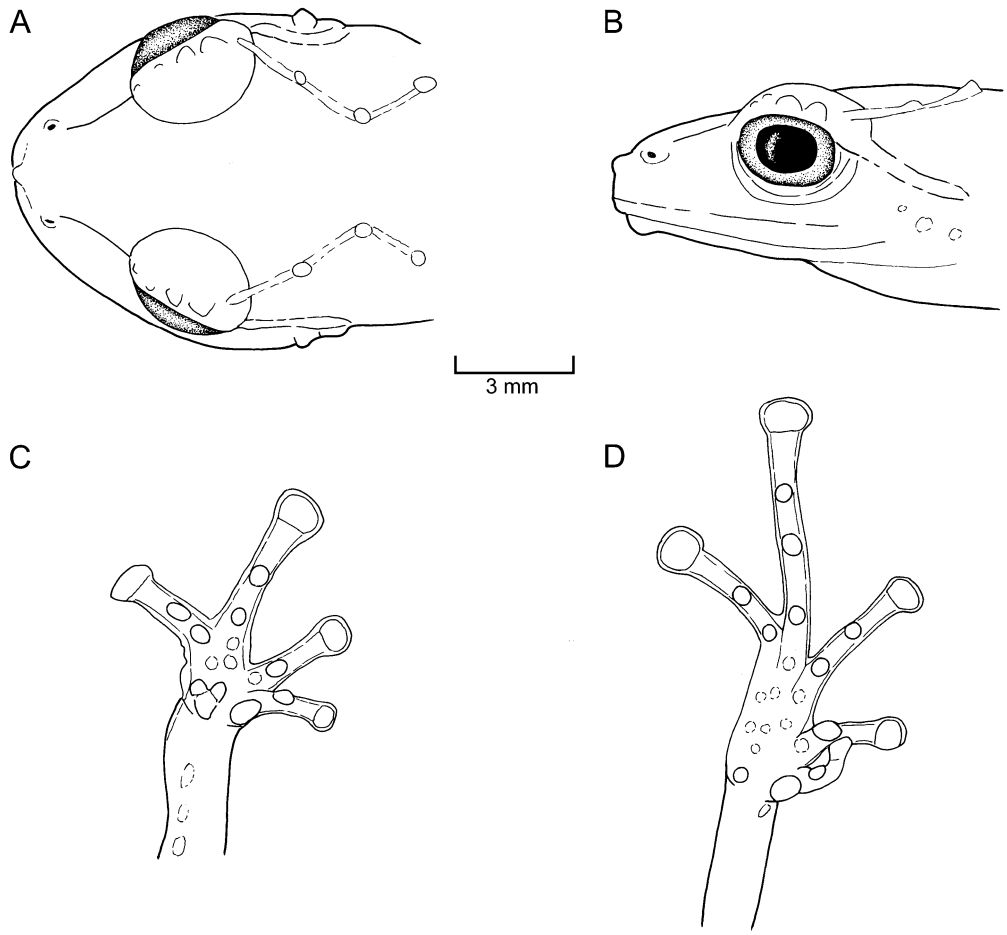


Figure 9. Dorsal (A) and lateral (B) views of head and ventral views of forefoot (C) and hind foot (D) of *Pristimantis vilcabambae* (AMNH 153057).

toe III; toe discs broad, rounded, about the same size as discs on fingers; (13) in ethanol, dorsum tan with blackish-brown H-shaped scapular fold; venter tan with dark brown flecks; groin and anterior surfaces of thighs dark brown with cream blotches; (14) SVL in single female 22.1 mm, in males 13.5–14.6 mm (n = 3).

Pristimantis vilcabambae lacks a tympanum; it has two conical tubercles on the upper eyelid, an H-shaped scapular fold, one conical tubercle on the heel, lateral fringes on the fingers and toes, many distinct supernumerary tubercles, and (in ethanol) groin and anterior surfaces of thighs dark brown with cream blotches. Eleven other species of *Pristimantis* in the Andes and Amazonian lowlands in Peru (*acuminatus, colodactylus, coronatus, croceoinguinis, cruciocularis, flavobracatus, imitatrix, lirellus, martiae, tantanti,* and *ventrimarmoratus*) lack a differentiated tympanic membrane. *Pristimantis vilcabambae* is the only one of these in the Andes of southern Peru. *Pristimantis vilcabambae* and *P. carvalhoi* are similar in size (SVL 13.5–14.6 mm in male *P. vilcabambae*; 13.5–14.8 mm in male *P. carvalhoi*; Lynch 1980), have conical tubercles on the dorsum, and an areolate venter, but *P. vil-*

cabambae (*P. carvalhoi*) lacks a tympanum (tympanic annulus visible beneath skin), has conical tubercles on the upper eyelid (no tubercles), lateral fringes on the digits (no fringes), large supernumerary tubercles on plantar surface (small supernumerary tubercles at bases of toes), and a conical tubercle on the heel (absent). *Pristimantis vilcabambae* is most similar to *P. croceoinguinis.* Both are similar in size (SVL in males 13.5–14.6 mm vs. 13.9–18.2 mm, respectively), lack dorsolateral folds, areolate venter, tubercles on the upper eyelid, and conical tubercle on the heel and have no vocal slits or nuptial pads in males. *Pristimantis vilcabambae* differs from *P. croceoinguinis* in having fingers and toes with lateral fringes (absent in *P. croceoinguinis*), dorsum shagreen with a few conical tubercles (tuberculate), supernumerary tubercles present (absent), and venter tan with dark brown blotches (tan with brown mottling). Furthermore, *P. vilcabambae* is an Andean species, whereas *P. croceoinguinis* is restricted to the upper Amazon Basin in southern Colombia, Ecuador, and extreme northeastern Peru. *Pristimantis vilcabambae* and *P. flavobracatus* from central Peru have conical tubercles on the upper eyelid and on the heel, and no vocal sac, vocal slits, or nuptial pads in males, but male *P. vilcabambae* are smaller (SVL of 13.5–14.6 mm vs. 18.2–19.6 mm), fingers and toes have lateral fringes (absent in *P. flavobracatus*), plantar surface with many, prominent supernumerary tubercles (few, low), and venter tan with dark brown blotches (dark brown).

Description of the Holotype. Head slightly broader than body, longer than wide; head width 36.7% of SVL; head length 39.8% of SVL; cranial crests absent; snout moderate, rounded in dorsal and lateral views, with a small, conical tubercle on its terminal end (Figs. 9A, B); eye diameter 92.6% of eye–nostril distance; nostrils protuberant, directed laterally; canthus rostralis slightly rounded in dorsal view, rounded in profile; loreal region slightly concave; lips rounded; upper eyelid with two conical tubercles along its outer margin; upper eyelid width 88.0% of IOD; supratympanic fold narrow, weak, more like a row of tubercles, extending from posterior edge of upper eyelid diagonally to insertion of forelimb; tympanic annulus and membrane absent; two small, conical postrictal tubercles present on both sides of head. Choanae small, ovoid, not concealed by palatal shelf of maxilla; dentigerous processes of vomers small, in an oblique row, narrowly separated, 3 teeth on left, 5 on right process of vomer; tongue slightly longer than wide (5.4 mm long; 4.9 mm wide), notched posteriorly, posterior half free.

Skin on dorsum shagreen with few conical tubercles located dorsolaterally; H-shaped occipital fold bearing three conical tubercles on each side and contacting upper eyelid (Fig. 9A); skin on flanks tuberculate forming a short dorsolateral ridge on each side of body; skin on venter areolate; weak discoidal fold present; cloacal sheath short; one enlarged, round tubercle on each side of upper half of cloacal opening. Outer surface of ulnar on left forelimb with a row of three small tubercles, on right forelimb with a low fold; palmar tubercles low, outer palmar tubercle bifid, approximately 2.5 the size of ovoid, inner palmar tubercle; subarticular tubercles well defined, ovoid in ventral view, subconical in lateral view; supernumerary palmar tubercles distinct, ovoid, approximately half size of subarticular tubercles; fingers with lateral fringes; outer fringe of finger IV continuing as discontinuous fold to outer edge of palm; finger I shorter than finger II; discs on fingers broadly expanded, approximately 2× the size of digit proximal to it, most prominent on fingers III and IV; discs slightly truncate; ventral pads of fingers well defined by circumferential grooves (Fig. 9C).

Hind limbs long, slender, tibia length 47.1% of SVL; foot length 41.1% of SVL; upper surfaces of hind limbs shagreen with small tubercles; anterior surfaces of

thighs smooth, posterior surfaces shagreen; heel with an enlarged, conical tubercle; outer surface of tarsus with two, small, low tubercles; inner tarsal fold short, tuberclelike; inner metatarsal tubercle ovoid, six times the size of round outer metatarsal tubercle; subarticular tubercles well defined, ovoid in ventral view, subconical in lateral view; plantar supernumerary tubercles distinct, about half the size of supernumerary tubercles; toes with lateral fringes; outer fringe of toe V continuing as discontinuous fold to proximal edge of plantar; basal webbing present, most prominent between toes IV and V; discs about the same size as those on fingers; discs slightly truncate; toes having ventral pads well defined by circumferential grooves; relative lengths of toes: 1 < 2 < 3 < 5 < 4 (Fig. 9D); toe V slightly longer than toe III (disc on toe III and on toe V not reaching distal subarticular tubercle on toe IV).

Measurements (in mm) of holotype: SVL 22.1; tibia length 10.4; foot length 9.1; head length 8.8; head width 8.1; eye diameter 2.5; IOD 2.5; upper eyelid width 2.2; internarial distance 2.0; eye–nostril distance 2.7.

Coloration of Holotype in Preservative. Dorsum grayish tan with a blackish-brown H-shaped scapular fold, dark brown, middorsal stripe on head extending from snout to interorbital region; forelimbs grayish tan with two narrow brown bars on lower forelimb; forefeet and hind feet tan with brown flecks; limbs grayish tan with five narrow, diagonal brown bars; canthal stripe absent, brown supratympanic stripe present; upper lip tan with brown bars below eye, two on right, three on left side; sides of head grayish tan; flanks colored like dorsum with two dark brown, broad diagonal stripes separated by a cream blotch that contains a dark brown fleck in its center; groin dark brown with a cream, ovoid blotch in left groin, and a cream, diagonal bar in right groin; anterior surfaces of thighs dark brown with two cream ovoid blotches on left thigh, and one cream longitudinal blotch on right thigh; posterior surfaces of thighs dark brown with two cream blotches on its upper half; concealed surfaces of shanks dark brown with cream blotches; throat, chest, and belly cream with dark brown blotches and small dark brown spots; posterior half of belly and anterior half of thighs dark brown; remaining ventral surfaces tan and dark brown mottled; iris dark gray.

Coloration of Holotype in Life. Unknown.

Variation. All specimens have a blackish-brown H-shaped scapular fold with conical tubercles on its outside and a conical heel tubercle as described for the holotype. Presumably as a result of preservation, the tubercles are not as distinct in the paratypes as in the holotype. Males lack vocal sac, vocal slits, and nuptial pads. Amount of cream blotches in groin, anterior surfaces of thighs and concealed surfaces of shanks is variable. All males have a dark brown interorbital bar. The smallest specimen (AMNH 153059, SVL 9.5 mm) has a dark brown dorsum with a distinct H-shaped scapular fold, dark brown venter, and tan flanks. See Table 3 for measurements and proportions.

Etymology. The specific name *vilcabambae* refers to the Cordillera Vilcabamba, a small range of the Andes Mountains in south-central Peru that extends about 260 km northwestward from the city of Cusco; the range is bordered by deep canyons formed by the Río Tambo, Río Ene, Río Apurímac, and Río Urubamba.

Distribution and Ecology. Pristimantis vilcabambae is known only from the type locality (Map 1). Nothing is known about its ecology. For comments on vegetation and herpetofaunal diversity, see paragraph on distribution and ecology of *P. tanyrhynchus.*

Phrynopus ayacucho sp. nov.
Map 1, Figures 10–11

Holotype. MCZ 24362 (Fig. 10), an adult female collected at Rapi, Provincia

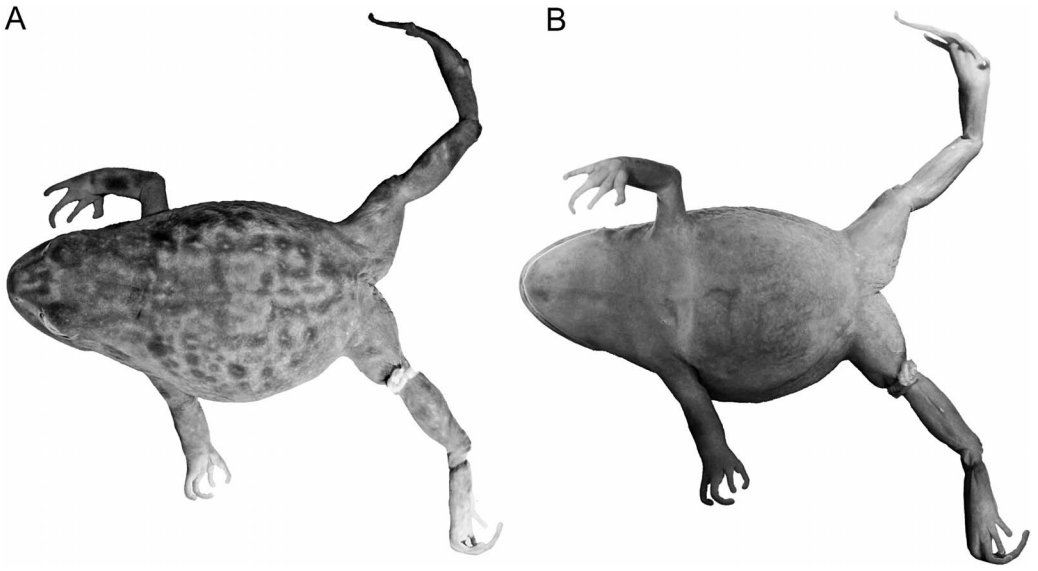


Figure 10. Dorsal (A) and ventral (B) views of *Phrynopus ayachucho* (MCZ 24362, holotype, SVL 29.2 mm).

de La Mar, Departamento de Ayacucho, Peru, by W. F. Walker, Sr.

Paratype. MCZ 24363, a juvenile collected with the holotype by W. F. Walker, Sr.

Diagnosis. A medium-sized species of *Phrynopus* having knob-shaped terminal phalanges and the following combination of characters: (1) Skin on dorsum smooth with small, elongate tubercles, forming discontinuous occipital and dorsolateral folds, skin on venter areolate; weak discoidal fold present; (2) tympanic membrane absent, tympanic annulus visible beneath skin, about one-third diameter of eye, its upper and posterolateral part covered by supratympanic fold; (3) snout short, rounded in dorsal and lateral views; (4) upper eyelid with small tubercles; width of upper eyelid narrower than IOD; cranial crests absent; (5) dentigerous processes of vomers small, oblique, broadly separated, embedded in buccal mucosa of mouth, teeth barely visible; (6) male characters unknown; (7) finger I shorter than finger II; tips of digits rounded; (8) fingers without lateral fringes; (9) ulnar and tarsal tubercles absent; (10) heel without tubercles; inner tarsal fold absent; (11) inner metatarsal tubercle moderate, elongate, 2× as large as outer; outer metatarsal tubercle rounded; few low, supernumerary plantar tubercles present; (12) toes without lateral fringes; toe webbing absent; toe V slightly longer than toe III; tips of digits slightly smaller than those on fingers; (13) in ethanol, dorsum tan with dark brown blotches; elongate tubercles ocellate colored (each tubercle tan surrounded with dark brown) forming occipital and dorsolateral folds; remaining surfaces uniformly tan; (14) SVL in single adult female 29.2 mm.

Phrynopus ayacucho is readily distinguished from other central Peruvian *Phrynopus* (except *P. peruanus*) and from southern Peruvian *P. cophites* by having a tympanum. Both *P. ayacucho* and *P. peruanus* are of similar size, but *P. ayacucho* has long, slender extremities (short, robust in *P. peruanus*), and uniformly tan venter (tan with dark gray blotches in *P. peruanus*). Southern Peruvian *Phrynopus* are much smaller (SVL 16.3 mm in *P. bagrecito,* 18.4 mm in *P. boettgeri,* 25.1 mm in *P. peruvianus*) than *P. ayacucho,* and two

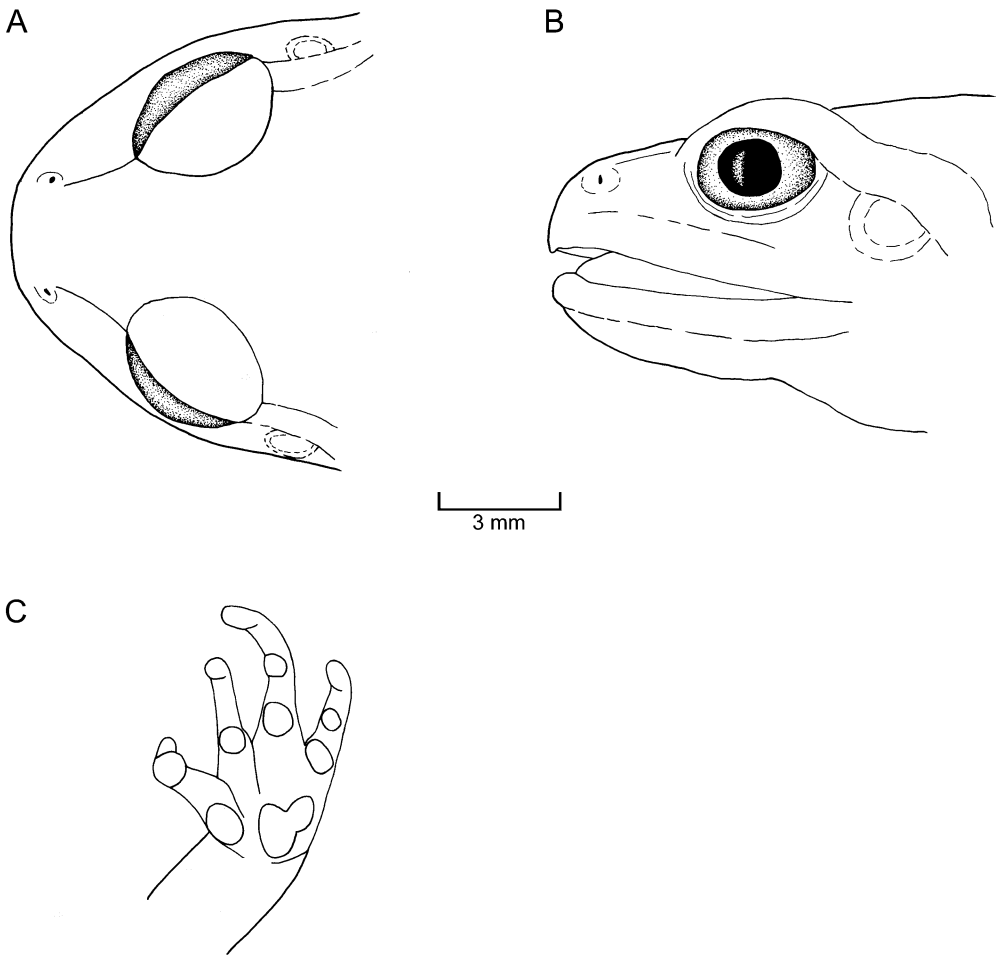


Figure 11. Dorsal (A) and lateral (B) views of head and ventral view of forefoot (C) of *Phrynopus ayachucho* (MCZ 24362). Finger 1 is swollen below tip and might indicate the presence of an internal parasite.

of them (*P. bagrecito* and *P. peruvianus*) have a tarsal fold, which is absent in *P. ayacucho*.

Superficially, *Phrynopus ayacucho* can be confused with the narrow-toed *Pristimantis lucida* (formerly *Phrynopus*), which is known from several localities in eastern Andean Ayacucho. In ethanol, both species have a tan dorsum with brown blotches and a uniformly tan venter, but *P. ayacucho* lacks a dark brown canthal stripe and interorbital bar (both present in *P. lucida*). Furthermore, *P. ayacucho* has a short snout (long in *P. lucida*), has the first finger much shorter than second (slightly shorter), fingers and toes without lateral fringes (fringes present), toe V longer than toe III (equal length), and small dentigerous processes of vomers (prominent). *Pristimantis pereger* (formerly *Phrynopus*) is known from elevations of 1,650–2,900 m on the eastern slopes of the Cordillera Oriental and Cordillera Vilcabamba in Departamento de Ayacucho. It has weak circumferential grooves (absent in *P. ayacucho*) on the digital discs on fingers and toes, and the digital groove is interrupted by a small papillalike projection on the tip of the digit

in between the pad and the disc cover (Lehr and Aguilar, 2006).

Description of the Holotype. Head narrower than body and about as wide as long; head width 33.6% of SVL; head length 33.2% of SVL; snout short, rounded in dorsal and lateral views (Figs. 11A, B); eye diameter larger than eye–nostril distance (eye–nostril distance 89.7% of length of eye); nostrils not protuberant, directed dorsolaterally; canthus rostralis straight in dorsal view, rounded in section; loreal region slightly concave; lips rounded; upper eyelid bearing small, low tubercles; width of upper eyelid narrower than IOD (upper eyelid width 74.2% of IOD); supratympanic fold short, narrow; tympanic membrane absent, tympanic annulus present beneath skin; tympanum length 35.5% of eye length, separated from eye by distance equal to length of tympanum; tympanum round, its upper and posterolateral margin concealed by supratympanic fold; one elongate, two low postrictal tubercles present on left side (one on right side) of head. Choanae small, ovoid, not concealed by palatal shelf of maxilla; dentigerous processes of vomers small, oblique, broadly separated, situated posteromedial to choanae, left dentigerous process bearing 2 minute teeth, right dentigerous process without teeth; tongue 1.5× as long as wide (length 6.3 mm, width at midlength of tongue 4.2 mm), not notched posteriorly, posterior one-fourth free.

Skin on dorsal surfaces smooth with low, elongate tubercles forming a discontinuous occipital and dorsolateral fold, flanks tuberculate; venter areolate; weak discoidal fold present; cloacal sheath short, one large, flat tubercle on both sides of cloaca next to its lower margin. Outer ulnar tubercles absent; palmar tubercles low, outer palmar tubercle bifid, approximately 2× the size of elongate, inner palmar tubercle; supernumerary tubercles close to base of fingers, round, low, half the size of subarticular tubercles; subarticular tubercles prominent, ovoid in dorsal view, rounded in lateral view; fingers without lateral fringes; finger I shorter than finger II; tips of fingers rounded (Fig. 11C). Hind limbs slender, tibia length 32.2% of SVL; foot length 36.3% of SVL; upper surfaces of hind limbs smooth with scattered low tubercles; proximal posteroventral surfaces of thighs coarsely areolate; heel without tubercles; outer surface of tarsus without tubercles; tarsal fold absent; inner metatarsal tubercle elevated, elongate, about 2× ovoid outer metatarsal tubercle; few, low plantar supernumerary tubercles; subarticular tubercles well defined, ovoid in dorsal view and rounded in lateral view; toes without lateral fringes; toe webbing absent; tips of toes rounded; relative lengths of toes: $1 < 2 < 3 < 5 < 4$; toe V slightly longer than toe III (tip of toe III reaching middle of penultimate subarticular tubercle on toe IV, tip of toe V not reaching ultimate subarticular tubercle on toe IV).

Measurements (in mm) of holotype: SVL 29.2; tibia length 9.4; foot length 10.6; head length 9.7; head width 9.8; eye diameter 2.9; tympanum diameter 1.0; IOD 3.1; upper eyelid width 2.3; internarial distance 2.4; eye–nostril distance 2.6.

Coloration of Holotype in Preservative. Dorsum tan with dark brown blotches; elongate tubercles ocellate in color (each tubercle tan surrounded with dark brown) forming occipital and dorsolateral folds; head dorsally with brown blotches except for narrow tan interorbital bar; dark brown supratympanic stripe present; extremities dorsally with dark brown blotches; remaining surfaces uniformly tan.

Coloration of Holotype in Life. Unknown.

Variation. The only other known specimen is a juvenile of 14.8 mm SVL. Toe V is shorter than toe III on both hind feet. No variation in coloration pattern could be observed.

Etymology. The specific name, a noun in apposition, refers to the Departamento de Ayacucho in southern Peru where the species was collected.

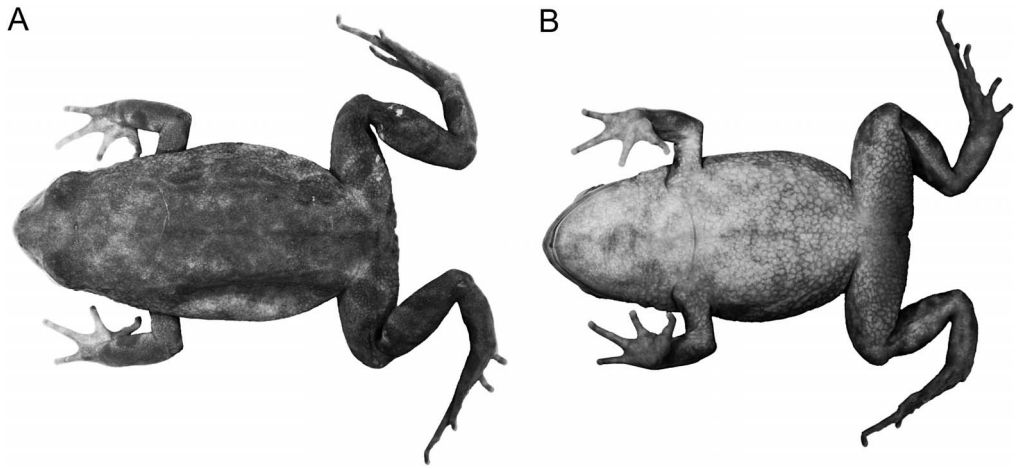


Figure 12. Dorsal (A) and ventral (B) views of *Phrynopus kotosh* (FSM 103969, holotype, SVL 23.2 mm).

Distribution and Ecology. The species is only known from the type locality in northeastern Departamento de Ayacucho near Chiquintirca (Map 1). Rapi is likely the short form for Hacienda Rapi (13°5′51″S, 73°48′49″W). *Telmatobius walkeri* was also described from "Rapi, one hundred and eight kilometers east of Ayacucho, Department of Ayacucho, Peru" (Shreve, 1941:79). Hacienda Rapi is at 3,411 m above sea level. No other species of *Phrynopus* or *Pristimantis* are known from this locality. Nothing is known about its ecology.

Phrynopus kotosh sp. nov.
Map 1, Figures 12–13

Holotype. FSM 103969 (Fig. 12), an adult female collected at 10.8 km W of Huancapallac at 2,950 m on 9 March 1969, Provincia de Huánuco, Departamento de Huánuco, Peru, by F. G. Thompson.

Paratypes. Two adult females (FSM 103967–68), four adult males (FSM 103970–73), collected on 9 March 1969 with the holotype by F. G. Thompson.

Diagnosis. A medium-sized species of *Phrynopus* having knob-shaped terminal phalanges and the following combination of characters: (1) Skin on dorsum shagreen with scattered tubercles, that on venter areolate; discoidal fold absent, thoracical fold present; discontinuous dorsolateral folds present; (2) tympanic membrane and tympanic annulus absent; (3) snout acutely rounded in dorsal view, rounded in lateral view; (4) upper eyelid with small tubercles; width of upper eyelid narrower than IOD; cranial crests absent; (5) dentigerous processes of vomers ovoid, oblique, widely separated, each bearing 2 long teeth; (6) males lacking vocal slits and nuptial pads; (7) finger I shorter than finger II; tips of digits rounded; (8) fingers without lateral fringes; (9) ulnar and tarsal tubercles present; (10) heel with small tubercles; inner tarsal fold absent; (11) inner metatarsal tubercle ovoid, 2× as large as outer; outer metatarsal tubercle conical, rounded; many low, supernumerary plantar tubercles present; (12) toes without lateral fringes; basal toe webbing present; toe V slightly longer or slightly shorter than toe III; toe tips rounded, as large as those on fingers; (13) in ethanol, dorsum and venter tan and brown mottled, venter paler than dorsum; (14) SVL in adult females 23.2–26.2 mm (n = 3), in adult males 14.6–17.4 mm (n = 4).

Phrynopus kotosh is readily distinguished from its congeners by having the combination of dentigerous processes of

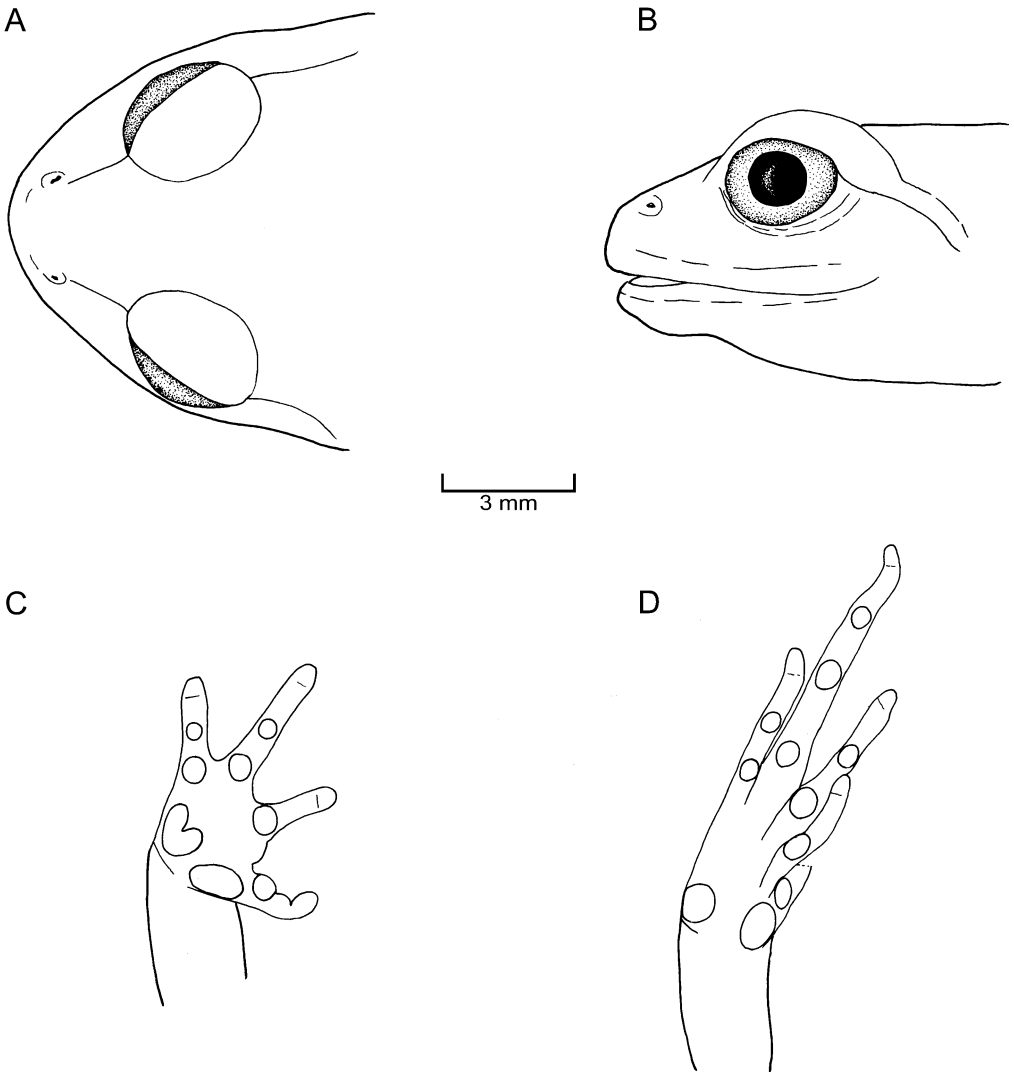


Figure 13. Dorsal (A) and lateral (B) views of head and ventral views of forefoot (C) and hind foot (D) of *Phrynopus kotosh* (FSM 103969). Tip of toe I is missing.

vomers (each bearing 2 relatively long teeth), dorsolateral folds, and no tympanum. Sixteen species of Peruvian *Phrynopus* lack a tympanum. Of these, only three species (*P. bracki, dagmarae,* and *kauneorum*) have dentigerous processes of vomers, and only *P. dagmarae* has weak dorsolateral folds (erroneously mentioned as absent according to original description by Lehr et al. [2002]). *Phrynopus kotosh* and *P. dagmarae* are similar, but they can be distinguished as follows (characters for *P. dagmarae* in parenthesis): dorsolateral folds discontinuous (weak and short), fingers and toes without lateral fringes (narrow fringes present; erroneously mentioned as absent in the original description by Lehr et al. [2002]), heel with small tubercles (with one conical tubercle), plantar supernumerary tubercles present (absent).

TABLE 4. MEASUREMENTS (MM) AND PROPORTIONS OF ADULT *PHRYNOPUS KOTOSH* AND *P. OBLIVIUS*; RANGE (MEAN ± 1 SD).

Character	*P. kotosh*				*P. oblivius*			
	Females (n = 3)		Males (n = 4)		Females (n = 3)		Males (n = 4)	
SVL	23.2–26.2	(24.4 ± 1.3)	14.6–17.4	(15.5 ± 1.1)	21.8–23.9	(22.7 ± 0.9)	17.5–19.7	(18.6 ± 0.8)
TL	8.6–9.3	(9.0 ± 0.3)	6.0–6.7	(6.4 ± 0.2)	8.7–9.1	(8.9 ± 0.2)	6.6–8.1	(7.5 ± 0.5)
FL	9.4–10.5	(9.9 ± 0.5)	6.1–7.9	(7.0 ± 0.6)	7.9–9.4	(8.8 ± 0.7)	6.8–8.1	(7.5 ± 0.5)
HL	8.3–9.6	(8.8 ± 0.6)	5.5–6.8	(6.0 ± 0.6)	7.5–7.7	(7.6 ± 0.1)	6.3–7.1	(6.7 ± 0.3)
HW	7.8–8.6	(8.1 ± 0.4)	5.2–5.9	(5.5 ± 0.3)	7.5–7.6	(7.6 ± 0.0)	6.5–7.1	(6.8 ± 0.2)
ED	2.2–2.5	(2.3 ± 0.1)	1.5–1.9	(1.7 ± 0.2)	2.2–2.6	(2.4 ± 0.2)	2.0–2.2	(2.2 ± 0.1)
IOD	2.3–2.6	(2.5 ± 0.1)	2.0–2.3	(2.2 ± 0.1)	2.5–2.8	(2.7 ± 0.1)	2.4–2.6	(2.5 ± 0.1)
EW	2.0–2.4	(2.2 ± 0.2)	1.2–1.6	(1.4 ± 0.1)	1.5–2.0	(1.8 ± 0.2)	1.3–1.5	(1.4 ± 0.1)
IND	1.8–2.0	(1.9 ± 0.1)	1.4–1.5	(1.5 ± 0.0)	1.8–2.1	(1.9 ± 0.1)	1.5–1.8	(1.7 ± 0.1)
E–N	2.1–2.7	(2.3 ± 0.3)	1.4–1.8	(1.6 ± 0.1)	1.8–1.8	(1.8 ± 0.0)	1.5–1.9	(1.7 ± 0.2)
TL/SVL	0.34–0.39		0.39–0.42		0.38–0.40		0.38–0.43	
FL/SVL	0.40–0.41		0.42–0.45		0.35–0.43		0.38–0.44	
HL/SVL	0.35–0.37		0.36–0.39		0.32–0.35		0.34–0.37	
HW/SVL	0.33–0.34		0.33–0.36		0.32–0.35		0.35–0.39	
HW/HL	0.90–0.94		0.87–0.95		0.99–1.00		0.96–1.05	
E–N/ED	0.84–1.23		0.82–1.07		0.69–0.82		0.68–0.86	
EW/IOD	0.77–1.04		0.57–0.73		0.51–0.80		0.54–0.58	

Both *Phrynopus kotosh* and *P. oblivius* are of similar size (see Table 4); males lack vocal sacs and nuptial pads. *Phrynopus kotosh* has weak, discontinuous dorsolateral folds (absent in *P. oblivius*), toe V and toe III about equal in length (toe V slightly longer), and dentigerous processes of vomers (absent). Superficially, *Phrynopus kotosh* is similar to *P. montium,* with which it has been confused (e.g., Duellman, 2000; Lehr et al. 2005). Both are similar in size and are brown with the dorsum being darker than the venter. Furthermore, *Phrynopus montium* has a tympanic annulus visible beneath the skin (tympanic annulus absent in *P. kotosh*), and males have a vocal sac and vocal slits (absent).

Description of the Holotype. Head narrower than body, slightly longer than wide; head width 33.6% of SVL; head length 35.8% of SVL; snout short, acutely rounded in dorsal view, rounded in lateral view (Figs. 13A, B), with terminal tubercle on its tip; eye diameter slightly larger than eye–nostril distance; nostrils slightly protuberant, directed dorsolaterally; canthus rostralis straight in dorsal view, rounded in profile; loreal region plain; lips rounded; upper eyelid with small tubercles; width of upper eyelid narrower than IOD (upper eyelid width 76.9% of IOD); supratympanic fold short, narrow; tympanic membrane and tympanic annulus absent, two enlarged, ovoid, conical postrictal tubercles on right side of head, one elongate ridge on left side of head present. Choanae small, ovoid, not concealed by palatal shelf of maxilla; dentigerous processes of vomers moderate, ovoid, oblique, situated posteromedially to choanae, each vomer bearing 2 elongate teeth, vomers narrowly separated; tongue 1.5× as long as wide not notched posteriorly, posterior one-fourth free.

Skin on dorsum shagreen with scattered tubercles, discontinuous dorsolateral folds present; skin on flanks coarsely tuberculate; skin on venter areolate, other ventral surfaces smooth; discoidal fold not evident, thoracical fold present; cloacal sheath short; large tubercles absent in cloacal region. Outer surface of ulnar each with a low ridge; palmar tubercles low, outer palmar tubercle bifid, approximately 1.5× the size of elongate, inner palmar tubercle; supernumerary tubercles close to base of fingers, round, low, half the size of subarticular tubercles; subarticular tuber-

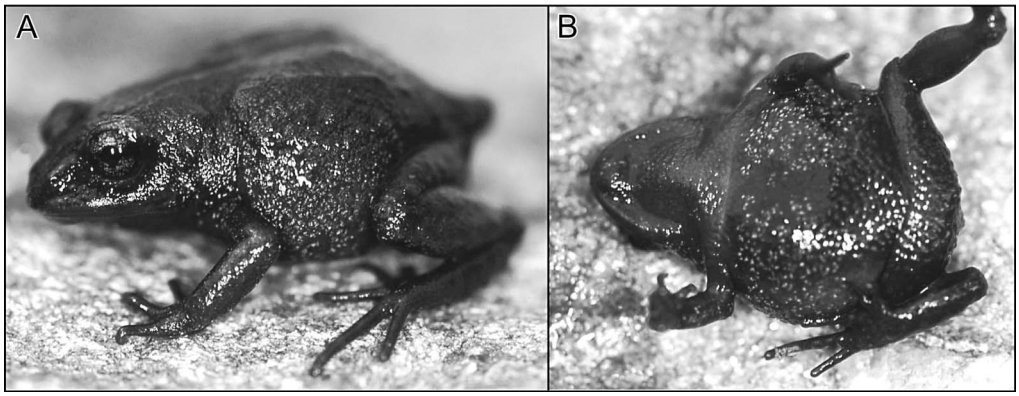


Figure 14. Dorsal (A) and ventral (B) views of *Phrynopus oblivius* (MHNSM 19979, holotype, SVL 21.8 mm).

cles prominent, ovoid in dorsal view, rounded in lateral view; fingers without lateral fringes; finger I shorter than finger II; tips of digits rounded (Fig. 13C).

Hind limbs slender, tibia length 37.1% of SVL; foot length 40.5% of SVL; upper surface of hind limbs smooth with small, scattered tubercles; posterior and ventral surfaces of thighs coarsely areolate; heel with small, round tubercles; outer surface of tarsus each with three, small, ovoid tubercles; inner metatarsal tubercle elevated, ovoid, about 2× conical, rounded outer metatarsal tubercle; many, low plantar supernumerary tubercles present; subarticular tubercles well defined, ovoid in dorsal view, rounded in lateral view; toes without lateral fringes, basal webbing present; toe tips rounded as large as those on fingers; relative lengths of toes: 1 < 2 < 3 < 5 < 4 (right foot), 1 < 2 < 4 < 5 < 3 (left foot) (Fig. 13D); toe V slightly longer or shorter than toe III.

Measurements (in mm) of holotype: SVL 23.2; tibia length 8.6; foot length 9.4; head length 8.3; head width 7.8; eye diameter 2.5; IOD 2.6; upper eyelid width 2.0; internarial distance 1.8; eye–nostril distance 2.1.

Coloration of Holotype in Preservative. Dorsum mottled tan and brown, discontinuous dorsolateral folds pale gray; each lower forelimb with one dark brown blotch, limbs with dark brown blotches; weakly defined dark brown canthal and supratympanic stripes present; dark brown blotch on upper lip below eye; venter tan and brown mottled, paler than dorsum; iris dark gray.

Coloration of Holotype in Life. Unknown.

Variation. No variation in coloration pattern is evident, except that one specimen (FSM 103973) has a tan middorsal stripe. Furthermore, this specimen has more prominent dorsolateral folds than the other specimens. See Table 1 for ranges and proportions of the type series.

Etymology. The specific name *kotosh* is a noun and refers to the pre-Columbian culture Kotosh (around 3000 B.C.). Kotosh ruins ("temple of the crossed arms") are among the earliest signs of civilization in Peru. They are located in the Río Mito/Río Higueras Valley west of Huánuco, where the new species was found.

Distribution and Ecology. The new species is only known from the type locality in the eastern part of the Cordillera Central (Map 1). Nothing is known about its natural history.

Phrynopus oblivius sp. nov.
Map 1, Figures 14–15

Holotype. MHNSM 19979 (Fig. 14), an adult female collected below the village of Maraynioc (11°2039.4″S, 75°26′44.7″W), Vitoc Valley, at 3,220 m on 13 December

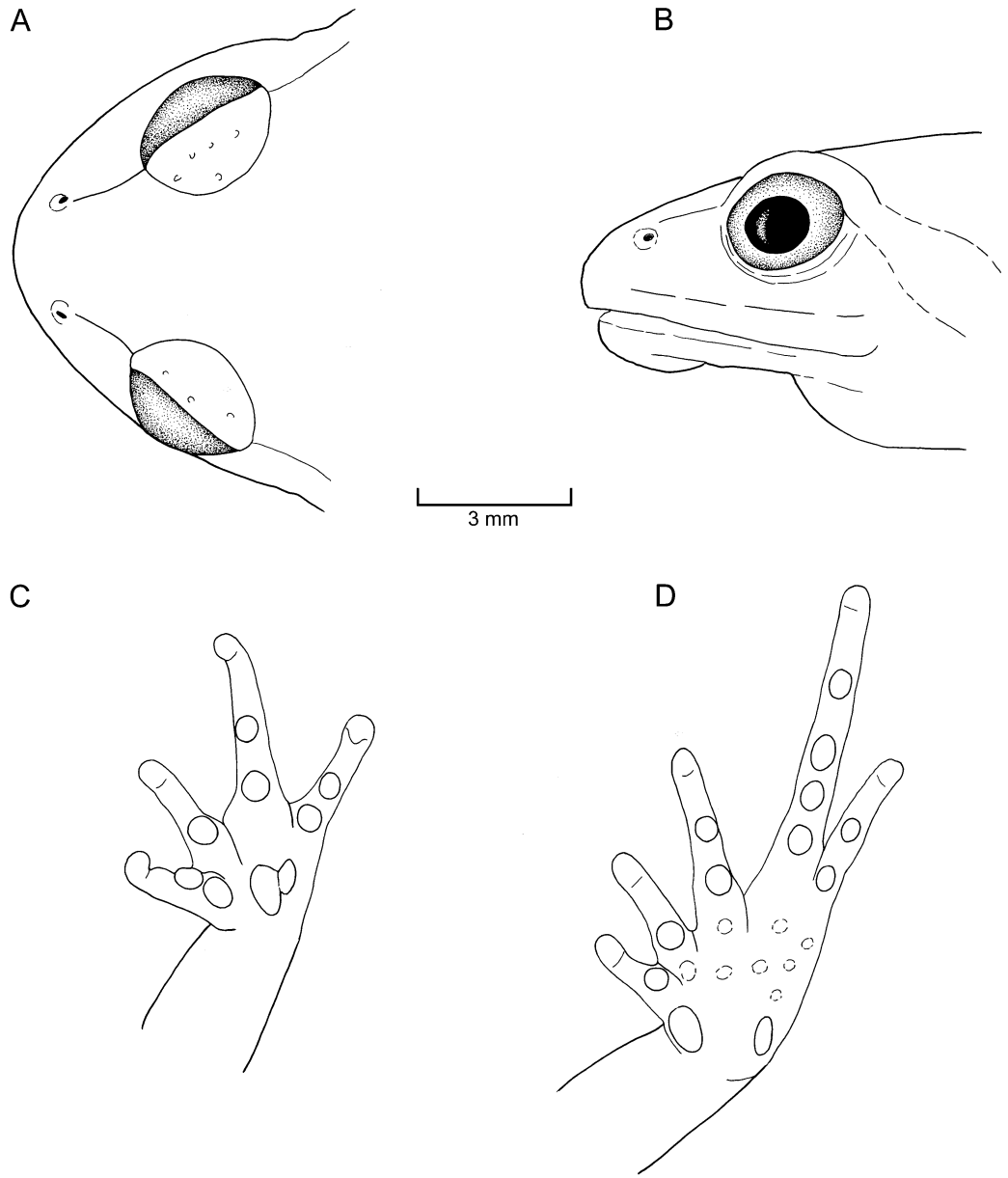


Figure 15. Dorsal (A) and lateral (B) views of head and ventral views of forefoot (C) and hind foot (D) of *Phrynopus oblivius* (MHNSM 19979).

2005, Provincia de Tarma, Departamento de Junín, Peru, by E. Lehr.

Paratypes. Six (four males: MHNSM 19981, MTD 46803–05; two females: MHNSM 19980, MTD 46806) collected at Maraynioc (11°20′33.2″S, 75°26′39.2″W), Vitoc Valley, at 3,210 m on 14 December 2005 (MTD 46804 on 13 December 2005), Provincia de Tarma, Departamento de Junín, Peru, by E. Lehr and J. Boettger;

three females (MCZ 24354, 24357, USNM 217417) obtained at Maraynioc, 45 mi NE of Tarma, Peru, by J. A. Griswold, Jr.

Referred Specimens. A series of 251, mostly untagged specimens (MCZ 24351–53, 24355–56, 24358) in medium to bad condition, USNM 217416, all collected at Maraynioc, 45 mi NE of Tarma, Peru, by J. A. Griswold, Jr.

Diagnosis. A small species of *Phrynopus* having knob-shaped terminal phalanges and the following combination of characters: (1) Skin on dorsum smooth with few, small tubercles, that on venter weakly areolate; discoidal fold present; dorsolateral folds absent; (2) tympanic membrane and tympanic annulus absent; (3) snout rounded in dorsal and lateral views; (4) upper eyelid with small tubercles; width of upper eyelid narrower than IOD; cranial crests absent; (5) dentigerous processes of vomers absent; (6) males lacking vocal slits and nuptial pads; (7) finger I shorter than finger II; tips of digits rounded; (8) fingers without lateral fringes; (9) ulnar and tarsal tubercles present; (10) heel with small tubercles; inner tarsal fold absent; (11) inner metatarsal tubercle small, ovoid, 2× as large as outer; outer metatarsal tubercle small, rounded; low, supernumerary plantar tubercles present; (12) toes without lateral fringes; toe webbing absent; toe V slightly longer than toe III; toe discs slightly smaller than those on fingers; (13) in life, dorsum dark brown with small, white spots, venter reddish brown with small, white spots; iris gold with black reticulations; (14) SVL in adult females 21.8–23.9.0 mm (n = 3), in adult males 17.5–19.7 mm (n = 4).

Phrynopus oblivius is readily distinguished from all species in the genus by its small size; smooth skin with few, small tubercles; and dark brown dorsum and reddish brown venter. It shares the absence of a tympanum with 14 other species in central Peru. Both *Phrynopus oblivius* and *P. kotosh* are of similar size (see Table 4); males lack vocal sacs and nuptial pads. *Phrynopus oblivius* (*P. kotosh*) has dorsolateral folds absent (weak, discontinuous), toe V slightly longer than toe III (about equal in length), and dentigerous processes of vomers absent (present).

Phrynopus oblivius has been confused with *P. montium* in the herpetological collection of the MCZ and in several publications (e.g., Duellman, 2000; Lehr et al., 2005). *Phrynopus oblivius* (*P. montium*) lacks a tympanic membrane and annulus (annulus visible beneath skin), and males lack vocal slits and a vocal sac (both present; Lynch, 1975), but male *P. oblivius* lack nuptial pads (present dorsally on swollen thumb; MCZ 22859). *Phrynopus montium* is only known from the type locality at Cascas approximately 30 km (straight-line) from Maraynioc in Departamento de Junín.

Description of the Holotype. Head narrower than body, about as wide as long; head width 34.9% of SVL; head length 35.3% of SVL; snout short, rounded in dorsal and lateral views (Figs. 15A, B); eye diameter larger than eye–nostril distance (eye–nostril distance 81.8% of length of eye); nostrils slightly protuberant, directed dorsolaterally; canthus rostralis straight in dorsal view, rounded in section; loreal region slightly concave; lips rounded; upper eyelid bearing few small tubercles; upper eyelid width 53.6% of IOD; supratympanic fold narrow and low; tympanic annulus and tympanic membrane absent; two enlarged postrictal tubercles on each side of head. Choanae small, ovoid, not concealed by palatal shelf of maxillary arch; dentigerous processes of vomers absent; tongue 2× as long as wide, slightly notched posteriorly, posterior one-half free.

Skin on dorsum with few, small tubercles more dense on posterior part of dorsum; dorsolateral folds absent; skin on flanks areolate with many tubercles; skin on venter weakly areolate, that on posterior ventral surfaces of thighs coarsely areolate; skin on other ventral surfaces smooth; discoidal fold present; cloacal sheath short, large tubercles in cloacal region absent. Three small, low ulnar tuber-

cles on each forelimb; palmar tubercles low, outer palmar tubercle bifid, approximately 2× size of ovoid, inner palmar tubercle; supernumerary tubercles present, round, low, half size of subarticular tubercles; subarticular tubercles ovoid, low, well defined on base of fingers; fingers without lateral fringes; finger I shorter than finger II; tips of digits rounded (Fig. 15C). Hind limbs slender, tibia length 39.9% of SVL; foot length 43.1% of SVL; upper surfaces of hind limbs smooth with few scattered tubercles; heel bearing small tubercles; outer surface of tarsus each with three, low tubercles; tarsal fold absent; inner metatarsal tubercle elevated, ovoid, about 1.5× ovoid outer metatarsal tubercle; many small, low plantar supernumerary tubercles present; subarticular tubercles well defined at base of fingers, ovoid in dorsal view and rounded in lateral view; toes without lateral fringes; tips of digits rounded; relative lengths of toes: 1 < 2 < 3 < 5 < 4 (Fig. 15D); toe V slightly longer than toe III (tip of toe III extending to midlength of penultimate subarticular tubercle on toe IV, tip of toe V not reaching ultimate subarticular tubercle on toe IV).

Measurements (in mm) of holotype: SVL 21.8; tibia length 8.7; foot length 9.4; head length 7.7; head width 7.6; eye diameter 2.2; IOD 2.8; upper eyelid width 1.5; internarial distance 1.9; eye–nostril distance 1.8.

Coloration of Holotype in Preservative. Dorsum grayish brown; gray interorbital stripe; flanks paler than dorsum; brown canthal and supratympanic stripes; brown bar on upper lip below eye; venter tan and dark brown mottled; inner 2 fingers and inner 3 toes dorsally pale gray, outer once brown; forefoot and hind foot ventrally tan and brown mottled.

Coloration of Holotype in Life. Dorsum, flanks, and venter chocolate brown with small white spots. Black canthal and supratympanic stripes present, black blotch on upper lip below eye; iris gold with black reticulations (based on photos of live specimen).

Variation. Coloration is variable. One specimen (MTD 46804) has tan middorsal and midventral stripes, tan stripes ventrally on forelimbs extending across chest, and ventrally on hindlimbs; the dorsum and flanks of one specimen (MTD 46803) are pale reddish brown with dark brown blotches, and the venter of one specimen (MTD 46805) is orange-brown with small white spots on the thighs. See Table 4 for measurements and proportions.

Etymology. The specific name is the past tense of the Latin verb *oblitus,* meaning forget. The specific name refers to the fact that *Phrynopus oblivius* was confused with *P. montium* for many years and not recognized as a distinct species.

Distribution and Ecology. Phrynopus oblivius is known from elevations of 3,210–3,220 m in the Vitoc Valley (Map 1). Individuals were found in remnants of a cloud forest beyond the old village and former Hacienda Maraynioc; all were found during day on humid ground beneath rocks next to a small creeks. One specimen (MTD 46804) was found under a rock together with *Gastrotheca griswoldi* (MTD 46811). No other anurans are known from the type locality.

DISCUSSION

Three of the new species of *Pristimantis* were obtained from the Cordillera de Vilcabamba in southern Peru, which is known for high biological diversity and endemism. The Cordillera de Vilcabamba is mostly separated from the major Cordillera Oriental of the Andes; the two ranges are connected only at the southern end of the Cordillera de Vilcabamba. This isolation has created unique characteristics of the Cordillera resulting in a highly endemic flora and fauna. For a historic overview of the scientific exploration of the Cordillera de Vilcabamba, which started in the late 1960s and mainly focused on birds and mammals, see Alonso et al. (2001). In 1997 and 1998, anthropological, botanical, and zoological expeditions assessed the biodiversity at several sites in the northern

and southern parts of the Cordillera de Vilcabamba. The results published by Alonso et al. (2001) contained chapters on the herpetofauna (Icochea et al., 2001a; Rodríguez, 2001) and two lists of species in the appendix (Icochea et al., 2001b; Rodríguez and Rivera, 2001). These authors mentioned that the anuran diversity is high and endemic and assumed possible new species of frogs but pointed out that comparisons with specimens needed to be made. *Pristimantis tanyrhynchus* is similar to *P. rhabdolaemus* from southern Peru and Bolivia, *P. vilcabambae* shows similarities with *P. croceoinguinis* from the Amazon basin in northern Peru and southern Ecuador. An interesting finding is that *P. seorsus* shares morphological characteristics with other members of the *P. orestes* Group, which was known only from the Cordillera Occidental in northern Peru (Lehr and Duellman, 2007). Presently, *P. seorsus* is the only species of *Pristimantis* attaining an elevation of 3,350 m in southern Peru. Two species (*P. seorsus, P. vilcabambae*) lack a tympanum. The absence of a tympanum for eleutherodactyline frogs in central Peru and its correlation with elevation has been graphically demonstrated by Lehr et al. (2006). Hopefully, tissue samples will become available in the future to assess phylogeographic relationships of the anuran fauna from the Vilcabamba region with species from other Andean regions.

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APPENDIX

Specimens Examined

Pristimantis carvalhoi: PERU: HUÁNUCO: W slope Serrania de Sira: KU 154868; PASCO: Nevati, KU 144312.

Pristimantis cordovae: PERU: LA LIBERTAD: ca. 8 km NE Quiruvilca, 3,542 m: MHNSM 21990 (holotype), MHNSM 21991, 21998, 21999 (paratypes).

Pristimantis corrugatus: PERU: SAN MARTÍN: Ullilen, 3,000 m: MHNSM 28063 (holotype); Quintecocha, 3,130 m: MHNSM 28062, 28064–67 (paratypes).

Pristimantis croceoinguinis: ECUADOR: NAPO: Santa Cecilia: KU 104576–84, 104614–16, 109078–85, 110790–93.

Pristimantis lanthanites: PERU: LORETO: junction Río Yanamono and Río Amazonas, 210 m: KU 220446, 220898, San Jacinto, 175 m: KU 222000–01.

Pristimantis lucida: PERU: Ayacucho: 7 km N Mahuayura, N slope Abra Tapuna, 3,710 m: KU 162427–34 (paratypes).

Pristimantis melanogaster: PERU: AMAZONAS: Chachapoyas, N slope Abra Barro Negro, 28 km SSW Leimebamba, 3,470 m: KU 212321 (holotype), 212322–23 (paratypes), 218513 (paratype); 25.5 km SSW Leimebamba, 3,300 m: KU 181281 (paratype).

Pristimantis muscosus: PERU: SAN MARTIN: E slope Abra Pardo Miguel, 1,800 m, KU 200479–81 (paratypes), 200482 (holotype).

Pristimantis orestes: ECUADOR: LOJA: 11 km NE Urdaneta, 2,970 m: KU 141998 (holotype), 141999–003 (paratypes); 10 km S Saraguro, 3,100 m: KU 141996–97 (paratypes).

Pristimantis ornatus: PERU: PASCO: Cillapata (ca. 1.5 km NNE Auquimarca), 2,900 m: MHNSM 20664 (holotype), MHNSM 17831, 20665–71, MTD 44766–68, 44770–72, 45073 (paratypes).

Pristimantis pataikos: AMAZONAS: Chachapoyas, N slope Abra Barro Negro, 28 km SSW Leimebamba, 3,470 m: KU 212320 (holotype).

Pristimantis pereger: PERU: AYACUCHO: Yanamonte, 2,600 m: MHNSM 19982–84, MTD 46807–09.

Pristimantis pharangobates: CUSCO: Buenos Aires, 2,400 m: KU 173236 (holotype), 173237–53 (paratypes).

Pristimantis pinguis: PERU: CAJAMARCA: 23 km SW Celendin, 3,050 m: KU 18283 (holotype), KU 18282, 18284 (paratypes), near Chugur: SMF 81763 (2,900 m), SMF 81764–65 (3,000 m), Hacienda Taulis, ca. 6°50′S, 79°10′W: SMF 81754–57 (3,100 m), SMF 81758–62 (3,400 m).

Pristimantis rhabdolaemus: BOLIVIA: COCHABAMBA: 68.8 km SW Villa Tumari, 1,860 m: KU 183009; PERU: CUZCO: 7 km Santa Isabel, 1,900 m: KU 13887 (paratype); AYACUCHO: Huanhuachayocc, on Tambo trail: KU 175082–83 (paratypes); AYACUCHO: between Mitupucuru and Estero Ruana: KU 175084 (paratype); Toccate, montane forest next to the Río Chrurbamba, 1,940–2,000 m: MHNSM 18505–08; CUZCO: Huyro, 1,720 m: KU 175086–88.

Pristimantis simonbolivari: ECUADOR: BOLÍVAR: Bosque Protector Cashca Totoras, 3,000 m: KU 218252–56 (paratypes).

Pristimantis simonsii: PERU: CAJAMARCA: 23 km SW Celendin: KU 181357–59, 181360; 33 km SW Celendin: KU 181361–389.

Pristimantis stictoboubonus: PERU: SAN MARTÍN: Quintecocha, 3,130 m: MHNSM 24446 (holotype), MHNSM 24445 (paratype); Ullilen, 3,000 m: MHNSM 24447 (paratype).

Pristimantis vidua: ECUADOR: ZAMORA-CHINCHIPE: 15 km E Loja, 2,800 m: KU 120082 (holotype), 120083–88 (paratypes), 120090–91 (paratypes); AZUAY: 32 km S Cumbe, 3,180 m: KU 165652.

Phrynopus bagrecito: PERU: CUSCO: Río Marcapata, below Marcapata, ca. 2,740 m: KU 196512 (holotype), KU 196513–18, 196520–21, 196523–25 (all paratypes); Hacienda Huyro between Huayopata and Quillabamba, 1,830 m: KU 196527–28.

Phrynopus boettgeri: PERU: PUNO: Phara, 3,466 m: MHNSM 19966 (holotype), MHNSM 19967–76, MTD 46508–9, 46512–19 (paratypes).

Phrynopus bracki: PERU: PASCO: Parque de la Nación Yanachaga-Chemillén, 2,600 m: MHNJP 4400 (paratype); Parque de la Nacion Yanachaga-Chemillén: San Alberto: MHNSM 19906–08, MTD 45946–49.

Phrynopus bufoides: PERU: PASCO: La Victoria, 4,100 m: MHNSM 18074 (holotype), MHNSM 18066, MTD 45072 (paratypes).

Phrynopus cophites: PERU: CUSCO: S slope Abra Acanacu, 14 km NNE Paucartambo, 3,400 m: KU 138884 (holotype); N slope Abra Acanacu, 27 km NNE Paucartambo, 3,450 m: KU 138885–908, 138911–5 (all paratypes).

Phrynopus dagmarae: PERU: HUÁNUCO: Palma Pampa, 3,020 m: MHNSM 20451 (holotype), MTD 45932–34.

Phrynopus heimorum: PERU: HUÁNUCO: ±10 km E Conchamarca, 3,420 m: MHNSM 20441 (holotype).

Phrynopus horstpauli: PERU: HUÁNUCO: about 10 km E of Conchamarca, 09°59′44″S, 76°09′40″W, 3,420 m: MTD 41754–57; Ichocan, Jatunloma—forest, 10°10.16′S, 76°07.20′W, 3,100 m: MTD 44333–39; near Laguna Gwenguay, 10°11.04′S, 76°05.7′W, 3770 m: MTD 44349; Santa Rosa/Yaurin, 09°59′58.2″S, 76°10′02.5″W, 3,250 m: MTD 45625–27.

Phrynopus montium: PERU: JUNÍN: Cascas, near Huasahuasi: MCZ 2258–61 (paratypes); Monaynioc, 72 km NE Tarma: KU 206649–50.

Phrynopus parkeri: PERU: PIURA: summit Cordillera between Chanchaque and Huancabamba, 3,100 m: KU 135278 (holotype), 135279–305 (paratypes), 135307–311 (paratypes); 26 km SW Huancabamba, ca. 3,050 m: KU 196581–91; El Tambo, 2,720 m: KU 219820; El Tambo, 31.5 km E Chanchaque: KU 181288–90; 24.3 km SW Huancabamba: KU 181292; 25.5 km SW Huancabamba: KU 181293–96; 29.3 km SW Huancabamba: KU 181297–303; 31 km SW Huancabamba: KU 181304–56; El Tambo, 31.5 km E Chanchaque: KU 181393; CAJAMARCA: San Ignacio: Santuario Nacional Tabaconas Namballe, Lagunas Arrebiatadas: MHNSM 19913–18, MTD 45953–59.

Phrynopus peruanus: PERU: JUNÍN: Puna of Maraynioc (11°21′35.2″S, 75°28′52.6″W), 3,825 m: MHNSM 19977–78, MTD 46801–02; Maraynioc: 45 mi NE Tarma: MCZ 24310–19.

Phrynopus peruvianus: PERU: CUSCO: N slope Abra Acanacu, 29 km NNE Paucartambo, 3,450 m: KU 138917; N slope Abra Acanacu, 27 km NNE Paucartambo, 3,450 m: KU 138919–24, KU 138929–35; Tres Cruces: KU 17325, KU 173327–29; Paucartambo: Kosnipata: Esperanza, 13°10.938′S, 71°35.257′W, 3,090 m: MTD 46371–72; N slope Abra Acanacu, 29 km NNE Paucartambo, 3,400 m: MTD 45021–22.

Phrynopus pesantesi: PERU: PASCO: Laguna Quimaccocha, 4,390 m: MHNSM 19857 (holotype), MHNSM 19858–60, MTD 45887–88, 45890–91 (paratypes).

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