42

# A remarkable discovery: description of a big-growing new gecko (Squamata: Gekkonidae: *Phyllopezus*) from northwestern Peru

145-150

CLAUDIA KOCH, PABLO J. VENEGAS & WOLFGANG BÖHME

**Abstract.** A new species of *Phyllopezus* is described from the dry forest of the upper Marañon basin (Department of Amazonas, Peru), in the northern portion of the Cordillera Central at an elevation of 900-1000 m a.s.l.. The new species differs from all described species by its large size, the absence of enlarged tubercles on head, limbs and tail, and only indistinct rows of small and flat tubercles on the dorsum.

Key words. Squamata, Gekkonidae, Phyllopezus, new species, dry forest, Peru.

#### Introduction

In the Andes of northern Peru (Departments of Piura, Cajamarca, Amazonas and San Martin) the major structural and physiographic break known as the "Huancabamba depression" is found, consisting of a complex system of relatively low ridges, basins and deep valleys (DUELLMAN & PRAMUK 1999). The low altitude of the Andes in this region cause fragmentation of montane habitats, and introduce a complex mixture of environments (CADLE 1991).

One of these habitats is the dry forest of the upper Marañon basin which extends from the Huancabamba depression to the deep valley of the upper Marañon basin between the Cordillera Occidental and Cordillera Central. Herpetological exploration of the upper Marañon basin in the last three decades has been fruitful and some new species have been discovered e.g., anurans of the genera *Colosthetus* (DUELLMAN 2004) and *Eleutherodactylus* (DUELLMAN & PRAMUK 1999), gekkonid lizards of the genus *Phyllodactylus* (DIXON & HUEY 1970), and tropidurid lizards of the genus *Stenocercus* (FRITTS 1972, CA-DLE 1991).

Due to the complex geography and diverse terrain, Peru has not been adequately collected in herpetological terms, and some regions have not been explored at all (LEHR 2002, CAMPBELL & LAMAR 2004). As study expands into these previously neglected areas, numerous new records and descriptions of new species are published each year.

A four day trip in the dry forest of the upper Marañon basin was made in July 2005, searching for species occurring in this region. A comparatively large and obviously undescribed species of gecko was found during the research, which, with a maximum known snout-vent length (SVL) of 115 mm, is the third largest gecko in South America. Only *Thecadactylus rapicauda* HOUTTUYN, 1782, which reaches 126 mm SVL and *Phyllope-zus periosus* RODRIGUES, 1986, which reaches 120 mm SVL, are bigger. Herein we describe this new species from the northern part of the Cordillera Central, Peru.

### Materials and methods

All specimens collected were preserved in 96 % ethanol and stored in 70 % ethanol. Measurements of the head were taken with a Vernier caliper (nearest 0.1 mm), measurements of body and tail were taken by use of a tape measure. Data from other *Phyllopezus* 

species were taken from literature sources and examination of preserved material of the Zoologisches Forschungsmuseum Alexander Koenig (ZFMK). The holotype and two of the paratypes were deposited at the Museo de Historia Natural de la Universidad Nacional Mayor de San Marcos (MHNSM), three paratypes were deposited at the ZFMK.

# **Results and discussion** Generic assignment

Phenetically similar to Aristelliger COPE, 1862 from the Caribbean. However, Aristelliger is characterized by a unique synapomorphy, the hemipenial bones (KLUGE 1982, RösLER 1995, RösLER & BöHME in press). Absent here. Characters of *Phyllopezus* PETERS, 1878 from South America are in agreement, except for the tubercles, but these vary in other gecko genera (e.g. in the genus *Hemidactylus*; RösLER 1995), too. According to A. M. BAUER (pers. comm.) preliminary molecular data show that our new species indeed clusters with other *Phyllopezus*.

# Species description

# *Phyllopezus maranjonensis* sp. n. (Figs. 1-4)

Holotype: Museo de Historia Natural San Marcos, MHNSM 19555, an adult male from Quebrada Honda in the vicinity of Balsas (06°49'S, 78°00'W, approximately 900-1000 m above sea level), Provincia de Chachapoyas, Departamento de Amazonas, Peru; collected on 10 July 2005 by C. KocH and P. J. VENEGAS.

Paratypes: MHNSM 19553, ZFMK 84995, two adult males; MHNSM 19554, ZFMK 84996-97, three adult females, all collected with the holotype.

Diagnosis: A large species of *Phyllopezus* with a maximum known SVL of 115 mm;

small granules on the dorsum; in some specimens few, slightly enlarged tubercules present on the dorsum but seldom forming regular rows; enlarged tubercles absent from head, limbs and tail; distal infradigital lamellae single; claw extends much beyond dilated part of basal phalanx.

Comparisons: This species is distinguished from *Phyllopezus periosus* RODRIGUES, 1986 from Brazil and *Phyllopezus pollicaris* SPIX, 1825 from Argentina, Bolivia, Brazil and Paraguay (see Fig. 5) by the absence of enlarged, regular rows of trihedral tubercles on the dorsum and from *P. pollicaris* also by larger size – maximum snout-vent length, 115 mm rather than 95 mm (VANZOLINI 1953, RODRIGUES 1986).

Description of holotype: Rostral about twice as wide as high with a short median groove of about one-third of length of rostral; nostril surrounded by rostral, first labial, nasorostal, supranasal and postnasal; 18 scales between eye and postnasal; scales in loreal region about two to three times larger than midorbital scales; rear of head granular without intermixed tubercles; ten supralabials and nine infralabials; ear diameter contained in eye diameter 4.3 times; mental bell-shaped, a bit longer than wide, bordered posteriorly by two postmentals; postmentals slightly larger than other chin shields; postmentals immediately followed by transverse row of three scales, followed by second row of two smaller scales; postmentals contact first infralabial of each side; dorsum with 88 intermixed tubercles, scattered irregularly; tubercles small, rounded and somewhat flattened, only two to three times larger than granules (Fig. 3); postanal tubercles two on left side, three on right side; limbs, tail and head without tubercles; 31 scales across venter, 89 from throat to vent; ventral scales about four times larger than scales beneath head; median row of scales beneath tail distinctly widened; lamellar formula for hand 8-11-13-13-12, foot 6-12-14-12-13; Claw extends much beyond dilated part of basal phalanx.

Measurements of the holotype (in mm): Snout-vent length 112.5, axilla-groin length 42.3, tail length 116.8, head length 32.2, head width 22.5, eye diameter 5.7, ear diameter 1.3, snout length 19.1, distance from eye to ear 9.1.

In life, ground colour grayish tan; dorsum distinctly banded with broad maroon band, followed by narrow dark brown band, followed by broad band of ground colour; between rear of head and vent four of such sequences; margins of each band undulating; colouration of dorsum continues on tail but more distinct, with brighter colouration; limbs and head mottled with maroon; dorsal surface of feet slightly lighter than ground colour; ventral surface of body dirty white with several small, dark dots on each scale, more dense on tail.

In preservative, ground colour light gray; bands on dorsum grayish or grayish-brown.

Variation: Snout-vent lengths of adult males range from 104.5 to 112.5 mm (mean 107.7), females from 99.8 to 115 mm (mean 107.4), average for all adults 107.6 mm; tail length ranges from 85 to 116.8 mm (44.5 to 50.9 per cent of total length); postmentals always contact first labial; scales from postnasal to eye vary from 17 to 20 (mean 18.5); scales across venter range from 28 to 35 (mean 30.7), from throat to vent from 77 to 98 (mean 88.5); dorsal scales around midbody range from 117 to 131 (mean 122.7); number of enlarged scales in median row beneath tail vary from 58 to 65 (mean 62); scales between postnasal and eye vary from 17 to 20; supralabials range from 8 to 10 (mean 9.3), infralabials from 7 to 10 (mean 8.4); number of intermixed dorsal tubercles vary from 5 to 94 (mean 61.5); lamellae beneath fourth toe range from 11 to 13 (mean 12) (Fig. 4); tubercles absent from head, limbs and tail; postanal tubercles number 2 or 3 (2.8). Colouration of all individuals almost identical; ground colour varies from pale creamy-brown to grayish tan; number of sequences of bands on dorsum between rear of head and vent always four; ventral surface of tail sometimes banded with gray and creamy-white bands.

Distribution: The new species is only known from the type locality. It is located in the inter-Andean valleys of the upper Marañon basin, in the vicinity of Balsas (Department of Amazonas), Peru. It was collected on the western slope of the northern portion of the Cordillera Central (see DUELLMAN & PRAMUK 1999), at an elevation of 900 to 1000 m above sea level.

Natural history: *Phyllopezus maranjonensis* inhabits the dry forest of the upper Marañon basin. According to BRACK (1986), this habitat forms part of the Equatorial Dry Forest Ecoregion. This ecoregion penetrates the Pacific lowlands of northern Peru to the Marañon basin at the Abra of Proculla (BRACK 1986), which is the lowest pass in the Andes between Colombia and southern Chile.

Using the vegetation formations of DU-ELLMAN & PRAMUK (1999) the dry forest of the Marañon basin is known as thorn forest (Fig. 6). This xeric habitat receives up to 500 mm of rainfall annually (DUELLMAN & PRAMUK 1999), the forest being composed principally of the following trees: *Prosopis, Acacia, Capparis,* and *Pseudobombax,* with other drought-resistant trees, especially near streams (*Bursera, Jacaranda,* and *Phithecolobium*), and numerous cacti (*Cereus, Opuntia,* and *Lemairocereus*) that predominate on the low hills of the Marañon River.

All individuals of *Phyllopezus maranjonensis* were found at night perched generally with the head pointing toward the ground, from one to more than three metres above the ground, on high and almost vertical rocks of Quebrada Honda (Fig. 7) (a river arm that drains into the Marañón River). This new species appeared more abundant in the zones where the ravine is very narrow; forming a small canyon surrounded by completely vertical rocky walls. In these rocky walls existed many crevices and holes, which we suggest are the diurnal retreats of *P. maranjonensis*.

The new species was found sympatric with three other species of gecko; *Phyllodac*-

# CLAUDIA KOCH et al.



Fig. 1. Preserved holotype of Phyllopezus maranjonensis sp. n. (MHNSM 19555).



Fig. 2. Paratype of Phyllopezus maranjonensis sp. n. (MHNSM 19554) in life in dorsolateral view.



Fig. 3. Tubercles on the dorsum of the male holotype of *Phyllopezus maranjonensis* sp. n. (MHNSM 19555).



*tylus reissii*, and two as yet undescribed *Phyllodactylus*. Air temperature during the nights of investigation averaged 27.3 °C, substrate temperature of the rocks averaged 28.8 °C.

Fig. 4. Ventral view of the foot of one of the paratypes of *Phyllopezus maranjonensis* sp. n. (MHNSM 19554).

## Description of a new gecko from northwestern Peru



Fig. 5. Distribution of the species of the genus *Phyllopezus* in South America: *Phyllopezus maranjonensis* sp. n. (red), *Phyllopezus periosus* (yellow), *Phyllopezus pollicaris* (blue).

Etymology: The specific epithet is derived from the Marañon basin in northern Peru and the Latin suffix –ensis, meaning "place", in reference to the type locality.

# Remarks

The dry forest of the upper Marañon basin is known for its high number of endemic birds (STATTERFIELD et al. 1998). As yet, diversity and endemism in others taxa are poorly known. No specific herpetological study exists of the species that inhabit this xeric habitat (cf. VENEGAS 2005), but based on the distribution of lizard species from northern Peru it is clear that the majority of the species that occur in the Marañon dry forest are endemic to this habitat (e.g. *Ameiva* 



Fig. 6. General landscape of the upper Marañon basin in the Department of Amazonas, Peru.



Fig. 7. Beginning of the river arm "Quebrada Honda" near the type locality of *Phyllopezus maranjonensis* sp. n. in Balsas, Department of Amazonas, Peru.

bifrontata concolor, Gonatodes atricucullaris, Microlophus stolzmanni, Phyllodactylus interandinus, P. johnwrighti, Polychrus peruvianus, and Stenocercus huancabambae), except for Phyllodactylus reissii, which also occurs on the Pacific slope (cf. DIXON & HUEY 1970, PETERS & DONOSO-BARROS 1970, DIXON & WRIGHT 1975, CADLE 1991; CARRILLO & ICOCHEA 1995).

Furthermore, two new species of the genus *Phyllodactylus* where found together with the new *Phyllopezus*. These are still under study and will be published elsewhere. It is probable that more species of reptiles remain undiscovered along the fringe of dry forest of the upper Marañon basin.

#### Acknowledgements

We are indebted to JESUS CORDOVA and CESAR AGUILAR for allowing access to the collections of the Museo de Historia Natural de la Universidad Nacional Mayor de San Marcos, Lima, Peru, and for the loan of material. Furthermore, we thank the Deutscher Akademischer Austauschdienst (DAAD) for financial support and ANDREAS SCHLÜTER, Staatliches Museum für Naturkunde, Stuttgart, for sharing his experience with Peruvian authorities. For preliminary information on molecular genetics of the new taxon we are indebted to AARON M. BAUER of the Department of Biology, Villanova University, Pennsylvania, USA.

#### References

- BRACK, A. (1986): Las Ecorregiones del Perú. – Bol. Lima, **44**: 57-70.
- CARRILLO, N. & J. ICOCHEA (1995): Lista taxonómica preliminar de los reptiles vivientes del Perú.– Publ. Mus. Hist. Nat. UNMSM (A), 49: 1-27.
- CADLE, J.E. (1991): Systematics of lizards of genus *Stenocercus* (Iguana: Tropiduridae) from northern Peru: new species and comments on relationship and distributions patterns. – Proc. Acad. Nat. Sci. Philadelphia, **143**: 1-96.
- CAMPBELL, J.A. & W.W. LAMAR (2004): The venomous reptiles of the western hemisphere, Volume I. – Cornell University Press, Ithaca, 475 pp.
- DIXON, J.R. & R.B. HUEY (1970): Systematics of the lizards of the gekkonid genus *Phyllodactylus* of mainland South America. – Los Angeles County Mus. Contrib. Sci., **192**: 1-77.
- DIXON, J.R. & J.W. WRIGHT (1975): A review of the lizards of the iguanid genus *Tropidurus* in Peru. – Los Angeles County Mus. Contrib. Sci., **271**: 1-39.
- DUELLMAN, W.E. (2004): Frogs of the genus Colostethus (Anura; Dendrobatidae) in the Andes of northern Peru. – Sci. Pap. Nat. Hist. Mus. Univ. Kansas, 35: 1-49.

- DUELLMAN, W.E. & J.B. PRAMUK (1999): Frogs of the genus *Eleutherodactylus* (Anura: Leptodactylidae) in the Andes of northern Peru. Sci. Pap. Nat. Hist. Mus. Univ. Kansas, 13: 1-78.
- KLUGE, A.G. (1982): Cloacal bones and sacs as evidence of gekkonid lizard relationship. – Herpetologica, 38(3): 348-355.
- LEHR, E. (2002): Amphibien und Reptilien in Peru: Die Herpetofauna entlang des 10. Breitengrades von Peru: Arterfassung, Taxonomie, Ökologische Bemerkungen und Biogeographische Beziehungen. – Natur und Tier - Verlag (NTV Wissenschaft), Münster, Germany, 208 pp.
- PETERS, J.A. & R. DONOSO-BARROS. 1970. Catalogue of the neotropical Squamata: Part II. Lizards and Amphisbaenians.– Bull. U. S..Natl. Mus., 297: 1-293.
- RODRIGUES, M.T. (1986): Uma nova espécie do gênero *Phyllopezus* de Cabaceiras: Paraíba: Brasil; com comentários sobre a fauna de lagartos da área (Sauria: Gekkonidae). – Pap. Avul. Zool., S. Paulo, **36**(20): 237-250.
- Rösler, H. (1995): Geckos der Welt: Alle Gattungen. Urania, Leipzig, Berlin, Jena, 256 pp.
- RÖSLER, H. & W. BÖHME (in press): Peculiarities of the hemipenes of the gekkonid lizard genera *Aristelliger* COPE, 1861 and *Uroplatus* DUMÉ-RIL, 1806.- In: Proc. 13th Ord. Gen. Meet. Soc. Europaea Herpetologica.
- SPIX, J.B. (1825): Animalia nova sive species novae Lacertarum quas in itinere per Brasiliam annis MDCCCXVII-MDCCCXX jussu et auspicius Maximiliani Josephi I Bavariae Regis suscepto collegit et descripsit Dr. J. B. de Spix. - Lipsiae: T. O. Weigel; F. S. Hybschmanni, Monachii, 26 pp.
- STATTERSFIELD, A., M. CROSBY, A. LONG & D. WEGE (1998): Endemic bird areas of the world – Priorities for biodiversity conservation. – Bird Life Cons. Ser. 7, 846 pp.
- VANZOLINI, P.E. (1953): Sobre o gênero *Phyllopezus* PETERS (Sauria: Gekkonidae). – Pap. Avul. Zool., S. Paulo, **11**(22): 353-369.
- VENEGAS, P.J. (2005): Herpetofauna del bosque seco ecuatorial de Perú: taxonomía, ecología y biogeografía. Z. Áridas, 9: 9-26.

# Manuscript received: 19 June 2006

Authors' addresses: CLAUDIA KOCH, WOLFGANG BÖHME, Zoologisches Forschungsmuseum Alexander Koenig, Adenauerallee 160, D-53113 Bonn, Germany, E-Mail: samnok@gmx.de, w.boehme.zfmk@unibonn.de; PABLO J. VENEGAS, Asociación Cracidae Peru, Torres Paz 708, Chiclayo, Peru, E-Mail: sancarranca@yahoo.es.