

# B R E V I O R A

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### THREE NEW TOADS FROM SOUTH AMERICA: *BUFO* *MANICORENSIS*, *BUFO SPINULOSUS ALTIPERUVIANUS* AND *BUFO QUECHUA*

BY JOSÉ M. GALLARDO

Museo Argentino de Ciencias Naturales  
Buenos Aires

#### INTRODUCTION

In the course of a general study of the Neotropical Bufonidae, I received some material from the British Museum (Natural History) (BMNH), the American Museum of Natural History (AMNH), the Carnegie Museum (CM) and the Museum of Zoology at the University of Michigan (MZUM) which included the new forms described below.

One of these is a quite different form of *Bufo* from the State of Amazonas, Brasil; another is a subspecies of *Bufo spinulosus* from the Department of Oruro, Bolivia, and the last a new species of the *Bufo ockendeni* group from the Department of Cochabamba, Bolivia.

#### *BUFO MANICORENSIS* sp. nov.

*Type.* BMNH 1898, 3.10.1, adult male, Manicoré, Rio Madeira, State of Amazonas, Brasil.

*Description.* Head elongate and sharp. Rostrum nearly vertical. Nostrils on a prominence, elongate and oblique. Cephalic crests well marked, with smooth or somewhat rippled borders. Subnasal crests visible. Canthal crests nearly convergent. Maxillary crests somewhat expanded. Preorbital crests slightly sloping posterolaterally. Postorbital crests sloping anterolaterally, close to the anterior border of the tympanum. Suborbital crests not expanded, rather distant from the lower border of the eye.



Supraorbital crests somewhat raised; interorbital space very narrow and concave, with granules in the parietal region. Parietal crests elongate and oblique, forming an angle with the supraorbital crests. Orbitotympanic crests short but distinct. Greatest diameter of eye, 6 mm. Vertical diameter of tympanum, 3 mm. Tympanum on an outward sloping plane. Paratoids subtriangular with indistinct borders, with their long axis oblique medio-laterally, with flat dorsal granules. One subgular vocal sac. Dorsum with flat granules. Belly with the larger granules on abdominal region. Limbs with dorsal conical granules. Without interdigital membrane in the hand; 1st and 2nd fingers subequal; subarticular tubercles double on fingers 2 and 3; two carpal tubercles, the inner one smaller, elliptic and somewhat salient, the outer larger and rounded. Subarticular tubercle double on toe 4; interdigital membrane in the toes to near the tip of the digits, but in toe 4 basal and prolonged as a serrated cutaneous fringe; two metatarsal tubercles small but elongate, the inner more salient; tarsal fringe absent. Dorsal coloration light brown, with some darker spots, not well marked. Belly light.

*Dimensions.* Head and body 50 mm. Head length 12.5 mm. Head width 17 mm. Head height 5.5 mm. Interorbital space 2.5 mm. Elbow to the third finger 21 mm. Femur 18 mm. Tibia 16 mm. Heel to the fourth toe 25.5 mm. Foot 17 mm.

*Diagnostic features.* *Bufo manicorens*'s differs from all other Neotropical toads; the shape of the head and cephalic crests recall certain Asiatic forms. In the Neotropical area the nearest species is *Bufo intermedius* Günther, but this is distinguished by the well marked parietals and preorbitals, the interorbital space narrower than the upper eyelid, the distinct tympanum, and by the paratoids which are not elliptical and are separated from the eye by the orbitotympanic crests. The new species is not as close to *Bufo valliceps* Wiegmann and differs from that species in having less prominent cephalic crests, the interorbital space narrower, double subarticular tubercles on the foot and no lateral granules in a row continuing the paratoids posteriorly.

*Material studied.* BMNH 1898, 3.10.1 (1 specimen), Manicoré, Rio Madeira, Brasil, B. Piffard.

**BUFO SPINULOSUS ALTIPERUVIANUS subsp. nov.**

*Type.* AMNH 14418, adult female, Challapata, Department of Oruro, Bolivia.

*Description.* Head very short and wide. Loreal region sloping



outward. Rostrum vertical. No cephalic crests, excepting maxillaries; canthus rostralis thick. Interorbital space granular. Tympanum sloping out. Paratoids well marked and rounded, continued laterally by large granules (each granule with many horny points). Two types of dorsal granules: the larger with one central horny point and many others around it, the smaller with only one horny point. Larger granules on abdominal region. First finger longer than second; subarticular tubercles on the fingers, double or semidivided; palmar outer tubercle larger and rounded, inner smaller and elongate. Interdigital membrane of the foot basal but prolonged as a fringe on the toes; subarticular tubercles on the toes, simple or sometimes double; two metatarsal tubercles, the inner more salient; a thick tarsal fringe.

*Dimensions.* Head and body 80 mm. Head length 17 mm. Head width 30 mm. Head height 11 mm. Interorbital space 6 mm. Upper eyelid width 6 mm. Eye 7 mm. Tympanum 3.5 mm. Paratoid 9 mm. by 8.5 mm. Elbow to the third finger 38 mm. Femur 36 mm. Tibia 30 mm. Heel to the fourth toe 50 mm. Foot 35 mm.

*Paratype.* AMNH 14417, Choro, Bolivia, adult female 82 mm.

*Distribution.* The two localities of the material studied, Challapata and Choro, are in the Department of Oruro, Bolivia; the type locality is at 3700 metres altitude.

*Diagnostic features.* According to Vellard (1959), there are six subspecies of *Bufo spinulosus*: *B. s. spinulosus*, *B. s. arequipensis*, *B. s. limensis*, *B. s. trifolium*, *B. s. flavopictus* and *B. s. orientalis*. *B. s. altiperuvianus* adds a seventh.

*Bufo s. altiperuvianus* differs from *B. s. spinulosus*, the Bolivian subspecies structurally and geographically closest (Department of La Paz) in having the head shorter, not so distinct from the body; the loreal region sloping more laterally; tympanum larger; paratoids larger and more rounded. Capurro (1950: 11) has cited *B. spinulosus* from Tarapacá Province, Chile (west of Oruro Department, on the other side of the Cordillera Occidental), but specimens of this provenance that I examined at the Chicago Natural History Museum are different from the form here described.

*Remarks.* I name this subspecies after the old Spanish name, Alto Perú, of the region from which it derives.

*Material studied.* AMNH 14418 (1 specimen) Challapata, Bolivia. AMNH 14417 (1 specimen) Choro, Bolivia.



*BUFO QUECHUA* sp. nov.

*Type.* CM 4225, adult female, Incachaca, 2500 m., Department of Cochabamba, Bolivia.

*Description.* Head triangular, widest at the angle of the mouth; loreal region sloping outward. Maxillary border marked; canthus rostralis thick; supraorbital crest absent; parietal crest visible; orbitotympanic crest thick; one rostral-internasal crest more or less marked. Tympanum not visible. Paratoids approximately elliptic, dorsally smooth. Body dorsally with sparse large granules, but with abundant small granules. One lateral row of granules, continuing the paratoids, each granule with a large central papilla and smaller papillae around it; below the row, lateral granules of the same type. Belly with abundant conical and simple granules. Elongate limbs, with conical granules dorsally. First finger longer than second; fingers free, borders with small conical granules; subarticular tubercles generally simple, but double on the third finger; outer palmar tubercle large and rounded, inner one smaller and elongate. Tarsal fringe absent; two metatarsal tubercles elongate and approximately of the same size, the outer one more salient; interdigital membrane near the toe tips, but on the fourth only a little more than half its length and prolonged as a cutaneous fringe; subarticular tubercles on toes, small and simple. Dorsum light brown with three large darker triangular spots not well marked; one interocular with base to the front and two others on the body with the base to the rear; a vertebral light line divided the last two triangles. Limbs dorsally with transverse wide dark bands. Belly yellowish with dark spots shaped very irregularly.

*Dimensions.* Head and body 50 mm. Head length 12 mm. Head width 17 mm. Head height 7 mm. Eye 5 mm. Upper eyelid width 4.5 mm. Interorbital space 5 mm. Paratoid length 7.5 mm. Elbow to the third finger 22 mm. Femur 20 mm. Tibia 17 mm. Heel to the fourth toe 28 mm. Foot 20 mm.

*Paratypes.* CM 4223, 4224, 4226, Incachaca, Dept. Cochabamba, Bolivia. Head and body: 62 mm., 41.5 mm., 37 mm., respectively.

*Diagnostic features.* Four other species related to *Bufo quechua* have been previously described: *B. ockendeni* Boulenger, *B. inca* Stejneger, *B. leptoscelis* Boulenger and *B. fissipes* Boulenger. In the table below their differential characters and the altitude at which they are found are shown.



|                                     | <i>B. ockendeni</i>         | <i>B. inca</i>              | <i>B. leptoscelis</i> | <i>B. fissipes</i>                               | <i>B. quechua</i>         |
|-------------------------------------|-----------------------------|-----------------------------|-----------------------|--------------------------------------------------|---------------------------|
| Cephalic crests                     | Supraorbitals and parietals | Supraorbitals and parietals | Parietals             | Absent                                           | Parietals                 |
| Tympanum                            | Not visible                 | Visible                     | Visible               | Not visible                                      | Not visible               |
| Paratoids                           | Subtriangular               | Elongate                    | Subtriangular         | Elongate                                         | Elongate                  |
| Tarsal fold                         | One row of granules         | One row of granules         | Absent                | Absent                                           | Absent                    |
| Interdigital membrane on fourth toe | Half toe length             | Less than half toe length   | Half toe length       | Very much less than half toe length, rudimentary | More than half toe length |
| Lateral granules                    | Each with one point         | Each with one point         | Crowded and spinose   | —                                                | Each with many points     |
| Ventral granules                    | Rounded                     | Conical                     | —                     | —                                                | Conical                   |
| Altitude                            | 1350-1900 metres            | 1500-1800 metres            | 1950 metres           | 1800 metres                                      | 2200-2600 metres          |



From this comparison of characters it may be deduced that *Bufo fissipes*, described from Santo Domingo, Province of Carabaya, Perú, is the nearest relative of *B. quechua*. But *B. fissipes* differs in the absence of parietal crests and the rudimentary interdigital membrane. Comparing the altitudes of the five species, it is noticed that *B. quechua* is seen to live at the highest altitudes; in some localities, such as Yungas de Chapare, Department of Cochabamba, Bolivia, it coincides with *B. ockendeni* but this last lives also at lower altitudes. It is interesting to see that *B. ockendeni* is, in this group of five species, the one that lives at the lowest altitude and has the widest known distribution, from Central and S.E. Perú to the departments of Cochabamba and Santa Cruz in Bolivia. The other three previously described species are restricted to S.E. Perú: *B. inca* (departments of Ayacucho and Cusco), *B. leptoscelis* and *B. fissipes* (Department of Puno, but at different altitudes). *B. quechua* occurs in the Yungas of the Department of Cochabamba, Bolivia.

*Material studied* (including comparative material). *Bufo quechua*: CM 4223-26 (4 specimens) Incachaca, Department of Cochabamba, Bolivia, 2500 m., J. Steinbach.

USNM 118704 (1 specimen) Socotal, Yungas del Chapare, Department of Cochabamba, Bolivia, J. Steinbach, II-1929.

MZUM 89414 (1 specimen) Yungas del Chapare, Department of Cochabamba, Bolivia.

MZUM 76075 (1 specimen) Yungas de Cochabamba, 2200 m., Department of Cochabamba, Bolivia.

MZUM 68163 (3 specimens) Yungas de Cochabamba, 2200 m., Department of Cochabamba, Bolivia.

MZUM 68166 (1 specimen) Cochabamba Valley, 2600 m., Department of Cochabamba, Bolivia.

*Bufo fissipes*. AMNH 6105 (1 specimen) Juliaca, Perú, H. H. Keays. Chicago Natural History Museum 64879, 64850 (2 specimens) Puno, Perú.

*Bufo inca*. USNM 107648 (1 specimen) 1 mile above San Miguel, Ayacucho, Perú, O. F. Cook, V-27-1915.

MCZ 4758 (1 specimen) Idma, Urubamba Valley, 6000 ft., Perú, E. Heller, X-1915.

*Bufo ockendeni*. MCZ 15425 (1 specimen) Chaquimayo, Perú. Chicago Natural History Museum 3581-82 (2 specimens) Chaquimayo, S.E. Perú, H. C. Watkins.



AMNH 6111-17 (16 specimens) Juliaca, Perú, H. H. Keays.  
MZUM 68153 (1 specimen) Yungas del Chapare, Department  
of Cochabamba, Bolivia.  
MZUM 68152 (2 specimens) Tarata, 1900 m., Bolivia.  
CM 3806b, 4515 (2 specimens) Cerro Hosano, west of Santa  
Cruz, 1400 m., J. Steinbach.

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