

## A New Species of *Batrachuperus* from Northwestern China

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**Abstract.**— We describe a new species of salamander in the genus *Batrachuperus* from Tsinling Mts. in western China. The new species is morphologically most similar to *B. longdongensis*, but differentiated by the absence of horny covers on palms and tarsi. It represents the most northeastern distribution and the lowest elevation of the genus.

**Key words.**— Caudata, *Batrachuperus*, new species, China, Tsinling

### Introduction

The salamander genus *Batrachuperus* Boulenger, 1878 contains seven species (Frost, 1985). Three species occur on the western side of the Tibet Plateau (Iran and Afghanistan). The remaining four species are found on the eastern side of the Tibet Plateau in China. During the fieldwork in 1986 and 1999, we collected specimens of *Batrachuperus* from Zhouzhi, China. This collection marks the most northeastern distribution of the genus. The specimens are different

from all other described species (Fei et al., 1990), and we describe them as a new species.

### *Batrachuperus taibaiensis*, new species (Fig. 1). Taibai Stream Salamander

**Holotype:** NIEA 860122. An adult male from the upper stream of Heihe River, near Hua Er Ping Village, Zhouzhi County, Shaanxi Province, China (33.85°N, 107.82°E), collected by M. Song on August 8, 1986, elevation 1260m. The holotype is deposited



Figure 1. Paratype of *Batrachuperus taibaiensis* (MVZ 230964).



at the herpetological collection of Northwest Institute of Endangered Animals, Xi'an, China.

**Paratypes:** Allotype, NIEA 860116, an adult female, collected from the same locality at the same time as the holotype. Other paratypes include NIEA 860114-5, 860117-9, 860121, 860126-7, 860129-139 and MVZ 230964-65, 230979-86. The NIEA series are collected from the same locality at the same time as the holotype and are deposited at the herpetology collection of Northwest Institute of Endangered Animals, Xi'an, China. The MVZ series are collected from the same locality on September 30, 1999 by Z. Liu, and are deposited at the herpetology collection of the Museum of Vertebrate Zoology, University of California, Berkeley.

**Diagnosis:** A relatively large, robust stream salamander; distinguished from other members of the genus by the large size, vomerine teeth arranged in a "Λ" shape, and lack of horny cover on palms and tarsi. Morphologically, the species most closely resembles *B. longdongensis*. Both species are distinguished from others by large size and vomerine teeth arranged in a "Λ" shape. Between the two species, *B. longdongensis* differs from *B. taibaiensis* by the presence of the horny cover on palms, tarsi, and tail tip, as well as the presence of gill slits in adults. *Batrachuperus*

*taibaiensis* is distinguished from geographically neighboring species, *B. tibetanus*, by its large size and the arrangement of vomerine teeth. Most phylogenetically closely related to *B. karlschmidti* and *B. tibetanus*. Its cytochrome *b* gene sequence differs from *B. longdongensis* by 9.2%, from *B. karlschmidti* by 7%, and from *B. tibetanus* by 8.2-8.6% (J. Fu et al., unpublished data).

**Description:** *Batrachuperus taibaiensis* is a large (adults males over 217 mm maximum SL), stout species. Head moderately depressed, its length from snout to gular fold longer than its width; snout short and round. Labial fold well developed, often partially covers the lower jaw. Angle of jaw just behind the posterior corner of eye. Both maxilla and mandible with tiny teeth. Tongue elliptical, without free end. Vomerine teeth four, arranged in "Λ" shape.

Body stout. Male body length slightly longer than tail length and female body and tail length about the same. Costal grooves 11. Limbs relatively short but strong; when adpressed, tips of digits do not overlap and are always separated by 1-3 costal folds in adults, but contacted in juveniles. Separation is greater in males. Fingers four, 3-2-4-1 in order of length. Toes four, 3-2-4-1 in order of length. Most individuals without palmar and tarsal tubercles. No horny cover

Table 1. Measurement (range, means) and percentage ratios of each character dimension to SVL. All measurements are in mm.

Measurement	Holotype	Allotype	Male (n=11)	Juvenile	Female (n=9)
Snout-vent length	102	105	92.9±12.1 73—110	65	102.1±7.1 94—111
Tail length	115	105	98.5±13.7 76—115	60	101.3±7.5 91—113
Head length	26	27	25.4±2.9 20—29	19	27.2±1.5 25—28
Head width	23	25	20.4±1.6 18—23	13	21.4±1.7 19—25
Forelimb length	26	22	22.7±2.5 20—27	18	23.7±1.2 22—26
Hindlimb length	30	30	29.6±3.0 25—36	21	30.9±2.5 23—34
Limb interval	52	51	44.8±7.9 33—59	30	52.2±8.7 44—68
Vomerine teeth	4	4	4	4	4



on palms, tarsi, and ventral side of the fingers, and toes. Some individuals have horny cover of the very tips of the fingers and toes. Tail round at the base and gradually flattened laterally. Tail fin moderately high. Skin smooth. The measurements of the type specimens are presented in table 1.

**Habitat and distribution:** This species is only known from the type locality, which is the most north-eastern distribution of the genus and the only known location from the northern slope the Tsinling Mts. It has also the lowest elevation of the genus (1260m).

This species inhabits in fast moving streams (close to the headwater of Heihe River). During daytime, they are found under rocks in the stream, and have never been observed under rocks on the riverbank. The stream is well covered by the canopy from both sides of the river and has steep slopes.

**Etymology:** The name *taibaiensis* is derived from the name of the nearby peak, Taibai Peak, which is the highest point of Tsinling Mts.

**Remarks:** Recent phylogenetic study of the genus supported the species status of *B. taibaiensis* (Fu et al. unpublished data). It is the sister group of the clade including *B. karlschmidti* and *B. tibetanus*. Together,

the clade is the sister group of *B. yenyuansis* and *B. pinchonii*.

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