

**RANGE EXTENSION OF THE CROCODILE SALAMANDER,  
*TYLOTOTRITON VERRUCOSUS*, TO PHU LUANG, THAILAND**

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ABSTRACT

A specimen of *Tylototriton verrucosus* Anderson, 118 mm in total length, was recently collected from a peak in Phu Luang Wildlife Sanctuary of Loei Province at an elevation of about 1500 m. A search of several museums has revealed two other specimens taken by local collectors from Phu Luang, and several specimens from new locations in Chiang Mai Province. Previously published accounts record the Thai range of this salamander as within Chiang Mai Province only, based on three published records comprising only two adults and some larvae.

INTRODUCTION

The Faculty of Science of Chulalongkorn University, at the request of the Royal Forest Department, Ministry of Agriculture and Cooperatives, Bangkok, conducted an investigation of dinosaur footprints in the vicinity of Phu Luang Wildlife Sanctuary of Loei Province during the beginning of the rainy season in 1984. On 19 May, at 0930 h in foggy weather, about 1.5 km east of the sanctuary office at Larn Nok-Kraba, an 118 mm salamander of the species *Tylototriton verrucosus* Anderson, 1871, was seen clumsily walking on an elephant trail. It was collected alive.

The capture site was damp and wet with very little sunlight penetrating to the ground. The soil was a mixture of sand and decomposing leaves of trees, grasses and bamboos in addition to growing mosses and lichens. Narrow and shallow water passages among boulders and rocks are common at high elevations in this sanctuary. The elevation of this location, which is on one of the high mountain peaks, is about 1500 m. It is more than 300 km east of Chiang Mai, the only other previously documented locality of this species of salamandrid in Thailand. Another specimen of about the same size was later seen preserved in formalin in a small collection of fauna maintained at the sanctuary office. It is not described in detail here.

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During the preparation of this manuscript, additional specimens of this species collected from Phu Luang and other localities were discovered in museums in Bangkok. A formalin-preserved specimen, 149 mm long, was found in the collection of the Kasetsart Museum of Fisheries (KUMF). It was captured by Mr. Dumrong Chaiglom of the Royal Forest Department from Phu Luang Wildlife Sanctuary on 21 March 1965, at 1200 m. Another Phu Luang specimen of 130 mm (CTNRC 0033) from Wang Sap-hung District, collected by Mr. Anuwat Wattanapongsiri on 13 May 1968, was also seen among 25 other specimens (43–149 mm) from Chiang Mai Province in the Centre for Thai National Reference Collections (CTNRC). The Chiang Mai specimens were taken by various collectors from Doi Chiang Dao on 1 August 1966, Doi Pui on 20 November 1970, Doi Intanon in December 1978 and 5 August 1979 and Doi Suthep on 15 July 1979 and 20 August 1983. Another specimen 145 mm, collected by Mr. Viroj Nutaphand in May 1977 at Doi Ang-Khang near Doi Intanon, was seen in the Chulalongkorn University Museum of Zoology (CUMZ).

It is therefore probable that *Tylotriton verrucosus* is not rare in its habitat in the northern part of Thailand, but the species is endangered because it exhibits a high degree of selectivity in regard to the conditions under which it will live and reproduce. The montane forests of this area are gradually being transformed and degraded, and this will threaten the survival of the species.

This is the only species of Salamandridae to be found in Thailand, although there are records of six species of *Tylotriton*, or crocodile salamanders, in East Asia, and 90 species of 15 genera of this family in the world (FREYTAG in GRZIMEK, 1970).

The present measurements follow TAYLOR'S (1962) work, *The Amphibian Fauna of Thailand*. The specimen will be deposited in the CUMZ.

#### DESCRIPTION

Data for the present living Phu Luang specimen in mm follow: snout to termination of vent 61.5; tail 56.5; snout to arm insertion 18.5; axillary to groin 32.2; width of head 15.6, length of head 18.4; arm 21.9, and leg 21.0. Sex cannot be determined with certainty.

Colouration: most parts of body and tail dark, ventral surface also dark but shining, head becoming dull brownish, lighter on jaws and chin; ridge along middle of back dull orange and gradually brighter on upper and lower edges of slightly compressed tail; tubercles or glands, which are 13 in number on each side of dorsolateral region, dull orange; tips of all digits and a small longitudinal area about vent orangish; inside of mouth flesh colour, without markings. There is no line of demarcation between the two colours except on the tail.

## DISCUSSION

This species of true salamander was originally described by ANDERSON (1871) as *Tylototriton verrucosus*. It is readily identified by its characteristic morphology of head and body and also colouration.

Locally, the animal is known as "Kra-taang nam" ("Krataang" is a northeastern Thai name for agamid fence lizards, and "nam" means water in Thai). I was told that locally it can attain about 25 cm in total length (only 20 cm according to FREYTAG, 1970). It is not rare in the sanctuary but is confined mainly to habitats near water. The local people used to collect, kill and sun-dry the animals for mixing with roots of special kinds of herbs for use in curing fever.

The type locality of the species is Nantin, Momien (Tengyueh) and Hotha valleys of western Yunan. According to TAYLOR (1962) "This species has a range from western Yunan and northern Burma west to Sikkim. It reaches an elevation above 6000 ft." TAYLOR'S description is based on an adult of 130 mm in total length collected by Mrs. Birgit Degerbøl Hansen from Doi Intanon, Chiang Mai, 2000 m above sea level. Prior to this, M. SMITH (1924) had made a collection of about 40 larvae of less than 75 mm in length from Chiang Dao, Chiang Mai, at an elevation of about 1500–1800 m. SUVATTI (1949) failed to list the species in his *Fauna of Thailand*. However, in his memoir (now kept in Kasetsart University Museum of Fisheries, Bangkok) to the rector of the university, dated 13 August 1965, a reference to 3 salamander specimens collected from Huey Kok-ma, Chiang Mai, was made, with their mating season of about the beginning of July. In the same Province, Bueng-wa on Doi Buang-ha was another location recorded by him. "Mah-nam" (meaning "water dog"; this Thai name probably a reflection of the sound it produces which is like the bark of a dog) and new Thai names "Jing-jok nam" ("water wall-lizard") and "Jorake-nam" ("water crocodile") are other vernacular names noted by him.

Recently, BEAVER (1982) collected a living specimen, 186 mm in total length, from Doi Suthep, Chiang Mai, in December 1977, and studied its morphometry and biology for 6 months by feeding it with earthworms. It was later released into its habitat. The Phu Luang specimen also ate 2 or 3 medium sized earthworms per week.

The specimens reported here extend the known range of the species to Loei Province in Thailand, and reaffirm its montane habit.

According to NAPEETAPAT & NUNPAKDEE (1982) no urodele was known among 31 species of amphibians and reptiles recorded from Khao Yai National Park, at an elevation of 800–1350 m, which lies some 300 km south of Phu Luang.

My colleague, Dr. Arom Rasmidatta, and a student of mine, Mr. Chavalit Vittayanon, independently informed me that they had seen adult specimens with the price of 100–150 baht per animal in Bangkok pet shops but their exact capture localities were not revealed.

## REMARKS

It is interesting to note that this Phu Luang specimen made a short low noise while snapping its jaws when being packed for transport to Bangkok in the next morning. The same sound was produced again in early morning on 20 July 1984 while snapping at an earthworm (and missing).

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