

On the Distribution of lesser known Himalayan Toad, *Duttaphrynus himalayanus* (Gunther, 1864) and Stuart's Toad, *Duttaphrynus stuarti* (Smith, 1929) [Bufonidae] in Arunachal Pradesh, India

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ABSTRACT

Based on the collection of toad specimens from two field sites, we are reporting herein additional distributional records of *Duttaphrynus himalayanus* and *Duttaphrynus stuarti* from Arunachal Pradesh. Brief diagnostic features, morphological measurements and natural history notes are also provided herein.

Key words: *Duttaphrynus himalayanus*, *Duttaphrynus stuarti*, Arunachal Pradesh, Kane Wildlife Sanctuary, Lower Subansiri, Distribution

Introduction

The Anuran genus *Duttaphrynus* Frost *et al.*, 2006 has 23 recognised species in the world (Frost, 2024), of which 18 are known to occur in India. Amongst them, only four are reported from the Himalayan State of Arunachal Pradesh, viz. *D. melanostictus* *D. stomaticus* (Lutken, 1864), *D. himalayanus* (Gunther, 1864) and *D. stuarti* (Smith, 1929) (Sinha and Saikia, 2022). Globally, the lesser known Himalayan Toad *D. himalayanus* is distributed in Bangladesh, Nepal, Bhutan, China, Myanmar, Pakistan and India. In India, this species is recorded from Assam, Arunachal Pradesh, Himachal Pradesh, Manipur, Meghalaya, Sikkim and West Bengal (Frost, 2024). Within the State of Arunachal Pradesh, the occurrence of *D. himalayanus* has been reported from

Tirap (Sarkar and Sanyal, 1985), West Kameng (Sarkar and Ray, 2006) and Namdapha National Park (Dinesh and Radhakrishnan, 2019). As per Frost (2024), the lesser known Stuart's Toad *D. stuarti* is distributed only in Bhutan, Myanmar and North-East India; in North-East India the species is known to occur in Arunachal Pradesh, Meghalaya and Sikkim (Frost, 2024). Confirmed occurrence of Stuart's toad in Arunachal Pradesh are from Eaglenest Wildlife Sanctuary (Agarwal and Mistry, 2008), Lower Dibang Valley (Roy *et al.*, 2018), Namdapha National Park (Dinesh and Radhakrishnan, 2019) and Upper Dibang Valley (Sinha and Saikia, 2022). While the Himalayan toad, *D. himalayanus* usually inhabits fields, within dense forest and specially maintain distance from natural water bodies, *D. stuarti*, on the other hand, mostly

prefers undisturbed habitat (Mathew and Sen, 2010). Herein, we are reporting new locality record of *D. himalayanus* and *D. stuarti* with brief morphological features along with natural history notes.

Materials and Methods

During the faunal survey, Visual Encountered Survey (VES) (Crump and Scott, 1994) and Active Searching Method (ASM) (Rolfe and McKenzie, 2000) through the foot and trails were adopted. The specimens were collected by hand picking method. The collected specimens were photographed in the field and euthanized using chloroform and later fixed in 8% formalin for overnight. The specimens were then washed gently and preserved in 70% ethanol. Morpho-metric measurements (Table 1) were taken using digital caliper (0.1mm) followed after (Mathew and Sen, 2009). Identity of the specimens were confirmed with the help of morphological feature listed in Sarkar and Ray, 2006; Chanda, 2002 and Mathew and Sen, 2009. The specimens were deposited and catalogued in National Zoological collection (NZC) of Zoological Survey of India (ZSI), Arunachal Pradesh Regional Centre, Itanagar.

Results and Discussion

Both the collected specimens were in a juvenile stage and identified as *Duttaphrynus himalayanus* (Fig.1A) and *D. stuarti* (Fig.1B) based on the morphological features listed in Sarkar and Ray (2006); Chanda (2002) and Mathew and Sen (2009). The morphological features are as follows:

Duttaphrynus himalayanus (Gunther, 1864)

Material examined: Regd. No. ZSI/APRC/A-360,



Fig. 1A. Dorsal view of *D. himalayanus* (in live)



Fig. 1B. Dorsal view of *D. stuarti* (in preservation)

01 ex., Kane Wildlife Sanctuary, Lower Siang, coll. by Ilona J Kharkongor and party.

Diagnosis: The examined specimen is a small sized toad of SVL 21.36, with the tibio-tarsal articulation reaching between eye and nostril. Its dorsal surface is uniform yellowish grey (in life) and grayish brown (in preservatives), with dark brown warts. Ventrally, it is yellowish brown with numerous black dots from throat to belly region. The head is longer than broad, tympanum relatively smaller in size and indistinct, with the nostril closer to the snout than to eye; parotids elongated.

Natural history: The specimen in this report was collected in the month of March from the vicinity of a rocky pool in a dried-up torrential hill-stream that drains to the Hiju-Abu River. The habitat is rocky and steep; the hill-stream banks are covered with moss and ferns and the surrounding areas is forested with a thick undergrowth of herbs and shrubs.

Duttaphrynus stuarti (Smith, 1929)

Material examined: Regd. No. ZSI/APRC/A-344, 01 ex., Deed Circle, Lower Subansiri, coll. by Temjenmongla and party.

Diagnosis: The studied specimen has an SVL of 22.79 mm, with the tibio- tarsal articulation reaching to the tip of the snout. The dorsum is reddish brown with the anterior portion granular, while the posterior parts are with keratinized, spiny warts. The ventrum is reddish-yellow with the chest, throat, belly and thighs granular. The head, which is wider than long, is with a prominent snout and the nostrils are placed closer to the snout than to the eye. The canthus rostralis is distinct, the inter-orbital space slightly concave, tympanum present and slightly bigger than half of the eye diameter; parotid glands

Table 1. Measurements of examined toads (in mm).

Parameters	<i>D. himalayanus</i>	<i>D. stuarti</i>
SVL	21.36	22.79
HL	9.47	8.31
HW	8.78	8.43
MN	6.66	7.73
TYD	0.74	1.34
TYE	0.76	0.52
EL	3.73	2.84
EN	2.09	2.79
SN	1.48	1.44
SL	3.67	3.76
IFE	5.16	4.47
IBE	7.59	7.28
FLL	6.12	6.65
HAL	5.56	5.98
TFL	2.92	3.35
FLL	8.47	8.62
TL	8.55	8.94
TFOL	7.21	8.65
FTL	4.11	3.73
ITL	2.13	1.29

Abbreviations: SVL = snout-vent length; HL = head length; HW = head width; MN = mandible-nostril distance; TYD = tympanum diameter; TYE = tympanum-eye distance; EL = eye length; EN = eye-nostril distance; SN = snout-nostril distance; SL = snout to eye distance; IFE = distance between the front of eyes; IBE = distance between the back of eyes; FLL = forelimb length; HAL = hand length; TFL = third finger length; FL = femur length; TL = tibia length; TFOL = tarsus-foot length; FTL = fourth toe length; ITL = inner toe length

are elongated. Forelimb moderate, fingers long and thin, toes long and with rudimentary web.

Natural history: The reported specimen was collected in the month of September from a shallow stream. The habitat is undisturbed with thick forest cover surrounded by ferns, herbs, shrubs and broad leaf trees. The temperature of the stream was 14–17 °C and relative humidity 28–30 % at the time of survey.

The known altitudinal distribution of *D. himalayanus* is from mid altitude of 520 m in Namdapha National Park (Sarkar and Sanyal, 1985), while Sarkar and Ray (2006) did not mention altitudinal range in their report. In this paper, we are reporting this species from a low altitudinal range of 194 m asl from near Hiju Abu river, Kane Wildlife Sanctuary, giving the altitudinal distribution of this species to be from 194 m to 520 m asl. On the other hand, historical records of *D. stuarti* indicate that the

species has a known altitudinal distribution range from 285m to 2100m asl.

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Conflict of Interest - None

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