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Locality Record of *Leptobrachium smithi* Matsui, Nabhitabhata & Panha, 1999 (Anura: Megophryidae) on the north bank of Brahmaputra river in India

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ABSTRACT

The genus *Leptobrachium* Tschudi, 1838 is currently represented by 32 species all over the world distributed throughout mainland and insular Asia with two species so far from India. *Leptobrachium smithi* is known from Rani-Gharbhanga Landscape, Borduar-Mayang Landscape, Barail Range and Barak Valley all from south of River Brahmaputra. We herein report additional distribution records of *Leptobrachium smithi* from Ultapani Reserve Forest, Shankarghala and Mathanguri of Manas National Park on the north bank of the River Brahmaputra. The report from Ultapani, Shankarghala and Mathanguri is an extension of range of species by around 100 to 176 km north. Mineralogic and stratigraphic data of Brahmaputra basin indicates that the Brahmaputra River has changed position several times during the Holocene. The presence of the species on the north bank across the river barrier may be attributed to the positional changes of the river and due to lateral shifting of the river.

Key words: *Leptobrachium smithi,* distribution, Brahmaputra, North bank, Assam

INTRODUCTION

The genus *Leptobrachium* Tschudi, 1838 represents a group of Megophryidae frogs and is considered to contain two subgenera, *Vibrissaphora* Liu, 1945, with adult males bearing spines on upper lip, and *Leptobrachium,* which is without such spines (Ohler *et al*., 2004*).* Fu *et al*. (2007) suggested that *Leptobrachium* is the sister taxon of *Vibrissaphora*. However later *Vibrissaphora* was regarded as a synonym of *Leptobrachium* (at the level of genus) and it rejected the monophyly of *Leptobrachium* and *Vibrissaphora* as subgenera (Zheng *et al*., 2008).

Frost (2013) considered 32 species of the genus as valid out of which, two species namely- *Leptobrachium smithi* and *Leptobrachium bompu* have been reported from India (Sondhi and Ohler, 2011). The record of *Leptobrachium rakhinensis* (Wogan, 2012) from Northeast India is shown to be a case of mistaken identity (Dutta *et al.*, 2013).

Leptobrachium smithi was described from Thailand (Matsui *et al*., 1999) and subsequently from India (Sengupta, Choudhury and Das, 2001), Myanmar (Das and Chanda, 2004), Laos (Stuart, 2005) and Bangladesh (Reza, 2009; Mahony *et al*., 2009). In India the species is reported from Assam (Choudhury *et al*., 2002; Das *et al.*, 2009; Sengupta *et al*., 2010; Dey, 2010), Meghalaya (as *L. hasseltii*) (Chanda, 1994) and Mizoram (Lalremsanga, Sailo and Hooroo, 2007). All these localities are on the southern bank of the river Brahmaputra in India. While surveying the herpetofauna in the reserve forests under Bodoland Territorial Council (BTC) in western Assam, we came across specimens of *Leptobrachium smithi* and herein report this species occurrence along with natural history notes.

MATERIALS AND METHODS

Samples were observed/collected from the potential habitat by employing Active Visual Search Method (Sarkar *et al*., 1992) and Pitfall trap (Heyer *et al*., 1994). During the study stream transects was employed as sampling unit. Stream transects (following Hyer *et.al*.,1994) of 50m X 2m were laid randomly along the steams and the surrounding area of the stream not extending 50 meters from the stream and searched for the *Leptobrachium smithi*. A total 10 sampling units were laid each time. The sample collected from each unit was put in moist cloth bags. On completion of the search, the specimen collected were examined, counted, measured, photographed and released back in the collected site. In the field, air-temperature and humidity was recorded with a Thermo-hygrometer (VICTOR-VC230A). A Garmin™ GPSMAP76 GPS was used to obtain geographic coordinates. Only three (3 Nos.) samples have collected for preservation and is been deposited to Zoology Department, Arya Vidyapeeth College, Guwahati, Assam India with collection no.- AVC/SJN1, AVC/SJN2 and AVC/SJN3. The collected specimens were measured with a dial caliper to the nearest 0.01 mm (Das *et al*., 2013).

RESULTS

On 24th July 2012, approximately between 9:15-10:30 PM, we came across a breeding population of *Leptobrachium smithi* in Shankarghala (26°17'33.173"N, 90° 32'22.914"E), Bongaigaon, District, Assam. Again, on 28th July 2012 at 8:10 PM, we observed one specimen

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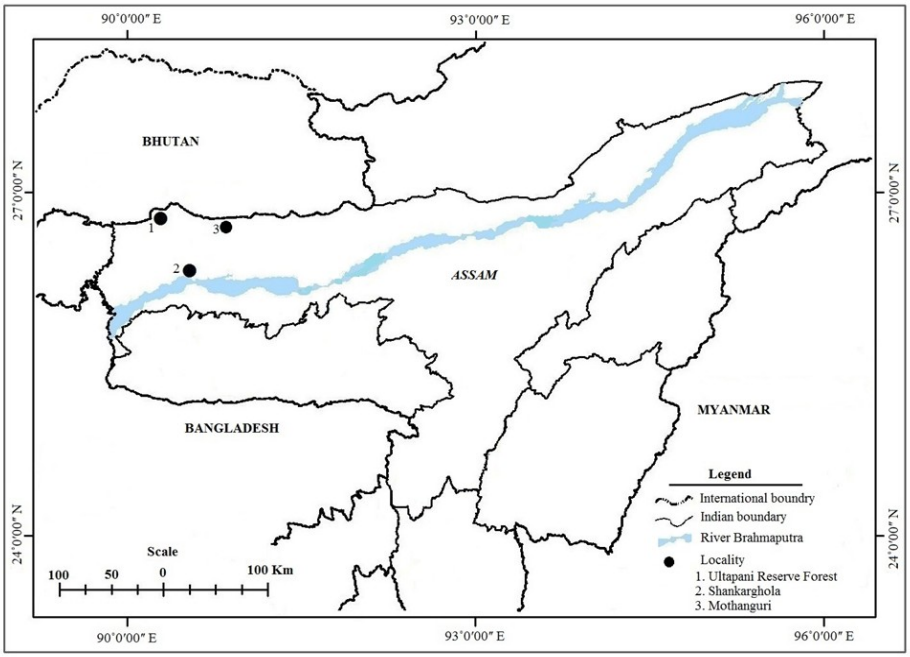

Figure 1. Map showing distribution of *Leptobrachium smithi on the north bank of the river Brahmaputra in India.*

(SVL: 54.12 mm) from Ultapani Reserve Forest (26° 46'31.822"N, 90°17'13.807"E), Kokrajhar District, Assam. Juveniles of this species were observed near Mathanguri (26°47'23.621'N, 90°54'57.717"E) of Manas National Park in the month of April 2007.

DISCUSSION

The individuals of north bank match in morphometry (Table 1) with the populations of south bank of Brahmaputra, except for relative length of the toe I, which was found to be significantly higher [T_1:SVL= 0.105 ± 0.006 against 0.079 ± 0.025 of south bank population; T -Value = 5.15, P-Value = 0.001(Minitab 14 demo.ink)].

Picture 1. Lateral view of *Leptobrachium smithi* from Shankarghola, Bongaigaon District, Assam

This frog inhabited semi evergreen forest between 40m to 378m altitudes above msl. Juveniles were observed in moist leaf litter on stream bed. Adult frogs were observed in forest floor, bamboo leaf litter near stream, on narrow forest road near stream, on wet boulder of a small perennial slow flowing stream and on sandy shore of hilly stream. The frog appeared to prefer moist microhabitat near stream and from all records the month of June and July (monsoon) seemed to be most active period for this frog (Reza, 2009; Sengupta *et al*., 2001; Lalremsanga *et al*., 2007).

The occurrences of this species on western Assam, the north bank of Brahmaputra River represents the northern and western most distribution limit of the species (Figure 1).

Table 1. Relative measurements of morphological parameters of *Leptobrachium smithi* of North and South bank of Brahmaputra. The measurements are mean ± SD

Variable	North bank	South bank
HL:SVL	0.441 ± 0.012	0.411 ± 0.044
HW:SVL	0.430 ± 0.008	0.408 ± 0.034
SL:SVL	0.182 ± 0.004	0.177± 0.014
EN:SVL	0.098 ± 0.005	0.093± 0.011
INS:SVL	0.087 ± 0.005	0.075 ± 0.006
IOS:SVL	0.152 ± 0.010	0.139 ± 0.020
UEW:SVL	0.113 ± 0.006	0.104 ± 0.008
ED:SVL	0.127 ± 0.004	0.131 ± 0.013
HTYD:SVL	0.060 ± 0.009	0.066 ± 0.015
TE:SVL	0.062 ± 0.009	0.060 ± 0.010
TBL:SVL	0.366 ± 0.005	0.364 ± 0.043
T1:SVL	0.105 ± 0.006	0.079 ± 0.025
IMT:SVL	0.034 ± 0.005	0032 ± 0.006

CONCLUSION

Brahmaputra is often regarded as a major geographic barrier for distribution of animals (Biswas and Pawar, 2006). Mineralogic and stratigraphic data of Brahmaputra basin indicates that the Brahmaputra river has changed positions

several times during the Holocene. The presence of the species across the river barrier may be attributed to two principal causes, the positional changes of the river (Sengupta *et al*., 2009) or formation of narrow land bridges by alluvial deposition due to lateral shifting of the river (Lahiri and Sinha, 2012).

Appendix 1:

Abbreviation used:

SVL (Snout-vent length): Distance from tip of the snout to the vent; HL (Head length): Distance between tip of the snout to the angle of the jaws; HW (Head width): width of the head at the angle of the jaw; SL (Snout length): Distance from the anterior corner of the eye to the snout tip; EN (Eye-nostril distance):Space between anterior corner of eye to nostril; INS (Inter narial space): Distance between the nostril (dorsally); IOS (Inter orbital space):Minimum distance between the eye (Dorsally); UEW (Upper eye lid width) maximum width of the upper eye lid; ED (Eye diameter): Horizontal length of the eye ball; HTYD (Horizontal Tympanic diameter) :Horizontal distance from the anterior to the posterior rim of the tympanum; TE (Tympanum – eye diatance): Distance from anterior corner of the tympanum to the posterior corner of eye; TBL (Tibia length): distance from the knee joint to the end of the shank by flexing the limb; T1 (First toe length): distance from the base to the tip of the first toe; IMT (Inner metatarsal tubercle length): distance from the base to the tip of the inner metatarsal tubercle.

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