



Research Paper

New record of *Duttaphrynus stomaticus* (Lutken, 1864) (Anura: Bufonidae) from Aligarh, Uttar Pradesh, with systematic account, conservation status and differences from *D. melanostictus* (Schneider, 1799)

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Abstract: The present communication deals with the new record of *Duttaphrynus stomaticus* (Lutken, 1864), the Marbled Toad, from Aligarh (Uttar Pradesh) with its systematic account, altitudinal range, distribution, habitat, food & feeding, breeding, conservation status and threats. It is mostly found along with allied species, *D. melanostictus* (Schneider, 1799), the Common Toad and hence their differentiating characters are also provided.

Keywords: New record, *Duttaphrynus stomaticus*, Aligarh.

INTRODUCTION:

Amphibian fauna of Uttar Pradesh has been studied by Ray (1991, 1992), Das *et al.*, (2012), Kannaujia *et al.*, (2017). Kannaujia *et al.* (2017) didn't mention the localities or districts of their occurrence. Biswas (2000) studied breeding habits of

Chirixalus dudhwaensis Ray, 1992 from Dudhwa National Park (Lakhimpur Kheri dist). Recently a specimen of *Duttaphrynus stomaticus* (Lutken, 1864), the Marbled Toad, was collected from a residential area in Aligarh which is interesting as no record is available and hence reported here as new to the district. Earlier, it has been recorded from Gautam Buddh Nagar, Lucknow and Mirzapur districts (vide inaturalist). It was described by Lutken (1864) as *Bufo stomaticus* (type-locality restricted to Assam by Boulenger, 1891). Boulenger (1883) described *Bufo andersonii* (type-locality restricted to Ajmer, Rajasthan by Parker, 1938), synonym of former (now *Duttaphrynus stomaticus*). It is allied to *D. melanostictus* (Schneider, 1799), the Common Toad, but differs in a number of characters, especially in the presence of bony ridges on head.

**COLLECTION SITE: HAYAT
MANZIL, ALIGARH**

Location: Aligarh at coordinates 27.88° N and 78.08° E between rivers Ganga and Yamuna in western part of Uttar Pradesh. The collection site, Hayat Manzil, is a residence on Qila Road, Aligarh.

Climate: Humid subtropical. Summers (April-June) hot with maximum temperature reaching 47° C in May, winters (December-February) cool with minimum temperature 0° C in January with thick fog; monsoon season starts late June and continues till early September with a maximum rainfall of 235 mm in the month of August. The rain fills ponds and pools all around which become good breeding grounds for frogs and toads.

Flora: The residence (Hayat Manzil) is lush green with flowering and other plants which attract insects.

**DUTTAPHRYNUS STOMATICUS
(LUTKEN, 1864)**

Systematic account and other aspects

Synonymy:

Bufo stomaticus Lutken, 1864 (1863), *Vidensk. Medd. Dansk Naturhist. Foren.*, Ser. 2, 4: 305 (type locality: ostindiske (= East Indies); restricted to Assam, India, by Boulenger, 1891. *Ann. Mag. Nat. Hist.*, Ser. 6, 7: 279-283); Gunther 1864. *Rept. Brit. India*: 420; Boulenger, 1882. *Cat. Batr. Sal. S. Ecaudata in the collection of the British Museum* (2nd Ed.): 281; Boulenger, 1891. *Ann. Mag. Nat. Hist.*, Ser. 6, 7: 463; Sclater, 1892. *Proc. Zool. Soc. Lond.*: 347; Annandale, 1908. *Rec. Indian Mus.*, 2: 305; Annandale, 1909. *ibid.*, 3: 283; Annandale & Rao, 1918. *ibid.*, 15: 39; Rao, 1923. *J. Bombay nat. Hist. Soc.*, 29 (1): 132; Hora & Chopra, 1923. *ibid.*, 25: 369-376; Nieden, 1923. *Das Tierreich*, 46: 409; Smith., 1929. *Rec. Indian Mus.*, 31: 79; Daniel, 1963. *J. Bombay nat. Hist. Soc.*, 60: 429; Khan,

1965. *Biologia*, 11:1-39; Mertens, 1969. *Stuttg. Beitr. Naturk.*, 179: 73; Inger, 1972. *Bufo of Eurasia*. In: Blair, W. F. (Ed.); 358; Sarkar, 1984. *Rec. zool. Surv. India*, 81 (3-4): 217-219; Inger & Dutta, 1987. *J. Bombay nat. Hist. Soc.*, 83 (Suppl.): 138; Khan & Mufti, 1994a. *Pakistan Journal of Zoology*, 26: 25-30; Khan & Mufti, 1994b. *ibid.*, 26: 285-292; Ray, 1999. *Mem. zool. Surv. India*, 18 (3): 64-67, pl. 22, figs. 1-4, pl. 23, figs. 1, 2; pl. 24, figs. 1, 2, pl. 25 (map); Chanda, 2002. *Handbook Indian Amphibians*: 28, map 7; Kamble, 2005. *Conservation Area Series*, 24: 224-225, Frost et al., 2006, *Bull. Am. Mus. Nat. Hist.*, 297: 364 (excluded from *Bufo* and unassigned to genus); Sen & Mathew, 2008. *Rec. zool. Surv. India*, Occ. Paper No. 291: 7; Dinesh et al., 2009. *Rec. zool. Surv. India*, Occ. Paper No. 302: 6; Bahuguna & Bhutia, 2010. *State Fauna Series*, 18 (Part-1): 506, 508-509; Khan, 2010. *Pakistan J. Wildl.*, 1 (2): 37; Khan, 2015. *Taxonomic synonymy of amphibians of Pakistan*: 2; Kanaujia et al., 2017. *Biological Forum- An International Journal*, 9 (1): 123, fig. (p. 126).

Bufo pantherinus Anderson, 1817 (nec Dumeril & Bibron, 1841). *Proc. Zool. Soc. Lond.*: 203.

Bufo andersonii Boulenger, 1883, *Ann. Mag. Nat. Hist.*, Ser. 5, 12: 163 (type-locality: Agra district, Ajmere and Tatta, India; restricted to Ajmere, Rajputana, India by Parker, 1938, *Ann. Mag. Nat. Hist.*, Ser. 11, 1: 491, by restricting the name to the lecto-syntypes from Rajputana); Boulenger, 1890. *Faun. Brit. India*, Rept. & Batr.: 504; Annandale, 1909. *Rec. Indian Mus.*, 3: 284; Mc Cann, 1938. *J. Bombay nat. Hist. Soc.*, 40: 426; Soman, 1960. *ibid.*, 57; Mansukhani & Murthy, 1964. *Rec. zool. India*, 62 (1-2): 52; Mansukhani & Sarkar, 1981. *ibid.*, 79 (1-2): 267-273; Chanda, 2002. *Handbook Indian Amphibians*: 28, map, 7.

Bufo Andersonii Murray, 1884, *Vert. Zool. Sind*: 401 (type-locality: Sind (Tatta [ponds] and Joongshai), Pakistan). Synonymy (with *Bufo andersonii* [= *Bufo stomaticus*] by Boulenger, 1885, *Zool. Rec.*, 21: 17).

Bufo stomaticus peninsularis, Rao, 1920. *J. Bombay Nat. Hist. Soc.*, 27 (1): 126.

Bufo stomaticus stomaticus, Rao, 1920. *J. Bombay Nat. Hist. Soc.*, 27 (1): 126.

Duttaphrynus stomaticus, Van Bocxlaer *et al.*, 2009, *BMC Evol. Biol.*, 9 (e131): 4; Husain, 2015. In: *Aquatic Ecosystem: Biodiversity, Ecology and Conservation*: 220-221; Frost, 2020. *Amphibian Species of the World*: an Online Reference. Version 6.1 (Date of access). Electronic Database accessible at <https://amphibiansoftheworld.amnh.org/index.php>. American Museum of Natural History, New York, USA. doi.org/10.5531/db.vz.0001 .

Firouzophrynus olivaceus, Safaei-Mahroo & Ghaffari, 2020. *Compl. Guide Amph. Iran*: 20.

Common Names: Assam Toad, Indian Marbled Toad, Indo-Gangetic (Marbled) Toad, Indus Toad, Indus Valley Toad, Marbled Toad, Punjab Toad.

Material Examined: 1 example, Hayat Manzil, Qila road, Aligarh, Uttar Pradesh, 21.viii.2020, by Er. T. R. K. Sherwani, Aligarh.

Diagnostic Features: Head wider than long, without cranial ridges, snout short and blunt, nostrils nearer tip of snout than eye, interorbital space flat, a little broader than upper eye-lid, tympanum distinct, round, nearly equal or $2/3^{\text{rd}}$ of eye diameter; parotids elliptical and flat; forelimbs moderate, 1^{st} finger equal to or slightly longer than 2^{nd} , 3^{rd} longest, 4^{th}

shortest; subarticular tubercle single and blunt; palmer tubercle prominent, triangular and wider anteriorly; hind-limbs stout and short, tarso-metatarsal articulation reaching hind edge of eye, when folded along body; toes $2/3^{\text{rd}}$ - $3/4^{\text{th}}$ webbed, two moderate metatarsal tubercles, single subarticular tubercles; skin rough above with numerous flat warts; colouration variable as per environment and season, yellowish or olivaceous with dark mottling or reticulation above, whitish or immaculate below with dark mottling on throat, three dark cross bands on forelimbs, tips of digits dark brown .

Sexual dimorphism: Male smaller than female, with a subgular vocal sac, nuptial callosities on outer side of 1^{st} finger. Females larger and lack other male characters.

Size: Snout to vent 3 inches (Boulenger, 1890); Snout to vent 76 mm (Chanda, 2002); 9 cm (Husain, 2015).

Tadpole: Head and body moderately flat and oval; tail less than twice as long as head and body combined with high dorsal and low ventral fin, mottled with dark brown; oral disc antero-ventral; lower jaw with three rows of labial teeth, upper jaw two rows, beak finely serrated with lateral oral papillae; body and tail speckled with light brown. Khan (1965, 1968), Khan & Mufti (1994a, b), Ray (1999) studied morphology and behaviour of tadpoles in detail.

Length: 30-31 mm in total length, tail 20 mm (amphibiaweb).

Altitudinal Range: 100-1828 m (Chanda, 2002); Up to 4,500 m (Husain, 2015; iucnredlist).

Distribution:

India: Andhra Pradesh, Assam, Bihar, Chandigarh, Delhi, Gujarat (Jayantilal Park, Ahmedabad; Navapura, Vadodara dist.; Ghogha, Bhavnagar dist.), Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka (Madhugiri Rural, Tumkur

dist.), Kerala (vide inaturalist), Madhya Pradesh, Maharashtra (Paldhi, Jalgaon dist.; Lamaj, Satara dist.), Manipur, Odisha, Punjab (Ramuwala, Bathinda dist.; Moga dist.), Rajasthan (Ajmer and Udaipr dists.), Sikkim, Tamil Nadu (Veerapuram, Chennai), Uttarakhand (Corbett Tiger Reserve; Rajaji Tiger Reserve; Western Doon Siwaliks; Dehra Dun, Pauri, Tehri, Almora, Nainital, Pithoragarh and Udham Singh Nagar dists.), Uttar Pradesh (Katarniaghat Wildlife Sanctuary, Bahraich dist.; Noida, Gautam Buddha Nagar dist.; Lucknow and Mirzapur dists.), West Bengal and Western Ghats.

Elsewhere: Afghanistan (Kandahar), Bangladesh (Kurigram dist.), Iran, Myanmar, Nepal (Chainpur; Maghauri), Oman, Pakistan (Karachi; Nawan, Dera Ghazi Khan dist.) and Sri Lanka (introduced, Manamendra-Arachchi & Pethiyagoda, 1998). Bhutan and China (uncertain vide iucnredlist).

Habitat: Plains, hills, grasslands, scrublands, forests, agricultural fields and around human habitations.

Food & Feeding: Feed on insects and other arthropods; come out in night for searching food.

Breeding: Breeds both in perennial and seasonal ponds, pools or puddles and slow-moving streams. Males emit nuptial calls 'rreong-rreong-rreong-rreong-rreong' in a continuous pitch. The spawn is laid in the form of strings which get attached to aquatic weeds for further development (Ray, 1999). Call also recorded as *Rreong-Preong-Preong* (Bahuguna & Bhutia, 2010).

Conservation Status: IUCN Red List-Least Concern.

Threats: Not threatened, being highly adaptable species. However, localized threats may be loss of their habitat due to infrastructure development, intensified agriculture, breeding water pollution by using agro-chemicals, accidental road killings and long-term drought



Figure 1: *Duttaphrynus stomaticus*,
the Marbled Toad
(Courtesy: Er. T.R.K. Sherwani, Aligarh, U.P.)



Figure 2: *Duttaphrynus melanostictus*,
the Common Indian Toad
(by Dr. H. J. Husain, the 3rd author)

Table: Showing differences between *Duttaphrynus stomaticus* (Lutken, 1864) and *D. melanostictus* (Schneider, 1799).

Sl. No.	Character	<i>Duttaphrynus stomaticus</i> (Lutken, 1864)	<i>Duttaphrynus melanostictus</i> (Schneider, 1799)
1.	Head	Without bony ridges	With bony ridges
2.	Tympanum	Nearly equal or $2/3^{\text{rd}}$ of eye diameter	Equal or more than eye $1/2$ or $2/3^{\text{rd}}$ of eye diameter.
3.	Parotids	Flat, elliptical, sometimes with tubercles	Elevated
4.	Fingers	1 st equal to 2 nd or slightly longer, 3 rd longest, 4 th shortest, subarticular tubercles blunt	1 st and 2 nd almost equal, 3 rd longest, 2 nd slightly shorter than 4 th , metacarpal tubercles spinous and intermingled with spiny warts.
5.	Toes	$2/3^{\text{rd}}$ to $3/4^{\text{th}}$ webbed, three distal phalanges of 4 th web free, 1 st smallest, 4 th longest, 3 rd longer than 5 th ; two sharp-edged metatarsal tubercles; subarticular tubercles small and simple; tarso-metatarsal articulation reaches hind hedge of eye or between shoulder and eye.	Less than $1/2$ webbed, three distal phalanges of 4 th web free, 1 st smallest, 4 th longest, 3 rd longer than 5 th ; two prominent metatarsals, outer oval, inner elliptical and projecting; subarticular tubercles small and single; tarso-metatarsal articulation reaches near tympanum.
6	Skin	Rough with flat warts	Rough with spiny warts, tips with black spines
7.	Nuptial callosities (male)	On 1 st finger	On first two (inner) fingers, cornified with black spinules, tips of digits with black caps
8.	Adult size	9 cm (Husain, 2015)	16. 5 cm (Husain, 2015).
9.	Tadpole	Brown, tail mottled with light brown pigmentation; head and body club-shaped, head wider than body; intestinal coil with three loops (Ray, 1999).	Black, tail with broadly rounded tip, densely pigmented; head and body globular, head width equal to body; intestinal coil with two loops (Ray, 1999).
10.	Juvenile	Light brown with pinkish warts on body; palmer tubercle triangular, broad distally; 1 st finger longer than 2 nd ; toes $1/2$ webbed.	Blackish with spinules on body and cross bars on limbs; tympanum inconspicuous; plamer tubercle elongated; 1 st finger longer than 2 nd ; toes $1/4^{\text{th}}$ webbed.

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