



The Journal of Threatened Taxa (JoTT) is dedicated to building evidence for conservation globally by publishing peer-reviewed articles online every month at a reasonably rapid rate at www.threatenedtaxa.org. All articles published in JoTT are registered under [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/) unless otherwise mentioned. JoTT allows unrestricted use, reproduction, and distribution of articles in any medium by providing adequate credit to the author(s) and the source of publication.

Journal of Threatened Taxa

Building evidence for conservation globally

www.threatenedtaxa.org

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

COMMUNICATION

RECORDS OF TWO TOADS *DUTTAPHRYNUS SCABER* AND *D. STOMATICUS* (AMPHIBIA: ANURA: BUFONIDAE) FROM SOUTHEASTERN INDIA

S.R. Ganesh, M. Rameshwaran, Naveen A. Joseph, Ahamed M. Jerith & Sushil K. Dutta

26 July 2020 | Vol. 12 | No. 10 | Pages: 16272–16278

DOI: 10.11609/jott.6110.12.10.16272-16278



For Focus, Scope, Aims, Policies, and Guidelines visit <https://threatenedtaxa.org/index.php/JoTT/about/editorialPolicies#custom-0>

For Article Submission Guidelines, visit <https://threatenedtaxa.org/index.php/JoTT/about/submissions#onlineSubmissions>

For Policies against Scientific Misconduct, visit <https://threatenedtaxa.org/index.php/JoTT/about/editorialPolicies#custom-2>

For reprints, contact <ravi@threatenedtaxa.org>

The opinions expressed by the authors do not reflect the views of the Journal of Threatened Taxa, Wildlife Information Liaison Development Society, Zoo Outreach Organization, or any of the partners. The journal, the publisher, the host, and the partners are not responsible for the accuracy of the political boundaries shown in the maps by the authors.

Member



Publisher & Host





Records of two toads *Duttaphrynus scaber* and *D. stomaticus* (Amphibia: Anura: Bufonidae) from southeastern India

S.R. Ganesh¹ , M. Rameshwaran² , Naveen A. Joseph^{3#}, Ahamed M. Jerith⁴ & Sushil K. Dutta⁵

¹ Chennai Snake Park, Rajbhavan Post, Chennai, Tamil Nadu 600022, India.

² Reptile Conservation of India (RCI), No: 9/98, Dr. Chelladurai Nagar, Krishnapuram Post, Tirunelveli, Tamil Nadu 627011, India.

³ National Troopers for Conservation of Nature (NTCN), 3/79 C, East Street, Mudivaithanenthal, Thoothukudi, Tamil Nadu 628102, India.

⁴ M.Sc Wildlife Biology, Govt. Arts College, Udthagamandalam, Tamil Nadu 643001, India.

⁵ Assam Don Bosco University, Tapesia Gardens, Kamarkuchi, Sonapur, Tapesia, Assam 782402, India.

- deceased

¹snakeranglerr@gmail.com (corresponding author), ²mrameshwaran@gmail.com, ³mvrjoseph@gmail.com, ⁴ahamedjerith@gmail.com, ⁵duttaphrynus@gmail.com

Abstract: We document two toad species *Duttaphrynus scaber* and *D. stomaticus* from southeastern India, in the Coromandel Coastal Plains. Owing to incorrect data presented in previous reports denoting the occurrence of these toad species, their occurrence in the said region has remained obscure. Our results, presented here, on both the species are based on morphological data from 15 preserved voucher specimens and direct field observations made by the authors in situ. In this work, we report *D. scaber* from Chengelpet and *D. stomaticus* from Thoothukudi. We revisited these places after studying the labeled specimens in Chennai Snake Park Trust Museum, to confirm their occurrences in the respective region and provide natural history notes based on our field observations.

Keywords: Chengelpet, Coromandel Coast, field sighting, India, morphology, toad, Thoothukudi (Tuticorin).

Editor: Neelesh Dahanukar, IISER, Pune, India.

Date of publication: 26 July 2020 (online & print)

Citation: Ganesh, S.R., M. Rameshwaran, N.A. Joseph, A.M. Jerith & S.K. Dutta (2020). Records of two toads *Duttaphrynus scaber* and *D. stomaticus* (Amphibia: Anura: Bufonidae) from southeastern India. *Journal of Threatened Taxa* 12(10): 16272–16278. <https://doi.org/10.11609/jott.6110.12.10.16272-16278>

Copyright: © Ganesh et al. 2020. Creative Commons Attribution 4.0 International License. JoTT allows unrestricted use, reproduction, and distribution of this article in any medium by providing adequate credit to the author(s) and the source of publication.

Funding: None.

Competing interests: The authors declare no competing interests.

For **Author details** see end of this article.

Author contribution: SRG and SKD conceived the work. SRG collected data for both the species dealt with; while MR, NAJ and AMJ collected data for one species. MR, NAJ and AMJ did most of the fieldwork, while SRG participated in some field tours. SRG studied the voucher materials, at least some of which were also perused by MR, NAJ and AMJ. SKD provided previous records from European and American museums and provided historical literature, besides advising this work overall. SRG and SKD led the writing in consultation with MR, NAJ and AMJ. All the authors equally participated in finalizing the write-up and read and approved the final version.

Acknowledgements: We thank our respective organisations for encouraging our research activities. SRG thanks the Executive Chairman and Trustees of the Chennai Snake Park for the encouragement and facilities provided. We thank the Tamil Nadu Forest Department, Tuticorin, for supporting and facilitating the fieldwork; Mr. S. Mohammed Zakkaria and Mr. C. Eswara Pandi for helping us during field trips; the local people for information on these species. SRG thanks S.P. Vijayakumar, P.S. Siva Prasad, Kelum Manamendra-Arachchi and Dinal Samarasinghe for their kind information on these toads. SKD acknowledges the help rendered by staff of the Assam Don Bosco University. This paper is dedicated to our coauthor—late Mr. Naveen A. Joseph who parted from us in a tragic, untimely accident. Thanks are due to Jayaditya Purkayastha for sharing photos and details of *D. stomaticus* from Assam; and to anonymous referees for their constructive criticism on this manuscript.



INTRODUCTION

In amphibians, much of the diversity in the Indian peninsula is concentrated in the Western Ghats hill range (Biju 2001; Dinesh et al. 2009; Gururaja 2012), a global biodiversity hotspot covered with evergreen forests (Bossuyt et al. 2004). Other ecoregions in peninsular India are either under-surveyed or are depauperate in amphibian diversity (Dutta 1997; Daniels 2005; Gururaja 2012). Toads including species from the Indian peninsula were subjected to both morphological (Manamendra-Arachchi & Pethiyagoda 1998; Dubois & Ohler 1999) and molecular (Bocxlaer et al. 2009) reviews. But much of the above-mentioned studies better represent material from the Western Ghats and studies on toad species from southeastern India are largely lacking (Srinivasulu et al. 2013). Apart from the better-known, Common Indian Toad *D. melanostictus* (Schneider, 1799), two other species—the Dwarf Toad *D. scaber* (Schneider, 1799) and the Marbled Toad *D. stomaticus* (Lütken, 1864)—have been reported from the Coromandel Coastal Plains (Dutta 1997; Daniel 2002; Daniels 2005; Srinivasulu et al. 2013). Both morphological (Dubois & Ohler 1999) and molecular (Bocxlaer et al. 2009) studies revealed that *D. scaber*, *D. stomaticus*, and *D. melanostictus* all fall into different species groups of their own.

The type locality of *Duttaphrynus stomaticus* is Assam (Boulenger 1891; Dutta 1997). It is also known throughout the Indo-Gangetic floodplains from Aravallis up to Bengal, through the Terai belts of Nepal and Siwalik foothills and on to other places in northeastern India. South of this vast area, *D. stomaticus* is known from the Seoni Hills and Chota Nagpur Plateau and on to Salsette / Bombay in the Konkan Coast and eastwards in the Deccan Plateau (Dutta 1997; Daniel 2002; Deuti et al. 2014; Frost 2020). Further south, reports based on old museum collections (Dutta 1997) and a recent field sighting (Sondhi 2009) exist. Recently, Srinivasulu et al. (2013) recommended further studies on southern Indian *D. stomaticus* populations due to conflicting views about its presence there and some misidentified reports that were later falsified. They even mentioned the population referred to by Dutta (1997) from Tirunelveli Plains as *Duttaphrynus* cf. *stomaticus*.

Duttaphrynus scaber was first described from 'Orientalia India' (= eastern India; Dutta 1997). It had, in fact, starting from the description of its synonym from Trivandrum (= *Bufo fergusonii*), has been better reported from western India, and not the eastern part of the peninsula (Frost 2020). In the adjacent island of Sri Lanka, *D. scaber* has remained relatively better-studied

(Bogert & Senanayake 1966; Manamendra-Arachchi & Pethiyagoda 1998; Jayawardena et al. 2017), compared to India. Recently, Padhye et al. (2013) reported it from northern Western Ghats, based on both morphological and molecular data. But unfortunately, past reports of this species from Kadayam in southern Western Ghats foothills (Vijayakumar 2002), Chengelpet (Das & Martin 1998), and Mayiladuthurai (Ganesh & Chandramouli 2007; Nath et al. 2012) in Coromandel Coastal Plains were missed, although historical reports from nearby localities were mentioned (Boulenger 1892; Rao 1915). Puducherry was also added as another coastal plains site record for *D. scaber* (Seshadri et al. 2012 read with Srinivasulu et al. 2013).

Thus, reports from southeastern India of *D. scaber* fall short due to lack of voucher material (see Ganesh & Chandramouli 2007; Nath et al. 2012) while that of *D. stomaticus* falls short due to lack of recent field sightings with ample morphological descriptions (see Dutta 1997; Sondhi 2009). Adding on to this, some works have, sadly, confused the identities of *D. scaber* and *D. stomaticus*, again from the Coromandel Coastal Plains (Seshadri et al. 2012). All these factors, cumulatively, led Srinivasulu et al. (2013) to revisit such reports that were not based on collected voucher specimens accompanied with ample morphological description notes as well as recent field sightings in situ. The problem is further confounded by reports based on misidentifications (see Srinivasulu et al. 2013). In this paper, we present further records of *D. scaber* and *D. stomaticus* from southeastern India. Thus, though described in the 19th century, and often reported in many studies across the country (Dutta 1988, 1997), their occurrence in southeastern India, in the Coromandel Coastal Plains have remained murky. To fill up this lacuna, we describe the morphology and provide field observations for these two species based on both live and preserved materials originating from Coromandel Coastal Plains, in southeastern India.

METHODS

We conducted visual encounter surveys (Crump & Scott 1994) for collecting primary field data, both day and night. The sighted live individuals were gently restrained and examined, briefly measured and photographed in situ to enable unambiguous species identification, seen in light of publications dealt with by Srinivasulu et al. (2013). They were soon released after recording data and were not preserved and deposited in museums due to the want of permits. The preserved specimens already

present in museum holdings were examined in detail. Measurements were recorded to the nearest mm using vernier calipers (least count 0.1mm). Morphological features were documented using a magnifying hand lens (X 5 optical zoom). Measurement protocols and morphometric nomenclature followed Dutta & Manamendra-Arachchi (1996). Colouration notes of live individuals were taken during field work and based on photographs taken there on. Photographs were taken using Canon Powershot SX-130IS model camera and some are reproduced here as photographic vouchers. Coromandel Coastal Plains Ecoregion definition follows Everard (2018). Habitat type classification follows Champion & Seth (1968). Museum abbreviation CSPT refers to Chennai Snake Park Trust, Chennai, India. Geo-coordinates and elevation values were extracted from Google Earth software.

RESULTS

TAXONOMY

Duttaphrynus stomaticus (Lütken, 1864)

(Marbled Toad: Image 1)

Taxonomic history: This species was originally described as *Bufo stomaticus* by Lütken (1864). The type locality of this species is 'East India' (restricted to Assam, fide Boulenger 1891) and the type specimens are currently untraceable (Dutta 1997). There are currently three subjective junior synonyms (Dutta, 1997; Frost, 2020) namely: *Bufo pantherinus* (non Boie) Anderson, 1871, *Bufo andersoni* Boulenger, 1883 (type loc. Ajmere, Rajputana), *Bufo andersonii* Murray, 1884 (type loc. Thatta & Joongshai in Sind) and *Bufo stomaticus peninsularis* Rao, 1920 (type loc. Watekole, Coorg, Mysore; status: incertae sedis). Bocxlaer et al. (2009) revised its generic allocation as *Duttaphrynus stomaticus*.

Material examined (n=7): CSPT/A-21, three adult males and four adult females, date and collector unknown, all collected from Tuticorin (8.764°N & 78.136°E; 5m), Coromandel Coastal Plains, peninsular India.

Description: Small to medium-sized toad; skin fairly smooth, often with blunt pustules; no ridges on top of head; tympanum $\frac{1}{2}$ the size of eye, visible; parotid glands bean-shaped; fingers free; toes 35–45% webbed; relative finger lengths: 1=2<4<3; relative toe lengths: 1<2<5<3<4. Measurements (range in mm, juvenile's data in parenthesis): Snout to vent length: 35.0–43.0 (26.0), body width: 8.0–11.5 (5.0), axilla-groin distance:

20.0–24.5 (14.5), head length: 11.5–12.5 (8.5), head width: 7.0–8.0 (5.5), head depth: 4.0–8.5 (3.0), humeral length: 4.0–5.0 (2.5), radio-ulnar length: 4.0–5.0 (2.5), carpal length: 3.0–4.5 (2.0), femoral length: 7.0–8.5 (4.5), tibia length: 5.0–6.5 (3.5), metatarsal length: 4.5–6.0 (3.5), eye diameter: 2.0–3.0 (2.0), tympanum diameter: 0.5 (0.5), eye to nostril distance: 2.5–3.0 (2.0), eye to tympanum distance: 2.5–3.0 (2.0), eye to lip distance: 1.0 (0.5), internarial distance: 1.0–1.5 (0.5), interocular distance: 3.5–4.5 (2.5). Colouration: Dorsum dull ruddy brown, light yellow or dark brownish grey, with yellowish random wavy white spots and patterns; adult males with yellow, single, mid-gular vocal-sac; venter off-white with some dark markings; eyes yellow with a horizontally oval, black pupil.

Field observations: On 5 and 6 April 2015, we conducted night surveys (20.00–04.00 h) in Tuticorin for a total of 40 man hours (8hr x 5men). A total of five sightings, consisting of three adult males and two adult females were obtained. Individuals were sighted actively foraging on land, near paddy fields dotted with coastal scrub belts and grasslands. These short term observations require further field surveys to add more to our knowledge on the natural history of *D. stomaticus* in Tuticorin (also see Sondhi 2009).

Duttaphrynus scaber (Schneider, 1799)

(Dwarf Toad: Image 2)

Taxonomic history: This species was first described as *Bufo scaber* Schneider, 1799 (type loc. ex orientali India). As this nomen was confused with *Bufo scaber* Daudin, 1803 (a synonym of *Bufo melanostictus* Schneider, 1799), it was also considered as a synonym of *D. melanostictus* till resurrection by Dubois & Ohler (1999). Again, Dubois & Ohler (1999) also synonymized the nominate taxon *Bufo fergusonii* Boulenger, 1892 (type locality - Trevandrum on the Cavalry Parade Ground) with *Bufo scaber* Schneider, 1799 (non Daudin, 1802). Bocxlaer et al. (2009) revised its generic allocation as *Duttaphrynus scaber* (also see Bogert & Senanayake 1966; Jayawardena et al. 2017).

Material examined (n=8): CSPT/A-19 four adult males, two subadult males and two adult females, date and collector unknown, all collected from Chengelpet (12.727°N & 79.975°E; 115m), Coromandel Coastal Plains, peninsular India.

Description: Small-sized toad, with a rather depressed body, flat head, blunt snout and fairly slender limbs; skin very rough and warty with numerous pustules both dorsally and ventrally, larger pustules tipped with black keratinized point endings; distinct



Image 1. *Duttaphrynus stomaticus* CSPT/A-21 dorsal, ventral, lateral views. Live individuals and habitat. © S.R. Ganesh.

bony ridges on top of head; tympanum subequal to eye, visible; parotid glands rounded; fingers free; toes <25% webbed; relative finger lengths: $1=2<4<3$; relative toe lengths: $1<2<3<5<4$. Measurements (in mm): Snout to vent length: 40.0–47.0, body width: 8.0–11.5, axilla-groin distance: 19.0–26.0, head length: 12.5–14.0, head width: 8.0–9.0, head depth: 4.5–6.0, humeral length:

3.5–4.5, radio-ulnar length: 4.0–5.5, carpal length: 4.0–5.0, femoral length: 7.0–8.5, tibia length: 5.0–6.0, foot length: 5.0–6.5, eye diameter: 2.0–3.0, tympanum diameter: 1.0, eye to nostril distance: 3.0–3.5, eye to tympanum distance: 2.5–3.0, eye to lip distance: 1.5, internarial distance: 3.0–3.5, interocular distance: 3.5–4.0. Colouration: Dorsum dull ruddy brown, light



Image 2. *Duttaphrynus scaber* CSPT/A-19 dorsal, ventral, lateral views. Live individuals and habitat. © S.R. Ganesh.

yellow or dark brownish black; venter dirty white with some brownish minute specklings; adult males with yellow, single, mid-gular vocal sac; eyes yellow with a horizontally oval, black pupil.

Field observations: From diurnal (09.00–16.00 h) field surveys in Chengelpet by the first author during August 2013 and February 2014, for a period of 50 man hours, this species was sighted commonly. A total of 12

sightings consisting of six adult males (identified based on nuptial pads and gular sacs), four adult females and two juveniles (unsexed) were obtained. The toads were observed resting underneath rocks, debris and inside stone piles.

DISCUSSION

The current report of both the preserved voucher specimens and recent field observations attest to the fact that in deed both *D. scaber* and *D. stomaticus* are present in southeastern India. This means that three different species groups – *D. melanostictus* group, *D. scaber* group and *D. stomaticus* group are widely distributed in India (Dubois & Ohler 1999; Bocxlaer et al. 2009), with at least one species in each group. Recent records of *D. scaber* from northern Western Ghats by Padhye et al. (2013) stressed the fact that precise records are more from the Western Ghats, including historical record of Trevandrum (Boulenger 1892) and their report from Thrissur. As recent publications from southeastern India (Ganesh & Chandramouli 2007; Nath et al. 2012) are not based on voucher specimens, authors in general have not been unequivocal about the reports of *D. scaber* from southeastern India. The same holds true for *D. stomaticus* as well. In this case, despite it being absent in the adjacent and closely-affiliated Sri Lanka (Manamendra-Arachchi & Pethiyagoda 1998), previously this species has been reported from Tuticorin and Tirunelveli in the far south of India by Dutta (1997). Dutta (1997) in his compilation of exhaustive museum specimens of Indian frogs lodged worldwide reported *D. stomaticus* from Tuticorin and Tirunelveli based on Carnegie Museum specimens. But for this record, *D. stomaticus* has not been convincingly reported from anywhere in southern India (Srinivasulu et al. 2013). Our specimens studied here conformed to the topotypical *D. stomaticus* population (fide Choudhury et al. 2001; Jayaditya Purkayashtha pers. comm.).

For a long while, only *D. melanostictus* has been thought to be the common species of toad widespread across India (Dutta 1997). Dutta (1988) provided scores of records of two more congeners—the same ones reported here—*D. scaber* and *D. stomaticus* from eastern peninsular India. Most records of *D. stomaticus* from peninsular India are scarce, e.g., in the Circar Coast (Dutta 1988; Mahapatro & Dash 1991), in the Konkan Coast (Daniel 2002), in the Deccan plateau (Srinivasulu & Das 2008) and in Western Ghats (Rao 1920). Most records are from the Northwestern Frontier (Sharma et al. 2011) and the Indo-Gangetic Plains (Grosjean & Dubois 2005), and eastwards to type locality—Assam and the northeast India in general (see Ahmed et al. 2009). Similarly, reports of *D. scaber* from India are from the Western Ghats (Boulenger 1892; Satyamurti 1967; Vijayakumar 2002; Ganesh & Asokan 2010; Padhye et al. 2013) and the Eastern Ghats (Thurston 1888; Satyamurti

1967; Srinivasulu & Das 2008; Ganesh & Asokan 2010; Ganesh et al. 2018), Deccan (Donahue & Daniel 1966), while a few reports exist from the Circar Coast (Dutta 1988) and Coromandel Coast (Rao 1915; Das & Martin 1998; Ganesh & Chandramouli 2007; Nath et al. 2012; Seshadri et al. 2012 read with Srinivasulu et al. 2013). A series of preserved specimens of both these species from southern India (Coimbatore, Srivilliputhur, Madurai near the Western Ghats foothills and Tuticorin near the coast) has been reported (Ganesh et al. 2020). But it has not been corroborated by field surveys that these toads exist in the regions mentioned. This work supplements existing records of *D. scaber* and *D. stomaticus* with voucher specimen descriptions and/or field observations made from under-reported areas in southeastern India.

REFERENCES

- Biju, S.D. (2001). A synopsis to the frog fauna of the Western Ghats India. ISCB Occasional Paper, Thiruvananthapuram, Kerala, India, 24pp.
- Bogert, C.M. & R. Senanayake (1966). A new species of toad (*Bufo*) indigenous to southern Ceylon. *American Museum Novitates* 2269: 1–17.
- Bossuyt, F., M. Meegaskumbura, N. Beenaerts, D.J. Gower, R. Pethiyagoda, K. Roelants, A. Mannaert, M. Wilkinson, M.M. Bahir, K. Manamendra-Arachchi & P.K. Ng (2004). Local endemism within the Western Ghats-Sri Lanka biodiversity hotspot. *Science* 306(5695): 479–481. <https://doi.org/10.1126/science.1100167>
- Boulenger, G.A. (1891). Description of new Oriental Reptiles and Batrachians. *Annals and Magazine of Natural History* 7(series 6): 279–283; <https://doi.org/10.1080/00222939109460608>
- Boulenger, G.A. (1892). Description of a new toad from Travancore. *Journal of the Bombay Natural History Society* 7: 317–318.
- Bocxlaer, I., S.D. Biju, S.P. Loader & F. Bossuyt (2009). Toad radiation reveals into-India dispersal as a source of endemism in the Western Ghats-Sri Lanka biodiversity hotspot. *BMC Evolutionary Biology* 9: 131. <https://doi.org/10.1186/1471-2148-9-131>
- Choudhury, N.K., M.F. Ahmed & S. Sengupta (2001). Distribution of *Bufo stomaticus* Lutken, Amphibia: Family Bufonidae, in Assam, northeast India. *Journal of the Bombay Natural History Society* 98(3): 457–458.
- Crump, M.L. & N.J. Scott Jr. (1994). Visual encounter surveys, pp. 84–92. In: Heyer, W.R., M.A. Donnelly, R.W. McDiarmid, L.C. Hayek & M.S. Foster (eds.) *Measuring and Monitoring Biological Diversity: Standard Methods for Amphibians* Smithsonian Institution, Washington, DC, 171pp.
- Daniel, J.C. (2002). *The Book of Indian Reptiles and Amphibians*. Bombay Natural History Society and Oxford University Press, Mumbai, India, 238pp.
- Daniels, R.J.R. (2005). *Amphibians of Peninsular India*. Universities Press (India), Private Limited, Hyderabad, India, 286pp.
- Das, I. & G. Martin (1998). *Bufo fergusonii* (Ferguson's Toad). *Ecology. Herpetological Review* 29(3): 164.
- Deuti, K., P.G.S. Sethy & S. Ray (2014). Amphibians of the Eastern Ghats. *Records of the Zoological Survey of India* 114(1): 119–144.
- Dinesh, K.P., Radhakrishnan, C., Gururaja, K.V., & Bhatta, G.K. (2009). *An annotated checklist of amphibian of India with some insights into the patterns of species discoveries, distribution and endemism* (Vol. 302). Zoological Survey of India, Kolkata, 154pp.
- Donahue, J.P. & J.C. Daniel (1966). Occurrence of the toad *Bufo*

- fergusonii* Boulenger in Hyderabad. Andhra Pradesh, India (Anura: Bufonidae). *Journal of the Bombay Natural History Society* 63(2): 447.
- Dubois, A. & A. Ohler (1999).** Asian and Oriental toads of the *Bufo melanostictus*, *Bufo scaber* and *Bufo stejnegeri* groups (Amphibia, Anura): a list of available and valid names and redescription of some name-bearing types. *Journal of South Asian Natural History* 4(2): 133–180.
- Dutta, S.K. (1988).** First records of *Bufo stomaticus* and *Bufo fergusonii* (Anura: Bufonidae) from Orissa, with comments on their distribution. *Journal of the Bombay Natural History Society* 63(2): 439–441.
- Dutta, S.K. (1997).** *Amphibians of India and Sri Lanka (checklist and bibliography)*. Odyssey Publishing House, Bhubaneswar, India, 342pp.
- Dutta, S.K. & K.N. Manamendra-Arachchi (1996).** *Amphibian fauna of Sri Lanka*. Wildlife Heritage Trust of Sri Lanka, Colombo, 230pp.
- Everard, M. (2018).** The characteristics, representativeness, function and conservation importance of tropical dry evergreen forest on India's Coromandel Coast. *Journal of Threatened Taxa* 10(6): 11760–11769. <http://doi.org/10.11609/jott.2807.10.6.11760-11769>
- Ganesh, S.R., A. Kalaimani, P. Karthik, N. Baskaran, R. Nagarajan & S.R. Chandramouli (2018).** Herpetofauna of southern Eastern Ghats, India – II, from Western Ghats to coromandel coast. *Asian Journal of Conservation Biology* 7(1): 28–45.
- Ganesh, S.R. & J.R. Asokan (2010).** Catalogue of Indian herpetological specimens in the collection of the Government museum, Chennai, India. *Hamadryad* 35(1): 46–63.
- Ganesh, S.R. & S.R. Chandramouli (2007).** A study of the Herpetofaunal community of Mannampandal, Nagapatinam dist. Tamil Nadu. *Cobra* 2(1): 33–43.
- Ganesh, S.R., S. Bhupathy, P. Karthik, G.B. Rao & S. Babu (2020).** Catalogue of herpetological specimens from peninsular India at the Sálím Ali Centre for Ornithology & Natural History (SACON), India. *Journal of Threatened Taxa* 12(9): 16123–16135. <https://doi.org/10.11609/jott.6036.12.9.16123-16135>
- Grosjean, S. & A. Dubois (2001).** Description of advertisement calls of five *Bufo* species (Bufonidae) from South and South-east Asia. *Hamadryad* 26: 235–246.
- Gururaja, K.V. (2012).** *Pictorial Guide to the Frogs and Toads of the Western Ghats*. Gubbi Labs Publications, Bangalore, India, 154+xviii pp.
- Jayawardena, B., G. Senevirathne, N. Wijayathilaka, K. Ukuwela, K. Manamendra-Arachchi & M. Megakumbura (2017).** Species boundaries, biogeography and evolutionarily significant units in dwarf toads: *Duttaphrynus scaber* and *D. atukoralei* (Bufonidae: Adenominae). *Ceylon Journal of Science* 46(5): 79–87. <http://doi.org/10.4038/cjs.v46i5.7455>
- Krishnamurthy, S.V. (1999).** Amphibian diversity in a few selected environs of Western Ghats, pp. 107–117. In: Hussain, S.A. & K.P. Achar (eds). *Biodiversity of the Western Ghats complex of Karnataka*, Biodiversity Initiative Trusts, 263pp.
- Lütken, C.F. (1864).** Nogle ny Krybyr og Padder. *Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening i Kjøbenhavn, Serie 2*, 4: 292–311. [In German]
- Manamendra-Arachchi, K. & R. Pethiyagoda (1998).** A synopsis of the Sri Lankan Bufonidae (Amphibia: Anura) with description of new species. *Journal of South Asian Natural History* 3: 213–248.
- Mahapatro, B.K. & M.C. Dash (1991).** Breeding behaviour and morphometric relation of *Bufo stomaticus* Lütken (Anura: amphibia). *Journal of the Bombay Natural History Society* 88(1): 20–25.
- Nath, A., S. Sutradhar, A. Kalaimani, V. Vijyan, B.M. Krishnakumar, B.L. Narayana, B. Naresh, G. Baburao, D. Sneha, B.G. Krishnan, B. Vinoth, R. Maniraj, D.M. Reddy, D. Adimallaiah, K. Swamy (2012).** Herpetofaunal assemblage with special emphasis on community structure and spatiality in amphibians of Cauvery delta region, Tamil Nadu. *Asian Journal of Conservation Biology* 1(2): 78–85.
- Padhye, A., R. Pandit, R. Patil, S. Gaikwad, N. Dahanukar & Y. Shouche (2013).** Range extension of Ferguson's Toad *Duttaphrynus scaber* (Schneider) (Amphibia: Anura: Bufonidae) up to the northern most limit of Western Ghats, with its advertisement call analysis. *Journal of Threatened Taxa* 5(11): 4579–4585. <https://doi.org/10.11609/JoTT.o3345.4579-85>
- Rao, C.R.N. (1915).** Notes on some south Indian Batrachia. *Records of the Indian Museum* 11: 31–38.
- Rao, C. N. (1920).** Some south Indian batrachians. *Journal of the Bombay Natural History Society* 27(1): 119–127.
- Satyamurthi, S.T. (1967).** The South Indian Amphibia in the collection of the Madras Government Museum. *Bulletin of the Madras Government Museum new series Natural History Section* 7(2): 1–90; p 1. I–XIII.
- Schneider, J.G. (1799).** *Historia Amphibiorum Naturalis et Literariae. Fasciculus Primus. Continens Ranas, Calamitas, Bufones, Salamandras et Hydros in Genera et Species Descriptos Notisque suis Distinctos*. 222 pp.
- Seshadri, K.S., C. Vivek & K.V. Gururaja (2012).** Anurans from wetlands of Puducherry, along the East Coast of India. *Check List* 8(1): 23–26. <https://doi.org/10.15560/8.1.023>
- Sharma, K.K., V. Sharma, N. Sharma & P. Nagar (2011).** *Bufo stomaticus* (Marbled Toad). Defensive behavior. *Herpetological Review* 42: 583.
- Sondhi, S. (2009).** Herpetofauna of Tuticorin. Publication of Forest Research Institute, Dehradun, India.
- Srinivasulu, B., S.R. Ganesh & C. Srinivasulu (2013).** New regional record and notes on historical specimens of Günther's Toad *Duttaphrynus hololius* with comments on other southeastern Indian congeners. *Journal of Threatened Taxa* 5(13): 4784–4790. <https://doi.org/10.11609/JoTT.o3621.4784-90>
- Srinivasulu, C. & I. Das (2008).** The herpetofauna of Nallamala Hills, Eastern Ghats India: an annotated checklist, with remarks on nomenclature, taxonomy, habitat use, adaptive types and biogeography. *Asiatic Herpetological Research* 11: 110–131.
- Thurston, E. (1888).** *Catalogue of Batrachia, Salientia and Apoda (Frogs, toads and caecilians) of southern India*. The superintendent, Government Press, Madras, 52pp+pl.13.
- Vijayakumar, S.P. (2002).** On the occurrence of *Bufo scaber* Schneider, 1799 from Kalakkad-Mudanthurai Tiger Reserve, Tamil Nadu. *Frog Leg* 3: 2–3.

Author details: S.R. GANESH is a Scientist at the Chennai Snake Park, conducting research on reptiles and amphibians of Southern India. His research themes include documenting diversity of under-explored eco-regions, updating and refining species characterizations and finding out modern day distribution patterns with respect to southern India's herpetofauna. M. RAMESHWARAN is an ardent wildlifer and nature enthusiast, particularly a reptile conservationist who is the founder of Reptile Conservation of India, located in Thirunelveli. Regularly conducts nature camps, eco-tours and delivers awareness programmes and talks about Indian snakes and other reptiles to the public. Has conducted several wildlife census and surveyed extensively across several places in Tamil Nadu and also in Maharashtra. NAVEEN A. JOSEPH (late) was a keen naturalist and wildlife enthusiast, he was the Founder Director of National Troopers for Conservation of Nature, located in Tuticorin. He was involved in campaigning wildlife awareness and nature-orientation programmes for children and adults; undertook awareness programmes and crusades for educating the public about Indian snakes, demystifying their false beliefs and promoting conservation. Had carried out several wildlife census and treks in Tamil Nadu and Kerala. AHAMED M. JERITH is a student of MSc zoology at the Govt. Arts College, Udhamandalam; hailing from Tuticorin and exposed to snakes and snake awareness programmes right from childhood. Has a keen interest on Indian snakes and other reptiles and aims to promote their conservation. SUSHIL K. DUTTA is an Emeritus Professor at the Assam Don Bosco University. A member of the Indian Academy of Sciences and a senior Indian herpetologist. Graduated twice, once from the Utkal University (Odisha) and then again from the University of Kansas, USA, studying batrachology both the times. Has extensively published on herpetology, including in journals like Nature. Has mentored several, leading, present day generation herpetologists across the country.





PLATINUM
OPEN ACCESS



The Journal of Threatened Taxa (JoTT) is dedicated to building evidence for conservation globally by publishing peer-reviewed articles online every month at a reasonably rapid rate at www.threatenedtaxa.org. All articles published in JoTT are registered under [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/) unless otherwise mentioned. JoTT allows unrestricted use, reproduction, and distribution of articles in any medium by providing adequate credit to the author(s) and the source of publication.

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

July 2020 | Vol. 12 | No. 10 | Pages: 16195–16406

Date of Publication: 26 July 2020 (Online & Print)

DOI: 10.11609/jott.2020.12.10.16195-16406

www.threatenedtaxa.org

Editorial

Pakshirajan Lakshminarasimhan: a plant taxonomist who loved plants and people alike
– Mandar N. Datar, Pp. 16195–16203

Communications

The worrisome conservation status of ecosystems within the distribution range of the Spectacled Bear *Tremarctos ornatus* (Mammalia: Carnivora: Ursidae) in Ecuador
– José Guerrero-Casado & Ramón H. Zambrano, Pp. 16204–16209

Living with Leopard *Panthera pardus fusca* (Mammalia: Carnivora: Felidae): livestock depredation and community perception in Kalakkad-Mundanthurai Tiger Reserve, southern Western Ghats
– Bawa Mothilal Krishnakumar, Rajarathinavelu Nagarajan & Kanagaraj Muthamizh Selvan, Pp. 16210–16218

An updated checklist of mammals of Odisha, India
– Subrat Debata & Himanshu Shekhar Palei, Pp. 16219–16229

Negative human-wildlife interactions in traditional agroforestry systems in Assam, India
– Yashmita-Ulman, Manoj Singh, Awadhesh Kumar & Madhubala Sharma, Pp. 16230–16238

Prevalence and morphotype diversity of *Trichuris* species and other soil-transmitted helminths in captive non-human primates in northern Nigeria
– Joshua Kamani, James P. Yidawi, Aliyu Sada, Emmanuel G. Msheliza & Usman A. Turaki, Pp. 16239–16244

Detection of hemoparasites in bats, Bangladesh
– Shariful Islam, Rakib Uddin Ahmed, Md. Kaisar Rahman, Jinnat Ferdous, Md. Helal Uddin, Sazeda Akter, Abdullah Al Faruq, Mohammad Mahmudul Hassan, Ausraful Islam & Ariful Islam, Pp. 16245–16250

Ecology of the Critically Endangered Singidia Tilapia (Teleostei: Cichlidae: *Oreochromis esculentus*) of lake Kayanja, Uganda and its conservation implications
– Richard Olwa, Herbert Nakiyende, Elias Muhumuza, Samuel Bassa, Anthony Taabu-Munyaho & Winnie Nkalubo, Pp. 16251–16256

Length-weight relationships of two conservation-concern mahseers (Teleostei: Cyprinidae: *Tor*) of the river Cauvery, Karnataka, India
– Adrian C. Pinder, Rajeev Raghavan, Shannon D. Bower & J. Robert Britton, Pp. 16257–16261

The identity and distribution of *Bhavana annandalei* Hora, 1920 (Cypriniformes: Balitoridae), a hillstream loach endemic to the Western Ghats of India
– Remya L. Sundar, V.K. Anoop, Arya Sidharthan, Neelesh Dahanukar & Rajeev Raghavan, Pp. 16262–16271

Records of two toads *Duttaphrynus scaber* and *D. stomaticus* (Amphibia: Anura: Bufonidae) from southeastern India
– S.R. Ganesh, M. Rameshwaran, Naveen A. Joseph, Ahamed M. Jerith & Sushil K. Dutta, Pp. 16272–16278

Some rare damselflies and dragonflies (Odonata: Zygoptera and Anisoptera) in Ukraine: new records, notes on distribution, and habitat preferences
– Alexander V. Martynov, Pp. 16279–16294

Floristic diversity of Anjaneri Hills, Maharashtra, India
– Sanjay Gajanan Auti, Sharad Suresh Kambale, Kumar Vinod Chhotupuri Gosavi & Arun Nivrutti Chandore, Pp. 16295–16313

A checklist of macrofungi (mushroom) diversity and distribution in the forests of Tripura, India
– Sanjit Debnath, Ramesh Chandra Upadhyay, Rahul Saha, Koushik Majumdar, Panna Das & Ajay Krishna Saha, Pp. 16314–16346

Short Communications

A threat assessment of Three-striped Palm Squirrel *Funambulus palmarum* (Mammalia: Rodentia: Sciuridae) from roadkills in Sigur Plateau, Mudumalai Tiger Reserve, Tamil Nadu, India
– Arockianathan Samson, Balasundaram Ramakrishnan & Jabamalainathan Leonaprinny, Pp. 16347–16351

Impact of vehicular traffic on birds in Tiruchirappalli District, Tamil Nadu, India
– T. Siva & P. Neelanarayanan, Pp. 16352–16356

Ichthyofaunal diversity of Manjeera Reservoir, Manjeera Wildlife Sanctuary, Telangana, India
– Kante Krishna Prasad, Mohammad Younus & Chelmal Srinivasulu, Pp. 16357–16367

New distribution record of the endemic and critically endangered Giant Staghorn Fern *Platynerium grande* (Fee) Kunze (Polypodiaceae) in central Mindanao
– Cherie Cano-Mangoang & Charissa Joy Arroyo Gumban, Pp. 16368–16372

Notes

First photographic record of the Dhole *Cuon alpinus* (Mammalia: Carnivora: Canidae) from the Sirumalai Hills in Tamil Nadu, India
– B.M. Krishnakumar & M. Eric Ramanujam, Pp. 16373–16376

Tracing heavy metals in urban ecosystems through the study of bat guano - a preliminary study from Kerala, India
– Jithin Johnson & Moncey Vincent, Pp. 16377–16379

Population dynamics and management strategies for the invasive African Catfish *Clarias gariepinus* (Burchell, 1822) in the Western Ghats hotspot
– Kuttanelloor Roshni, Chelapurath Radhakrishnan Renjithkumar, Rajeev Raghavan, Neelesh Dahanukar & Kutty Ranjeet, Pp. 16380–16384

First records of the black widow spider *Latrodectus elegans* Thorell, 1898 (Araneae: Theridiidae) from Nepal
– Binu Shrestha & Tobias Dörr, Pp. 16385–16388

First report of the assassin bug *Epidaurus wangi* (Heteroptera: Reduviidae: Harpactorinae) from India
– Swapnil S. Boyane & Hemant V. Ghate, Pp. 16389–16391

Observations of the damselfly *Platylestes cf. platystylus* Rambur, 1842 (Insecta: Odonata: Zygoptera: Lestidae) from peninsular India
– K.J. Rison & A. Vivek Chandran, Pp. 16392–16395

***Herminium longilobatum* (Orchidaceae), a new record for Bhutan**
– Ugyen Dechen, Tandin Wangchuk & Lam Norbu, Pp. 16396–16398

Recent record of a threatened holoparasitic plant *Sapria himalayana* Griff. in Mehao Wildlife Sanctuary, Arunachal Pradesh, India
– Arif Ahmad, Amit Kumar, Gopal Singh Rawat & G.V. Gopi, Pp. 16399–16401

Eleven new records of lichens to the state of Kerala, India
– Sonia Anna Zachariah, Sanjeeva Nayaka, Siljo Joseph, Pooja Gupta & Scaria Kadookunnel Varghese, Pp. 16402–16406

Member



Publisher & Host

