



ISSN Print: 2394-7500  
 ISSN Online: 2394-5869  
 Impact Factor: 8.4  
 IJAR 2023; 9(2): 253-257  
[www.allresearchjournal.com](http://www.allresearchjournal.com)  
 Received: 05-01-2023  
 Accepted: 07-02-2023

**Quaynat Nisha Mansoori**  
 Research Scholar, Department  
 of Zoology, Govt. Science P.G.  
 College, Rewa, Madhya  
 Pradesh, India

**Vinita R Kashyap**  
 Associate Professor,  
 Department of Zoology, Govt.  
 Science P.G. College, Rewa,  
 Madhya Pradesh, India

**Corresponding Author:**  
**Quaynat Nisha Mansoori**  
 Research Scholar, Department  
 of Zoology, Govt. Science P.G.  
 College, Rewa, Madhya  
 Pradesh, India

## Diversity, distribution and status of the amphibian fauna of Rewa district of Madhya Pradesh

Quaynat Nisha Mansoori and Vinita R Kashyap

### Abstract

30 species of amphibians were reported during a survey belonging to 19 genera of 9 families and 2 orders from Rewa district, Madhya Pradesh, India, during June 2019 to May 2022. Out of 28 species recorded, 18 species are endemic to Bahuti fall. All of the tehsils in this district except Bahuti fall under semi-arid zone having rich amphibian diversity. Nigari tehsil is flanked by Bahuti fall with high rainfall and humidity harboring highest number of species, while Samaria tehsils is a drought prone zone with the lowest number of species. Time constrained visual encounter survey (VES) method was used for sampling amphibians from all possible habitats of the study area. Along with a checklist, information about the habitat, rainfall, temperature, distribution and status of amphibians in the district are given.

**Keywords:** Amphibian diversity, distribution, status, habitats, Rewa district

### Introduction

The diversified topography, geographic location, high rainfall and humidity are likely to be supported to the survival of numerous species of amphibians in the Vindhyan region. Amphibian of India comprises of about 405 species (Dinesh *et al.*, 2017) <sup>[1]</sup>, however the exact number of species has not been known since new species of a amphibians are being discovered. The amphibian fauna of British India was first published by Boulenger (1890) <sup>[2]</sup>. In India, several taxonomic revisions and new species have been described by Giri *et al.* (2004) <sup>[3]</sup>, Kuramoto *et al.* (2007) <sup>[4]</sup>, Biju and Bossuyt (2009) <sup>[5]</sup>, Padhye *et al.* (2014, 2015 and 2017) <sup>[6-8]</sup>, Biju *et al.* (2014) <sup>[9]</sup>, Dahanukar *et al.* (2016) <sup>[10]</sup> and Garg & Biju (2017) <sup>[11]</sup>. The state of Madhya Pradesh is located on the Biogeographic zone of the Deccan Plateau of Peninsular India. It is bestowed with a variety of habitats and ecotones, and is arbitrarily divided into Malwa, Bundelkhand, Baghelkhand, Vindhyan, With varied topography and environmental conditions, Madhya Pradesh harbors rich and unique herpeto fauna diversity. The present herpetofauna composition of Madhya Pradesh contains 18 species of amphibians under 13 genera of 4 families and 77 species and subspecies of reptiles under 50 genera of 17 families (Chandra *et al.* 2005 and Ingle, 2004 and Ingle *et al.* 2012) <sup>[12-14]</sup>. However, most of the studies on amphibians in this district are limited to short surveys. Hence the present survey was undertaken to make an extensive and systematic study of the amphibian fauna of Rewa district with special reference to their diversity, distribution, habitat and status. This survey provides baseline data and scientific information for conservation of amphibians from arid zones.

### Material and Methods

Rewa is located at 24°32' N 81°18' E. It has an average elevation of 275 meters (902 feet). It is connected by all-weather roads to Allahabad, Mirzapur, Sidhi, Shahdol, Satna, Katni and Sirmour. Rewa town has its own importance on account of its location, where rich mineral deposits are found out of these three main rock formations; mirror sand, iron ore and Limestone are prominent.

The present study has been carried out from June 2019 to May 2022. Field studies were mainly done by visits to all ten tehsils of Rewa district and to all the protected areas, during rainy and dry season both in day and night. At all locations, intensive search for amphibians was undertaken by visual encounters method; the standard method formulated for measuring.

and monitoring the amphibian diversity by IUCN/SSC-DAPTF (Crump, Heyer *et al.*, 1994) Here all possible sites such as the riverbank, near water bodies, along streams, in agricultural lands, grasslands, under leaf litter, on tree trunks, on foliage's, under stones, logs, rock crevices and decaying vegetation were searched. The search is made of frogs and toads using torch lights during night. On every amphibian sighting, information on species, habitats, microhabitat and altitude was recorded. All amphibians observed during the study were photographed and after taking morphometric measurements they are released back into their natural habitat, as per the standard methods for amphibians (Crump, Heyer *et al.*, 1994) <sup>[15]</sup>. Specimen identification was made on the basis of morphometry, calls, available literature Boulenger (1890) <sup>[2]</sup>, Chanda (2002) <sup>[16]</sup>, Chandra & Gajbe (2005) <sup>[12]</sup> and with the help of other taxonomists. The nomenclatures of species were updated with the checklist by Dinesh *et al.* (2017) <sup>[1]</sup> and Frost (2017) <sup>[17]</sup>.

## Results and Discussion

A total of 30 species of amphibians were recorded from various parts of Rewa district during the survey belonging to 19 genera of 9 families and 2 orders (Table 1). Considering

number of species in each family Bufonids with 3 species, Dicroglossids 9 species, Microhylids 4 species, Nyctibatrachids 2 species, Ranids 3 species, Ranixalids 3 species, Rhacophorids 3 species and 3 species of Caecilians (Table 1). Of these 19 species recorded during the study are endemic to the Western Ghats. 30 species of amphibians of Rewa district fall under the various categories of the IUCN red list; endangered 2, critically endangered 1, vulnerable 3, least concerned 17, data deficient 1, near threatened 2 and 4 not assessed. 8 species were included in the schedules IV of Indian Wildlife (protection) act and two species come under Appendix II of CITES. The highest number of amphibian species was recorded from Huzur tehsil (28 species), while the lowest number of species was observed in Sirmour tehsil (8 species). Status of amphibians shows that 10 species are abundant, 3 are common and 17 species are rare in the study area.

*Duttaphrynus stomaticus*, *Fejervarya caperata*, *Fejervarya cepfi* (Garg and Biju 2017) <sup>[11]</sup>, *Sphaerotheca pashchima* (Padhye *et al.* 2017) <sup>[8]</sup>, *Uperodon marmorata*, *Uperodon systoma*, *Pseudophilautus amboli* and *Ichthyophis bombayensis* are first reports from the study area. We found *Ichthyophis bombayensis* road killed specimen in Huzur tehsil.

**Table 1:** Checklist of amphibian fauna of Rewa district with distribution, status, endemism, IUCN status (Dinesh *et al.* 2017)<sup>[19]</sup> and WPA-cites.

Sr. No.	Name of Species	Common Names	Location of Species (Tehsils)	Status	Endemism	IUCN Red Lest	WPA-cites
<b>Order: Anura (Fischer von Waldheim) Family: Bufonidae (Gray)</b>							
1	<i>Duttaphrynus melanostictus</i> (Schneider 1799) <sup>[20]</sup>	Common Indian Toad (Common Asian Toad)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Abundant	NE	LC	
2	<i>Duttaphrynus stomaticus</i>	Marbled Toad (Indus Valley Toad)	3, 4, 5, 6, 7, 8, 9, 10	Abundant	NE	LC	
3	<i>Xanthophryne koynayensis</i> (Soman, 1963) <sup>[21]</sup>	Koyna Toad	1	Rare	EWG	EN	
<b>Family: Dicroglossidae (Anderson)</b>							
4	<i>Euphlyctis cyanophlyctis</i> (Schneider, 1799) <sup>[20]</sup>	Indian Skittering Frog (Indian Skipper Frog)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Abundant	NE	LC	Sch. IV APP.II
5	<i>Fejervarya caperata</i> (Kuramoto, Joshy, Kurabayashi and Sumida, 2007) <sup>[4]</sup>	Canara Cricket Frog	1	Rare	EWG	Not Assessed	
6	<i>Fejervarya cepfi</i> (Garg and Biju, 2017) <sup>[22]</sup>	CEPF Burrowing Frog	1	Rare	EWG	Not Assessed	
7	<i>Fejervarya keralensis</i> (Dubois, 1975) <sup>[24]</sup>	Kerala Warty Frog (Verrucose Frog)	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Abundant	EWG	LC	Sch. IV
8	<i>Fejervarya syhadrensis</i> (Annandale & Narayan, 1919) <sup>[26]</sup>	Bombay Wart Frog	1, 2, 3, 4, 5, 6, 7, 8	Abundant	NE	LC	
9	<i>Hoplobatrachus tigerinus</i> (Daudin, 1802) <sup>[27]</sup>	Indian Bull Frog	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Abundant	NE	LC	Sch. IV App.II
10	<i>Sphaerotheca breviceps</i> (Schneider, 1799) <sup>[20]</sup>	Indian Burrowing Frog	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Abundant	NE	LC	
11	<i>Sphaerotheca dobsonii</i> (Boulenger, 1882) <sup>[25]</sup>	Dobson's Burrowing Frog	1,2	Rare	EWG	LC	
12	<i>Sphaerotheca pashchima</i> (Padhye, Dahanukar, Sulakhe, Dandekar, Limaye and Jamdade, 2017) <sup>[8]</sup>	Western Burrowing Frog	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Abundant	NE	Not Assessed	
13	<i>Microhyla ornata</i>	Ornate Narrow-mouthed Frog	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	Abundant	NE	LC	
14	<i>Uperodon globulosus</i>	Grey Balloon Frog	1, 2, 3, 4, 8	Common	NE	LC	
15	<i>Uperodon marmorata</i>	Marbled Ramanella	1, 2	Rare	EWG	EN	
16	<i>Uperodon systoma</i> (Schneider, 1799) <sup>[20]</sup>	Marbled Balloon Frog	3, 4, 5, 6, 7, 8, 9, 10	Abundant	NE	LC	Sch. IV
<b>Family: Nyctibatrachidae (Bloomers-Schlosser)</b>							
17	<i>Nyctibatrachus humayuni</i>	Bombay Night Frog	1	Rare	EWG	VU	
18	<i>Nyctibatrachus petraeus</i> (Das and Kunte, 2005) <sup>[28]</sup>	Castle Rock Night Frog	1	Rare	EWG	LC	
<b>Family: Ranidae (Rafinesque)</b>							

19	<i>Clinotarsus curtipes</i>	Bicolored Frog	1	Rare	EWG	NT	Sch. IV
20	<i>Hydrophylax bahuvistara</i> (padhye, Jadhav, Modak, Nameer and Dahanukar, 2015) <sup>[7]</sup>	Fungoid Frog	1, 2	Rare	EWG	LC	Sch. IV
21	<i>Indosylvirana caesari</i> (Biju, Garg, Mohony, Wijayathilaka, Senevirathne and Meegaskumbura, 2014) <sup>[9]</sup>	Bronzed Frog (Maharashtra Golden Backed Frog)	1	Rare	EWG	NT	Sch. IV
<b>Family: Ranixalidae (Dubois)</b>							
22	<i>Indirana beddomii</i>	Beddome's Leaping Frog	1	Rare	EWG	LC	Sch. IV
23	<i>Indirana chiravasi</i> (Padhye, Modak and Dahanukar, 2014) <sup>[6]</sup>	Emboli Leaping Frog	1	Rare	EWG	Not Assessed	
24	<i>Indirana leithii</i>	Leith's Leaping Frog	1	Rare	EWG	VU	
<b>Family: Rhacophoridae Hoffman</b>							
25	<i>Polypedates maculatus</i>	Common Indian Tree Frog (Chunam Frog)	1, 2, 3, 4, 8	Common	NE	LC	
26	<i>Pseudophilautus emboli</i> (Biju and Bossuyt, 2009) <sup>[5]</sup>	Emboli Bush Frog	1	Rare	EWG	CE	
27	<i>Raorchestes bombayensis</i> (Annandale & Narayan, 1919) <sup>[26]</sup>	Bombay Bush Frog	1, 2, 3, 4, 8	Common	EWG	VU	
<b>Order: Gymnophiona (Muller)</b>							
<b>Family: Ichthyophiidae (Taylor)</b>							
28	<i>Ichthyophis beddomei</i>	Bed dome's Caecilian	1	Rare	EWG	LC	
29	<i>Ichthyophis bombayensis</i> (Taylor, 1960) <sup>[23]</sup>	Bombay Caecilian	1	Rare	EWG	LC	
<b>Family: Indotyphlidae (Leisure, Renous, and Gasc)</b>							
30	<i>Indotyphlus maharashtraensis</i> (Giri, Gower and Wilkinson, 2004) <sup>[3]</sup>	Maharashtra Caecilian	1	Rare	EWG	DD	

1-Huzur, 2-Gurh, 3-Mauganj, 4-Naigarhi, 5-Raipur Karchuliyan, 6-Sirmour, 7-Teonthar, 8-Semaria, 9-Gangeo, 10-Jawa

Rare- species found in 1-2 tehsils, Common- species found in 3-6 tehsils and Abundant- species found in more than 6 tehsils.

EWR-Endemic to Western Ghats, NE- Non-Endemic EN- Endangered, CE- Critically Endangered, VU- Vulnerable,

LC- Least Concerned, DD-Data Deficient, NT- Near Threatened.

Schedules IV- Indian Wildlife (protection) Act App. II of CITES - The Conservation on International Trade in Endangered Species of Wild Flora and Fauna.

**Table 2:** Amphibian fauna of Rewa district with habitat, microhabitat, altitude range, annual temperature and annual rainfall.

Sr. No.	Name of Species	Habitat	Microhabitat	Altitude (m)		Mean Annual Temp. (°C)		Annual Rainfall (mm)	
				Min	Max	Min	Max	Min	Max
1	<i>D. melanotekites</i>	Terrestrial, near human habitats	On bare land, under stone, in crevices, under streetlamps, near water bodies, agriculture land	500	1100	17	40	500	3000
2	<i>D. stomatous</i>	Terrestrial, near human habitats	On bare land, under stone, near water bodies agriculture land, grass land	500	1100	25	35	500	2000
3	<i>X. koinonias</i>	Terrestrial, On lateritic rock	On plateau, Under rock, in crevices, in grasses surrounded by forest	900	1200	18	26	1500	3000
4	<i>E. cyanophytes</i>	Aquatic, littoral	Found in almost all kinds of freshwater bodies	500	1100	17	38	500	3000
5	<i>F. caperata</i>	Semi aquatic	Wet soil, in grasses near water bodies, paddy and sugar cane field, on forest floor	600	800	20	24	1000	1500
6	<i>F. cepfi</i>	Semi aquatic, burrowing frog	Wet soil, on forest floor, forest edge, in grasses near water bodies, paddy and sugar cane field	650	1100	17	27	1500	3000
7	<i>F. Keralans</i>	Semi aquatic	Wet soil, in grasses near water bodies, paddy and sugar cane field, in swamp area, in villages	500	1000	17	38	500	3000
8	<i>F. syhadrensis</i>	Semi aquatic, near human habitation	Wet soil, in grasses near water bodies, paddy and sugar cane field, in swamp area, in villages	500	1000	20	30	500	2000
9	<i>H. tigerinus</i>	Semi aquatic, near human habitation	Agricultural fields, in ponds, lakes, wells and on forest floor	500	1100	17	40	500	3000
10	<i>S.breviceps</i>	Terrestrial, near human habitation	Moist soil, near water bodies, in agricultural land, on bare ground. Burrowing species	500	1000	17	40	500	2000
11	<i>S. dobsonii</i>	Terrestrial, burrowing frog	In leaf litter, on forest flour, moist soil close to water bodies, in paddy field, forest edge habitat	500	1050	22	27	1000	3000
12	<i>S. pashchima</i>	Terrestrial, near human habitation	Moist soil, near water bodies, in agricultural land, on bare ground. Burrowing species	500	1000	17	40	500	2000
13	<i>M. ornata</i>	Semi aquatic, near human habitation	In grasses, in and near water bodies, under stones, in crevices, on bare ground	500	1050	18	38	500	2500
14	<i>U. globulosus</i>	Terrestrial, burrowing frog	Termite Mountain, On bare ground, near water bodies, agriculture land	650	1000	22	30	1000	2500
15	<i>U. mormorata</i>	Terrestrial, burrowing frog	On wet soil, leaf litter, in paddy and sugar cane field, in forest	660	1000	22	24	1000	3000
16	<i>U. systoma</i>	Terrestrial, near human habitation, burrowing frog	Termite Mountain, On bare ground, near water bodies, agriculture land	500	634	17	38	500	1000

17	<i>N. humayuni</i>	Aquatic, forest dwelling	Near shallow water streams, in rock crevices, in perennial stream, on leaves over hanging on running water	560	1100	21	25	2000	3000
18	<i>N. petraeus</i>	Aquatic, forest dwelling	In shallow water streams, in rock crevices, in perennial stream, on leaves over hanging on running water, under stones	562	600	25	25	2000	3000
19	<i>C. curtipes</i>	Semi aquatic, forest dwelling	Forest floor, leaf litter, found near water bodies, slow running streams	630	1100	17	27	1000	3000
20	<i>H. bahuvistara</i>	Semi aquatic	found near water bodies, forest floor, leaf litter, in paddy and sugar cane field	600	1000	20	30	1000	2000
21	<i>I. caesari</i>	Semi aquatic,	Found near water bodies, forest floor, leaf litter, slow flowing streams	630	1100	17	25	1000	3000
22	<i>I. beddomii</i>	Terrestrial	On moist rock, on forest floor, leaf litter, in grasses near water bodies	550	1200	17	28	1000	3000
23	<i>I. chiravasi</i>	Terrestrial	On tree trunk, on moist rock, on forest floor, leaf litter, on moist soil, on wet cliffs	500	1000	24	25	1000	3000
24	<i>I. leithii</i>	Terrestrial	On tree trunk, on wet rock, on forest floor, leaf litter, in grasses, on moist soil	590	1000	22	26	1500	3000
25	<i>P. maculatus</i>	Arboreal	On herbs, shrubs, trees, on sugarcane plantation	500	1100	20	30	500	1500
26	<i>P. amboli</i>	Arboreal	On herbs, shrubs, trees in forest	500	1000	24	25	1000	3000
27	<i>R. bombayensis</i>	Arboreal	On herbs, shrubs, trees, on sugar cane plantation and on ground	500	1300	18	25	1000	3000
28	<i>I. beddomei</i>	Fossorial	In moist loose soil, in forest, in marshes, cultivated land, in leaf litter	1000	1200	14	27	1000	3000
29	<i>I. bombayensis</i>	Fossorial	In humus rich soil, in leaf litter in forest, cultivated land, under rocks, in marshes	800	1550	19	27	1500	3000
30	<i>I. Maharashtraensis</i>	Fossorial	Under moist soil: in forest, under rocks, on plateau	630	1000	25	25	2000	3000

## Conclusion

Survey of amphibians in Rewa district concludes that the non-endemic frogs viz. *Duttaphrynus melanostictus*, *Duttaphrynus stomaticus*, *Euphlyctis cyanophlyctis*, *Fejervarya keralensis*, *Fejervarya syhadrensis*, *Hoplobatrachus tigerinus*, *Sphaerotheca breviceps*, *Sphaerotheca dobsonii*, *Sphaerotheca pashchima* *Microhyla ornata*, *Uperodon systoma* and *Polypedates maculatus* are widely distributed, well adapted and occur in all microhabitats while species which are endemic to Western Ghats shows diversity in habitat type. The highest number of species are found at altitude 1100m, where rainfall is high (1000-3000mm) and temperature is low (17-30°C). The lowest numbers of species were recorded at altitude 600m where rainfall is low (below 600mm) and temperature is high (35-40°C). (Table 2) Some species overlap in their altitude range. Species were recorded from all the altitudes indicating their diverse adaptation to live in the low and high altitudes (Andrews *et al.*, 2005)<sup>[17]</sup> Environmental conditions and habitat of species play an important role in the distribution and diversity of species. Hence this survey provides baseline data and scientific information for conservation of amphibians from arid zones.

## Acknowledgements

Authors are thankful to the various authorities of the district viz., forest dept., irrigation Dept. and Research Centre Govt. Science P.G. College Rewa (M.P.) for providing necessary facilities during study period.

## References

- Dinesh KP, Radhakrishnan C, Channakeshavamurthy BH, Kulkarni NU. A Checklist of Amphibia of India Updated till April 2017. Mhadei Research Center, Online Version, c2017.
- Boulenger GA. Fauna of British India, including Ceylon and Burma, Reptilia and Batrachia. London, Taylor and Francis, c1890.
- Giri V, Gower J, Wilkinson M. A new species of Indophiles, Taylor (Amphibia: Gymnophiona: Caeciliidae) from the Western Ghats: India. Zoo taxa. 2004;739(1):1-19.
- Kuramoto M, Joshy SH, Kurabayashi A, Sumida M. The genus Funerary (Anura: Randede) in central Western Ghats, India with description of four new cryptic species. Current Herpetology Journal. 2007;26(1):81-105.
- Biju SD, Bossuyt F. Systematic and phylogeny of *Philatus Gistel*, 1848 (Anura, Rhacophoridae) in Western Ghats of India, with description of 12 new species. Zoology Journal of the Linnean Society. 2009;155(2):374-444.
- Padhye AD, Modak N, Dahanukar N. *Indirana chiravasi*, a new species of leaping frog (Anura: Ramixotidine) from Western Ghats of India. Journal of Threatened taxa. 2014;6(10):6293-6312.
- Padhye AD, Jadhav A, Modak N, Nameer D, Dahanukar N. *Hydrophilic bahu Vistara*, a new Species of Fungoid frog (Amphibia: Ranidae) from Peninsular India. Journal of Threatened taxa. 2015;7(11):7744-7760.
- Padhye AD, Dahanukar N, Sulakhe S, Dandekar N, Limaye S, Jamdade K. *Spheritic Paschim*, a new species of burrowing frog (Anura: Dicoglossidae) from Western India. Journal of Threatened taxa. 2017;9(6):10286-10296.
- Biju SD, Garg S, Mohony S, Wijayathilaka N, Senevirathne G, Meegaskumbura M. DNA barcoding, phylogeny and systematic of Golden-backed frog (*Hylarana*, Ranidae) of Western Ghats-Sri Lanka biodiversity hotspots, with the description of nine new species. Contribution to Zoology. 2014;83(4):296-335.
- Dahanukar N, Modak N, Krutha K, Nameer P, Padhye A, Molur S. Leaping frog (Anura: Ramixotidine) of the Western Ghats of India, An integrated taxonomic

- review. *Journal of Threatened taxa*. 2016;8(10):9221-9288.
11. Garg S, Biju SD. Description of four new species of burrowing frog in the *Fejervarya rufescence* complex (Dicroglossidae) with notes on morphological affinities of *Fejervarya species* in Western Ghats. *Zoo taxa*. 2017;4277(4):451-490.
  12. Chandra K, PU Gajbe. An Inventory of Herpetofauna of Madhya Pradesh and Chhattisgarh. *Zoos' Print Journal*. 2005;20(3):1812-1819.
  13. Ingle M. Ophiofauna of Ujjain & certain Areas of Malwa Region (Madhya Pradesh), *Records of the Zoological Survey of India*. 2004;103(part 1-2):17-31.
  14. Ingle M, Sarsavan A, Verma P, Powar P. Herpetofauna Inventory of Gandhi Sagar Wildlife Sanctuary Madhya Pradesh. National seminar on Current Trend of Wildlife Research in India with Special Reference to Herpetology, P. G. Dept. of Zoology, North Orissa University, Takatpur, Baripada, Odisha. 2012, p. 37.
  15. Crump ML, Scott NJ. Jr. Visual Encounter Surveys. in: Heyer WR, Donnelly MA, McDiarmid RW, Hayek LC and Foster MS (eds.) *Measuring and Monitoring Biological Diversity: Standard Methods for Amphibians*. Smithsonian Institution Press, Washington, D.C, 1994, p. 84-92.
  16. Chanda SK. *Handbook of Indian Amphibians*. Zoological Survey of India, Kolkata, India, 2002, p. 1-335.
  17. Frost DR. *Amphibian Species of the World: an online reference*. Version 6.0 (30/04/2017). <http://research.amnh.org/lvz/herpetology/amphibia/index.html>. *Journal of American Museum of Natural History*, New York, USA, c2017.
  18. Andrews MI, George S, Joseph JA. Survey of the amphibian fauna of Kerala-distribution and Status. *Zoos' Print Journal*. 2005;20(1):1723-1735.
  19. Dinesh, K.P., C. Radhakrishnan, B.H. Channakeshavamurthy, P. Deepak and Nirmal U Kulkarni,. 2017. Checklist of Amphibia of India, updated till April 2017 available at <http://mhadeiresearchcenter.org/resources> (online only).
  20. Schneider, J.G. *Historiae Amphibiorum naturalis et literariae. Fasciculus Primus, continens Ranas, Calamitas, Bufones, Salamandras et Hydros, in genera et species descriptos notisque suis distinctos*. Friederici Frommann, Jena, 1799; xiii + (1) + 264 pp., corrigenda, Pl. 1-2.
  21. Soman, P.W. A new Bufo from Maharashtra. *Journal of Biological Sciences*. 1963;6:73.
  22. Garg S, Biju SD. Description of four new species of Burrowing Frogs in the *Fejervarya rufescens* complex (Dicroglossidae) with notes on morphological affinities of *Fejervarya species* in the Western Ghats. *Zootaxa*. 2017;4277:451-490.
  23. Taylor EH. On the caecilian species *Ichthyophis monochrous* and *Ichthyophis glutinosus* and related species. *Univ Kansas Scie Bull*. 1960;40:37-120.
  24. Dubois A. Un nouveau complexe d'especes jumelles distinguées par le chant: Les grenouilles du Nepal voisines de *Rana limnocharis* Boie (Amphibiens, Anoures). *C R Seances Acad. Sci. D*. 1975;281:1717-1720.
  25. Boulenger GA. *Catalogue of the Batrachia Salientia s. Ecaudata in the collection of the British Museum*. Second Edition. London (Taylor and Francis): 1882; i-xvi + 1-503, pl. 1-30.
  26. Annandale N, Narayan CR. The tadpoles of the families Ranidae and Bufonidae found in the plains of India. *Records of Indian Museum, Calcutta*. 1919;15 (for 1918):25-40.
  27. Daudin, F. *Histoire naturelle, generale et particuliere des Reptiles*. Vol. III. F. Dufart, Paris, 1802, 452.
  28. Das, Indraneil and Kunte, Krushnamegh. New species of *Nyctibatrachus* (Anura: Ranidae) from Castle Rock, Karnataka State, Southwest India, *Journal of Herpetology*. 2005;39(3):465-470.