

PRELIMINARY STUDY OF HERPETOFAUNAL DIVERSITY IN RADHANAGARI WILDLIFE SANCTUARY (WLS), KOLHAPUR, MAHARASHTRA, INDIA

Omkar V. Yadav and S. R. Yankanchi*

Department of Zoology, Shivaji University, Kolhapur-416 004, Maharashtra, India

E-mail: sryankanchi@yahoo.co.in

ABSTRACT

The present study was undertaken to the survey of Herpetofauna carried out in the selected area of Radhanagari Wildlife Sanctuary (WLS), Kolhapur district, Maharashtra during June 2013 to May 2014. The Radhanagari Wild Life Sanctuary is located between 16°10" to 16°30" north latitude and 73°52" to 74°14" east longitude. During survey, we reported 56 species of herpetofauna which represents about 6.5% of all known Herpetofauna from India. All reported species belong to 42 genera distributed among the 20 families in which 34 species of Reptiles belonging to 12 families are distributed over 26 genera and 22 species of amphibians belonging to 8 families are scattered over 16 genera. The present study indicates that species count at Radhanagari Wildlife Sanctuary is likely to increase with additional surveys and systematic work.

Keywords: Diversity, Herpetofauna, Radhanagari WLS.

INTRODUCTION

Amphibians and Reptiles play an important role in our efforts to conserve biodiversity and account for one quarter of all vertebrate species with great risks in tropical ecosystems. (Mittermeier *et al.* 1992)

India harbors 342 species of amphibians which includes 306 species of anura, 35 species of gymnophiona and 1 species of salamander (Dinesh *et al.* 2013). The amphibians of the Western Ghats are miscellaneous and supreme; with over 80% of the 181 amphibian species are endemic to the region (Radhakrishnan & Rajmohana 2012). In India, 518 reptiles species were recorded which includes 3 crocodylian species, 34 species of turtles and tortoises, 202 saurian species and 279 species of serpentes belonging to 28 families. (Aegnals *et al.* 2012), among which Western Ghats comprise 203

species with 61% (124 spp.) endemism (Radhakrishnan & Rajmohana 2012). Radhanagari Wildlife Sanctuary (Bison Sanctuary) located in Radhanagari tehsil of district Kolhapur in Maharashtra state of India. It situated at the southern end of the Sahyadri range in the Western Ghats. The popularly known "Bison Sanctuary" is the first declared wildlife sanctuary in Maharashtra notified in 1958 as a Dajipur Wildlife Sanctuary. In the present study, an attempt has been made to document the diversity of herpetofauna in Radhanagari Wildlife Sanctuary.

MATERIAL AND METHODS

Study area:

The present study was conducted in Radhanagari Wildlife Sanctuary located at South-West of Maharashtra at 16°10" to 16°30" N and 73°52" to 74°14"E. Having a total area of 351.16 km²

WLS has major habitats include tropical evergreen forests with rich flora and fauna. Flowering plants diversity extends over 1,500 species (Yadav and Sardesai 2002). WLS harbors main angiospermic species of *Memecylon*, *Syzygium*, *Terminalia*, *Musa* with *Emblca officinalis*, *Mangifera indica*, *Careya*

arborea, *Glochidion ellipticum*, *Ficus racemosa*, *Catunaregam spinosa*, *Semecarpus anacardium* and *Strobilanthes callosus* is found over almost the entire area. Radhanagari WLS having a moderate climate with three distinct seasons, viz., the monsoon (mid June to October), winter (October to February) and summer (March to

Figure-1. Location map of Radhanagari wildlife Sanctuary, Kolhapur (MH, India)

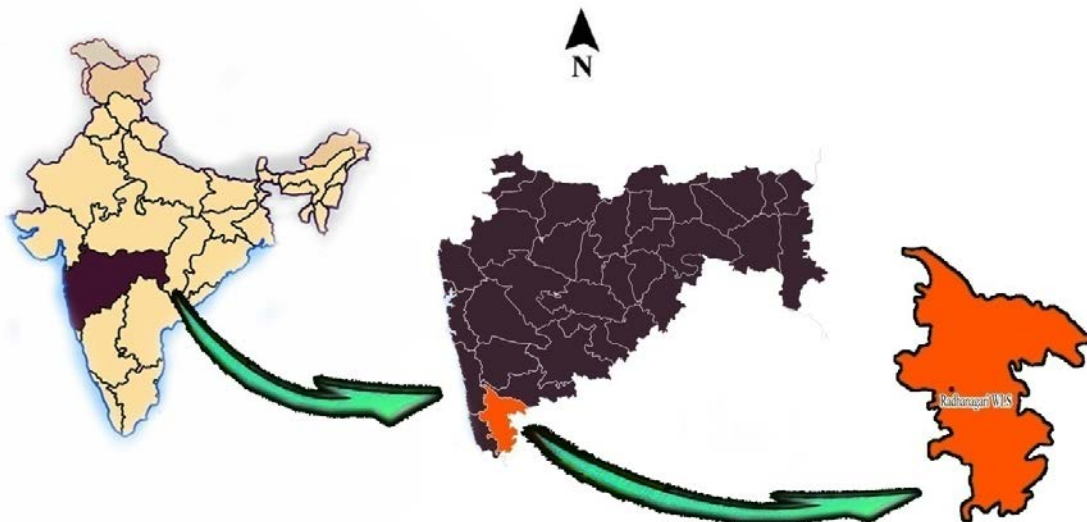


Table No. 1- Checklist of Amphibian species in Radhanagari WLS, Kolhapur (MH) India

S.No.	Species	Scientific name	Family	IUCN status
1	Common Indian Toad	<i>Duttaphrynus melanostictus</i> (Schneider, 1799)	Bufoinae	LC
2	Indian skittering frog	<i>Euphylyctis cyanophlyctis</i> (Schneider, 1799)	Dicroglossidae	LC
3	Indian bull frog	<i>Hoplobatrachus tigerinus</i> (Daudin, 1802)	Dicroglossidae	LC
4	Indian burrowing frog	<i>Sphaerotheca breviceps</i> (Schneider, 1799)	Dicroglossidae	LC
5	Dobson's burrowing frog	<i>Sphaerotheca dobsonii</i> (Boulenger, 1882)	Dicroglossidae	LC
6	Indian Rice Frog	<i>Fejervarya limnocharis</i> (Gravenhorst, 1829)	Dicroglossidae	LC
7	Syhadra frog	<i>Zakerana syhadrensis</i> (Annandale, 1919)	Dicroglossidae	LC
8	Rufescent Burrowing Frog	<i>Zakerana rufescens</i> (Jerdon, 1854)	Dicroglossidae	LC
9	Ornate narrow-mouthed frog	<i>Microhyla ornata</i> (Dumeril and Bibron, 1841)	Microhylidae	LC
10	Red narrow-mouthed frog	<i>Microhyla rubra</i> (Jerdon, 1854)	Microhylidae	LC
11	Marbled Ramanella	<i>Ramanella marmorata</i> (Rao, 1937)	Microhylidae	EN
12	Indian balloon frog	<i>Uperodon globulosus</i> (Gunther, 1864)	Microhylidae	LC
13	Bombay night frog	<i>Nyctibatrachus humayuni</i> (Bhaduri and Kripalani, 1955)	Nyctibatrachidae	VU
14	Night frog	<i>Nyctibatrachus sp.</i>	Nyctibatrachidae	---
15	Fungoid frog	<i>Hylarana malabarica</i> (Tschudi, 1838)	Ranidae	LC
16	Bronzed frog	<i>Hylarana temporalis</i> (Gunther, 1864)	Ranidae	NT
17	Beddome's leaping frog	<i>Indirana beddomii</i> (Gunther, 1875)	Ranixalidae	LC
18	Leaping frog	<i>Indirana sp.</i>	Ranixalidae	---
19	Chunam tree frog	<i>Polypedates maculatus</i> (Gray, 1834)	Rhacophoridae	LC
20	Amboli bush frog	<i>Pseudophilautus amboli</i> (Biju and Bossuyt, 2009)	Rhacophoridae	CE
21	Bombay bush frog	<i>Raorchestes bombayensis</i> (Annandale, 1919)	Rhacophoridae	VU
22	Bombay caecilian	<i>Ichthyophis bombayensis</i> (Taylor, 1960)	Ichthyophiidae	LC

Abbreviations: CE- Critically Endangered, EN- Endangered, LC- Least Concerned, LR/NT- Lower Risk/ Near Threatened, NA- Not Assessed, NT- Near Threatened, VU- Vulnerable.

Table No. 2- Checklist of Reptilian species in Radhanagari WLS, Kolhapur (MH) India.

S.No.	Species	Scientific name	Family	IUCN status
1	Indian black turtle	<i>Melanochelys trijuga</i> (Schweigger,1812)	Bataguridae	LR/NT
2	Indian garden lizard	<i>Calotes versicolor</i> (Daudin, 1812)	Agamidae	NA
3	Roux's forest lizard	<i>Calotes rouxii</i> (Duméril & Bibron, 1837)	Agamidae	LC
4	Fan throated lizard	<i>Sitana ponticeriana</i> (Cuvier, 1829)	Agamidae	LC
5	Brook's house gecko	<i>Hemidactylus brookii</i> Gray, 1845	Gekkonidae	LC
6	Yellow green house gecko	<i>Hemidactylus flaviviridis</i> Rüppell, 1835	Gekkonidae	LC
7	Deccan ground gecko	<i>Geckoella deccanensis</i> (Gunther, 1864)	Gekkonidae	LC
8	Bombay Leaf-toed Gecko	<i>Hemidactylus prashadi</i> (Smith, 1935)	Gekkonidae	LC
9	Common keeled skink	<i>Eutropis carinata</i> (Schneider, 1801)	Scincidae	LC
10	Three-lined grass skink	<i>Eutropis trivittata</i> (Hardwicke & Gray, 1827)	Scincidae	LC
11	Common Indian Monitor	<i>Varanus bengalensis</i> (Daudin, 1802)	Varanidae	LC
12	Brahminy worm snake	<i>Ramphotyphlops braminus</i> (Daudin, 1803)	Typhlopidae	LR/NT
13	Phipson's shieldtail	<i>Uropeltis phipsonii</i> (Mason, 1888)	Uropeltidae	VU
14	Large-scaled shieldtail	<i>Uropeltis macrolepis</i> (Peters,1862)	Uropeltidae	LC
15	Common sand boa	<i>Gongylophis conicus</i> (Schneider,1801)	Boidae	NA
16	Whitaker's boa	<i>Eryx whitakeri</i> (Das,1991)	Boidae	NA
17	Indian rock python	<i>Python m. molurus</i> (Linnaeus, 1758)	Pythonidae	LR/NT
18	Common trinket snake	<i>Coelognathus helena helena</i> (Daudin,1803)	Colubridae	LR/NT
19	Montane trinket snake	<i>Coelognathus helena monticollaris</i> (Schulz,1992)	Colubridae	NA
20	Indian Rat snake	<i>Ptyas mucosa</i> (Linnaeus,1758)	Colubridae	LR/NT
21	Common kukri snake	<i>Oligodon arnensis</i> (Shaw,1802)	Colubridae	LR/NT
22	Russell's kukri snake	<i>Oligodon taeniolatus</i> (Jerdon,1853)	Colubridae	LC
23	Common wolf snake	<i>Lycodon aulicus</i> (Linnaeus,1754)	Colubridae	LR/NT
24	Travancore wolf snake	<i>Lycodon travancoricus</i> (Beddome,1870)	Colubridae	LC
25	Barred wolf snake	<i>Lycodon striatus</i> (Shaw,1802)	Colubridae	NA
26	Striped keelback	<i>Amphiesma stolatum</i> (Linnaeus,1758)	Colubridae	LR/NT
27	Checkered keelback	<i>Xenochrophis piscator</i> (Schneider,1799)	Colubridae	LC
28	Green keelback	<i>Macrophistodon plumbicolor</i> (Cantor,1839)	Colubridae	NA
29	Common vine snake	<i>Ahaetulla nasuta</i> (Lacepede,1789)	Colubridae	LR/NT
30	Common Indian krait	<i>Bungarus caeruleus</i> (Schneider,1801)	Elapidae	NA
31	Spectacled cobra	<i>Naja naja</i> (Linnaeus,1758)	Elapidae	NA
32	Russell's viper	<i>Daboia russelii</i> (Shaw & Nodder,1797)	Viperidae	NA
33	Saw Scaled Viper	<i>Echis carinatus</i> (Schneider, 1801)	Viperidae	NA
34	Bamboo pit viper	<i>Trimeresurus gramineus</i> (Shaw,1802)	Viperidae	LC

Abbreviations: CE- Critically Endangered, EN- Endangered, LC- Least Concerned, LR/NT- Lower Risk/ Near Threatened, NA- Not Assessed, NT- Near Threatened, VU- Vulnerable

mid June). The temperature has a relatively narrow range between 10 °C to 35 °C. Average rainfall for last five years is 2500 mm (Hydromet division, India meteorological department).

A survey of herpetofauna was conducted from June 2013 to May 2014. The conducted survey was done by opportunistic field observations. Active searches were made by walking across

small streams and roads, turning rocks, investigating under bushes logs, leaf litters and on walls of buildings etc. we also observed basking reptiles during day time and snakes on rescue calls to include most of the species in WLS. Frogs were also surveyed on the basis of their calls between 19.30-22.30 hr aided by torchlight. Species were measured (Snout-vent length) and released back.

Figure-2. Family wise distribution of Amphibian species in Radhanagari WLS, Kolhapur (MH) India

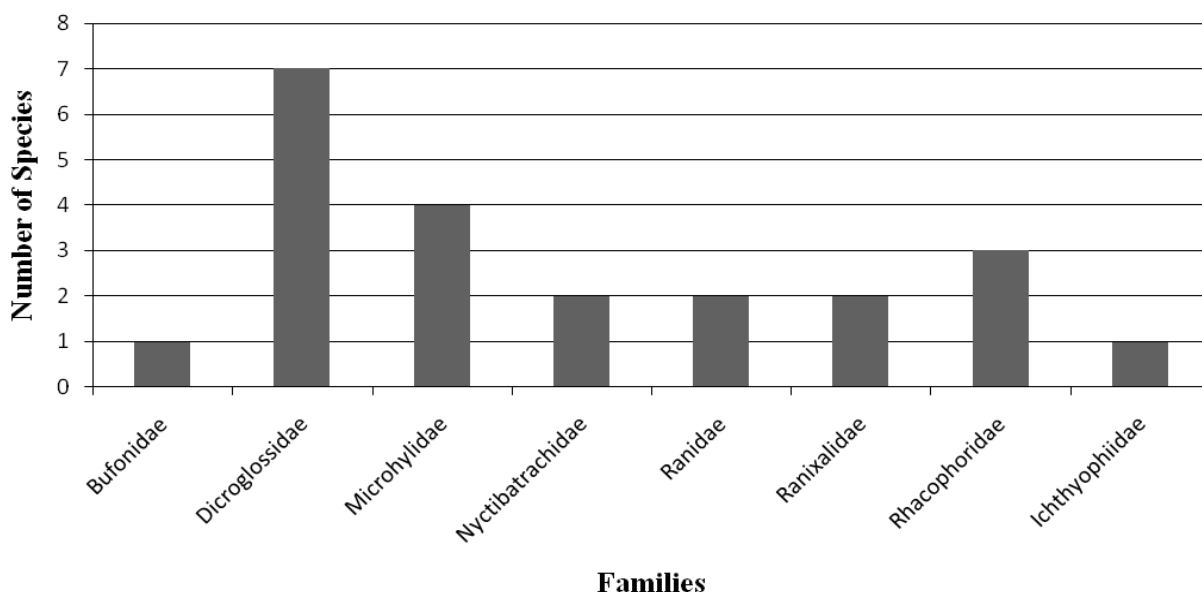
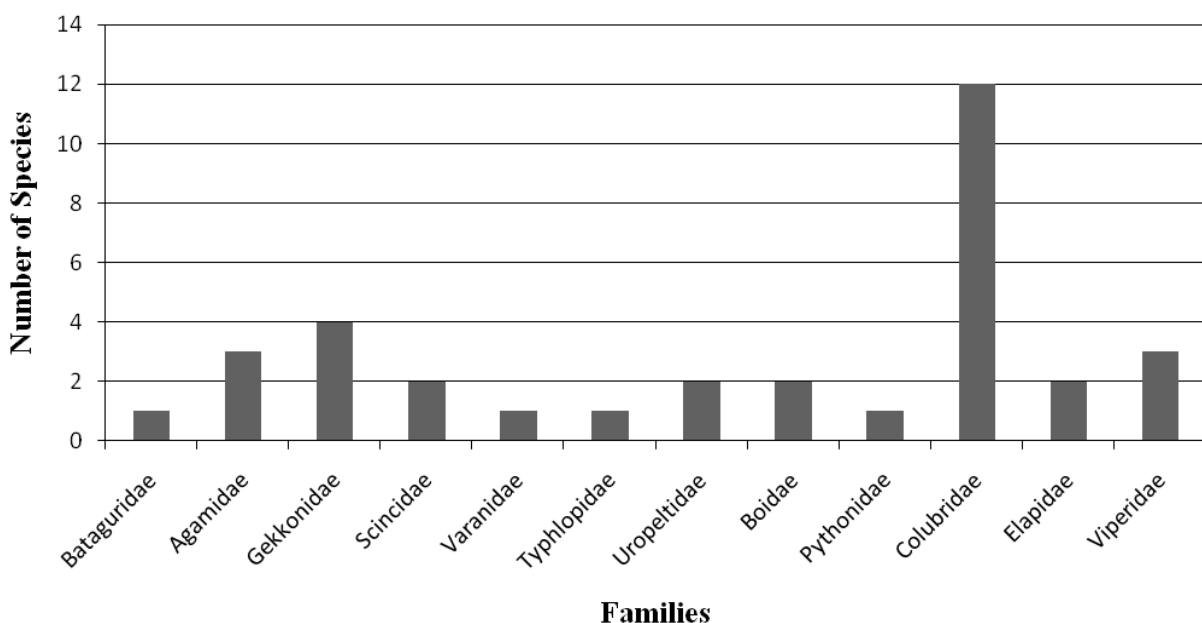


Figure- 3. Family wise distribution of Reptilian species in Radhanagari WLS, Kolhapur (MH) India



All species encountered are identified up to species level using keys and other publications (Gunther 1864; Boulenger 1890; Smith 1931, 1935, 1943; Dutta 1997; Bossuyt 2002; Daniels 2002; Daniels RJR 2005; Giri & Bauer 2008; Whitaker & Captain 2008; Aengals *et al.* 2012; Gururaja 2012) and the assessment of threat status of the observed species in the area was based on IUCN red list (2013).

RESULTS AND DISCUSSION

Studies on the amphibians revealed that the presence of 22 species belonging to 8 families are scattered over 16 genera (Table-1). A total of 34 species of Reptiles belonging to 12 families are distributed over 26 genera (Table-2).

The family-wise distribution of Amphibians of Radhanagari WLS is given in Fig. 2. Family Dicroglossidae dominated the amphibian fauna of Radhanagari WLS with 7 species followed by Microhylidae 4 species, Rhacophoridae 3 species, Ranidae, Nyctibatrachidae and Ranixalidae 2 species each, Bufonidae, and Ichthyopidae with a single species. In reptiles, more number is observed from family Colubridae with 12 species followed by Gekkonidae with 4 species, Agamidae and Viperidae with 3 species, Scincidae, Uropeltidae, Boidae & Elapidae with 2 species and Bataguridae, Varanidae, Typhlopidae, & Pythonidae with single species (Fig.3).

During the present survey, we recorded two amphibian species is which may unknown and their identity was done with reference (e.g, *Nyctibatrachus sp.*, *Indirana sp.*). These tentatively identified species are either previously unknown or are members of cryptic species complexes.

From observed herpeto faunal species in Radhanagari WLS *P. amboli* critically endangered, *R. mormorata* is endangered species and *N.humayuni*, *R. bombayensis* & *U. phipsonii* are vulnerable species. According to Indian Wildlife (Protection) Act, 1972 *Varanus bengalensis* and *Python m. molurus* have highest legal protection status, under Schedule I

followed by *Naja naja*, *Ptyas mucosa* and *Xenochrophis piscator* are in Schedule II, rest other snake species are included in Schedule IV of aforesaid Act.

This was just a preliminary study of diversity of Herpetofauna in Radhanagari WLS, with less number of visits to few spots thus it is sure that present study represents fraction of actual herpetofaunal assemblage and additional and in-depth study reveal more unrecorded species from this study.

ACKNOWLEDGEMENTS

We are thankful to the Maharashtra Forest Department for granting permission to conduct the study.

Thanks to N. P. Grampurohit, S. M. Kumbar, Abhijeet Das, Varad Giri, Karthikeyan Vasudevan, Sujith Gopalan and Atish Gawai for sharing knowledge. We thank Amol, Omkar Gurav, Pankaj, Nirmala, Ankita, Shahin for assistance in the field.

REFERENCES

1. Aengals, R., V.M. Sathish Kumar & M. J. Palot: Updated Checklist of Indian Reptiles, (2012).
2. Bossuyt, F.: A new species of *Philautus* (Anura: Ranidae) from the Western Ghats of India. *J. of Herp.*, 36(4), 656–661 (2002).
3. Boulenger, G.A.: The fauna of British India including Ceylon and Burma: Reptilia and Batrachia, London (1890).
4. Daniels, J.C.: The book of Indian Reptiles and Amphibians. Bombay Natural History Society and Oxford University Press, Mumbai (2002)
5. Daniels, R.J.R.: Impact of tea cultivation on anurans in the Western Ghats. *Curr Sci.* 85, 1415-1422 (2003).

6. Daniels, R.J.R.: Amphibians of peninsular India. Indian Academy of Sciences, Universities Press, Hyderabad (2005). Francis, London (1935). (Reprinted 1974, 1995 by Today and Tomorrow's Printers and Publishers, New Delhi).
7. Dinesh, K.P., C. Radhakrishnan, K.V. Gururaja, K. Deuti & G. Bhatta: A Checklist of Amphibia of India with IUCN Red list Status, Updated till April 2013, (2013).
8. Dutta, S.K.: Amphibians of India and Sri Lanka (checklist and bibliography). Odyssey Publishing House, Bhubaneswar (1997).
9. Giri V. B. & A. M. Bauer: A new ground-dwelling *Hemidactylus* (Squamata: Gekkonidae) from Maharashtra, with a key to the *Hemidactylus* of India. *Zootaxa*, 1700, 21–34 (2008).
10. Gunther C.L.C Albert: The Reptiles of British India. Published by Oxford & IBH Publishing Co. New Delhi (1864).
11. Gururaja K. V.: Pictorial Guide to Frogs and Toads of the Western Ghats. Gubbi Labs Publication, (2012).
12. Mittermeier, R.A., Carr, J.L., Swingland, I.R., Werner, T.B., Mast, R.B.: Conservation of amphibians and reptiles. In: Adler, K. (Ed.), Herpetology, Current Research on the Biology of Amphibians and Reptiles. Society for the Study of Amphibians and Reptiles, Oxford, OH, pp. 59-80 1992.
13. Radhakrishnan, C. & K. Rajmohana: Fauna of ecosystems of India-Western Ghats. Director, ZSI, Kolkata, India (2012).
14. Smith, M.A.: The fauna of British India including Ceylon and Burma: Reptilia and Amphibia.
15. Vol.1.Loricata, Testudines. Taylor and Francis, London (1931). (Reprinted 1974, 1995 by Today and Tomorrow's Printers and Publishers, New Delhi).
16. Smith, M. A.: The fauna of British India including Ceylon and Burma: Reptilia and Amphibia. Vol II. Sauria. Taylor and Francis, London (1935). (Reprinted 1974, 1995 by Today and Tomorrow's Printers and Publishers, New Delhi).
17. Smith, M. A.: The fauna of British India including Ceylon and Burma: Reptilia and Amphibia. Vol III. Serpentes. Taylor and Francis, London (1943). (Reprinted 1974, 1995 by Today and Tomorrow's Printers and Publishers, New Delhi).
18. Whitaker, R. and A. Captain: Snakes of India. The Field Guide. Draco Books.Chengalpattu, Tamil Nadu (2008).
19. Yadav, S. R and Sardesai, M. M.: Flora of Kolhapur district. Shivaji University, Kolhapur, Maharashtra, India (2002).
