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Lizard (Reptilia: Sauria) diversity of Dampa Tiger Reserve, Mizoram, India

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ABSTRACT

Knowledge on lizards, particularly the suborder Saurian, and their conservation aspects is very poor. An attempt was made to collect information on these small and lesser known animals so that an appropriate strategy can be formulated for their conservation. Inventorization study on Saurian fauna was conducted at Dampa Tiger Reserve, Mamit district, Mizoram, India, during the period of February 2011 to October 2014. 22 species of lizards were recorded and they can be classified into 5 families and 12 genera. Two species cannot be identified to the species level.

Key words: Saurian diversity; Dampa Tiger Reserve; lizard.

INTRODUCTION

Dampa Tiger Reserve (DTR) is located in Mamit District of Mizoram along the Bangladesh border. It is situated at the western limit of the state, falls within 23° 23' 15"N - 23° 42' 20''N latitudes and 92° 16' 25"E - 92° 25' 55''E longitudes and lies in the western part of Mizoram. Dampa was notified as wildlife sanctuary in 1985 with an area of 681 sq km (approx) and re-notified as sanctuary by excluding portion of the initial area with an area of 340 sq km (approx). It was finally re-notified on attaining the status Project Tiger in 1994 as Dampa Tiger Reserve with a total area of 500 sq km making it the largest protected area in Mizoram. Elevation of the area ranges from 210 to1,100 m above mean sea level. The natural vegetation in the reserve is tropical evergreen to semi-evergreen, corresponding to the Cachar Tropical Evergreen 1B/C3 and semi-evergreen 2B/C2 forest.[1] The forest in the moist valleys is lofty and evergreen, while the steeper slopes on the west aspect have more deciduous elements, often with sympodial bamboos in the understory.[2] The vegetation ranges from evergreen to semi evergreen tropical forest, tending towards subtropical characteristics at the higher reaches of the higher hills to the east. This area has one of the last remaining

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Figure 1. Various views of the study site, Dampa Tiger Reserve.

Figure 2. *Calotes versicolor*

Figure 3. *Calotes emma*

Figure 4. *Calotes* cf. *irawadi*

Figure 5. *Draco maculatus maculatus*

Figure 6. *Draco* cf. *maculatus divergens*

Figure 7. *Draco* cf. *blanfordi*

Figure 8. *Japalura planidorsata*

Figure 9. *Ptyctolamus gularis*

Figure 10. *Gekko gecko*

Figure 11. *Hemidactylus platyurus*

Figure 12. *Hemidactylus brookii*

Figure 11. *Hemidactylus garnotii*

Figure 14. *Hemidactylus frenatus*

Figure 15. *Cyrtodactylus* sp.

Figure 16. *Takydromus sexlineatus*

Figure 17. *Sphenomorphus maculatus*

Figure 18. *Sphenomorphus indicus*

Figure 19. *Eutropis multifasciata*

Figure 20. *Eutropis macularia*

Figure 21. *Tropidophorus assamensis*

Figure 22. *Varanus bengalensis*

Figure 23. *Varanus salvator*

natural low- to mid-elevation forests in western Mizoram.[3]

Study on the biodiversity of Mizoram is in the juvenile stage and many species are yet to be documented. The Saurian fauna in Mizoram is poorly documented except some pilot survey.[2,4,5] Subsequently Mahony[6] described *Japalura otai* from a Museum specimen of Zoological Survey of India which was collected from Sairep village, Lunglei district, Mizoram. Lalremsanga *et al*.[7] further added 3 species to the state lizard fauna making it a total of 34 species belonging to 5 families. Only 15 species were so far recorded from DTR.[2]

Materials and Methods

Extensive surveys were conducted from February 2011 to October 2014 in DTR in western Mizoram (Fig. 1) . DTR had been administratively divided into two ranges, Teirei on the northwest side and Phuldungsei in the southeast. Its westernmost border follows the Khawthlangtuipui River, which forms the international border with Bangladesh.

Sampling was done using standardized field survey methods,[8] and it was done thoroughly throughout the study site using visual encounter survey (VES), a simple method which has been shown to be effective for surveying tropical rainforest herpetofauna.[9] Because of the terrain and vegetation visual encounter survey was most successful method in each site. The sampling sites were taken randomly covering both the stream and land with vegetation areas; survey was made for both diurnal and nocturnal animals. The animals found in the sites were collected by hand picking and net, image of the live animals were taken on the spot. Specimens were fixed in 10% formaldehyde and identification was done to the smallest possible taxon using relevant literature.[10]

Results

22 species of lizards belonging to 12 genera and 5 families were recorded during the study period. Agamidae dominated the Saurian fauna of DTR. It is represented by 4 genera with 8 species which include 36.4% of the total species collected. Both Gekkonidae and Scincidae were represented by 3 genera and 5 species each comprising 27.7% of the total lizard species collected

Table 1. Saurian species of Dampa Tiger Reserve. ('+' indicates presence and '–' absence.)

Sl. No.	Family and species	Present study	Pawar and Birand[2]
	Agamidae		
1.	*Calotes versicolor*	+	+
2.	*Calotes emma*	+	+
3.	*Calotes* cf. *irawadi*	+	–
4.	*Draco maculatus*	+	+
5.	*Draco maculatus divergens*	+	–
6.	*Draco* cf. *blanfordi*	+	+
7.	*Japalura planidorsata*	+	+
8.	*Ptyctolamus gularis*	+	+
	Gekkonidae		
9.	*Gekko gecko*	+	+
10.	*Hemidactylus platyurus*	+	+
11.	*Hemidactylus frenatus*	+	+
12.	*Hemidactylus brookii*	+	–
13.	*Hemidactylus garnotii*	+	–
14.	*Cyrtodactylus* sp.	+	–
	Lacertidae		
15.	*Takydromus sexlineatus*	+	+
	Scincidae		
16.	*Sphenomorphus maculatus*	+	+
17.	*Sphenomorphus indicus*	+	–
18.	*Eutrophis multifasciata*	+	+
19.	*Eutrophis macularia*	+	+
20.	*Tropidophorus assamensis*	+	+
	Varanidae		
21.	*Varanus bengalensis*	+	+
22.	*Varanus salvator*	+	–

from the area. 2 species were recorded under the family Varanidae comprising 9% of the total population of lizard collected and only 1 species comprising 4.5% was recorded under the family Lacertidae (Table 1 & Fig. 24).

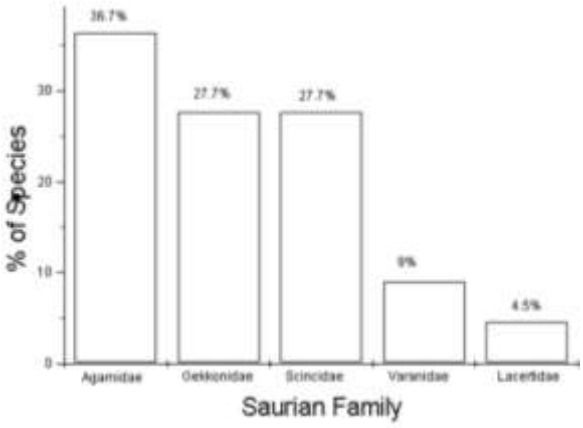

Figure 24. Percentage composition of saurian species in Dampa Tiger Reserve.

Species account

Family Agamidae

Calotes versicolor Daudin, 1802 (Fig. 2)

Remarks: Many individuals were sighted in shrubs along forest paths. It is the most common lizard found within the reserve.

Calotes emma Gray, 1845 (Fig. 3)

Remarks: Individuals of these species were sighted on trees in forested area and shrubs along forest paths. This species is found in sympatry with *Calotes versicolor.*

Calotes cf. *irawadi* Zug, Brown, Schulte & Vindum, 2006 (Fig. 4)

Remarks: We collected individuals of this species from shrubs and trees at about 1m from the ground in the forest. This species is sighted only in Phuldungsei Range. Morphologically, the individual is similar to *Calotes irawadi* described from Myanmar.[11] Comparison of with the described species of *Calotes* from Myanmar[10] will probably help in identifying this species.

Draco maculatus maculatus Gray, 1845 (Fig. 5)

Remarks: Several individuals of this species were sighted on trees at Teirei Rest House and near Damparengpui village.

Draco cf. *maculatus divergens* Taylor, 1934 (Fig. 6)

Remarks: Three specimens of this species were collected from trees at the vicinity of West Phaileng village. Morphologically, this species is similar to *Draco maculatas maculatus* except for the bluish color at the base of the gular pouch.

Draco cf. *blanfordi* Blanford, 1878 (Fig. 7)

Remarks: A single individual was collected from the tree in the secondary forest, which is a trail to tuilut antipoaching camp.

Japalura planidorsata Jerdon, 1870 (Fig. 8)

Remarks: Three individuals of this species were collected from jungle trails at Dampa Tlang and at the vicinity of Chikha anti-poaching camp. They are found in the forest floor living among leaf litters.

Ptyctolaemus gularis Peters, 1864 (Fig. 9)

Remarks: Individuals of this species were found in jungle trails. They were normally sighted in the forest floor and fallen trees.

Family Gekkonidae

Gekko gecko Linnaeus, 1758 (Fig. 10)

Remarks: The individuals were sighted in the hill slope of the degraded forest along the road side and some juvenile were also sighted on the ground floor. With the distinctive calls of this species, calls were also heard inside the forested area.

Hemidactylus platyurus Schneider, 1792 (Fig. 11)

Remarks: Three individual was on a tree. Some were sited within the dwelling of human surrounding area was covered with secondary forest. These geckos are often found in associa-

tion with large rocks during day and night.

Hemidactylus brookii Gray, 1845 (Fig. 12)

Remarks: Three individuals were sited from Teirei guest house and largely from rundown houses at various localities of human habitat. This species was mainly observed in during night. Individuals were also seen in the tree.

Hemidactylus garnotii Duméril & Bibron, 1836 (Fig. 13)

Remarks: Three specimens were collected from human habitat and two individual were sighted in the abandon hut of jhum cultivation.

Hemidactylus frenatus Lanza, 1990 (Fig. 14)

Remarks: This species was sited largely from human habitations and rundown houses at various localities of the study area. Within human surroundings; this species was mainly observed in cracks of walls and crevices. Few individuals were also seen in the tree.

Cyrtodactylus sp. (Fig. 15)

Remarks: A single individual of the species was encountered during the night sampling on the slope of the rock wall, on the way to Dampa antipoaching camp from Teirei guest house.

Family Lacertidae

Takydromus sexlineatus Daudin, 1802 (Fig. 16)

Remarks: Individuals of this species were sighted at the bank of Seling River and Sazuk River. One individual was collected near Bamboo Hut anti-poaching camp at the bank of Seling River.

Family Scincidae

Sphenomorphus maculatus Blyth, 1853 (Fig. 17)

Remarks: Individuals of this species were collected from Teirei Forest Lodge and near Dampa Rengpui village.

Sphenomorphus indicus Gray, 1853 (Fig. 18)

Remarks: Many individuals of this species were sighted on the bank of rivers. They are hidden under rocks and boulders.

Eutropis multifasciata Kuhl, 1820 (Fig. 19)

Remarks: Individuals of this species were collected near human habitat areas and near stagnant water and ponds.

Eutropis macularia Blyth, 1853 (Fig. 20)

Remarks: Individuals of this species were collected near human habitat and forest edges.

Tropidophorus assamensis Annandale, 1912 (Fig. 21)

Remarks: One individual of this species was seen basking on a boulder at a small stream of Seling River. This rare species was described by Annandale in 1912 from the Harigaj Range, Sylhet Hills of Bangladesh. Although Mathew[1] remarked that the species was rediscovered by her from Phairuangkai, Lunglei district, Mizoram[12], it was Pawar and Birand[2] who rediscovered this species from Ngengpui Wildlife Sanctuary of Mizoram after more than 90 from the original description.

Family Varanidae

Varanus bengalensis Daudin, 1802 (Fig. 22)

Remarks: Individuals of this species were sighted in forest trails and at the bank of rivers. These animals are often seen crossing the roads and the locals usually hunt this individual for meat.

Varanus salvator Laurenti, 1768 (Fig. 23)

Remarks: One individuals of this species was seen basking on a fallen tree at Sazuk River. The individual are also hunt by the poachers for meat as it is the largest they are easily sighted.

DISCUSSION

Lizards, under the suborder Sauria of class Reptilia are one of the groups of reptiles undergoing phylogenetical changes, primitive to the

specialized and structural modifications with greater variations than any other group of reptiles on earth since 250 million of years.[14] The current study reported about two third of the total number of species recorded from the state. It is observed that species of the family Agamidae dominates the Saurian diversity of DTR with 4 genus comprising 8 species, and is followed by Gekkonidae and Scincidae with 3 genera and 5 species each. Furthermore, among the Agamidae the most abundant species observed in the area are *Calotes versicolor* and *C. emma*. Owing to the previous studies,[1] there were 7 species of Agamidae reported from DTR. Apart from the previous report the herein study further reported *Calotes* cf. *irawadi* and *Draco maculatus divergens* from DTR. It is worthmentioning that during the whole study period *C.* cf. *irawadi* is found only from Phuldungsei range which is the south eastern part of the area. The type locality is Chatthin Wildlife Sanctuary and has the broadest occurrence in Myanmar's Central Dry Zone.[10] Das *et al*.[14] also collected a specimen resembling *C. irawadi* from Barail Wildlife Sanctuary of Assam, India. If the present species from DTR is *C. irawadi*, the range of this species is extended ca. 300 km westward.

Previous worker listed 3 species of Gekkonidae viz *Gekko gecko*, *Hemidactylus frenatus* and *H. platyurus.*[2] We also observed the previously reported three species and further enriched the diversity by reporting *Hemidactylus brookii* and *H. garnoti* from the area. It is interesting to mention that the study herein reported *Cyrtodactylus* sp., the genus which has never been reported from the study area. The only *Cyrtodactylus* species reported and identified from Mizoram is *C. khasiensis.*[15] The *Cyrtodactylus* sp. observed in this study is very similar to *C. khasiensis* but differs from it in having 7-10 (vs. 12-14) femoral pores in male and a relative digital length of the pes, 5>4>3>2>1 (vs. 4>5>3>2>1).

As mentioned earlier, the present study recorded 5 species belonging to 3 genera under the family Scincidae. The species under the family Scincidae had been reported from other place of Mizoram, however *Sphenomorphus indicus* was reported only from Palak and Ngengpui Wildlife Sanctuary, the Southern part of Mizoram[2] and had never been reported from DTR. The reported occurrence of the species *S. indicus* in this study extended the distributional range of the species in Mizoram.

Varanidae, the widely distributed Saurian, though listed as Least Concern in the IUCN Red List[16], it is listed under Schedule I of Wildlife Protection Act, 1972. The animals had been reported from Assam, Meghalaya and Nagaland by some worker.[12] The study herein reported 2 species under the family viz. *Varanus bengalensis* and *V. salvator*. The only study on the Saurian fauna of DTR recorded *V. bengalensis.*[2] However, there were no reports on the occurrence of *V. salvator* in DTR. The present record of *V. salvator* is a new addition to Saurian fauna of DTR. It was observed in the study area, even as a whole of Mizoram, that the population of Varanidae is drastically declined which may be attributed to the local tribes who hunted down the animals for food. It was further observed that the meat of the animal is a delicacy for the Bru people of the area.

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REFERENCES

1. Champion HG & Seth SK (1968). *A Revised Survey of the Forest Types of India*. Published by Govt. of India, New Delhi. pp. xxvii+404.
2. Pawar S & Birand A (2001). A Survey of amphibians, Reptiles and Birds in Northeast India. *CERC Technical Report #6, Centre for Ecological Research and Conservation, Mysore.*

3. Forest survey of India (1999). *The State of Forest Report*. Forest survey of India, Dehradun, India.
4. Harit DN & Ramanujam SN (2002). Reptilian fauna of Mizoram, India. *Cobra*, 47, 5–7.
5. Matthew R (2007). *Fauna of Mizoram, State Fauna Series*, 14. Published by Zoological Survey of India, Kolkata, v+691pp. Reptilia, pp. 545–577.
6. Mahony S (2009). A new species of *Japalura* (Reptilia: Agamidae) from northeast India with a discussion of the similar species *Japalura sagittifera* Smith, 1940 and *Japalura planidorsata* Jerdon, 1870. *Zootaxa* 2212, 41–61.
7. Lalremsanga HT, Khawlhring L & Lalrotluanga (2010). Three additional lizard (Squamata: Sauria) records for Mizoram, India. *J Threatened Taxa*, 2, 718–720.
8. Heyer WR, Donnelly MA, McDiarmid RW, Hayek LAC & Foster MS (1994). Measuring and Monitoring Biological Diversity, Standard Methods for Amphibians. Smithsonian Institution Press, Washington DC.
9. Doan TM (2003). Which methods are most effective for surveying rain forest herpetofauna? *J Herpetol*, 37, 72–81.
10. Smith MA (1935). *The Fauna of British India, including Ceylon and Burma. Reptilia and Amphibia. Vol. II. - Sauria*. Taylor and Francis, London. Xii + 185 pp + pl.
11. Zug GR, Brown HHK, Schulte II JA & Vindum JV (2006). Systematics of the garden lizards, *Calotes versicolor* Group (Reptilia, Squamata, Agamidae), in Myanmar: central dry zone populations. *Proc California Acad Sci*, 57, 35–68.
12. Mathew R (2006). North-eastern water skink *Tropidophorus assamensis* Annandale (Reptilia: Sauria: Scincidae) in Mizoram, North East India. *Cobra*, 63, 14–15.
13. Ahmed MF, Das A & Dutta SK (2009). *Amphibians and Reptiles of Northeast India- A Photographic Guide*. Aaranyak, Guwahati, India.
14. Das A, Saikia U, Murthy BHCK, Dey S & Dutta SK (2009). A herpetofaunal inventory of Barail Wildlife Sanctuary and adjacent regions, Assam, north-eastern India. *Hamadryad*, 34, 117–134.
15. Jerdon TC (1870). Notes on Indian Herpetology. *Proc Asiat Soc Bengal*, 1870, 66–85.
16. Bennett D, Gaulke M, Pianka ER, Somaweera R & Sweet SS (2015). The IUCN Red List of Threatened Species. Version 2013.3 www.iucnredlist.org. Downloaded on 10 March 2015.