FAUNA OF PROTECTED AREAS - 9

HERPETOFAUNA OF VANSDA NATIONAL PARK, GUJARAT

Raju Vyas

Sayaji Baug Zoo, Vadodara, Gujarat 390018, India

ABSTRACT

A detailed survey of herpetofauna was made from June 1998 to December 1999 in Vansda National Park (VNP). A total of 54 species of herpetofauna, including 13 species of amphibians (1 species of caecilian and 12 species of frogs) and 41 species of reptiles (1 species of turtle, 13 species of lizards and 27 species of snakes) of 41 genera belonging to 16 different families were recorded. During the study, threats like road kills and agricultural practice were recorded.

KEYWORDS

Amphibians, Gujarat, Reptiles, Vansda National Park

Only a few scattered publications on the herpetofauna of Vansda National Park include Boulenger (1890), Taylor (1960), Vyas (2000) and Vyas & Dutta (in press). This paper is a result of the study carried out as part of a project "Biodiversity study of Vansda National Park" undertaken by the Gujarat Ecological Education and Research (GEER) Foundation, Gandhinagar.

STUDY AREA

Vansda National Park (VNP) (20^{0}51'16"-21^{0}21'22"N & 73^{0}20'30"-73^{0}31'20"E) in Vansda Taluk of Navsari District is a hilly terrain with hills of moderate altitudes from 110-360m, an extension of the Sahyadri Range. After 1986 the forest area of 23.99km^2 was declared as National Park under the Wildlife (Protection) Act, 1972 by the State Forest Department, Government of Gujarat (notification no. GANV/3585/WLP/2076/87594 dated 13.vi.1986). The northeastern boundary of the Park is formed of Waghai-Bilimora railway line along with parallel Ambica-Khapri River while the southern boundary is marked by Navtad-Waghai State Highway. The western side is marked by Navtad-Kala Amba road (Figure 1). The forest of VNP is of southern Indian tropical moist deciduous forest type and further classified as southern moist mixed deciduous forest, bamboo break and tropical riverine forest (Champion & Seth, 1968).

Climate: The climate is tropical with three distinct seasons, *viz*., the monsoon (mid June to October), winter (October to February) and summer (March to mid June). The southwest monsoon is irregular and erratic. Maximum rain is experienced in the month of July with occasional showers during November to January and March to May. Average rainfall is 1000-4650mm. Temperatures begin to increase from about latter half of February. May is the hottest month with mean daily maximum temperature of about 40^{0}C and the mean daily minimum of about 26^{0}C. December is the coldest month with the mean daily maximum temperature of about 25^{0}C and a mean minimum of 16^{0}C. Due to passing of western disturbances across northern India during the cold season, spells of colder weather occur and the minimum temperature occasionally drops down to about 4^{0}C.

The Park has a very rich flora and fauna. Totally, 440 species of flowering plants belonging to 78 families from 292 genera are recorded, of which 108 species are trees, 51 shrubs, 64 climbers, 202 herbs and 25 grasses. The Park also harbours many higher vertebrates (Singh *et al.*, 2000).

METHODOLOGY

Totally 45 field days were spent to rapidly assess the herpetofauna during June 1998 to December 1999 with the objective to determine the present distribution and status of the species. Baseline information on habitat and threats were also gathered. The entire area was divided into small zones. Each zone was randomly (biased) explored on the basis of habitat structure and, possibility and availability of the species. All important major and minor water bodies, including seasonal rivulets were extensively explored for aquatic species, especially amphibians. In addition to interviews, colour pictures of various species were shown to local people and forest personnel to gather data. Information was collected from past relevant literature.

All collected specimens were examined and carefully identified using diagnostic keys provided by Smith (1935, 1943), Daniel (1963a,b, 1975) and Daniels (1997). Nomenclatures of Das (1994) and Dutta (1997) were adopted for reptiles and amphibians, respectively. The status of each species were assessed in four categories, abundant (>100), common (<100-50), less common (50-20) and rare (<20) determined on the basis of occurrence, sighting and area of the habitat (preferred by each species) in the National Park. The criteria was considered only for amphibians and Lacertilia group of reptiles.

RESULTS

Amphibians: Totally 13 species of amphibians of 10 genera belonging to five different families were recorded from the Park (Table 1). Maharashtra Caecilian *(Ichthyophis bombayensis)* was recorded for the first time from VNP. Originally, type specimen of caecilian species was collected by F. Gleadow in 1888 from Waghai (Boulenger, 1890). Present collection of a caecilian specimen (180mm long) from Sadad Devi forest area of the Park is a very important record.

During the present survey, *Microhyla ornata, Euphlyctis cyanophlyctis* and *Fejervarya limnocharis* were found abundantly while *Fejervarya syhadrensis, Uperodon globulosa, Ramanella montana* and *Ichthyophis bombayensis* were rarely seen and the remaining seven species of amphibians were found to be common.

Reptiles: The status of the 41 species of reptiles except snakes belonging to 31 genera and 11 families recorded from VNP is

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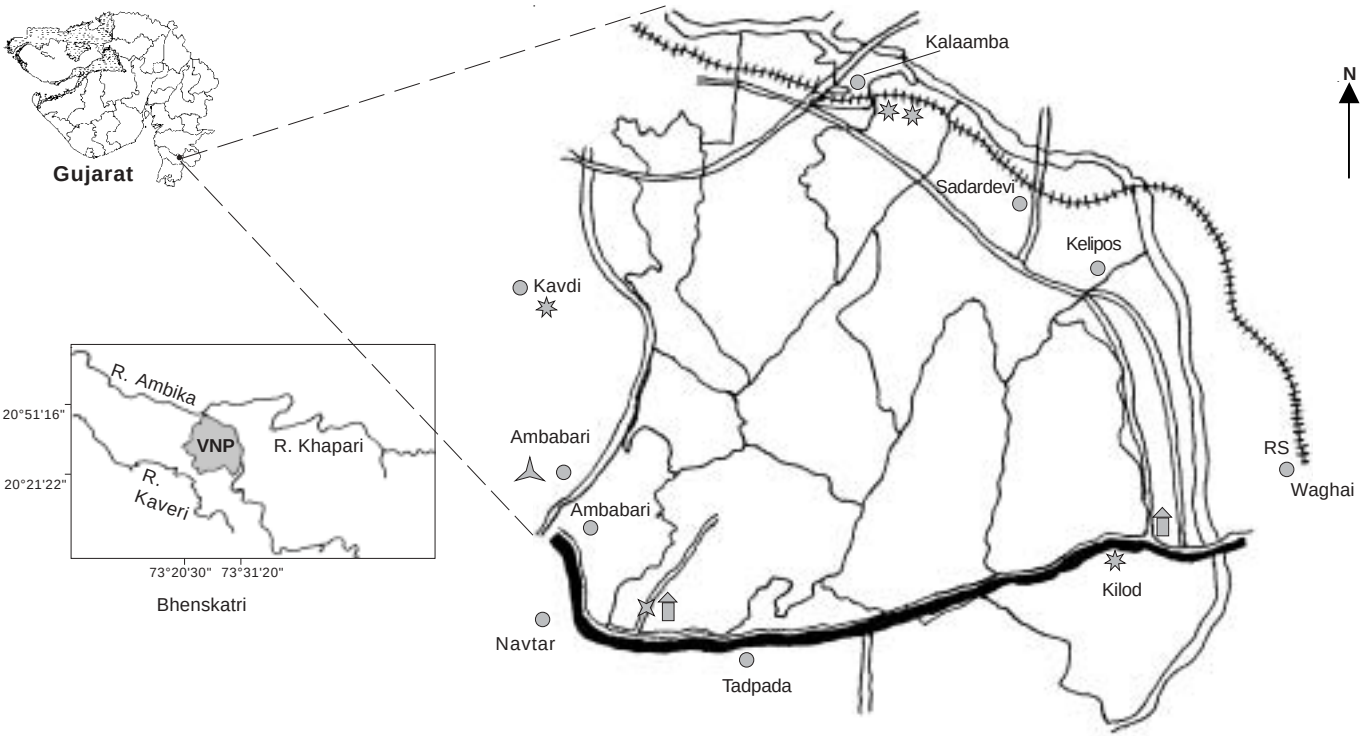

Figure 1. Map showing the geographical position of Vansda National Park, Gujarat

Table 1. Systematic list of Amphibian of the Vansda National Park, Gujarat

Scientific name	Common name
Ichthyophidae	
Ichthyophis bombayensis	Maharashtra Caecilian
Bufonidae	
Bufo melanostictus	Common Asian toad
Bufo stomaticus	Marbled Toad
Microhylidae	
Microhyla ornata	Ornate Narrow-mouthed Frog
Ramanella montana	Jerdon's Ramanella
Uperodon globulosus	Grey Balloon Frog
Ranidae	
Euphlyctis cyanophlyctis	Indian Skipping Frog
Euphlyctis hexadactylus	Indian Green Frog
Hoplobatrachus tigerinus	Indian Bull Frog
Fejervarya limnocharis	Cricket Frog
Fejervarya syhadrensis	Syhara Frog
Polypedates maculatus	Indian Tree Frog
Sphaerothca breviceps	Short-headed Burrowing Frog

provided in Table 2.

Threats: During the study period, the following direct and indirect threats affecting the herpetofauna in the region were identified.

Traffic and transportation: State highway (2km road) and railway (5km railway track) passes through VNP. The motor road is very busy; on an average, over 100-500 vehicles/day pass through. During rainy days, a large number of herpetofauna are killed by traffic.

Data on only five hours (20 June 1999: during rainy morning) of sampling shows that 19 species from eight families of amphibians and reptiles were killed under highway vehicles at VNP during heavy rains (Table 3). This indicates the threat impact on the entire herpetofauna, especially at the time of breeding.

Agricultural practice: Local tribes collect leaf litter and chop off branches and twigs (almost rendering the tree devoid of any crown) to burn them in their agricultural fields for the improvement of soil. This method is locally called *aachar.* The collections of huge amounts of leaf litter decreases humus and indirectly affects the microhabitat of many organisms. In addition, it changes the chemical composition of the soil. The use of chemical fertilisers and pesticides in crop fields also adds to the negative impacts.

Shifting cultivation: This involves the clearing of small patches of forest for cultivation to be abandoned the next year for similar activity elsewhere. This type of practice in protected areas directly affects habitat, by increasing fragmentation and degradation of the habitat.

Minor forest product collection: The following factors are responsible for soil erosions: grazing by domestic cattle, forest fire, and collection of minor forest products like tubers, bulbs and herbs. Very recently, it was observed that Forest Corporation of Gujarat was offering handsome price for collection of medicinal plants. As a result, large areas of hill slopes are dug out by tribals to collect medicinal plants like *'mushli' (Chlorophytum borivilianum, C. tuberosum* and *Curculigo orchioides).* In addition, a tradition in tribals to use straws of *Karvi* or *Karav*

Table 2. Systematic list of Reptiles and its status of Vansda National Park, Gujarat

Common name	Scientific name	Status
Trionychidae		
Indian Flapshell Turtle	*Lissemys punctata*	*Rare*
Gekkonidae		
Kollegal Ground Gecko	*Geckoella collegalensis*	Rare
Brook's House Gecko	*Hemidactylus brookii*	Abundant
Yellow-green House gecko	*Hemidactylus flaviviridis*	Abundant
Bark gecko	*Hemidactylus leschenaultii*	Abundant
Agamidae		
Roux's Forest Lizard	*Calotes rouxii*	Abundant
Indian Garden Lizard	*Calotes versicolor*	Abundant
Fan-throated Lizard	*Sitana ponticeriana*	Abundant
Chemaleonidae		
Indian Chamaeleon	*Chamaeleo zeylanicus*	Common
Scincidae		
Gunther's Supple Skink	*Lygosoma guentheri*	Common
Spotted Supple Skink	*Lygosoma punctatus*	Common
Keeled Grass Skink	*Mabuya carinata*	Abundant
Bronze Grass Skink	*Mabuya macularius*	Common
Varanidae		
Bengal Monitor	*Varanus bengalensis*	Rare
Typhlopidae		
Brahminy Worm Snake	*Ramphotyphlops braminus*	
Beaked Worm Snake	*Rhinotyphlops acutus*	
Boidae		
Common Sand Boa	*Eryx conica*	
Red Sand Boa	*Eryx johnii*	
Indian Rock Python	*Python molurus*	
Colubridae		
Common Vine Snake	*Ahaetulla nasutus*	
Brown Vine Snake	*Ahaetulla pulverulenta*	
Buff-striped Keelback	*Amphiesma stolata*	
Banded Racer	*Argyrogena fasciolatus*	
Forstein's Cat Snake	*Boiga forsteni*	
Common Indian Cat Snake	*Boiga trigonatus*	
Common Bronze-back Tree Snake	*Dendrelaphis tristis*	
Common Indian Trinket Snake	*Elaphe helena*	
Common Wolf Snake	*Lycodon aulicus*	
Barred Wolf Snake	*Lycodon striatus*	
Green Keelback	*Macropisthodon plumbicolor*	
Banded Kukri Snake	*Oligodon arnensis*	
Streaked Kukri Snake	*Oligodon taeniolatus*	
Rat Snake	*Ptyas mucosus*	
Black-headed Snake	*Sibynophis subpunctatus*	
Checkered Keelback Water-snake	*Xenochropis piscator*	
Elapidae		
Common Indian Krait	*Bungarus caerulens*	
Common Slender Coral Snake	*Calliophis melanurus*	
Spectacled Cobra	*Naja naja*	
Viperidae		
Indian Russell's Viper	*Daboia russelii*	
Indian Saw-scaled Viper	*Echis carinatus*	
Bamboo Pit Viper	*Trimeresurus gramineus*	

(*Cariva callosa*) a plant that grows only on high hills, is another factor for soil erosions in the area. Soil erosion in the forest indirectly affects the amphibian fauna, especially endemic species like *Icthyophis bombayensis.* Loss of topsoil impacts on earthworm population and other arthropods, which are one of the only food sources for ceacilians and other fossorial frogs.

Table 3. A sample data of Herpetofauna killed under running vehicles at Vansda National Park, Gujarat (during rains)

Scientific name	No. of road kills
Ichthyophidae	
Ichthyophis bombayensis	3
Bufonidae	
Bufo melanostictus	9
Bufo stomaticus	*5*
Microhylidae	
Microhyla ornata	21
Ranidae	
Euphlyctis cyanophlyctis	15
Hoplobatrachus tigerinus	18
Fejervarya limnocharis	27
Sphaerotheca breviceps	5
Agamidae	
Calotes rouxii	2
Calotes versicolor	1
Chemaleonidae	
Chamaeleo zeylanicus	2
Colubridae	
Amphiesma stolata	5
Boiga forsteni	1
Lycodon aulicus	2
Macropisthodon plumbicolor	1
Ptyas mucosus	1
Xenochrophis piscator	6
Elapidae	
Bungarus caeruleus	1
Naja naja	1

References

Boulenger, G.A. (1890). *The British India, Including Ceylon and Burma. Reptilia and Battrachia*. Taylor and Francis, xviii+541pp.

Champion, H.G. and S.K. Seth (1968). *A Revised Survey of the Forest Types of India.* Govt. of India, Delhi, 404pp.

Daniel, J.C. (1963a). Field guide to amphibian of western India. Part-I. *Journal of the Bombay Natural History Society* 60: 415-438.

Daniel, J.C. (1963b). Field guide to amphibian of western India. Part-II. *Journal of the Bombay natural History Society* 60: 690-702.

Daniel, J.C. (1975). Field guide to amphibian of western India. Part-III. *Journal of the Bombay natural History Society* 72: 506-522.

Daniel, R.J.R (1997). A field guide to the frog and toads of the Western Ghats, India. Parts I, II and III. *Cobra* (27 to 29): 1-25, 1-24, and 1-13.

Das, I. (1994). The reptiles of south Asia, checklist and distribution summary. *Hamadryad* 19: 15-40.

Dutta, S.K. (1997) *Amphibians of India and Sri Lanka (Checklist and bibliography).* Odyssey Publication House, Bhubaneswar, Orissa, India, 342pp.

Singh, S., B.R. Raval, B.H. Patel, K. Tatu, D. Patel, R. Vyas and B.H. Patel (2000). *Biodiversity Study on Vansda National Park.* Gujarat Ecological Education & Research Foundation, Gandhinagar, 176pp.

Smith, M.A. (1935). *Fauna of British India, Reptile & Amphibian* Vol. II, Taylor and Francis, London, 185pp.

Smith, M.A. (1943). *Fauna of British India, Reptile & Amphibian* Vol.III, Taylor and Francis, London, 583pp.

Taylor, E.H. (1960). On the caecilian species *Ichthyophis monochrous* and *Ichthyophis gluthinosus* with description of related species. *University Kansas Science Bulletin* 40(4): 37-120.

Vyas, R. (2000). Notes on distribution and breeding ecology of *Geckoella collegalensis* (Beddome, 1870). *Hamadryad* 25(1): 45-46.

Vyas, R. and S.K. Dutta (in press). First records of Syhadra frog (*F. syhadrensis*) from Gujarat State, India. *Hamadryad*.

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