HERPETOFAUNA OF GIR PROTECTED AREA

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Introduction

Very scanty and scattered information is available from literature on reptiles of Gir Forest. Only few workers have worked on the crocodiles (Whitaker, 1978; Chavan, 1979; Chellam 1986; Vijaykumar, 1997), turtles and tortoises (Frazier, 1989) and snakes (Vyas, 1993). Depending on secondary information Singh and Kamboj (1996) listed 24 species of reptiles in the management plan of Gir. No systematic taxonomic studies have been carried out on the herpetofauna of Gir. So it was felt to start a pilot project on reptiles and amphibians.

Methodology

It is always a difficult task to survey wild animals, in the vast areas of forest and it is more so with elusive reptiles. As it was not possible to explore vast areas of Gir Forest within a short study period (February 1997 to January 1998) by systematic sampling methods Random Sampling Method was employed as follows:

1. Entire Gir Forest was divided into nine different zone as per the road map of Gir Forest (Fig. 1).
2. Each zone was randomly explored on the basis of habitat structure and possibility and availability of the species.
3. Extensive exploring in randomly selected river stretches (all major rivers).
4. Checking of all major and minor perennial water bodies for aquatic species.
5. For recording direct sightings a suitable data sheet was developed (Annexure1) and first hand information was collected. Information was also collected from local people (inhabitants of forest) and forest personnel about different species of reptiles, by showing them good quality coloured photograph of reptiles.

Capture and Collection of Specimen

Since the method of using Accidental Pitfall and Funnel Traps are time consuming, most of the reptiles were hand collected from the wild with utmost care and skill. After examination of the specimens, they were released back into the wild. Similarly, a few specimens of amphibia were collected for species identification.

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A total of 122 specimens of reptiles and 51 specimens of amphibians were examined as a result of an extensive day and night field work during the study period. Totally, 1228 Data Sheets of direct sighting records were analyzed for a few important ecological parameters of reptiles, especially species of Lacertilia group.

Species Identification

All specimens were examined and carefully identified by using diagnostic keys by Smith (1935; 1943), Vyas (1996) and Daniel (1997) and nomenclatures adopted here are those of Das (1994) and Dutta (1997) for reptiles and amphibians, respectively.

Results

A brief description of different group of reptiles are as follows.

Crocodile

Mugger or Marsh Crocodile (*Crocodylus palustris*) is common in all major water bodies. It was also found in small pockets of river system of Hiran, Singoda, Rawal and Machundari. A good number of Mugger nestings were also observed in all four sites. Present population of Mugger is around five hundred in Gir Forest, which is the largest population in the state.

Turtle/Tortoise

Indian Flap Shell Turtle (*Lissemys punctata*) is very common and found in all major and minor water bodies of Gir. The Indian Star Tortoise (*Geochelone elegans*) is also widely distributed in Gir. During the study period, although the species was found in western Gir, on the basis of primary information and past observations, Star Tortoise is commonly found in the scrub forests of eastern Gir.

Lizards

Four nocturnal (Gecko) and seven species of diurnal lizards are known to occur in the Gir Forest. Sighting data of lizard shows that all the species are very widely distributed in the Gir Forest and their habitat-wise distribution and status are mentioned in Table 1.

Snakes

Total 22 species of snakes belonging to five families are recorded, along with five species of venomous snakes. At present it is not

possible to discuss about the status of all snake species that occur in Gir due to limited study, but three species of non-venomous snakes, *Ramphotyphlops braminus*, *Ptyas mucosus* and *Xenochrophis piscator* and two species of venomous snakes *Naja naja* and *Echis carinatus* are common in Gir.

During rainy season, few sub-adults of Indian Rock Python (*P. molurus*) were sighted in riverine forest and once near Jamvala in agricultural field, a full grown Python was observed, but this is not enough to presage the status of the species in Gir.

Distribution and Habitat

Efforts were made to evaluate the status and distribution of different reptilian species in different habitat types but could do so with certain insights in case of lizards only. Due to shorter period of study it was not possible to know the distribution status of snakes. During the present study three species of aquatic, six species of arboreal and the remaining 27 terrestrial forms of reptiles were observed in the Gir Forest. According to evolutionary adaptation of each species of reptiles, they inhabit different habitats. Riverine patches and rocky areas are found rich from species abundance point of view. Availability of lizards in different habitat types In Gir is given in Table 1. Species composition of reptiles in Gir is given in figure 2.

New records of species from the Gir Forest

Three species of lizards from Gekkonidae family and species of snakes from Colubridae and Elapidae families (including a venomous snake) were recorded for the first time from the Gir Forest.

Lizards

1. *Hemidactylus brookii* (Gray, 1845)
2. *Hemidactylus triedrus* (Daudin, 1802)
3. *Geckoella collegalensis* (Beddome, 1870)

Snakes

4. *Boiga trigonatus* (Schneider in: Bechstein, 1802)
5. *Ahaetulla nasutus* (Andersson, 1898)
6. *Ahaetulla pulverulenta* (Duméril, Bibron and Duméril, 1854)
7. *Oligodon arnensis* (Shaw, 1802)
8. *Oligodon taeniolatus* (Jerdon, 1853)
9. *Sibynophis subpunctatus* (Duméril, Bibron and Duméril, 1854)
10. *Argyrogena fasciolatus* (Shaw, 1802)
11. *Ramphotyphlops braminus* (Daudin, 1803)
12. *Calliophis melanurus* (Shaw, 1802)

Six species of anuran amphibians belonging to Bufonidae and Ranidae families are also reported for the first time from Gir Forest.

Bufonidae

1. *Bufo melanostictus* Schneider, 1799
2. *Bufo stomaticus* Lütken, 1862

Table 1. Habitat-wise distribution and status of lizards in Gir Forest

Species	Dry Deciduous	Riverine	Scrub land	Grass land	Agriculture	Associated with humans	Status
Gekkonidae							
Hemidactylus brookii	Common	Common	Common	Rare	Common	Common	Common
Hemidactylus flaviviridis	Common	Common	Rare	Rare	Rare	Common	Common
Hemidactylus triedurus	Common	Uncommon	Common	Rare	Rare	Uncommon	Uncommon
Geckoella collegalensis	Common	Uncommon	Common	Rare	Rare	Uncommon	Uncommon
Agamidae							
Calotes versicolor	Abundant	Abundant	Common	Rare	Common	Common	Abundant
Sitana ponticeriana	Abundant	Common	Abundant	Abundant	Common	Common	Abundant
Chamealeonidae							
Chamaeleo zeylanicus	Common	Common	Rare	Rare	Rare	Rare	Uncommon
Scincidae							
Lygosoma punctatus	Uncommon	Common	Rare	Rare	Common	Common	Common
Mabuya carinata	Common	Common	Common	Rare	Common	Common	Common
Mabuya macularius	Abundant	Common	Uncommon	Uncommon	Common	Uncommon	Abundant
Varanidae							
Varanus bengalensis	Common	Abundant	Uncommon	Uncommon	Common	Uncommon	Common

Ranidae
3. *Euphlyctis cyanophlyctis* (Schneider, 1799)
4. *Hoplobatrachus tigerinus* (Daudin, 1803)
5. *Limnonectus limnocharis* (Gravenhorst, 1829)
6. *Limnonectus* sp.

Discussion

Thirty-six species of reptiles and six species of amphibians belonging to 15 families are recorded from the Gir Forest, which shows the richness of herpetofauna and its diversity. It represents 37.98% of the state and 6.14% of the country's herpetofauna.

The diversity of herpetofauna which forms an important link in the food chain is also an indicator of good health of the Gir ecosystem. Not only birds of prey but smaller cats were also observed depending on reptiles. Mugger population of the Gir Forest is one of the largest populations in the state (65%) and most probably highest density in the wild, but the Muggers inhabit mostly man made water bodies, which are till today in dispute with the state irrigation department. No clear guidelines are available for maintaining minimum water level in three major reservoirs in the Gir Forest. The entire aquatic habitat of the crocodile population needs clear legal mandate for its population.

Accidental forest fire and annual fire practice also affect terrestrial herpetofauna, but it requires a long-term study to assess the impact for final conclusion.

During the study period, it was observed that local people (who live in and around the Gir Forest) kill snakes out of fear without knowing its conservation value. Therefore, awareness through education programmes on reptiles, especially for snakes, is an urgent need of the hour.

Acknowledgement

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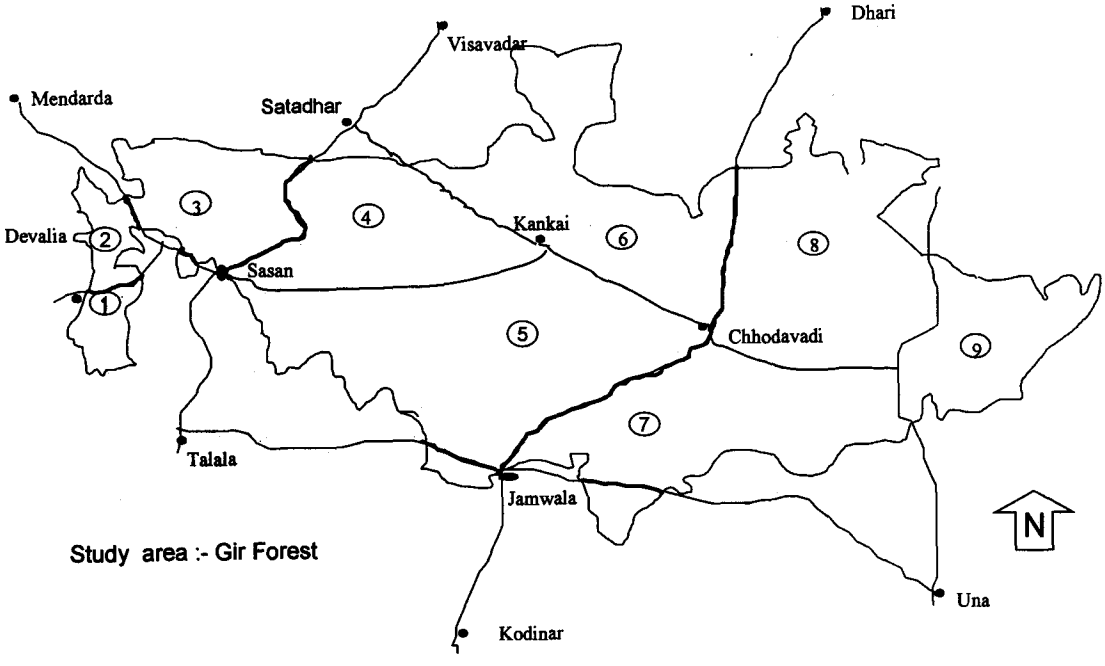

Figure 1. Zonation of Gir Protected Area

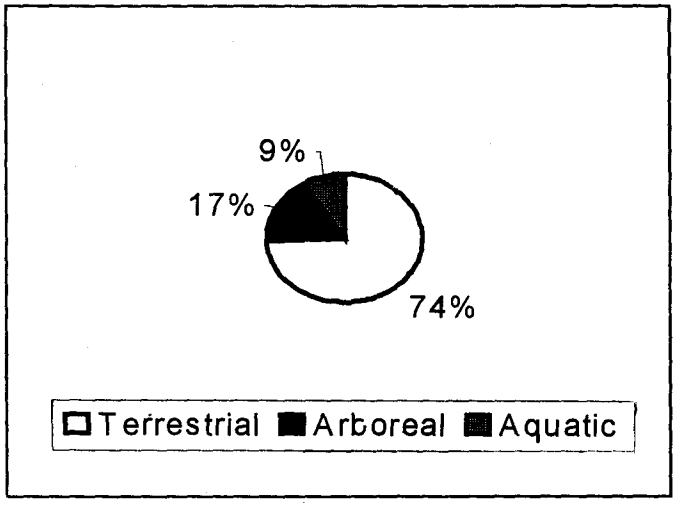

Figure 2. Species composition of reptiles of Gir

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Annexure 1.

Data sheet

Gir Forest Ecodevelopment Project — No: Date:

Reptile fauna - Data sheet — Time: Temp:

Species:

Habitat type: Grassland/Scrub/Riverine/Agri/Dry Deciduous/ with human associate

Micro Habitat:

Topography: Undulate/Flat/Hilly/Drybed/Riverbed

Behaviour: Basking/Forging/Display

Remarks:

Table 2. List of Reptiles in Gir forests

Common. Name	Species
Mugger Crocodile	*Crocodylus palustris*
Indian Star Tortoise	*Geochelone elegans*
Indian Flapshell Turtle	*Lissemys punctata*
Brook's House Gecko	*Hemidactylus brookii*
Yellow-green House Gecko	*Hemidactylus flaviviridis*
Termite Hill Gecko	*Hemidactylus triedrus*
Spotted Ground Gecko	*Gecolla coligalances*
Indian Garden Lizard	*Calotes versicolor*
Fan-throated Lizard	*Sitana ponticeriana*
Indian Chemeleon	*Chamaeleo zeylanicus*
Spotted Supple Skink	*Lygosoma punctatus*
Keeled Grass Skink	*Mabuya carinata*
Bronze-back Grass Skink	*Mabuya macularius*
Bengal Monitor	*Varanus bengalensis*
Brahminy Worm Snake	*Ramphotyphlopus braminus*
Common Sand Boa	*Eryx conica*
Red Sand Boa	*Eryx johnii*
Indian Rock Python	*Python molurus*
Common Vine Snake	*Ahaetulla nasutus*
Brown Vine Snake	*Ahaetulla pulverulenta*
Buff-striped Keelback	*Amphiesma stolata*
Common Cat Snake	*Boiga trigonatus*
Common Bronze-back Tree Snake	*Dendrelaphis tristis*
Indian Trinket Snake	*Elaphe helena*
Common Wolf Snake	*Lycodon aulicus*
Bandad Kukri Snake	*Oligodon arnensis*
Streaked Kukri Snake	*Oligodon taeniolatus*
Rat Snake	*Ptyas mucosus*
Banded Racer	*Argyrogena fasciolatus*
Dumeril's Black-headed Snake	*Sibynophis subpunctatus*
Checkered Keelback Water Snake	*Xenochrophis piscator*
Common Indian Krait	*Bungarus caeruleus*
Slender Coral Snake	*Calliophis melanurus*
Spectacled Cobra	*Naja naja*
Russel's Viper	*Daboia rusellii*
Indian Saw-scaled Viper	*Echis carinatus*