Cobra

Volume - 45 July - September 2001

CHENNAI SNAKE PARK TRUST

Quarterly Newsletter of the Chennai Snake Park Trust

Cover

An adult Annandale's treefrog *Chirixalus simus*. For details see page 30.

Photo : **Kaushik Deuti**

"I don't know how many thousand years
Of evolution have not taught the gecko
You can't jump up downwards.

Blue-flecked, pink-flecked, semi-transparent,
Sucker-footed, he creeps
Across the ceiling. He sees
With his extraordinary protuberant eyes
A fly, just hovering below him....,
He
jumps
and

Flick!
He falls to the floor.
Poor little half-dazed lizard!"

- John Heath-Stubbs.

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REPTILIAN SURVEY AND AWARENESS PROGRAMME AT LAFARGE INDIA LTD NEAR BILASPUR

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Introduction

On the request of M/s.Lafarge India Ltd. (Arasmeta Cement Plant) the Chennai Snake Park undertook a study of venomous and non-venomous snakes on their factory site and colony. It was reported that a middle-aged woman was bitten by a venomous snake (possibly a krait) and she died. The residents noticed snakes frequently particularly during the rainy season (June – August) and have been very scared of snakes irrespective of the snakes being poisonous or not.

Study area

The Lafarge India Ltd is located in Janjgir-Champa District in the Chhattisgarh State. The colony area is about 52 ha with a resident human population of around 750. A railway exchange yard of about 15 ha.is also there. There is a perennial stream crossing the factory and the colony site. The factory and the colony are surrounded by paddy fields.

Vegetation and soil

The survey area consisted of thick growth of subabul (*Leucaena leucocephala)* with tall grass and shrubs. In the residential area they have planted *Peltophorum ferrugineum, Cassia siamea, Cassia fistula, Thespesia populnea, Delonix regia, Michelia champaca, Tectona grandis, Terminalia arjuna, Azadirachta indica, Mangifera indica, Madhuca indica* and ornamental plants. The soil is black in colour and the terrain is undulating in nature.

Methodology

The team consisted of two scientists (the authors of this paper) and two field staff (Mr.M.Mani and Mr.S.P.Subbaiah, senior animal keepers of the Chennai Snake Park). The study was conducted from 11.8.2001 to 14.8.2001. The team made a rapid survey on 11.8.2001. Based on the survey, the team decided to take up a detailed survey in the snake prone areas. These included

1.Peripheral zone of residential area
2.Railway exchange yard and
3.Factory site.

The team made an intensive search from 8.30am to 12.00 Noon and 2.30pm to 6.00pm for four days. Niches of aquatic, terrestrial and fossorial animals were throughly searched and the names of the species and frequency of occurrence recorded. During the evening the team conducted awareness programmes.

Results

Reptile survey

During the survey period, 11 species of reptiles were identified of which five species were lizards and six species were snakes (Table.1). The house gecko (*Hemidactylus brooki)* and bark gecko (*Hemidactylus leschenaulti)* are the most common species of the area. The white-spotted garden skink (*Riopa albopunctata)* was found under the stones and rubbish. Common skink (*Mabuya carinata)* was found adjacent to the stream and in the garden areas of the colony. It was mostly found within piles of stones and boulders. A 1.2m long common monitor lizard (*Varanus bengalensis)* was noticed in the factory area during the night while it was crossing a mud road. Striped keelback (*Amphiesma stolata)* was noticed mostly in residential areas, especially in and around the houses. Checkered keelback (*Xenochrophis piscator)* was sighted near the residential area and along the sides of the stream. Rat snake (*Ptyas mucosus)* was sighted in the residential area. We noticed all the rat snakes during early mornings and late evenings. The banded krait (*Bungarus fasciatus*) was sighted in

open spaces of the residential area and the factory site. It was common in the residential area. We noticed one young common cobra (*Naja naja)* killed by a gardener near the guest house. One baby python (*Python molurus)* measuring about 60cm was sighted near the guest house on a cloudy day around 11.00 am. Even though the factory has thick vegetation we did not notice any arboreal snakes in the area. On enquiring the employees it seemed that there had been no sighting of arboreal snakes.

Awareness programme on reptiles

The team conducted seven awareness programmes for the employees, colony people, ladies club and school with the help of Mr. V.P.Pankaj, Officer (Administration). During the programme we showed live snakes and screened a video film on snake bite and treatment. Families of the workers were taught first aid and treatment. Instructions were given so as to remove the blind fear about snakes and other reptiles.

Conclusion

On completion of our survey, we suggested to the management measures to meet the snake problem *viz*., removal of unwanted materials like logs, rubbish, stones near the colony, cutting down excessive and uncontrolled growth of plants and shrubs near the colony and the factory site and keeping adequate stock of antivenom serum in their hospital.

Acknowledgements

We acknowledge the financial support and hospitality provided by M/S. Lafarge India Ltd. We are thankful to Shri.B.Vijayaraghavan, Chairman and Dr.R.J.Ranjit Daniels, Hon. Secretary and Trustees of the Chennai Snake Park Trust for permiting us to undertake this study and Dr.V.Kalaiarasan, Director, Chennai Snake Park for his support.

Table.1. List of reptiles and their frequency

Family	Commom name	Scientific name	Frequency
Gekkonidae	House gecko	*Hemidactylus brooki*	Many
	Bark gecko	*Hemidactylus leschenaulti*	Many
Scincidae	Common skink	*Mabuya carinata*	Many
	Whit-spotted garden skink	*Riopa albopunctata*	5
Varanidae	Common monitor	*Varanus bengalensis*	1
Boidae	Indian python	*Python molurus*	1
Colubridae	Striped keelback	*Amphiesma stolata*	8
	Checkered keelback	*Xenocrophis piscator*	6
	Rat snake	*Ptyas mucosus*	6
Elapidae	Banded krait	*Bangarus fasciatus*	6
	Indian cobra*	*Naja naja*	1

*= Dead Specimen

HERPETOFAUNA OF RAMPARA WILDLIFE SANCTUARY, GUJARAT

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Introduction

The Rampara Wildlife Sanctuary (the Bhojpur vidi) Gujarat State was a 'shooting reserve' of the ex-ruler of Wankaner State. In the past, Rampara had mixed deciduous forest, which is now converted into thorny forest dominated by *Acacia senegal*. The sanctuary supports some of the herpetofaunal species that are widely distributed and of common occurrence in a variety of habitats.

Study area

Rampara Wildlife Sanctuary is located between 22° 31′ N to 22° 34′ 88″ N latitudes and 70° 55′ 54″ E to 70° 58′ 59″ E longitudes, in Wankaner taluka of Rajkot district in Saurashtra peninsula. The sanctuary is a compact block of 1501 ha area. The highest peak in the sanctuary area is 216 m above msl. The average altitude of the sanctuary is about 150 m above msl. The sanctuary is 3 km away from the Machchhu dam.

The terrain of the region is undulating with barren hillocks, narrow ridges and mild slopes. The sanctuary comprises the watershed of river Machchhu drained by two major nallahs, known as 'Waghari galo vonkalo' and 'Pat galo vonkalo'.

Climate

The climate of the sanctuary is tropical and semi-arid. Monsoon season in the area is short and rainy days are few, having a mean of 26 rainy days in the entire season. The area is drought-prone and variation in rainfall from year to year is considerable. The average annual rainfall of the area is 549mm. During winter season, January is the coldest month and minimum temperature is 10° C. In the summer season, hot days generally occur in the month of May-June when temperature rises to 41° C.

Water

Water remains in some pockets and nallahs only up to winter. Water scarcity is the main shortcoming of the habitat as not a single water hole persists up to summer. More than half a dozen check dams have been constructed across nallahs by the Forest Department of Gujarat. The check dams of the sanctuary provide suitable habitat for developing stages of amphibians and turtles.

General vegetation

Rampara had mixed dry deciduous forest, scrub forest and savannah type vegetation. Now it has thorny forest after notification as the sanctuary. But just before the notification, it was a wasteland with scattered *Acacia* and *Butea* trees and a wandering population of the bluebull (V.C.Soni, unpublished data). Recently, Singh *et al* (1999) have recorded 265 species of plants in the sanctuary, which includes 52 tree species, 39 shrub species, 39 grass species, 41 species of climbers, twiners and creepers and 94 species of herbs.

Acacia senegal, Phoenix sylvestris, Butea monosperma, Acacia nilotica, Cassia auriculata and *Zizyphus nummularia* are the dominant species of the sanctuary now.

Materials and methods

The study was carried out from 22nd August 1998 to 15th February, 1999.

Amphibians were collected with bare hands from moist places and from check dams using a net; only one or two specimens per species were collected. The samples were preserved in 4% formalin or 70% alcohol. All the animal samples were taken to the laboratory for identification and ientified using standard references such as Daniel (1963,1975) and Naik and Vinod (1996).

For searching of reptilian species, the entire sanctuary was divided into six radial trails leading from the watchtower to the sanctuary's boundary. Trails were separated from each other by 60° and numbered 1 to 6. During trail survey, reptiles were indentified and recorded. Unidentified samples were collected. The sanctuary area was thoroughly searched for reptiles. Snakes were captured using a long stick with a hook, collected in a glass jar, identified and released back. Lizards were collected with bare hands. For identification Smith (1933,1935, 1943), Daniel (1983), Das (1985) and Vyas (1996) were followed.

Results

Amphibians

Three species of frogs and two species of toads were recorded during this study viz. *Euphlyctis cyanophlyctis, Limonectes limnocharis* and *Hoplobatrachus tigerinus* belonging family Ranidae and *Bufo melanosticutus* and *Bufo stomaticus* belonging to family Bufonidae (Appendix)

Among these five species *E. cyanophlyctis* is the most common frog and was found in almost all the check dams of the sanctuary. *H. tigerinus* and *L.limnocharis* are most common in the State but their numbers are few in the sanctuary. *B. melanostictus* emerges often during

the rains in August. This toad is very common and found in large numbers in the sanctuary. Areas around check dams remain damp and are found suitable for toads, but the majority of the area is drier. The diversity of amphibian fauna of the sanctuary is very limited because of the hibitat quality which is not suitable for amphibians.

Reptiles

There were 23 reptilian species in the sanctuary consisting of two species of turtles, 10 species of lizard and 11 species of snake (Appendix)

Chelonians

1. *Geochelone elegans*

This animal was sighted six times during the field study. Six plant species consitute the food of *Geochelone elegans* in the sanctuary (Table. 1).

Table 1: Food species of *Geochelone elegans* their density and frequency of occurrence in the sanctuary

Sr.No	Food of *Geochelone elegans*	Density per sq.m.*	Frequency of occurrence*
1.	*Tridax procumbens*	0.1	28.20
2.	*Urginea indica*	0.004	2.56
3.	*Cassia tora*	0.3	48.71
4.	*Achyranthes aspera*	0.01	7.69
5.	*Aristida adscensionis*	18.7	97.43
6.	*Helicteres isora*	——	Occasionally seen

*= Source: Singh *et al.* (1999)

2. *Lissemys punctata*

This is a common animal in the sanctuary. It is a schedule I animal under the Indian Wildlife (Protection) Act, 1972, a near threatened animal in the country because of hunting for food and trade.

Lizards

Ten species of lizards belonging to six families were reported in the sanctuary. Out of which three species were abundant, six common and one species uncommon.

Varanus bengalensis

It is the most common lizard in the sanctuary as well as in the State. This is a vulnerable species due to hunting for food. During the present study the lizard was observed most of the time near the check dams.

Snakes

Due to the dense thorny forest, with rolling terrain and some grass patches the habitat looks suitable to snakes. Eleven snake species belonging to five families have been reported. Most common snake species in the sanctuary are *Naja naja*. *Echis carinatus* and *Ptyas mucosus*.

Python molurus

Python molurus was seen by villagers near Machchhu dam, which was approximately 3 km away from the sanctuary. The sighting was confirmed by interviewing the villagers. During Feb-'99 staff of the sanctuary had seen python near the forest Guest House. However, during the field study, python could not be seen. *Python molurus* is protected under Schedule I of the Indian Wildlife (Protection) Act, 1972. It suffers heavily from over-exploitation for the illegal skin trade and steady loss of forest habitat. Python is a highly endangered species in the sanctuary.

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Appendix. Herpetofaunal diversity and its status in the Rampara Wildlife Sanctuary

Sr.No.	English Name	Scientific Name	Habits	Status
	AMPHIBIANS			
	Bufonidae			
1.	Common Asian Toad	*Bufo melanostictus*	Terrestrial	Abundant
2.	Marbled Toad	*Bufo stomaticus*	Terrestrial	Common
	Ranidae			
3.	Indian Skipping Frog	*Euphlyctis cyanophlyctis*	Aquatic	Abundant
4.	Cricket Frog	*Limnonectes limnocharis*	Semiaquatic	Uncommon
5.	Indian Bull Frog	*Hoplobatrachus tigerinus*	Aquatic	Uncommon
	REPTILES			
	Testudinidae			
6.	Indian Star Tortoise	*Geochelone elegans*	Terrestrial	Uncommon
	Trionychidae			
7.	Indian Flapshell Turtle	*Lissemys punctata*	Aquatic	Common
	Eublepharidae			
8.	Fat-tailed Gecko	*Eublepharis fuscus*	Terrestrial	Uncommon
	Gekkonidae			
9.	Yellow-green House Gecko	*Hemidactylus flaviviridis*	Terrestrial	Common
10.	Brook's House Gecko	*Hemidactylus brookii*	Terrestrial	Abundant
	Agamidae			
11.	Indian Garden Lizard	*Calotes versicolor*	Arboreal	Abundant
12.	Fan-throated Lizard	*Sitana ponticeriana*	Terrestrial	Abundant

Sr.No.	English Name	Scientific Name	Habits	Status
	Scincidae			
13.	Keeled Grass Skink	*Mabuya carinata*	Terrestrial	Common
14.	Bronze Grass Skink	*Mabuya macularia*	Terrestrial	Common
15.	Spotted Supple Skink	*Lygosoma punctatus*	Terrestrial	Common
	Lacertidae			
16.	Jordon's Snake-eye Lacerta	*Ophisops jerdonii*	Terrestrial	Common
	Varanidae			
17.	Bengal Monitor Lizard	*Varanus bengalensis*	Terrestrial	Common
	Typhlopidae			
18.	Brahminy Worm Snake	*Ramphotyphlops braminus*	Fossorial	—
	Boidae			
19.	Red Sand Boa	*Eryx johnii*	Fossorial	—
20.	Common Sand Boa	*Eryx conicus*	Fossorial	—
21.	Indian Rock Python*	*Python molurus*	—	—
	Colubridae			
22.	Indian Trinket Snake	*Elaphe helena*	Terrestrial	—
23.	Rat Snake	*Ptyas mucosus*	—	—
24.	Common Wolf Snake	*Lycodon aulicus*	Terrestrial	—
25.	Checkered Keelback Water Snake	*Xenochrophis piscator*	Aquatic	—
	Viperidae			
26.	Saw-scaled Viper	*Echis carinatus*	Terrestrial	—
	Elapidae			
27.	Spectacled Cobra	*Naja naja*	Terrestrial	—
28.	Common Indian Krait	*Bungarus caeruleus*	Terrestrial	—

Note: *Not seen, reported by villagers and Forest staff of the sanctuary.

ECOLOGY AND STATUS OF THE ANURAN FAUNA OF ELEVEN DISTRICTS OF BRAHMAPUTRA VALLEY OF ASSAM

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Introduction

The Brahmaputra Valley is an old alluvial plain stretching over an area appoximatly 750 X 80 k.m. The state of Assam is located on the Northeastern part of India, (89°45′ – 96° 0′ E longitude and 24° 0′ – 28°0′ N latitude), with tropical evergreen forests having diverse fauna, tropical grasslands in low lands of Brahmaputra and other tropical vegetations.

It has 4 seasons:- Pre monsoon (March–May), monsoon (June-August), retreating monsoon (Sept–Nov) and winter (Dec- Feb).

During 1997 to 1999, surveys were made specially in eleven districts of Assam to observe the ecology and status of anurans. During the investigation 20 anuran species, 13 genera and 6 families were recorded. Their abundance, seasonality, activity pattern, micro-and macro-habitat and causes of decline were recorded.

Diversity of Anuran Fauna

Twenty anuran species of 13 genera were found in the different places of districts – Kamurp, Nalbari, Barpeta, Goalpara, Dhemaji, Drrang, Nagoan, Marigaon, Golaghat, Sibsagar and Karbi – Anglong. There is high species diversity in anuran fauna, because of the diversity in habitat. These animals are mostly found sitting on the edge of water bodies, irrigation canals, drainage systems in the paddy fields, floating in permanent water bodies and sometimes they are found even on dry and damp surfaces with abundant vegetation of *Cymbidium sp, Eichornia sp. Ipomea sp, Colocasia sp, Oryza sp,* etc., They are associated with aquatic, semiaquatic, terrestrial, fossorial and arboreal microhabitats.

Discussion

It is expected that the richness of the anuran species might be greater than the reported figures, because of the diverse habitats of the different districts. Most of the anuran species occur in evergreen, semievergreen, moist deciduous, dry deciduous, scrub jungle, grasslands, paddy fields, banana plantation, tea plantation, etc., though basically they are associated with aquatic systems.

Out of the 20 species *Hyla annectens*, *Megaphrys sp.*, *Silvirana sp.*, *Cirixalus sp.*, *Amolops sp.*, and *Philautus sp.*, are rare in the eleven districts of Assam. Amongst these 20 species, one (5%) is aquatic, 2(10%) are fossorial, 4(20%) are arboreal, 4(20%) are semiaquatic and 5(25%) are semiaquatic/terrestrial forms.

Species Accounts

Hoplobatrachus tigerinus

Habit	:	Semiaquatic/Terrestrial.
Status	:	Common
Seasonality	:	Premonsoon, Post monsoon
Activity	:	Diurnal/Nocturnal
Macrohabitat	:	Paddy fields/ponds/thick vegetation/low lying damp places.
Microhabitat	:	Edge of the open field water/edge of water having shrubs,grass and other vegetation/under ferns
Reasons of decline	:	Human interference, hunting, pollution, and habitat destruction.
Position in IUCN	:	Vulnerable.
Distribution	:	In all above mentioned districts.

Hoplobatrachus crassus

Habit	:	Semiaquatic.
Status	:	Common
Seasonality	:	Premonsoon, Monsoon
Activity	:	Nocturnal
Macrohabitat	:	Paddy fields/grassy fields.
Microhabitat	:	Vegetation.
Reasons of decline	:	Loss of habitat and human interference.
Position in IUCN	:	Lower Risk (near threatened)
Distribution	:	In all districts except Karbi-Anglong.

Limnonectes limnocharis

Habit	:	Terrestrial/Semiaquatic.
Status	:	Common.
Seasonality	:	All seasons.
Activity	:	Nocturnal
Macrohabitat	:	Grasslands/Paddy fields.
Microhabitat	:	Edge of field in water, amidst grasses, under logs, stones and in water along the side of roads.
Reasons of decline	:	Pesticides, habitat destruction and predation.
Position in IUCN	:	Vulnerable.
Distribution	:	In all above-mentioned districts.

Euphlyctis cyanophlyctis

Habit	:	Aquatic.
Status	:	Common.
Seasonality	:	All seasons.
Activity	:	Diurnal/Nocturnal
Macrohabitat	:	Streams, ponds, and puddles.
Microhabitat	:	Floating in water, edge of water.
Reasons of decline	:	Water pollution, habitat loss, human interference, and hunting.
Position in IUCN	:	Lower Risk (near threaten).
Distribution	:	In all above-mentioned districts.

Rana erythraea

Habit	:	Semiaquatic/Terrestrial.
Status	:	Rare.
Seasonality	:	Premonsoon, Monsoon
Activity	:	Nocturnal
Macrohabitat	:	Under the Shrubs, deciduous forests.
Microhabitat	:	Damp places, on the leaves of tree, and bannana tree.
Reasons of decline	:	Not known.
Position in IUCN	:	Lower Risk (near threatened).
Distribution	:	Almost all above-mentioned districts.

Rana alticola

Habit	:	Terrestrial/Semiaquatic.
Status	:	Rare.
Seasonality	:	Premonsoon, Monsoon.
Activity	:	Nocturnal
Macrohabitat	:	Streams.
Microhabitat	:	Edge of water, along the banks, under the vegetation.
Reasons of decline	:	Human interference.
Position in IUCN	:	Lower Risk (near threatened).
Distribution	:	In Kamrup and Darrang district.

Rana taiphensis

Habit	:	Semiaquatic/Terrestrial.
Status	:	Rare.
Seasonality	:	Monsoon, Premonsoon.
Activity	:	Dirunal/Nocturnal.
Macrohabitat	:	Cultivated lands, Paddy fields, Shrubs.
Microhabitat	:	On the paddy leaf, leaf of shrubs.
Reasons of decline	:	Human interference, pesticides.
Position in IUCN	:	Lower Risk (near threatened).
Distribution	:	Almost all, except Karbi-Anglong, Golaghat and Nagaon districts.

Amolops gerbilus

Habit	:	Terrestrial.
Status	:	Infrequent.
Seasonality	:	Monsoon.
Activity	:	Nocturnal.
Macrohabitat	:	Streams, moist forest.
Microhabitat	:	On the edge of water, damp forest.
Reasons of decline	:	Not known.
Position in IUCN	:	Lower Risk (near threatened).
Distribution	:	Kamrup and darrang districts

Amolops sp

Habit	:	Terrestrial.
Status	:	Rare.
Seasonality	:	Monsoon.
Activity	:	Nocturnal.
Macrohabitat	:	Streams, evergreen and moist deciduous forest.
Microhabitat	:	Under the tree moist places near water.
Reasons of decline	:	Human interference.
Position in IUCN	:	Lower Risk (near threatened).
Distribution	:	Golaghat district.

Polypedates leucomystax

Habit	:	Arboreal.
Status	:	Infrequent/ common.
Seasonality	:	Monsoon, Post monsoon.
Activity	:	Nocturnal.
Macrohabitat	:	Evergreen moist forest.
Microhabitat	:	On the bamboo tree, bannana tree, branches, brick wall etc.,
Reasons of decline	:	Not known.
Position in IUCN	:	Lower Risk (least concerned).
Distribution	:	Almost all districts.

Philautus sp

Habit	:	Arboreal.
Status	:	Rare.
Seasonality	:	Monsoon.
Activity	:	Nocturnal/Diurnal.
Macrohabitat	:	Moist vegetation, Bushes, and Tea plantation.
Microhabitat	:	On leaves, bushes and on the branches of tree.
Reasons of decline	:	Habitat destruction.
Position in IUCN	:	Lower Risk (near threatened).
Distribution	:	Goalpara district.

Chirixalus sp

Habit	:	Arboreal.
Status	:	Rare.
Seasonality	:	All seasons
Activity	:	Nocturnal/Diurnal.
Macrohabitat	:	Moist thick vegetation, Bushes.
Microhabitat	:	Under the bamboo, on leaves, bushes and in tree hole.
Reasons of decline	:	Habitat loss, human interference.
Position in IUCN	:	Endangered.
Distribution	:	Sibsagar and Darrang district.

Microhyla ornata

Habit	:	Fossorial.
Status	:	Rare.
Seasonality	:	Premonsoon, Monsoon, Postmonsoon
Activity	:	Diurnal /Nocturnal.
Macrohabitat	:	High land of paddy field, open field.
Microhabitat	:	On the moist sandy places, under debris.
Reasons of decline	:	Human interference.
Position in IUCN	:	Lower Risk (least concerned)
Distribution	:	Almost all districts.

Michrohyla berdmorei

Habit	:	Semiaquatic.
Status	:	Rare.
Seasonality	:	Monsoon and Postmonsoon.
Activity	:	Nocturnal.
Macrohabitat	:	Open field and thick vegetation.
Microhabitat	:	Holes in the field, mud and moist place.
Reasons of decline	:	Not known.
Position in IUCN	:	Lower Risk (near threatened)
Distribution	:	Kamrup and Dagaon district.

Uperodon globulosus

Habit	:	Fossorial.
Status	:	Rare.
Seasonality	:	Monsoon and Postmonsoon.
Activity	:	Nocturnal.
Macrohabitat	:	Sandy thick vegetation, moist forest.
Microhabitat	:	Under the soil, rock, and thick bushes.
Reasons of decline	:	Habitat destruction.
Position in IUCN	:	Lower Risk (near threatened)
Distribution	:	Kamrup, Nalbari Darrang and Barpeta district.

Bufo melanostictus

Habit	:	Terrestrial.
Status	:	Common.
Seasonality	:	Premonsoon, Monsoon and Postmonsoon.
Activity	:	Dirunal/Nocturnal.
Macrohabitat	:	Open field, grass lands, around human habitation
Microhabitat	:	Under hole, stones, grass, on the soil and within houses.
Reasons of decline	:	Hunting for experiments for academic purposes, pesticides.
Position in IUCN	:	Vulnerable.
Distribution	:	In all districts.

Bufo stomaticus

Habit	:	Terrestrial.
Status	:	Rare.
Seasonality	:	Monsoon and Postmonsoon.
Activity	:	Nocturnal.
Macrohabitat	:	Dry semiarid area.
Microhabitat	:	Under the sand, crevices of tree and trunk under the stones.
Reasons of decline	:	Habitat loss and Human interference.
Position in IUCN	:	Lower Risk (near threatened).
Distribution	:	Darrang and Nalbari district.

Megophrys sp

Habit	:	Semiaquatic.
Status	:	Rare.
Seasonality	:	Premonsoon, Monsoon.
Activity	:	Nocturnal.
Macrohabitat	:	Channels, streams and thick vegetation.
Microhabitat	:	Edge of the water, under the bushes.
Reasons of decline	:	Habitat loss.
Position in IUCN	:	Lower Risk (near threatened).
Distribution	:	Kamrup and Golaghat district.

Hyla annectens

Habit	:	Arboreal.
Status	:	Rare.
Seasonality	:	Premonsoon,Monsoon and Postmonsoon.
Activity	:	Nocturnal.
Macrohabitat	:	Thick vegetation, forest.
Microhabitat	:	On the edge of pools, hollow tree trunk.
Reasons of decline	:	Habitat destruction, human interference.
Position in IUCN	:	Lower Risk (near threatened).
Distribution	:	Karbi-Anglong and Golaghat district.

SNAKES OF MADHYA PRADESH, UJJAIN AND MALWA REGION

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The Ujjain district which was considered as the 'cultural capital' of India in the past, is also a significant segment of Madhya Pradesh known for its floral & faunal wealth and of course the famous 'Mahakal Temple'. The Malwa region lying almost in the heart of India, forms a distinct unit- 27° 70′-25° 10′ North & 73° 45′- 79° 14′ East. It has an area of 1,50,000 km square including Ujjain district. The tropic of cancer passes almost through its middle. The climate in general is tropical monsoon type. There is a large gap between maximum & minimum temperature. Due to tempreature variations, humidity and rainfall conditions also change with the vegetation. Malwa region's flora is typically one of the plateau types. Previously it was mixed moist deciduous forest along with grasslands which is now changing into arid zone flora i.e. dry deciduous forest with grassland & thorny shrubs. Black soil covers almost the whole region.

The present paper is mostly based on the study of snakes collected from city area of Ujjain district and also surrounding areas of Malwa region of M.P. The collection studied contains a total of 34 species of snakes falling under 25 genera and 9 families. Smith (1935,1943), Gharpurey (1962), Deoras (1965), Whitaker (1978), Daniel (1983), Murthy (1986) have already focussed our attention on the snakes occuring in Madhya Pradesh. Some of the recent works which deal with the ophio-fauna of Malwa region of M.P., are those of Ingle (1996), Vyas (1998) & Ingle (2001). To make the account up-to-date four new taxa have been added. The complete list of snakes known from the Malwa region of Madhya Pradesh till date is given below.

Family	Species	Status
Typhlopidae	1. *Ramphotyphlops braminus*	VC
	2. *Typhlops diardi diardi*	C
	3. *Typhlops acutus*	UC
Uropeltidae	4. *Uropeltis ocellatus*	R
Boidae	5. *Python molurus*	R
	6. *Eryx conicus*	VC
	7. *Eryx johnii johnii*	R
Dipsadidae	8. *Lycodon aulicus aulicus*	VC
	9. *Lycodon aulicus capucinus*	C
	10. *Lycodon striatus*	R
	11. *Oligodon arnensis*	C
	12. *Oligodon taeniolatus*	RFT
	13. *Sibnyophis subpunctatus*	R
Natricidae	14. *Amphiesma stolata*	VC
	15. *Macropisthodon plumbicolor*	C
	16. *Xenochrophis piscator*	VC
	17. *Atretium schistosum*	UC
Colubridae	18. *Elaphe helena*	C
	19. *Ptyas mucosus*	VC
	20. *Argyrogena fasciolatus*	UC
	21. *Argyrogena gracilis*	RFT
	22. *Dendrelaphis tristis*	UC
	23. *Dendrelaphis pictus*	R
	24. *Ahaetulla nasutus*	R
	25. *Psamophis condanarus*	RFT
Homalopsidae	26. *Boiga trigonata*	C
Elaphidae	27. *Bungarus caeruleus*	C
	28. *Calliophis melanurus*	RFT
	29. *Naja naja naja*	VC
	30. *Naja naja kouthia*	R
	31. *Naja naja oxiana*	VC
Viperidae	32. *Vipera russelli*	C
	33. *Echis carinatus*	UC
	34. *Trimeresurus gramineus*	R

VC-Very common, C-Common, UC-Uncommon, R-Rare, RFT- recorded first time.

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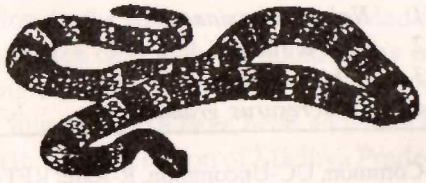

MOULTING IN INDIAN ROCK PYTHON *(PYTHON MOLURUS)*

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Moulting or ecdysis is characteristic in snakes. New skin develops from the epidermis and the old one sheds off after formation of new skin. Moulting in snakes is less studied in India. Information exists on the moulting of *python reticulatus* and *P. molurus* (Biswas and Acharjyo, 1976 & 1977; Rathinasabapathy and Kalaiarasan,1995) on the *Ophiophagus hannah* (Acharjyo *et al.*1978 & Acharjyo and Murthy, 1983) and on *Vipera russelli* (Naulleau and Brule, 1989; Paulraj and Naidu,1987). Present observations were taken at the Rajkot zoo. The data provides intermoulting days (IMD) and time of moulting of two Indian Rock Pythons.

One python was collected from Sankveli Dam, Barda (Jamnagar) on 8th July 1998. It weighed 10 kg and was 8 feet(c.2.7m) long (hereafter described as Python I). The second python was taken from the Zoo on 25thAugust 1993. It weighed 12.4 kg with 10 feet (c.3.0m) long (hereafter described as Python II). The observations were carried out from March 1999 to March 2000.

Both pythons moulted during night except on one occasion (1/8/99, Python I). Inter moulting duration was higher in winter in both the pythons. During the monsoon of 1999, Python II had a longer inter-moulting period. Inter-moulting period varies according to age, health and environmental conditions.

Table. 1.Date of moult and inter-moulting days (IMD) observed in Python at Rajkot

Python I			Python II		
Date of moult	IMD	Time	Date of Moult	IMD	Time
12.03.1999	0	Night	17.03.1999	0	Night
20.04.1999	69	Night	20.05.1999	64	Night
19.06.1999	30	Night	24.09.1999	127	Night
01.08.1999	43	Day	28.11.1999	65	Night
20.09.1999	50	Night	02.03.2000	112	Night
02.11.1999	43	Night			
14.03.2000	133	Night			

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OCCURRENCE OF ORNATE FLYING SNAKE, *CHRYSOPELEA ORNATA* (SHAW) IN NORTH KERALA

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The Ornate Flying Snake, *Chrysopelea ornata* (Shaw) is a small to medium-sized snake with smooth and slightly glossy scales. The back of the snake is black, beautifully marked with yellow or white cross-bands, and speckles and rosettes. Belly is greenish and the head is brightly barred. The pattern and colouration of head and body vary geographically. Average length of the adult snake is about 1m. The snake can climb up with the help of the lateral folds on the belly scales and can glide over short distances by coiling itself and springing, simultaneously by hollowing the ventral body scales to produce a parachuting effect. It feeds mostly on frogs, lizards, small birds and small mammals, which are killed by constriction. Even small snakes and insects have been recorded as part of its diet (Smith, 1943).

The species is known to occur in Sri Lanka, India and throughout the Indo-Chinese subregion. It is common in Sri Lanka and the Indo-Chinese subregion. In India, though the species is not uncommon, it is seldom met with. Within Indian limits, the species has been recorded from Western Ghats, Madhya Pradesh, Bihar, Bengal, Orissa and northeastern India (Murthy, 1986 and Mathew, 1995). A recent record of the snake in a village at Rajkot indicates its occurrence also in Gujarat (Shashank, 1999).

The snake is diurnal in habits and is normally found on larger trees of thick forests in hills. However, in Sri Lanka and Thailand it is reported to occur around houses and gardens (Whitaker, 1978). The report from Gujarat has also been from the roof of a *kuchcha* building amidst a farmland surrounded by a number of large trees.

In Kerala, the snake has been reported from the forested habitats in Wyanad (Gilbert, 1959 and Thomas *et al.* 1997), Parambikulam (Radhakrishnan, 1996), Periyar (Mukherjee, 1985 and Zacharias, 1997) and Chinnar (Abraham *et al.,* 1999). In the present communication, we are reporting the snake's occurrence on trees in the coastal plains of north Kerala. The snake is locally called *'Nagathan Pampu'* and *'Alankaara Pampu'*.

In June 1996, a 20cm long young one of the snake was collected from a *Ficus bengalensis* tree at Thottada, Kannur district in Kerala by the snake collectors of the Parassinikadavu Snake Park located in the Kannur district. In May 1998, the park received three immature snakes from Vadakara in Kozhikode district of Kerala. A number of adult specimens collected mostly from the non-forested habitats in the coastal plains of Kannur district were subsequently added to the Park. One of the adult specimens measured 1.5m in length. In captivity though an adult laid six eggs, the eggs did not hatch. The most recent collection of the snake, an immature one of about 25cm in length came from Kolayad in Kannur district. This one, probably, is an escapee from the nearby Kannavam Reserve Forest.

The snake appears to be common in Kannur district; nevertheless, Wall (1905) has not mentioned about its occurrence in Kannur. Though chiefly a forest species, the present records and those from Gujarat (India), Sri Lanka and Thailand indicate that the species can inhabit suitable habitat in non-forested areas as well.

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DISCOVERY OF SECONDARY OR 'SATELLITE' MALES IN ANNANDALE'S TREEFROG *CHIRIXALUS SIMUS* (ANURA: RHACOPHORIDAE)

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Chirixalus simus (Rhacophoridae) was first described from Mangaldai in Assam in 1915 by T. N. Annandale (Annandale, 1915). The Annandale's treefrog remained elusive for more than 80 years till it was rediscovered in 1999 from Rajpur, South 24 Parganas district of West Bengal (Deuti *et al*, 2001). Since its rediscovery in 1999, I have been making observations on the breeding behaviour of the species in Rajpur, which is just 6 km to the south of Calcutta. In the following paper, I present some of the observations made during June-July of two consecutive years viz., 2000 and 2001.

The Annandale's treefrog passes the winter and summer hiding within sheaths of banana plants. With the commencement of the monsoons in June, the males arrive at breeding sites and start calling from specific posts. Most commonly, the site of calling males is the grass *Saccharum spontaneum*.

Calling males were found to be of 23-24 mm snout-vent length (SVL). They called from heights of 40-45 cm above the ground sitting on the grass at positions from where a wide area may be visible. Interestingly, I found other males taking position near the calling males at about 25-30 cm above the ground. These males were mostly silent. Although, I first though these to be immature males, on dissection, they were found to be mature with fully developed testes and vocal sacs. These males were however smaller (20-22 mm SVL).

Foam nest of *Chirixalus simus*

After more rains, when 6-8 cm water accumulated at the base of the grass forming temporary pools, females started approaching the males one by one. Females were bigger than the males in the range of 28-30 mm SVL. The number of females that thus arrived was lower than that of the calling and non-calling males that had arrived at the breeding site. I noticed one or more non-calling males attempting to interrupt the females and mount them. More than once did these males succeed in mounting the females. Amplexus was axillary.

I consider the smaller and non-calling males as 'sexual parasites' that intercept and mate with females before they reach the males of their choice. Such males may therefore be what are known as secondary or 'satellite' males. Of the five successful amplexus and mating that I observed in *Chirixalus simus*, two involved satellite males.

I also observed that when a female paired with a calling or satellite male, a few other satellite males sat around the pair in groups of 2-6 individuals till the process of building the foam nest commenced. As soon as the mated pair started building the foam nest, these satellite males dispersed.

Foam nests of *Chirixalus simus* were more or less of the same size (c. 6x3x2 cm) and they contained between 195-234 eggs irrespective of which male the female mated with. The nests were constructed around 30-40 cm above the water on the grass. The tadpoles emerged out of the nest in two days and slid down into the water below as the rain water dissolved the foam nest. The tadpoles metamorphosed into froglets of 9 mm SVL after 27-28 days.

Acknowledgements

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RANDOM HARVEST

How to make the best of a pest

Random Harvest in *Cobra* Vol.22 (1995) had an account of the ravages caused in Australia by the cane toad (*Bufo marinus*) introduced from Venezula in 1935 in a misdirected attempt to control the cane beetle. An item in the *Hindu Business Line* of Aug.16, 2001 speaks of an innovative venture by John Kreuger, a taxidermist of Townsville, Australia, who stuffs cane toads for sale to tourists. He plans to export to the U.S. 35,000 stuffed cane toads since this has been found to be popular with the tourists. The mounted toad is shown standing on its hindlegs hugging a bottle of booze and leaning on a cane!

Referring to the voracious and undiscriminating appetite of this 15 cm long species, the report also says that "it has been known to eat its own young along with any indigenous plant and animal species unfortunate enough to cross its path".

MAD

Mad cow disease or bovine spongiform encephalopathy (BSE) is a degenerative disease of the central nervous system in cattle and first identified in 1986 in Great Britain. Affected animals act crazy, have difficulty in standing up and usually die within two weeks to six months. Eating infected beef has been linked to a human version of the disease called new variant Creutzfeldt – Jakob disease.

The mad cow disease reached epidemic proportions in Western Europe in 2000 leading to large-scale slaughter of cattle and destruction of their carcasses to arrest the spread of the disease and infection of humans eating beef from affected cattle. The occurrence has also been reported from Italy, Spain, Portugal, Japan, the Falkland Islands and Canada.

A cryptic item in *The New Indian Express* of Aug.17, 2001 refers to the wildlife authorities in the state of South Wales going on the alert for "the brain-wasting virus known as mad snake disease" affecting snakes. Is this in any way similar to the mad cow disease? More information will be welcome.

Plumpy baby stumpy

The Australian stumpy-tailed lizard, common throughout the Australian mainland, has an average length of 41 cm. The stumpy, unlike many other lizards, gives birth to live young instead of laying eggs. The baby stumpy at birth is approximately 35% of the mother's body weight, which causes the mother a great deal of distress during the last months of pregnancy and childbirth.

If a human female was to give birth to a baby that was 35% of her body weight, it would mean giving birth to a child the size of an average six-year old.

(Source: *The New Indian Express,* Sept.5, 2001)

A call for snakes, frogs and sparrows

Those who remember the reports many years ago about organised, massive killing of sparrows in China under the mistaken belief that they were an unmitigated pest of agricultural crops ('mistaken' because even though sparrows are grain-eating birds, they play a beneficial role; the young are fed on insects which cause much greater damage to the crops) will find some cause for cheer in the following news item in the *Hindu Business Line* of Oct.15, 2001. Those of us who are concerned with the conservation of snakes and frogs will also feel encouraged by this report:

"Farmers in western China have appealed for 5,000 snakes, 20,000 sparrows and 2,00,000 frogs to fight a swarm of locusts, the official Xinhua news agency reported.

"It quoted Bi Fubin, who was seeking the locust eaters for farmers in Gulao, near Chongqing as saying the numbers were calculated carefully to solve the problem without resort to environmentally unfriendly pesticides".

"It might sound like a lot of frogs, but they could easily be supplied 'if each restaurant in China kills one less frog every day", Bi was quoted as saying".

Similarities

The best-known example of animals using a part of their body as a lure for catching prey is the angler fish. About 300 species of angler fish inhabit the tropical and temperate seas and most of them have a modified dorsal fin spine, tipped with a flap of skin which can be positioned in front of the mouth. The prey, mistaking the lure for food, approaches to investigate and gets snapped up by the fish.

Less well-known is the fact that a similar ruse is employed by certain species of snakes also. Angus Bellairs has this to say in *The Life of Reptiles* (1969):

"Certain back-fanged snakes of southern Africa known as bird snakes (*Thelotornis*) are believed to use their tongues to attract their prey, which consists of small birds and lizards. The tongue is bright orange or red with black tips, and its movements simulate those of an insect [Fitzsimons, V.F.M. (1962) *Snakes of southern Africa*. London, Macdonald]. It is thought that some rattlesnakes and other pitvipers may also use the technique of the lure, for they have the end of the tail coloured yellow with a dark tip; when it wriggles it looks like a worm with a black head. Moccasins (*Agkistrodon hypnale*)* have been seen to capture frogs which are attracted by its movements. This colouration, however, is only present in young snakes, and in the fer-de-lance *(*Trimeresurus* [=*Bothrops*] *atrox*) it seems to be only in the young males that the tail bears these conspicuous markings.

* Editor's note: *Agkistrodon hypnale* is actually an Indian pit viper - the Hump-nosed pit viper (now known as *Hypnale hypnale*) endemic to the Western Ghats. Also, the genus *Trimeresurus* include pit vipers restricted to south and south east Asia. Moccasins is *Agkistrodon piscivorus*. Tropical American pit vipers are in the genus *Bothrops*.

The importance of the tail for attracting prey is therefore uncertain, though it would appear that whether by chance or 'design' it sometimes achieves this purpose".

It was for long a mystery how marine birds which ingest considerable quantities of sea water excreted salt efficiently particularly because the avian kidney is even less efficient at elimination of salt than the mammalian kidney. In 1957-58, Schmidt – Nielson and co-workers in the U.S. discovered that seabirds could excrete salt in the form of a highly concentrated solution of sodium chloride. The salt gland responsible for this is the lateral nasal gland situated in the skull. The duct of each gland conveys the concentrated salt solution to the nasal cavity from where it flows through the external nares to the tip of the bill. The lateral nasal gland in these birds is ten times as efficient as their kidney in eliminating salt from their blood.

Seasnakes too ingest a lot of seawater resulting in high level of salt in their blood. They too have sinus glands in their mouth, which absorbs excess salt from the body fluids which is ejected from the mouth in the form of concentrated salt solution.

- B.Vijayaraghavan

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