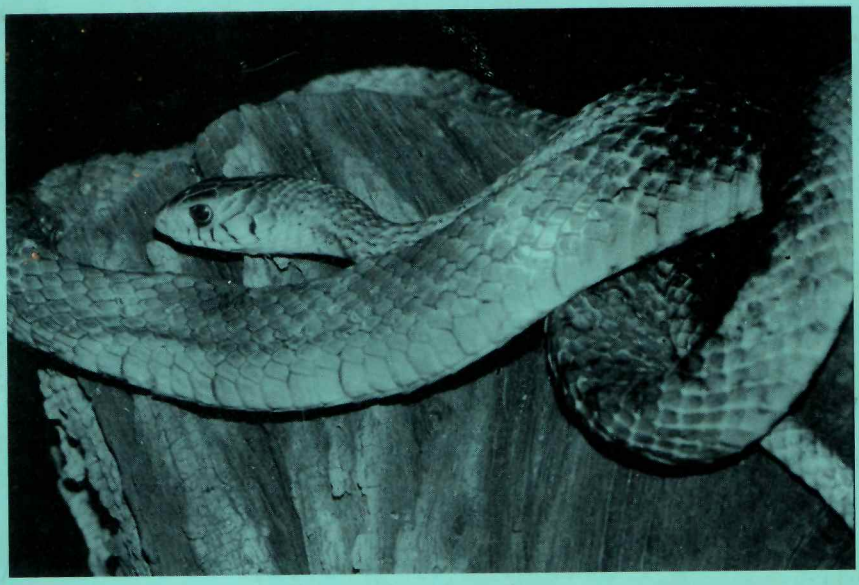
Cobra

Volume - 44 April - June 2001



CHENNAI SNAKE PARK TRUST

Quarterly Newsletter of the Chennai Snake Park Trust

Cover

Rat snake (*Ptyas mucosus*)

Commonly occurs in agricultural fields and human habitations. It mainly feeds on rats and squirrels.

Photo : **R.J. Ranjit Daniels**

"People thought they could explain and conquer nature – yet the outcome is that they destroyed it and disinherited themselves from it."

- Vaclav Havel
The Unconquered Nature of Science – 1993

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CONTENTS

A SURVEY OF NESTING OLIVE RIDLEY SEA TURTLE IN CHENNAI COAST

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Introduction

Sea turtles are large marine reptiles that have survived for at least 120 million years. Having evolved from land based ancestors these large reptiles need to complete their breeding cycle on land. The olive ridley *(Lepidochelys olivacea)* is the smallest of sea turtles off the coast of India and is the sea turtle most often found in Chennai. In the month of December the adult turtles migrate large distances and assemble near the coast of Chennai to breed. After fertilization the gravid female crawls ashore to dig a flask shaped nest in the sand with her back flippers. Close to a hundred eggs are laid in the nest before the female covers the nest and returns to sea. The eggs are incubated by the sun's heat and hatchlings emerge after 54 to 56 days. They immediately dash towards the sea in the cool of the night to escape predators like feral dogs, crabs and owls. There are predators in the sea also and very few hatchlings attain maturity. This is nature's way of maintaining a balance in the adult population since a greater survival rate will lead to over population.

Had everything gone by nature's way in Chennai the beach could have been an ideal nesting ground for the olive ridley. But due to destruction of habitat by vegetation accelerated by human and natural factors, construction of concrete structures close to the high tide line, beach front lighting, poaching of eggs and drowning of adult turtles in trawler nets, the olive ridley of Chennai is in real danger of becoming locally extinct. Conservation measures were taken in early seventies by the Madras Snake Park Trust by collection, relocation and incubation of eggs in a hatchery. The hatchlings that emerged were safely released into the sea. Over the years this initiative was followed up by the Central Marine Fisheries Research Institute (C.M.F.R.I), Tamil Nadu Forest Department and now by Student's Sea Turtle Conservation Network (S.S.T.C.N).

Objective

The present study intends to identify the existing threats to the sea turtle population of Chennai coast, after all these years of conservation work.

Study area

South Chennai is an important nesting ground of the olive ridley recognised worldwide. A 60 km stretch of beach south of Besant nagar extending up to Mammallapuram was surveyed to determine the status of the habitat and the adult population. The ground vegetation consists of *Pandanas; Spinifex* and *Ipomea.* Lots of fishing hamlets are present at frequent intervals. *Casuarina* and cocunut plantations are present. There is a lagoon at Muttukadu. Development activities in the form of residential areas and small-scale industries are observed.

Study period

Peak nesting is related to the phase of the moon and hence the study was done between new moon on January 24th to full moon on February 8th in the year 2001. The nesting period in Chennai starts in late December and ends in March.

Method

Starting from Besant Nagar beach, a 5 km trail was surveyed every day in the morning during the study period. Dragmarks left by the nesting turtle was taken as an indication of the presence of a nest. A nesting site that had a human disturbance and a flask shaped depression was considered a poached nest. No nests were collected during the study period. Morphometrics of adult turtles that drown in fishing nets and get washed ashore were recorded in a data sheet.

Results

S.no	Sector	Number of dead turtles	Number of nests
1	BesantNagar to Neelankarai	5	1
2.	Neelankarai to V.G.P. Golden beach	3	1
3.	V.G.P. Golden beach to Uthandy	-	-
4	Uthandy to Kanathur	1	-
5.	Kanathur to Muttukadu	-	-
6.	Kovalam to Crocodile Bank	2	6
7.	Crocodile Bank to Nemily kupppan	4	4
8.	Nemily Kuppan to Pattipulam	4	-
9.	Pattipulam to Mammalapuram	-	1

Discussion

Life in the seashore is dynamic. The Chennai coast is no exception and is continously in the process of change. The overgrowth of ground vegetation, and increase in residential areas are some of the major changes observed. Traditional fishermen who were previously satisfied with their catch are turning to other professions. This change in the socioeconomic structure has made fishermen take to poaching of sea turtle eggs which otherwise would enjoy traditional protection. Thirteen nests were sighted during the study period and all of them vulnerable to poaching. The nests

are located from the dragmark left by the lower shell (plastron) and the back flippers. Nests were found 10-50 m away from the high tide line. Maximum number of nests was sighted in the Kovalam-Crocodile Bank sector. This sector was devoid of any human disturbance. Besant Nagar – Neelankarai sector was regularly monitored by volunteers of S.S.T.C.N. and close to a hundred nests were collected during this season. Nineteen dead turtles that had drowned in fishing nets were washed ashore. All the factors detrimental to sea turtle population that were observed in the study are listed as follows.

1. Opportunistic poaching of eggs for local consumption.
2. Drowning of adult turtles in fishing nets.
3. Chemical pollution from small-scale industries.
4. Beach front lighting which disorients nesting turtles and hatchlings.
5. Overgrowth of vegetation like *Ipomea*.
6. Sand mining.

There are some places past Kovalam where wild nesting and hatching take place due to the remoteness of these areas. A dead juvenile hawksbill sea turtle *(Eretmochelys imbricata)* was found near Kovalam, which is rare sighting in this part of the beach.

Conclusion

All the detrimental factors that existed in the early seventies are existing even today and it is only through commitment and dedication that the olive ridley can be saved from extinction.

Acknowledgements

I am grateful to Salim Ali Centre for Ornithology and Natural History (SACON) for enabling me to undertake the survey and the volunteers of Student's Sea Turtle Conservation Network (S.S.T.C.N.) for their constant source of encouragement.

PRELIMINARY SURVEY OF THE REPTILIAN FAUNA OF MOUNT ABU WILDLIFE SANCTUARY AND SNAKE CONSERVATION EFFORTS IN MOUNT ABU TOWN

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The Mount Abu Wildlife Sanctuary adjoins Gujarat border, situated in the Sirohi districts in southern Aravallis of Rajasthan State. It is situated between 24° 30′ N and 24° 43′N and between 72° 34′ E and 72° 52′ E. The area is covered by pre-Aravallian gneiss. These rock formations are of igneous origin. The Abu hills are almost entirely made up of hard Erinpura granite.

Upper reaches of Abu consists of semi-evergreen forests while foot-hills posses deciduous type of forests. It is the only sanctuary in Rajasthan, which possesses semi-evergreen type of forests. Mt. Abu town is the only hill station in the state of Rajasthan.

Reptilian faunal studies of Mt. Abu have not gained the attention of many researchers in the past. Only few studies were conducted here. McCann (1946) listed 11 species of snakes and 6 species of non-serpent reptiles from Abu hills. Very recently, Sharma (2000) reported Brown Whip Snake (*Ahaetulla pulverulenta*) from this sanctuary. Present study provides further details about the reptilian fauna of Mt. Abu Sanctuary.

Mt. Abu Wildlife Sanctuary is rich in reptilian diversity. Rainy season is the best period to watch and study the reptiles, while winter is the worst for this purpose due to severe cold (sometimes mercury goes down to zero).

Snake Conservation in Mt. Abu Town

A snake friendly team ('Nature's Friends') was formed in Mt. Abu town to rescue the snakes which are encountered in city area. The wildlife wing of the Forest Department played a very significant role in this activity. From the month of March 2000 to February 2001 as many 52 snakes were bagged from inside houses, shops, offices and other similar places. A list of bagged snakes is given in Table.2.

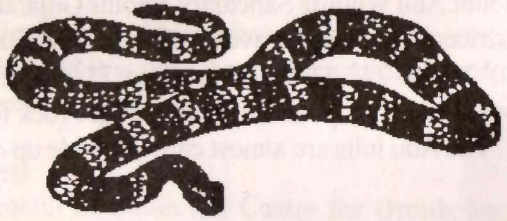

Table 1 : Reptiles of Mt. Abu Wildlife Sanctuary

Name of species	Scientific name	Local name	Status	Remark
1. Marsh crocodile	*Crocodylus palustris**	Mugger -Machichh	Introduced	Present in Trevor's Tank and Kodra Dam
2. Roofed terrapin	*Kachuga tecta*	Kachua	Not known	-
3. Indian Mud turtle	*Lissemys punctata*	Kachua	Not known	
4. Northern house gecko	*Hemidactylus flaviviridis*	Vishamra	Very common	
5. Brook's gecko	*Hemidactylus brookii*	Vishamra	Less common	
6. Termite hill gecko	*Hemidactylus triedrus*	Vishamra	Less common	
7. Fat-tailed gecko	*Eublepharis macularius*		Not known	Observed in foot-hill zone
8. Common garden lizard	*Calotes versicolor*	Kangatio	Very common	
9. Fan-throated lizard	*Sitana ponticeriana*		Less common	Observed in foot-hill zone
10. Indian chameaeon	*Chamaeleo zeylanicus*	Holinda	Very common	
11. Common skink	*Mabuya carinata*	Nagarbamni	Common	
12. Snake skink	*Riopa punctata*	Nagarbamni	Common	
13. Earless Dwarf skink	*Ablepharus grayanus*		Not known	
14. Common Indian monitor	*Varanus bengalensis*	Gohira, Patla-goh	Very common	
15. Common worm snake	*Typhlina bramina*		Common	
16. Beaked worm snake	*Typhlina acutus*		Less common	
17. Russell's earth boa	*Eryx conicus*		Less common	
18. John's earth boa	*Eryx johnii*	Dumbi	Common	Observed in foot-hill zone
19. Indian python	*Python molurus*	Ajgar	Common	Observed in foot-hill zone
20. Trinket snake	*Elaphe helena*		Common	

Name of species	Scientific name	Local name	Status	Remark
21. Common Rat snake	*Ptyas mucosus*	Dhaman	Very common	
22. Common kukri snake	*Oligodon arnensis*		Less common	
23. Variegated kukri snake	*Oligodon striatus*		Less common	
24. Tree snake	*Dendrelaphis tristis*		Less common	
25. Common wolf snake	*Lycodon aulicus*		Very common	
26. Checkered keelback	*Xenochrophis piscator*	Dindu	Very common	
27. Bulffstriped keelback	*Amphiesma stolata*		Less common	
28. Green keelback	*Macropisthodon plumbicolor*		Very common	
29. Cat snake	*Boiga trigonata*		Common	
30. Forsten's cat snake	*Boiga forsteni*		Not common	
31. Common green whip snake	*Ahaetulla nasutus*		Common	
32. Brown whip snake	*Ahaetulla pulverulenta*		Less common	
33. Common Indian krait	*Bungarus caeruleus*		Less common	Observed in foot-hill zone
34. Indian cobra	*Naja naja*	Nag,Kalinder	Common	
35. Russell's viper	*Vipera russellii*	Chitti	Less common	
36. Saw scaled viper	*Echis carinatus*		Common	

* Once a mugger was seen devouring a Rat snake in Trevor's Tank.

Table.2: Monthwise number of snakes rescued inside the Mt. Abu town during a period one year (2000 -2001)

Species	M	A	M	Ju	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Total
Elaphe helena	0	1	0	0	4	1	0	0	0	0	0	0	6
Ptyas mucosus	1	1	0	2	3	6	1	0	0	0	0	0	14
Dendrelaphis tristis	0	0	0	1	0	0	0	0	0	0	0	0	1
Lycodon aulicus	0	1	0	1	0	0	0	0	0	0	0	0	2
Macropisthodon plumbicolor	1	2	1	4	5	8	0	0	0	0	0	0	21
Boiga trigonata	1	0	0	0	1	2	0	0	0	0	0	0	4
Naja naja	0	0	1	0	0	2	0	0	0	0	0	0	3
Echis carinatus	0	0	0	0	0	0	1	0	0	0	0	0	1
Total	3	5	2	8	13	19	2	0	0	0	0	0	52

It is evident from Table.2 that maximum number of snakes enter human habitation during rainy season i.e. from June to September. Since this is the breeding season and temperature conditions become optimum, their activities are increased. During winter i.e. from October to February they remain in hibernation and the city becomes relatively snake free.

The time records of snake sightings by the public were also maintained. Out of 52 cases, for 44 sightings time was recorded. These are provided in Table.3.

Table.3. Hour-wise snake reporting by the people

Hours	1-6	6-8	8-10	10-12	12-14	14-16	16-18	18-20	20-22	22-24	Total
No. of sightings	1	10	4	2	3	5	7	7	5	0	44

It is clear for Table.3 that maximum number of snake sightings were between 06.00 and 08.00 hrs and 16.00 and 20.00 hrs. Snakes which were bagged from the city area were released safely away from the city inside the Mt. Abu Sanctuary.

Acknowledgements

We thank Mr. R.G. Soni (PCCF&CCF-WL) Mr. U.M.Sahai (CF-WL), Mr. Virendra Singh (CF-WL), Mr. M.K. Vijaivergiya (Dy.CWLW) and Mr. T.C. Verma (Dy.CWLW) for facilities and constant guidance.

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SNAKES OF TAMILNADU: A STATUS REPORT

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The state of Tamilnadu is a land of hills, plains, rivers, wetlands and cultivation. Such diversity of ecosystems has provided enormous scope for a great diversity of snakes. Excluding the marine and estuarine species, there are 78 species of snakes representing 9 families and 37 genera (Table 1). Of these 46 species (nearly 60% of all species of snakes in Tamilnadu) are endemic to the hills of southern India, largely the Western Ghats. Species including the uropeltids *Brachyophidium rhodogaster, Uropeltis broughami, Uropeltis dindigalensis, Uropeltis liura* and the dipsadid *Oligodon nikhili* are exclusive to the state of Tamilnadu.

Much less is known of the diversity of estuarine and sea snakes in the state of Tamilnadu. The dog faced water snake (*Cerberus rhynchops*; Homalopsidae) is the only estuarine snake that is common in the state. The species inhabits mangroves and estuaries moving about considerably during the rains invading rice fields and freshwater ponds closer to the sea. The exceptional occurrence of *Chersydrus granulatus* (Achrochordidae) in Tamilnadu has been reported from the coasts of Thanjavur.

Sea snakes (family Elapidae; subfamily Hydrophinae) are known based on occasional specimens washed ashore or those landed by fishermen in fishing nets. Ten species of sea snakes (out of the 20 known from India) have thus been reported from the coasts of Tamilnadu (largely from Chennai and neighbourhood) by the Zoological Survey of India. Of these, *Enhydrina*

schistosa (locally called '*valai kadian*') is the most commonly reported species. Other species frequently taken in nets by fishermen are *Hydrophis spiralis*, *Hydrophis cyanocinctus* and *Microcephalophis gracilis*. While there have been reports of *Pelamis platurus, Praescutata viperina, Lapemis curtis, Kerilia jerdoni, Hydrophis fasciatus* and *Hydrophis caerulescens* from the coasts of northen Tamilnadu, these are very rare.

Much of the reports on sea snakes in Tamilnadu are of specimens washed ashore or taken in fishing nets. Experience from the coasts of Chennai suggests that the frequency of accidental catches of sea snakes in fishing nets is fairly high especially after the first rains (June-July). According to the fishermen, these snakes stay longer floating in the surface, basking, on cooler days when they get trapped in fishing nets.

Very little is known of the habits and ecology of sea snakes. Like the dog faced water snake, all the above mentioned species of sea snakes produce live young in water. Whereas the dog faced water snake feeds on a variety of fishes including mud-skippers and gobies, the food habits of sea snakes is still rather obscure. Little scientific effort has unfortunately been put into understanding the ecology and behaviour of sea snakes in their natural habitats. It is therefore necessary that scientific studies of sea snakes in the coastal waters of Tamilnadu be given high priority.

Freshwater snakes that are widespread and common in Tamilnadu are just two species viz., *Xenocrophis piscator* and *Atretium schistosum*. The former is common even in hill streams in the Western Ghats. The latter however, is a species of stagnant wells, ponds and rainwater puddle. Both species are very common in the city of Chennai. Although these are non-venomous species, in urban areas they are killed due to fear. Further, after the first rains when the snakes move about in the nights, many are killed on roads within city limits. Survival of these snakes within urban limits can be ensured only through public awareness programmes and education.

The Indian rock python (*Python molurus*) is amongst the endangered animals of India. Thanks to captive breeding (eg. Chennai Snake

Park, Arignar Anna Zoological Park) and protection within protected areas in the Western Ghats, the population of the species seems to have improved. However, outside protected areas where the species is locally found, it is frequently collected for skin and by snake charmers. A detailed study of the status of the rock python in Tamilnadu has to be undertaken.

The greatest diversity of snakes in Tamilnadu is in the family Uropeltidae – all burrowing snakes largely endemic to the Western Ghats. Of the 32 species known from India (all from the Western Ghats), 25 occur in the state of Tamilnadu (Table 1). Being burrowing species, very little is known about their ecology and habits. Uropeltids are quite adaptive inhabiting moist forests in the Western Ghats from close to sea level till over 2000 m ASL in the Nilgiris and Palnis. After the pioneering studies of Dr M V Rajendran in the 1970s little research has gone into understanding the ecology and status of these snakes which not only contribute to the snake species diversity in Tamilnadu but also to the high levels of endemism in snakes of India.

The world's largest venomous snake the king cobra (*Ophiophagus hannah*) is known from the Western Ghats of Tamilnadu. It is nevertheless rare. There is an urgent need to understand its ecology and status in the wild. The Indian cobra (*Naja naja*) is widespread throughout Tamilnadu except in the higher hills. Thanks to the spread of agriculture and the rise in rodent populations the Indian cobra is even common within urban areas. In fact, most of the reports of large snakes entering homesteads in the city of Chennai is of this species – the other being the rat snake (*Ptyas mucosus*). The other 3 species of dangerously venomous snakes in Tamilnadu viz., *Bungarus caeruleus* (krait), *Vipera russelli* (Russell's viper) and *Echis carinatus* (saw-scaled viper) are less common in urban centres inhabiting agriculture and suburban landscapes. Very little is known of the habits and ecology of the venomous coral snakes (*Calliophis* spp) and pit vipers (*Hypnale* sp and *Trimeresurus* spp) in the state. Although coral snakes and pit vipers are largely confined to the moist forests of the Western Ghats, one species of coral snake (*Calliophis melanurus*) is found in the scrub jungles including the Guindy National Park within Chennai.

Much of the diversity of land snakes lies in the humid forests of the Western Ghats. A recent study by the Wildlife Institute of India and Salim Ali Centre for Ornithology and Natural History of reptiles in the forests of the Kalakad-Mundanthurai Tiger Reserve has shown that the diversity of snakes is highest above altitudes of 1200 m. At this altitude, snakes dominate terrestrial reptilian communities. Few other studies exist in Tamilnadu which describe the distribution and diversity of snakes.

The montane regions of the Western Ghats are too cold for most species of snakes. However, at these altitudes we find some of the burrowing snakes in the family uropeltidae and dipsadidae (*Xylophis perroteti, Xylophis stenorhynchus*) and shrub dwelling snakes in the family colubridae (*Ahaetulla perroteti, Ahaetulla dispar*). Ecology and conservation of high altitude species of snakes need careful study.

Populations of some of the common large-sized snakes viz., *Naja naja, Ptyas mucosus, Vipera russelli, Xenochrophis piscator, Eryx conicus*, etc have apparently dwindled throughout the state, especially in northern Tamilnadu. A part of this decline may be attributed to the snake-skin trade that flourished in this part of the state till about 25 years ago (illegal trade continues here and there at a much smaller scale). Over the years, there might have been a recovery in the numbers of these species of snakes. However, habitat loss and direct conflicts with humans may have interfered with the process. The impact of harvests (both past and present) on selected species of common snakes and the overall changes in habitats that might have affected the recovery of local populations have to be scientifically investigated.

Conservation of snakes in Tamilnadu can be effective only when scientific measures are complemented with sound education. The Chennai Snake Park has been making efforts in educating the public on snakes over the past 25 years. Recently, the Chennai Snake Park has undertaken exclusive programmes to educate school teachers and children on snakes and their role in the ecosystem. Over the past four years, such education programmes have been conducted in over 200 schools in and around the suburbs of Chennai.

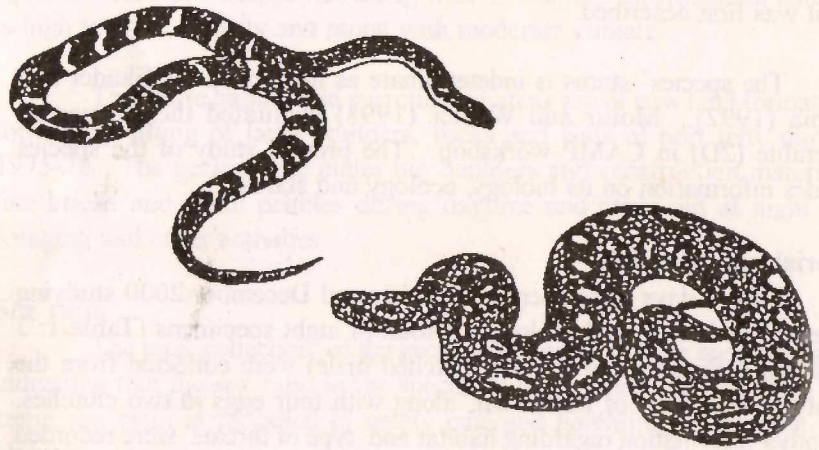
Table 1: Snakes known from Tamilnadu excluding the marine and estuarine species

Typhlopidae	1. *Ramphotyphlops braminus*	
	2. *Typhlops porrectus*	
	3. *Typhlops thurstoni*	E
	4. *Typhlops tindalli*	E
Uropeltidae	5. *Melanophidium punctatum*	E
	6. *Platyplecturus trilineatus*	E
	7. *Platyplecturus madurensis*	E
	8. *Brachyophidium rhodogaster*	E
	9. *Teretrurus sanguineus*	E
	10. *Plecturus perroteti*	E
	11. *Plecturus guentheri*	E
	12. *Uropeltis arcticeps*	E
	13. *Uropeltis ellioti*	E
	14. *Uropeltis ocellatus*	E
	15. *Uropeltis woodmasoni*	E
	16. *Uropeltis ceylanicus*	
	17. *Uropeltis rubromaculatus*	E
	18. *Uropeltis myhendrae*	E
	19. *Uropeltis broughami*	E
	20. *Uropeltis nitidus*	E
	21. *Uropeltis dindigalensis*	E
	22. *Uropeltis beddomii*	E
	23. *Uropeltis macrorhynchus*	E
	24. *Uropeltis rubrolineatus*	E
	25. *Uropeltis maculatus*	E
	26. *Uropeltis petersi*	E
	27. *Uropeltis liura*	E
	28. *Uropeltis pulneyensis*	E
	29. *Uropeltis smithi*	E
Boidae	30. *Python molurus*	

	31. *Eryx conicus*	
	32. *Eryx johni*	
Dipsadidae	33. *Lycodon travancorensis*	E
	34. *Lycodon aulicus*	
	35. *Lycodon striatus*	
	36. *Oligodon venustus*	E
	37. *Oligodon arnensis*	
	38. *Oligodon nikhili*	E
	39. *Dryocalamus nympha*	E
	40. *Dryocalamus gracilis*	E
	41. *Xylophis perroteti*	E
	42. *Xylophis stenorhynchus*	E
	43. *Sibnyophis subpunctatus*	
	44. *Amphiesma stolata*	
	45. *Amphiesma beddomei*	E
	46. *Amphiesma monticola*	E
	47. *Macropisthodon plumbicolor*	
	48. *Xenochrophis piscator*	
	49. *Atretium schistosum*	
Colubridae	50. *Elaphe helena*	
	51. *Ptyas mucosus*	
	52. *Argyrogena fasciolatus*	
	53. *Liopeltis calamaria*	
	54. *Dendrelaphis pictus*	
	55. *Dendrelaphis grandoculus*	E
	56. *Dendrelaphis tristis*	
	57. *Chrysopelea ornata*	
	58. *Ahaetulla perroteti*	E
	59. *Ahaetulla dispar*	E
	60. *Ahaetulla nasutus*	
	61. *Ahaetulla pulverulentus*	E
Homalopsidae	62. *Boiga trigonata*	
	63. *Boiga ceylonensis*	
	64. *Boiga forsteni*	

	65. *Enhydris seiboldi*	
Elapidae	66. *Bungarus caeruleus*	
	67. *Calliophis melanurus*	
	68. *Calliophis beddomei*	E
	69. *Calliophis nigrescens*	E
	70. *Calliophis bibroni*	E
	71. *Naja naja*	
	72. *Ophiophagus hannah*	
Viperidae	73. *Vipera russelli*	
	74. *Echis carinatus*	
	75. *Hypnale hypnale*	E
	76. *Trimeresurus macrolepis*	E
	77. *Trimeresurus malabaricus*	E
	78. *Trimeresurus strigatus*	E

E = Endemic to the hills of south India



STUDY ON ENDEMIC GECKO *HEMIDACTYLUS PORBANDARENSIS* FROM PORBANDAR, GUJARAT, INDIA

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Introduction

Hemidactylus is a genus belonging to the family Gekkonidae and widely distributed in the hotter parts of the world. This genus comprises of about 78 known species of terrestrial and arboreal geckos. Eighteen species of *Hemidactylus* geckos are recorded in India and seven species inhabit Gujarat State. *Hemidactylus porbandarensis* was described by Sharma (1981) on the basis of five specimens found from Porbandar City, Porbandar district. There has been no subsequent information regarding the species after it was first described.

The species' status is indeterminate as mentioned by Tikader and Sharma (1992). Molur and Walker (1998) evaluated the species as Vulnerable (2D) in CAMP workshop. The present study of the species provides information on its biology, ecology and status.

Material and Methods

Fifteen days were spent in October and December 2000 studying the gecko, its habitat and ecology. A total of eight specimens (Table 1: 3 males and 4 females and a newly hatched male) were collected from the vicinity of New Port of Porbandar, along with four eggs in two clutches. Also other information regarding habitat and type of threats, were recorded during the study.

All collected specimens were preserved in 10% formaldehyde solution. All morphometric details were measured with dial vernier callipers and other relevant information of the specimens was recorded, after preservation. The eggs were carefully tranferred from the field to the laboratory for incubation.

Results

Distribution Range

Present data on the species indicates that the species is confined to the New Sea Port area of Porbandar city (Lat. 21° 38′ N and Long. 69° 37′ E). The area is about 10,000 ha (approximately) only. I made an extensive search nearby in similar habitats for locating the species. Totally eight sites (Table. 2) were explored to find out newer habitats, if any. But I failed to collect any gecko of the said species, except in the collection site of New Sea Port area, from where Sharma (1981) collected the original type specimens.

Habitat

The gecko's habitat in human settlements was open saline land covered with a few xerophytes along with *Prosopis*. Surrounding habitat is high in wind velocity and moist with moderate climate.

The entire habitat and surrounding areas are of new land formation formed by filling of large boulders, rocks and soils of port jetty during 1975-78. The geckos hide under big boulders and construction materials like bricks and small pebbles during daytime and come out at night for foraging and other activities.

Sex ratio

The total collection of the geckoes included 3 males and 4 females indicating that the sex ratio in the species is most proably 1 : 1. Also the same sex ratio is recorded in newly emerged hatchlings from both the clutches.

Breeding season

I found a newly hatched male gecko of the species and four eggs in vicinity, from where were found adult specimens of the species. Also four females were collected, two of them having enlarged belly and there appeared two undeveloped eggs through the semi-transparent belly skin. It was a clear sign of breeding. These two observations indicate that the months of October and November form the breeding season of the species.

Egg size and Incubation period

The eggs are white coloured with very thin calcareous shell and somewhat round shape. The eggs measured on average 8.97 X 8.63 mm and the average incubation period was 28 days recorded with the range of 24-32 days (Table. 3), at the 80-90% humidity and room temperatures (24-33° C).

Hatchlings' colour and size

Totally four hatchlings were measured with an avergae body length (TBL) 43.9 mm. All four hatchlings had light cream coloured body with brown irregularly arranged square and round spots on dorsal surface being very obscure on limbs. A black or light brown coloured streak runs along each side of head running through the eyes. Belly, light cream coloured, giving clear appearance of internal organs especially the heart through the transparent skin.

Threat on the species

During the study the following threats were recorded over the range of the species. 1) The species is only recorded form the small area of New Port and New Port Road at Porbandar City, Porbandar District, Gujarat under the huge boulders, large stones and brick debris. The entire area is continuously developing and regularly changing in area, which affects the entire poulation and it's breeding performance. 2) Most of the population is found under the material for new construction of houses and offices in the port area. This activity damages eggs of geckos, resulting in low recruitment in the population. 3) The area is part of human settlements,

having regular use of insecticides by local municipal authority for hygiene, which has indirect impacts on the species. 4) Local people kill geckos due to fear believing them to be poisonous.

Summary and discussion

Hemidactylus porbandarensis is distributed only in a small area of Sea Port of Porbandar city and its sex ratio is 1:1. Female laid two white eggs of 8.97 X 8.63 mm size during the breeding season (October to December). The incubation period was observed to be 28 days with the range of 24 to 32 days. Total body length of hatchlings is 43.9 mm as measured.

The present study shows that the species is distributed very commonly within its very narrow range, in highly developed area with maximum anthropogenic activity. Therefore it requires special conservation measures and further detailed study on ecology and biology of the species needs to be taken up. Also, it needs special attention and legal protection. Regular surveys are required on this endemic gecko to find out its actual population size and density in the area.

I strongly believe that the present known distribution range of the species is not the original range because the area is a newly formed landscpae by using of huge amount of earth and boulders, which have come from the nearby reserved lands and Barda Wildlife Sanctuary. It might be that the species was transported through the construction materials of the port jetty or through the cargo shipment (the Porbandar Port imports coal and coke, fertilizer and dates from abroad).

There are many examples in reptilian species, which are accidentally transported from their natural range through construction materials, drift wood, baggage, vegetables and fruits. Establishment of *Gehyra mutilata* is the best example of accidental transportation through human linked agency (Das, 1998).

During the study I have tried to find the species from five new locations, which are near and surrounding the New Port habitat, but failed to obtain any specimens. Not finding any specimen from the surrounding area and its restricted distribution in such small area suggest that the species might have come through shipment from elsewhere.

Table.1. Details of body size of *Hemidactylus porbandarensis* gecko collected during the study (measurements in mm)

Sl.no	Snout to vent length (SVL)	Tail length (TL)	Total body length (TBL)	Sex
1.	44.92	41.00	85.92	Male
2.	46.34	Tail lost	46.34 +	Male
3.	47.7	42.82	90.52	Female
4.	39.60	36.92	76.52	Female
5.	33.50	28.46	61.96	Male
6.	34.50	Tail lost	34.50 +	Female
7.	37.00	33.00	70.00	Female
8.	22.64	Tail lost	22.64 +	Male
Range	22.64-47.70	33.00-42.82	22.64-90.52	5 Male: 4 Female

Table.2. List of localities explored for the gecko species *H. porbandarensis* around the Porbandar City, Gujarat, India.

No. Name of the locality*	Description of Habitat	Results
1. Koyalo Dungaer and Harshad Mata's temple complex	Civil area with open Rocky land, small xerophytes, *Acacia, Prosopis*	The gecko not found
2. Kuchhadi	Open scrub land with Marshy land, wetland	Not found
3. Bileshwer+	Thorny deciduous forest & wetland	Not found
4. Bhukh Bara Nes+	Thorny deciduous forest & wetland	Not found
5. New Port compound, Porbandar	Civil area, open patches with small bushes of *Prosopis* and *Acacia*	The gecko found
6. New Port Road, Porbandar	Civil area, open patches with small bushes of *Prosopis* and *Acacia*	The gecko found
7. Old Port area, Porbandar	Civil area with open patches of land	Not found
8. Light house, Chobari forest, Guest house, Porbandar	Civil area, sandy beach, open land and *Prosopis* patches	Not found

*Randomly and extensively explored one square km area for the gecko species.

+ Part of Barda Wildlife Sanctuary.

Table 3. Details of *H. porbandarensis* eggs, date of collection and incubation (measurements in mm)

No clutch	Size of eggs		Date of collection	Date of hatching	Incubation period	Hatchling size SVL + TL = TBL
	Length	Width				
1.	8.94	8.88	13.10.2000	6.11.2000	24 days	23.0 + 22.5=45.5
	9.62	8.92				22.0 + 22.2=44.2
2.	8.78	8.46	14.10.2000	15.11.2000	34 days	20.6 + 23.0=43.6
	8.54	8.26				20.4 + 22.0=42.4
Average	8.97	8.63			28 days	21.5+ 22.4= 43.9

SVL= Snout to vent length ; TL= Tail length; TBL= Total body length.

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A FOOT FLAGGING FROG FROM THE WESTERN GHATS

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The genus *Micrixalus* (Boulenger) is represented by seven species restricted in distribution to the forests of Southern India (Dutta 1997). *Micrixalus fuscus* designated as the type for the genus (Myers 1942) has a wider distribution in Southern India, among members of the same genus (Dutta 1997). This species has bluish grey colour on the dorsal surface of its feet (Inger et al. 1984). Several members of the genus *Staurois* in Borneo have colourful hind foot webbing (Inger, 1966). Foot flagging behaviour has been reported in *Staurois parvus* (Harding 1982). This note records a similar behaviour in *M. fuscus*. Such behaviour has already been observed in *M. fuscus* (Malhotra and Davis 1991), however a comparative account is lacking. The present observation provides a detailed documentation of foot flagging in *M. fuscus* and provides a comparative account of the behaviour.

Field observations were made as part of an intensive study on the amphibian community of the rainforest of the Western Ghats of South India. The study was conducted in Kalakkad-Mundanthurai Tiger Reserve (KMTR) and Indira Gandhi Wildlife Sanctuary (IGWLS), within an elevation range of 700 to 1400 m from May 1996 to January 1999.

M. fuscus, the dusky torrent frog (Das and Dutta 1998) was one of the common Ranids encountered in riparian rainforest habitats of KMTR and IGWLS. This species was found active during daytime

and vocalized from 0600 to 1800 hr. The activity peaked between 1600 and 1800 hr. Vocalizations started with an initial "krrik...krrik" and followed by a quick sequence of "kichi...kichi...kichik". It has a repertoire of calls like "kwik" and "chi...chi...chi" interspersed with more common notes described above. Calling in this species was prevalent during the dry season lasting from February to May in KMTR and IGWLS.

The frog sat on exposed rock, between 2 and 10 cm above water and stretched one of its hind limbs away from the body, spreading the web on its feet. Later it brought the hind limb behind the body and folded it to sitting position. Then it displayed using the other hind limb in a similar fashion. This movement of the hind limbs in synchrony produces a "flagging effect". The frogs continued calling during the display. Eight displaying frogs collected turned out to be males and they sat 20 to 100 cm apart on the stream. During intense activity one caller could try to chase away the nearest caller by leaping on to the same rock and calling. The disturbed animal usually produced a weak squeak and escaped from the intruder. This display probably has both intra- and inter-sexual significance.

Foot flagging would obviously be most effective in daytime and it is interesting to note that activity of *M. fuscus* and *M. saxicola* continues during day light hours. This behaviour was not observed in the species during night. Although, *M. saxicola* was not observed performing this behaviour, it would be reasonable to expect it in this species, since it has bluish grey webbing and vocalized during day time.

The affinities and differences between the two genera of Ranids, *Micrixalus* and *Staurois* have long been debated. *Micrixalus* was synonymised with *Staurois* (Roux 1905) and later re-erected. It differed from *Staurois* in lack of vomerine teeth (Boulenger 1888) and from some species of that genus in having a "*Rana*-like tadpole" (Noble 1931). Vomerine teeth is a superficial character that has

appeared time and again in Ranids (Myers 1942). Even the lingual papilla, which was suspected to be an important generic character (Myers 1942) is not consistent within *Micrixalus* of India. At least in Rhacophorids the systematic value of this character is still unclear (Dutta and Aarachchi 1996 p. 162). Four species earlier treated as belonging to *Micrixalus* from Northeast India, Siam, Borneo and Philippines possess characters that digress from the description of the genus by Boulenger (1888) that suggested treating *Micrixalus* from the Western Ghats and Srilanka in a separate genera (Pillai 1978). Dubois (1987) erected the genus *Phrynoglossus* and renamed *M. borealis* as *Phrynoglossus borealis* without any justification (Dutta 1997).

The validity of this genera and several other taxonomic revisions have been questioned, and the need to identify reliable morphological characters and accumulate data on character distribution in order to classify Ranids is overwhelming (Inger 1996). Since 1888 there has been little effort by taxonomists to identify new characters or even review the systematic value of characters that have been used to classify this genus. However, revisions in the taxonomy have taken place at periodic intervals, which leaves a lot to be explained (Inger 1996, Daniels 1996).

The genus *Micrixalus* and its congeners have minor morphological variations among them, however, this assemblage has a diverse geographical distribution (for discussion see Das, 1998). The record of foot flagging behaviour is a new character and evidence in favour of the similarity between *Micrixalus* and *Staurois*. Whether this similarity is a true taxonomic affinity or a consequence of convergence between the Western Ghat and Malayan amphibian fauna needs to be investigated.

The Madagascan and the Western Ghats-Sri Lankan amphibian fauna have undergone independent convergent adaptive radiations resulting in identical ecomorphs in the regions (Bossuyt

and Milinkovitch 2000). A similar pattern could be expected to arise between the Western Ghats and south east Asian amphibians. It might be profitable to examine the monophyly of the genera through their genetic distances. This paper also highlights the importance of recording the behaviour of amphibians such "foot flagging" which could be used as evidence for some underlying evolutionary processes.

Acknowledgements

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NOTES ON THE OCCURRENCE OF DHAMAN (*PTYAS MUCOSUS*) IN THE HIGHER ALTITUDES OF NILGIRIS, WESTERN GHATS

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The dhaman or common rat snake (*Ptyas mucosus* Linnaeus, 1758) is widespread in India and neighboring countries (Smith, 1935). This species is reported to be common in lower and middle altitudes up to 1300 m above MSL. In the present paper, we report the distribution of rat snake above 2000 m MSL in the Nilgiri Biosphere Reserve.

We have been conducting reptile surveys in the higher altitude (above 2000 m) of the Nilgiri Biosphere Reserve since September 1999. Sampling was done all over the upper Nilgiri plateau including the protected Mukkuruthi National Park and several Reserve Forests especially the plantations. There were several unauthenticated reports of the occurrence of a large species of snake in tea gardens. A few inhabitants also indicated that the species involved is the rat snake. However, till January 2001, we could not confirm this.

During January 2001, while surveying near Ooty, we found two rat snakes along the embankment of a reservoir of the Hindustan Photo Films (HPF). They were about 200 cm and 150 cm in total length. The snakes were basking (13.00 hours, ambient air temperature 18° C). Fourteen sloughs were found on 150X10 m stone embankment of the water body. Three intact sloughs measured 60 cm from head to tail tip. It appears that the snakes were taking advantage of the heated substratum of the exposed (granite) stones. Also, the crevices found among the stones provided shelter to the snake.

The altitude of the area was 2142 m MSL. Whitaker (1978) reported that this species has distribution up to 4000 m without providing locality data. Apart from this, published literature show that this snake may be found up to 1800 m (Daniel 1983). The rat snakes are also found in Palani Hills, especially around the tea gardens and are exceptionally larger (Albert Rajendran, per. com.). It is possible that the rat snake may invade new localities along with human and agricultural activities.

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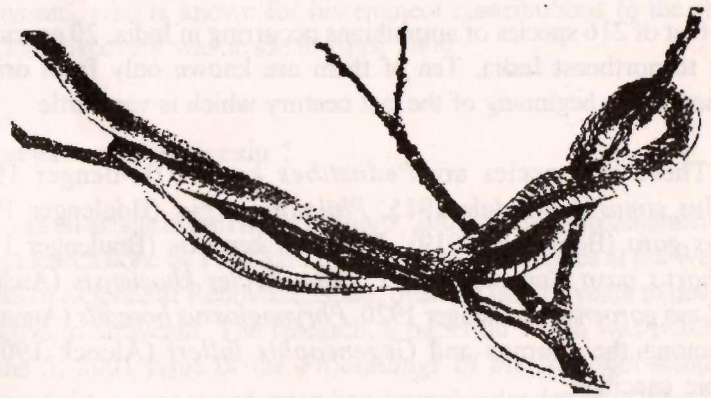

RANDOM HARVEST

Amphibian conservation

Lake Net, a global network committed to the conservation and sustainable management of lakes, seeks to incorporate amphibian conservation into its "priority Lakes for Global Conservation" framework. Anyone with data on lakes which are vital to amphibian biodiversity, are requested to contact Laurie Duker at:

Laurieduker@monitorinternational.org

Source: *Froglog* Newsletter of the Declining Amphibian Populations Task Force June 2001 No.45

Endemic Amphibians of Northeast India

Out of 216 species of amphibians occurring in India, 20 species are endemic to northeast India. Ten of them are known only from original description at the beginning of the last century which is very little.

These ten species are *Pedostibes kempi* (Boulenger 1919), *Chirixalus simus* Annandale 1915, *Philautus argus* (Boulenger 1912), *Philautus garo* (Boulenger 1919), *Philautus kempiae* (Boulenger 1919), *Rhacophorus naso* Annandale 1912, *Limnonectes khasiensis* (Anderson 1871), *Rana garoensis* Boulenger 1920, *Phrynoglossus borealis* (Annandale 1912) among the anurans and *Gegeneophis fulleri* (Alcock 1904), a monotypic caecilian.

Amongest these ten species 3 are Critically Endangered, 3 are Endangered, 1 is Vulnerable, 2 are Data Deficient and 1(*P. argus*) is not evaluated (BCPP CAMP Report 1998). However, only three of them are included in Schedule-IV of the Indian Wildlife (Protection) Act, 1972 and none have been assigned CITES categories.

A study on the current status of these ten endemic and poorly known species is being carried out with financial assistance from the Smithsonian Institution as a Trainee's Fellowship of the Wildlife Conservation and Management Training Program.

(Source:*Froglog* Feb.2001 No.40)

A new species of *Nyctibatrachus*

In an article in *Current Science* Vol.80, No.7, 10 April 2001, S.V.Krishnamurthy, A.H.Manjunatha Reddy and K.V.Gururaja of the Dept. of Post Graduate Studies and Research in Environmental Science, Kuvempu University, Shankaragatta, India describe a new species of *Nyctibatrachus* from the Western Ghats part of Kudremukh National Park, Karnataka, India. This species of frog with a snout-vent length of 52-84 mm., stout body, rough and highly wrinkled dorsum has been named *N.hussaini* after S.A.Hussain, who is known for his eminent contributions to the study of birds. The discovery was made in April 2000.

An alternative to Antivenin ?

In an article in the *Hindu* of July 5, 2001, D.Balasubramanian reports on the research done by Prof.Sara Fuchs and her colleagues at the Weizmann Institute of Science at Rehovoth, Israel, over the last 15 years to develop an alternative to antivenin. The research, a paper on which was published in the June 5, 2001 issue of the *Proceedings of the National Academy of Sciences,* USA, aimed at understanding the molecular details of what happens when a snake such as the cobra injects its venom into its victim. Once the

basics of this process are understood, an attempt can be made to counteract it by blocking a crucial step that leads to the action of the venom. Research on these lines has identified a peptide molecule called *alpha-bungarotoxin* (the bungaro is after the Telugu name for the cobra). We could thus have a drug to replace snake antivenom. Since the peptide is capable of being synthesized in large amounts from readily available amino acids it will be much cheaper than antivenom. Also, it does not need to use animals for mass production.

– B. Vijayaraghavan

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AIMS AND OBJECTIVES OF

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i) To maintain and display a captive collection of snakes and other reptiles as a means of education of the public.

ii) To undertake captive breeding of vulnerable species of snakes and other reptiles.

iii) To promote knowledge on snakes, and other reptiles and amphibians and dispel the erroneous beliefs about them.

iv) To aid and assist research on reptiles and amphibians.

v) To provide facilities for the identification and classification of snakes and other reptiles and amphibians and, for this purpose, maintain a museum of study collections.

vi) To maintain a library of books and other literature on reptiles and amphibians.

vii) To publish scientific and semi- scientific literature on snakes and other reptiles and amphibians.

viii) To undertake survey on the distribution and status of snakes and other reptiles and amphibians.

ix) To provide consultancy services on snakes and other reptiles.

x) To provide a common forum for interaction among amateur scientists and friends of reptiles and amphibians.