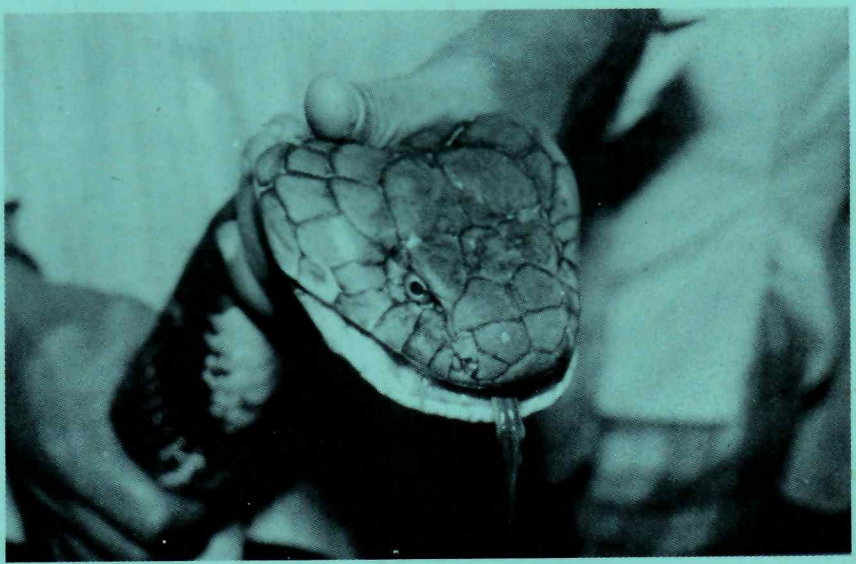
Cobra

Volume - 42 October - December 2000



CHENNAI SNAKE PARK TRUST

Quarterly Newsletter of the Chennai Snake Park Trust

Cover

King cobra that swallowed a python. (See page 12)

Photo : **Gopal Kotiyan, Deepak Studio.**

Accuse not Nature, she hath done her part;
Do thou but thine !
- Milton.

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REPTILES AND AMPHIBIANS OF KARNATAKA*

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The state of Karnataka has a rich herpetofauna. Although there is no precise figure that illustrates the number of species of reptiles and amphibians in the state, the two groups of vertebrates might together amount not less than 160 species. This is a rather conservative figure. As more research from the state is getting published, more and more species are getting added to the list of reptiles and amphibians.

The topography, climate and the geographical spread of Karnataka has created a wide range of habitats that suit a rich assemblage of reptiles and amphibians. The extensive coastal habitats, the Western Ghats reaching heights of nearly 1800 m ASL, the many rivers, wetlands and the eastern plateau have enabled a tremendous diversity of natural and human-modified habitats including beaches, estuaries, mangroves, rain forests, grasslands, deciduous forests, scrub and cultivation. Further, the more or less tropical climate has favoured the diversification of the herpetofauna. Thus from what is documented it might be inferred that there are 72 species of amphibians including caecilians, frogs and toads in the state. In fact, this is 60% of the amphibian fauna known from the Western Ghats, thereby rendering the state the richest in the region.

* Paper presented in Bangalore at the State sponsored workshop on "Developing a Biodiversity Information System for Karnataka" on November 28, 2000.

During the first half of the last century, Professor C. R. N. Rao of Bangalore had conducted extensive surveys of the amphibian fauna of Karnataka. He had collected and described a number of species during this time. Unfortunately, the specimens collected and deposited by Professor Rao have been lost. It has therefore not been possible for subsequent researchers to confirm the validity of at least 15 species described by him. Even if these are treated as 'uncertain', the amphibian fauna known from the state of Karnataka is far higher than any other comparable area in the Western Ghats.

The amphibian fauna of the state is interesting in many ways. The Torrent Toad (*Ansonia ornata*) an endemic species was first described from Bhagmandala in Kodagu district more than 100 years ago. Although currently the species is known from parts of Wyanad in Kerala, the largest population still exists in southwestern Karnataka. *Nyctibatrachus* is an endemic genus restricted to the Western Ghats. Of the 10 species of this hill stream frog described hitherto, 8 are known from the state.

Bush Frogs (*Philuatus*) are amongst the most diverse genera of amphibians in India. Of these at least 23 species are known from the Western Ghats; many being endemic. Twelve species of Bush Frogs are known from Karnataka. Further, of the 15 species of Caecilians known from the Western Ghats, 7 occur in the state. *Gegeneophis krishni* the most recently described species of Indian caecilian was based on a specimen obtained from Addoor in Dakshina Kannada.

New species of frogs have also been added from the state during the last two years. Amongst the new descriptions are *Microhyla sholigari* collected from BR Hills and *Polypedates pseudocruciger* that has its northern limits in southwestern Karnataka (Baindur).

While there could be many more species of reptiles (not less than 90 species) in the state than there are amphibians, this group has not been equally well documented. We do know that there are 7 species of chelonians (turtles and tortoises) in Karnataka. These are the Olive Ridley Turtle (*Lepidochelys olivacea*), Starred Tortoise (*Geochelone elegans*), Travancore Tortoise (*Indotestudo forsteni*), Leith's Soft Shell (*Aspideretes leithii*), Flapshell (*Lissemys punctata*), Cane Turtle (*Geoemyda sylvatica*) and Pond Turtle (*Melanochelys trijuga*). As with other parts of the Indian coasts, there might be stray records of sea turtles other than Olive Ridley which have been overlooked.

Human persecution has decimated the natural populations of the Marsh Crocodile (*Crocodylus palustris*) in the state. Nevertheless, there are still protected populations of the species in the river Cauvery and other major rivers in the north. Few recent reports are available on the exact status of the crocodile in Karnataka.

The diversity of lizards in the state is less understood. The largest and widespread species of lizard in the state is the Common Monitor Lizard (*Varanus bengalensis*). Besides the Monitor Lizard, there are the Indian Chameleon (*Chameleon zeylanicus*), 4-5 species of *Calotes*, one species of Flying Lizard (*Draco dussumieri*), one species of Fanthroated Lizard (*Sitana ponticeriana*), two species of rock lizards (*Psammophilus dorsalis* and *P. blanfordanus*), geckoes in the genera *Hemidactylus, Cnemaspis, Cyrtodactylus, Hemiphyllodactylus*, etc, and a number of skinks (*Mabuya, Riopa* and others). The exact number of species in each of these genera within the state is still unknown.

Undescribed species of lizards are being discovered by recent studies. For instance, a small gecko that I collected in the Indian Institute of Science campus, Bangalore, a few years ago has been

recently described as *Hemiphyllodactylus aurantiacus*. Geckoes in this genus are generally forest dwellers known from parts of the Western Ghats, Eastern Ghats, Northeastern India and Southeast Asia. Also, one of the most species rich genera of lizards viz., *Cnemaspis*, commonly called Dwarf Geckoes, contain the maximum number of species endemic to south India. Very little is known of these small forest geckoes which are largely tree-dwelling and diurnal. Dwarf Geckoes are widespread in the hills and forests of Karnataka.

Snakes in Karnataka are as little studied as the lizards are. What we know is that there are still small populations of the Indian Rock Python (*Python molurus*) and King Cobra (*Ophiophagus hannah*) within the state. The former is widespread, whereas the King Cobra is restricted to the Western Ghats. Venomous snakes, apart from the King Cobra, known from the state include the Indian Cobra (*Naja naja*), Common Krait (*Bungarus caeruleus*), Sawscaled Viper (*Echis carinatus*), Russell's Viper (*Vipera russelli*) and pit vipers in the genera *Trimeresurus* and *Hypnale*. Very little is known about the diversity of sea snakes along the coasts.

Eryx whitakeri, a species of Sand Boa was first described about 10 years ago after specimens were collected from around Mangalore. In the same area, an unusual and unmarked colour variant of the Russell's Viper has been collected. More careful investigations might reveal that this viper is a new species too. Interestingly, the Common Krait which is normally a plains and cultivation species, occurs in the evergreen forests in Uttara Kannada district.

Amongst the arboreal snakes are *Ahaetulla nasutus, A. pulverulentus*, *Chrysopelea ornata, Dendrelaphis tristis*, and *Boiga forsteni*. Uropeltidae, the unique and endemic family of burrowing snakes restricted to the humid tracts of southwestern India and

Sri Lanka, is also well represented in the state. It is however, cryptic and its diversity is least understood.

The above discussion was intended to merely highlight the diversity of the herpetofauna in the state of Karnataka. Very little is known of the ecology of the different species, their status and geographical range within the state. Habitat loss and direct killing by humans (especially larger reptiles) are continuously taking a heavy toll on the herpetofauna. During the rains, a number of species are killed on roads while attempting to cross from one habitat patch to the other.

Research should focus on updating the species lists and adding information on geographical range, habitat requirement and status. Species under heavy human pressure need special attention. Herpetofaunal sanctuaries need to be considered. Potential localities in Karnataka are within the forests of Dakshina Kannada (eastern side) including Kudremukh, Agumbe, Neria Estates, Dharmasthala, Subramanya, Sringeri and the intervening hill ranges. This complex of undulating hills, grasslands and evergreen forests seem to be the best for both amphibians and reptiles in the state. My studies in these areas have shown that the lower and mid-elevation habitats are best suited for amphibians and reptiles.

Attention should also be paid to educating the people in the state. Reptiles and amphibians, in general, are the most misunderstood of organisms. They are persecuted much more than any other group of animals due to the scores of myths and superstitions that prevail amongst the rural masses.

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List of Reptiles and Amphibians known from Karnataka

Family	Genus	Species	Group
Reptiles			
Crocodylidae	*Crocodylus*	*palustris*	Crocodiles
Dermochelyidae	*Dermochelys*	*coriacea*	Turtles and
Cheloniidae	*Lepidochelys*	*olivacea*	tortoises
Bataguridae	*Geoemyda*	*silvatica*	
	Melanochelys	*trijuga*	
Testudinidae	*Geochelone*	*elegans*	
	Indotestudo	*forstenii*	
Trionychidae	*Aspideretes*	*leithii*	
	Lissemys	*punctata*	
Eublepharidae	*Eublepharis*	*macularius*	Lizards
Gekkonidae	*Cnemaspis*	*kandianus*	
		mysoriensis	
		indica	
	Cyrtodactylus	*albofasciatus*	
	Geckoella	*collegalensis*	
	Hemidactylus	*brookii*	
		frenatus	
		giganteus	
		leschenaulti	
		maculatus	
		prashadi	
		reticulatus	
		triedrus	
	Hemiphyllodactylus	*aurantiacus*	
Agamidae	*Calotes*	*calotes*	
		ellioti	
		nemoricola	
		rouxii	
		versicolor	
	Draco	*dussumieri*	
	Psammophilus	*blanfordanus*	
		dorsalis	

Family	Genus	Species	Group
	Sitana	*ponticeriana*	
Chamaeleonidae	*Chameleo*	*zeylanicus*	
Scincidae	*Mabuya*	*carinata*	
		beddomii	
		macularius	
		trivittata	
	Riopa / Lygosoma	*punctata*	
		lineata	
	Ristella	*beddomii*	
	Ophisops	*beddomei*	
Varanidae	*Varanus*	*bengalensis*	
Typhlopidae	*Ramphotyphlops*	*braminus*	Snakes
	Typhlops	*beddomei*	
		porrectus	
Uropeltidae	*Plecturus*	*canarensis*	
	Melanophidium	*wynaudense*	
	Rhinophis	*sanguineus*	
Boidae	*Eryx*	*conica*	
		johnii	
		whitakeri	
	Python	*molurus*	
Colubridae	*Ahaetulla*	*nasutus*	
		pulverulentus	
	Amphiesma	*beddomii*	
		monticola	
		stolata	
	Argyrogena	*fasciolata*	
	Atretium	*schistosum*	
	Boiga	*trigonata*	
		forsteni	
		ceylonensis	
	Cerberus	*rynchops*	
	Chrysopelea	*ornata*	
	Dendrelaphis	*tristis*	
		pictus	
	Elaphe	*helena*	
	Liopeltis	*calamaria*	

Family	Genus	Species	Group
	Lycodon	*aulicus*	
		striatus	
	Macropisthodon	*plumbicolor*	
	Oligodon	*arnensis*	
		affinis	
		brevicauda	
		teniolatus	
		venustus	
	Ptyas	*mucosus*	
	Sibnyophis	*subpunctatus*	
	Xenochrophis	*piscator*	
Elapidae	*Callophis*	*melanurus*	
	Bungarus	*caeruleus*	
	Naja	*naja*	
	Ophiophagus	*hannah*	
Hydrophiidae	*Enhydrina*	*?*	
	Hydrophis	*?*	
	Lapemis	*?*	
	Microcephalophis	*?*	
	Pelamis	*?*	
Viperidae	*Vipera*	*russelli*	
	Echis	*carinatus*	
	Trimeresurus	*malabaricus*	
	Hypnale	*hypnale*	
19	**61**	**93**	
Amphibians			
Ichthyophiidae	*Ichthyophis*	*beddomei*	Caecilians
		bombayensis	
		glutinosus	
		malabarensis	
		peninsularis	
Caeciliidae	*Gegeneophis*	*carnosus*	
		krishnai	
Bufonidae	*Ansonia*	*ornata*	Toads
	Bufo	*brevirostris*	
		scaber	

Family	Genus	Species	Group
		hololius	
		melanostictus	
		parietalis	
		stomaticus	
Microhylidae	*Kaloula*	*taprobanica*	Narrow-
	Microhyla	*ornata*	mouthed
		rubra	Frogs
		sholigari	
	Ramanella	*minor*	
		montana	
		mormorata	
		triangularis	
		variegata	
	Uperodon	*globulosus*	
		systoma	
Rhacophoridae	*Philautus*	*bombayensis*	Bush frogs
		charius	and
		crni	Tree frogs
		elegans	
		glandulosus	
		hassanensis	
		kottigeharensis	
		leucorhinus	
		melanensis	
		narainsis	
		swamianus	
		variabilis	
	Polypedates	*leucomystax*	
		maculatus	
		pseudocruciger	
	Rhacophorus	*malabaricus*	
Ranidae	*Euphlyctis*	*cyanophlyctis*	True Frogs
		hexadactylus	
	Hoplopbatrachus	*crassus*	
		tigerinus	
	Indirana	*beddomii*	
		leithii	
		gundia	

Family	Genus	Species	Group
		tenuilingua	
	Limnonectes	*brevipalmata*	
		keralensis	
		limnocharis	
		mysorensis	
		syhadrensis	
	Micrixalus	*fuscus*	
		saxicola	
	Nyctibatrachus	*aliciae*	
		beddomii	
		deccanensis	
		humayuni	
		kempholeyensis	
		major	
		sanctipalustris	
		sylvaticus	
	Rana	*aurantiaca*	
		curtipes	
		malabarica	
		temporalis	
	Tomopterna	*breviceps*	
		dobsonii	
		leucorhynchus	
		rufescens	
6	**19**	**72**	

Note: This list contains only the names of species which are definitely known from the state of Karnataka and where there is no uncertainty over their taxonomic status.

KING COBRA SWALLOWING ROCK PYTHON

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Keddhu is a small village situated near Aladangadi in Belthangadi taluk of Dakshina Kannada district in Karnataka State. There are good patches of forests in and around this village in the Western Ghats.

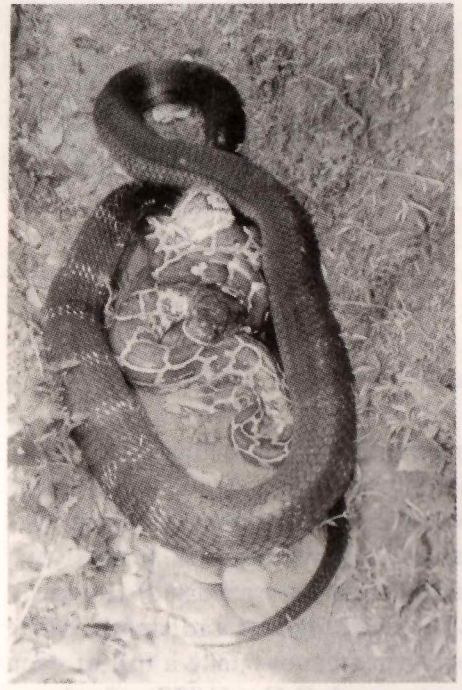
It was a bright day and the weather pleasant. It was the month of August, the mid-period of monsoon, and the surrounding areas were lush green. I had an exciting message from the villagers that a huge black snake had caught a python and was struggling to swallow it! I immediately rushed to the spot with some friends from Nagarika Seva Trust (an active local NGO). More than two hundred people were crowded near a narrow bund close to a paddy field. I made my way through the crowd and witnessed a terrific event! A male king cobra (*Ophiophagus hannah)* that was about 14 feet long (more than 4m) had caught a rock python (*Python molurus*) which was about 6 feet (about 2m) in length by its neck. The struggle went on for only a few minutes. By this time the python had coiled round the king cobra's neck and was tightening the grip. But the deadly venom succeeded in killing the prey and slowly the king cobra could free itself from the grip of the python. The people tried hard to release the python from the king cobra's jaws. This made the king cobra abandon the dead python and go away. But this was not the end of the show!

After sometime, the king cobra came back to the spot and resumed it's unfinished job. The villagers who, thinking that the show was over had started vacating the spot, once again gathered

to witness the drama. But, this time, they did not disturb the king cobra as they knew that the python was dead.

In the meantime, the news had spread wide and people had started gathering from nearby villages also. Gopal Kotiyan, a local professional photographer was at the spot capturing the rare event on camera (See cover). The king cobra was least bothered by all this and was enjoying the feast.

The king cobra took some three hours to complete the meal and then started moving lethargically. By then one of the villagers came forward and caught the king cobra in a professional style and with the help of the others stuffed it into a gunny bag and carried it and set it free in the evergreen forests of Charmadi hills.



Stage 1.

People in Dakshina Kannada district do not harm or kill snakes including the king cobra, cobra and python. They believe that whenever a king cobra or a python enters the paddy field, the owner of that field will reap good crop that year. To some extent these species are still protected by such beliefs and tradition.

The photographs show the sequence of the king cobra swallowing the python.

Stage 2.

Stage 3.

Photo Credits: Gopal Kotiyan, Deepak Studio, Belthangadi, Dakshina Kannada.

Editor's note:

A publication in 1977 shows a photograph of a king cobra being strangled and killed by a reticulated python (*Python reticulatus*) in Malaysia. The authors of the book have remarked that such instances are unusual. The instance in Dakshina Kannada does suggest that the king cobra fed on pythons more often than reported. However, as with many other predators, risk of injury and death while attempting to overpower large prey species may take a toll of even king cobras (Parker, H.W / Grandison, A.G.C. (1977) *Snakes a Natural History.* British Museum (Natural History), Cornell University Press, London).

NOTES ON KING COBRA BEHAVIOUR

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Ophiophagus hannah commonly known as King Cobra or Hamadryad, inhabits the moist forests and mangroves of South and Southeast Asia. In India, it is patchily found in the Western Ghats, Himalayas (west to Dehra Dun), Orissa and through the east and northeast till the Andaman Islands. It is likely that the species had a larger and more continuous range, which was interfered with in the recent past by human activities. The King Cobra, thanks to its large size, snake-eating habits, dangerously venomous bite and elusive nature is probably one of the most misunderstood of animals in India. Several myths prevail about its habits in the wild. While these are interesting, they contribute little to the conservation of the species.

My interest in King Cobras began while I was a boy of 5 or 6. My grandmother who had spent some years before independence in Myanmar (then Burma) had shown me photographs of tribal women in the Himalayas dancing and 'kissing the cobra'. These photographs showed King Cobras rising out of baskets to a height that almost reached the lips of a standing adult woman. Considering the height of the woman who leaned forward and kissed the cobra to be not less than 1.5m, one might imagine that the snake stood up that high!

Over the years, I read all that I could lay my hands on about the King Cobra. I also listened to a number of elders describe its ferocity, including its ability to chase galloping horses! The most interesting of these accounts is what people in Uttara Kannada, often narrated. Local belief is that '*kalinga*'(local Kannada name of King Cobra) hangs down from trees and whistles. Any human being within reach is attacked on the head. The snake then sucks out the brain!

Popular beliefs, though not always, do have some basis. There seems to be truth in people describing the King Cobra as a snake that 'raises its hood' as high as a man's face. That the snake also ascends trees is not far from real. In fact, the popular name 'Hamadryad' is derived after a mythical tree-dwelling nymph. When agitated, the King Cobra can really move fast too. However, its repute as a ferocious snake does not seem justified.

The first time I got some reliable information of the King Cobra was in 1975. A Danish friend, Bent Christensen, who worked in a local estate near my home town Nagercoil, once brought home some photographs that he had taken of a freshly killed snake. The pictures were that of a large King Cobra that was about 4 m in length (see photograph). It was killed by one of the plantation workers in Keeriparai while he went to the stream for a bath. The stream was in spate due to rains and as the man was in waist deep water, the snake that was drifting by tried to get on to him. The man little aware that it was venomous, pushed it off his body and killed it with a short stick. He then dragged it along the road to the nearest teashop just to display before the crowd the large snake that he had killed. It was then identified as a King Cobra.

Subsequently, I have seen remains of King Cobras killed by plantation workers in Dakshina Kannada indicating that it could enter human dwellings and hence be vulnerable. I have also been

told of instances in Keeriparai (Kanyakumari district) and Narakkadu (Tirunelveli district), where King Cobras have frequently taken shelter under roofs, coiled on rafters and refusing to be displaced. Unfortunately, such behaviour has invariably resulted in the snakes being shot dead!

A few years ago, while working in Orissa, I came across the King Cobra for the first time in its habitat in the wild. It happened in the morning while a few of us, including a local snake catcher-turned-field guide, were walking through thin mangroves in the periphery of Bhitarkanika. While we were almost out of the mangroves, a couple of natives came running to us and uttered something in Oriya. Their excitement and subsequent discussions made me understand that it was a King Cobra. The snake had just crossed their path and entered a burrow. While we reached the burrow that was under the exposed roots of a mangrove tree, there was no sign of the snake. However, the snake-catcher-cum-guide who was with us took a slender stick and started probing the burrow. He then confirmed that the snake was within.

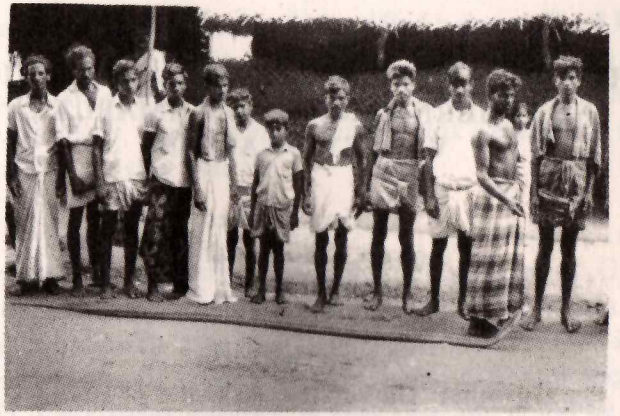
In a little while, the guide had almost got his entire head and shoulders into the burrow holding a lighted matchstick to locate the snake! By this time the snake had started hissing loudly. It however, did not attack him. He then took the long stick and kept poking the snake till it moved and suddenly put his hand in and grabbed the snake by its tail! Little by little, he pulled the snake out – a 2.6m male, and dropped it on the ground. The snake was quite agitated by this time and it charged the guide with its mouth fully open and its head held at the height of his knees. This man very calmly squatted on the ground and waited for the snake to reach him. He put out his hand and stopped the snake by touching it below the chin. Surprisingly the snake lost balance and within seconds its head was secure within the hands of the snake catcher!

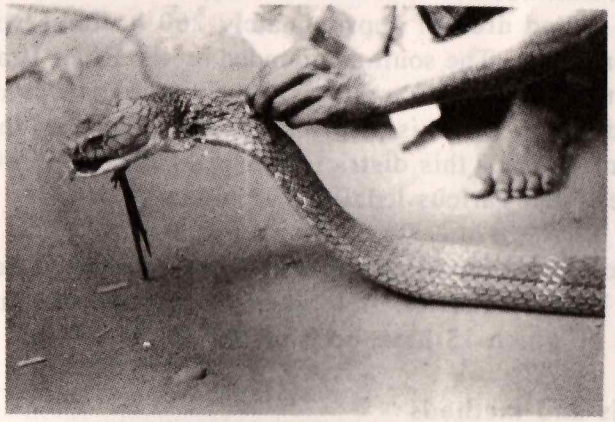
As we measured the snake, the snake showed no signs of aggression and was all the time trying to run away from us. It repeatedly defecated as much as any other snake would do when handled. Finally, when we set it free, it ran with great speed and went right up a tall tree and disappeared amidst the dense canopy!

A captive snake within the small enclosure maintained by the Forest Department in Bhitarkanika spent most of its time in water - often fully submerged. It seems that the King Cobra can occupy any of the four habitat niches viz., aquatic, fossorial, terrestrial and arboreal. A broad habitat niche preference in a species that is otherwise a specialist is quite natural. The King Cobra known to more or less exclusively feed on snakes and be restricted to forests would less likely survive if it were also specialised in habitat niche occupancy.

While reading through published information on Indian King Cobras dating back to the late 1800s it is apparent that the snake has been reported from time to time in grasslands also. Few reports however had anything to authenticate its aggression and ferocity. Instead they all substantiated the snakes ability to 'rear up' high above the ground, its being timid and always attempting to escape when cornered, its tendency to climb up trees when stressed and the lightening speed with which it swims in water.

The King Cobra, despite is dreadful appearance and repute is just one more of the shy and retiring predators unduly persecuted by humans. It is time that careful field studies are undertaken to better understand its ecology and habits so that long term conservation strategies are developed.





Photos: The King Cobra killed in Keeriparai in 1975 and photographed by Bent Christensen. Note the size of the head and the overall length of the snake.

THE ANURAN FAUNA OF NALBARI DISTRICT, NORTHERN PART OF BRAHMAPUTRA VALLEY OF ASSAM

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Nalbari district – area 1999 sq km (Longitude 91° 0′ E – 91° 45′ E and Latitude 26° 0′ N – 26° 45′ N), is endowed with wetlands covering a land area of approximately 200 hectares with diverse vegetation types. The south is bounded by the River Brahmaputra, north by the Himalayan range, east by Kamrup district and west by Barpeta district. There is no prior report available on the diversity of anuran fauna of this district although Chanda (1994) reported 27 species from various localities of Assam.

In the present investigation collections were made from various parts of Nalbari district. A total of 16 species of anurans were collected of which 13 have been identified.

Materials and methods

The species were collected from temporary pools, permanent water bodies, thick vegetation, tree trunks and underground. Collected anurans were preserved in 8% formalin for taxonomic study.

Results and Discussion

The amphibians collected and identified belonged to 4 Families, 9 Genera and 16 species. *Bufo melanostictus, Euphlyctis cyanophlyctis, Hoplobatrachus tigerina, Limnonectes limnocharis, Limonectes laticeps, Polypedates leucomystax* were found in almost all the localities of this district.

Bufo stomaticus was recorded from Baganpara area. *Hoplobatrachus crassa* was collected from Mukalmua, Ghograpar area. But the species is very rare. *Microhyla ornata* was found in Ghograpar, Khatikuch area and *Uperodon globulosum* in Barma area. *Rana erythraea* is very scarce in the different localities of this district. *Chirixalus vittatus* is very rare and could be collected only from Kumarikata area of this district.

Systematic List of Anurans of Nalbari District.

Order : **Anura**
Family : **Bufonidae**
Bufo melanostictus
Bufo stomaticus
Family : **Microhylidae**
Microhyla ornata
Uperodon globulosum
Family : **Ranidae**
Rana erythraea
Rana taipehensis
Euphlyctis cyanophlyctis
Hoplobatrachus tigerinus
Hoplobatrachus crassa
Limnonectes limnocharis
Limnonectes laticeps
Family : **Rhacophoridae**
Polypedates leucomystax
Chirixalus vittatus

There is population depletion of ecologically and commercially important species viz. *Hoplobatrachus tigerina* due to killing and export. Records revealed that *H. tigerina* was sold @ Rs.10.00 per kg during the year 1987. Capture and selling are done during the peak breeding season. Several quintals of this species are regularly supplied. Secondly, during fish breeding season, most of the fish growers kill *H. tigerina* due to their carnivorous nature. The species is thus under severe anthropogenic stress in some parts of this district.

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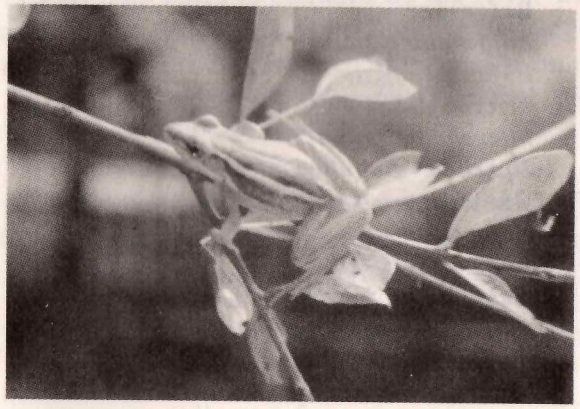

Rana taipehensis.

Reference:

Chanda, S.K. (1994) Anuran (Amphibia) Fauna of North East India. *Mem. Zoological Survey of India*, 19:2.

RECORD OF *PHILATUS FEMORALIS* FROM THE ARALAM WILDLIFE SANCTUARY, KERALA AND THE HIGH DEGREE OF ENDEMICITY OF AMPHIBIANS IN THE AREA.

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The Amphibians of Aralam have been studied by Radhakrishnan (1996) and Saju and Easa (1999). Totally 21 species were recorded during these studies. *Philautus femoralis* (Yellow banded bush frog) has been recorded from the Sanctuary during a visit by the author in March, 2000. It is endemic to the southern Western Ghats, ranging from Kerala upto Uttara Kannada (Daniels, 1997). A lone frog was spotted among the litter on the bank of the river. *P. femoralis* can be easily distinguished because of its green color and the yellow stripe, starting from the tip of the snout, running above the eye and along the side and reaching the loin. The skin is more or less smooth.

Among the 22 species of amphibians so far recorded from the Aralam Sanctuary, 73% are endemic to the Western Ghats. All the three caecilians recorded are endemic to the Western Ghats. Of the 13 Ranids, nine are endemic and of the five species of Rhacophorids, four are endemic. It is evident that the endemicity in the case of amphibians reported from Aralam Sanctuary is very high and it adds to the conservation importance of this forest.

Certain practices in the adjoining Aralam Farm, which is an undertaking of the Central Government, are posing a threat to the Sanctuary. A large quantity of chemical pesticides is being used in the farm which can surely harm the fauna of this Sanctuary especially, the highly vulnerable amphibians for which the home ranges overlap over the Sanctuary and the farm.

References:

Daniels, R.J.R. (1997) A field guide to the frogs and toads of the Western Ghats, India: Part III. *Cobra,* 29: 1-13.

Radhakrishnan, C. (1996) Amphibians from Aralam Wildlife Sanctuary, Western Ghats, Kerala. *Zoo's Print,* 9(8): 1-2.

Saju, A and Easa.P.S. (1999) Additions to the Amphibians of Aralam Wildlife Sanctuary, Kerala. *Cobra,* 38: 12-13.

List of Amphibians recorded from the Aralam Wildlife Sanctuary: (Radhakrishnan 1996, Saju and Easa, 1999 and Kunhikrishnan, personal observation)

Family : Ichthyophidae		
1.	*Ichthyophis malabarensis*	E
2.	*Ichthyophis tricolor*	E
Family : Uraeotyphlidae		
3.	*Uraeotyphlus menoni*	E
Family : Bufonidae		
4.	*Bufo melanostictus*	
Family : Ranidae		
5.	*Hoplobatrachus tigerinus*	
6.	*Rana curtipes*	E
7.	*Rana temporalis*	E
8.	*Indirana beddomii*	E
9.	*Indirana brevipalmata*	E
10.	*Indirana leithii*	E
11.	*Linonectes limnocharis*	
12.	*Euphlyctis cyanophlyctis*	
13.	*Euphlyctis hexadactylus*	
14.	*Micrixalus saxicola*	E
15.	*Micrixalus nudis*	E
16.	*Nyctibatrachus major*	E
17.	*Tomopterna rufescens*	E
Family : Rachophoridae		
18.	*Philautus leucorhinus*	E
19.	*Philautus pulcherrimus*	E
20.	*Philautus femoralis*	E
21.	*Rhacophorus malabaricus*	E
22.	*Polypedatus maculatus*	

E – Endemic to Western Ghats

RANDOM HARVEST

Alive and well in down-under

A rare American alligator-snapping turtle, stolen while a juvenile twenty years ago from a Reptile Park in Sydney, Australia, has been recovered from the city's sewers. During this extended sojourn in the unaccustomed and somewhat unedifying habitat, it had grown to a hefty 50 Kg.! Seven other immature turtles stolen along with it are yet to show up.

(Source: *Hindu Business Line* Dec.1,2000)

Jaws!

On the morning of the 2nd Jan.2001, Rajamma, a middle-aged woman was washing clothes, squatting on the banks of the Neyyar reservoir in Kerala, with her back to the waters. Before she knew what had struck her, a crocodile grabbed her by the shoulder and dragged her into the deep waters. All the shoutings of the crowd collected on the banks and the stones thrown were of no avail and the reptile did not let go its hold. Long before the police arrived 4½ hours later and shot the reptile dead, the woman was dead.

Such attacks on humans by the marsh crocodile (*Crocodylus palustris*) – unlike in the case of the saltwater crocodile (C.*porosus*) – are extremely rare. One explanation given is that the croc had its nest somewhere near where the woman was squatting and the croc thought that it had good reasons to be aggressive. To make matters worse, she had her back to the waters.

A few marsh crocodiles were introduced into the Neyyar reservoir many years ago as a conservation measure. They have now grown in numbers. The unfortunate incident, in the wake of two similar incidents earlier, which however did not have fatal consequences, has sparked off demands from the over one thousand settlers (unauthorised) on the shore of the reservoir that all the crocs here should be re-located to reservoirs where there are no human settlements.

Snake stones

Among the many indigenous remedies, of dubious value, for snake venom is the 'snake stone'. Belief in this exists in many parts of India and elsewhere also, particularly other Asian countries. The belief is that when the site of a snake-bite injury is touched with this stone, the stone will get stuck there and suck out the poison. Once the poison is sucked out, the stone will fall off. If it is then immersed in milk, the poison will drain out and it can be dried and re-used.

What is a 'snake stone'? Descriptions differ. Gharpurey (*Snakes of India and Pakistan*) identifies it as burnt bones or pumice or porous chalk. ("As they have all some adhesive and absorptive power, they are made to stick to the bitten part, but they have no action on snake poison".)

In *Snake Fauna of Sri Lanka*, P.H.D.H.De Silva gives several accounts of 'snake stones' used by gypsies and described by different authors. These include charred bones and sambar antlers calcined and buried "in black mud for twelve months".

Another material passed off as 'snake stone' is bezoar. The word is derived from the Persian *padzahar* or *pazahor* which denotes

an antidote. Descriptions of bezoar also vary. According to Watts's *Dictionary of Economic Products*, the true bezoar is a concretion in the stomach of the Persian wild goat which has a proclivity to this growth which sometimes makes the animal sick and kills it. The concretion varies in size from a pea to a fist, is greenish in colour, destitute of taste and odour and almost insoluble in water. It is made up of ellagitannin deposited around a nucleus, such as a bit of bark, the ellagitannin having been derived from the food plants.

The book mentions the similar materials obtained from the stomachs of other animals as substitutes. According to different authors, these other animals include monkey, wild boar, pig, ox, camel, goat, porcupine, horse, sheep, fish, cobra and viper. 'Hair balls' found in the stomach of some animals, particularly ruminants, are also referred to as substitutes.

Encyclopaedia Asiatica has an entry titled 'BEZOAR, Serpent stone'. The names in various languages given here include *gorochana* in Sanskrit and *Visha kallu* (poison stone) and *pamu kallu* (snake stone) in Tamil. The extensive entry also says: "Honigberger mentions that Padzahr siah, PERS., Kani zahr mohra, HIND., is a dark green serpentine; and a specimen in the Madras Museum, brought from Delhi by Mr.Charles Gubbins, as Zahr mohra, is undoubtedly this mineral". (The Oxford English Dictionary defines 'serpentine' as a 'dark green mineral consisting of hydrated magnesium silicate, sometimes mottled or spotted like a snake's skin'. Enquiries at the Madras Museum did not help locate any material answering to this description. The bezoar available in the zoology section of the Madras Museum and shown to me was a perfectly spherical ball 12.5 cm in diameter and 607 gms in weight, earth-brown in colour, which appeared to be made up of compacted animal hair. This 'hair ball' was reported to have been obtained from the stomach of a buffalo.

In a pers. com. (Oct.'96), Dr.C.Ramankutty of Arya Vaidya Saala, the famed ayurvedic centre at Kottakkal, Kerala, informs me as follows: "*Gorochanam* has been identified as the concretion found in the stomach and in the gall-bladder of an ox or cow. It is known as bezoar in English. The purified form of bezoar is known as *Fel bovium purificatum* in Latin which is obtained by evaporating ox-gall to one-third, adding alcohol, filtering, distilling off and evaporating until it acquires a suitable consistency". He also writes that *Bhavaprakasam*, "one of the ancient, authentic publications on herbal, animal and mineral products" makes no more than a passing reference to *gorochanam* as an antidote (taken internally) to poison. In reply to a specific query, he adds that "to the best of (his) knowledge, there is no other reference regarding the usefulness of *gorochanam* in the treatment of snake bite".

- B.Vijayaraghavan

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