

Cobra

Volume 34

October - December 1998



*Quarterly Newsletter
Of the Chennai Snake Park Trust*

CHENNAI SNAKE PARK TRUST
BOARD OF TRUSTEES

Shri B. Vijayaraghavan. IAS (Retd.)
Chairman

Dr. R.J Ranjit Daniels
Hon. Secretary

Shri P.V. Laxminaryana
Dr. V. Krishnamurthy
Shri S. Subbarayalu Naidu IFS (Retd.)
Shri K. R. Venkatesan IFS (Retd.)
Dr. A.V. Gopalakrishnan
Shri M. Raghuraman
Shri V.S. Raghavan
Dr. T. Sundaramoorthy

Wildlife Warden, Chennai
(Ms. Mita Banerjee IFS)

Jt. Director, Tourism Dept.,
Government of Tamil Nadu.
(Shri S.M. Sankaralingam)

Officer-in-Charge,
Zoological Survey of India,
Southern Regional Station,
Chennai.
(Dr. P.T. Cherian)

Head, Dept. of Zoology,
Madras University.
(Dr. Jayapaul Azariah)

Editorial Committee:

Dr. R.J. Ranjit Daniels,
Editor.

Shri. B. Vijayaraghavan
Dr. V. Krishnamurthy
Dr. A.V. Gopalakrishnan
Shri. V. Kalaiarasan

Cover

Beaked worm snake (*Typhlina acutus*)

This species is the largest amongst Indian worm snakes. The snake in the photograph measures 38 cm and was collected in Hyderabad.

Photo : M.V. Ravikumar

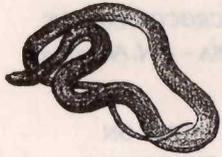
Cobra

Volume - 34

October - December 1998

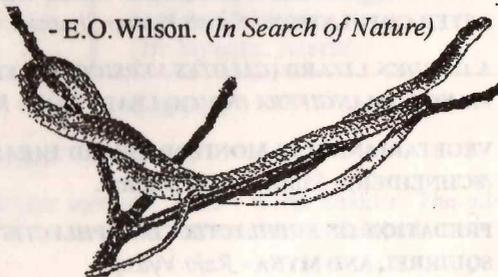
CONTENTS

- 1** BREEDING OF SPECTACLED CAIMAN (*CAIMAN CROCODILUS*) AT THE NANDANKANAN ZOOLOGICAL PARK, ORISSA - L.N.Acharjyo, S.K.Kar and S.K.Patnaik.
- 6** STATUS, RANGE EXTENSION AND ECOLOGICAL NOTES ON INDO-GANGETIC FLAP SHELL TURTLE, *LISSEMYS PUNCTATA ANDERSONI* (TESTUDINES : TRIONYCHIDAE) IN JAMMU SHIWALIKS, J&K STATE - Anil K. Verma and D.N. Sahi.
- 10** SURVEY OF REPTILIAN FAUNA OF JAMWA RAMGARH WILDLIFE SANCTUARY, RAJASTHAN - Satish Kumar Sharma.
- 12** STUDIES ON LIZARD DIVERSITY IN SELECTED SACRED GROVES OF KERALA - M. Srinivasan, G. Ramaswamy and P. S. Easa.
- 16** TERRITORIAL BEHAVIOUR IN *EUPHLYCTIS CYANOPHLYCTIS* - Pranab Kumar Mallick.
- 19** ADDITIONAL RECORD OF THE TRAVANCORE TORTOISE, *INDOTESTUDO FORSTENII* (SCHLEGEL & MULLER) TESTUDINIDAE : REPTILIA) IN KERALA - C.Radhakrishnan.
- 20** FADING OF BREEDING COLOUR IN MALE *CALOTES VERSICOLOR* AFTER COPULATION - Satish Kumar Sharma.
- 21** A GARDEN LIZARD (*CALOTES VERSICOLOR*) FEEDING ON A DRY MANGO (*MANGIFERA INDICA*) LEAF - Satish Kumar Sharma.
- 22** VEGETARIANISM IN MONITOR LIZARD *VARANUS BENGALENSIS* (SCHNEIDER) - Satish Kumar Sharma.
- 23** PREDATION OF *EUPHLYCTIS CYANOPHLYCTIS* TADPOLES BY SQUIRREL AND MYNA - Raju Vyas.
- 24** ABOUT A LITTLE KNOWN SNAKE PARK IN MAHARASHTRA : AN APPEAL - Baburao Takkekar.
- 25** RANDOM HARVEST - B.Vijayaraghavan.



Science and the Humanities, biology and culture, are bridged in a dramatic manner by the phenomenon of the serpent. Fabricated from symbols and bearing portents of magic, the snake's image enters the conscious and unconscious mind with ease during reverie and dreams. It appears without warning and departs abruptly, leaving behind not a specific memory of any real snake but the vague sense of a more powerful creature, the serpent, surrounded by a mist of fear and wonderment.

- E.O. Wilson. (*In Search of Nature*)



**BREEDING OF SPECTACLED CAIMAN
(CAIMAN CROCODILUS) AT THE NANDANKANAN
ZOOLOGICAL PARK, ORISSA**

L.N.Acharjyo

House No.M-71, Housing Board Colony,
Baramunda, Bhubaneswar-751 003.

S.K.Kar

Research Officer (Wildlife),
C/o Chief Wildlife Warden, Orissa.

and

S.K.Patnaik

Chief Wildlife Warden, Orissa,
7-Saheed Nagar, Bhubaneswar - 751 007.

The spectacled caiman (*Caiman crocodilus*) inhabits the quiet waters of lakes, ponds, swamps, marshes and, sometimes, brackish waters or along the bends and meanders of large rivers in northern South America including the Amazon basin (Groombridge, 1982). The caiman grows upto 2.0 to 2.5m in length. Among the exotic crocodiles, this species is exhibited and bred in a number of Indian zoos. This paper intends to report on some aspects of breeding of the spectacled caiman observed at the Nandankanan Zoological Park, Orissa during the period 1986 - 97.

Three sub-adult spectacled caimans (one male and two females) were received at the Nandankanan Zoological Park, Orissa on 16.10.1986 from the Madras Crocodile Bank. One of the females died on 7.6.1987. The caimans were exhibited in a covered enclosure having a floor space of approximately 70.0 sq.m. The land area was planted with ornamental bamboo clumps. The depth of the pool was one metre at the deepest part. Attempt was made to keep the pool always filled upto the brim to facilitate easy movement of the animals into and out of water. The pool was cleaned once in a week and refilled with fresh water.



This pair of caimans was maintained on a diet of cut pieces of beef six days in a week. A live chicken was given occasionally to each as an alternative, as the caiman grew in size.

Observations

Breeding:

The female started laying eggs in 1989. The eggs were laid in a mound nest, about 3-5m away from the water's edge. The nest of 1991 consisting of plant materials such as dry sticks, leaves, twigs, etc., had a diameter of 50 cm and height of 35 cm. The mother used to remain near the nest indicating nest guarding behaviour. The details of breeding of this species in the park are given in Table-1.

As the Table will show, the eggs were laid invariably either in May or June and the eggs hatched in the latter part of July to early August. The clutch size (of five clutches) varied from 27 to 34 with a mean of 30.8 eggs. The eggs were hard-shelled, white in colour, elliptical in shape and the size of nine eggs recorded during 1990 and 1991 varied from 5.8-6.8 x 3.6-3.8cm. The weight of two eggs laid during 1991 was 55 gm each. The limited observations indicate that the egg-laying is not a regular feature in this species in the park. Acharjyo, *et al.*, (1996) reported on this feature in Gharials of Nandankanan Zoological Park.

The 36 hatchlings of 1990 and 1991 measured from 19.50 - 23.00 cm (mean 22.04 cm) from tip to tip including tail length from 10.00 to 12.00 cm (mean 11.14 cm). They weighed from 31.00 to 55.00 gm (mean 42.19 gm).

Growth

Nine hatchlings of 1990 measured 21.30-23.00 cm (mean 22.16 cm) from tip to tip and weighed 31.00 - 34.00 gm (mean 32.22 gm) at the time of hatching. These hatchlings, at the age of one year measured 51.00 to 79.00 cm (mean 69.22 cm) from tip to tip and weighed from 1.180 to 2.320 kg (mean 1.868 kg).

Supply to other zoos:

Four zoo-bred caimans (2 males and 2 females) were supplied to the Thiruvananthapuram zoo on 14.4.1994, two (one male and one female) were supplied to Vadodara zoo on 24.1.1996 and two (one male and one female) were supplied to the Regional Science Centre, Bhubaneswar on 5.10.1997.



Discussion

In India, caimans are breeding at the Madras Crocodile Bank Since 1981 (pers. com. R. Andrews, August 10, 1998) and at the Crocodile Breeding and Rehabilitation Centre, Kukrail (Uttar Pradesh) since 1986 (Ashok and Mishra, 1990). At Kukrail, egg-laying was reported during May-June. Hatching of eggs took place during August; clutch sizes were 32-34 eggs and the incubation period was 78-100 days (Ashok and Mishra, 1990).

In the Venezuelan llanos, nesting season was August-September depending upon rainfall patterns and local conditions. Mound nest constructed of plant materials average 177 x 104.5 cm with a height of 44.5 cm. The eggs vary from being spherical to elliptical with an average size of 63.8 x 44.7 mm and average weight of 59.9 gm. (Groombridge, 1982). Groombridge further reported that the incubation period was 70-90 days and the nest temperatures were 28-32 degree C.

According to Del Toro (1969), mound nest of this species consisting of debris including sticks, grass and dead leaves with a diameter of one metre and 40 cm height was constructed by a female at Tuxtala Gutierrez Zoo (Mexico) during May. Egg laying was recorded on 5th July and the eggs hatched on 18th September after 76 days of incubation. It was also reported that either the female or the male remained near the nest all the time not allowing the keeper or anyone else to approach the nest.

Hunt (1969) reported that a mound nest of size 152 x 90 cm, 23 cm height, composed of pea gravel and materials (damp moss and leaves) supplied by Atlanta Zoo authorities, was constructed by a gravid female caiman during May 1967. Hatching took place on 13th August, 1967. The eggs measured 6.3 x 3.8 cm and each of the five caiman hatchlings measured 23 cm in length.

Table-1: Details of breeding of spectacled caiman

Sl.No	Date of egg-laying	Clutch size	Date of hatching	Incubation period	No. of hatchlings	Percent hatching	Remarks
1	06.06.1989	27	Did not hatch	-	Nil	-	All eggs were spoiled
2	19.05.1990	33	08.08.1990 (4)* 09.08.1990 (4) and 12.08.1990 (1)	82-86	9	27.27	24 eggs were spoiled
3	20.05.1991	34	31.07.1991 (25) and 01.08.1991 (2)	73-74	27	79.41	7 eggs did not hatch
4	1992	Egg laying was not recorded during 1992					
5	10.05.1993	30	20.07.1993	81	19	63.33	11 eggs did not hatch
6	21.06.1994	30	30.08.1994	71	5	16.67	25 eggs did not hatch
7	1995	Egg laying was not recorded during 1995					
8	May 1996	Not recorded	31.07.1996	Not recorded	20	Not recorded	
9	1997	Egg laying was not recorded during 1997					

* No. of individuals hatched



References :

Acharjyo, L.N., Kar, S.K and Patnaik, S.K. (1996) : Studies on captive breeding of the Gharial, *Gavialis gangeticus* (Gmelin) in Orissa, *J.Bombay nat. Hist. Soc.*(2) : 210-213.

Ashok and Mishra, S.B. (1990) : Caiman breeding in captivity at Kukrail, *Indian Forester*, 116(11) : 896 -900

Del Toro, M.A.(1969) : Breeding the spectacled caiman, *Caiman crocodilus* at Tuxtla Gutierrez Zoo *International Zoo Year Book* 9: 35-36.

Groombridge, B.(1982) : *The IUCN, Amphibia-Reptilia Red Data Book*, Part-I, IUCN, Gland, Switzerland, 291-295.

Hunt, R.H.(1969) : Breeding of spectacled caiman, *Caiman crocodilus* at Atlanta Zoo-*International Zoo Year Book*, 9:36-37.



**STATUS, RANGE EXTENSION AND ECOLOGICAL
NOTES ON INDO-GANGETIC FLAPSELL TURTLE,
LISSEMYS PUNCTATA ANDERSONI (TESTUDINES :
TRIONYCHIDAE) IN JAMMU SHIWALIKS, J&K STATE.**

Anil K. Verma

Rural Technology Unit, Regional Research Lab.,
Canal Road, Jammu-180001.

and

D.N. Sahi

P.G. Department of Zoology,
University of Jammu, Jammu-180001.

Introduction

The freshwater turtle *Lissemys punctata* is one of the most widespread species in India, being found in swamps, lakes and rivers (Smith 1931; Daniel, 1983; Das, 1987). This species, as of today, exists in two sub-specific forms viz. *Lissemys punctata punctata* & *Lissemys punctata andersoni*. The former northern sub-species, *L. p. punctata* was considered the *forma typica* till Webb (1980) showed that the trinomial *punctata* should be correctly applied to the southern sub-species, *Lissemys p. granosa* of Smith (1980) and Pritchard (1979) from peninsular India and Sri Lanka.

Such a recommendation, amazingly enough, gave no name for the widely distributed and familiar yellow spotted northern sub-species and Webb (opp. cit.), therefore, proposed the name *andersoni* for it. While Smith (1931) remarked that the northern sub-species is absent from Assam, nearly half a century later, Talukdar (1979) and Das (1987) reported that *L. punctata andersoni* was widespread in the Brahmaputra drainage and extended its range of occurrence upto West Khasi Hills of Meghalaya in the Northeast, Punjab & U.P., in the North and Rajasthan in the West.

Das (1987) maintains that the comparative sizes of the enteroplastrial callosities as advocated by Smith (1931) were highly variable in size even within a



single form, sometimes being absent altogether, and therefore, could hardly be defended as a good taxonomic character. Das finally based his findings on the possession of yellow-blotched head and carapace in the sub-species *L. p. andersoni* which has been followed by the authors in this study.

Methodology Followed

A recent faunistic survey conducted in Jammu Shivaliks (32° 30' - 32° 48' N ; 75° 5' - 75° 23' E) J&K state, resulted in the collection of a number of specimens of the Indo-Gangetic flapshell turtle from roadside ponds, irrigation canals and lakes from an altitudinal range of 245-710m above sea level. The turtles were mostly studied at the site itself and released after recording the necessary morphometric details. Occasionally a specimen or two were brought to the laboratory for ascertaining their taxonomic identify. Carapace and plastron measurement (CL = Carapace length; CW=Carapace width; PL=Plastron width;) and shell-height (SH) in millimeters (mm) were taken with plastic tape and live-weights were recorded to the nearest gram (g) with the help of a spring balance. The various collection techniques employed for capture of freshwater turtles have been explained elsewhere in detail (Gupta, 1979; Verma, 1992).

Morphometric Description

Carapace, circular to oval in outline (CL=184-310; CW=175-268); widest just anterior to hind limb; width of disc 87-95% of its length. Carapace moderately arched. Carapace smooth slightly flared posteriorly and with a pale-coloured margin at the base. Shell height (SH=54-113) about 25-36% of CL.

Plastron nearly as long as 85-95% carapace (PL=168-265 and PW=130-205); mostly cartilagenous with 7 callosities. Head moderate to large. Proboscis short and stout; edges of jaw smooth. Claw large and heavy. Body weight 652-2900 g.

Coloration in life: Carapace olive brown above with large yellow spots of varying shapes and sizes. Plastron creamish-yellow. Head & limbs grey with light yellow spots on head & neck. With age these spots disappear. These morphological characters of specimens recorded during the course of this study match the description by Webb (1980) and Das (1987).



Ecological Notes: This turtle species prefers slow running irrigation canals, river distributaries, ponds, lakes and other still water. It is generally a non-aggressive species and rarely bites. It feeds upon aquatic vegetation, small fishes, insects, tadpoles and earthworms, showing an omnivorous food habit.

L. p. andersoni burrows itself deep (3-6 cms) inside the mud-bottom when waterbodies dry up during extreme summer & thus avoids moisture loss and escapes predation. Nests were located in the fields with a probing stick by driving its pointed end vertically into the nesting ground, taking enough care not to pierce and damage any eggs.

When the rod sank quickly into the ground it was almost a sure sign that the nest was there. Mostly nests were located close to waterbody in open or under cover of vegetation during August through October. In one live nest as many as 8-12 eggs measuring 22-33mm diameter were recorded. All the eggs were white in colour with a brittle shell and resembling table tennis-balls. Occasionally, clutches that were predated and destroyed by wild pigs, jackals or *Varanus* or trampled over by cattle were also noticed.

Present Status: It is a 'rare' turtle species in J&K State. It has been enlisted as 'vulnerable' in rest of India as it is heavily exploited for its flesh and eggs & has been protected under Schedule 1 of the Indian Wildlife (Protection) Act, 1972.

Distribution in J&K state: District Kathua; Udhampur district (Lake Mansar & Lake Surinsar) and Jammu district.

Range in India: Punjab, Rajasthan, Uttar Pradesh, Madhya Pradesh, Bihar, Assam, Meghalaya and West Bengal (Das, 1987 & 1991).

Elsewhere: Nepal, Bangladesh, Burma and Pakistan (Das, 1987).

Acknowledgements

We are grateful to Head, P.G. Department of Zoology, University of Jammu, Jammu for providing necessary facilities at the department during the course of this study.



References:

- Daniel, J.C. 1983. The book of Indian reptiles. *Bombay Natural History Society, Bombay.*
- Das, I. 1985. Indian turtles: A field guide. *World Wildlife fund, India (Eastern region), Calcutta.*
- Das, I. 1987. Distributional records for chelonians from North Eastern India : *J. Bombay Nat. Hist. Soc.* 87 (1) : 91-97.
- Gupta, V.K. 1979. Studies on the female reproductive cycles of some chelones from Jammu. *Ph.D. Thesis, University of Jammu, Jammu.*
- Pritchard, P.C.H. 1979. *Encyclopedia of turtles T.F.H. Publ. Inc., Neptune, New Jersey.*
- Smith, M.A. 1931. The fauna of British India including Ceylon and Burma. *Reptilia and Amphibia. Vol. I. Loricata, Testudines, Taylor and Francis, London.*
- Talukdar, S.K. 1979. *Lissemys punctata punctata* (Bonnaterre) (Testudines : Trionychidae). An addition to the chelonian fauna of Brahmaputra drainage, Assam, *Indian J. Zootomy* 20 (3): 181.
- Verma, A.K. 1992. Studies on the male reproductive cycles of some emydid turtles of Jammu. *Ph.D. Thesis, University of Jammu, Jammu.*
- Webb, R. 1980. The identity of *Testudo punctata* Lacepede 1788 (Testudines : Trionychidae). *Bull Mus. Nat. Hist. Paris* 4 (2) : 547-557.



**SURVEY OF REPTILIAN FAUNA OF
JAMWA RAMGARH WILDLIFE SANCTUARY, RAJASTHAN**

Satish Kumar Sharma
Range Forest Officer

Aravalli Afforestation Project, Jhadol (F.), Dist.
Udaipur, Rajasthan-313 702.

The Jamwa Ramgarh Wildlife Sanctuary is located in Jaipur district of Rajasthan State. This Sanctuary notified in 1982, comprises of a single range. The dominant vegetation that occurs in the Sanctuary are *Anogeissus pendula*, *Acacia senegala*, *Boswellia serrata*, *Lannea grandis* etc. The famous Jamwa Ramgarh Lake is situated at the outskirts on the Sanctuary. Trees of *Phoenix sylvestris* and thickets of *Typha angustata*, *T. elephantina*, *Phragmites karka* can be seen down-stream of the lake.

A systematic account of the reptilian fauna is given below in Table.I. It covers 20 genera and 22 species belonging to 16 families. This is the outcome of a one year survey made from July 1991 to July 1992.

Table 1: List of reptiles observed in Jamwa Ramgarh Wildlife Sanctuary

Family	Name of Species	Habitat	Status
Crocodylidae	<i>Crocodylus palustris</i>	Lake Water	VR
Emydidae	<i>Kachuga tecta</i>	Lake and down stream water	R
Trionychidae	<i>Lissemys punctata</i>	Lake and down stream water	C
Testudinidae	<i>Geochelone elegans</i>	Dry area and foot hills	VR
Gekkonidae	<i>Hemidactylus flaviviridis</i>	Human habitations and crevices of rocks	VC
	<i>H. brookii</i>	Tree trunks and hollows of stems	C



Agamidae	<i>Calotes versicolor</i>	Tree trunks and thickets of bushes	VC
Scincidae	<i>Mabuya carinata</i>	Forest floor	C
	<i>Riopa punctata</i>	Forest floor	C
	<i>Acanthodactylus cantoris</i>	Near <i>Saccharum bengalense</i> clumps in sandy areas	C
Varanidae	<i>Varanus bengalensis</i>	All habitats	VC
Typhlopidae	<i>Rhamphotyphlops braminus</i>	Moist and shady areas	C
Boidae	<i>Eryx johni</i>	Dryer parts	C
	<i>E. conicus</i>	Dryer parts	R
Dispadidae	<i>Lycodon aulicus</i>	All habitats	C
Natricidae	<i>Xenochrophis piscator</i>	Riverine	C
Colubridae	<i>Ptyas mucosus</i>	Near human habitations	C
	<i>Argyrogena ventrimaculata</i>	Scrub jungle	C
	<i>Spalerosophis diadema</i> var. <i>atriceps</i> .	Scrub Jungle	C
Homalopsidae	<i>Boiga trigonata</i>	Collected one from baya nest	R
Elaphidae	<i>Naja naja</i>	All habitats	C
Viperidae	<i>Echis carinatus</i>	Rocks and scrub jungle	VC

C= Common, VC= Very Common, R = Rare, VR= Vary Rare.

Acknowledgements

The author is grateful to the officials of the Forest Department of Rajasthan for the facilities and encouragement during the survey.



STUDIES ON LIZARD DIVERSITY IN SELECTED SACRED GROVES OF KERALA

M. Srinivasan, G. Ramaswamy and P. S. Easa*

Division of Wildlife Biology, A. V.C. College, Mannampandal.

*Division of Wildlife biology, KFRI, Peechi.

Ecological degradation and deforestation are progressing at an alarming rate. However, there is a network of traditionally protected areas called "sacred groves". These sacred groves are patches of vegetation preserved on religious grounds and man's innate reverence for nature with special significance to worship of selected trees. These groves serve as vehicles for ecological and genetic conservation wherein inherent diversity of flora and fauna are preserved. They are invariably associated with certain gods or goddesses. Sacred groves are called "Nanthavanam" in Tamil, and "Kavu" in Malayalam.

Sacred groves play a dynamic role in balancing the ecosystem including the agroecosystem of the region. Sacred grove is the abode of various organisms. Due to changing socio-economic conditions as well as land use systems, many sacred groves are now threatened and altered both in terms of size, vegetation structure and species composition. In India, scientific investigations pertaining to the sacred groves are restricted only to listing of plants in the states of Karnataka, and in Maharashtra (Gadgil and Vartak, 1975) and in Kerala (Induchoodan, 1988, 1991). There has not been any comprehensive ecological study on the fauna of sacred groves.**

Lizards are grouped under the suborder Sauria (Lacertilia) of the large order Squamata. About half of the living reptiles consists of lizards (Daniel, 1983). Lizards, despite their abundance and diversity evoke little popular response. A majority of Indian lizards have become rare (Murthy, 1990).

The study was conducted in three sacred groves in Kerala. They are Iringole, Mookuthala and Sangukulangara sacred grove. The Iringole sacred grove is situated in Perumbavoor Municipal area of Ernakulam district, Kerala. It is one of the biggest groves in Kerala and is about 10 ha. in extent. The area lies between



10° 10' N latitude and 76° 30' E longitude. A luxuriant patch of west coast tropical evergreen forest preserves the Bhagavathy Amman temple.

The Mookuthala sacred grove is situated in the Nannamukku village of Nannamukku Pachayat of Malapuram district, Kerala. It is about 3 ha in extent. The area lies between 10° 49' and 11° 40' N latitude and 75° 50' and 76° 35' longitudes. The climate is generally hot and humid. Maximum precipitation is received during southwest monsoon. The forest of Mookuthala sacred grove is lowland, which could be classified as southern tropical west coast evergreen type (Champion and Seth, 1968).

Sangukulangara sacred grove is situated in Srinarayanapuram near Kodungallur of Thrissur district, Kerala. It is about 3 ha in extent. The grove lies between 10° 40' N latitude and 76° 53' E longitude. National Highway 17 is closer to this place. Maximum precipitation is received in the period of southwest monsoon. The average annual rainfall is about 2500 mm. The forests of Sangukulangara sacred grove could be classified as southern tropical west coast evergreen (Champion and Seth, 1968).

The time-constrained method (Vogt and Hine, 1982) was adopted. Data on lizard species were collected in the morning, afternoon and in the evening spending two hours every time. Nine days were spent in Iringole covering the area 27 times. Eight days were spent with 24 sampling in the other two groves.

The three sacred groves harbored a total of seven species (four families) of lizards. The details of the species occurring in the three groves are given in Table-1.

The number of sightings of species was found to vary according to the time of the day and also varied according to the area. Mornings and evenings were the best time to get maximum number of observations.



Acknowledgment

Student author (Srinivasan) acknowledges the division of Wildlife Biology, A.V.C.College, Mayiladuthurai for giving him a chance to do this project and records his gratitude to the Director, Scientists and Research scholars Kerala Forest Research Institute, Peechi, for their help during the study.

Table-1. Details of lizard species sighted in the three sacred groves of Kerala. (IG-Iringole grove, MG-Mookuthala and SG-Sangukulangara grove)

Species Name	IG	MG	SG
I Family: Gekkonidae			
<i>Cnemaspis littoralis</i>	+	+	+
II Family: Agamidae			
<i>Draco dussumieri</i>	-	-	+
<i>Calotes versicolor</i>	+	+	+
III Family: Scincidae			
<i>Mabuya carinata</i>	+	+	+
<i>Mabuya macularia</i>	+	+	+
<i>Sphenomorphus dussumieri</i>	-	-	+
IV Family: Varanidae			
<i>Varanus bengalensis</i>	+	-	-

+ Present - absent



References :

- Champion, H.G and Seth, S.K. 1968.** *A revised survey of the forest types of India.* Nasik Government of India Press. 404 pp.
- Daniel, J.C. 1983.** *The book of Indian reptiles,* Bombay Natural History Society, Bombay.
- Induchoodan, N.C. 1988.** Ecological studies of Iringole Sacred grove. Thesis submitted to Kerala Agricultural University for the award of M.Sc. Degree in Forestry.
- Induchoodan, N.C. 1991.** Ecological studies on the Sacred groves of Kerala, Interim report submitted to WWF, New Delhi. pp.55.
- Murthy, T.S.N. 1978.** A new species of the Tree lizard (*Calotes elliotti*) Gunther (Reptiles:Agamidae) from New Amarambalam, Kerala. *The Indian J. Zoology* X 1 X (2):79-80.
- Nair, H.G. 1992.** Ecology studies of a Sacred grove for M.Sc Project work submitted to College of Forestry, Trissur.
- Gadgil, M and Vartak, V.D. 1975.** Sacred groves of India: A plea for continued conservation. *J. Bombay nat. Hist. Soc.*, 72(2):314-320.
- Vogt. R.C and Hine, R.L. 1982.** Evaluation technique for assessment of Amphibian and Reptile populations in Wisconsin. 201-217. *Herpetological communities* (eds) Norman J. Scott Jr. Washington, DC, US. Fish and Wildlife Service. pp 239.
- ** A recent study of birds in Sacred groves of West Bengal was published in Current Science (1998) - Éd.**



TERRITORIAL BEHAVIOUR IN *EUPHLYCTIS CYANOPHLYCTIS*

Pranab Kumar Mallick

Department of Zoology, Dum Dum Motijheel College,
Dum Dum, Calcutta - 700 074.

Information is available on courtship of *Rana verrucosa*, *Euphlyctis cyanophlyctis* and *Hoplobatrachus tigerinus* (Mallick 1982, 1988, 1998). The present paper deals with the behaviour of male and female *Euphlyctis cyanophlyctis* during spawning. To study the territorial behaviour of *Euphlyctis cyanophlyctis*, 25 breeding grounds were visited in the vicinity of Duillya, Howrah District, West Bengal, India during monsoon period for five consecutive years (1993-1997). These aquatic frogs are territorial and prefer temporary pools close to sides of permanent habitats (Mallick, 1988).

(A) Behaviour of males

(i). **Calling** : Started at an ambient temperature ranging from 28° - 30° C and mostly at dusk or later after a shower. Three types of calls were recorded, including territorial advertisement (Types : I & II) and agonistic (Type : III).

Type-I advertisement calls were short-pitched and of short duration, opened by a single male in the breeding area.

Type-II advertisement calls are of high intensity, emitted spontaneously by males at irregular intervals both during the day and night, culminating in a chorus.

Playback of Type-II call from a tape recorder (37 times) evoked territorial males to emit Type-II advertisement calls. Type-III call, the defence or encounter call was noted 56 times to be directed towards an individual of the same sex in an agonistic encounter. This type of call is emitted when the intruding male reached within a distance of 0.3 meter from the resident male. When the intruder proceeded further, aggressive challenges including physical attacks on the opponent were observed.



(ii). **Postures** : A high posture was exhibited by territorial males with inflated lungs and stretched limbs over water, with the toes and belly underwater, the head held up at a slight angle exposing the bright white throat. Maintenance of such a posture by resident males have been found even when they were not actively calling. Other territorial males entering the breeding ground has been observed to maintain a low posture with only the top of the head and eyes above the surface of the water (Mallick, 1986) and such satellite males apparently moved into the territories cautiously.

(iii). **Male-male competition** : Some of the territorial males in the breeding area delivered

Type-II calls. A male always kept possession of a particular area of about 0.3 meter in diameter. Males sometimes jump above the surface of water on seeing a conspecific male intruding.

Agonistic behaviour has also been observed (Mallick, 1986). Males in the breeding territory frequently challenge one another. When a male of the same breeding territory is found to enter into the area of another individual, he would be attacked by the resident male. Aggressive behaviour has been noted 105 times in the breeding territory populated by more than 10 males. The aggressive encounters in every case lasted for one or two seconds. Resident males before attacking the intruder, deliver Type-III encounter call.

(B) Behaviour of females

Females did defend territories but no aggressive interaction between females were observed. Females, in selecting males move into male territories with a low posture similar to that of satellite males. On selection of a resident male, female approach was slow, keeping the body low. After reaching close to the male, she became stationary. The male climbed on the back of the female and clasped her in axillary amplexus.



Acknowledgement

Financial support from U.G.C. Grant NO.F-26-1 (816)/90 SR(II) is gratefully acknowledged.

References :

- Mallick P.K. 1982.** Breeding behaviour of *Rana verrucosa* Gunther, 69th Indian Science Congress, 7(3) : p.46, Late Abstract.
- Mallick P.K. 1986.** Territoriality in the frog, *Rana cyanophlyctis*: vocalizations and agonistic behaviour, 7th Nat. Symp. on Recent Advances in Life Sciences, Gulberga, p.108-109.
- Mallick P.K. 1988.** Mating behaviour of *Rana cyanophlyctis*, Proc. 8th Nat. Symp. Life Sci., Patna, p.9-12 (Eds : A.K.Saxena and V.L.Saxena, Manu Publications, Kanpur).
- Mallick P.K. 1998.** Calling behaviour and courtship of *Hoplobatrachus tigerinus*, *Cobra*, 32:p.1-6.



NOTES

ADDITIONAL RECORD OF THE TRAVANCORE TORTOISE, *INDOTESTUDO FORSTENII* (SCHLEGEL & MULLER) (TESTUDINIDAE : REPTILIA) IN KERALA.

Indotestudo forstenii (Schlegel & Muller), commonly known as the Travancore tortoise is endemic to the Western Ghats and is known to occur in Kerala, Tamil Nadu and Karnataka states. Bhupathy and Choudhury (1995) provided precise, updated information on the distribution of the Travancore tortoise. Accordingly, the species is found in Neyyar, Peppara, Peechi, Parambikulam, Silent Valley and Idukki wildlife sanctuaries, the Periyar Tiger Reserve, Chalakudy and Karulai forests of Kerala, Kothaiyer Reserve Forest and Indira Gandhi Wildlife Sanctuary of Tamilnadu, Sharavathi, Mookambika and Dandeli sanctuaries, Neria and Agumbe forests of Karnataka. The species also occurs in some islands of Indonesia and is believed to have been introduced there. Groombridge (1993) has categorised the Travancore tortoise as a rare species.

During the course of a faunistic survey conducted in the Pathanamthitta district of Kerala, a juvenile specimen of the species was collected, and the observations made are reported here.

Observations

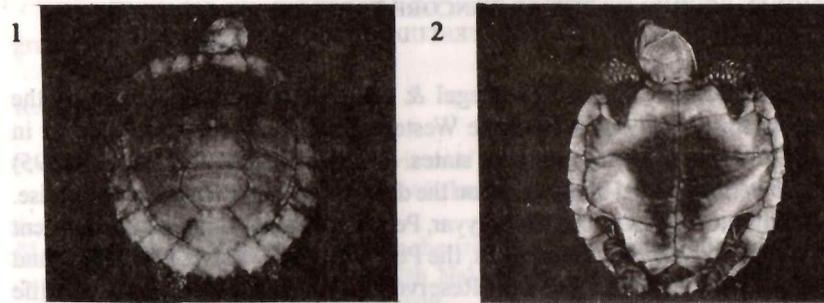
Material examined: 1 example (figs. 1 & 2) of *Indotestudo forstenii* (Schlegel & Muller) (Synonyms : *Testudo forstenii*, *Geochelone forstenii*, *Testudo travancorica*, *Geochelone travancorica*) collected near Pamba (Goodrickal range, Ranni forest division), Pathanamthitta district, Kerala on 19.11.1997 by P.M.Sureshan and party.

Diagnosis : Nuchal (cervical) shield absent; suture between the pectoral shields shorter than that between the humeral.

Measurements (in mm) :

Carapace length	: 66.70
Carapace width	: 64.60
Plastron length	: 52.36
Shell height	: 38.74

Habitat: The specimen studied was obtained from a semi-evergreen forest habitat near Pamba river.



Figures 1 & 2 : Dorsal and Ventral views of the Travancore tortoise, *Indotestudo forstenii* collected from Pathanamthitta district, Kerala.

Acknowledgements

The author is grateful to Dr.J.R.B.Alfred, Director, Zoological Survey of India, Calcutta for facilities and encouragement.

References

- Bhupathy, S. & B.C. Choudhury (1995)** Status, distribution and conservation of the Travancore tortoise, *Indotestudo forstenii* in Western Ghats. *J.Bombay Nat. Hist. Soc.* 92 (1) : 16-21.
- Groombridge, B. (ed.) (1993)** *1994 IUCN Red list of Threatened Animals*, IUCN Gland, Switzerland and Cambridge, U.K.

C. Radhakrishnan

Zoological Survey of India, Calicut - 673 002.

FADING OF BREEDING COLOUR IN MALE *CALOTES VERSICOLOR* AFTER COPULATION

During the months of June and July 1997, I observed five copulating pairs of common garden lizard (*Calotes versicolor*) in the forest areas of Jhadol Range in Udaipur district of Rajasthan State. While observing this, I found three things common in all five cases:

(1) Copulation took place on ground, (2) the act was observed between 8.00 to 10.00 hrs, and (3) before copulation, the head, shoulders, part of the forelegs and anterior half of the body of all the males were of bright scarlet colour with black patches, but just after completion of copulation, the scarlet colour of the body faded within a few seconds. No change was recorded in the black patches of the throat.

In one case, at the outskirts of Phulwari Sanctuary, I observed a copulating pair at about 1103 hrs and the male lost the brilliance of the scarlet colour at about 1104 hrs. I observed the male till 1600 hrs continuously. During these five hours the male remained in a faded scarlet colour. I could not follow the male further and hence it is difficult to say anything about further changes in the intensity of the scarlet colour.

The brilliance of scarlet colour may help to differentiate the copulated males from non-copulated males atleast on a particular day.

Satish Kumar Sharma

Range Forest Officer,

Aravalli Afforestation Project, Jhadol(F), Dist.Udaipur, Rajasthan - 313 702.

A GARDEN LIZARD (*CALOTES VERSICOLOR*) FEEDING ON A DRY MANGO (*MANGIFERA INDICA*) LEAF

According to Daniel (1983) the Garden Lizard (*Calotes versicolor*) is mainly insectivorous. Besides, insects and a few other small animal food items, there are also a few reports of vegetable food being taken by the garden lizard (Mc Cann, 1940; Daniel & Shull, 1963; Sharma, 1982; Bhatti *et al.*, 1987; Sekar, 1988; Sharma, 1994).

On 21st June 1998, about 10 AM., during a visit to Akyawd Forest Nursery of Deola Forest Range in Udaipur district of Rajasthan State, I happened to observe a full grown male *Calotes versicolor* feeding on a fallen dry leaf of mango (*Mangifera indica*) on ground below the tree. Initially it made one small bite at the tip of one of the fallen dry leaves and swallowed the piece without any difficulty. It



made three efforts *in toto* in the same way and ate a small portion of the mango leaf. Chhaju Ram, the person-in-charge of the nursery, told me that he had observed this behaviour of the same (?) *Calotes* many times for the last one week.

References :

- Bhatti, U.S., Bhatti, S.K. & Bhatti, S.S. (1987) : Vegetation in the food contents of Garden Lizard (*Calotes versicolor* (Daudin) Reptilia: Agomidae). *J. Bombay nat. Hist. Soc.* 84 (3): 692-93.
- Daniel, J.C. (1983) : *The book of Indian Reptiles*. Bombay Natural History Society, Mumbai.
- Daniel, J.C. & Shull, E.M. (1963) : A list of the reptiles and amphibians of Surat, Dangs, South Gujarat. *J. Bombay nat. Hist. Soc* 60: 737-43.
- Mc Cann, C. (1940) : A reptile and amphibians miscellany. *J. Bombay nat. Hist. Soc.* 42:45-64.
- Sekar, A.G. (1988) : A note on the food habit of the garden lizard *Calotes versicolor*. *J. Bombay nat. Hist. Soc.* 85 (1): 199.
- Sharma, R.C. (1982) : Taxonomic and ecological studies on the reptiles of Gujarat. *Records of Zool. Survey of India*. 80:85-106.
- Sharma, S.K. (1994) : The Common Garden Lizard *Calotes versicolor* (Daudin) feeding on germinating seeds of *Feronia limonia* (Linn.) Swingle. *J. Bombay nat. Hist. Soc* 91 (1) : 150.

Satish Kumar Sharma

Range Forest Officer,

Aravalli Afforestation Project, Jhadol (F), Dist. Udaipur, Rajasthan-313 702.

VEGETARIANISM IN MONITOR LIZARD *VARANUS BENGALENSIS* (SCHNEIDER)

In August, 1998, a monitor lizard *Varanus bengalensis* was observed in the Akyawad Forest Nursery of Aravalli Afforestation Project Range Deola, in Udaipur district of Rajasthan feeding on the tender leaves of mentha (*Mentha spicata* L.). According to Daniel (*The Book of Indian Reptiles*, BNHS, 1983) *V. bengalensis* is a carnivorous reptile which catches any animal it can overcome like skinks, calotes, small turtles and snakes, fish, crabs, prawns, insects, arachnids



and nestlings of squirrels, bats, etc. It also eats carrion and eggs of birds. Leaves of *M. spicata* is a new addition to the diet of monitor lizards from southern Rajasthan. Hence this is worth placing on record.

Satish Kumar Sharma

Range Forest Officer,

Aravalli Afforestation Project, Jhadol (F), Dist. Udaipur, Rajasthan. 313 702

PREDATION OF *EUPHLYCTIS CYANOPHLYCTIS* TADPOLES BY SQUIRREL AND MYNA.

On 21st July, 1998, I was standing near a water tank in my garden. The unused water tank was filled with rain-water and was converted into a pool. This was used by a small population of Indian skipper frogs (*Euphlyctis cyanophlyctis*) as breeding site. At 0735 hrs, I saw a five-striped palm squirrel (*Funambulus pennanti*) running very fast and jumping into the pool (the water was only 5-10 cm deep). The squirrel very swiftly grabbed something like a small animal from the water and ate it; within five minutes the squirrel caught almost 20-22 animals and ate them. After very carefully watching the squirrel, its victims were identified. They were the *E. cyanophlyctis* tadpoles.

Next day in the morning, I observed a pair of common myna (*Acridotheres tristis*) also catching tadpoles and froglets from the same pool and feeding them to their two young ones.

These two observations of the preying habits of squirrel and myna are quite interesting and very unusual. The myna and some of the insectivorous birds are known to feed on tadpoles and frogs but squirrel feeding on tadpole is not known.

Raju vyas

Sayajibaug zoo, Vadodara-390 018, Gujarat, India



ABOUT A LITTLE KNOWN SNAKE PARK IN MAHARASHTRA : AN APPEAL

Snakes play a crucial role in the destruction of rodents which take a heavy toll of food grains. If snakes are to be saved, we must educate the people. We must remove their blind beliefs about snakes. For this purpose, I formed the Shetakari Shikshan Mandal in the secondary school, named Mamasahab Lad Vidyalaya at Dholgarwadi. I am a teacher and the Head Master of the said School. I wished to run a snake park and laboratory here. Wherever I went, I used to catch snakes, bring them home and keep them in earthen pots and wooden boxes. After some days, I came to know that snakes don't live long in boxes and pots and, I began to keep them in concrete pits where they would get water, insects, and frogs. After constructing the school building with the help of the local people and my fellow teachers, I constructed a snake park consisting of fourteen pits.

I showed the students how to handle the snakes, how to catch them and how to identify them. Gradually they began to identify poisonous and non-poisonous snakes and then began to catch them. At present 300 girls and 375 boys love the snakes and easily handle them. They also help the snake bite patients to reach the hospital and get treatment in time.

Surrounding villagers and farmers are benefited by this education on snakes. They don't kill them but let them live in their fields. Besides these people, military commandos, officers of the Forest department and medical students and also doctors often visit the snake park to learn about snakes.

On the occasion of Nagpanchmi, there is a great show of snakes to impart scientific knowledge to the public. A very big fair is held in the school premises. This programme has been telecast on Mumbai Doordarshan and Panjim Doordarshan.

We are running this snake park with our own meagre funds. Donors and government are requested to help us to develop this snake park..

Baburao Takkekar
Secretary,
Shetakari Shikshan Mandal, Dholgarwadi, Maharashtra.



RANDOM HARVEST

Forward & Backward in Evolution

Scientists generally agree that the rattlesnake developed its rattle in the course of its long evolution as a mechanism to warn unwanted visitors like the larger mammals as it lay coiled up on the great plains of Northern and Central America waiting for rats, mice and other small warmblooded animals to pass by.

In the Feb.1998 issue of *The Monitor*, the Newsletter of the Hoosier Herpetological Society, Ed. Ferrer writes about one species of rattlesnake, the Santa Clara rattlesnake (*Crotalus catalinensis*) which has, in the course of further evolution, moved in the reverse direction and shed its rattle. It had reached its present habitat in Santa Catalina island probably by rafting from the mainland. In its new environment, the rattle was not only not necessary but could be an impediment. The island does not have large animals who could trample on the snake by accident and, therefore, had to be 'rattled' away. Also, the snake seems to have changed its diet and hunting habits. Instead of 'sitting and waiting' as other rattle snakes do, this species hunts at night for spiny lizards and sparrows roosting in the shrubs. While out on such a trip, a noisy rattle might prove a liability.

Hop-step-and-fly

"Also known as the 'flying frog', the Bornean tree frog makes a more or less vertical descent through the trees with its outspread foot membranes acting like little parachutes".

(Sanctuary. Feb.98)

Something to Crow Over

The Hindu of 17th Dec. 1998 carries a report from the *New Scientist* on the work of Dr. Claudia Almeida and colleagues of the State University of Norte Fluminense in Rio de Janeiro, Brazil, based on research done at the University of



Wisconsin to develop antivenin from the yolk of eggs from hens immunised with small doses of viperine venom. Several advantages are claimed for this over antivenin developed from the blood of horses injected with snake venom. Chicken antivenin is upto six times more potent than horse antibodies; the antibodies in egg yolk are highly concentrated and purer than those in mammalian blood; only simple equipments are required; it is easy to produce; it causes fewer adverse reactions; it is cheaper.

Legislation Turned Turtle

In the *Random Harvest* in Vol.24(April - June 1996) of *Cobra*, I had referred to the announcement by the U.S Govt. of a ban on shrimp imports from countries which had failed to ensure the provision of turtle extruder devices (TED) in shrimp nets to prevent accidental killing of endangered sea turtles by shrimp trawlers. There was a set-back to this laudable effort when the Dispute Settlement Board (DSB) of the World Trade Organisation (WTO) to which the U.S is a signatory quashed the ban imposed by the U.S. The U.S. Government went on appeal against this to the appellate body under WTO. The appellate body, in October '98, confirmed the orders of the DSB. The positive side to the appellate decision was that it ruled (a) that the trade interests of the member countries of WTO cannot supersede environmental interests and (b) that sea turtles are "exhaustible natural resources" within the meaning of Article XX (g) of GATT (General Agreement on Trade and Tariff). The appellate body, however, confirmed the orders of the DSB quashing the U.S. ban only for the reason that there was an "unjustifiable discrimination" in the application of the U.S legislation and hence it was repugnant to Article XX of GATT. One can only hope that the U.S. Government will set right whatever lacuna there is in its legislation in order to save the bold and enlightened measure it had taken to conserve the endangered and vulnerable sea turtles of the world.

- B. Vijayaraghavan

Annual subscription for 4 issues of COBRA
commencing from the date of
subscription including postage.

Inland Individual - Rs. 75/-
Inland- Institution - Rs. 150/-
Overseas Individual & Institution - U.S. \$ 10/-

Subscription may be sent by MO/DD
drawn in favour of
" Chennai Snake Park Trust"
Payable at Chennai.

Chennai Snake Park Trust
Raj Bhavan Post
Chennai - 600 022. India.

Printed on behalf of the Chennai Snake Park Trust
by aad infinitum, alwarpet, chennai 600 018.

**AIMS AND OBJECTIVES OF
CHENNAI SNAKE PARK TRUST**

- 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.