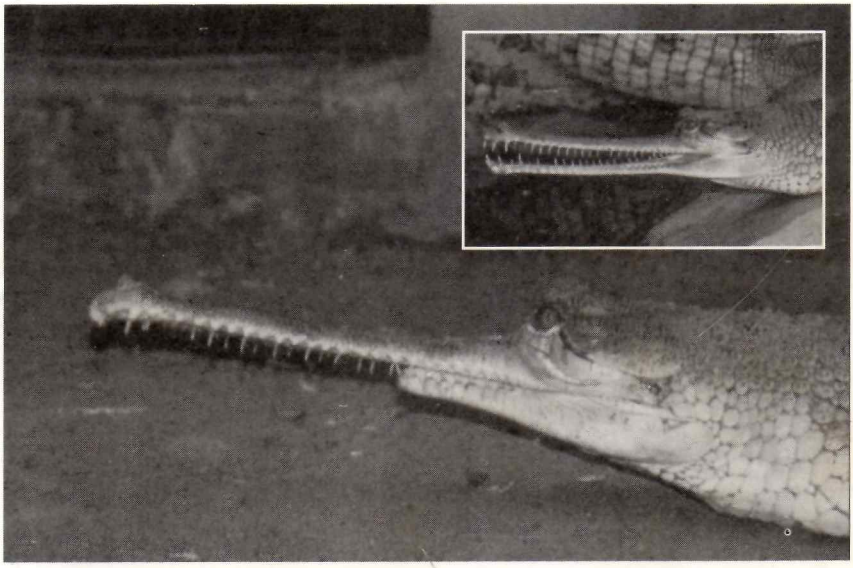
Cobra

Volume - 60 April - June 2005



CHENNAI SNAKE PARK TRUST

Quarterly Journal of the Chennai Snake Park Trust

Cover

The handicapped gharial (*Gavialis gangeticus*). Inset: Normal gharial. **See pp. 26-29**

Photo: R.R. Chari

A Crocodile

"Hard by the lilied Nile I saw
A duskish river-dragon stretched along,
The brown habergeon of his limbs enamelled
With sanguine almandines and rainy pearl:
And on his back there lay a young one sleeping,
No bigger than a mouse; with eyes like beads,
And a small fragment of its speckled egg
Remaining on its harmless, pulpy snout,
A thing to laugh at, as it gaped to catch
The baulking merry flies. In the iron jaws
Of the great devil-beast, like a pale soul
Fluttering in rocky hell, lightsomely flew
A snowy trochilus, with roseate beak
Tearing the hairy leeches from his throat."

– Thomas Lovell Beddoes
(1803 – 1849)

Habergeon = A sleeveless coat-of-mail
Sanguine = blood-red colour
Alamandine = A precious stone (garnet) deep red in colour.
The poet seems to be a little confused about the colour of the Nile crocodile's limbs.
Trochilus = A small bird reported to pick the teeth of the Nile crocodile (*Crocodylus niloticus*) and also remove from its mouth a leech which is said to greatly torment the reptile. The belief about the "crocodile bird" dates from the time of Aristotle (384-322 BC) but opinion is divided on whether this is fact or fiction. The bird has sometimes been identified as the Egyptian plover (*Pluvianus aegypticus*) but even this is not certain. No such occurrence has ever been reported in regard to other crocodiles.

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CONTENTS

REPTILIA OF ACHANAKMAR WILDLIFE SANCTUARY, CHHATTISGARH

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Abstract

The present paper deals with the study of reptiles from the Achanakmar Wildlife Sanctuary, Chhattisgarh State. The paper gives information on 14 species belonging to 13 genera and seven families. Kollegal ground gecko *Cyrtodactylus collegalensis* (Beddome) has been recorded for the first time from Chhattisgarh.

Introduction

Achanakmar Wildlife Sanctuary (AWLS) is situated in the Satpura range and lies between 22° 24′ and 22° 35′ N latitudes and 80° 55′ and 81 ° 35′ E longitudes. The sanctuary is located in Bilaspur district and the total area is 553.286 sq. km. The forest of the sanctuary is mainly of tropical moist deciduous type having the Sal forests, mixed forests, Teak plantations and thick Bamboo forests.

The sanctuary is rich in faunal diversity including invertebrates. It is excellent biogeographical terrain with occasional small plateaus and shallow valleys which provide good shelter for the higher vertebrates as well as lower animals. Nevertheless, very little information is available in

respect of faunal diversity in the sanctuary except on some mammals and birds. While working on faunal diversity of the sanctuary during the months of June and July 2004, the team from the Zoological Survey of India, Jabalpur, studied the reptiles of the sanctuary. A total 14 species of reptiles pertaining to 13 genera and 7 families were identified adding a new record of a gecko, Kollegal ground gecko *Cyrtodactylus collegalensis* (Beddome) to the fauna of Chhattisgarh. Furnished below is a list of the 14 species identified along with full details of the new record of the gecko found by the study team.

CLASS – REPTILIA
ORDER – SQUAMATA
SUBORDER – SAURIA

Family: Gekkonidae

1. ***Cyrtodactylus collegalensis* (Beddome)**
Kollegal ground gecko

Material studied: 1 ex., Manjhi Dongri, Bilaspur, 07/VI/04, Reg. No. V-3927, Coll. A. Sing & Party.

Habit and habitat: The species is arboreal and insectivorous. It occurs in forests at low elevations.

Diagnostic characters: This small gecko has a remarkable similarity with *C. nebulosus* in scalation but is devoid of enlarged dorsal tubercles on the back. Its colour pattern is also different and two main colour forms are recognized. In Beddome's speciosus form, dorsum is having four dark brown, black-margined cross bands. In *Cyrtodactylus collegalensis* dorsum is light brown to grey, with a series of large, rounded black-margined spots arranged in pairs.

Distribution: India: Chhattisgarh, Madhya Pradesh and hilly districts of Southern India. Elsewhere: Sri Lanka.

2. ***Hemidactylus brooki* Gray**
Spotted house gecko
Material studied: 1 ex., Near Chaparva Rest house, Bilaspur, 07/ VI/ 04, Reg. No.V-3938, Coll., A.Singh & Party. 1 ex., observed near Maniyari river bank, Chaparwa, Bilaspur.

Family: Agamidae

3. ***Calotes versicolor* (Daudin)**
Garden lizard
Material studied: 1 ex., Diyawan Forests, Bilaspur, 28/VII/04, Reg. No. V-3941 and, 1 ex., Diyawan Pahari, Bilaspur, 11/VI/04, Reg. No.V-3942, Coll. A. Sing & Party.

4. ***Psammophilus blanfordanus* (Stoliczka)**
Blanford's rock agama
Material studied: 3 ex., Manjhi Dongri, Bilaspur, 07/VI/04, Reg. No.V-3940, Coll. A.Singh & Party. 2 exs., observed near Kabir Forest aria, Bilaspur.

5. ***Sitana ponticeriana* Cuvier**
Fan throated lizard
Material studied: 2 ex., Marvahi Forest, Bharosang, Bilaspur, 20/VI/ 04, Reg. No.V-3939, Coll. A.Singh & Party. 1 ex., observed near, Kudiya dam, Bilaspur.

Family: Scincidae

6. ***Mabuya carinata* (Schneider)**
Common keeled grass skink or
Common skink or Brahminy skink
Material studied: 1 ex., Chaparwa, Bilaspur; and 2 exs., Atariya Guest House, Bilaspur.

7. ***Mabuya macularia* (Blyth)**
Bronze grass skink or Little skink
Material studied: 1 ex., observed Near Maniyari River Bank, Chaparwa, Bilaspur and 1 ex., Atariya Guest Hosue, Bilaspur.

Family: Varanidae

8. *Varanus bengalensis* (Linnaeus)
Common Indian monitor
Material studied: Observed on Jhandi Road, Dist.-Bilaspur.

SUB ORDER – SERPENTES

Family: Boidae

9. *Python molurus* (Linnaeus)
Indian rock python
Material studied: One observed near Khudiya Dam, Bilaspur.

Family: Colubridae

10. *Amphiesma stolata* (Linnaeus)
Buff striped keelback
Material studied: One observed on Sarasdol Road, Bilaspur, 23/VII/04, Reg. No.V-3921, Coll. A.Singh & Party.

11. *Lycodon aulicus* (Linnaeus)
Common wolf snake
Material studied: One observed in Satta Pani, Bilaspur, 09/VI/04, Reg. No.V-3920, Coll. A.Singh & Party.

12. *Ptyas mucosus* (Linnaeus)
Rat snake
Material studied: One observed near Nursery, Atariya, Bilaspur.

13. *Xenochrophis piscator* (Schneider)
Checkered keelback
Material studied: One observed near Bharosang, Marvahi Forest, Bilaspur.

Family: Elapidae

14. *Bungarus caeruleus* (Schneider)
Common Indian krait
Material studied: One observed near Atariya Guest House, Bilaspur.

Acknowledgements

The authors are grateful to Dr.J.R.B. Alfred, Director, Zoological Survey of India for providing all the necessary facilities and encouragement. Thanks are also due to Conservator of Forests, Bilaspur, Chhattisgarh and his staff for the facilities and logistic support during the survey work. The financial assistance of Ministry of Environment and Forests, Govt. of India, New Delhi for the project is also acknowledged. We are also thankful to party members Dr.Ajeet Singh, Research Associate and Mr. Sunil Gupta, Junior Research Fellow of the station for their help during the collections and their valuable inputs.

References

Chandra, K and Gajbe, P.U. (2004). An inventory of Herpetofauna of Madhya Pradesh and Chhattisgarh. *Zoos Print Journal* 20 (3): 1812 – 1819.

Denial, J.C. (2002). *The Book of Indian Reptiles and Amphibians.* Published by Bombay Natural History Society 1-158 pp.

Sharma, R.C. (2002). *The Fauna of India and the adjacent countries,* Reptilia Vol.II. (Sauria): 1-430. (Published by Zoological Survey of India, Kolkata).

Sharma, R.C. (2003). *Hand book Indian Snakes:* 1-292. (Published by Zoological Survey of India, Kolkata).

Smith, M.A. (1935). *The Fauna of British India including Ceylon and Burma, Reptilia and Amphibia,* Vol.2 (Sauria). Taylor & Francis, London, 440 pp.

Smith, M.A. (1943). *The Fauna of British India including Ceylon and Burma, Reptilia and Amphibia, Vol.3* (*Serpentes*). Taylor & Francis, London, 583 pp.

REPTILIAN FAUNA IN AND AROUND KORATTUR LAKE, CHENNAI

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Introduction

Korattur Lake encompasses 4 sq. km. area comprising of a vast water spread and surrounding scrub jungles. There are also extensive patches of grasslands in and around the lake. The lake spreads over many towns, namely, Srinivasapuram and Pattravakkm in the south and Madhananguppam & Puthagaram in the north. The lake area has some temples and, therefore, people come and go frequently.

The flora here is diverse. Owing to the location of the lake in the alluvial plains, it has very fertile soil and an average annual rainfall of about 100 cm. The lake has many patches of scrubland in it besides the scrub-covered lake bund. The 4 m high lake bund has dense vegetation comprising of toddy palm (*Borassus flabellifer*), umbrella thorn (*Acacia planifrons*), neem (*Azadirachta indica*). Shrubs include prickly pear (*Opuntia* sp.) and medicinal ones like tulsi (*Ocimum sanctum*) and notchi (*Vitex negundo*). The marsh plant locally known as venmaruthai, flourishes here. It has a characteristic hollow stem with large leaves and a purple coloured tumbler shaped flower. It grows in clusters here and there in the lake. Water plants like the lilly, water hyacinth and many types of wetland rushes abound in the lake.

There are a number of human settlements all around the lake. People here collect fuel-wood (mostly *Acacia*) and fallen logs. They also graze their cattle in these meadows and scrubs, which obviously damages the pristine parts of the lake. Apart from this, the lake is also the place where the Soka Ikeda College is situated. Human disturbance is on the increase in the area. To add to this, there are a few small farmhouses with a few native trees and shrubs. Greens and vegetables like brinjal, ladies finger, tomato, pumpkins are cultivated. Loads of fertile soil are taken from the lake for house construction purposes. People also wash their clothes, take bath etc. in the lake.

Study period

The survey was done for a period of five years (i.e. 2001 – 2004). The present communication limits the observations to snakes and other reptilian fauna sighted only in and around the lake area. We follow Das (2003) for scientific names.

Results

In all we recorded twenty two species of reptiles from the Korattur Lake.

Lizards

Eight species of lizards belonging to five genera and three families were recorded. All geckos here are nocturnal and found mainly in and around neem and palm trees. Skinks are active during the day. They stick to the rocky outcrops and small shrubs. They occur in plenty once the dam and the large stream are dry. Agamids are very common, especially the garden lizard. They are the main prey for the many snakes here. We have recorded rat snakes, vine snakes and bronzebacks feeding on these lizards. Out of the two species of agamid lizards found here, the fan throated lizard, is rare. It has been sighted only a few times, that too, in the northern fringes of the lake.

Snakes

Thirteen species of snakes belonging to thirteen genera and six families have been recorded (Table 2).

The common worm snake is a small snake that is often mistaken for earthworm. It is well adapted to a fossorial life and can be found under rocks in the lake bund and in the dry water-hyacinth beds.

The common sand boa is a very rare snake here. We have observed a sand boa. It is a nocturnal snake that may be occasionally active in early mornings and late evenings. It is the only constrictor found here.

Land snakes include the common wolf snake and the Russell's kukri snake. The wolf snake is a small snake with dark brown body and pale yellow bands. It is nocturnal. Kukri is a beautifully marked snake with longitudinal stripes and splashes here and there. But its distinctive feature is the arrow shaped mark on the head. Both these snakes live in secured and well sheltered places that have abundant geckos to feed on.

Rat snake is the longest snake here. We have seen 8 feet long rat snakes from the lake. Rat snakes are found in the lake bund, the nearby scrub patches and near the houses. Sightings and rescues of hatchlings from houses confirm their breeding population inside houses. They are regularly eaten by the local gypsies.

Two species of arboreal snakes, the bronzeback tree snake and green vine snake are found. They are snakes of the scrub. Both are diurnal and are fond of agamid lizards or nesting birds. They live mainly in the *Acacia* scrubs. During late evenings we have observed both bronzebacks and vine snake sleeping in a coiled position on the branches of acacia trees.

Keelbacks were recorded mostly in the vicinity of the water body. The striped keelback is a land snake frequenting grassy meadows and bushes and the vicinity of water bodies. They feed on crickets, frogs and toads. The checkered keelback and olive keelback are water snakes. They are

nocturnal or diurnal depending on the climate. They both feed on fish, frogs and crabs. They live in marshes, ponds and waterlogged grasslands. All these keelbacks aestivate during summer (March-June) inside the dry water hyacinth beds along with flapshell turtles.

Venomous snakes are rare here. The common krait is very rare. We have sighted a krait in a house, seen a few dead kraits on the road and near houses. There is also a record of a krait bite victim in Korattur.

The slender coral snake is the smallest venomous snake here barely growing larger than a foot in length. It is also rare. But we have caught some coral snakes from houses.

Unlike these two venomous snakes, cobras are not so rare. We have caught cobras from houses and released them safely in the lake area. We have also seen cobras in the lake area, collected their sloughs from many parts of the lake area but mainly from the dam and the large stream when dry. Cobras can be sighted in the lake area mainly at night, though sometimes a cobra may make a daytime appearance. Juvenile cobras are also observed mainly in houses. Year after year hatchlings regularly turn up from June to September.

Table 1 & 2 give details of the snakes recorded. To identify the snakes, we have used Das (2002).

Turtles

There is only one species of turtles here. The Indian flapshell turtle (*Lissemys punctata*) is the common freshwater turtle of south India. It is found in the wetland habitat in the lake. Many turtles have been rescued by us from houses and the roadside and even from railway tracks. They stray far out of their usual haunts especially on wet and rainy nights. During summer, they congregate in large numbers to aestivate inside the dried up water-hyacinth beds.

Checklist of reptiles of Korattur Lake

Order: Chelonia

Family: Trionychidae

1. Flapshell turtle (*Lissemys punctata*)

Order: Squamata

Sub-order: Sauria

Family: Gekkonidae

2. House gecko (*Hemidactylus frenatus*)
3. Brook's gecko (*Hemidactylus brooki*)
4. Bark gecko (*Hemidactylus leschenaultii*)

Family: Scincidae

5. Keeled grass skink (*Mabuya carinata*)
6. Little skink (*Mabuya macularia*)
7. Spotted supple skink (*Riopa punctata*)

Family: Agamidae

8. Common garden lizard (*Calotes versicolor*)
9. Fan throated lizards (*Sitana ponticeriana*)

Sub-order: Serpentes

Family: Typhlopidae

10. Common worm snake (*Typhlops braminus*)

Family: Boidae

11. Common sand boa (*Eryx conicus*)

Family: Dipsadidae

12. Common wolf snake (*Lycodon aulicus*)
13. Russell's kukri snake (*Oligodon taeniolatus*)

Family: Colubridae

14. Rat snake (*Ptyas mucosa*)

15. Green vine snake (*Ahaetulla nasuta*)
16. Bronzeback tree snake (*Dendrelaphis tristis*)

Family: Natricidae

17. Striped keelback grass snake (*Amphiesma stolatum*)
18. Checkered keelback water snake (*Xenochrophis piscator*)
19. Olive keelback water snake (*Atretium schistosum*)

Family: Elapidae

20. Common krait (*Bungarus caeruleus*)
21. Slender coral snake (*Calliophis melanurus*)
22. Spectacled cobra (*Naja naja*)

Acknowledgements

The authors would like to thank their parents for allowing them to carry on with their interest in reptiles and Dr.N.M.Ishwar, GNAPE for comments on the manuscript.

References

Das, I. (2002): *A photographic guide to Snakes and Other Reptiles of India.* New Holland Publishers (UK) Ltd. 144 Pp.

Das, I. (2003): Growth of knowledge on the reptiles of India, with an introduction to systematics, taxonomy and nomenclature. *J.Bombay.nat. hist. Soc.* 100 (2&3): 446-501.

Table 1: Snakes recorded from the Korattur Lake during 2001-2004.

S.No.	Species	Year			
		2001	2002	2003	2004
1.	*Typhlops brahminus*	5	0	4	0
2.	*Eryx conicus*	0	0	0	1
3.	*Lycodon aulicus*	0	2	2	5
4.	*Oligodon taeniolatus*	0	0	1	5
5.	*Amphiesma stolatum*	10	6	37	15
6.	*Xenochrophis piscator*	9	5	63	7
7.	*Atritium schistosum*	6	13	55	40
8.	*Ptyas mucosus*	1	2	23	32
9.	*Dendrelaphis tristis*	0	1	13	34
10.	*Ahaetulla nasuta*	2	1	85	52
11.	*Bungarus caeruleus*	0	1	0	0
12.	*Calliophis melanurus*	0	0	1	1
13.	*Naja naja*	0	4	3	5

Table 2: Habitat and Status of snakes recorded from Korattur lake.

Sl.No.	Scientific name	Habitat	Status*
1	*Typhlops brahminus*	All habitats	O
2	*Eryx conicus*	Scrub & Grassland	R
3	*Lycodon aulicus*	Urban	O
4	*Oligodon taeniolatus*	Urban	O
5	*Amphiesma stolatum*	Grassland	C
6	*Xenochrophis piscator*	Wetland	C
7	*Atritium schistosum*	Wetland	C
8	*Ptyas mucosus*	Scrub & Grassland	C
9	*Dendrelaphis tristis*	Scrub	O
10	*Ahaetulla nasuta*	Scrub	C
11	*Bungarus caeruleus*	Urban	R
12	*Calliophis melanurus*	All habitats	O
13	*Naja naja*	All habitats	R

* R – Rare; C- Common; O-Occasional.
Common – Five or more individuals per month.
Occasional – No. of individuals depend on the season.
Rare – Less than three individuals per month.

FIRST RECORD OF ASIAN HOUSE GECKO *HEMIDACTYLUS FRENATUS* (SCHLEGEL) FROM GUJARAT STATE, WESTERN INDIA

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During the study of reptilian fauna of Gujarat, I have found a few gecko specimens from four islands: Bet Dwaraka Is. (Okha Mandal tehsil), Ajad Is. (Khambhaliya tehsil), Kalubhar Is. and Pirotan Is. of Jamnagar District, Gujarat, India. All the four islands are located on the south coast of Gulf of Kachchh (= Kutch). The last two islands fall in the Marine National Park and Marine Sanctuary. The Bet Dawaraka and Ajad Island are small villages of Jamnagar District.

A lizard caught here was identified as the Asian house gecko (*Hemidactylus frenatus*) with the help of literature (Smith 1935) and specimens in the collections in the Bombay Natural History Society, Mumbai.

The Marine National Park and Marine Sanctuary are in Jamnagar District of Gujarat State, India, and are the first Indian marine protected areas. The marine eco-system here is unique. The entire protected areas are located between the south coast Kachchh district and north coast of Jamnagar district. It is a complex of varied habitats including marine, coastal, mangrove forest, savanna grassland and dry thorny forest greatly influenced by the tides. Here 162.89 sq kms area and 457.92 sq kms area

are categorized as Marine National Park and Marine Sanctuary. In all, a total 931.33 sq kms of area including mangrove forests is considered a single marine eco-system. This entire eco-system is collectively known as Marine Protected Area (MPA). This complex habitat contains 42 islands of different sizes. The protected area is the habitat for over 21 species of reptiles (14 species of terrestrial reptiles), and is the breeding ground of Green turtle (*Chelonia mydas*) and Olive ridley sea turtle (*Lepidochelys olivacea*) (Vyas 2000).

Three adult specimens of geckos were collected from the islands of Gulf of Kachchh for the voucher. They were deposited in the museum of the Bombay Natural History Society [BNHS 1707, 1708 and 1709], Mumbai. Data of measurements and pholidosis of the specimens are given in Table 1.

The dorsal side of *H. frenatus* is pinkish-brown in colour with irregularly arranged black or brown obscured markings. A light brown stripe on both sides of head from eye to neck region. Tail light yellowish pinkish with pointed tubercles arranged in six rows. The enlarged dorsal tubercles irregularly on back, outer (laterally) are arranged in two rows distinctly.

Hemidactylus frenatus is one of the very widely distributed geckkonidae species. This species is distributed in tropical and subtropical parts of the world from south–east Asia, Indo-China, Malay Peninsula, East Indian Archipelago and islands of the Indian Ocean, tropical Australian region, East Africa and St. Helena (Smith 1935, Deraniyagola 1939, Daniel 2002). Also, the species has been introduced accidentally in many parts of world including New Guinea, Fiji, Mexico, Belize, Gautemala, Panama, Honduras, Costa Rica and USA (Hawaii and Florida) through anthropogenic activities (Sanez & Kelawinski 1996 and Norman 2003).

The literatures show that this gecko is distributed in India in Uttar Pradesh, Rajasthan, Bihar, Maharashtra, West Bengal, Tamil Nadu, Andaman and Nicobar Islands including Gujarat State (Tikader & Sharma 1992,

Molur & Walker 1998 and Das 2002). But none of them was showing its specific localities in Gujarat. Sharma (2000) has not listed the species from Gujarat (see Tikader and Sharma 1992; Map 19 on page 212). Also, Vyas (1998 & 2000) and Gayen (1999) have not mentioned the species from the state. Therefore, the present record of the species from the four islands of Gulf of Kachchh including the Marine National Park and Marine Sanctuary, Gujarat is the first authentic record of the species from Gujarat State.

The distribution of the gecko from Gujarat State in these four islands out of 42 islands of Gulf of Kachchh shows that it might have been transported through human agencies but this species is found only in these four islands out of the 42 inhabited islands. Das (2002) has mentioned that the species has been introduced into almost every part of the tropics and subtropics by human activities. There are many examples of reptile species, accidentally transported from its natural distribution range through construction materials, drift wood, baggage, vegetables and fruits and establishing themselves in the new environment (Mahendra, 1937).

Acknowledgement

I thank H.S.Singh, Former Director of Gujarat Ecological Education Research (GEER) Foundation, Gandhi nagar and R.J.Asari, Conservator of Forests, Jamnagar for logistic supports and permission for the study. Also, I am grateful to Mr.Varad Giri, Research Assistant, Bombay Natural History Society, Mumbai for identification and confirmation of the species.

References

Daniel, J. C. (2002): *The Book of Indian Reptiles and Amphibians.* Bombay Natural History Society/Oxford University Press, Mumbai. 238 pp.

Das, I. (2002): *A Photographic Guide to Snakes and other Reptiles of India.* New Holland Pub. (UK) Ltd. 144 pp.

Deraniyagola, P.E.P. (1939): *The tetrapod reptiles of Ceylon,* Colombo. 412 pp.

Gayen, N.C. (1999): A synopsis of the reptiles of Gujarat, western India. *Hamadryad* 24(1): 1-22.

Mahendra, B.C. (1937): The zoogeography of India in the light of herpetological studies. *Science Culture* 6 (7): 368-378.

Molur, S. & S.Walker (Eds.). (1998): Report of the Workshop 'Conservation Assessment and Management Plan for reptiles of India' (BCPP – Endangered Species Project), Zoo Outreach Organisation, Conservation Breeding Specialist Group, India, Coimbatore, India 175 pp.

Norman, B.R.(2003): A new geographical record for the introduced house gecko, *Hemidactylus frenatus,* at Cabo San Lucas, Baja California Sur, Maxico, with notes on other species observed. *Bulletin of the Chicago Herpetological Society* 38(5): 98 – 100.

Tikadar B.K. & R.C. Sharma. (1992): *Handbook of Indian Lizards.* Zoological Survey of India, Calcutta. 250 Pp.

Saenz, D. & P.D.Kelawinsky (1996): Geographic Distribution *Hemidactylus frenatus. Herpetological Review* 27(1): 32

Sharma, R.C. (2000*):* *Reptilia, in State Fauna Series 8: Fauna of Gujarat, Part – I,* Zoological Survey of India: 243 – 297.

Smith, M.A., (1935): *The Fauna of British India, including Ceylon and Burma. Reptilia and Amphibia. Vol.II. Sauria.* Taylor and Francis, London. Iv + 440 pp.

Vyas, R., (1998): The reptiles of Gujarat state: Updated distribution. *Tigerpaper,* 25(1): 8 – 14.

Vyas. R., (2000): Comments on 'A synopsis of the reptiles of Gujarat, India'. *Hamadryad* 25 (2): 203-207.

Vyas, R. (2000): Reptilian diversity in and around of Marine National Park and Marine Sanctuary, Gujarat State. Report submitted to Gujarat Ecological Education Research (GEER) Foundation, Gandhinagar, Gujarat. 10 pp. (Unpublished).

Table 1 : Morphometric measurements (in mm) of *Hemidactylus frenatus* from Jamnagar District, Gujarat, India (Bombay Natural History Society = BNHS catalogue numbers)

			BNHS 1707	BNHS 1708	BNHS 1709
		Collection Place & Date	Pirotan Is. 8 may 02	Ajad Is. 14 May 02	Bet Dawark 14 Jun.02
1.	From tip of snout to vent	SVL	48.00	38.00	38.00
2.	From the cloaca to the tip of the tail	TL	55.00	38.00	28.70+
3.	The distance between the angle of the jaw and snout tip	HL	08.70	07.42	06.60
4.	Angle of the jaw	HW	08.84	07.50	07.00
5.	The distance between the fore limb—the hind limps.	A-G	21.44	17.00	18.16
6.	The greatest diameter of the eyes	ED	02.70	02.54	02.70
7.	The distance between the anterior-most point of eye and the nostrial.	E-N	05.92	04.00	03.84
8.	The distance between the anterior-most point of the eyes and the tip of the snout.	E-S	06.26	05.04	04.60
9.	The anterior edge of the ear opening to the posterior-most point of the eyes.	E-E	04.40	03.66	04.00
10.	The greatest diameter of the ear opening.	EL (S)	00.82	00.90	00.88
11.	Upper labials R/L	UL R/L	11/11	11/11	11/11
12.	Lower labials R/L	LL R/L	9/10	9/9	9/9
13.	Mental shape and size with adjacent labials	M	Large	Large	Large
14.	Dorsal body scales-large tubercles rows arrangement	DO-SR	Irregular	Irregular	Irregular
15.	4th Digit lamellae	4DL	7	7	8
16.	4th Toe lamellae	4TL	9	9	10
17.	Numbers of wax glands & position	WG-PO	32	26	—
18.	Sex	S	Male	Male	Female

INDIAN POND FROG *EUPHLYCTIS HEXADACTYLUS* (LESSON, 1834) (AMPHIBIA: ANURA: RANIDAE) IN SOUTH KANARA DISTRICT – WITH VARIED PATTERN OF POROUS WARTS

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Euphlyctis hexadactylus (Lesson, 1834) is commonly known as the Indian pond frog. The colour of the dorsum is grass green or olive green with or without a pale yellow vertebral line from snout to vent. The juvenile has bars or spots of dark green and black on the back (Fig. 1). A black streak is present along the supra-tympanic fold. The back of thigh is patterned in black and whitish/yellowish. The tympanum is distinct, ranging as 80-86% of eye diameter (more than ¾ of the eye diameter). First finger is longer than the second. Toes fully webbed and dermal fringe on fifth toe. Outer metatarsals separated till base by web. Tibio tarsal articulation reaches posterior border of eye. A finger-like prominent inner metatarsal tubercle present. Skin is smooth dorsally and warty on flanks, anal area and on throat. Morphological measurements recorded are in Table 1.

Euphlyctis hexadactylus specimens were collected during July to December, 2003 from Konaje and Inoli in Mangalore Taluk (100 m ASL) and Koteshwar in Kundapur Taluk (20m ASL) in South Kanara district, Karnataka (Fig 2), which lies between 12° 30′ to 14° N latitude and 74° 30′ to 75° 45′ E longitude.

Euphluctis hexadactylus can be easily distinguished from its closely related species *Euphlyctis cyanophlyctis* on the basis of its size, build and the presence of two curved series of porous warts (Fig 3), one each on lateral side of belly extending posteriorly upto thigh and anteriorly to the supra-tympanic fold, and an another row ventrally on either side of the belly (Sen and Mathew, 2004).

All specimens of *Euphlyctis hexadactylus* examined in the present study exhibited the presence of these two distinct rows of porous warts (Fig 3). The specimens studied, however, were found to differ with respect to the presence/absence of (i) a wavy (semicircular) line of porous warts across the throat (Fig 3A, 4A and Fig 5A); (ii) a line of porous warts on throat extending from just below the position of the eye towards the throat on the ventral side (Fig 4A and 5A); (iii) a line of porous warts on the corners of lower jaw (Fig 4C and 5A) and (iv) a U shaped line of porous warts above the anus (Fig 3B and 4B).

Based on the presence or absence of these porous warts the frogs have been categorized as type I, II and III (Table 2). These porous warts were blackish in some specimens, probably reflecting parasitic infestation (Sen and Mathew, 2004).

Most of the frogs examined from Konaje and Inoli from Mangalore Taluk and Koteshwar in Kundapur Taluk (South Kanara district) conform to type II (53%). However, type I and type III were representing 29 and 12 per cent respectively (Table 2 and 3). The porous warts were indistinct in frogs (Tag No.7) from Koteshwar.

It needs to be explored further whether the frogs categorized as morphovariant typed as I, II and III (Table 2 – based on the absence/presence of the porous warts across the throat, a line of porous warts from eye to throat on ventral side and a set of porous warts around the corners of the lower jaw) is due to varied genotypes/varied gene expression.

Acknowledgement

The work has been supported under the project funded by DST, New Delhi.

Reference

Sen Nibedita and Rosamma Mathew. (2004): Occurrence of *Euphlyctis hexadactylus* (Lesson, 1834) (Amphibia: Anura: Ranidae) in North East India with notes on its morphological characters. *Cobra* 55: 1-6.

Fig 1: The juvenile and the adult frog showing bars of dark green and black on the back.

Fig 3: Various rows of porous warts as seen in *Euphlyctis hexadactylus* showing a U shaped line of porous warts above the anus (3A), two curved series of porous warts one each on lateral side of belly extending posteriorly upto thigh and anteriorly to the supra-tympanic fold (3A), an another row ventrally on either side of the belly as seen in vental and lateral view (3B and 3C) and a way line of porous warts across the throat (3B) – Type I.

Fig 4: Various rows of porous warts as seen in *Euphlyctis hexadactylus* showing a U shaped line of porous warts above the anus (4A), two curved series of porous warts one each on lateral side of belly extending posteriorly upto thigh and anteriorly to the supra-tympanic fold (4A), and an another row ventrally on either side of the belly as seen in ventral and lateral view (4B and 4C), wavy line of porous warts across the throat (4B), a line of porous warts extending from just below the position of the eye towards the throat on the ventral side (4B) and a line of porous warts on the corners of lower jaw (4C) – Type II.

Fig 5: Various rows of porous warts as seen in *Euphlyctis hexadactylus* showing the absence of a wavy line of porous warts across the throat, a line of porous warts on throat extending from just below the eye site towards the throat on the ventral side and a line of porous warts on the corners of lower jaw – Type III.

Fig. 1

Juvenile Adult

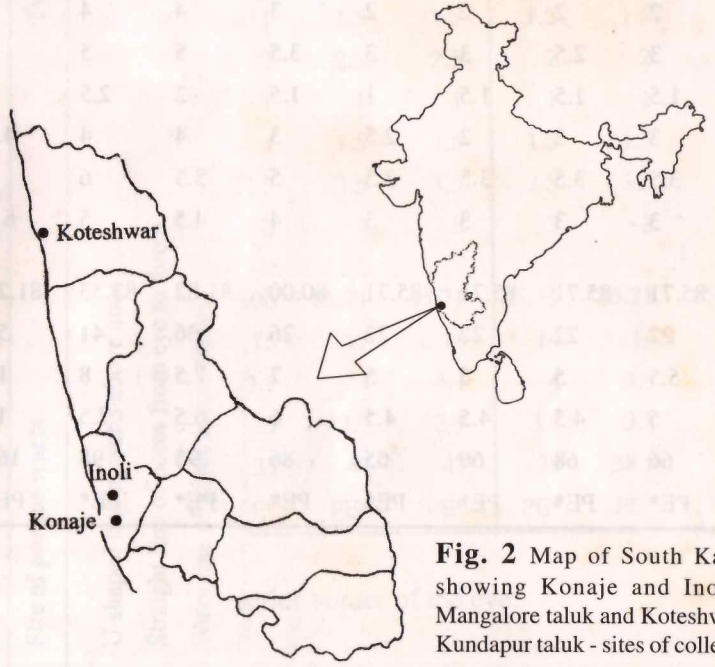

Fig. 2 Map of South Kanara showing Konaje and Inoli in Mangalore taluk and Koteshwar in Kundapur taluk - sites of collection

Fig. 3

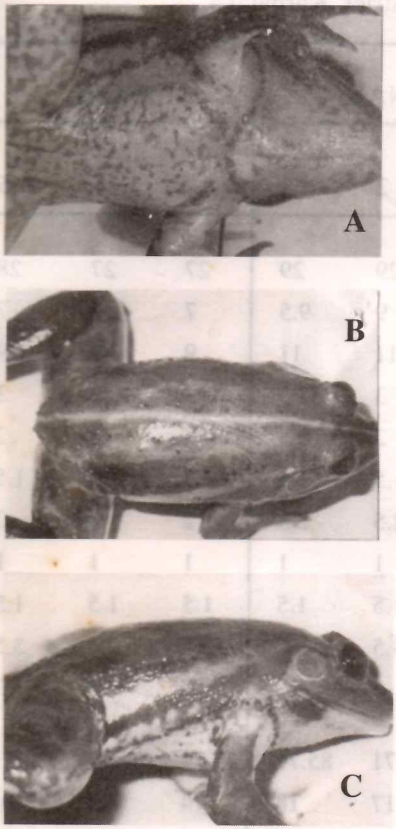

Fig. 4

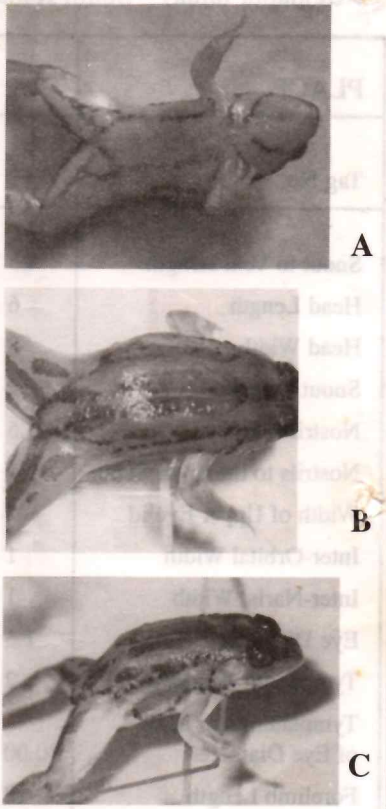

Fig. 5

Table 1: Morphometric measurements (in mm) for *Euphlyctis hexadactylus* specimens collected from Konaje, Inoli (Mangalore taluk) and Koteshwar (Kundapur taluk) – South Kanara district, Karnataka.

PLACE	KONAJE			INOLI			KOTESHWAR										
Tag No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Snout to Vent Length	23	29	29	27	27	28	31	35	38	39	39	41	49	62	64	110	113
Head Length	6	9	9.5	7	7	7	9.5	12	12	11	12	12	16	20	22	34	38
Head Width	8	11	11	9	9	9	11	14	14	12	14	14	19	23	25	38	42
Snout Length	2	3	3.5	3	3	3	3.5	4	4	4	4	4	6	8.5	8	13.5	15
Nostril to Eye	1.5	2	2.5	2	2	2	2.5	3	2.5	2.5	3	2.5	4	5.5	6	9.5	11
Nostrils to the tip of Snout	1	1.5	1.5	1.5	1.5	1.5	1.5	2	2	2	2	2	3	4	4	5	5.5
Width of Upper Eyelid	2	2.5	2.5	2	2	2	2.5	3	3	2.5	3	3	3.5	5	5	7	8
Inter-Orbital Width	1	1	1	1	1	1	1.5	1.5	1.5	1.5	1.5	1	1.5	2	2.5	4	5
Inter-Narial Width	1	1.5	1.5	1.5	1.5	1.5	1.5	2.5	3	2	2	2.5	3	4	4	4.5	5
Eye Diameter	2.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	5	5.5	6	8	9
Tympanum Diameter	2	3	3	3	3	3	3	3	3	3	3	3	4	4.5	5	6.5	7.5
Tympanum size as % of Eye Diameter	80.00	85.71	85.71	85.71	85.71	85.71	85.71	85.71	85.71	85.71	85.71	85.71	80.00	81.82	83.33	81.25	83.33
Forelimb Length	13	17	18	14	14	16	19	22	22	22	22	22	26	36	41	51	63
1st Finger Length	3.1	4	4.1	4	3.9	4	5	5	5.5	5	5	5	7	7.5	8	13	15
2nd Finger Length	3	3.9	3.9	3.8	3.8	3.8	4.5	4.5	5	4.5	4.5	4.5	6	6.5	7.5	11	13
Hindlimb Length	35	47	47	39	38.5	43	52.5	64	66	68	60	65	86	95	98	167	168
Tibio Tarsal Articulation	PE*	PE*	PE*	PE*	PE*	PE*	PE*	PE*	PE*	PE*	PE*	PE*	PE*	PE*	PE*	PE*	PE*

PE* = Reaching to the posterior border of the eye.

Table 2: Porous warts pattern seen in *Euphlyctis hexadactylus* specimens collected from Konaje, Inoli and Koteshwar (South Kanara district), Karnataka.

Site of porous warts	Type I	Type II	Type III
U shaped line of warts above anus	"	"	"
Straight line of pores from eye to throat	X	"	X
Wavy line of pores across throat	"	"	X
Pores at the corners of lower jaw	X	"	X

" = Present X = Absent

Table 3: Number of *Euphlyctis hexadactylus* specimens from Konaje, Inoli and Koteshwar exhibiting varied pattern of porous warts.

	No. of specimens	Type I	Type II	Type III	Pattern not clear
KONAJE	3	1	2	-	-
INOLI	3	-	3	-	-
KOTESHWAR	11	4	4	2	1
TOTAL	**17**	**5**	**9**	**2**	**1**
% Pattern Type		29	53	12	6

A GHARIAL (*GAVIALIS GANGETICUS*) (GMELIN) WHICH LOST ITS LOWER MANDIBLE IN INTRA-SPECIFIC FIGHTING

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Chennai Snake Park had acquired six gharials (*Gavialis gangeticus*) from Nandankanan Biological Park, Bhuvaneswar, in Feb. 1992. On arrival, each measured about one meter in length. Age not known. They were housed in an open enclosure with a pond at the centre where they continue to be. They are fed with various species of freshwater fishes.

On 29.12.2004, at about 8.30 a.m. the animal keeper in charge of the enclosure reported that a female gharial in the enclosure had lost its lower mandible (snout) presumably due to infighting among the individuals. We rushed to the spot and noticed the injured female gharial measuring about 2.65 m. in a corner of the enclosure along with an adult male gharial. When the second author was going round the Park at 8.00 a.m. he had noticed all the six gharials in the pond. The fight would have taken place between 8 and 8.30 a.m. The female gharial had lost its lower mandible (snout) for a length of about 20 c.m. out of a total length of 32 c.m. and blood was oozing. The water trough was drained and the broken portion was taken out. It measured 21 Cm. long and 3 Cm. wide at the widest end. This portion was kept in the freezer.

Dr.S.Lakshmanan, Trustee and Veterinarian, was called in for immediate medical help. In the meantime, efforts were made to isolate the injured gharial, but this did not succeed because all the six gharials in the enclosure including the injured one were herded together. Whenever we tried to separate them with a stick, they started hitting each other and sometime hitting the enclosure wall.

To prevent further damage, the efforts to isolate the injured gharial were given up.

The injured gharial was dressed with povidone iodine solution and povidone iodine cream applied by using a long stick with cotton buds. The other gharials were closely examined. It was noticed that a male gharial had bruises and injury on the snout and near the eye. This was also dressed with povidone iodine. In all probability, the fight had occurred between this male and the female.

On 30.12.2004 we approached the Madras veterinary college to find out whether the broken part could be fixed back with a metal plate. Dr.M.G.Jayathangaraj, Associate Professor, Madras Veterinary College came to the Snake Park the same day and examined the injured gharial. He had discussions with the professor in the Anatomy department of Madras Veterinary College. Dr.M.G.Jayathangaraj opined that the broken jaw could not be fixed since the broken piece was exclusively horny material without any muscle portion. Dr.S.Lakshmanan and Dr.Jayathangaraj decided to administer antibiotics. Two ml of Enrofloxacin was administered intra-muscular using dart gun.

Again on 3.1.2005, two ml of Entrofloxacin was given intra-muscularly. From 29.12.2004 dressing was done regularly. The wound healed very well by 21.1.2005.

From the day of injury 29.12.2004 to 13.2.2005 the injured gharial did not take any feed in the normal course. The animal keeper tried to feed it by hand. On 14.2.2005 it took one tilapia about 4 inches long. The gharial was finding it difficult to grab the fish in the absence of the lower mandible. Subsequently, the gharial took fish on 05.03.2005 (one),

19.03.2005 (Seven Nos.), 26.03.2005 (One) and 02.04.2005 (12 Nos.). It did so with effort, the animal keeper pushing the fish near its mouth.

On 09.04.2005 the injured Gharial took 10 fishes lying on the ground and more fish from the water.

Since after the accident the front of the upper mandible has no opposing lower mandible, the gharial has lernt to grab the fish despite its handicap. It grabs the fish between the residuary portion of the lower mandible and the base of the upper mandible.

Special attention is being continuously given to this gharial to ensure proper feeding.

One case of fatal male-male conflict in the gharial during the breeding season was reported by Bustard and Maharana (1981).

Daniel (2002) has mentioned that the mating occurs in cold weather months of December to January. It is not known whether the infighting took place during (attempted) copulation.

The six gharials in the enclosure have not bred so far.

This account will be of special interest for two reasons. Instances of aggression, intra-specific or otherwise, rarely occur in the gharial unlike in other crocodilians especially the salt water crocodile (*Crocodilus porosus*).

Secondly, it shows how well a gharial has coped with a major handicap in feeding

Acknowledgements

We are thankful to Mr.B.Vijayaraghavan, Chairman, Chennai Snake Park Trust for his constant encouragement and support to our research activities. We also thank Dr.S.Lakshmanan, Trustee, Chennai Snake Park Trust and Dr.M.G.Jayathangaraj, Assistant Professor, Department of Wildlife Science, Madras Veterinary College, Chennai – 7 for treatment provided and continuous monitoring of the injured gharial. The services of Mr.M.Mani, animal keeper are appreciated for looking after the animal with care.

References

Bustard, H.R. and S.Maharana (1981): Fatal male-male conflict in the Gharial, *Gavialis gangeticus* (Gmelin) (Reptilia, Crocodilia). *J. Bombay Nat. Hist. Soc.* 78(1): 171-173.

Daniel, J.C. (2002): *The Book of Indian Reptiles and Amphibians,* Oxford University Press, Mumbai.

RANDOM HARVEST

Some consolation?

The established view is that since amphibians are particularly sensitive to environmental changes, habitat destruction has resulted in a rapid decline in their diversity. Somewhat contrary to this comes a report in *Froglog* of June 2004 from Jerry Lea and Luca Luiselli.

Their studies on amphibians in southern Nigeria have shown that "many anuran species do in fact benefit from habitat alteration and, although some ... species may lose out, overall species diversity may be maintained or even increase. The most highly adaptable species appear to belong to the Ranidae, and one of the reasons for their success is undoubtedly their ability to utilize multiple habitat types according to prevailing environmental conditions." A comparison over a period of 20 to 40 years in areas that have seen at least a tenfold reduction in forest habitat has shown that "in both lowland and montane forest habitats the forest specialists have been replaced by more generalist species or those preferring disturbed habitats and these species now dominate." "In both environments, species richness has at least been maintained, ... but in the lowland case, species richness has risen quite noticeably... This maintenance/increase in species richness may be as a result of an increased diversity of microenvironments in the new 'bushland' and secondary forest mosaic compared to the pristine forest". Some members of the Ranidae are seen to have a wide range of adaptations and life-history characteristics (e.g. generalist feeding habits, egg guarding behaviour, within-season clutch partitioning, large terrestrial component and rapid development of tadpoles, high mobility and wide habitat tolerances) that enable them to switch between a variety of habitats depending upon prevailing conditions.

This report is, of course, not a source of adequate consolation. Declines in individual species if they lead to extinction or near-extinction cannot be compensated by an overall increase in species diversity or substitution of specialists by generalists, or *vice versa*.

Water monster threatened

Salamanders are amphibians belonging to the order Urodela with 358 species. They are found in the temperate Northern hemisphere and tropical South America. The juveniles live in water with feather-like gills and fin around tail; adults live mainly on dry land.

Among the salamanders is a creature, *Axolotl,* found in ponds and lakes of the Mexican plateau. The name in Aztec language means 'water monster'. The curious thing about it is that it does not grow beyond the 'tadpole' or larval stage and retains throughout its life most of the characteristics of the larvae such as gills three feathery pairs and a dorsal fin which extends from the back of its head to the tip and round the underside of its long tail. What is equally curious is that, notwithstanding this stunted growth, their reproductive system matures and the larval form is able to reproduce.

While this is what normally happens, some individuals may metamorphose into land-dwelling gill-less adults in response to the drying up of their ponds.

'Neoteny' is the word to denote this unique feature of retention of juvenile features in the adult animal and attainment of sexual maturity while still in a mainly larval stage.

Axolotls are easy to raise in laboratory and are used in a variety of genetic experiments. It attains a length of about 12". Scientific Name: *Ambystoma mexicanum.*

Froglog of Feb.2005 describes the Axolotl as one of Latin

America's most threatened amphibians. The conversion of large-scale water bodies to built-up areas has drastically altered the habitat. Added to this, introduced predators, pollution and illegal collection for food and medicines have taken their toll on the axolotl. A partnership of Mexican and British organisations has been developing a conservation programme for this unique salamander.

An unlikely surrogate mother

A 120 year old 300 kg giant male Aldabra tortoise (*Geochelone gigantea)* in Haller Park animal facility in Mombasa has become a 'surrogate mother' to a baby hippopotamus swept into the Indian ocean by the tsunami of Dec. 2004. When the stressed and distraught motherless baby hippo was released in the Park, "he lumbered to the tortoise which has a dark grey colour similar to grown-up hippos." The pair are now inseparable. "They swim, eat and sleep together... The hippo follows the tortoise exactly the way it follows its mother. If somebody approaches the tortoise, the hippo becomes aggressive as if protecting its biological mother".

Source: *Voice of the Turtle*
(San Diego Turtle and Tortoise Society, Mar.2005)

The 'how' of species diversity in frogs?

Writing in the Dec. 2004 issue of *Alytes, International Journal of Batrachology,* Alan Dubois tries to answer the question why there are so many frog species in Sri Lanka and southern India. "Several recent publications have pointed out the discovery that many new species of frogs remain to be described in Sri Lanka..... and probably also in southern India, especially in the Western Ghats... If confirmed, these findings would much more than double the number of frog species in Sri Lanka, and increase significantly the number of amphibian species in India. Most of these new species are members of the genus *Philautus* ... a group of small tree-frogs... These frogs lay egg-clutches in terrestrial shelters (in leaf-litter, under stones

or barks, etc.) where these large unpigmented eggs undergo direct development". The author proposes a hypothesis "to try and account for the exceptional radiation in these frogs": these direct-developers would be submitted to 'familial' rather than 'individual' mortality, which would tend to increase allele fixation in isolated populations. In the species that lay numerous eggs in water, the tadpoles later disperse and are all submitted similarly to selection which results in a distribution of characters in the population. In contrast to this, in *philautus* and in other groups with terrestrial clutches, the eggs are submitted to largely random or massive mortality : a given clutch may or may not be discovered by a predator. If discovered, the entire clutch gets destroyed and, if not, the entire clutch survives. If a surviving clutch bears special characters these will be widely distributed in the frogs resulting from this clutch, much more than in the population with tadpoles. In some extreme cases, one generation may be enough to result in the total replacement of one allele by another in a population. Thus taxa (genera, families) including species subject to 'familial' mortality would tend to have higher rates of speciation than taxa subject to 'individual' mortality.

Turtle alert!

According to a report in the *New Indian Express* May 21, 2005, India's Petroleum Conservation Research Association (PCRA) and the Director General of Hydrocarbons (DGH) – all honourable men and women – have locked horns over the fate of the Olive Ridley on a part of the Orissa coast. DGH is keen to explore the area for gas. PCRA is worried that the exploration activities which will include installation of artificial lights and flaring of gas will have a very harmful impact or the turtles and their nesting activity. DGH disagrees and points out that the drilling locations are 30-50 km. away from the foraging, breeding and nesting areas. The Multi-Disciplinary Expert Group of the Ministry of Environment and Forests, Government of India, that visited the exploration sites could not make up its mind and has asked for detailed studies.

The less irritable python

Leafing through Simon & Schuster's *Encyclopaedia of Animals* (1984), I came across an observation that "... the pale grey race [of the Indian python, *Python molurus*] found in West India is reportedly less irritable than others and is used by 'snake charmers". Readers are invited to comment on whether this alleged difference in temperament has any basis.

– B.Vijayaraghavan.

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