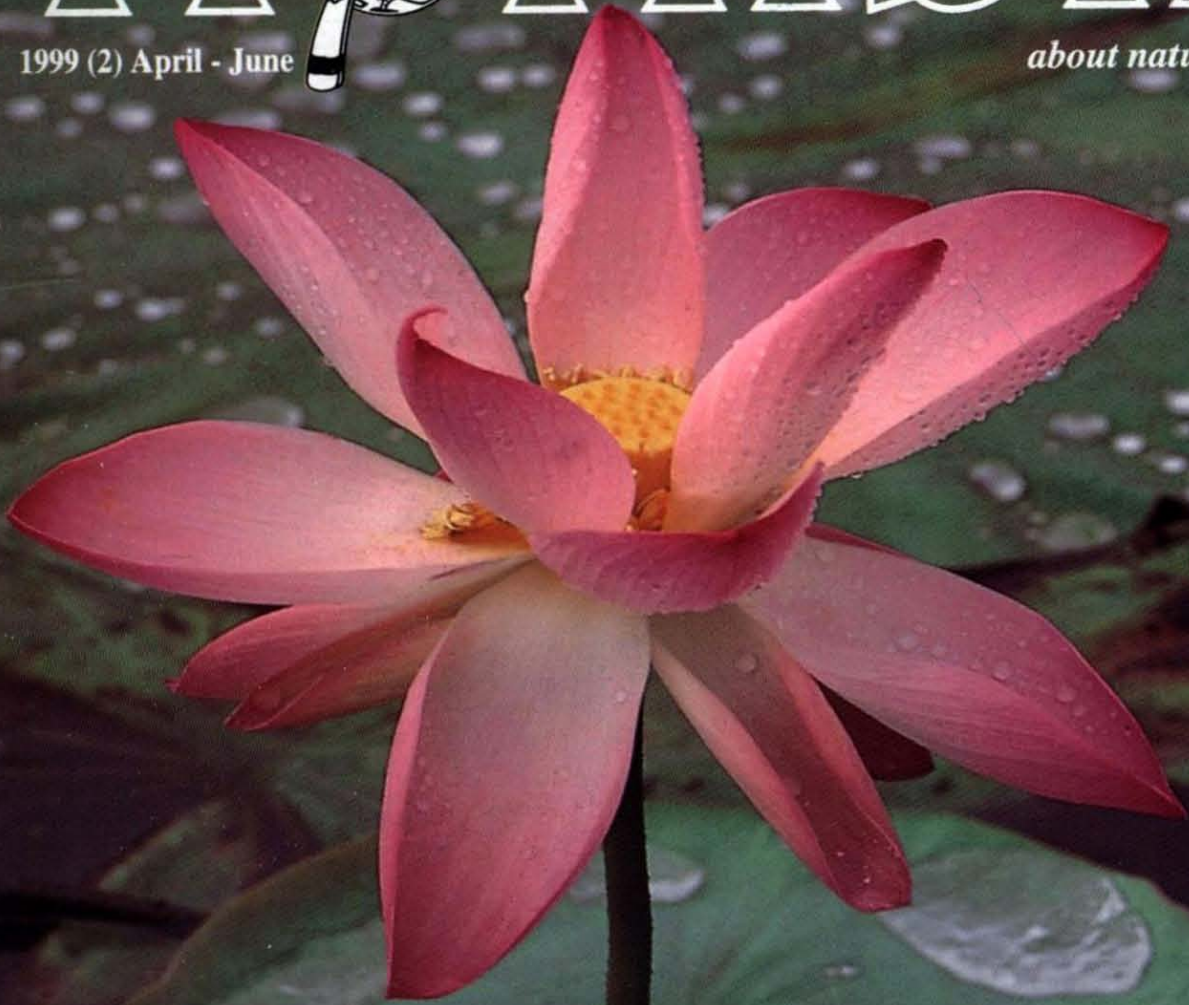


# Hornbill



1999 (2) April - June

*about nature and us*



**BOMBAY NATURAL HISTORY SOCIETY**

# Professional Camera Care

*Mazda gives your equipment, the care it deserves...*

- *Specialists in repairs of Nikon autofocus SLR cameras with computer aided repair & reprogramming facilities.*
- *State of the art checking & testing equipments*
- *Computerised camera analysis.*
- *Factory trained technicians.*
- *Extensive stocks of genuine spare parts.*



Authorised Service Agents For India

**HASSELBLAD**

**Nikon**

**Metz**

306, Veena Killedar Ind. Est., Pais St., K. Khadye Marg, Mumbai - 400 011  
Tel.: (022) 3079284 / 93 Fax: (022) 3089211

**EXECUTIVE COMMITTEE****President**

Mr. B.G. Deshmukh

**Vice President**

Mrs. D.S. Variava

**Honorary Secretary**

Mr. J.C. Daniel

**Honorary Treasurer**

Mr. Sunil Zaveri

**Director**

Dr. A.R. Rahmani

**Members**

Mr. Humayun Abdulali

Dr. Sarah M. Almeida

Dr. A.M. Bhagwat

Dr. Erach K. Bharucha

Dr. B.F. Chhappargar

Mr. K.P. Karamchandani

Dr. Ashok S. Kothari

Dr. Shashi Menon

Mr. Sunjoy Monga

Mr. Ulhas Rane

Mr. Bittu Sahgal

Mr. Ravi Singh

The Secretary, Ministry of  
Environment & Forests,  
Govt. of India.

The Director of Archaeology  
& Museums, Govt. of  
Maharashtra

**Editors**

J.C. Daniel

Isaac Kehimkar

Gayatri Ugra

Sunjoy Monga

**Layout**

V. Gopi Naidu

**Editorial Assistant**

Vibhuti Dedhia

**Cover***Indian Lotus*

Isaac Kehimkar

Published and printed quarterly  
by J.C. Daniel for the  
Bombay Natural History Society,  
Printed at St. Francis ITI Press,  
Borivli, Mumbai.  
Reg. No. RN 35749/79,  
ISSN 0441-2370.

# Contents

4

## A Trip in Quest of Frogs

— S.U. Saravanakumar

The amphibians of the  
Western Ghats are an  
unexplored group.  
Much needs to be done  
to unravel the facts  
about them.



26

## Sanctuaries of Saurashtra

— Anil Mulchandani

The flora and fauna of  
the sanctuaries in  
Saurashtra are prolific.  
However, uncontrolled  
development is  
irreparably damaging  
this region.



## OTHER FEATURES .....

- 9. .... News Briefs
- 12. .... Miscellanea
- 14. .... Indian Wildflowers
- 18. .... Seashore Lore — 33. Masquerade
- 21. .... Review
- 22. .... The Young Naturalist
- 24. .... Response
- 30. .... Nature Watch

For more information on the Society and its activities, write to the Honorary Secretary,  
Bombay Natural History Society, Dr. Salim Ali Chowk, Shaheed Bhagat Singh Road, Mumbai 400 023.  
Tel.: 282 1811 Fax: (91-22) 283 7615.

Views expressed by the contributors in the Hornbill are not necessarily those of the BNHS. Unsolicited articles  
and photographs, and materials lost or damaged are not our responsibility and no claims will be entertained.

## Water of Life

*The ENVIS (Environmental Information System) programme at the Society collects and disseminates information on the inland wetlands in the country. We are appalled to find that wetlands are the most abused among the life supporting habitats in the country. A sample survey of four districts in Tamil Nadu showed that many are being filled up or put to other uses. Those within the control of the forest department expose the department's one track mind. They have been planted with Acacias and similar trees. The tanks had been dug in ancient days to store water against the vagaries of the monsoon. The tanks and village ponds provided the water of life for the people and the birds and beasts, both wild and domestic, and life revolved around them. They charged the wells that were the source of an easily available water supply. The culture of tapped water has, in many instances, made the village tanks redundant to man, but they are still vital to other life forms. Tapped water supply in India is as fitful and wayward as the nation's supply of electricity, and taps are often only ornamental. In the meanwhile, tanks which are the fundamental life support system for all the wildlife and waterbound vegetation are being converted into bus stands and housing colonies, for there is no legal protection for wetlands — a waste of a life support system which has already reached a critical stage when we consider the difficulties between states in the distribution of water.*

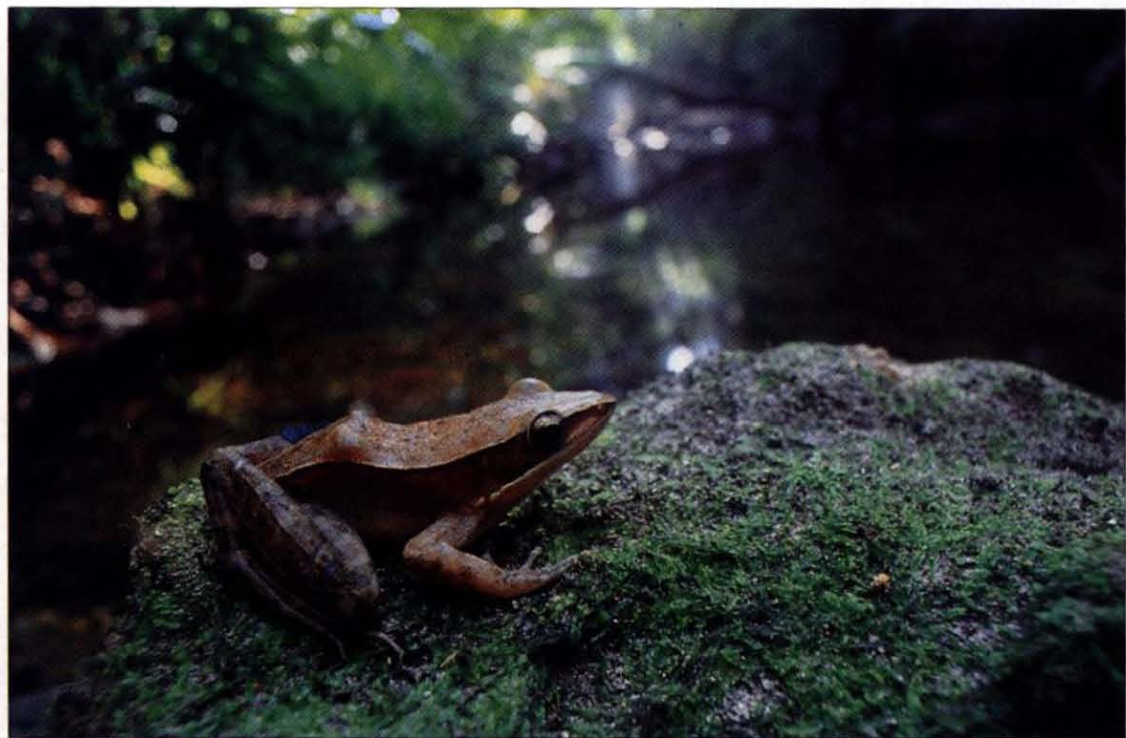


J.C. DANIEL



# A Trip in quest of **FROGS**

Text and Photographs: S.U. Saravanakumar



A cool and moist habitat is the ideal home for *Rana temporalis*

The Western Ghats are a treasure  
trove of amphibians. However,  
little is known about the  
amphibians of this region.

A beginning has been made, but  
much still remains to be known.

Maybe a new species?

An amphibian can make three distinctions when it encounters another living being, which in the course of its life help it to survive. Meet something smaller than itself: eat it! Meet something bigger than itself: beat it! Meet something its own size: mate it!

Disregarding this simple doctrine for survival, amphibians sometimes get into serious trouble, like this red eyed, black bellied, slimy skinned bicoloured frog that was resting among the cool leaf litter close to my feet, as I squiggled a few lines in my field notebook for this article. It had been more than a month since I began field work in Varagaliar, an elephant camp close to Topslip in the Anaimalai hills of the Western Ghats.

I had always been romancing with the Western Ghats, and it was with an almost maniacal passion that I convinced the faculty of the Wildlife Institute of India of my need to be there. There could be no reason more convincing to justify my presence in the Western Ghats than a study of its amphibians. With about 120 species of which 89 are endemic, the Western Ghats are a treasure chest of amphibians, yet very little information exists about the amphibians in this area and India as a whole. Luckily Dr. Ravi Chellam, the man who studied the lions of Gir, my superior and guide for the study, also shared my interest in the subject and the area, which made it easy for me. In late November, 1994, with little knowledge of amphibians, a big load of books, a camera and a guitar I moved to my field site, the Western Ghats. Mani and Palanisamy, my field assistants, were to be my companions for the next five months, and Varagaliar, the valley with working elephants, deep jungles and poetic sunsets, my home.

My interest in community ecology and conservation biology led me to examine the problem of habitat conversion on the local faunal communities. Amphibians, with their permeable skin, are extremely

sensitive to changes in their surroundings and hence ideal subjects for studying the effects of distribution on ecosystems. Varagaliar seemed an ideal site for this kind of a study.

Early in the 1970's, a large-scale operation was undertaken in Varagaliar to plant teak. A fairly large chunk of natural vegetation was cleared for this purpose. Thus, in Varagaliar, the natural and converted habitats lie juxtaposed, creating an ideal set-up for the study. The Varagaliar river, flowing along the valley, connects both habitats and is a corridor for the movement of amphibians.

The first month in the field was hectic and frustrating — setting up a field station, hiring field assistants and learning to catch frogs. My daily routine was to search plot after plot of both the vegetation types at dawn and dusk when the amphibians are active. I standardised my sampling method, thus making the comparison of both habitats possible.

For a person studying amphibians for the first time, Varagaliar is a paradise. On my very first day, as I walked along the Varagaliar river, almost every step sent a frog leaping into the river, and was I glad to see them! However, there was no way I could identify the species with such a brief glimpse.

Thus began my adventurous crawling, stalking and grabbing of those shocked beings.

Identification, however, was not so easy. So great was the colour variation within a species that at first I believed enthusiastically that every variant was a new species, only to be disappointed. Particularly notorious is *Indirana beddomii*. Within a small area I once collected a bright orange, a yellow and a white specimen, the only common character being the dark brown eye stripe. We, however, began to develop an eye for locating amphibians and searches became easy and routine. The joy of locating a new species was equal for all three of us — working as a team was turning out to be fun.

I began my field work with the notion that the diversity of amphibians would be higher in the natural vegetation patches as compared to teak plantations, but I was wrong. The commonly seen species such as Beddome's frog (*Indirana beddomii*), verrucose frog (*Limnonectes keralensis*), bronzed frog (*Rana temporalis*) and bush frog *Philautus* sp. were almost equally abundant in both the vegetation types. There were a few species that were restricted to one of these vegetation types, but I was able to collect just one or two specimens of such



The notorious *Indirana beddomii* comes in more than one colour morphs

species throughout my study period, and these were not enough to draw conclusions. No index or statistical test was going to support such findings. Many previous studies had shown that natural vegetation had greater species diversity as compared to converted habitats. Was Varagaliar going to be different?

The one species that occurred only in the natural vegetation was the bicoloured frog (*Rana curtipipes*). I had observed quite a few specimens in moist and cool areas and sometimes even along the dry forest paths in evergreen forests. But it was remarkable that not a single specimen occurred in teak plantations, not even within a small patch of teak that was enclosed on all sides by natural vegetation. This was a strong sign that this species

requires natural vegetation for its survival. I spent some time studying the microhabitat requirements and behaviour of the bicoloured frog in the hope of finding an explanation for its compulsive need for natural vegetation. The restriction of the bicoloured frog to natural vegetation seemed the only perceptible difference between the two habitats as far as amphibian communities were concerned. However, the natural vegetation patches and the teak plantations showed perceivable differences in their structure and microclimate. Natural vegetation had a greater percentage of canopy cover which was consistent throughout the year. Teak being a deciduous species, the entire plantation wore a denuded look for almost a month from February to March.

The natural vegetation patch was also cooler, more moist and with very little daily fluctuation in temperature and humidity. On the other hand, teak plantations showed a much greater daily variation. Early mornings were very cold and moist, and evenings hot and dry. Thus, the amphibians existing in teak plantations had to withstand a wide range of temperatures and adapt to relative humidity levels as low as thirty percent. Since amphibians have a highly permeable skin, water loss is a major factor affecting their survival. Such varying conditions of rapidly fluctuating temperatures and very low level of humidity require hardiness and adaptability on the part of amphibians if they are to survive in the teak plantations.

All these observations only added another sticky orb to this complicated web of community ecology. If the two habitats were so visibly different how was it that they supported similar amphibian communities? I was probably sampling only a small portion of the amphibian community of the two habitats which consisted of species existing in both areas.

The answer to this intriguing problem came as a revelation.

One evening in early January, we were sampling in the teak plantations along the banks of the Varagaliar river. Within the teak plantations the banks are sandy, probably because of heavy erosion. We trudged along plot after plot. Most of them had just one frog or none at all as we usually found in teak plantations. After the fifth plot, we moved into a small patch of



Unlike other frogs the bicoloured *Rana curtipes* was never seen in the teak plantations

vegetation — a clump of indigenous trees amidst the teak trees. This was not a typical representative of teak plantations, but I was sampling them anyway.

After demarcating the plot with a nylon rope, the three of us stepped in to begin the search. One step and a plop: frogs kept popping out from every imaginable place within the leaf litter and soon all three of us had our hands full, with many more frogs around to be caught. In all, this plot held sixteen frogs, a major improvement on the usual tally of one or none. And there were many more outside our demarcated plot, and within the limits of the clump of trees. It came to me as a flash, as it should have to anyone, that these bits of natural vegetation inside teak plantations could

actually provide ideal conditions for amphibians to survive.

Taking this clue, I checked other such clumps which were scattered through the teak plantations along the stream courses. My observations were similar, however, every clump of vegetation did not overflow with frogs. These clumps of natural vegetation along the streams were tiny pockets holding a remarkably large congregation of amphibians. It became obvious that teak plantations with clumps of natural vegetation held amphibians in similar abundance to habitats in natural vegetation.

While analysing the data, I found that the microclimate within these clumps was similar to the evergreen forests in their microclimate, and therefore highly suitable for amphibian survival. Thus, the frogs seemed

to congregate in these islands of vegetation.

But what would be the case in teak plantations, without the clumps of natural vegetation? To check this I compared data between teak plantations devoid of natural vegetation and evergreen forests.

The trend observed made a little more sense. *Rana temporalis* and *Limnonectes keralensis* were found to be quite infrequent in teak plantations. Both species are known to occur only in forested areas with a good canopy, and the fact that they were more abundant in the clumps of natural vegetation confirmed the findings of the previous studies.

The only two species that were found in high abundance in pure teak stands were *Indirana beddomii* and *Philautus* sp. I had often found *Indirana beddomii* far away from water



even during peak summer. Their hardiness could explain their survival in the harsh conditions of teak plantations. *Philautus* as a genus is known to use grass as a habitat. Since the teak plantations had abundant grass cover, *Philautus* were abundant in teak plantations.

The forest department of Tamil Nadu had in the past

What I had set out to find, I had found. Conversion of natural vegetation to commercial monocultures has been known to result in species loss. In Varagaliar, at least one species definitely suffered, *Rana curtipes*.

It was late August when I went back to Varagaliar. The southwest monsoon was nearing its end and all of Anaimalai

*Limnonectes keralensis* and *Rana temporalis*, which occurred close to water during my dissertation work, were now seen at distances of two hundred metres away from water.

I searched the teak plantations for signs of *Rana curtipes*, but there was no clue of their presence. Monsoon had not altered their avoidance of teak plantations. This only confirmed my previous observations and reiterated the importance of natural vegetation for the survival of this species.

In a couple of years after this study, I have slowly realised that there is still a lot to know about the frogs of Varagaliar and amphibians of the Western Ghats. Frog watchers are a small but faithful group, and I am sure they will help to unearth new information, unimagined trends and probably a few new species in the future. And as far as Varagaliar is concerned, and the entire Western Ghats, it is my deepest hope that there is no need for further clearing natural vegetation. Also, care should be taken to preserve the patches of natural vegetation existing in teak plantations, at least for the sake of these web-footed friends of man. 🌿

S.U. Saravanakumar is a field biologist working at the Wildlife Institute of India, Dehradun. He has a special interest in nature photography.

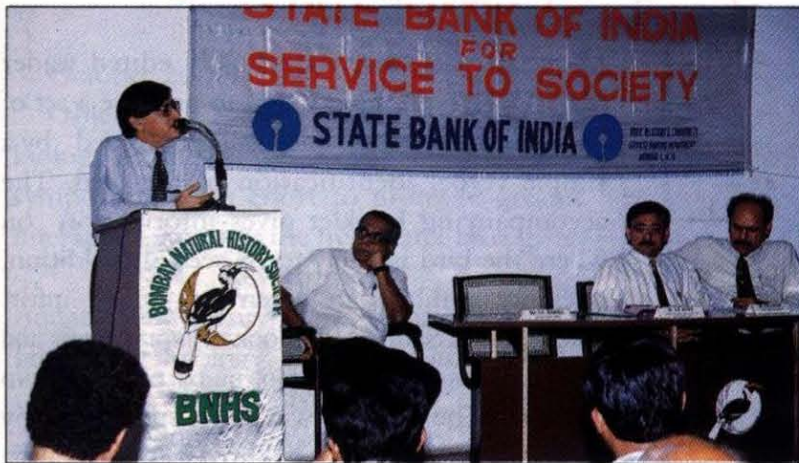


*Limnonectes keralensis* — one among the diverse treasures of amphibians at Varagaliar

specified that whenever natural vegetation was cleared for plantation purposes, the regions close to water sources would be left intact. This was done in the belief that it would prevent the drying of the source and provide cover for animals. The department can now add another justification, that these strips of vegetation act as a refuge for amphibians of the decimated natural vegetation.

was wet and green. I was here to see what the frogs were up to during the monsoon. From their loud calls and terrific numbers I knew they were doing fine. After a week of field work in the pouring rain, I got back to Dehra Dun. Monsoon is the time when amphibians are known to spread out and sometimes move remarkable distances away from water sources. Species such as

## SBI helps BNHS protect environment



Mr. A.K. Batra stressed the importance of NGOs in Community Service

The State Bank of India undertakes a host of activities under the aegis of its Community Services Banking, to meet its social obligation as a caring corporate citizen.

As a first step towards Environment Protection, an endowment of Rs. 10 lakhs was granted to the BNHS for supporting the Society's activities in wildlife research, environment protection and spreading public awareness. The interest from the State Bank of India Endowment Fund will be used for public education, awareness and research, and other projects.

Mr. J.C. Daniel, Hon. Secretary, BNHS, said that such altruistic gestures have helped the Society to achieve its objectives and he looks forward to more such contributions from the corporate sector.

Speaking on the occasion, Mr. A.K. Batra, Chief General Manager, SBI, Western Region, stressed the importance of NGOs in community service. Mr. Batra further stressed that India's future lies in sustainable development and not just in materialistic growth at the cost of environmental degradation. 🌱

## Grant from Tata Education Trust

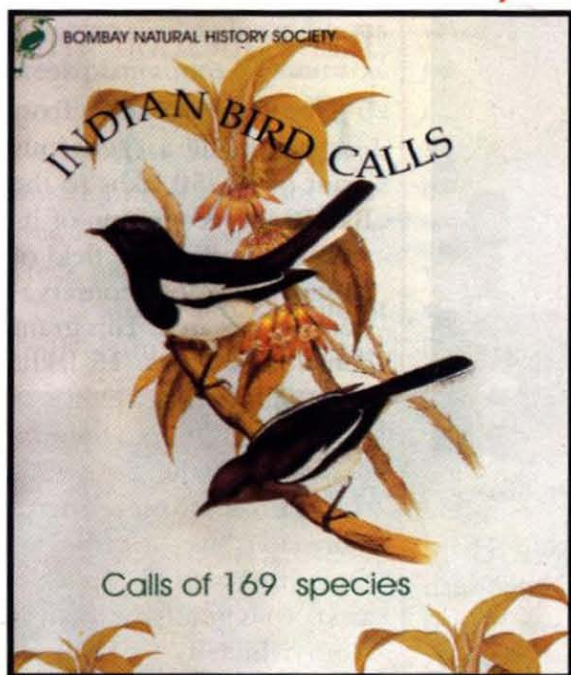
The Tata Education Trust has made a generous grant of Rs. 50 lakhs to the BNHS, in recognition of its valuable work in the field of nature education, conservation and research. This grant constitutes of Rs. 15 lakhs for Environment Activities as per the training programme designed by the Conservation Education Centre, Goregaon, over a period of three years, and Rs. 35 lakhs as a corpus grant, the interest from which is to be used exclusively for maintaining controlled temperature in the specimen collection room, computerising BNHS research and recruiting additional scientific officers.

The Conservation Education Centre conducts nature education and awareness activities, including special programmes for school children. The grant will also help to safeguard the National Heritage collection at Hornbill House. 🌱

## Donation for Hornbill

We gratefully acknowledge a donation of Rs. One lakh from Mr. Rishad Naoroji, given for creating awareness of nature conservation issues and for the study of natural history through *Hornbill*.

## First Audio Tapes on Indian Bird Calls

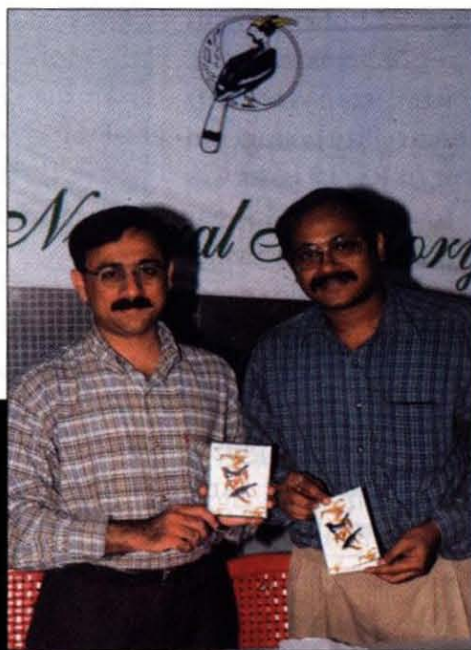


The first ever bird call tapes produced by the BNHS, were released on 8th May, 1999. The tapes were released simultaneously at Hornbill House, Ramnarain Ruia College, Matunga, and the Rotary Service Centre, Santacruz.

Dr. Erach Bharucha, EC member, BNHS, and an environmentalist, compiled the tapes from the recordings made by him and by B.C.R. Bertram and Br. Antonio Navarro, St. Xavier's High School,

Mumbai. 169 calls were finally edited under Mr. J.C. Daniel's supervision to produce a set of two 60 minute tapes. Each call is preceded by a simple verbal identification of the bird. The accompanying booklet gives information on where the bird is likely to be seen. In addition, reference numbers are given for quick information from Salim Ali's *BOOK OF INDIAN BIRDS AND COMPACT HANDBOOK OF THE BIRDS OF INDIA AND PAKISTAN*. The project was fully sponsored by Seth Purshotamdas Thakurdas and Divaliba Charitable Trust through the good offices of Dr. Pratap R. Saraiya.

The set of two tapes is priced at Rs. 160/- (Rs. 120/- for members), packing and forwarding charges extra. 🍎



Top: Mr. Sunil Zaveri, Hon. Treasurer and Dr. Shashi Menon releasing the tapes at Ramnarain Ruia College, Mumbai



Left: Dr. Pratap R. Saraiya being greeted by Dr. E. Bharucha and Mr. B.G. Deshmukh, President, BNHS at Hornbill House

## National Symposium on Aquatic Biodiversity & Emerging Trends in Freshwater Biology

October 24-27, 1999

Objectives: Biodiversity and freshwater biology are the frontier areas of research. This symposium is an effort to promote greater interaction amongst the freshwater biologists.

### Key themes

- Aquatic biodiversity: Flora, fauna  
 Freshwater Ecology: Taxonomy, Ecosystem dynamics  
 Aquatic pollution: Water quality, Indicator species  
 Fish biology: Behaviour, genetics, physiology, biochemistry, endocrinology  
 Fishery resources: inland (including coldwater), reservoir  
 Aquaculture: Fish farming in hills and other parts of India.

### Registration fees

Delegates: Rs. 500  
 Accompanying member: Rs. 300

### Scientific Programme

#### Day one

- Technical session I Aquatic Biology
- Technical session II Freshwater Biology
- Technical session III Aquatic Pollution

#### Day two

- Technical session IV Fish Biology
- Technical session V Fishery Resources
- Technical session VI Aquaculture

For further details contact:

Department of Zoology  
 H.N.B. Garhwal University  
 Srinagar-Garhwal 246 174  
 India.

## Appeal

**O**n the night of 20th December, 1998, a group of miscreants attacked Kahitama Beat of Manas National Park and killed three of its staff — Bimal Chandra Kalita, Forest Guard, Hav. Bentik Sangma and Constable Chandra Keswar Gogoi. Each of them is survived by his wife and young children.

All three were excellent workers and have lost their lives while protecting the forest and

wildlife. There is now no known source of income available to the bereaved families. We appeal to the well-wishers of forests and wildlife to provide financial help to the families of the deceased. Kindly send your contributions by cheque or demand draft to: The Member Secretary, Wildlife Areas Development & Welfare Trust, Rehabari, Guwahati 8, Assam.

### Answers for The Young Naturalist

- |  |   |   |   |   |                                   |
|--|---|---|---|---|-----------------------------------|
| <b>Across:</b><br>1. Siberia<br>2. Stem<br>4. Python<br>5. Tusk<br>7. Atlas<br>8. Antler<br>11. Cuckoo | 12. Elephant<br>13. Teak<br>15. Gir<br>16. Claw<br>20. King Cobra<br>22. Anaconda<br>25. Herbivore<br>26. Six | 28. Fig<br>31. Tortoise<br>32. Turtle<br>34. Tree Frog<br>36. Fugu<br>37. Caterpillar<br>38. Botany | <b>Down:</b><br>3. Tiger<br>4. Peacock<br>6. Sanjay Gandhi<br>9. Acid<br>10. Weed<br>12. Epiphyte<br>14. Fern | 17. Whale<br>18. Bat<br>19. Bamboo<br>21. Carnivore<br>23. Omnivore<br>24. Butterfly<br>27. Eight<br>29. Dodo | 30. Leaf<br>33. Enemy<br>35. Rui. |
|--|---|---|---|---|-----------------------------------|

The sense of smell in animals

Unlike the true cats, the civet cats have an extraordinary powerful smell. I once had a beautiful grey beast brought to me by some Nagas late in the evening as it was getting dusky. They asserted that it was absolutely tame so I took it out of the basket, and it at once licked my hands and climbed over me uttering a sound like a purr. I kept it with me for about an hour and then wanting to go to bed decided to lock him up in an old aviary, I had once used for some eagles. Leaving it, as I thought, safely shut up, I turned in, but hardly was I in bed before I heard a scratching at the thatch roof and presently down dropped the civet, pushed itself cheerfully through my mosquito net and evinced the greatest delight at having found me once more. Feeling that it was hardly a desirable bed companion, I again grabbed it by the neck and carried it out to the cage. Shut up once more, it was out, however, and back in my bed almost as soon as I was. Determined to be allowed to sleep in peace I again carried him right away out of the garden to a huge cotton tree about 200 yards away

and saw him run safely up into the top branches far overhead, but, before I got back to my garden, I turned to have a look and there was my recently acquired pet with its nose to the ground simply racing over it after me.

This cat would often nose out birds nests in trees or bushes within a few feet of the ground and then climb up, and devour any eggs or young contained in them. When he arrived at a bush with a nest in it he would halt for a second or two with his little nose lifted up and quivering about in every direction until it was in a bee-line with the nest, and then up he climbed. Fortunately, he was the most amenable animal to deal with I have ever had, and soon learnt that no nests within my garden fence must be touched. He was immense pals with all the dogs and could track them up by scent at a gallop, proceeding in ungainly leaps after the manner of his kind. His sight for distant objects was very poor, though for anything near it was exceptionally quick. 🐾

E.C. Stuart Baker,  
July 1920.

The sense of hearing in animals

I have been able to compare the powers of hearing in animals and have noticed that invariably the leopard was the first to hear any sound, with the occasional exception of a little prick-eared Tibetan dog. The first sound, which to my human ears, used to convey the news that anyone was approaching my compound, was the creaking of a bamboo gate which let them into it, but long before this the animals knew all about it. First the leopard would prick up his ears, raise his head, and

stare, with that curious far away look in his pale eyes, in the direction of the new arrival, next the deer would erect their heads, stamp with their forefeet and also turn in the same direction, and lastly the dogs would show that they too had heard. The bears and monkeys never seemed to take any notice unless the person was approaching about meal time, but even then they were the last to pay attention. 🐾

E.C. Stuart Baker,  
July 1920.

## Voracity of a Python

On the 10th November, 1912, during the Diwali holidays, while shooting at Popatpura near Bavla, in Ahmedabad District, I was walking after snipe, in company with Mr. J.H.E. Tupper, I.C.S., when one of the beaters called out that there was a big snake. We found that it was a large python, (*Python molurus*) lying torpid. We proceeded to shoot it, and as it was lying half coiled up, its body was naturally a good deal injured in the process. Seeing a feather sticking out of a wound, we told one of our men to extract the bird to which it belonged. He pulled a duck out of the wound and took out five others one after the other, six ducks in all. They were all quite or recently fresh, their feathers being complete and none far gone in digestion. They looked as if they had all been swallowed at about the same time. There were gadwall and spotbill among the ducks, but we did not note the description of all the ducks. All had been swallowed head foremost. The python, when stretched, roughly measured was fully eight feet long. Is not this an unusually heavy meal for a python to make?

Shortly after, while wading in the water after a wounded duck, I saw a snake swimming near me. It made little attempt to avoid me, and I shot it through the head. It was a python about six feet in length. 🐍

P.R. Cardell, I.C.S.  
Bombay, 11th December, 1912.

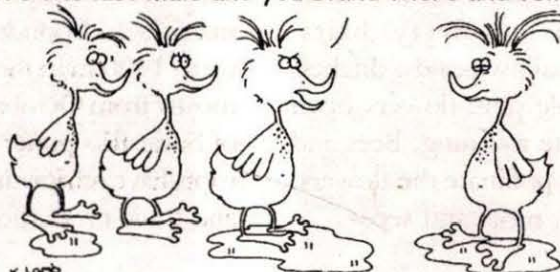
## Moths attracted by tobacco smoke

I have read with interest Mr. Oxenham's note on a butterfly attracted by tobacco smoke. I have noticed the same thing more than once. The smell of tobacco itself is hateful, if not deadly, to most insects, but the aroma of its fumes certainly has an attraction for some kinds of moths. The smell of wine is much more generally attractive to both moths and butterflies, and I need not say that they do not always draw the line at smelling it. When I have seen a moth perplexing itself to discover the source of the intoxicating fragrance, I have offered it a sip in a spoon, and the offer has been most gratefully accepted. It is rather a curious thing that this taste, among butterflies at least, is confined to certain genera which we rarely or never see at flowers, such as *Euthalia*, *Kallima*, *Charaxes* and most of the Satyrinae. The Papilioninae and Danainae, which are fond of flowers, will not be tempted with liquor. Neither will the Nymphalid genera *Hypolimnas* and *Junonia*, nor any of the Blues. But those butterflies which may be caught with sugar are much attracted by the juice of certain trees exuding when the bark is cut, and they often show a taste for grosser refreshment. 🐛

E.H. Aitken,  
Karwar, 16th August, 1893.

Editor's Choice

We're the last female droop-billed swampducks in the world, and you're the last male and you stand there and tell us you're gay?



Source: Earth Mirth  
Courtesy: Kingswood Press

# Indian Wildflowers

Text and Photographs: Isaac Kehimkar

Wetlands are among the most productive and most threatened ecosystems. Sometimes mistakenly called wastelands, wetlands have been drained, "reclaimed" and polluted.

We have lost much of this waterlogged wealth this way. The unique wetland ecosystem abounds in an array of plant life.

## 53. INDIAN LOTUS

*Nelumbo nucifera*

Hindi name: *Kamal*

The large fragrant flowers can easily be recognised among the large cup-shaped leaves that often emerge out of the water. Gregarious and often dominant, the lotus is seen throughout India up to 600-1400 m in the Himalaya. Its rhizomes, fruit and leaves are eaten as vegetables. Flowers and rhizomes are used to treat diarrhoea.

## 54. STAR WATER LILY

*Nymphae nouchali* var *cyanea*

Hindi name: *Kumudini*

Often found in garden pools, this aquatic gregarious herb with floating leaves is also seen in lakes, ponds and canals throughout India. Flowers all round the year, faintly fragrant flowers remain open throughout the day. The rhizome is cooling and tonic. Used in treating diarrhoea and dysentery. Flowers are astringent. Seeds are constipating and restorative.

## 55. COMMON WATER LILY

*Nymphaea pubescens*

Hindi name: *Kumudini*

Common throughout the warmer regions of India. The undersides of the toothed leaves are covered with dense, velvety hairs. Gregarious, common in shallow ponds, ditches, and gardens. White or pale pink flowers open in the evening, close by late morning. Bees and wasps come for nectar and pollinate the flowers. It has edible leaves, stems, roots and seeds.

## 56. FRINGED WATER-SNOWFLAKES

*Nymphoides indica*

Hindi name: *Barachuli*

A gregarious aquatic herb with floating leaves, common in shallow ponds and slow flowing waterbodies. This herb, which flowers throughout the year is a dominant feature of wetlands. Rhizomes, roots and leaf stalks are used as vegetable. A bitter herb, used as antiscorbutic and febrifuge.

## 57. MARSH GLORY

*Ipomoea aquatica*

Hindi name: *Kalamb / Nari*.

Common throughout India and Sri Lanka in marshy, water-logged places, this trailing runner has hollow floating stems that root at the nodes. The flowers open in the morning and fade by late afternoon. Flowers throughout the year except in the rains. Caterpillars of Death's Head Hawkmoth feed on its leaves. Tender shoots are cooked and eaten. Used as tonic.

## 58. MARSH BARBEL

*Hygrophila auriculata*

Hindi Name: *Talimkhana*.

Gregarious stands of this 80 cm tall, thorny shrub are common in and around freshwater marshes and ponds. Seen throughout India and up to 1400 m in the Himalayan foothills. Flowers mostly from October to January. The Pansy group of butterflies prefer to lay eggs on this plant. The roots have refrigerant, diuretic, anti-inflammatory and tonic properties.

# Wetland Blooms



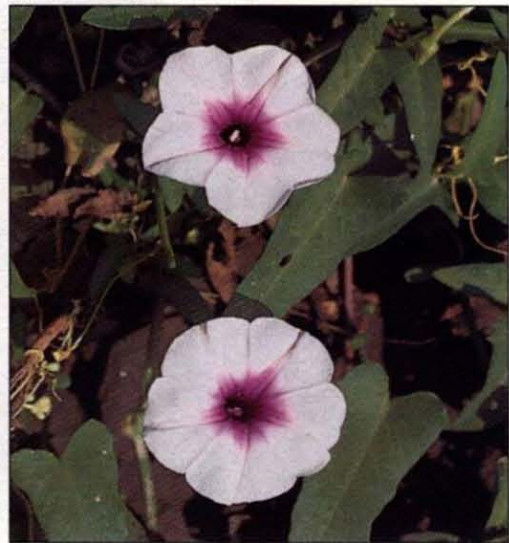
INDIAN LOTUS



FRINGED WATER-SNOWFLAKES



STAR WATER LILY



MARSH GLORY



COMMON WATER LILY

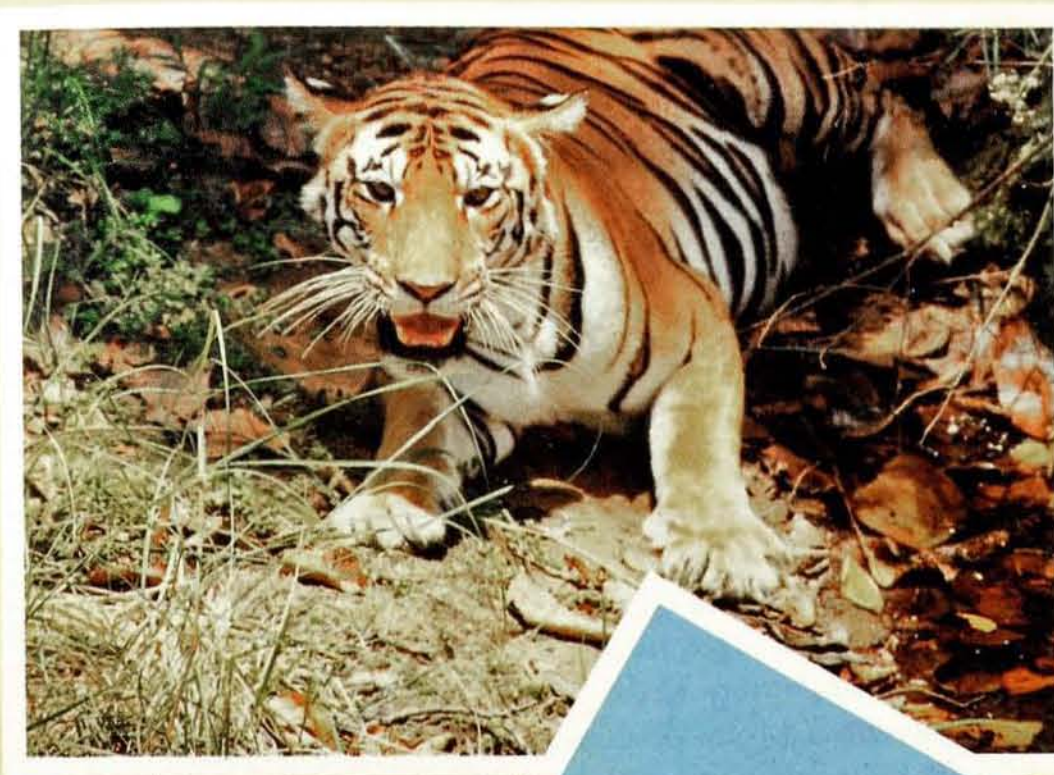


MARSH BARBEL

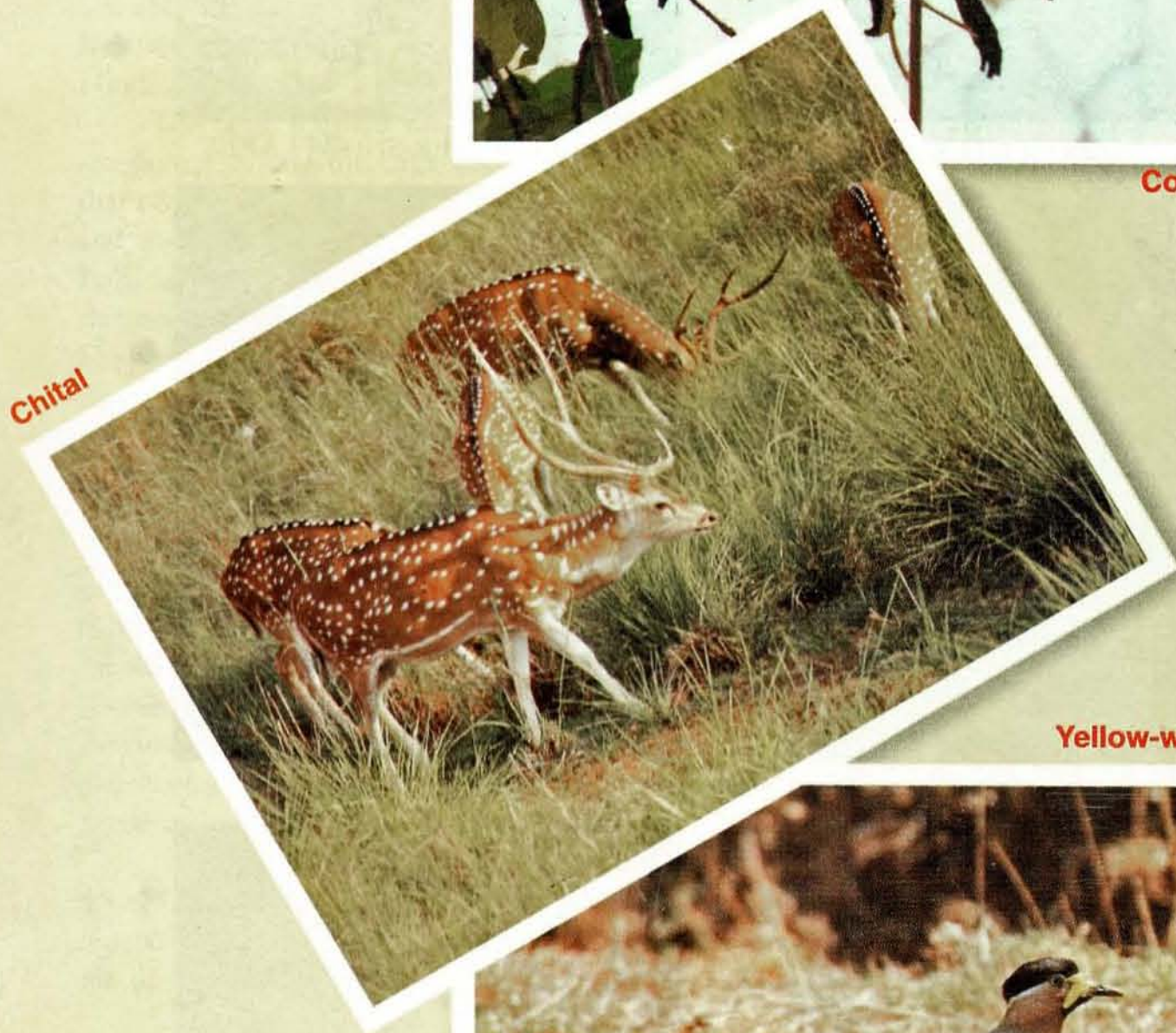




Common Langur



Tiger



Chital

Yellow-wattled lapwing



Bauhinia vahlii

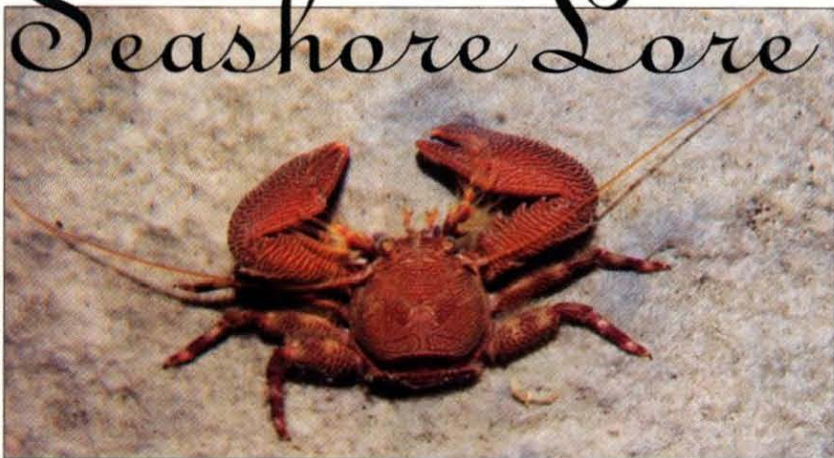
Barasingha



**Kanha National Park**  
A Photofeature  
by Ashok S. Kothari

# Seashore Lore

B.F. CHHARGAR AND R.D. PADTE



The pretty porcelain crab is related to the hermit crabs



## 33. Masquerade

When a crab is not a crab



S.A. HUSSAIN

A coconut crab on a coconut tree is a rare sight

---

### Beefsea

---

*For I have friends who dwell  
by the coast,  
Pleasant friends they are to me!  
It is when I'm with them  
I wonder most  
That anyone likes the sea.*

Lewis Carroll

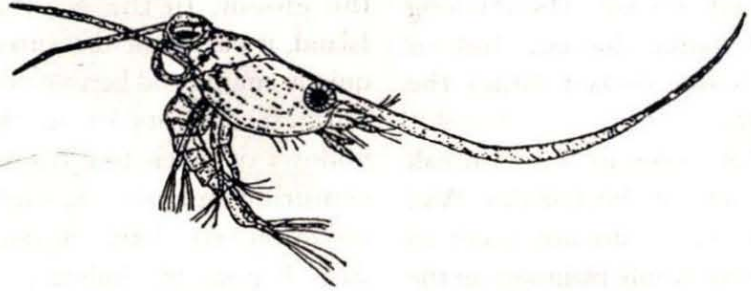
William Shakespeare may have said, "What's in a name? A rose by any other name would smell as sweet." But biologists are more particular in dotting their i's and crossing their t's, and are unhappy when animals are called by inappropriate names. Thus there are many so-called "crabs" which are only distantly related to the true crabs (Brachyura).

One such is the porcelain crab, a representative of which, *Petrolisthes bosci*, is common on our shores. It is doubly misnamed. Firstly, it is not a crab, but is related to the hermit crabs (Anomura), though superficially it looks more like a true crab. Coloured a pretty crimson, speckled with

innumerable short creamy white lines, it has a flat body and huge, flattened claws which also give it its other name — broad-clawed crab. The abdomen is tucked under its body, giving the animal a crabby appearance, but unlike in a true crab where it is so tightly stuck to the body that some force is required to extend it, in the porcelain crab it is quite loose and can be readily extended. They can also be distinguished as they have only three pairs of walking legs, whereas true crabs have four. Here the fourth pair are slender rods tucked closely against the sides of the body.

The antennae (feelers) are very long. It may rightly be named a "brittle crab", as the legs and claws are readily shed at the slightest handling, so that most of them are found with one or more legs or claw missing. While crabs are scavengers, porcelain crabs feed on tiny plankton by spreading out their third maxillipeds (foot-jaws) which have a dense fringe of long, plumose hairs serving as a net to trap the plankton.

In case one wonders why it is called a porcelain crab, the name comes from a related genus, *Porcellana*. The true porcelain crabs which, incidentally, are Brachyurans, are the tiny ones of a size between a pea and a marble, found on mudflats, whose body has the

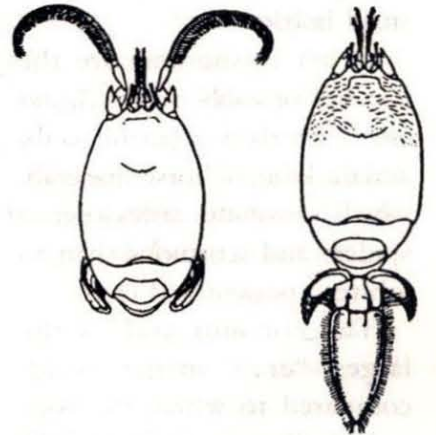


The zoaea larva of porcelain crabs has long spines like a dunce's cap.

ivory grey colour and texture of porcelain (e.g. *Philyra*). But, as the name porcelain crab is commonly used for *Petrolisthes* and *Porcellana*, these (*Philyra*) are better called pebble crabs, which more aptly describes their size and shape.

The larvae of porcelain crabs are zoecae (just as in true crabs), but can be readily distinguished by their extraordinarily long rostral and dorsal spines.

Another misnomer is the mole crab (*Emerita, Hippra*). They are very common on sandy beaches all along the east coast of India, though they also occur at Ratnagiri. The term "mole" truly describes its habit of burrowing rapidly. Like a child (or dog) resenting being bathed, they seem not to like water. It is amusing, when the tide is coming in, to see hundreds of them popping out on the sand as the outgoing swash exposes, for a moment, the wet sand. But the next incoming wave sends them digging helter-skelter into the sand as if in a hurry to avoid getting wet. It reminds me of



A mole crab as it is seen on the beach (left), and with its abdomen extended (right).

the saying, "each one on his own and the devil take the hindmost". About 4 cm long, their narrow body is shaped like a spindle, with the abdomen loosely tucked under it.

The first pair of feelers (antennules) are held close to each other to form a respiratory tube, while the second pair (antennae) are very hairy, looking somewhat like long handlebar moustaches. The tiny eyes, at the end of long thin stalks, look like miniature matchsticks. The legs are hairy and are highly efficient for digging; the first pair are the

longest. The tail (telson) is long and lance-shaped, but is normally tucked under the body.

The males are less than half the size of the females. And mole crabs do not seem to observe family planning; in the breeding season, digging up a square metre of sand can yield enough of the young to fill a small bottle.

Other misnomers are the coconut or robber-crab (*Birgus latro*) which is a hermit crab, and the king, or horseshoe crab, which is evolutionarily closer to spiders and scorpions than to lobsters, prawns and crabs.

The coconut crab is the largest "crab" in the world, compared to which the rock crab (*Scylla serrata*) is a puny 15 cm wide. In India, it is found only on the South Sentinel Island of the Andaman Island group, and at Galathea Bay in the Nicobar Islands. Like the porcelain crab it too is doubly misnamed. Coconuts are not its normal diet, nor does it "rob" coconuts from trees. But it can climb up coconut trees; this ability was noted by the Arab merchant Soleyman as early as the 9th century AD.

It is extremely shy and encountered during the day on the Sentinel Island. This is because the island is so thickly forested that the canopy of branches and foliage allows very little sunlight to penetrate into

the gloom. In the Nicobar Island, it passes the day sitting quietly among and between the buttressed roots or in the hollows of fallen tree trunks, venturing out only at night except on very cloudy or rainy days. It goes into hiding even on moonlit nights.

Its propensity to climb coconut trees seems to be very rare, as hardly anyone has seen it up such a tree. Even the natives of Nicobar Is. do not believe that it feeds on coconuts. The damage to coconuts is attributed to the crabs, but the real culprits are often rats. But the pile of broken coconut shells as well as husk below the six coconut trees on South Sentinel Island leads to a strong suspicion that these were made by coconut crabs, and not by rats or monitor lizards (*Varanus*). A crab which broke its tether and climbed up a nearby coconut tree at night remained there for the whole of the next day, dropping down to the ground the next night and hurrying off to a boulder on the seashore. The tender shoots of the palm tree were found to have been cut (and probably eaten), but none of the coconuts had been touched.

Walking on the ground is clumsy. The first two pairs of walking legs are used, while the small third pair lift the abdomen off the ground. Unlike true crabs, coconut crabs can walk

(or rather shuffle) forward, backwards or sideways, but they prefer to walk forward, except when carrying things, when they go into reverse gear. Digging holes for shelter is done by scooping the soil by the smaller right claw, conveying it to the larger left claw, which then shoves it away to the left of its body to form a 10 cm high pile. After finishing its digging, the crab turns around, backing into the pit and hiding its abdomen — sometimes its whole body — in the hole.

The claws are too big to be used as "hands" while feeding, as the large claw cannot reach the mouth. The claws pass the food morsel to the third maxillipeds (foot-jaws) just outside the mouth which, in turn, convey it to the inner mouth parts.

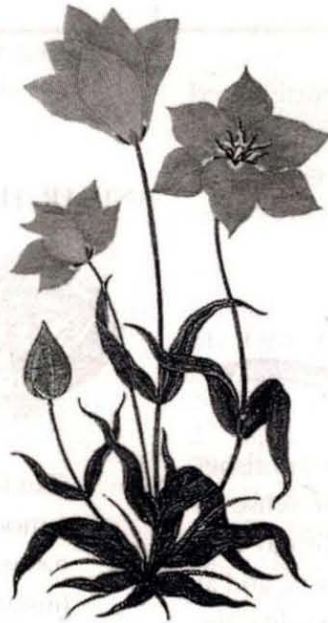
The coconut crab is highly vulnerable; it is on Schedule I of the Indian Wildlife Act, 1972, and killing one is punishable with a six months jail sentence. But, in the good old days before the Act came into force, Dr. Robert Grubh, Rex Pimento and others of the Society had visited Sentinel Island and even brought two live coconut crabs, which lived at Hornbill House for a few months. They thrived on cooked rice, chapatis, coconut kernel, chikoos (sapota), lizards, sparrows and meat. 🐞

## FLORA AND FAUNA IN MUGHAL ART

Edited by Som Prakash Verma,  
Marg Publications, Mumbai,  
Vol. 50, No. 3. March 1999,  
pp. 164. Hardbound Rs. 1950/-

.....  
Reviewed by Gayatri Ugra  
.....

In the Introduction to this handsome volume, editor Som Prakash Verma has summarised different aspects of Mughal art which incorporate flora and fauna in their subject matter and decorative design. While orthodox Islam discourages the depiction of humans and animals in "graven images", the art of the Mughals is replete with flora and fauna in miniature paintings, carpets, stone carving and inlay work. The dodo *Raphus cucullatus*, now extinct, was recorded by Mughal miniature painters (p. 84), along with other species which, mercifully, still exist. The Asiatic cheetah *Acinonyx jubatus*, also extinct, is painted in numerous miniatures, and also woven in carpets such as the Boston Museum Shikargah (a hunting carpet), which also has a *simurgh* (mythical bird)



attacking the *gajasimb*, a mythical enemy of the elephant. The drawing reaches close to perfection in the five elephants being attacked by a *gajasimb* (p. 64).

In the words of R. Nath, in his chapter on Mughal architecture (p. 149), "A Mughal habitat could rarely be conceived without trees, plants and running water". Babur, the founder of the dynasty, is survived by a rich legacy of gardens at Agra, Dholpur and in Afghanistan. The Mughal gardens in Kashmir bear testimony to this legacy, which reached a peak in the times of Jehangir and

Shah Jehan. According to Verma, Babur (1526-30) has given a graphic account of Indian flora in his memoirs, *BABURNAMA*, (pp. 109-110).

The well known Ustad Mansur was commissioned by Jehangir to prepare illustrated folios on flowers. These are portraits of flowers painted realistically. They are embellished with floral borders that are imitated by the textile industry and in Indopersian carpets being made in India to this day. The Indian carpet industry owes almost its entire range of floral and faunal design to its Mughal origin, a minuscule part being influenced by the Chinese and French traditions. Information on the original museum pieces among such carpets is well documented by Syamali Das (pp. 133-48).

The editing, designing and production of this book bear out the hallmark of Marg Publications. Just one disappointment: lack of space appears to have restricted the number of illustrations one would hope for in a premium quality book on a subject which promises a memorable visual feast. 🍷

**We are grateful to**  
**SETH PURSHOTAMDAS THAKURDAS & DIVALIBA CHARITABLE TRUST**  
**and**

**MEHTA SCIENTIFIC EDUCATION & RESEARCH TRUST**

for financial support for the publication of *Hornbill*.

Their consistent support is greatly appreciated.

Compiled by  
V. Shubhalaxmi and Vibhuti Dedhia

Do fishes breathe air? No, fishes breathe dissolved oxygen in the water with the help of gills.

Do fishes sleep? Yes, but with their eyes open. They shut their pupils as they have no eyelids.

## EEL



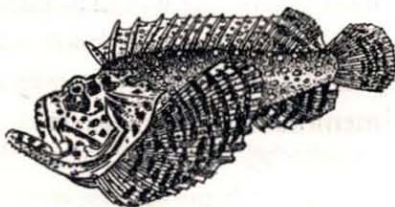
Are eels fishes or snakes? Eels are fishes with ribbon-like bodies. Their sense of smell is better than most fishes. By day they hide in crevices along rocky coasts, and at night they hunt for food. Some, like the electric eel can give a shock powerful enough to kill a man.

## ARCHER-FISH

Does a fish shoot to hunt? Yes, an Archer-fish does. On sighting an insect on plants or rocks outside the water, the Archer fish starts shooting water droplets, so that the insect falls in to the water.



## STONEFISH



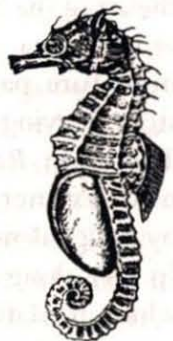
Can a stone kill? Yes, if it happens to be a Stonefish. Stonefishes look just like stones on the shallow seabed. But if you step on one, the poison in the spines on its fins can kill you within an hour.

## ANGLER FISH



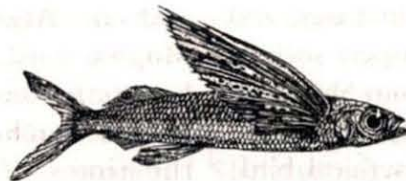
Can fishes fish? Angler fish do. They have a modified spine which forms an angling rod with a brush-like tip. When the fish is hungry, it buries itself in the sea bottom and wriggles its spine to attract an unwary fish, which mistakes it for a worm.

## SEAHORSE



Can males give birth? Male seahorses can. They have a pouch on their belly where the female lays eggs, leaving the male much pregnant with eggs in its pouch. When the young hatch, they pop out of their father's pouch and swim away.

## FLYING FISH



Can fishes fly? Yes, ofcourse. When in danger from big fishes, the Flying Fish jumps out of water, and is known to glide over a 100 m above water. The elongated fins on the side of the body and the specialised tail enable it to perform this unusual task.

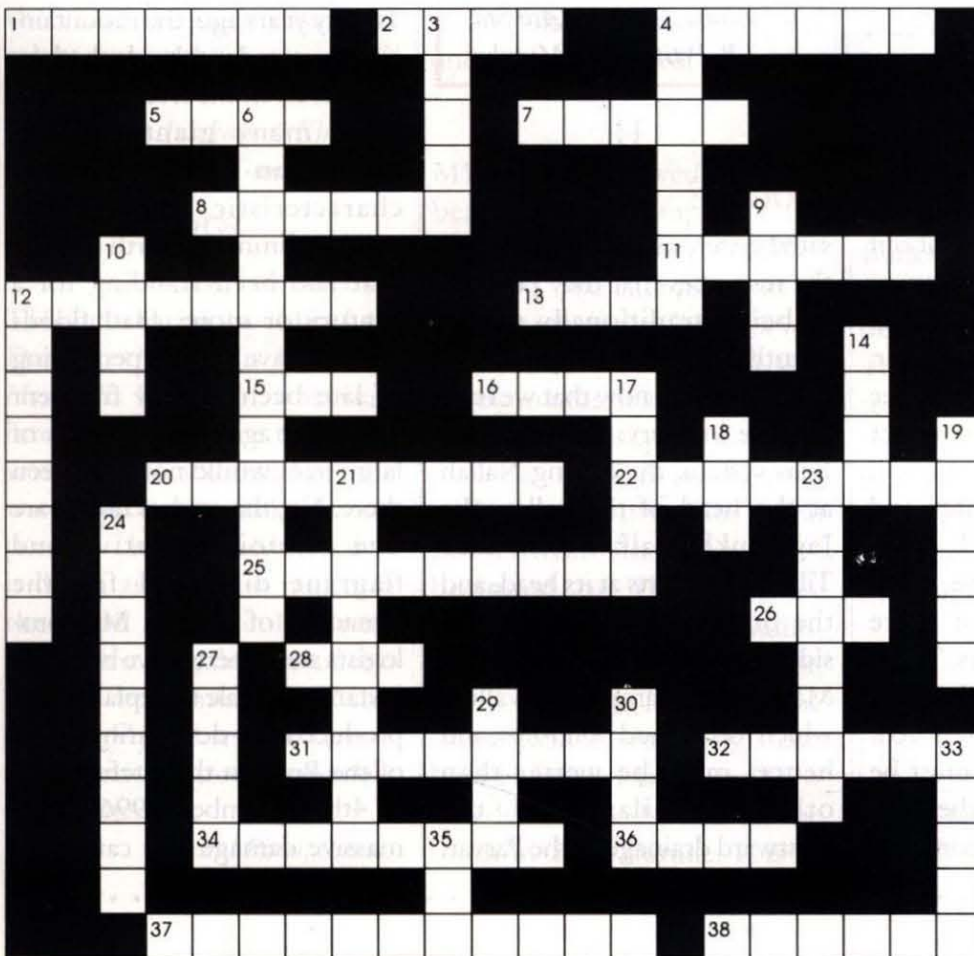
# CROSSWORD

Across:

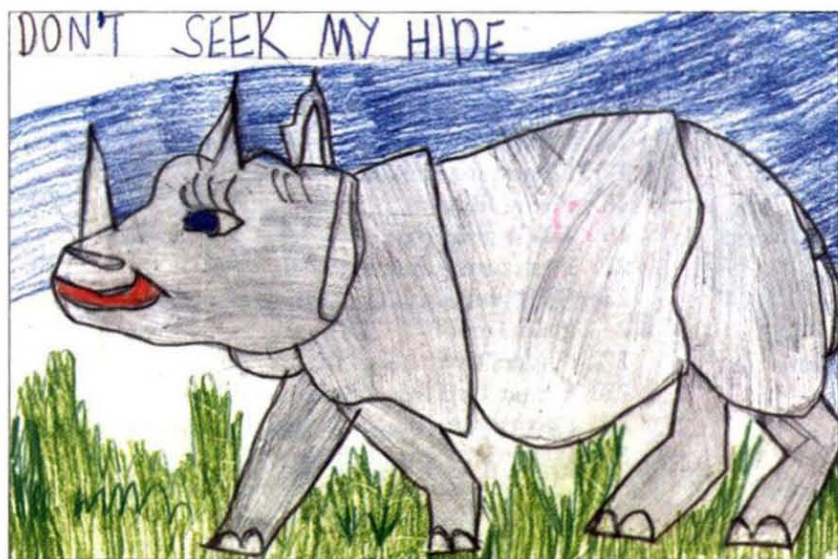
1. Place of origin of a tiger (7)
2. Cactus leaf is a modified ... (4)
4. Largest Indian snake (6)
5. A male and female Asian elephant can be identified by their ... (4)
7. Largest moth (5)
8. Horn of a deer (6)
11. Bird that lays its eggs in other's nests (6)
12. Largest mammal on land (8)
13. Myanmar is the highest exporter of ... wood (4)
15. Asiatic lions are only found in the ... (3)
16. Nail of a Tiger (4)
20. The only snake to make a nest to lay eggs (9)
22. A foreign film on snakes found in Brazil (8)
25. Plant eating animal (9)
26. Insects have ... legs (3)
28. A fruit which is a flower (3)
31. Animal with longest lifespan (8)
32. Marine cousin of tortoise (6)
34. Builds a foam nest for laying eggs (8)
36. Japanese dish prepared from puffer fish (4)
37. Young one of a butterfly (11)
38. Study of plants (6)

Down:

3. National animal (5)
4. National bird (7)
6. Official name of Borivali National Park (6, 6)
9. Pollutant gases in the air come down as ... rain (4)
10. It's out of place in a garden (4)
12. Neither parasite nor symbiont it is ... (8)
14. Oldest plant (4)
17. Largest marine mammal (5)
18. Flying fox is a ... (3)
19. Tallest grass (6)
21. Flesh eating animal (9)
23. Both plants and flesh eating animal (8)
24. Plain Tiger is a ... (9)
27. Spiders have ... legs (5)
29. Extinct bird from Mauritius (4)
30. Pitcher plant has ... modified into a pitcher (4)
33. Predator means ... (5)
35. ... leaves used in garlands and is also a food plant of Plain Tiger (3)



## Children do care



I AM worried about the rhino, please make prints of it. The rhino is almost extinct. I would love to become a member of the hornbill club. You published my sister's drawing, can you publish mine?

*Alisha Tibrewala, 4th Std,  
J.B. Petit School, Mumbai*



## Saved or Doomed?

WE have started talking about hills and mountains playing an important role in extracting, literally, moisture from the air. As populations grow, and the multifarious needs for water increase, the mountains will have to be given greater and greater attention. I have mentioned elsewhere, that certain valleys receive more precipitation than others. These valleys must be identified and their water regimes monitored. Forests in such valleys must be carefully protected — the local inhabitants should be compen-

sated generously for not utilising the resources that they perceive as being traditionally theirs. Identifying such valleys should not be difficult now that we have satellite imagery: In the upper Beas system, the Solang Nallah at the head of the valley, the Jagatsukh Nallah with Dev Tibba's ramparts at its head, and the drainage on the southern side of the Khanpuri ridge above Manali are examples of valleys which form cloud build-ups, and hence, must be wetter than others. Similarly, all the westward drainage of the Parvati

— Sainj Nalla watershed has powerful updrafts and as such, the Great Himalayan National Park assumes a greater significance than merely as a means of preserving Himalayan flora and fauna. Vegetation cover, and more important, the quality of its composition, must be given great attention.

During the last two decades there have been frequent reports of flash floods from the Beas Valley in Himachal Pradesh. It may be argued that there is greater media coverage because Manali has become a popular tourist draw. I do wish it were so, but my familiarity with this section of the Himalaya has a very different story to tell. Twenty years ago, the mountainsides were densely clothed by forests. Even the river bed had a good many giant trees of Himalayan beech with their characteristic black barked trunks of immense girth — trees that had been standing for a century or more. Had floods that we have been experiencing of late been equally frequent down the ages, these stands of large trees would not have been there. No, the recent floods are due to unimaginative and flagrant disregard for the dynamics of Nature. Meteorologists and experts have been, for instance, unable to explain what produced the devastating flood of the Beas on the fateful night of 4th September, 1996, when massive damage was caused to



the prestigious Snow and Avalanche Study Establishment (SASE), and an entire luxury hotel was swept away. The awesome power of Nature left everyone in a trauma which is still palpable. For the past so many months, I have been attempting to understand what had happened and in all humility I have an answer. Be they water shortages of Abdasa, Kutch and Marwar, Rajasthan or the rampaging floods of the Teesta and the Brahmaputra, lives must be adjusted to natural situations with deviations possible only to certain limits. The capacity to know these limits and adjusting to them is what makes the human species so unique. If there are frequent disasters, might not we be transgressing the limits?

*Lavkumar Khacher,  
Gandhinagar.*



### A Friendly Invader

THE editorial by Mr. J.C. Daniel, the Alien Invasion *Hornbill* 1998(1), was very interesting. Further to this, I would like to add that I use the water hyacinth to make the soil porous. The collected hyacinth is dried, and used as mulch in the soil for cultivating vegetables. Regular use of this invader helps makes the soil porous. Vegetables like carrots and potatoes grow extremely well in this soil.

*Snehal Patel, Surat.*

### Corals of Mumbai

IT was a relief to find from the "Poems in Stone" (*Hornbill* 1998(3)), that humans are not the only ones to indulge in war with their attendant boundary disputes, no man's land, counter-offensives, and tactical retreats. Isn't it a pity that these lovable creatures too behave in the same and cruel manner — albeit in self-defence? Why do corals bleach?

*Margaret D'Souza, Sirsi.*

Authors' reply: In most corals, the colour is not in their skeletons, but in the living tissue. This colour is due to the one-celled plants, zooxanthellae. Under adverse conditions, such as starvation, insufficient light, or warm sea water the corals throw off their zooxanthellae and appear bleached.

### II

MY teacher showed us some beautiful photographs of the Corals of Mumbai, *Hornbill* 1998(3). She later asked us to find out where the Coral Sea was located. Despite trying, I was unable to locate it in the atlas. Can you answer this query for me?

*K.C. Beena, Kannur.*

Authors' reply: The Coral Sea is near Australia. It is bounded on the west by Queensland (eastern Australia), on the north by New Guinea, Papua, Solomon Islands, on the east by Santa Cruz Islands and New Hebrides Islands, and New Caledonia Islands, and on the south by 30°S latitude. It is so

named because it has the Great Barrier reef on its west, and most of the islands have coral reefs.



### Are Army officers better naturalists?

I HAVE just received *Hornbill* 1998(2), in which the Miscellanea section carries contributions made by army officers. I am not suggesting that army officers were, or are more gifted naturalists than the other members of the Society. As you know it just happens that this profession simply places the officers in a position of advantage than others through their frequent travel. For instance in my 37 years in uniform I was located at 25 different un-specified army locations in practically every bio-geographic zone of the country.

The situation is the same today. Of course, in the period of Major General Hardwicke and Col. Burton (1857-1952) the BNHS was a magnet to which army officers were attracted in droves. They made useful contributions, so can the present generation. But times have changed and we have to get those new men in uniform inclined towards natural history and re-establish their links with the BNHS.

*Lt. Gen. Baljit Singh,  
Dist. Ranchi*



Eds: We thank WWF-I for allowing us to print the picture of the Hangul deer by Lt. Gen. R.K. Gaur in *Hornbill* 1999(1).



Purple Sunbird

# SANCTUARIES OF *Saurashtra*

---

**Text: Anil Mulchandani**  
**Photographs: Dinesh Shukla**

---



The Asiatic wild ass is a star attraction of the Little Rann

Suddenly, from nowhere, a wolf of impressive size appeared in front of us, just a hundred yards beyond the forest department gate to the Little Rann Sanctuary. We could not have hoped for a more exciting start to our trip, which would take us through five different habitats — the saline desert wilderness of the Little Rann of Kutch, marine ecosystems of the Gulf of Kutch, deciduous forests of the Gir, tropical thorn scrub forests and the Velavadar National Park — in a span of just 10 days. This little explored circuit of Saurashtra offers some prolific bird-watching opportunities in Asia, and a chance to see some of the rarest of wildlife species, including the Asiatic lion and the Indian wild ass.

## Little Rann of Kutch

We arrived at Dasada in the evening, and set off on a jeep safari into the Little Rann at dawn the next day. A drive across this flat wilderness is an exhilarating experience. The keen wind blows unchecked, flirting with your shirt and tousling up your hair. Shimmering mirages seem to fill the horizon with water, making the Rann resemble an unending sea coast.

The Indian wolf is the prime predator of the Little Rann Sanctuary. But today, the wolf population in this area has declined drastically. The young are clubbed to death by the Bharwad herdsmen to prevent increasing attacks on their livestock, resulting from the

decline in population of the blackbuck and chinkara in the Rann.

The star attraction of the Rann, however, is the Asiatic wild ass — a well muscled, chestnut brown and white member of the Equidae family. The best way of approaching these wild asses is by walking up to them. Being chased by trucks and cars has made them wary of vehicles.

The graceful Indian gazelle — chinkara — is another threatened resident of the Rann. This gazelle is severely decimated by poaching, despite the area being a Sanctuary. It is much sought after by the *dufars*, a semi-nomadic tribe that sells game meat at the local bazaars. The chinkara is not easy to see in the open for any length of time. It heads straight for cover in the bushes at the slightest disturbance. Visitors to the Little Rann in the early 1970s could see large herds of blackbuck in the peripheral scrublands, and in the rolling grasslands of Pung beyt in the hinterlands of the Little Rann. But today they are extinct in the Sanctuary. The same fate awaits the chinkara, unless steps are taken to stop poaching in the area.

By noon, we headed for the Bajana lake where scores of common Indian sandgrouse were landing for their afternoon drink. A flock of flamingoes moved gracefully over the water, their beaks probing for algae and molluscs, and a few dozen rosy pelicans floated over the calm water. A pair of huge Sarus cranes, with their vivid red heads strode through the grass, and congregations of more than 6000 demoiselle and common eastern cranes in flocks of 1000 to 1500 each, began their spectacular spiraling descent on the water for their mid-day roost. The Comb duck (Nakta), spotbill and the lesser whistling teal

are the resident duck species. Coots numbered several thousand on the open water lakes of Nawa talao. The white, black and glossy ibis are a common sight at the wetland. Sandpipers, snipe, little stint, red shank and other waders populated the reed beds. Grasslands around the marshes abound with birds such as the purple sunbird.

By sunset, we were looking for the Houbara bustard, a winter visitor of this region. A buff coloured bird, it is difficult to spot in the desert, but in flight the white mirrors on the wing, set off by black frames, make spectacular viewing. We noticed a marsh harrier roosting on the open



The painted stork inhabits the grassy marshland

ground in front of our jeep — harriers roost in this manner rather than in the bushes in the Little Rann.

The night sky was a canopy of stars as we made our way back to Dasada. We saw pelicans fishing in the moonlight at the wetlands of Patdi village, a jackal crossing the road and a long eared hedgehog on the roadside. It was early morning when we set out for Jamnagar, a six hour journey from Dasada. There was great excitement as we left the Rann, as we proposed to visit the coral fringed islands of the Marine National Park the next day.



Salt flats of the Little Rann are under threat from salt factories

The wetlands, scrub and grasslands covering the beyts of the Little Rann of Kutch, support an enormous diversity of wildlife spread over 4950 sq. km of salt flats. These are under threat from salt works that are clearing the vital green cover, polluting scarce fresh water resources with toxic bromide, and from over-grazing by free ranging cattle, sheep, goats and camels.

#### Marine National Park

We had verified the tide timings, and found them suitable for an early morning cruise to



The puffer fish is an unique resident of the Marine National Park

Pirotan Island. The journey began in the presence of three dolphins which rose over the surface of the water, elegantly diving back into it just paces away from the nose of our boat. The islands on the way were forested by mangroves, the canopy harbouring darters, cormorants, egrets and reef heron. Presently, looming up in the distance was Pirotan island. But the tide began to turn earlier than we expected, forcing us to wade in knee deep slush to reach the island. Soon we reached Pirotan, the home of the

unique puffer fish, where crab plovers, sanderlings, turnstones, a Terek's sandpiper, an oystercatcher and other birds had gathered to make the most of the cache of marine life left by the tide. Jackals searched for crabs in the rocky shores, and gulls and terns skimmed the water.

The natural habitats of the Gulf of Kutch are under severe threat as pollution is rampant, with the 200 km coastline from Jodhia to Okha-Mithapur littered with refineries, oil exploration projects, cement factories, chemical factories, thermal plants, salt works and fertilizer plants.

Developmental changes being planned by some industrial houses by 2000 AD will further pollute the water, and destroy the coastal environment. Unless major protests are registered now, the Marine National Park and Wildlife Sanctuary, India's first marine reserve, may be irreparably damaged.

#### The Gir Sanctuary

On the fifth day of our tour we reached the Gir by 4.00 pm. We could not wait to meet the king of Gir — the Asiatic lion, and set out

immediately towards the Sanctuary. Gir is spread over 1412 sq. km. Its scrubland, riverine evergreen flora and hill tracts are fed by seven rivers, interspersed with lakes, reservoirs and marshes. A few Sambar, chital, some hare, plenty of mongoose, and hordes of langurs were seen. The lion, however, eluded us the first day, but gave us an audience on the second day. What we had mistaken for a large bush, suddenly revealed itself by standing up and crossing the road! The few lions which do not react to human approach have given rise to the erroneous notion that the lions in the Gir are tame. A glimpse of a lion prowling through the forests will assure you that it is as fierce as the tigers of Kanha or Ranthambore. Even more remarkable sights were those of a large panther which passed by our bus ignoring our presence, and that of a chousingha, the only mammal with two pairs of horns.

The birdlife was pretty impressive too — tree pie, parakeet, grey drongo, painted partridge, painted sandgrouse, paradise flycatcher, golden oriole, magpie robin, crested hawk-eagle, crested serpent eagle, black eagle, shikra and grey tit were among the many birds we saw. At the Kamleshwar dam, we saw darters, painted storks and basking marsh crocodiles.

#### The Velavadar National Park

Next morning, we made an early start for the Velavadar National Park, where it easy to forget that you are not in the African Savannahs. Not only do the grasslands resemble those of Masai Mara and the Serengeti, but they are teeming with antelopes — among the handsomest of their kind in the world. There are about 1000 blackbucks in the national park, but during the dry season the numbers double to around 2000.

Velavadar is one of the few Indian parks where the wolf breeds regularly. Jackal and jungle cat are easily seen in the grasslands, and the fox

driven out by the rising population of the two larger canines — wolf and jackal — is pushed to the periphery of the park. Fox dens can be seen in late winter in the scrubby areas around the park, and jackal more often in summer in the grasslands. Nilgai is a common sight, while birds like the Bhavnagar sand lark, warblers, sirkeer cuckoo, swallows, quail and francolin abound. The common Indian, spotted, and the painted sandgrouse gather at water sources; demoiselle and common crane fly over the park in good numbers. Three waterholes, rather ugly in design, are vital to this arid area, especially in summer.

And evening is the time for Velavadar's greatest spectacle, the return of harriers — in numbers known to exceed 1500 from nearby cotton fields and grasslands — to their roost. Velavadar may be the largest roosting place for harriers in the world. It harbours what is easily one of the greatest congregations of birds of prey in the world.

Of all the harriers seen here 75% have been identified as Montagu's, the rest are almost entirely Pallid Harriers. A few dozen Marsh Harrier are seen at the roost. Hen Harriers have also been recorded. "I have seen and photographed a Pied Harrier in the Bahl plains," says Dilhaz Jaffrey, a wildlife photographer from Dholka, "in fact according to me the Bhal region which includes Velavadar alone has enough birdlife to satiate a photographer." As the Montagu's seems to feed almost entirely on locusts, a major agricultural pest of Saurashtra, there is a strong case for giving special importance to Velavadar National Park. It is now up to the larger conservation organisations of the country to bring this fact to the notice of the powers that be, that measures to protect Velavadar and other areas will bring manifold benefits to the natural world of India. 🌿

Lt. Col. (Retd.) S.R. Banerjee

The thoughtless shooting of blackbucks and chinkara by some stars brings out the ugly fact that the so called princely leisure of killing innocent animals by the

they dared to commit this crime in a Bishnoi area, and hence their deeds came into the limelight.

Bishnoi communities are well known for the sacrifices they have made to protect nature since their Guru Jammeshwarji Maharaj (popularly called Jamboji) launched

When he was just seven years old there was a severe drought in his village, during which he realised that mankind was heading towards a major catastrophe. Later, he preached twenty-nine principles from which the name Bishnoi (*Bish* - twenty and *Noi* - nine) was derived. These principles preach various aspects of brotherhood, penance, fighting social evils, reserving rights for women, wildlife preservation and kindness towards animals. Bishnois treat these principles as a religion and follow them with utmost devotion. A Bishnoi will not tolerate killing of wild animals and felling of a green tree.

Unfortunately, very little record is available on the sacrifices made by the Bishnois to protect nature. In 1661 AD, two women namely Karma and Goura from a village called Ramasari in Jodhpur district laid down their lives to protect Khejri (*Prosopis cineraria*) trees by clinging on to them. Khejri is a hardy tree, growing in the desert, which is probably why they adopted this tree for protection. However, Bishnois protect all trees and resist their destruction.



ISAAC KEHIMKAR

# Bishnois — The protectors of Blackbuck

privileged class still exists. These lords and ladies enjoying high status in society would have certainly gone unchallenged. Unfortunately,

this sect far back in 1542 AD. Born in 1508 AD, in Pipasar, a village near Jodhpur in Rajasthan, Jamboji was a man of great foresight.

A major sacrifice recorded in the history of the Bishnois was in 1787 AD, when Maharaja Abhay Singh, the king of Jodhpur, Marwar, sent his minister Girdhardas in search of wood. The king's men reached a village Khejrala, and started cutting Khejri trees next to a house owned by Ramukhor. Ramukhor's wife Amrita Beniwal was making curd when she heard the sound of the axes. She came out and pleaded with the king's men not to cut the trees. When her pleas fell on deaf ears, she and her three daughters clung to the trees and were killed by the king's men. Many more Bishnoi women and men came forward and sacrificed their lives after her. Sixty-nine women and two hundred and ninety-four men were killed in a bid to save the trees. On hearing of this mass sacrifice, the penitent Maharaja Abhay Singh came to the village and promised the Bishnois that he would not cut trees in future. To commemorate this great sacrifice, a shaheedi mela is held each year in Khejrala. This sacrifice motivated the Chipko movement initiated by Sunderlal Bahuguna in the Garhwal Himalaya.

The Bishnois treat all forms of life with high esteem. The blackbuck (*Antelope cervicapra*) listed in Schedule I of the

Wildlife (Protection) Act, 1972, is the only true antelope found in India. They were once seen in large herds in the arid areas of Gujarat, Rajasthan, Haryana, Punjab, Uttar Pradesh, Madhya Pradesh, up to Orissa in the east and also in southern India. Four races, namely *rajputanae*, *cervicapra*, *centralis* and *rupicapra*, were recognised.



*Bishnois have played a major role in preventing the extinction of the blackbuck in India. They are an embodiment of a classic example of man and animal living in perfect harmony.*

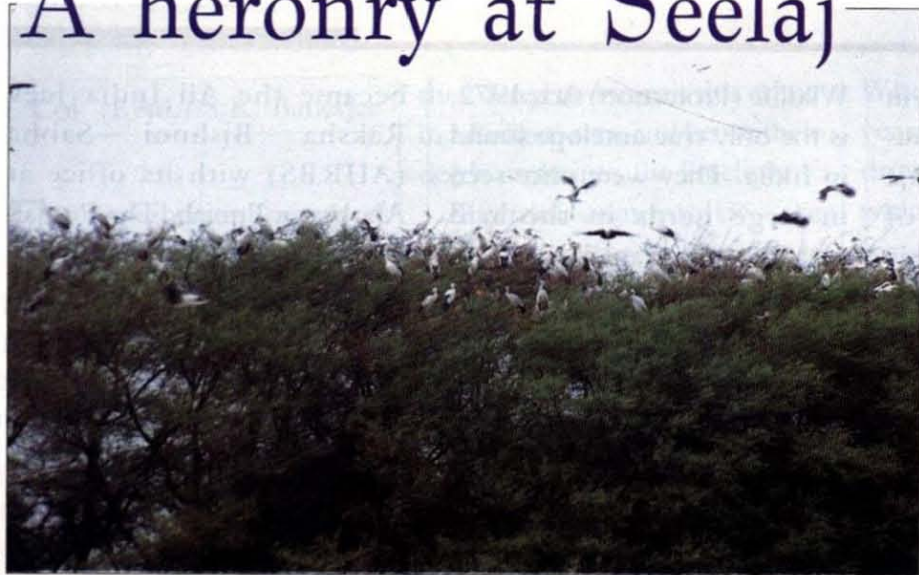
However, only two races, *rajputanae* and *cervicapra*, are recognised at present. Today, only small herds are seen in Rajasthan, Gujarat, Haryana, Punjab, Pilibhit and Chandraprabha areas in Uttar Pradesh, Kanha in Madhya Pradesh, and in Point Calimere Sanctuary and Guindy National Park in Tamil Nadu. Their habitat being mainly dry areas and scrub forests makes them vulnerable to poachers travelling in vehicles, armed with rifles and guns.

The Bishnois formed an anti-hunting committee in Punjab which in 1974 was renamed the Bishnoi Jeev Raksha Sabha. From January 15, 1975 it

became the All India Jeev Raksha Bishnoi Sabha (AIJRBS) with its office at Abohar in Punjab. The Punjab government has accorded the status of Sanctuary to thirteen Bishnoi villages in Abohar where more than four thousand blackbucks thrive. The AIJRBS is the wildlife protection wing of the Bishnois.

It would be no exaggeration to say that the Bishnois have played a major role in preventing the extinction of the blackbuck in India. They are an embodiment of a classic example of man and animal living in perfect harmony. Sharing their crops with wild animals, the adoption of an orphan blackbuck fawn by a Bishnoi woman and breast feeding it along with her own baby are probably not unheard of. We must all be grateful to Jamboji who taught the twenty-nine principles of life to the Bishnois, who vehemently follow his teachings even today and, we hope, will do so tomorrow. 🐾

# A heronry at Seelaj



A.J. URFI

Abdul Jamil Urfi and Narender Jethwa

Village ponds, or talabs as they are known in Gujarat, are a common feature of the rural landscape. Although these are primarily created to deal with water shortage, they are useful for many other purposes. The dry talabs of summer often attract water birds when they are overflowing with water during monsoon. If the ponds have small islands with trees they become suitable nesting grounds for colonial water birds such as the stork, cormorant, heron, egret and the spoonbill.

In 1996, we conducted a bird survey of the wetlands and ponds in and around Ahmedabad. We were especially interested in the nesting of the Pelecaniiformes and Ciconiiformes. Although quite a few village ponds had heronries, the most impressive was the one in the village ponds of Seelaj, about 20 km from the fringe of Ahmedabad. This waterbody covered an area of 10 acres, and had a large island with numerous *Acacia*, *Prosopis* and *Ficus* trees. During the peak summer months there were no nesting birds. But on 27th June, we saw about 20 openbill storks sitting on the tree tops. Their brilliant white plumage gleamed like fresh snow in the distance.

The first monsoon showers in Ahmedabad came around 15th June, in 1996. The openbills

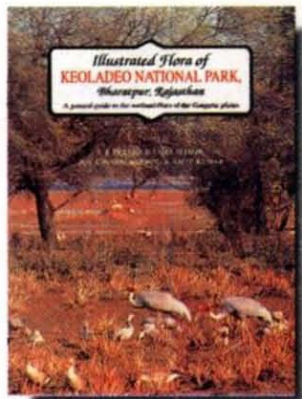
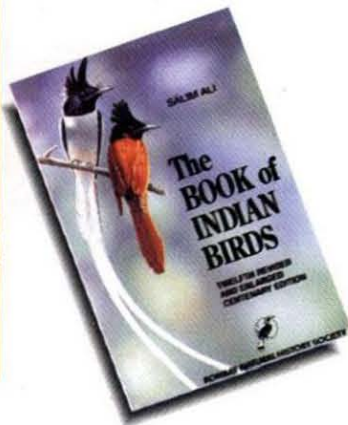
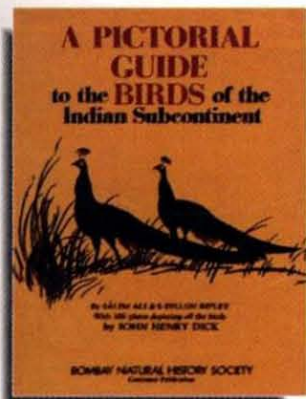
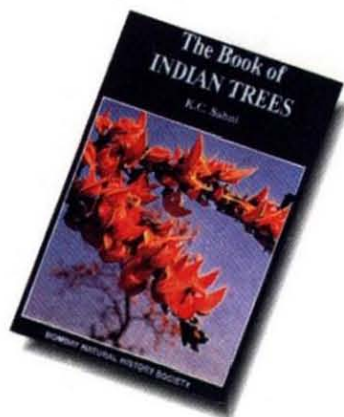
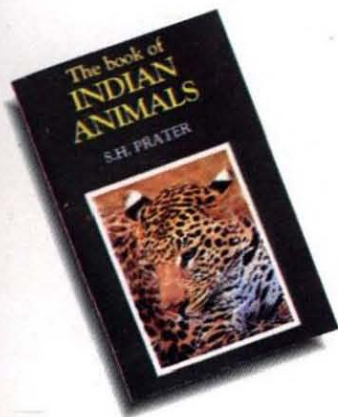
had begun nesting soon after the initial showers. On 30th June, we counted about 125 openbill storks, many of them in an advanced stage of nesting. Most of the nests of this species were located on the east side. By 2nd July, about 200 openbills were sighted feeding in the dried wetland. Some white ibis and cattle egret nests were also spotted. Until this stage it had not rained enough for the pond to fill up with water. The tank was filled much later in August; by this time the openbills had finished nesting.

The Seelaj heronry is very important as it has consistently provided nesting grounds over many decades. Some locals even said that they remember this heronry from as far back as their memories can take them. In Gujarat, the general attitude towards life forms is non-destructive. However, socio-economic factors seem to be taking priority over this attitude. This results in felling of trees for firewood and timber, and wetlands being drained for development. Birds of any heronry do not move far from the heronry site for feeding or collecting nesting material. However, changes occurring in the immediate vicinity of the heronry, such as application of pesticides in the agricultural fields and draining of wetlands, are slowly taking their toll on the bird population.

These, among other factors, have been kept in mind while drawing up a conservation programme for this heronry. Efforts should be made to educate the villagers about the importance of a wetland to help conserve it. The Seelaj heronry appears quite safe at the moment, but it may not be long before we sacrifice it to satisfy other developmental priorities. 🍀



Discover the  
LIVING WORLD



Other titles....

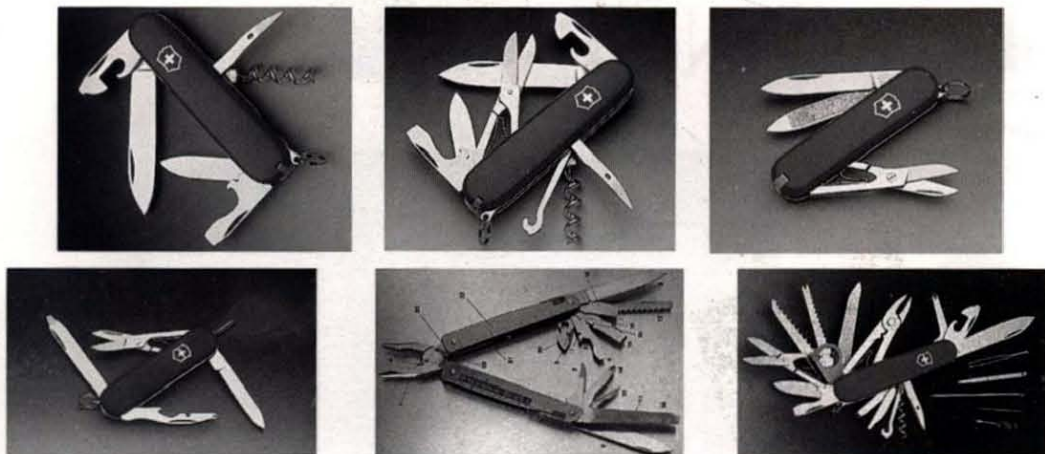
- ♣ **The Book of Indian Reptiles**  
by J.C. Daniel (under revision)
- ♣ **Some Beautiful Indian Climbers and Shrubs**  
by N.L.Bor & M.B.Raizada (in press)

with  
**BNHS**

*Publications*

# VICTORINOX

## The Famous Original Swiss Army Knife



Millions of people world over have successfully used Victorinox products in a variety of fields. They are sized for all possible needs. These knives are available in many different sizes, colours & combination of tools. Also available Victorinox range of professional kitchen knives.

## PELICAN PRODUCTS

High impact, water proof & corrosion resistant protector cases



Pelican line of protector cases are known through the world for their ability to withstand the elements & provide "hard knocks" protection. An incredibly light structural foam resin shelf always looks new, and is unaffected by dents and scratches or corrosion. They are watertight to a depth of 30 feet & unbreakable. They can be used to carry following kind of equipment: Camera & Camera accessories, Binoculars, Spotting scopes, Telescopes, Laptop computers, Fire fighting & Drug Testing equipment, Paramedic & Heart Resuscitation Unit, Telecom Systems, Military Applications, Oil & Geological Equipment for on/off shore, Small Musical Instruments, Instrument Meters, Precision Tools to name a few. Pelicans Copolymer Polypropylene cases are available in 13 different sizes.

**We also deal in Leica / Minox range of cameras, monoculars & spotting scopes, and Manfrotto / Gitzo range of camera tripods. All above products are available 100% officially through Photonics Enterprise.**

**P H O T O N I C S   E N T E R P R I S E**

**302 - A, Manish Apartment, S.V.P. Road, Borivli (West), Bombay 400 092  
Phone: +91-22-862 9152, Facsimile: +91-22- 801 2170, E-mail: solitare@vsnl. com**