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For more information on the Society and its activities, write to the Honorary Secretary, Bombay Natural History Society, Dr. Sálim Ali Chowk, S.B. Singh Road, Mumbai 400 023, Maharashtra, India.
Tel.: (91-22) 2282 1811
Fax: (91-22) 2283 7615
E-mail: bnhs@bom4.vsnl.net.in
Website: www.bnhs.org

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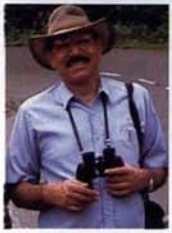


Victim or Vector?

In 1957, a strange virus was detected in the macaques of the Kyasanur Forest of the erstwhile Mysore state, now in Karnataka. A similar virus was also detected in Russia; so the question arose, how did this virus arrive in India? Obviously, the migratory birds were blamed as they travel between Russia (and other countries) and India. In the 1950s (and for the next three decades), when one talked of birds, the first person contacted in India was Dr. Sálim Ali. So, the Government of India asked him and the BNHS to find out which birds migrate to India. BNHS wrote back to the Government that although it is true that a number of birds migrate to India in winter from temperate regions, including the USSR, not much was known about their migration pattern. From the fear that migratory birds spread the virus emerged a large bird ringing project for India.

I see a clear parallel in the Kyasanur virus, as it was popularly known at that time, and the notorious Avian Influenza virus (H5N1) that has played havoc with the poultry industry in many countries of South and South-East Asia, and certain parts of Africa, since it was detected in 2002. More than 200 million domesticated birds have been killed by this virus or culled to stop its spread. The H5N1 strain of the virus has also infected about 200 people, of which over 100 have died. The World Health Organization (WHO) fears that if the virus modifies into a virus that spreads from human to human, then we will have a pandemic. The Spanish flu pandemic virus strain H1N1 that originated in birds in 1918 killed between 40 and 100 million people.

It will be wrong to surmise that only the migratory birds are responsible for the spread of this virus, but do we have strong evidence to back this? Even if we get strong evidence, can we stop bird migration and their local movement? Certainly not. Therefore, to prevent the spread of avian flu, we have to know the movement pattern of birds, the extent of infection in the wild populations, the epidemiology of the disease, the probability of cross-infection between wild and domestic birds, the immune systems of different species, locations of poultry farms, movement of poultry within and outside India and the extent of the trade besides other things. Without the knowledge of all these aspects, how can we take preventive measures to stop the spread of avian flu? BNHS does not have the expertise on all these subjects, but we have the experience and a long tradition of studying the movement pattern of wild birds. BNHS can collect blood samples of wild birds for the wildlife disease experts and the Animal Husbandry Department when we catch them for ringing.

To study movement pattern, we have to ring or colour mark the birds (some big birds such as Bar-headed Goose, Brahminy Duck, Black-headed Gull, cranes, storks can also be studied through satellite tracking). To ring or colour mark wild birds, we have to catch them. Here comes the first stumbling block! Permission to catch birds in India is given by the Chief Wildlife Warden (CWLW) of a State.

To study bird migration all over India, one needs permissions from 30 States! In many States, the writ of the Central Ministry of Environment and Forests to allow BNHS scientists to catch birds does not run. You have to request, convince, cajole each CWLW – which works only sometimes. For example, while the CWLW of Maharashtra, Orissa, Jammu & Kashmir and Uttar Pradesh easily gave permission to the BNHS, in Himachal Pradesh, the BNHS team waited for six days near Pong Dam for bird catching permission which never came despite letters, faxes, and phone calls to the CWLW. In Uttar Pradesh, we had the permission to catch birds, but the local Animal Husbandry officials refused to co-operate. So we ringed and released the birds, without taking any blood sample for avian flu detection. All this was during the period when newspapers were full of avian flu stories and the Animal Husbandry Departments of many states were doing exemplary work. One stubborn government *babu* can stop your work, no matter how important it is for the country.

As soon as we had confirmed news of the avian flu virus in the poultry in Navapur area of Nandurbar district of Maharashtra on February 18, 2006, we quickly sent a team of BNHS scientists to study the wild birds in the area. Later, another team was sent to collect blood samples of wild birds. Read about the BNHS response in this issue. More details will be given in our report to the Government of India. Our response was not a panic reaction, but the result of a long preparation from May 2005. Based on our detailed discussions and meetings with government officials, the MoEF has given us a two-year project called 'Avian flu Surveillance and Bird Monitoring'. Under this project, the BNHS is monitoring nearly 35 wetlands. Many of you are involved in this project so I will not go into details.

The evidence available all across the world suggests that wild birds are victims not vectors of the avian flu, because the pattern and timing of spread of this virus among poultry does not fit with the pattern and timing of wild bird migration. This was the case in India, as well as China, Russia and Vietnam. Other strong evidence is that the virus is lethal to birds, both domestic and wild, so infected wild birds cannot move long distances. For example, 16,000 live wild birds, mainly migratory, were tested in Hong Kong but none tested positive for the HPAI H5N1. Nonetheless, we have to keep vigil and be ready for the next migratory season. We have to build our capacity to take thousands of samples from wild birds all over the country. It means collaboration, cooperation and support of various government departments with the BNHS field scientists; it means getting blanket permissions to capture and rings birds from various states; it means building special facilities to analyse samples of wild birds on priority basis; it means motivating vets to come on time so the wild birds are not kept waiting unnecessarily for processing; it means respecting the importance of bird ringing; and it means developing a large, multi-disciplinary and multi-institutional project on the avian flu surveillance and bird monitoring in India.

A number of people blame the migratory birds for the spread of avian flu, but not many know that most wild birds are perhaps the main victim of this disease. For instance, nearly 10 per cent of the known population of the Bar-headed Goose died last year in its breeding ground in China. Besides habitat destruction, pollution, hunting and invasive species, disease is also becoming a major threat to many wild species. For example, many endemic bird species of Hawaii Islands became extinct as they had no immunity to the diseases brought by the introduced species. So, are wild birds vectors or victims of H5N1? Only good science will be able to answer this question.

Asad R. Rahmani

TARANTULAS
—THE HANDSOME GIANTS OF THE— SPIDER WORLD

Text: Sameer Kehimkar

Indian Ornamental Spider

SAMEER KEHIMKAR

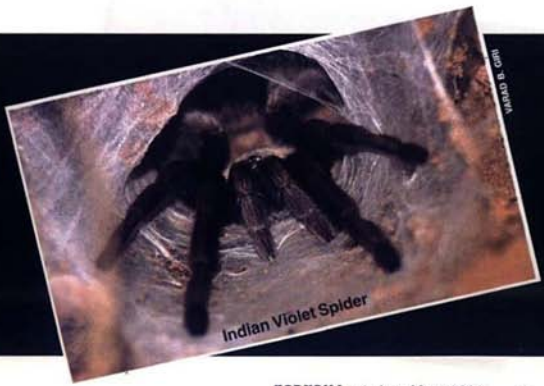
SAMEER KEHIMKAR

All tarantulas like this Indian Black Footed Spider are strict carnivores

As dusk descends over the misty hill forests of Matheran, birds settle in silence in their roosts, monkeys huddle for the night and shrill crickets take over from the cicadas' chorus; darkness seeps into the forests bringing out the creatures of the night. While tree frogs and geckos begin to emerge from their hideouts, from the depths of the web-lined tree holes emerge the elusive raiders of the night, the Indian Ornamental Spiders (*Poecilotheria regalis*).

I was on the look out to catch a glimpse of these tree-dwelling tarantulas, which wait among the trees under the cover of night. I first became aware of these handsome predators of the dark forests of the northern Western Ghats, when, one evening I came across what looked like a tangle of rubbish. It was a large spider's moult under a tree. The size of the moult was unbelievably large with bright lemon yellow and black markings on the underside, and curved wicked fangs that were at least 2 cm

Tarantulas are largely arboreal or ground-dwelling or opportunistic burrowers. Unlike other spiders, which weave webs for dwelling, tarantulas nest in burrows lined with webbing.



VARAD B. GIRI

Indian Violet Spider

Ground-dwelling tarantulas like the Indian Tunnel Spider are always seen under rocks

long. I looked for tarantulas on and around the tree below which I found the moult, but that evening I could not locate the owner of the moult. Next night, after a hurried dinner I returned to the same place. I was excited and kept flashing my torch around in anticipation of locating the spider. My torchlight picked up several moths, beetles, centipedes, geckos and tree frogs, but there was no tarantula.

For the next three to four hours, I looked around hoping my torchlight would pick the tarantula. Finally, I gave up for the night and began to retrace my steps to the lodge. But still hopeful, I kept on flicking the torch beam across the tree trunk. Then suddenly, I saw an odd shape on the tree. Although at first I could not see clearly because of the fog, I could gradually distinguish the shape. I could not believe my eyes, it was the most beautiful spider I had ever seen, the Indian Ornamental Spider! It was 5 m above the ground, facing down, sitting just a few centimetres from its burrow in the tree. Sensing the light, it slowly retreated into the burrow. I was thrilled. The following morning, I came back to the spot to take a proper look at the habitat of this spider. After checking out similar habitats, later in the evening I came across a tree with a hole covered with webbing; I clambered up the tree, and peered in with the torchlight.

To my delight, it contained a ball of silk, the size of a golf ball. It was an eggsac of the Indian Ornamental Spider! With much caution, so as not to disturb, I saw the mother lurking behind the eggsac, hugging it. The female is known to take care of her eggs and later hatchlings too. This scene could not be photographed. Some bush frogs also occupied the hole with the spider. Later, I saw a few more burrows with webbing but could not study them as they were high up in the trees. Having become familiar with the type of web they weave, I started spotting these spiders regularly around that area.

Tarantulas have an exoskeleton, which they moult repeatedly. The exoskeleton is made of chitin – a proteinaceous material that is hard, lightweight and weatherproof. They also have two claws and adhesive pads on each foot, which is why they are also known as cat-legged spiders.

On my next visit, my curiosity to check on the mother spider with the eggsac took me back to the tree. I hurriedly reached the tree hoping to find something exciting. "Oh no! This can't be. The tree has been cut down", I said. Dismayed, but still hopeful, I turned back and then at night, after dinner, got out to explore with my friends. Since my friends are not from the same profession as I, they were a little afraid and tired too. We were flashing our torches as we moved, I was leading them, and then what I saw was unbelievable. It was a burrow, about 1.5 m from the ground, and in its centre was a huge female Indian Ornamental Spider, surrounded by 35-37 young spiders. It was a breathtaking sight and I was stunned for a few seconds. The young ones were complete replicas of their parent. This time, unfortunately, I did not have a camera.

As soon as I returned home, I discussed this sighting with my friend Varad Giri, who had introduced me to the world of these giant spiders. He had earlier photographed this giant spider from Phansad Wildlife Sanctuary; he had also attended a spider workshop from which he provided me the identification keys. We soon planned a trip back to

VARAD B. GIRI

Opportunistic burrowers such as the Goa Mustard Spider are usually found nesting in ledges, road-side hollows or sometimes on trees

Tarantulas are solitary animals, with each having a separate dwelling, sleeping and eating pattern. In the early stages of development, tarantulas are bald and feeble. Males and females can be identified only post maturity.

VARAD B. GIRI

Indian Ornamental Spider

Arboreal tarantulas such as the Indian Ornamental Spider line tree holes with webbing before inhabiting them

photograph the tarantula family, but were a bit late; most of the spiders had dispersed before we arrived. A few had already occupied holes nearby. We found a few more spiders on this trip and planned to monitor them regularly and collect more data on their life cycle.

Most tarantulas are very restricted in their movement; if food and shelter is available they never shift to another hole. Females are often seen, but males are very difficult to spot as they are well camouflaged in the bark and are rather drab.

The genus *Poecilotheria* consists of around 14 species and is distributed across India and Sri Lanka. They stay in a colony. The nymphs, after hatching, moult and become spiderlings and stay together until they are sub-adults. The males wander away at an early age to avoid in-breeding. The spiderlings are identical to their mother, except for the colour which is not as bright as hers. When the spiderlings are with their mother they position themselves at the entrance of the hole, with the mother at the centre, or spread all over the tree to hunt. They just lie and wait for anything passing by and pounce on it. I have seen spiderlings hunt prey thrice their own size and just gorge, as their abdomens are stretchable. If the prey is still unfinished it is passed on to others. If food is in good supply, the spiderlings moult every month. In a batch one can see that some are bigger than the others while some are still the size they were born. Sometimes bigger spiderlings also feed on smaller ones. As they grow, they disperse to nearby trees. Therefore, only some specific areas hold a good population in about 1 sq. km, which is also why siblings are always neighbours.

A fully grown adult female may have a leg span of *c.* 18 cm; she is bigger in

Tarantulas have fangs near their mouth which they use to bite their prey, injecting it and stunning it with their venom. Tarantula fangs articulate vertically rather than side-to-side unlike other spiders. The venom of tarantulas is not lethal to humans, but can cause adverse reactions in people like in bee or wasp stings.

Predominantly black or brown in colour, tarantulas like this Indian Violet Spider are covered in iridescent colours

size than an average man's palm. The male is about half the size of the female. A female tarantula matures at two to three years. On an average, she lives for eight to nine years in the wild, but in captivity she lives for more than 15-20 years. Males mature at seven to ten months and live only for two to four years after maturity.

About one to three weeks after his final moult, the male spins a hammock-like sperm web. He then deposits a droplet of sperm onto it and draws up the sperm droplet into its embolus for later use. The sperm web is then destroyed, but can be spotted sometimes. After this the male is most fertile for the first six months. Females can produce multiple eggsacs, each year, until their death.

When males are ready to mate they tap their legs to produce bursts of buzzing or knocking. A female that is ready to mate answers with the same sound. The male then approaches and embraces the female from the front. He holds her chelicerae up with the

Tarantulas also possess a pair of modified front legs called pedipalps. In adult males, the pedipalps have an embolus, a bulb-like structure to store the sperm, at the end. The pedipalps act as a secondary sexual organ, through which the male transfers the sperm during mating.

The Goa Mustard Spider, like all other tarantulas, relies more on touch, taste and smell for sensing. It 'smells' using organs on its feet for perceiving air-borne chemicals and humidity

help of his tibial hooks, pushes her back and moves under her. The male then vibrates his sensing legs against her belly plate and inserts the tip of the embolus into her genital aperture and deposits his sperm. I have seen the male not lock her fangs and just move down and try to hook his embolus. The actual mating lasts between half a minute and a quarter of an hour. Males are often eaten up by the females in the attempt of mating if they cannot produce the specific sound signal. Indian Ornamental Spiders are more tolerant to spiders of their own species than those of other tarantulas. But if the female moults soon after mating the sperm is lost, and then the lengthy and risky mating process must begin all over again.

Later, if all goes well, the fertilized female has a larger appetite, although she stops feeding a few weeks before laying her eggs. Arboreal tarantulas often enlarge their cocoon, creating a closed nursery. The female spins a mat of silk to cover the eggs. She surrounds it a number of times with spun silk to form a round eggsac complete with urticating hairs incorporated, so that it is reasonably protected against both dryness and predators. The female remains in her burrow for around six weeks. During this time she constantly holds the sac in her jaws and regularly turns it. She rarely eats during this time. The eggsac may be put down for a while. If disturbed during this period, she stops the nurturing process and may even eat the eggsac.

Eventually, about 75 to 150 nymphs emerge from the eggs, but remain in the sac. At this stage they have little mobility and are without bristles and have almost no joints in their legs. These first stage nymphs shed the first skin at about three weeks when they start the second nymph stage. At this stage they resemble a small bald spider, but they still have little movement. The nymphs then crawl out of the eggsac and are still protected by the mother. They moult outside the eggsac a week or two later, to become true spiderlings. Often, after 4-5 months, the female produces another eggsac if the prey population is in good number.

All tarantulas have a pair of retractile claws like cats that are more

When frightened, tarantulas raise the first pair of legs in defence. Most New World species also possess 'urticating hairs' on their abdomen, which are used like darts, a defence mechanism. Loss of these can cause baldness. Mostly, however, tarantulas prefer to hide in their burrows.

developed in the arboreal species. Tarantulas are largely insectivorous, feeding mainly on grasshoppers and crickets. They have a preference for geckos and are known to feed on birds also, which is rarely seen. The habit has earned them the name Bird-eating Spiders. They may eat day old chicks in captivity, but such an occurrence is not recorded in the wild yet. In 1705, Maria Sibylla Merian, a Swiss naturalist visiting Suriname witnessed the incident and included it in her writings.

I have seen many tarantulas in Matheran. Just a few minutes after sunset, they emerge from their burrows. They wait at the entrance of their burrows or just wander around, and when they sense prey, pounce on it and grab it.

The tarantulas sense prey with the help of sensitive hair on their legs, which pick up tiny vibrations made by the prey. This is more accurate than their eyesight, which is not well developed. Once the prey is caught they inject tissue-destroying venom into the prey, which actually dissolves the prey. The prey is then sucked dry with the help of the hollow fangs. As they feed they keep wrapping the prey in silk until a small tight ball remains, which is later dropped out.

These spiders have a unique way of defecating. They position their abdomen out of the burrow, raise it a bit and shoot out droppings half a metre away.

Tarantulas are believed to be quite aggressive species, very fast moving and venomous. The venom is fatal to cats and dogs. In humans, the reaction to tarantula venom varies from one individual to another.

Once when I was handling a young male, I got bitten on the knuckles of my left hand. Later, there was a burning sensation at the bite site, followed by a tingling, aching sensation. To reduce the blood flow I applied ice and within 45 minutes there was a purplish blue stripe from my knuckles to my shoulder and the colour of my arm had darkened. Next day the pain had gone, leaving just a little numbness in my arm, but on the following day there was more pain and as days passed it increased. Stress exerted on any part of my body caused cramps and pain at the spot I was bitten. Even walking, lifting, sitting or laughing would cause cramps and lot of pain. All this continued for more than a week. After about six months I got similar cramps in my calf and back for a day. If the person bitten is more sensitive to the venom, the effects are worse. There will be vomiting, shortness of breath, dizziness and muscle cramps. This is an allergic reaction and should be immediately treated at a medical clinic or hospital.

Being quite attractive, these spiders make for a lucrative business in some parts of the world. They are exported from India and Sri Lanka. The spiders are known to be exported legally as they are not yet protected. They are collected by cutting open trees and smoking their burrows. These methods are quite destructive.

A spiderling can cost around $75. Tarantulas are extremely rare, hence, very little is known about them. If good dense forests are not protected rare spiders, frogs, snakes and other precious life forms will vanish with the forests even before they are known and studied.

Sameer Kehimkar is a freelance animator and graphic designer. His other passions are photography and researching micro-life forms in their natural habitat.

FACTOIDS

- The name 'Tarantula' originates from the city of Taranto in Italy. Initially, Wolf Spiders were believed to be tarantulas and their bites were supposed to be cured by doing a wild dance called Tarantella.
- So far, over 800 species of Tarantulas have been identified, the total number of identified spider species being 35,000. About 50 taranatula species, belonging to 10 genera, are found in India.
- Tarantulas breathe using two pairs of book lungs (the lamellae used to breathe is folded to resemble the pages of a book); breathing is mainly passive exchange of gases, with no physical exertion by the spider.
- Due to their breathing physiology, Tarantulas are highly sensitive to changes in humidity. Loss of water by evaporation, due to low humidity, results in an inability to flex their legs or move as the muscle movement is caused by hydraulic pressure of blood running into the legs. This might possibly explain the classic tarantula death pose with the legs tucked under, caused by loss of fluid and therefore subsequent loss of hydraulic pressure and movement.
- Tarantula blood is called Haemolymph and is clear and sometimes pale blue or yellow in colour.
- The main predators of tarantulas in India are wasps of the Family Pompilidae, commonly termed Tarantula Hawks.

Fringe Elephants

Text: J.C. Daniel and Ranjit Manakadan

AJAY DESAI

'Fringe elephants' is a term we have coined for pachyderms that are being pushed out of their native habitat due to population pressures (of both people and elephants). This is not something new. It has been happening for centuries as man usurped the plains and then the foothills to cultivate and meet the demands of his expanding population for natural resources. Elephants finally had to take to the refuge of the hills, where most of our forests now remain, but we have now started to loot their last preserves too. Left with nowhere else to retreat as earlier, elephants have started to stray into areas near human habitation (resulting in human-elephant conflict) and some have moved out in search of new homes. Elephant populations have also increased in some areas for reasons such as ban on capture for trade and control on poaching, necessitating dispersal due to declining food resources. One such example is of the elephants now occurring in Andhra Pradesh, which had migrated from the forests of Hosur (Tamil Nadu) and Bannerghatta (Karnataka). Their earlier attempts at recolonisation to the neighbouring states were not without considerable turmoil. The Bombay Natural History Society (BNHS) was involved in an attempt to drive back the first 'invaders' in the mid eighties of the last Century (see Hornbill Jan-Mar. 1988).

Elephants had disappeared from Andhra Pradesh about 200 years ago. Prior to this, elephants were recorded to be captured in the State for the Nizam's army and also listed as an export item along with tobacco from Cuddapah district! However, in the early 1980s, a herd moved into the Kuppam reserve forests (Chittoor district) from Hosur. The arrival of the elephants created a lot of excitement and enthusiasm intially, and the locals, having seen elephants only in temples, greeted the visitors with the same reverence as temple elephants, a few venturing to offer coconuts and getting killed in the process! Subsequently, more elephants moved into the area from Karnataka and Tamil Nadu. Some of the elephants later dispersed into the neighbouring areas of Andhra Pradesh (Sri Venkateswara Wildlife Sanctuary-National Park) and Tamil Nadu (Javadi Hills).

With time, the Forest Department accepted the presence of the elephants and declared an area of 357 sq. km in the Kuppam and Palamaner ranges as a wildlife sanctuary, the Koundinya Wildlife Sanctuary. However, in spite of habitat improvement and preventive measures taken up by the Forest Department to deal with human-elephant conflict, a total of 42 human deaths, 21 elephant casualties and 3,815 crop damage claims have been registered till date. This prompted the BNHS to undertake a one year (Jan.-Dec. 2005) project with the U.S. Fish and Wildlife Service to collect baseline data on the elephants, their habitat and on the issue of human-elephant conflict, which would help the Forest Department in formulating management initiatives to conserve the species.

Koundinya Wildlife Sanctuary consists of a cluster of small steep hills that comprise part of the southernmost stretch of the Eastern Ghats passing through Andhra Pradesh. The forest consists of dry mixed deciduous species. The River Palar and its tributaries, including the Koundinya (from which the Sanctuary gets its name) flow through the Sanctuary. The wildlife includes Spotted Deer (*Axis axis*), Four-horned Antelope (*Tetracerus quadricornis*), Mouse Deer (*Moschiola meminna*), Sloth Bear (*Melursus ursinus*), Dhole (*Cuon alpinus*), Striped Hyena (*Hyaena hyaena*), Indian Porcupine (*Hystrix indica*), Slender Loris (*Loris tardigradus*) and Hanuman Langur (*Semnopithecus entellus*). Among birds, important is the reported occurrence of the Yellow-throated Bulbul (*Pycnonotus xantholaemus*), a

threatened species that is endemic to southern India.

Earlier censuses estimates had put the population of elephants in Koundinya Wildlife Sanctuary (KWS) at around 60 individuals. We had planned a census to obtain our own estimates. But it was soon clear that there were only 11 animals (2 adult bulls, 2 sub adult bulls, 3 adult cows, 2 sub adult cows, 1 juvenile cow and 1 calf) and another calf was born towards the end of the year. Except for the adult bull and a sub-adult bull, the rest of the herd formed a consistent unit. The elephant numbers had come down due to dispersal to other areas, deaths and capture of rogues that were sent to zoos.

Hence, we could skip censuses, which was a relief as obtaining sightings of elephants in Koundinya is extremely difficult. The absence of roads, difficult rocky terrain, alternating hills and valleys, inaccessibility in some areas due to dense thorny thickets, transformed census operations into hard physical labour! Plus, with only 11 elephants in a 357 sq. km area the sample size would have been too low and would have made it impossible to get meaningful results. However, to record their movement and distribution in the Sanctuary, we relied on indirect methods, i.e. footprints, dung and feeding signs. For the uninitiated, it would be surprising to know that a measurement of circumference of an elephant's forefoot would give its height and also an indication of its age (and beyond a certain size, even sex!) as twice the circumference gives the height of the elephant!

A combination of indirect evidence, direct sightings and information from villagers revealed that elephants were not evenly distributed over the Sanctuary. They tended to avoid the Kangundi and Peddur Extension beats in the south and the Tekumanda and Musalimadugu beats in the north. Except for Musalimadugu, the other three beats were the most disturbed areas in the Sanctuary – this could be one reason for their near absence in these beats. Additionally, vegetation sampling showed these beats to be poor in terms of availability of the major food plants of elephants identified in Koundinya, i.e., *Albizia amara*. *Albizia lebbeck, Dicrostachys cinerea* and *Acacia caesia* (= *A. intsia*). Overall, food resources do not appear to be a limiting factor in Koundinya at present. However, grass – an important component in the elephant's diet – appears to be scarce due to poor soils and over grazing by livestock.

Unlike food, water is a scarce commodity in the Sanctuary during summer. The Palar and its tributaries, which flow through the Sanctuary, dry up at most of their stretches during the peak summer period. Locals claim that the streams used to hold water for longer periods about a decade back and attribute the change to the decline in rainfall over the years. However, on checking meteorological data, we found this to be untrue. Early drying is likely to be a consequence of lower ground water levels due to increase in human population and intensification of agriculture. Other than streams, a few small springs and natural pits on granite hills (which act as storage tanks for rainwater) are sources of water for elephants. Most of the larger water bodies are at the outskirts of villages and hence avoided by elephants. To supplement the water resources, the Forest Department has constructed a large number of check-dams all over the Sanctuary, but most are close to villages.

The main strategy adopted by the Forest Department to tackle the problem of human-elephant conflict (HEC), other than monetary compensation, is the electrified power fence. A power fence gives a severe shock, but does not kill due to the pulsating nature of its current. Power fences have been erected around 'enclosure villages' and at the outskirts of fringe villages. Data shows a decline in HEC cases over the years, but this is not primarily due to the establishment

RANJIT MANAKADAN

View of the Sanctuary. The hills get more and more denuded as they approach the plains of Tamil Nadu on the east and south

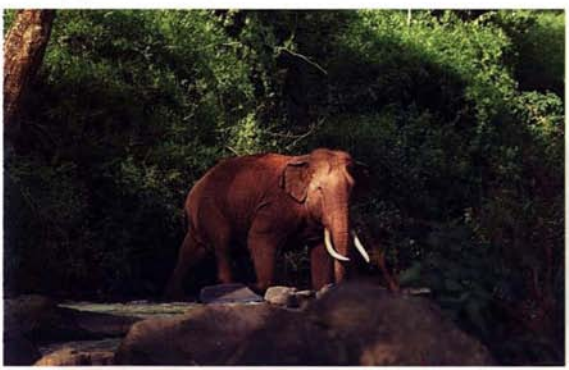
RANJIT MANAKADAN

Most of the large water resources are at the outskirts of villages, hence largely avoided by elephants

of power fences. Though power fences are generally considered effective, determined elephants (especially bulls using their tusks) can bring a fence down, as happens in Koundinya. In Africa, it is a combination of power fences and shooting of troublesome bulls that is practised. Proper erection and regular maintenance are also important for the effectiveness of power fences. The Forest Department faced thefts of fence material earlier, but this has been solved by erecting fences as close to villages as possible so that villagers can keep an eye on them – which shows that co-operation of villagers is important. Of course, all these need to go hand in hand with measures that improve the situation in the forest so that elephants do not stray out of their surroundings.

One major reason for less HEC is that the population of elephants has come down. Statistics show that, the numbers peaked around the late 1980s when there were close to 100 elephants in Koundinya. Being new to the area, the animals were probably restless and exploratory in nature. The elephants now remaining are more familiar with the surroundings and have more or less settled down. Most of the HEC and especially human deaths were by tuskers – bulls tend to be aggressive especially while in musth. Now, there are only two 'big bulls' around and it may just be a matter of time before these or other bulls start creating problems. Other reasons for HEC declines are that the locals are now aware of the danger from elephants and the Forest Department has a team of tribal 'elephant trackers', who know the forests in and out and are adept at driving elephants away from village surroundings.

As with most Indian sanctuaries, Koundinya faces problems from human related pressures and disturbances. As mentioned earlier the Sanctuary is a long and narrow strip with villages (50+) around its borders and few inside the Sanctuary. This is not an ideal shape or situation for a Sanctuary. Transects laid from villages towards the forest areas showed that grazing and woodcutting extended up to 3-4 km into the Sanctuary. This is alarming as the Sanctuary is only about 1-2 km broad in some areas. Additionally, the eastern and southeastern borders of the Sanctuary face the plains of Tamil Nadu which has a number of large towns (Gudiyattam, Ambur, Vaniyambadi and Jolarpettai), smaller ones and villages. Head and cycle loads of firewood being carried from the hills to the plains is a common sight around these areas. Already the hills (reserve forests of Tamil Nadu) that directly face the plains are almost totally denuded of vegetation. As a consequence, these pressures are progressing more and more into the interior hills and even



AJAY DESAI

The elephants at Koundinya were earlier new to the area and were hence restless and exploratory, but have now more or less settled down

into Koundinya. This belt is most frequented by elephants since their food plants are most abundant here; probably since the soil is more alluvial.

Is there a future for the elephants of Koundinya? With 50 and 500 effective breeding individuals hypothesized as minimum viable populations for survival of a species in the short term (to avoid in-breeding depression) and in the long term (from an evolutionary point of view) respectively; the future is already grim theoretically. Koundinya has only a small herd of elephants and except maybe for the largest bull, in all likelihood comprises individuals of the same family – not a pretty picture from the genetic perspective.

As for the habitat, apart from human related pressures, elephants are bulk feeders and have destructive feeding habits (breaking branches, debarking, pulling out plants and shrubs, and pushing down trees), thereby 'destroying' their own habitat. This was actually viable and benefits elephants (and many other animals) in the long run as it results in new growth and increases the availability of grass in forests, but not so now as forests are shrinking and elephants have no other option but to stick and feed in the same areas, thereby taking a toll on the habitat. Should we give all these ominous realities a backseat and try to save the elephants – the *raison de etre* of the Sanctuary – even though it seems to be an uphill task? Or take recourse to easier and more practical options? One would be to translocate the animals to the Sri Venkateswara Wildlife Sanctuary-National Park, where some of the elephants have already dispersed. However, the ground situation there needs to be investigated before a decision could be considered.

RANJIT MANAKADAN

Goats in the Javadi Hills (Tamil Nadu), where a herd had dispersed to from Koundinya

RANJIT MANAKADAN

View of the Sri Venkateswara Wildlife Sanctuary-National Park, the second home for elephants in Andhra Pradesh

The project ended in December 2005 and we are in the process of writing a report. Our document will provide baseline data on the situation of elephants and the habitat in Koundinya and suggest management and conservation measures that need to be taken up by the Forest Department. We have plans to continue the studies for another year at Koundinya, extending the scope of the investigations to the Sri Venkateswara Wildlife Sanctuary-National Park (to assess the long-term potential of the elephant habitats in Andhra Pradesh) and to the Hosur-Dharmapuri forests (the original home of the now Andhra elephants) to know if it was habitat loss and degradation or increase in populations that forced the elephants to move out of their original home.

J.C. Daniel was, for many years, Curator of BNHS. He is currently the Honorary Secretary of the Society and Principal Investigator of the Koundinya Elephant Project.

Dr. Ranjit Manakadan, Senior Scientist, BNHS. His current projects include the one on Asian Elephant in Koundinya Wildlife Sanctuary besides others.

FATAL GRIP

Text and photographs: Varad B. Giri

For snakes, as they are devoid of limbs, feeding is not an easy task! And when there is some 'unexpected' dish, things can get a little too difficult. I very recently encountered one such rare feast, the arboreal Vine Snake (*Ahaetulla nasuta*) feeding on a burrowing Shield Tail snake (*Uropeltis* sp.).

On September 28, 2005, I was in the Dajipur area of Radhanagari Wildlife Sanctuary, Maharashtra with my friends, Dhananjay Jadhav and Ravindra Bhambure, both very keen nature lovers and active members of Green Guards, a local NGO from Kolhapur. There are different forest trails in this patch of forest and at around 8 a.m. we were on the trail to *Patacha dang*, a nice evergreen patch of forest, when we encountered the snakes.

Shield Tail snakes surface only during the monsoon and usually move among leaf litter; Vine Snakes are diurnal and feed on lizards, frogs, small birds and mice. Why then, was the burrowing Shield Tail snake on a tree? Why did the delicate, whip-like Vine Snake try to bite more than it could chew?

I have seen a Vine Snake feed on a Shield Tail snake only once in the past, and don't know of any photographic or written record of such an incident. This could therefore be the first photographic evidence of such an occurrence.

8.40 a.m

Ravindra spotted a Vine Snake on a *Karvi* shrub. As only a small portion of the snake was visible, we rushed towards the shrub to get a closer look. Vine Snakes are arboreal and a good example of camouflage. We saw the Vine Snake hanging and holding tightly on to a full grown Shield Tail (about 38 cm long). The battle must have started a while ago.

The Vine Snake had a firm grip on the Shield Tail snake above the mid-body, about 5 cm behind the head. The rest of the Shield Tail's body was hanging without any support.

8.42 a.m

8.55 a.m

The Vine Snake was slowly biting its way towards the head of the Shield Tail snake so that it could start eating it. The Shield Tail snake, meanwhile, was desperately trying to entangle its head or tail in the bush to avoid being eaten. It was truly a struggle for life!

Vine Snakes have very thin necks. At one point during the struggle the Shield Tail snake coiled around the neck of the Vine Snake and 'sandwiched' the Vine Snake between itself and a small branch (which was thicker than the Vine Snake's neck). For a moment I thought the Vine Snake would either release its prey or die of suffocation. But it managed to wriggle out of this deadly embrace.

9.12 a.m

9.18 a.m

The Shield Tail snake was not willing to let go a single opportunity to free itself. It held on firmly to the twigs of the bush. At one moment the struggle was so intense that the Shield Tail snake was completely twisted. The Vine Snake too was determined.

The Vine Snake was slowly biting its way towards the head of the Shield Tail snake, who was by now becoming limp. Its body was hanging freely in the air except for some sudden jerks. This was the final try of the Shield Tail. One more strong jerk and it stopped moving. I think the mild venom of the Vine Snake had finally taken effect. The Vine Snake had now reached close to its destination, the head of its prey!

9.25 a.m

9.30 a.m

As there was no reaction from the adversary, the path ahead was easy. The Vine Snake began its heavy feast. Our movements were now disturbing the alert snake, which tried to pull its prey up the tree. This was a difficult task for the slender Vine Snake and so we moved away from the scene. We feared that our presence would result in the Vine Snake abandoning its hard earned meal. It took the Vine Snake almost 50 minutes and a lot of struggle to start its meal.

Camera: Canon EOS 300 D, Lens: 18-55 zoom.
Light: Built-in flash

Varad B. Giri is Scientist 'A' at the Herpetology Section of the Bombay Natural History Society.

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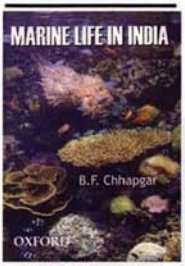
Reviewed by Beena Ramesh

THIS is the twelfth book by the septuagenarian author, who has literally "lived" marine biology with passion and dedication for well over 50 years.

Did you know that sick fish with festering wounds and parasites on their body visit fish doctors who treat them at regular 'dispensaries'? That, it is the male sea-horse who gets pregnant and gives birth to 150-200 babies at one delivery – a true case of women's lib! That, certain innocent looking creatures are actually cannibals who devour their siblings before they are born. And others who, if they break an arm or leg, will not only grow a completely new one, but the detached arm or leg will grow into a new animal! And if you thought that jet propulsion, sonar, and chemical warfare are products of modern technology, think again; they have been used by some marine animals over millions of years.



MARINE LIFE IN INDIA
by B.F. Chhapgar. 2005.
Oxford University Press,
New Delhi.
Pp. 368, 561 illustrations,
160 colour photographs,
(24.5 x 18.0 cm), Price: Rs. 350/-
Paperback.

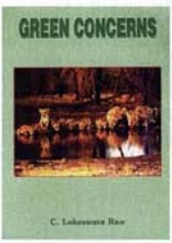
The author has vividly described these and many other interesting facets of marine life. He has a quaint style of writing. The titles of the chapters are more like riddles; one has to rack one's brain to get at their true meaning. What do you make of, for example, "Give a dog an ill name and hang him" for robber crabs, "On the rocks (but not whisky)" for sea anemones and corals, and "Oddest ancient oaf alive" for horseshoe crabs. He also used this style in his earlier book "Man Inside The Sea".

Each chapter starts with a logo and a poem related to the subject. Most chapters have humorous anecdotes, mostly where the author was in a soup, sometime with the cops and often, tongue-in-cheek, the incongruities of life and his gift of being able to laugh at himself.

Written in a simple language easily understood by lay persons and without excessive scientific jargon, the book is, at the same time so erudite that it will be valuable reference material for graduate level students and even post-graduates. Profusely illustrated with over 560 pictures, it has, in addition, 160 beautiful clear, educative colour photographs. For the price, it's a steal!

Reviewed by Asad R. Rahmani

THIS is a book on the author's diary noting from 1983 to 2004 on various conservation issues. According to the preface, the main purpose of the book is to "ignite curiosity and help in generating awareness and cultivating a Green Audit Approach." I do not know how the author will succeed in this because he cursorily covers 72 topics. The issues range from 'Cruelty to crocs' to 'Assault on Taj'. Most topics are dealt within 1-1½ page, and therefore not discussed in detail. The articles are general, more like newspaper articles than serious essays. Mr. Rao has an experience of 34 years as a journalist in *The Times of India*. The titles of the topics are very interesting. For instance, the chapter 'Crab menace to cops' talks about automobile pollution, faced by the cops at road junctions, and 'Johannesburg pow-wow' deals with the Kyoto Protocol which Uncle Sam is scuttling. The book suffers from many spelling and grammatical mistakes. Perhaps they can be corrected in the next edition.



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Lakshmi Prints and Pack, Hyderabad.
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**Strategist -Business Standard, April 12, 2006

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ABOUT THE POSTER

The picture was taken by a camera trap by the Snow Leopard Conservancy in Hemis National Park during the first ever camera consensus conducted on Snow Leopards, in 2003-2004

Snow Leopards (*Uncia uncia*) are distinguishable from other Cats by the distinct features of shorter muzzle, vertical chin, high forehead and the longer bushy tail. The colour of the coat ranges from soft grey to pure white on the underside. Spots are distinct on the head, nape and lower limbs, but break into rosettes on the rest of the body. In the winter coat the rosettes are not pronounced.

Snow Leopards are known to prey on livestock and cattle, when in the vicinity of human populace. However, not much is known of the Snow Leopard's wild habitat due to the inaccessibility of the area and the rarity of actually sighting the elusive creature.

Snow Leopard Conservancy

The Indian chapter of Snow Leopard Conservancy (SLC) is a local NGO working in trans-Himalayan regions of Ladakh, Zanskar and Spiti for the conservation of the highly endangered Snow Leopard in India. The programme is dedicated to the conservation of mountain ecosystems through a community-based approach. It focuses on building local stewardship through a multi-faceted approach of community based eco-tourism, education, research and improved animal husbandry practices that are specifically linked with Snow Leopard conservation. Although a new organisation, SLC-India has achieved distinction with its innovative highly participatory approach. A few of the programmes that SLC-India has initiated are:

- Established the Himlayan Homestays programme in Ladakh and Spiti.
- Trained over 90 Homestay providers in 15 sites in Ladakh and Zanskar and 31 providers in five sites in Spiti.
- First ever fully sustained livestock insurance scheme initiated in Ulley Village. The majority of the villages' large able-bodied livestock including yaks, dzos and horses have been insured against predatory animals and other accidents.
- Community led conservation drives in villages that include restoration of village cultural features like stupas, garbage management, imposing a ban on the sale of plastic bottles, fencing tree plantation areas and setting aside pasture areas.
- Predator-proofed corrals that directly benefited 300 odd families; The corrals prevent incidents of multiple predations where 20-50 sheep or more are killed at a single go.

We are grateful to

RISHAD NAOROJI

for a generous donation to the
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Snow Leopard
(*Uncia uncia*)

COURTESY: SNOW LEOPARD CONSERVANCY

KULIK
—The Little Known—
Bird Paradise

Text: Samiran Jha

Samiran Jha is a nature enthusiast and member of the BNHS

June 1985: The indicator at the speedometer was shivering at around 60, as our old diesel Ambassador was heading north in the unbearable heat. I was eager to see the birds I had heard of. The vehicle was taking more time than it should. At around 9 a.m., we crossed a river and a sudden change in the roadside vegetation did not escape my notice. Our vehicle stopped near a sign board indicating "Raiganj Wildlife Sanctuary". But where were the birds? Our driver pointed towards the treetops. "But those are white flowers!" I replied. A moment's pause later, few of the 'flowers' spread their wings in the deep blue sky. We rushed towards the watchtower! Once atop the watchtower, we found ourselves surrounded by thousands and thousands of birds over the trees. Their gurgling, chirping and singing echoed all over like a wild symphony. That was my first visit to possibly the biggest breeding colony of Asian Openbill-Storks *(Anastomus oscitans)* in India.

NAYAN KHANOLKAR

The peculiar bill of the Asian Openbill-Stork is useful in opening the thick shells of snails, which are a major part of the storks' diet

In 1992, I took admission into the Department of Zoology, Raiganj University College. My second visit to the Sanctuary, soon after, was followed by almost over a hundred visits. This was my favourite pastime during holidays.

SAMIRAN JHA

What appeared to be tree-tops blooming with white flowers were actually nesting flocks of Asian Openbill-Storks

AJIT DESHMUKH

Jheels and marshes are the Openbill-Storks' preferred habitat

If proper care and protection is given, a suitable forest patch can turn into a successful wildlife sanctuary. Raiganj Wildlife Sanctuary, popularly known as Kulik Bird Sanctuary, located 4 km north of Raiganj Town, West Bengal, is one such example. In the early 1970s, as part of the social forestry programme, a small part of the land in Uttar Dinajpur district was selected and planted with species like kadam (*Anthocephalus cadamba*), jarul (*Lagerstroemia flos-reginae*), sissoo (*Dalbergia sissoo*) and *Barringtonia* sp. With a little care the area soon developed into a beautiful green plantation forest. No one remembers how and from where the Openbill-Storks started coming and breeding at Kulik, but it was around 1970. Though several colonial water bird species, like Little Cormorant (*Phalacrocorax niger*), Indian Shag (*Phalacrocorax fuscicollis*), Large Egret (*Casmerodius albus*), Median Egret (*Mesophoyx intermedia*), Cattle Egret (*Bubulcus ibis*) breed here, they are outnumbered by the Asian Openbill-Stork. Over fifty thousand Openbill-Storks have been recorded in the Sanctuary by the Forest Department.

The first batch of Asian Openbill-Storks arrives at the Sanctuary during June in most years. Their date of arrival is unpredictable, though birds have been found to come with the onset of monsoon. They arrive in flocks of 50 to 200. Before settling, they usually circle over the Sanctuary for a few days. Late comers, however, settle immediately on their arrival. The flow of new arrivals continues almost up to the first week of August.

On arrival, the birds are non-territorial. They pass their time resting on the tops of tall trees. During this time, most remain motionless while others are busy preening. After a few days they become territorial. The male maintains an area of about 0.5 sq. m around his nest from other males. Territoriality is followed by a peculiar up-down display and mating. The mating mostly takes place at the nest site and follows the typical Ciconidae pattern. The closest nest that one

AJIT DESHMUKH

Cattle Egrets acquire an orange buff on the head, neck and back during the breeding season

NAYAN KHANOLKAR

Found near *jheels* and rivers, the Indian Shag mainly feeds on fish

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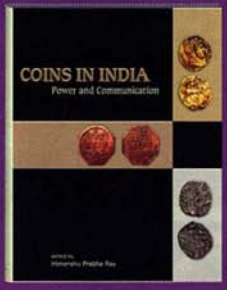

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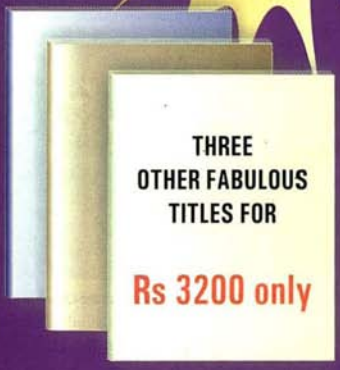

March 2006, de luxe library edition, 305 x 241 cm, 116 pages, 130 illustrations, ISBN: 81-85026-73-4
(listed price per copy Rs.2250/-)

The book spans the period from Greek and Roman coins, to coins of the Sultanate and Sikh kingdoms, to the persistence of coin issuing in present times when currency notes and credit cards are increasingly being used. There is worldwide interest in this subject and we believe the book is an important contribution.

Himanshu Prabha Ray has degrees in Archaeology, Sanskrit, and Ancient Indian History and teaches at the Centre for Historical Studies, Jawaharlal Nehru University.

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Code: Hornbill


AJIT DESHMUKH


NITESH PRAKASH

(Above): Little Egrets develop dainty, filamentous, ornamental feathers called 'aigrettes' on the back and breast during the breeding season

(Centre): Median Egrets have a pure white plumage and develop aigrettes in the breeding season

(Below): Black Crowned Night-Heron's are crepescular and nocturnal birds


NAVAN KHANOLKAR

can see with bare eyes is only within 3.5 m from the watch tower and to take a good half frame picture one does not need to have a sophisticated SLR camera with a bulky telephoto lens. One can simply impress their friends by taking a picture with a simple point and shoot camera.

I have seen that the Openbill-Storks prefer to nest in areas close to the watchtower and forest rest-house, where they are more likely to be free from disturbances, rather than the fringe of the Sanctuary. On the contrary, the cormorants prefer to nest in the middle of the Sanctuary which is surrounded by a 'U' shaped water canal. The breeding colony of the night herons was mostly confined to a few *Eucalyptus* sp. trees. In September 1995, a severe cyclone wiped out most of the Eucalyptus trees along with the nests, eggs and nestlings; the night herons left the Sanctuary the following year. However, on my last visit in 2004 I found that they were breeding again in the Sanctuary.

Openbill-Storks generally lay 3-5 eggs, which hatch between 28-35 days. It is a common sight in Kulik to see these incubating birds. On rainy or cloudy days the parent birds cover the eggs to stop losing body heat and on sunny days they spread their wings to shade their eggs and young fluffy chicks. October is the busiest time in Kulik. Hatchlings and fledglings are seen peeping out from almost every nest and their chirping and gurgling can be heard kilometres away. From a distance it sounds like hundreds of submersible pumps in action. The parent birds are always very busy at this time as they have to feed their ever-hungry nestlings. Their main food, the Apple Snail (*Pila globosa*) is abundant in the nearby rice fields and Kulik river.

Most of the birds start leaving Kulik by December and the Sanctuary gets a deserted look. However, an early rain returns life to Kulik. From February to late March it attracts passerine winter migrants and various kinds of flycatchers and warblers. Among them, the most noteworthy are Black-naped Monarch-Flycatcher (*Hypothymis azurea*) and Rusty-tailed Flycatcher (*Muscicapa ruficauda*). Resident birds include Black-headed Oriole (*Oriolus xanthornus*), Blue-throated Barbet (*Megalaima asiatica*) and Large Cuckoo-Shrike (*Coracina macei*).

But this little Bird Paradise is not free from problems. Until a few years ago, eggs collected from this Sanctuary were available in local markets as chicken eggs; poachers also collected young birds from nests. And although such problems have reduced in recent times, the heavy vehicular traffic of NH-34, which passes through the Sanctuary disturbs the breeding birds. The State Government's recent plan to relocate the NH-34 outside the Sanctuary may return Kulik's lost glory.

Down-*toad*-den:
A Series of Un*fortunate* Events

Common Indian Toads defend themselves against approaching predators by inflating themselves, making it difficult for the adversary to hold the toad.

Text and photographs: Aditya Kanade

Aditya Kanade is presently pursuing his Ph. D. at the Department of Computer Science and Engineering, Indian Institute of Technology, Bombay. He is also a member of the BNHS.

It's a beautiful morning on the campus of IIT Bombay. Everything is wet from the nightly showers and the morning dew. Powai Lake is still lazily wrapped up in a thick blanket of mist. Everything is calm and quiet.

Somewhere in that serenity, the perpetual game between life and death is unravelling. A Common Indian Toad (*Bufo melanostictus*) is in the grip of a mighty Checkered Keelback (*Xenochrophis piscator*)! "Now, it's just a matter of time", comments an onlooker. But then something descends. A pair of House Crows (*Corvus splendens*) land at the spot. Rightful or not, the crows want a share as well. The feathered ones are fearless of the snake. Using all their faculties, they attack the snake ferociously. Approaching from different directions, they poke it with their strong bills. The reptile is now in a peculiar position. "Defending its own prey", smiles the observer. Its mouth being full, the snake can only use its tail to scare away the Crows. The agile Crows continue to harass the snake till it has no choice but to spit out its prey. The Keelback considers it better to save itself than be greedy. Angered by being made to give up its prey, it hisses venomously at the crows. To avoid its fury, the crows fly to a nearby tree. The dejected snake moves away without delay.

The Toad is left dead on the grass. The blood from the wounds inflicted by the snake spreads on its back and along its left forelimb. The Crows are back to claim their feast. One strike from the Crow and suddenly, the Toad springs back to life! It was

just lying still, pretending to be dead. Alive or dead, the Toad has but one destiny. Recovering from the sudden surprise, the Crows renew their attempts at hurting the Toad.

The distressed Toad starts making calls, sounding "*pup-pup-pup*". The poking by Crows and the jumps and cries of the Toad continue till the Crows grow anxious of something above them. The frenzy and possibly those distress calls have caught the attention of some Jungle Crows (*Corvus macrorhynchos*) and Black Kites (*Milvus migrans*)! A pair of Jungle Crows, strike down like lightening bolts. The House Crows that were having an upper hand so far had to make way for the mightier Jungle Crows. "Help from heaven or assault from hell?" wonders the onlooker. Death surely is mocking the Toad.

The Toad endures the strikes from the ruthless Jungle Crows. It jumps, jumps, and jumps more to avoid the jabbing crows. But how long can this go on? Sooner or later...

Not knowing where to seek refuge the Toad is jumping haphazardly. But now it seems to have made up its mind. Wounded and bleeding, bearing the injuries inflicted by the crows, it moves ahead resolutely. Still making those miserable noises, the Toad is undoubtedly advancing towards the onlooker. That is its last hope of survival. Seeking help from the highest predator! Man! The life force had not deserted it even for a moment. It has now planned a masterstroke.

The crows quickly see its move. The distance is some 7-9 m. They still stand a chance of finishing it off before it gets near the human being. In desperation, they shower the Toad with blows. Enduring all of it, the Toad continues with great courage and finally manages to come literally to the onlooker's feet knowing very well that the Crows would not dare come closer.

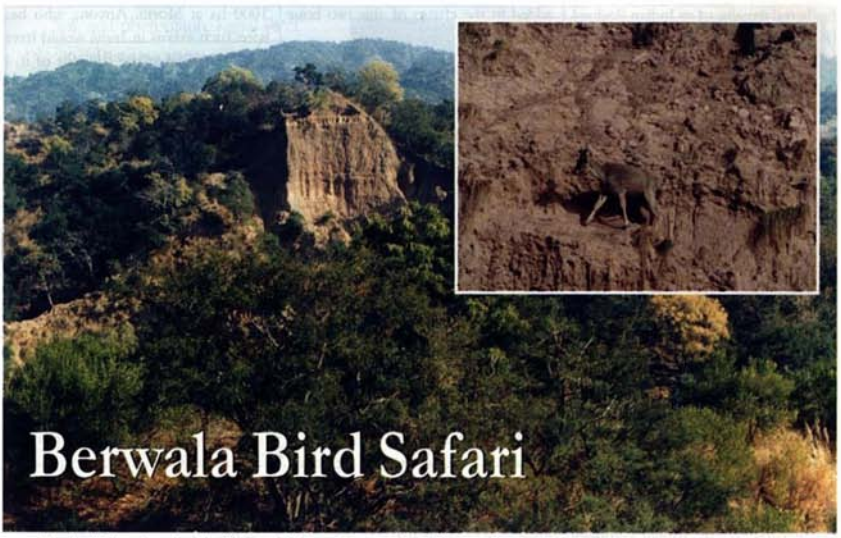
The tired Toad rests for a while under the supposed safety offered by the presence of a human being. But then greed comes in all shapes and sizes! Every one has a right to have a bite or two and why would the ants be left behind? A big black ant makes most out of the opportunity and takes its own share. The Toad cannot stir from its place as long as the Crows are there. The Crows are still lurking around with a show of disinterest. Toying with grass and pebbles they try to feign that they eat grass or even pebbles! The onlooker knows better and doesn't leave the Toad to die a miserable death.

Heavy billed and having a deep, hoarse 'caw', Jungle Crows are known to be omnivorous

Ants render their victim powerless by injecting it with formic acid

He does not mean to interfere in nature's course, but the little one has fought too many battles, too long and deserves a chance at life. The Crows probably lose interest and leave the spot. The Toad is injured but triumphant at the end of it. It slowly moves along in small and unsteady leaps, but with courage and faith in life and itself! For once, it has defeated death and honoured the spirit of life and what could be a greater reward than life itself.

Acknowledgements: I would like to thank Chandrakant Ahire for directing me towards the scene. I would also like to thank Krushnamegh Kunte for motivating me to write the observations.



Berwala Bird Safari

The floral diversty and mud-cliffs found in Berwala are typical of the geology of the Siwalik range (Inset: Himalayan Goral)

Text and photographs: Lt. Gen. Baljit Singh (Retd.)

Lt. Gen. Baljit Singh is an active promoter of nature conservation particularly within and by the Armed Forces over the last 50 years

Situated in the Morni Hills segment of the Siwalik range in Haryana, Berwala Wildlife Sanctuary of 250 ha is perhaps the smallest in the country. Inaugurated in May 2003, it is little known and waiting to be explored. As it is a mere 16 km from my hometown Chandigarh, on the black-topped road to Morni, I am a frequent visitor; I have visited the place twice in the company of Dr. Vibhu Prakash (BNHS), many times with Mr. Jakkati (Chief Wildlife Warden, Haryana) and almost always with Sada Ram, a wildlife inspector whose store of jungle-lore is enviable. Altogether, I have listed 83 species of birds, 19 mammals, 3 reptiles and 15 butterflies; the latter mostly by Vibhu.

Berwala lies in between and over the last two major ridges of the Siwalik range before they tumble down and eventually flatten out at the Ghagar river, merging with the plains of north-west India. Being the junction of the Siwalik range and the plains, it remains a bustling transit area in the altitudinal movement of birds between the lower Himalaya and the plains, synchronous with the cycle of seasons. Along its longest axis the Berwala Valley (30° 41' N, 76° 41' E, 300 m above msl) is about 4 km, and at the widest about 1 km. Typical of the Siwalik geology, Berwala has several bare and near-vertical mud cliffs, about 30 m at the base and rising dramatically to nearly 50 m above the valley floor. The valley, the numerous ravines and slopes of the ridges are densely wooded with the dry deciduous flora of Siwaliks. Predominant trees are *Jhingan* (*Lannea grandis*), *Dhakk* (*Butea monosperma*), *Khair* (*Acacia catechu*), *Gular* (*Ficus glomerata*) and *Ber* (*Ziziphus nummularia*). Some slopes have a rich cover of Bhabbar grass (*Eulaliopsis binata*).

There is one trail in the safari, which ascends from the floor of the valley to the top of the highest ridge, and after a long traverse over the entire crest line, descends back to the valley floor. The crest provides a grand panorama of the whole safari and also the entire Siwalik range as far and wide as the eye can see.

I had a memorable walk on this trail in November 2003. There were tracks of a big Sambar (*Cervus unicolor*) with a fawn in tow, several heaps of droppings of the Barking Deer (*Muntiacus muntjak*), spent quills of an Indian Porcupine (*Hystrix indica*) and the

feathered remains of an Indian Peafowl (*Pavo cristatus*), suggestive of a meal made by a carnivore. Thrice I saw Himalayan Goral (*Naemorhedus goral*), five in all, who gave remarkable displays of glissading down the mud cliff and down the knife-edge of a mud spur at lightening speed. A sounder of four Indian Wild Boar (*Sus scrofa*), surprised, stood blocking my path and then in a right jink disappeared inside the Bhabbar grass, grunting in disapproving anger all the while. A lone Bonelli's Eagle (*Hieraaetus fasciatus*) exhibited the power and grace of his steep glide-dive from far above down to its prey in the valley in the blink of an eye. And a solitary Eurasian Sparrowhawk (*Accipiter nisus*) was seen atop a tree that was rooted in a cliff-face in sheer defiance of gravity. Quite unpredictably, every now and then a variety of butterflies (Grass Yellow, Great Orange Tip, Indian Cabbage White, Peacock Pansy, Common Mormon and others unknown to me) added to the charm of this two hour walk.

There are three memories that I especially cherish. The first was on a hot summer's day in May 2004 near a natural spring. I saw a giant spoor of a Sambar and close to it, in stark contrast, one tiny footprint of a Porcupine along with the drag mark of her quills! The second is of a laughing-thrush heard on several visits, but I could not pin down its location. The sudden thunderclap of "whooo-wheee-wheee" or in the reverse was both impressive and unsettling. The voice syllabication by Grewal-Harvey-Pfister was dot on the Rufous-chinned Laughingthrush (*Garrulax rufogularis*)! My happiest encounter was with a flock of Yellow-throated Sparrow (*Petronia xanthocollis*).

The term Bird Safari would be intriguing to the reader. In May 2001, the Haryana Chief Minister (CM) decided to create a Lion Safari over 1000 ha at Morni. Anyone who has seen such safaris in India would have been horrified at the thought of it. I reasoned with the CM through his Principal Secretary that he should instead create a Bird Safari that will require no real infrastructure and no relocation of villages. I later learnt that the bureaucrats were not happy with the idea of the Lion Safari, but none would voice their opinion. Therefore, everyone backed my letter to the CM and the creation of the Bird Safari was accepted! Although the Bird Safari was inaugurated in 2003, its notification got linked with that of the Mahavira National Park, which was cleared by the Indian Board for Wildlife during one of its meeting. This is perhaps as far as individual initiative can go before it is thwarted by the maze of bureaucratic obstructions.

Footnote: As per a gazette notification dated December 10, 2004 Berwala Bird Safari was included within the boundaries of Khol-Hi-Rattan Wildlife Sanctuary.

SLEEPING BEAUTY

Text and photograph: Shilpa Bernard

Shilpa Bernard is a twelfth standard student at the DPS School in Ahmedabad.

It was a pleasant afternoon in mid-November. My mother was going for her afternoon nap when she suddenly saw a hunched shadow at the window. I quietly crept on to the balcony and was dumfounded to see, on the top of our 9th floor AC box, a handsome brown owl over a foot in height standing straight and stiff as a soldier but with its eyes shut. I carefully withdrew and rushed to get my digital camera. On my stealthy return, the owl was still asleep and permitted me two photos before it woke up in alarm and flew off. Before its picture disappeared from my mind I took down Sálim Ali & Ripley's PICTORIAL FIELD GUIDE and identified it as a Barn Owl (*Tyto alba*).

I wonder what it feeds on in our concrete jungle, though we still hear Grey Francolins in the morning as also the Red-wattled Lapwings which hang around the edges of our slimey Vastrapur Lake. From its appearance it was apparent that it does find adequate number of rats to live on in the city and its environs.

RUSTY-SPOTTED CAT

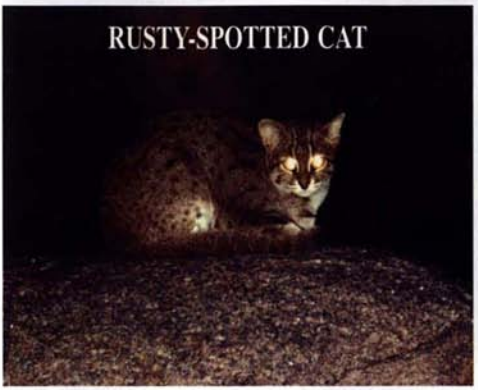
Text and photograph: Kunal Patel

Kunal Patel is a wildlife enthusiast.

It was during the course of a leopard ecology project in the dry deciduous forest of Baria and Chhota Udepur forest divisions of Eastern Gujarat that we saw a Rusty-spotted Cat (*Prionailurus rubiginosus*) one night. It was sitting on a large sandstone.

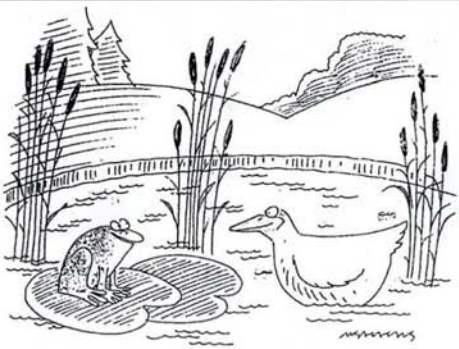
At first, with the aid of night vision, I could only identify its small size and striped forehead. Snatching at this rare opportunity, I managed to photograph the animal with the help of a powerful searchlight.

So far, I have had four sightings of the Rusty-spotted Cat at three different locations. This Cat is found more in peninsular India than in other parts of the country.



Rusty-spotted Cat is the world's smallest cat, found in India and Sri Lanka

EDITORS' CHOICE



"My lawyer finally got me on the endangered-species list!"

Drawing by M. Stevens, Courtesy: The New Yorker Magazine, Inc.

Common Hill Mynas vanishing from North Bengal!

Call it a another example of human avarice, but the passion for mimic birds that can repeat human speech or warble from a cage is stripping our hills of one of its greatest treasures. The Common Hill Myna (*Gracula religiosa*) or the Grackle is being slowly pushed towards extinction by the pet business, not only catering to clients from India but also from various parts of the world.

The natural forest singer is actually a chart buster in the world market. Common Hill Mynas or Pahari Mynas (as they are known in Bengal) have been an integral part of the North Bengal forests. At first it was only hill tribes living deep inside these forests and others like Nepalis, Khasias, Bhutias and Santhals who used to trap and hunt these birds for their famous ability to mimic words.

But soon this ability caught the fancy of elite buyers in Kolkata, Delhi and other cities. It was only a matter of time before their fame spread beyond the borders and the birds began to be exported to other countries especially South-East Asia where this species is a favourite among high end buyers.

The tribals have mastered their skills of trapping. Familiarising themselves with the bird's movements they employ various devices to capture them. The most common method is, of course, that of nets and glue. Often the trappers identify nests of Common Hill Mynas, located high on Sal trees, and when the chicks are between 10 and 15 days old they capture them and proceed to train and groom them for the market.

Common Hill Mynas are very popular as pets among all classes of people. About 30 cm in length, Common Hill Mynas are of stocky build, and glossy jet-black. They are identifiable by the two bright orange-yellow patches of naked skin and fleshy warts on the sides of the head and nape. A broad white band is visible on its wings – which is conspicuous even in flight. They are noisy, sociable and live in pairs or groups keeping to tree-tops in forest areas. Large congregations collect to feed on fruiting fig trees.

The Common Hill Mynas favour the forests of North Bengal, predominantly Sal with a variety of fruit trees. As long as some of these parts remained inaccessible due to the high altitude, these birds were present in great numbers. Spotting flocks of 50-60 birds was not uncommon. But nowadays it is almost impossible to find Common Hill Myna groups of four or six.

It is the same in all sectors of the North Bengal forests. The forest authorities admit that it has been difficult to control the ever-increasing trend of bird trapping. This maybe because the trappers are too secretive, the bird is small in size and therefore easy to transport, and the authorities generally give less emphasis to the theft of smaller species of fauna.

Between August and September, tribals like Santhals and Bhutias secretly scout the forest to trap Common Hill Myna chicks. These birds are then sold for paltry sums ranging from Rs. 50 to Rs. 100, to middlemen. However, these birds are then sold for much more than Rs. 5,000 in urban markets. Juvenile birds are transported mostly by road and they appear in the bird markets of Kolkata like Bowbazaar, College Street, Hatibagan, Rajabazar, and Alipur. Sometimes this trade operates through Assam and West Bengal reaching into Bangladesh from where they are exported to South-East Asian countries.

The scarcity of the bird and the ever-increasing demand has forced many traders to resort to deception. Unscrupulous traders often disguise Common Hill Mynas to look like their more famous cousins. The feathery portion above the myna's eyebrows are shaved and painted orange or yellow, the nest of the birds is then smeared with black grease to heighten the resemblance.

The Common Hill Myna is a protected species under the Wildlife (Protection) Act, 1972. Traders, however, have ingeniously circumvented the law by camouflaging these as other exotic birds permitted by the government. Since the sale of domesticated exotic varieties is permitted under the Wildlife (Protection) Act, traders have found a way to camouflage the birds, so that everything seems perfectly legal and aboveboard. The authorities need to wake up in time to check the trend otherwise North Bengal will lose this species in coming days.

Arunayan Sharma,
West Bengal

HSBC

The world's local bank

Issued in the interest of tiger protection

ASHISH KOTHARI

Bird protection area of Mangalajodi village

Where Blackbucks Roam, Turtles Breed and Birds Fear No More

Text: Neema Pathak and Ashish Kothari

The authors are members of *Kalpavriksh*. In the next few issues, they will present more case studies of CCAs and review India's own legal record in supporting such initiatives.

In these times when sponge iron plants, steel plants, commercial ports, coal and bauxite mines are changing the face of Orissa's landscape, when elephant corridors are being ripped apart by what the state's leaders consider "development," and when communities with ancient cultures are being converted into exploited labour, one wonders whether there is any hope for biodiversity conservation. Thought obviously goes to the national parks and sanctuaries in the state, several of them still harbouring rich wildlife. However, these sites are also embroiled in all kinds of conflicts, raising questions on their long-term sustenance.

Various communities in Orissa are triumphantly pushing conservation to new heights despite many hurdles

But there is also hope for nature in some unexpected quarters: youth clubs, women's groups, traditional elders and village panchayats. Across Orissa there are a number of local community groups, which are engaged in protection of wild habitat and/or species. Theirs are stories of struggle, of hurdles and constraint, but ultimately of conservation.

There are few places in India where Blackbuck can be seen grazing freely with the livestock of the village. Buguda village in Ganjam district is one such. Its inhabitants have been protecting Blackbucks from time immemorial. Fifty years ago the efforts were intensified by a few village elders, who realised that the incidents of hunting by outsiders were on the rise. Strict penalities were put in place for those found hunting or harming the animals. And though, a large percentage of agricultural fields are lying uncultivated today, due to scarcity of water and crop damage by Blackbuck, the resolve to protect the species is still very strong. The

village was recently awarded the Chief Minister's award for wildlife conservation.

Over 180 villages in Ranpur block of Nayagarh district are protecting forest patches, and combining them into a relatively contiguous stretch of possibly a few hundred sq. km. Some of these villages started protecting forests about 50 years back and are still struggling with strong internal politics and external pressure for timber smuggling. In villages like Dengajhari and Gundrubari, protection by all-women's groups is very successful. These women came forward to protect the forests because degradation was threatening the availability of non-timber forest produce (NTFP), on which their economy depends. Men were not able to handle the timber mafia on the face of physical violence, including life threats. Today all of the 180 villages, some with multi-caste and class composition, while others homogenous, have come together to form a block level Federation. The Federation provides technical support, a forum for discussions, facilitation of dialogue with politicians and government agencies and conflict resolution.

Villages claim the return or re-appearance of various species in the Ranpur forests, the most fascinating of which is that of Elephants (*Elephas maximus*). Local groups feel that with disruption of traditional Elephant corridors elsewhere, the animals prefer the regenerating forests of Ranpur. This phenomenon urgently needs to be further examined and understood.

The Ranpur example is only one of possibly over 10,000 community forest protection initiatives in Orissa! Unfortunately, there is almost no documentation of wildlife found at these sites.

ASHISH KOTHARI

Blackbuck graze freely with the village cattle at Buguda

Rushikulya is among the lesser-known rookeries (mass turtle nesting sites) in Orissa. Traditionally, local fisher-folk would collect the eggs for consumption or sale. Some youth in the village first realised the threatened status of the Olive Ridley Turtles (*Lepidochelys olivacea*) and the importance of the Rushikulya beach as a nesting site after interaction with Bivash Pandav of the Wildlife Institute of India. They then stopped eating and selling turtle eggs, and educated fellow villagers. They registered themselves as a non profit organisation, the Rushikulya Sea Turtle Protection Committee, and constructed an interpretation centre with funds from the Vasant J. Sheth Memorial Foundation. Now this awareness has spread, with neighbouring villages such as Gokharuda following suit. Some villagers are also earning an income from tourists, though this needs to

ASHISH KOTHARI

Mating Olive Ridley Turtles, just before mass nesting at the Rushikulya rookery

be made more systematic and regulated. In 2006, over 100,000 turtles are reported to have nested at Rushikulya.

Chilika Lagoon is famous for the Irrawady Dolphins, its fish productivity and lakhs of birds that visit it every year. Some restaurants in the area display a board mentioning that bird meat will not be served, an indication of the fact that people otherwise expect to get this 'delicacy!' Villagers in Mangalajodi, on the edge of Chilika, were among those who once earned a major part of their livelihood through hunting and selling bird meat. This was till a decade back, when the NGO Wild Orissa started spreading awareness about bird conservation. Today, the villagers are strictly protecting wintering and resident birds, and looking forward to an alternative source of income through tourists. One could see lakhs of wintering waterfowl at Mangalajodi this winter; many more than were visible at the official Nalabana Sanctuary inside Chilika.

These are just a few examples of numerous such initiatives in Orissa. It would be fascinating to find out how many such initiatives exist in the State and what kinds of ecosystems and species are being protected by them. These efforts, however, are facing a number of constraints that need to be urgently addressed. Firstly, the State Government is yet to recognise these as an effective system of conservation, with the exception of occasional awards like what Buguda got or the provision of some facilities to Mangalajodi by the Chilika Development Authority. Indirectly, the role of community initiatives in forest regeneration has been acknowledged in the Forest Survey of India report for 2003, but even this has not led to legal, administrative, or financial support from the Government. Secondly, very little input goes into providing livelihood support to the conserving groups, e.g. to youth at Rushikulya, or former bird poachers at Mangalajodi. The potential to develop eco-sensitive, pro-conservation tourism plans has not been realised. Community forestry initiatives could also do with support in watershed development and water harvesting (a crying need at Buguda), agricultural improvement, forest produce based enterprise, etc.

Unfortunately, official interventions have sometimes been counter-productive. For instance, the Forest Department has imposed Joint Forest Management (JFM) on community forestry initiatives, disrupting existing institutional mechanisms. Worse, the government has often introduced threats, e.g. by giving mining leases in areas conserved by communities — forests protected by four villages (Rajiharan, Nandijhor, Goalgadia and Similisahi) fall in the proposed Utkal Coal Project of Indian Metals & Alloys Ltd. No one considers the need to take the consent of communities before starting such projects.

If community wildlife conservation is to continue to flourish in Orissa, the above hurdles will need to be urgently tackled. There are some non-government agencies working towards identifying the hurdles faced by these initiatives and helping them resolve the same. Among some of the organisations are Vasundhara, a Bhubaneshwar based NGO, which is trying to do such research. The Orissa Marine Resources Conservation Consortium, initiated by groups like ATREE, consists of local fisher-groups and NGOs collaborating to conserve turtles and coastal habitats. The Wildlife Society of Orissa also extends some help to community groups. However, they can do with much more support from the Government.

ASHISH KOTHARI

Volunteers of Wild Orissa with village representatives from Mangalajodi at the conservation site

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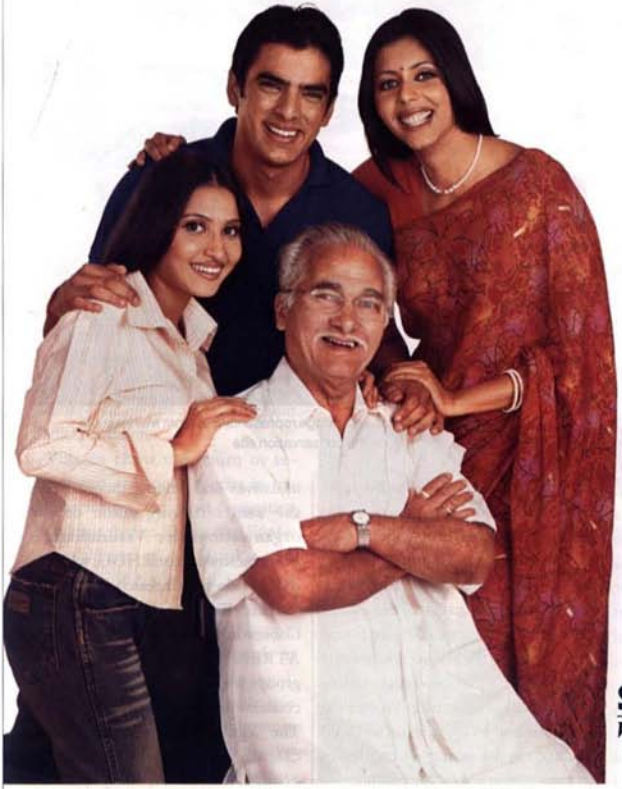

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BIRD FLU
SOME FACTS

Text: Girish Jathar
Photographs: S. Balachandran

Although much has been discussed about the impact of the bird flu epidemic on the human population, nothing has been said of what effect the epidemic has had on the wild bird populations. From the conservation perspective, Avian Influenza raises several questions. BNHS investigates and tries to provide answers.

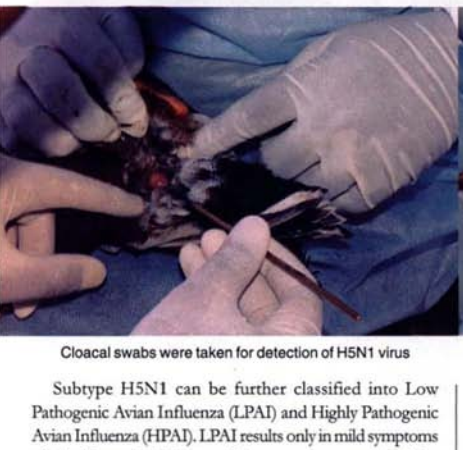
On February 18, 2006, the first outbreak of Avian Influenza in India was reported from Navapur town in the Nandurbar district of Maharashtra and Uchachal in Surat district of Gujarat. The disease had finally reached the Subcontinent!

Avian Influenza (AI) or 'Fowl Plague' or bird flu has been known to mankind since the last century. Until a few years back Avian Influenza was not common and was not known to the general public. It was known only to a few individuals, because of its sporadic outbreaks in the poultry circles. It was first reported in Italy, more than 100 years ago (around 1878). Pathogenic Avian Influenza was first recognised in the US in 1924-25 and then in 1929. Later, there were a few reports of AI from various parts of the world. But, when a strain of Highly Pathogenic Avian Influenza (HPAI) H5N1 virus, which killed thousands of chickens, appeared in Hong Kong in 1997, the disease caught public attention.

The Virus

Avian Influenza is an infection caused by a virus found in domestic as well as wild birds. Among wild birds, it is mainly found in ducks, geese, fowl, gulls and cormorants. The AI virus is of three types – A, B and C. Type A is of much concern as it has various strains; the two groups of glycoproteins present on the surface of this virus are Haemoagglutinin (H) and Neuraminidase (N) – H has 16 and N has 9 subtypes. Permutation of H and N can give rise to several subtypes. The H5N1 subtype is responsible for the recent outbreaks of AI.

known mortality of wild birds in the past was in Common Terns (*Sterna hirundo*) in South Africa in 1961. This virus was isolated and identified as H5N3. However, the recent outbreak in April 2005 in Qinghai Lake in Western China killed almost 6000 Bar-headed Goose (*Anser indicus*) at their breeding ground. The virus isolated from these dead geese was identified as HPAI H5N1. Qinghai Lake is an important breeding site of the Bar-headed Goose in Central Asia. In winter, the geese migrate towards Myanmar and India where they mingle with other migratory waterfowl. The virus can be transmitted from infected geese to other migratory birds. These migratory



Cloacal swabs were taken for detection of H5N1 virus

Blood samples were collected from wild birds

Subtype H5N1 can be further classified into Low Pathogenic Avian Influenza (LPAI) and Highly Pathogenic Avian Influenza (HPAI). LPAI results only in mild symptoms of the disease in chicken and does not cause mortality. But HPAI is highly contagious and causes high mortality in poultry. The HPAI virus has become endemic to the poultry in South-East Asia since 2003, resulting in more than 100 million poultry deaths, due to the disease or culling. This virus was not known to infect humans. The first report of HPAI H5N1 infection in humans was reported from Hong Kong in 1997, where 18 people were infected of whom six died. Since 2003 to date the HPAI has been found in eight countries and 186 humans have been infected, of which 105 have died. All humans who died or were infected had come in direct contact with infected poultry. The virus spreads to humans by inhalation.

Should we blame wild birds?

Avian Influenza viruses have been found in many bird species, but are most often found in migratory waterfowl, especially Mallard ducks (*Anas platyrhynchos*). The only birds may act as carriers and spread the virus to other countries.

In India, so far, there has been no report of wild bird mortality due to HPAI. There were, however, reports of wild bird mortality from Kulik Wildlife Sanctuary in West Bengal, Lakhota Lake in Jamnagar in Gujarat, Chilika Lake in Orissa and Yamuna river, Delhi. But in all cases, the deaths were possibly because of pasteurellosis, inclement weather and poisoning, and not because of Avian Influenza.

The BNHS Perspective

In May-June 2005, as soon as news of outbreak of bird flu was reported in China, with many Bar-headed Geese, Large Cormorants, and Black-headed Gulls dying, BNHS took the initiative and wrote to the Ministry of Environment and Forests to approve a project for monitoring wild birds for Avian Influenza. About 40 wetlands were selected from the database of the Important Bird Area programme of the BNHS and a few protocols developed to gather data. A proforma to

record the data collected was designed and circulated to BNHS members and staff. Detailed information on the HPAI was made available on the BNHS website www.bnhs.org.

Soon after the outbreak of AI on February 18, 2006, a BNHS team visited Navapur and Nandurbar talukas of Nandurbar district, and two reservoirs from Nasik and Aurangabad each, as a huge congregation of migratory birds was reported from this area. A survey was carried out from February 20-25, 2006. The team monitored 14 wetlands in three districts of Maharashtra. Careful observations were carried out to ascertain the number of sick and dead birds. Local people and fishermen were interviewed for possible reports of mortality of wild birds in recent times. Enquiries were also made to identify the possible connection between the poultry and the wetlands.

Ten reservoirs in Navapur and Nandurbar talukas were visited from February 20-23, 2006, but no congregations of migratory birds were seen. Most reservoirs were used for irrigation and commercial fishing. Indirect evidences of hunting of waterfowls were also recorded in some places. A small flock of domestic ducks was observed on the shores of Rangavali and Toranmal reservoirs in Nandurbar district. The domestic ducks and wild birds were mingling together here and therefore the possibilty of transfer of avian diseases between them was speculated. The domestic ducks, however, did not show any sign of sickness. Enquiries with locals revealed that there had been no mortality among wild birds. Of the ten reservoirs, only one reservoir was in proximity of a poultry farm, but there was no evidence suggesting connection between the poultry and the reservoir, ruling out the spread of infection to domestic poultry by wild birds.

In Nasik, a huge congregation of migratory birds was observed at two reservoirs, but no mortality was reported. On February 24, 2006, news of death of 150-200 waders in Gandheli village of Aurangabad was reported. The BNHS team found that the birds here may have died because of pesticide poisoning. No sick or dead birds were encountered, except in Gandheli village at Aurangabad. A second team led by Dr. S. Balachandran, Senior Scientist, BNHS visited Navapur area and ringed 39 individuals of 17 species. The blood samples of all birds have been sent to the High Security Disease laboratory in Bhopal and the results are yet to come.

At times, nasal swabs are taken for detecting H5N1 virus

The birds were ringed before they were released

Conclusions

So far, there has been no mortality due to Avian Influenza among wild birds, especially waterfowl, in Navapur and Nandurbar talukas. The AI outbreak is at present restricted only to poultry. Migratory birds are not responsible for the outbreak of AI in India as:

- All the poultry farms are more than 10 km away from the reservoirs, except in Nandurbar town.
- No dead or sick wild birds were seen during the BNHS survey.
- Enquiries with local people and fishermen revealed no mortality among wild birds.
- In some villages, where poultry birds were culled, wild birds such as House Sparrow (*Passer domesticus*), House Crow (*Corvus splendens*) and Cattle Egrets (*Bubulcus ibis*) and domestic stocks of chicken were alive and showed no symptoms of sickness.
- The cause of mortality of migratory birds in Gandheli village of Aurangabad is yet to be confirmed. Meanwhile, the other birds in the vicinity of the reservoir did not show any sign of sickness.

The Verdict

Although most strains of Avian Influenza are relatively non virulent, HPAI H5N1 appears capable of affecting many species of wild birds. All evidence suggests that it is very unlikely that the HPAI H5N1 is spreading because of wild birds. On the contrary, Avian Influenza poses a threat to wild bird conservation on several fronts. Some public and animal health officials may blame wild birds for spreading HPAI H5N1, and there may be calls for culling wild birds to control or limit its spread. Such a call will be disastrous; moreover it will not solve the problem. Recently published literature also suggests that there is no evidence of migratory birds carrying HPAI across countries.

Prevention and Control of HPAI

Controlling an outbreak of HPAI in wild birds is almost impossible. However, some points may be considered:

- Regular surveillance of wild birds on their breeding, staging and wintering ground to check the possible spread of virus among them.
- Study of the epidemiology and behaviour of the virus in wild bird populations should be initiated.
- Hunting and selling of wild birds at local markets should be strictly monitored.
- Husbandry of domestic birds should be designed so that wild and domestic birds do not share water and feeding sources.
- Better biosecurity for testing of poultry, controlling the movements and sale of poultry and poultry products, maintaining hygiene of poultry, disposal of poultry manure and its use in aquaculture and agriculture, and the control on the illegal trade in poultry, poultry products and captive wild birds.
- Confinement and effective vaccination of free-ranging poultry flocks.
- The role of poultry birds in spreading disease must be seen in a much larger context of the global poultry industry and the movement of huge quantities of poultry products around the world instead of speculating that wild birds are spreading the disease.
- Attempts to cull migratory wild birds or destroy their habitat are dangerous and earlier experience shows that this approach is completely ineffective, and indeed is likely to make matters worse as healthy birds are stressed and more prone to infection, hence aggravating the problem. This should therefore be avoided.
- The best way to prevent future outbreaks of HPAI from domestic to wild birds or vice versa is to avoid contact between these two groups.

Conservation implications for wild birds

Conservation of wild birds is very important in terms of global biodiversity. Therefore, the following points should be considered:

- The AI virus is highly pathogenic (causes high level of mortality) to wild birds and can adversely affect the conservation status of some threatened species.
- The World Health Organisation, Food and Agriculture Organisation and the World Organisation for Animal Health agree that the control of Avian Influenza in wild birds by culling is not feasible and advisable.
- Globally threatened species such as Red-breasted Goose (*Branta ruficollis*) in Greece and Dalmatian Pelican (*Pelecanus crispus*) in Bulgaria are at stake because HPAI is already reported from these countries. The infection of HPAI H5N1 can bring these species to the verge of extinction. Already about five to ten percent of the world population of the Bar-headed Goose (*Anser indicus*) has been wiped out in the outbreak at Qinghai Lake in China, during the spring of 2005.
- BirdLife International, UNEP-Convention on Migratory Species (CMS), four UN bodies and some other organisations have formed a task force. The task force seeks much better data and information on the cause of the spread of the disease. Various aspects of this disease and prevention measures will be worked out by them. ■

For Details visit www.bnhs.org
Or contact Girish Jathar at envisbnhs@vsnl.net

Girish Jathar is Scientist-In-Charge
at the ENVIS Centre at the BNHS.

Wetlands International has taken the initiative to bring virologists, ornithologists and modellers together, in order to develop a worldwide system for monitoring Avian Influenza in wild birds and to unravel possible mechanisms of disease transmission. This initiative is developed in close contact with the European Union (EU), World Health Organization (WHO) and the Food and Agricultural Organization (FAO), as well as with international nature conservation bodies such as the Ramsar Convention, the Convention on Migratory Species (CMS) and the African-Eurasian Waterbird Agreement (AEWA), BirdLife International and International Council for Game & Wildlife Conservation (CIC). They seek cooperation with like-minded bodies to enhance this important work.

BNHS and underprivileged children

The Bombay Natural History Society (BNHS) has taken an initiative to increase awareness of environment protection among economically underprivileged children through conservation education. In this regard, the BNHS-Conservation Education Centre (BNHS-CEC) at Mumbai has organised various activities such as nature trails and quizzes for the children. The project commenced on January 22, 2006. Since then, over 700 children have participated.

The programme is supported by the US Embassy's Cultural Welfare Department. NGOs such as Doorstep, REAP, Arambha, Akanksha, Salaam Baalak and Smile are co-operating to bring children into the programme. BNHS intends to reach to over 3000 students through this project.

BNHS PHOTO LIBRARY

Beneficiaries of the BNHS' nature conservation awareness among economically underprivileged children initiative attend a programme at the Sanjay Gandhi National Park

In addition to students from across different schools in Mumbai visiting the Centre, BNHS intends to extend the benefit of conservation education to underprivileged students. BNHS shall arrange free visits for any NGO that brings school children to the Centre. The bi-monthly Marathi newsletter for children '*Dhanesh*' will also be circulated to these schools. *Dhanesh* contains information on environment protection, tips for conservation and activities such as paper making at home. ■

A Toast to Trees

BNHS PHOTO LIBRARY

Enthusiastic participants take part in the nature walk and discussion at the 'Toast to Trees' event

Trees are an integral part of human lives and we share a dynamic relation with them. They are the source of food, shelter and clothing, and also add an aesthetic dimension to our lives with their beautiful flowers and leaves. Amidst the city's hectic life, we often ignore our tall and omnipresent friends. On March 26, 2006, the BNHS-Conservation Education Centre (CEC) at Mumbai organised a half-day programme 'Toast to Trees' for the general public. After the 'Breakfast with Butterflies' and 'Flamingo Watch', two very successful events, this was another effort to bring people closer to our green friends, the trees.

A variety of activities were organized for both the adults and children: nature trail, learning about herbariums, slide show, puppet show, educative tree games, wonders of wood, quiz, tips on tree planting, and face painting were some of them. Over a 100 people participated in the programme. ■

Vulture Venture

The Bombay Natural History Society (BNHS) and Earth Matters Foundation organised the launch of 'The Vanishing Vultures', a conservation film by the eminent filmmaker, Mike Pandey on April 7, 2006 at the British Council Auditorium, Mumbai. The film will be launched across several cities in India to increase public awareness and enlist support for the Vulture Advocacy Programme.

The screening of the film was followed by a discussion on the vulture crisis and ban of veterinary Diclofenac in India. The rapid decline of vulture populations for over a decade has been an issue of great concern. Dr. Asad R. Rahmani, Director, BNHS; Dr. Nita Shah, Advocacy Officer, Vulture Advocacy Programme-India, BNHS and Mr. Chris Bowden, Director, South Asia Vulture Programme, RSPB answered the queries of the audience regarding the role of veterinary Diclofenac in vulture-population decline. The benefits of using the substitute Meloxicam were also given due consideration during the discussion.

BNHS PHOTO LIBRARY

The audience participates in a discussion following the screening of Mike Pandey's 'The Vanishing Vultures'

The BNHS participated in a meeting on March 17, 2006, hosted by the Ministry of Environment and Forests, where representatives of various pharmaceutical companies were involved, to discuss the viability of a ban on veterinary Diclofenac. The response of the participants to eschew veterinary Diclofenac proved positive.

Other than the BNHS, the Wildlife Institute of India (WII), Poultry Diagnostic Research Centre (PDRC), Indian Veterinary Research Institute (IVRI) and Worldwide Fund for Nature-India (WWF) from India; Royal Society for Protection of Birds (RSPB), BirdLife International, and Zoological Survey of London (ZSL) from UK; Peregrine Funds, USA are also working towards finding a solution to the vulture issue at hand. ■

Water Conservancy for the Media

BNHS PHOTO LIBRARY

Members of the press in attendance at the workshop on water conservancy held by the NIC

The BNHS-Nature Information Centre (BNHS-NIC) at Sanjay Gandhi National Park, Mumbai, celebrated its second anniversary on 'Earth Day' – April 22, 2006. The BNHS-NIC organised a workshop, based on the theme 'Water', for media professionals on the occasion with support from British Gas, India and the Forest Department, Government of Maharashtra.

The participants discussed how the flora and fauna use water and adapt themselves in response to the availability of water. The BNHS-NIC aims to make the public aware of conservation issues through the educated media, as a sensitive and informed media can help in conservation through public awareness. Representatives from *Indian Express*, Times Group, *The Asian Age* among others attended this workshop. Mr. Avinash Kubal, Dy. Director of Maharashtra Nature Park, provided guidance to the participants through the slide show and a nature walk. ■

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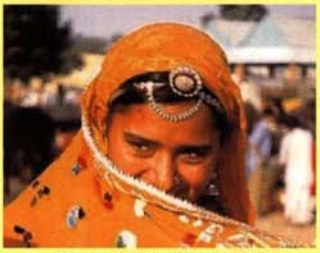

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