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ALTITUDINAL RANGE EXTENSION OF GARDEN LIZARD *CALOTES VERSICOLOR*

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The distribution of Garden lizard (*Calotes versicolor*) is depicted as the whole of the Indian and Indo-Chinese subregions, SE Iran, Afghanistan, Pakistan, Nepal, Bhutan, Ceylon, Andaman, South China (Yunnan, Guangdong, Guanxi, Hongkong, Hainan island) and northern part of Malay Peninsula (Myanmar, Thailand, W Malaysia, Pulo Condore Island) and Mauritius (Reunion & Rodrigues) (Günther, 1864; Smith, 1935; Waltner, 1975).

About the altitudinal distribution of *C. versicolor*, it has been written that it is common up to 6000feet (1800m) and not found above 7000feet (2100m) (Smith, 1935). Günther (1864: pp. 184-185) has written that *C. versicolor* is not found in the temperate zone of the Himalaya. The same statement is reported in Smith (1935: pp. 189-193), that *C. versicolor* does not penetrate far into Himalaya from the plains. Cox (1985) recorded the species as common up to 1980m in the Nepal Himalaya.

Bauer and Günther (1992) reported one specimen from Samdrup Jhongkhar (300m) in Bhutan, they have also examined 17 specimens, which were collected by Drs. O. Stemmler and M. Wûrmli of Naturhistorischen Museums Basel (NMBA) in April-May 1972, in the Kingdom of Bhutan. These specimens were collected from Phuntsholing (200-400m), Balu Jhura and Wangdi Phodrang (1400m). Biswas (1975) also reported a specimen from Samdrup Jhonkhar, Bhutan. Barbour (1912) recorded this species from the Tista Valley near the Bhutanease border of Sikkim (India). This species has been widely reported from Himalaya (Leviton *et al*., 1956; Mrsic, 1980; Nanhoe & Ouboter, 1987; Rendahl, 1937; Sura, 1987, 1989; Swan & Leviton, 1962).

I found one female *C. versicolor* near Kanchula kharak (2700m) in Kedarnath Wildlife Sanctuary, India in June, 2000. Kedarnath Wildlife Sanctuary is situated in western Himalaya ($30^0$25'-$30^0$45'N & $78^0$55'-$79^0$22'E) covering an area of 975km^2. It is one of the largest protected areas of Garhwal Himalaya. The altitude range in the sanctuary is from 1160m to 7068m. Kedarnath WLS is a home to Musk deer and other Himalayan fauna. I caught this female during the afternoon, identified using Smith (1935) and then released her. She was gravid. This altitudinal location of *C. versicolor* at Kanchula Kharak, an elevation of 2700m, is 600m higher then the last reported altitudinal location for it (Smith 1935). There is published information about atitudinal range extension of a few more reptiles, e.g. Rat Snake (*Ptyas mucosa*). Its altitudinal range limit was described at 1300m above mean sea level. Sahi *et al.* (1996) found two males and two females of this species at Kargil (2680m) and Khalsi (2750m) in Jammu and Kashmir State of India, while Nixon and Bhupathy (2001) found this species in Western Ghats at an altitude of 2142m.

The altitudinal range extension of *C. versicolor* can be attributed to several reasons. One of them could be global warming pushing a warm climate towards higher altitudes. Another speculation is that the species could have been there unreported.

This information presented here about range extension of *C. versicolor* calls for the need for intensive surveys to reexamine the distribution range of reptiles and amphibians of India.

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EAST INDIAN LEOPARD GECKO (*EUBLEPHARIS HARDWICKII* GRAY) FOUND IN PACHMARHI BIOSPHERE RESERVE (EUBLEPHARIDAE: SAURIA: SQUAMATA)

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A rare species of reptile, East Indian Leopard Gecko *Eublepharis hardwickii* has been recorded from the Pachmarhi Biosphere Reserve of Madhya Pradesh. Since two years, the Central Regional Station of the Zoological Survey of India at Jabalpur, is working on the faunal diversity of Pachmarhi Biosphere Reserve. The reserve has the highest ranges of Madhya Pradesh and represents the unique ecosystem of Central India. During the above period, four extensive faunistic surveys of about 70 days were carried out and data on more than 400 species of different groups of animals was collected.

The data included few interesting species, of these, an interesting species was identified as East Indian Leopard Gecko. The specimen was collected by Dr. Y.N. Gupta on 8 April 2001 from Mahadev Hills in Pachmarhi Biosphere Reserve. The species is also known as the Fat-tailed Lizard.

This species was described by Hardwicke and Gray in 1827 from India of the family Eublepharidae represented by three species in India (Das, 1997). Two other species, *E. macularis* (Blyth) and *E. fuscus* Borner are distributed in southern and eastern Afghanistan, Pakistan and northwestern India, whereas *Eublepharis hardwickii* Gray has been recorded from northcentral and eastern India including Madhya Pradesh (Khajuria, 1986) and probably from Bangladesh. These geckos are nocturnal, found in semi-arid and scrub areas, and seek shelter beneath rocks and stones by day and are rarely observed during day. Their movement is quite sluggish and they vary in colour pattern and size in their developmental stages.

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PREDATORY HABITS OF INDIAN SOFTSHELL TURTLE *TRIONYX GANGETICUS* CUVIER

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The Indian Softshell Turtle *Trionyx gangeticus* Cuvier inhabits the Indo-gangetic river system of central India. The river Chambal and its tributaries Parvati, Kalisindh, Mej and Banas support a healthy population of this species of turtles. The Softshell has established itself in all the major reservoirs and large village tanks in and around Kota city in southeastern Rajasthan; the village tank of Dungarja has a unique distinction of having a large population of softshells. In its heyday the tank abounded with fishes and frogs, which attracted many bird species like storks, herons and pelicans. Due to repeatedly failing monsoon the 36ha tank has been reduced to a meager pool of shallow and muddy water of 2-3ha.

The tank is teeming with turtles and the villagers estimate their number at 500 or more, but my estimate is between 250-300 turtles. During the winter months over 100 turtles may be seen basking on the margin of the tank. The tank is the only source of water for the villagers for their domestic needs. In the last couple of years a change in predatory habits of the turtles has been observed. The turtles have become fierce predators and have attacked humans and village dogs. An Indian Softshell Turtle had attacked and pulled a two-year old girl in the water while she was bathing with her mother. She was saved by some bystanders, who pulled her out of the turtle's clutches and she escaped with severe bite on her feet. In a more dramatic incidence a large turtle caught hold of a dog and pulled it into the water where it was attacked and devoured by 5-6 other turtles.

The available reference material mentions this species as carnivorous and scavengers of aquatic environment. The information on their being active predator is not available. The community killing and frenzied feasting could be a result of hunger and lack of food in the tank. Therefore, I found it prudent to report these incidences and changes in the predatory habits of Indian Softshell Turtle in this area.

SNAKE HUNTING FISH AT KUMBHALGARH WILDLIFE SANCTUARY, RAJASTHAN

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On 8 April 2000 at 0600hr I was going for regular observation of my focal study Hanuman Langur troop B-10 in the Kumbhalgarh Wildlife Sanctuary (KWS). As I passed through the langur troop B-2 roosting tree on my motorbike, I saw all the B-2 troop members looking towards the water supply pump some 50m from their roosting site as they look at any predator, but without any alarm calls or vocal communication. I went in the same direction where they were looking but saw nothing but some Mayan's flying and making noise at the small water body about 10-m diameter and 4.5-5.5-m deep. As I approached the water body, I saw a dead body of a calf floating on the water and one snake sitting on it. Using binoculars, I could identify the snake as the Checkered Keelback, *Xenochrophis piscator*. (Photographs of the snake were later confirmed by Dr. Sharma of Zoological Survey of India, Jodhpur).

I saw that many small and large fishes were feeding on the soft tissues of the dead calf. Suddenly the snake dived under water to one side of the body and when all the fishes moved to the other side of the body, the snake also moved to the other side. The fishes swam from one side to the other and disappeared for 5-7 minutes before reappearing again. The snake repeated the same attack behaviour three times without much success. Then in the fourth attempt it caught a medium sized (about 6-8 inch large) fish. Holding the fish tightly in its jaws the snake started an unusual swimming pattern resembling a coil and spring action. It then came out of the water and start swallowing the fish, which took 3-5 minutes to swallow completely.

I tried photographing the incident, but in the absence of an appropriate camera I was limited to photographing the snake on the carcass.

The *Xenochrophis piscator* is a widely distributed snake in the Gangetic basin, the Himalaya and in Andaman. Its main food comprises of small fishes and frogs (Sharma, 2003). Besides facing serious threats of road kill (Chhangani, 2004) the *Xenochrophis piscator* population has no major threats in Kumbhalgarh Wildlife Sanctuary.

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REPTILIAN FAUNA IN AND AROUND GAUHATI UNIVERSITY CAMPUS, ASSAM, INDIA

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The rich reptilian fauna of Assam is poorly known and no detail investigation so far has been made from Assam. The present knowledge is based on some scattered publications by Mathew (1982, 1983), Choudhury (1998), Baruah and Sengupta (1998), Datta *et al.* (1998), Choudhury *et al.* (1999), Sengupta *et al.* (2000), and Gogoi *et al.* (2001) in the state. We present here the reptile faunal composition in and around Gauhati University with notes on their habitat, microhabitat and threats.

Study area: The study area included Gauhati University Campus (91^{0}40'E & 26^{0}09'N) and nearby areas including Satmile, Forest school area, Sundorbari and Gorigaon. The campus is situated at a distance of about 15km south-west of Guwahati city, in the Kamrup district of Assam state, north-eastern India. It is spread over an area of about 600ac on the southern fringe of river Brahmaputra at an altitude of 60-65m above mean sea level. National Highway 37 divides the campus into two sectors.

Choudhury (1993) recorded 88 species of trees, 46 species of herbs and 43 species of shrubs from the campus. Based on the nature of vegetation, seven different types of habitats were identified in and around the present study area and are describe below.

Forest (F): The southwestern part of the campus is bordered by hillocks covered with semievergreen forest with fairly good undergrowth and big rocks. Main plant species are *Lagerstroemia parviflora, Dipterocarpus turbinatus, Albizzia lebek, Sterculia villosa, Ficus benghalensis, Ficus lepidosa.*

Scrubland (S): Present both in hillocks and plains with scattered plants and thick bushes such as *Ixora arborea, Lantana camera, Ricinus communis, Leucas linifolia, Mimosa pudica, Canthium glabrum, Memecylon cerasiforme* and isolated trees like *Ziziphus mauritiana, Ficus religiosa, Acacia auriculiformes*.

Grassland (G): These are scattered throughout the low lying areas of the campus having species like *Cynodon dactylon, Setaria gluaca, Thysanolaena agrostis* and *Saccharum spontaneum*..

Plantations (P): Mainly consists of plants like *Tectona grandis, Dalbergia sissoo, Poinicina regia, Shorea assamica, Samanea saman, Casia fistula, Mesua ferrea, Cedrela deodara, Mangifera indica* and are maintained around residential, administrative, academic buildings and along the two sides of NH 37.

Aquatic (Aq): Northeastern part of the campus is lowland having several naturally occurring waterbodies and marshy land having abundant and extensive growth of *Eichhornia crassipes* and *Marsilea quadrifolia.* Local villagers use some of these water bodies for paddy cultivation.

Human habitation (H): Main plant species of this area are *Mangifera indica, Musa paradisiaca, Cocos nucifera, Areca catechu, Nyctanthus arbor-tristis* and *Ficus religiosa.*

Agricultural lands (A): Main agricultural crop in and around the campus is *Oryza sativa.*

The climate of the study area is moist tropical with average annual rainfall around 1665mm, 90% of which occur between April and September. Temperature of the study area

Table 1. List of reptiles recorded from Gauhati University Campus

Scientific name	Common name	Activity pattern	Habitat	Microhabitat
TESTUDINES				
Trionichidae				
1. *Aspideretes hurum* (Gray, 1831)	Indian Peacock Softshell Turtle	Diurnal	Aq	Two individuals were found at the edge of a permanent marsh. One was found on the bank of a permanent pond at a distance of 2m from water.
SQUAMATA				
SAURIA				
Gekkonidae				
2. *Hemidactylus frenatus* Schlegel in : Dumeril & Bibron, 1836	Asian House Gecko	Nocturnal	F, P, H	Two from tree trunk (At 2.4m above ground), one from tree hole (at a height of 2m from ground), two from house wall (at a height of 1.5 to 2.8m).
3. *Hemidactylus karenorum* (Theobald, 1868)	Karen Gecko	Nocturnal	H	House wall (7 numbers), all between 1.5m to 2.5m above ground, three individuals were from under an advertisement board on a tree (3m above ground).
4. *Cosymbotus platyurus* (Schneider, 1792)	Flat-tailed Gecko	Nocturnal	F, P	Two from under tree bark (at ca. 1.2m above ground), another from tree trunk (at 1.6m above ground).
5. *Gekko gecko* (Linnaeus, 1758)	Tokay Gecko	Nocturnal	F	One was found inside a tree hole (at a height of 3.4m from the ground).
Agamidae				
6. *Calotes versicolor* (Daudin, 1802)	Indian Garden Lizard	Diurnal	F, S, G, P, H	Seven were found on bushes (at 1m to 2.6m above ground), three on tree trunks (at 1m to 1.8m above ground), three from leaf litter, one was found basking on a rock (maximum length 0.78m).
Scincidae				
7. *Lygosoma albopunctata* (Gray, 1846)	White-spotted Supple Skink	Diurnal	F, G, P	Two were collected from the surface of leaf litter, one from wet grass (0.50m high).
8. *Mabuya multifasciata* (Kuhl, 1820)	Many-lined Grass Skink	Diurnal	F, P	Two from leaf litter, one was caught while basking on a rock (maximum length of rock 0.60m), and two were found in rock crevices.
SERPENTES				
Typhlopidae				
9. *Ramphotyphlops brahminus* (Daudin, 1803)	Brahminy Blind Snake	Nocturnal	F	Three individuals were found under log (0.35m diameter), two were found under rock.
Boidae				
10. *Python molurus* (Linnaeus, 1758)	Indian Rock Python	Nocturnal	F, A	One individual was found under talus (rocks collected at the base of slopes), another was found in paddy field.
Colubridae				
11. *Amphiesma stolata* (Linnaeus, 1758)	Buff-striped Keelback	Diurnal	F, G, P, A, H	Three from leaf litter, two were found under log (0.43m in diameter), three from roadside, two from paddy cultivation area, one from grass (ca. 0.75m high), two from near ephemeral water pool.
12. *Dendrelaphis pictus* (Gmelin, 1789)	Painted Bronzeback Tree Snake	Diurnal	S	Two individuals were collected from top fronds of bushes (at 2.5m and 3.6m above ground).
13. *Enhydris enhydris* (Schneider,1799)	Common Smooth Water Snake	Nocturnal	Aq	One individual was found at a distance of 1m from a permanent marsh, another was found among floating vegetation (*Eichhornia sp*).
14. *Lycodon aulicus* (Linnaeus, 1758)	Common Wolf Snake	Nocturnal	H	Three individuals were found in the ceiling of a thatched house.
15. *Rhabdophis subminiatus* (Schlegel, 1837)	Red-necked Keelback	Diurnal	F, G, P	Two were found under fallen dry leaves, one from under accumulated leaf litter in a teak plantation area, one from moist grass patches (ca. 0.60m high)
16 *Ptyas mucosa* (Linnaeus, 1758)	Indian Rat Snake	Diurnal	F, G, A, H	One individual was found on fallen dry leaves, one from a grass patch (*saccharum sp*), one each from waterlogged paddy field and trail, one was caught inside the university library.
17. *Coelognathus radiatus* (Schlegel, 1837)	Copper-headed Trinket Snake	Diurnal	P, H	One was found under wet accumulated leaf litter in a teak plantation area, two individuals were caught from the experimental animal house
18. *Xenochrophis piscator* (Schneider, 1799)	Checkered Keelback Water Snake	Diurnal / Nocturnal	G, P, A, Aq	Two individuals were picked from ephemeral bodies, three from moist grasses (0.65m high), five from waterlogged paddy fields, and two from roadside plantation area.
Elapidae				
19. *Bungarus fasciatus*	Banded Krait	Nocturnal	F, H	One individual was collected from under a rotten log (0.68m in diameter), another was found inside a thatched house.
20. *Naja kaouthia* Lesson, 1831	Monocled Cobra	Diurnal / Nocturnal	A, H	Three individuals were observed near paddy fields -- two while crossing trails, one was caught inside the university hostel building.

A - Agriculture; Aq - Aquatic habitat; F - Forest; G - Grassland; H - Human habitation; NA - Not available; P - Plantation;

varies from 8^0C in winter to 37^0C in summer. The relative humidity ranges from 70% to 95% (Das, 1995).

Methodology: The study was conducted between March 2001 and October 2003. During the survey, random samplings were done through active searching in different habitats like semievergreen forest, scrubland, grassland, plantation, human habitation, wetlands, and agricultural lands. Our methodology involved close visual inspection of trees and shrubs up to a height of 4-5m, a careful search of the ground, water puddles, moist grasses, turning over litter, stones and logs and placing them properly in their original place. Collections were made by hand or with forceps while venomous snakes were caught using a hook ended aluminum stick. Detailed notes on habitat, microhabitat, and activity pattern were made during each capture.

All collected specimens were carefully identified using taxonomic keys of Smith (1931, 1935, 1943), Zhao and Adler (1993), and Mathew (1995). Scientific and common English nomenclature follows Das (1997, 2002, 2003). In addition to interviews, colour pictures of various species were shown to local peoples to ascertain the local name of the species.

Results and discussion: Twelve species of snakes, seven species of lizards and one species of turtle, belonging to 18 genera and eight families were recorded from Gauhati University Campus (Table 1). Local Assamese name of each reptilian species is given (Table 2).

The family Colubridae was found to be the most dominant genus representing 40% of the total reptile species followed by Gekkonidae (20%). The number of recorded species is lower than that for other sites where information is available (e.g. Sengupta *et al*., 2000), although this probably reflects the effect of the size of the area, as well as actual difference in diversity.

Many reptile species were found in more than one habitat in the study area, 12 species were found in forest habitat, nine in plantations, nine in human habitation, six in grassland, five in agriculture, three in aquatic and two in scrubland. Forest supports a higher number of species than other habitat types of present study area may be due to its structural complexity and microhabitat diversity.

A preliminary insight into reptilian assemblage in the present study area shows a domination of nocturnal species (N = 9) in comparison to diurnal species (N = 8), and three species found to be active both during day and night.

Threats: During the study period, following threats affecting the reptilian fauna in the region were identified.

Habitat destruction: Rapid rate of deforestation due to encroachment and illegal felling of trees, especially on hillocks pose serious threat to all the forest species. At the same time extraction of rocks from hillocks by stone quarries and fuelwood collection by local villagers destroys microhabitats, which can adversely affect species like *Python molurus* and *Bungarus fasciatus*. Similarly, natural water bodies of the study area are threatened from urban expansion and agricultural conversion, which can affect water snakes and turtles.

Human exploitation: Some species are being threatened by human exploitation for medicine (*Gekko gecko*) and for flesh (*Aspederetes hurum*). Wanton killing by humans out of fear and superstition threatens all snake species.

Fishing nets: During the study period *Xenochrophis piscator* (N = 7), *Enhydris enhydris* (N = 3), *Ptyas mucosa* (N = 1) *Asperderetes hurum* (N = 1) were found dead as they were entangled in gill nets used by the locals.

Table 2. Assamese names of reptiles

Scientific name	Local Assamese name
1. *Amphiesma stolata*	Bamuni sap
2. *Aspideretes hurum*	Bor kasso
3. *Bungarus fasciatus*	Goala sap
4. *Calotes versicolor*	Tejpiya
5. *Coelognathus radiatus*	Bagraj
6. *Cosymbotus platyurus*	Bon jethi
7. *Dendrelaphis pictus*	Karsola sap
8. *Enhydris enhydris*	Pani bora
9. *Gekko gecko*	Keko sap
10. *Hemidactylus frenatus*	Jethi
11. *Hemidactylus karenorum*	Ghar jethi
12. *Lycodon aulicus*	Machi sap
13. *Lygosoma albopunctata*	Naipiya
14. *Mabuya multifasciata*	Monikora
15. *Naja kaouthia*	Phati sap
16. *Ptyas mucosa*	Machoa gom
17. *Python molurus*	Jalphoria
18. *Ramphotyphlops brahminus*	Mati sap
19. *Rhabdophis subminiatus*	Halikatutia
20. *Xenochrophis piscator*	Dhora sap

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A RECORD OF PARKER'S BLACK TURTLE *MELANOCHELYS TRIJUGA PARKERI* FROM THE SOUTHERN PROVINCE OF SRI LANKA

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The Parker's Black Turtle *Melanochelys trijuga parkeri* (Deraniyagala, 1953), is rare, vulnerable freshwater turtle and is the only endemic testudine in Sri Lanka. It is characterized by its large size and the shape of the carapace where it differs from *Melanochelis trijuga thermalis* (Lesson, 1830) the only other subspecies present in the country.

On 21 December 2001, during a visit to a small local turtle hatchery in Bentota we found three live specimens (2 males and 1 female) of this turtle displayed in an enclosure. Also, 12 *Melanochelis trijuga thermalis* specimens were present in the same enclosure. All the specimens in the enclosure were said to be caught by the owners of the hatchery from the Bentota estuary at the bottom end of the Bentota river basin located at $6^0$23'-$6^0$26'N & $79^0$58'-$80^0$04'E .

The three specimens lacked the characteristic three yellowish dorsal bands like that of *M. t. thermalis* (Image 1) and instead had orange red markings on the dorsal and lateral sides of the head (Image 2).

M.t. parkeri, which is considered to be the rarest fresh water turtle in the country has only few scattered records. Deraniyagala (1953) cited that it is distributed in the dry zone of the coastal plain and of the lowest peneplain of the northern half of the country and recorded specimens from Marichchukate, Arnemaduwa, Pollonnaruwa and Nikaveratiya. Several subsequent studies have recorded this subspecies from the northern, northcentral, northwestern and upperparts of the eastern provinces of the country. The new locality is in the Southern province (Map 1), hence the collection of *M.t. parkeri* by the hatchery in Bentota from the above location is rather doubtful when considering the distribution of the species. Previous studies in the area have failed to record wild specimens from the same vicinity (Mendis Wickramasinghe *pers. comm.*). Detailed surveys are needed.

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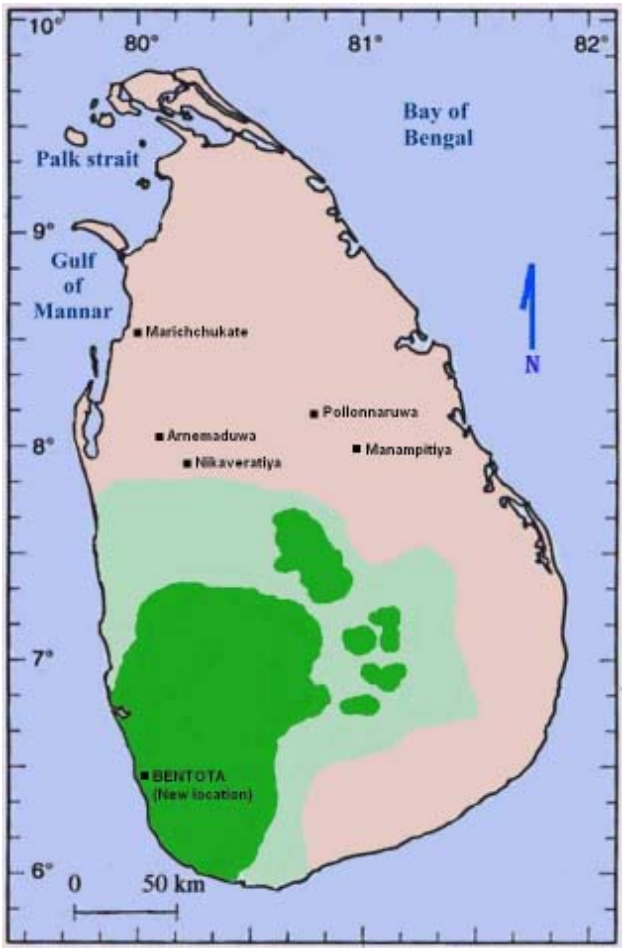
No.	Sex	Length (mm)	Width (mm)	Depth (mm)
1	Male	342	236	157
2	Male	293	210	122
3	Female	328	225	153

***Image 1. Dorsal aspect of a male* Melanochelys trijuga parkeri**

Image 2. Head of a male



Map 1. Cited sites where* Melanochelys trijuga parkeri *has been recorded from the country

CAPTIVE BREEDING OF STAR TORTOISE (*GEOCHELONE ELEGANS*) IN THE DEER PARK, NFCL, KAKINADA, ANDHRA PRADESH

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Throughout the world many zoological parks are devoting more and more space and facilities for breeding wild animals that are threatened in the wild. This propagation is being done with the hope of eventually reintroducing descendants of the captive animals into the wild. Zoos and captive animal facilities provide multiple opportunities for conservation and educate a great variety of people of all ages and levels. A safe zoo is one in which animals live longer and breed more effectively than they do in the wild (Walker, 1986). Knowledge about endangered species is inadequate and captive breeding programmes are very resource demanding and can only be afforded for a very small number of species (Rahbek, 1993).

To have better success of rearing and breeding of endangered species in captivity it is essential to study the behaviour and different facilities needed by the animals in the zoos. A study has been conducted in a mini zoo in Deer Park, NFCL, Kakinada, Andhra Pradesh to assess the facilities provided for captive management programme of wild animals. This paper is on captive breeding of Star Tortoises (*Geochelone elegans*) in the deer park.

Deer Park, NFCL: The Nagarjuna Fertilizers and Chemicals Limited (NFCL) is located in Kakinada, East Godavari District, Andhra Pradesh. The NFCL has developed 667ac as a green belt area where more than three lakh saplings consisting of 170 species have been planted transforming the highly saline marshy area into lush green habitat. Within the green belt area a deer park has been setup in an area of 6ha where Spotted Deer and Sambar are kept in captivity. In the park birds, rabbits and tortoises are kept in separate enclosures. Although tortoises have been breeding in captivity since 2001 the breeding data was not recorded systematically. The administrative staff including senior curator, veterinarian, animal keepers etc. look after the deer park. The deer park has also received recognition from Central Zoo Authority.

Star Tortoise distribution: The Indian Star Tortoise *Geochelone elegans* is restricted to the dry regions of southeastern and southern India, northwestern India, northern and eastern Sri Lanka and extreme eastern Pakistan in Sindh (Daniel, 1983; Das, 1991; Iverson, 1992; Das, 2002). It is primarily found in scrub forests, grasslands and coastal scrublands of arid and semi-arid regions (Daniel, 1983; Das, 2002). No subspecies of *G. elegans* are recognised. This species is still considered common throughout its range, though populations are declining due to habitat loss and illegal collection for the pet trade (Choudhury *et al*., 2000).

In India the stars are found in different states including Andhra Pradesh (Das, 2002). The species is locally called *Metta tabelu* and commonly found in Srikakulam and Chittoor districts. Precise information on the status of this species in the state is not known. This tortoise is revered by locals as incarnation of Lord Vishnu. There is a temple in Srikakulam in with the idol of tortoise, representing *Kurmavatara* (Tortoise avatar) of Lord Vishnu. Some times people donate pet tortoises or ones collected in nature not only to this temple but also to other temples in this region. One such temple is Sathyanarayana Swamy Temple at Annavaram in East Godavari District.

Methods: Under the University Grants Commission sponsored Endangered Species Project, field studies were conducted in the East Godavari District during July-September 2004. The present study was carried out by making a few visits to the NFCL Deer Park, Kakinada to collect data on different aspects of captive management of wild animals by following the methods given in Animal Management Course (Anon, 1980) of National Extension College, Cambridge, United Kingdom.

The tortoise enclosure in the park was measured. Sexes of adults were identified by observing the curved plastron of males. Body measurements of individual tortoises of different age classes were taken with the help of vernier calipers and weighing balance. Strait-line measurement of carapace and plastron were recorded. Tortoise eggs in one nest in the enclosure were excavated and all five eggs in the nest were measured with the help of vernier calipers and weighed using a spring balance.

Results: A total of 12 specimens of star tortoises were gifted to the park during May 1999 by Sathyanarayana Swamy Temple, Annavaram, Andhra Pradesh. At present there are 11 adult tortoises kept in an enclosure (6 x 2.4 x 1.4m) where adequate facilities like feeding and drinking water pans are provided for captive rearing. Kitchen wastes like green leaves, carrot, cabbage etc. are given as food to the tortoises. Of the 11 adults four are males and seven are females. The body measurements of the adults are given in table 1.

The stars bred for the first time in captivity in the park during 2001 when 12 young were hatched (Office record). The body measurements of the two-year old tortoises are given in Table 2. During 2003 a total of 47 young hatched in the months of June and July. The body measurements of hatchlings are given in Table 3. The average size of the hatchlings was 36mm in plastron length and 20g in body weight. The young tortoises are being reared carefully in a small enclosure within the large tortoise enclosure.

While searching the tortoise enclosure on 8 July 2003 for new hatchlings one old nest was found in which five eggs were present. The egg measurements are given in Table 4. These eggs hatched during 25-28 July 2003.

Discussion: The Star Tortoise is a small tortoise, with females reaching ten inches (25cm) and the males approximately six inches (15cm) in length (Pritchard, 1979; Das, 1991). In the NFCL Deer Park, Kakinada the maximum carapace length of a female is 29cm with a mean of 22cm. The biggest male measures 20.5cm in carapace length with a mean carapace length of males is 19.6cm.

Nesting seasons of Star Tortoises coincide with the monsoons. In western India, the nesting season is mid-November, while in south-eastern India eggs are laid from March to June, as well as from October to January. Clutch size is 1-10 eggs with an incubation period of 47-178 days (Das, 2002).

There are very few zoos in India, which breed the Star Tortoise in captivity (Anon, 2004; Rao & Choudhury, 1996; Choudhury & Bhupathy, 1992; Choudury *et al.*, 2000). The captive breeding of Star Tortoise in Deer Park, NFCL is a great contribution towards breeding biology of this species. The captive raised tortoise can be reintroduced into the wild

and can also be given as exchange to other zoos in Andhra Pradesh and in the country.

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Table 1. Body measurements of adult star tortoises at Deer Park, NFCL, Kakinada

S.No	Carapace Length(mm)	Carapace Width(mm)	Plastron Length(mm)	Shell Height(mm)	Body Weight (g)
Male					
1	198	124	174	95	1140
2	188	108	175	88	1015
3	205	124	182	105	1510
4	194	113	172	90	1210
Mean	**196.2**	**117.2**	**175.7**	**94.5**	**1218.7**
Female					
1	290	180	258	138	3885
2	240	154	225	134	2900
3	248	168	230	124	2900
4	248	152	230	120	2650
5	258	170	243	128	3150
6	265	173	234	122	2970
7	245	165	222	118	2280
Mean	**220.8**	**166.0**	**234.5**	**126.2**	**2962.1**

Table 2. Body measurements of two year's old Star Tortoises (Born in 2001) at NFCL Deer Park, Kakinada

S.No	Carapace Length (mm)	Carapace Width (mm)	Plastron Length (mm)	Shell Height (mm)	Body Weight (g)
1	85	65	79	52	135
2	95	70	89	57	195
3	87	67	83	57	146
4	73	61	70	50	98
5	85	64	81	52	145
6	87	65	81	55	155
7	88	65	80	53	155
8	84	64	80	54	135
9	82	64	76	50	126
10	71	57	67	45	91
11	71	57	66	42	80
12	73	57	66	47	85
Mean	**81.75**	**69.0**	**78.0**	**59.0**	**97.0**

Table 3. Body measurements of Star Tortoise hatchlings born in June 2003 at Deer Park, NFCL, Kakinada

S.No	Carapace Length(mm)	Carapace Width(mm)	Plastron Length(mm)	Shell Height(mm)	Body Weight (g)
1	37	37	35	24	17
2	41	37	37	26	20
3	40	39	35	25	21
4	40	38	37	26	21
5	40	38	37	26	24
6	45	42	40	28	28
7	43	41	40	26	25
8	45	43	42	28	28
9	44	41	40	27	25
10	43	42	37	27	24
11	46	43	41	26	27
12	44	42	42	29	29
13	45	42	42	28	30
14	46	42	41	28	29
15	44	40	38	27	26
Mean	**42.8**	**40.4**	**38.9**	**26.7**	**24.9**

Table 4. Egg measurements (one clutch) of star tortoises at Deer Park, NFCL, Kakinada

S.No	Egg Length(mm)	Egg Width(mm)	Egg Length (g)
1	39	35	28
2	40	35	28
3	38	35	27
4	39	34	27
5	37	35	27
Mean	**38.6**	**34.8**	**27.4**

Figure. 1. Tortoise enclosure in Deer Park, NFCL, Andhra Pradesh

Figure 2. Adult tortoise in the enclosure. A male trying to copulate is also seen

Figure 3. Hatchlings of Star Tortoise in the enclosure in Deer Park, NFCL, Andhra Pradesh

HERPETOFAUNA OF SHAHDOL DISTRICT, MADHYA PRADESH

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Shahdol district (23^{0}N & 81.3^{0}E) is located in the eastern half of Madhya Pradesh. In this communication, we are reporting the distribution of an amphibian species and 13 reptiles species from Shahdol district. This report is based on observations and collections made during June and July 2003 in the Jaisinghnagar tehsil area of Shahdol district. Distribution of the recorded species in Madhya Pradesh and Chhattisgarh is also given. Daniel (2002) and Smith (1943) were referred for the identification of species. The material treated herein are deposited with the National Zoological Collection. Z.S.I., Jabalpur. An account of the recorded species is given as follows:

Amphibia: Anura: Microhylidae

1. *Kaloula taprobanica* Parker, 1934
Painted Kaloula
Material examined: 1 ex.; Jhiriyatola village, Jaisinghnagar tehsil, Shahdol district. Madhya Pradesh; coll. R. Gupta; 26.vi.2003.
Recorded Distribution: India: Madhya Pradesh (Chhindwara, Jabalpur, Seoni, Shahdol), Assam, Bihar, Karnataka, Orissa, Tamil Nadu, West Bengal. *Elsewhere:* Sri Lanka.

Reptilia: Testudines: Trionychidae

2. *Lissems punctata* (Bonnaterre, 1789)
Indian Flapshell Turtle
Observations: One sighting during July 2003.
Recorded Distribution: Throughout India. In Madhya Pradesh (Jabalpur, Seoni, Shahdol). *Elsewhere:* Bangladesh, Myanmar, Nepal, Sri Lanka.

Squamata: Sauria: Agamidae

3. *Calotes versicolor* (Daudin, 1802)
Indian Garden Lizard
Material examined: 1 ex.; Jhiriyatola village, Jaisinghnagar tehsil, Shahdol district, Madhya Pradesh; coll. R. Gupta; 10.vi.2003.
Recorded Distribution: Throughout India. In Madhya Pradesh (Balaghat, Hoshangabad, Jabalpur, Seoni, Shahdol, Shivpuri), Chhattisgarh (Bastar, Sarguja). *Elsewhere:* Bangladesh, Bhutan, Maldives, Nepal and Sri Lanka.

4. *Sitana ponticeriana* Cuvier, 1844
Fan-throated Lizard
Observations: Many sightings. Very common species.
Recorded Distribution: Throughout India except wet areas (with heavy rainfall). In Madhya Pradesh (Balaghat, Hoshangabad, Jabalpur, Seoni, Shahdol). *Elsewhere:* Nepal, Pakistan, and Sri Lanka.

Scincidae

5. *Mabuya carinata* (Schneider, 1801)
Common Keeled Grass Skink
Observations: Many sightings, very common species.
Recorded Distribution: Throughout India except northwestern India and West Bengal. In Madhya Pradesh (Hoshangabad, Jabalpur, Mandla, Seoni, Shahdol, Shivpuri), Chhattisgarh

(Sarguja, Bastar). *Elsewhere*: Nepal.

Varanidae

6. *Varanus bengalensis* (Daudin, 1802)
Common Indian Monitor
Observations: One sighting during June 2003.
Distribution: The Indian subcontinent. In Madhya Pradesh (Hoshangabad, Jabalpur, Mandla, Seoni, Shahdol).

Serpentes: Typhlopidae

7. *Ramphotyphlops braminus* (Daudin, 1803)
Common Worm Snake
Material examined: 1 ex.; Jhiriyatola village, Jaisinghnagar tehsil, Shahdol district, Madhya Pradesh, coll. R. Gupta, 16.viii.2003
Distribution: Throughout India. In Madhya Pradesh (Balaghat, Jabalpur, Seoni, Mandsaur, Ratlam, Jhabua, Shahdol, Shajapur, Ujjain, Dewas, Indore, Dhar). *Elsewhere*: Sri Lanka, Indo- China. Southeast Asia.

Boidae

8. *Python molurus* (Linnaeus, 1758)
Indian Rock Python
Observations: One sighting during July 2003.
Distribution. India: Madhya Pradesh (Dewas, Dhar, Indore, Jabalpur, Jhabua, Mandla. Seoni, Shahdol, Ujjain), Gangetic Plains, Peninsular India. *Elsewhere:* Nepal, Pakistan and Sri Lanka.

Colubridae

9. *Amphiesma stolata* (Linnaeus, 1758)
Buff-striped Keelback
Observations: Two sightings during July 2003.
Recorded Distribution: Throughout India. In Madhya Pradesh (Dewas, Dhar, Indore, Jabalpur, Jhabua, Mandsaur, Ratlam, Seoni, Shahdol, Shajapur, Ujjain), Chhattisgarh (Bastar). *Elsewhere:* Bangladesh, Bhutan, Sri Lanka, Nepal and Pakistan.

10. *Argyrogena fasciolatus* (Shaw, 1802)
Banded Racer
Observations: This species identified from a decomposing specimen.
Recorded Distribution: Peninsular India. North to Himalaya and in the east to West Bengal. In Madhya Pradesh (Dewas, Gwalior, lndore, Jabalpur, Mandla, Shahdol, Ujjain). *Elsewhere:* Pakistan and Sri Lanka.

11. *Ptyas mucosus* (Linnaeus, 1758)
Indian Rat Snake
Observations: One sighting during June 2003.
Recorded Distribution: Throughout India. In Madhya Pradesh (Dewas, Dhar, lndore, Jabalpur, Jhabua, Mandla, Mandsaur, Ratlam, Seoni, Shahdol, Shajapur, Ujjain), Chhattisgarh (Bastar). *Elsewhere:* Bangladesh, Nepal and Pakistan.

12. *Xenochrophis piscator* (Schneider, 1799)
Checkered Keelback Water Snake
Material examined-1 ex.; Jhiriyatola village, Jaisinghnagar tehsil, Shahdol, district, Madhya Pradesh; coll. R. Gupta; 15. vi. 2003.
Recorded Distribution: Throughout India. In Madhya Pradesh (Dewas, Dhar, Hoshangabad, Indore, Jabalpur, Jhabua, Mandsaur, Ratlam, Seoni, Shahdol, Shajapur, Shivpuri, Ujjain), Chhattisgarh (Bastar). *Elsewhere:* Bangladesh, Bhutan, Nepal, Pakistan and Sri Lanka.

Elapidae

13. *Bungarus caeruleus (Schneider,* 1801)
Common Indian Krait
Material examined: 1 ex. Jhiriyatola village, Jaisinghnagar tehsil, Shahdol district Madhya Pradesh; coll. R. Gupta; 16.vi.2003.
Recorded Distribution: India: Madhya Pradesh (Dewas, Dhar, Indore, Jabalpur, Jhabua, Mandla, Mandsaur, Ratlam, Seoni, Shahdol, Shajapur, Ujjain), Maharashtra, Rajasthan, Uttar Pradesh. *Elsewhere:* Bangladesh, Pakistan and Sri Lanka.

14. *Naja naja* (Linnaeus, 1758)
Spectacled Cobra
Observations: One sighting during July 2003.
Recorded Distribution: Throughout India. In Madhya Pradesh (Dewas, Dhar, Guna, Indore, Jabalpur, Jhabua, Mandla, Mandsaur, Ratlam, Seoni, Shahdol, Shajapur, Ujjain). *Elsewhere:* Africa, Malaysia and South Asia.

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CONSERVATION AND ACTION PLAN FOR FRESHWATER TURTLES AND TORTOISES OF INDIA

Second announcement

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AN INTERESTING SPECIMEN OF *PYXIDEA MOUHOTII* (GRAY) FROM MANIPUR IN NORTHEASTERN INDIA

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A Keeled Box Turtle *Pyxidea mouhotii* (Gray, 1862) has been recorded from many localities of northeastern India (Bhupathy & Choudhury, 1992; Choudhury, 1993, 1996b, 1998, 2001b) including a few specimens from the north bank of the Brahmaputra river (Choudhury, 1996a, 2001a). Outside India, the species has been recorded in Indo-china from Myanmar to Vietnam and also in Hainan (Stubbs, 1991).

In Manipur, it was recorded for the first time in Tamenglong district (Choudhury, 1996). I report a recent record of an interesting specimen also from the same district of Manipur. On 24 January 2001, a live turtle was caught by villagers after burning the hill slopes for *jhum* (slash-and-burn shifting cultivation) in Sempang village (24^{0}52'N & 93^{0}26'E) near Kaikao. The elevation of the village is 750m. Since the turtle was kept for consumption, I bought it for Rs.30/- for releasing it after examination. It may be mentioned here that during the preparation of the field for *jhun*, a large number of testudines are caught all over the northeastern India, which end up on tables.

The most interesting feature of this specimen was its carapace which was yellowish with dark (blackish or greenish-grey) blotches of irregular shape and often broken (see plate) instead of brown without any blotches. The carapace was flat with three keels and serrated marginals. The plastron was buffy and not yellowish-brown as is usually found. It measured (in cm): straight line carapace length 14.5; curved carapace length 15.7; straight line carapace width 10.2; curved carapace width 14.5; shell height c.6.0; plastron length – greatest 14.2; plastron length – notch to notch 13.3; plastron width 8.5 and weight 425gm. It was probably a female as was evident from the stripe on the sides of its face.

The earlier record from Tamenglong (Choudhury, 1996) and one recorded during the current study from almost the same area were normal coloured. The habitat in the area was mostly degraded tropical wet evergreen rainforest with bamboo in old *jhums* and current *jhum* clearings on hilly terrain in the basin of the Barak river.

Considering its unusual colouration and possibility of recapture as *jhum* burning was still going on, I deposited it in the Imphal Zoo through a local NGO (MASS), which will also enable researchers to see the live specimen.

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***Pictures of Keeled Box Turtle* Pyxidea mouhotii**

FIRST RECORD OF A SPARASSID SPIDER PREYING ON AN AGAMID LIZARD (*CALOTES CALOTES*) IN SRI LANKA

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There are few documented reports of natural predation of arthropods on amphibians (e.g. Bhatnagar, 1971; Gopi Sundar, 1998; Bambaradeniya, 2001). But an Arachnid preying on an agamid is recorded for the first time from the island.

This observation was made on 14 August 2000, in my home garden located in Dodanwela (Kandy district - Wet Zone). An adult sparassid spider (Family Sparassidae; previously Heteropodidae) having a body length of 37mm was seen capturing a juvenile Green Garden Lizard (*Calotes calotes*) (Image 1) having a SV length of 32mm and a tail length of 84mm (Image 2), on a wall facing the garden. The agamid was caught by its neck by the chelicerae of the spider, and was alive and trembling when the observation started at 0827hr, and assumed dead by 0905hr. The spider remained in the same position and place until 0912hr and moved slowly dragging the dead agamid towards a fern bush.

By 0945hr the head of the lizard was totally swallowed and the fangs were embedded in the dorsal side of the lizard's neck. But after about 10 minutes the spider started vomiting its prey. By 1020hr the agamid was totally heaved.

Two tiny holes about 1mm deep were observed in the neck of the carcass, 12mm from the snout and the skin on the head was partly scarred.

Apart from *Calotes calotes*, *Calotes versicolor*, *Calotes liolepis**, *Otocryptis weigmanni** and *Lyriocephalus scutatus** have been recorded from the same home garden.

Image 1. Spider capturing the lizard

Image 2. Carcass of the lizard

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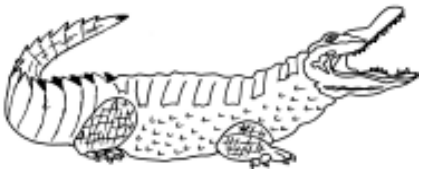
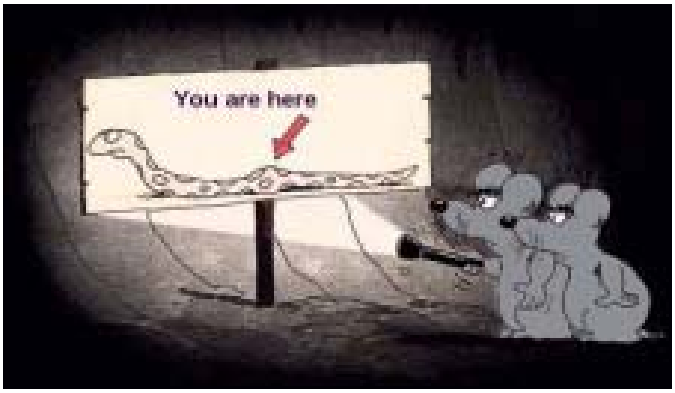
* Endemic species





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