

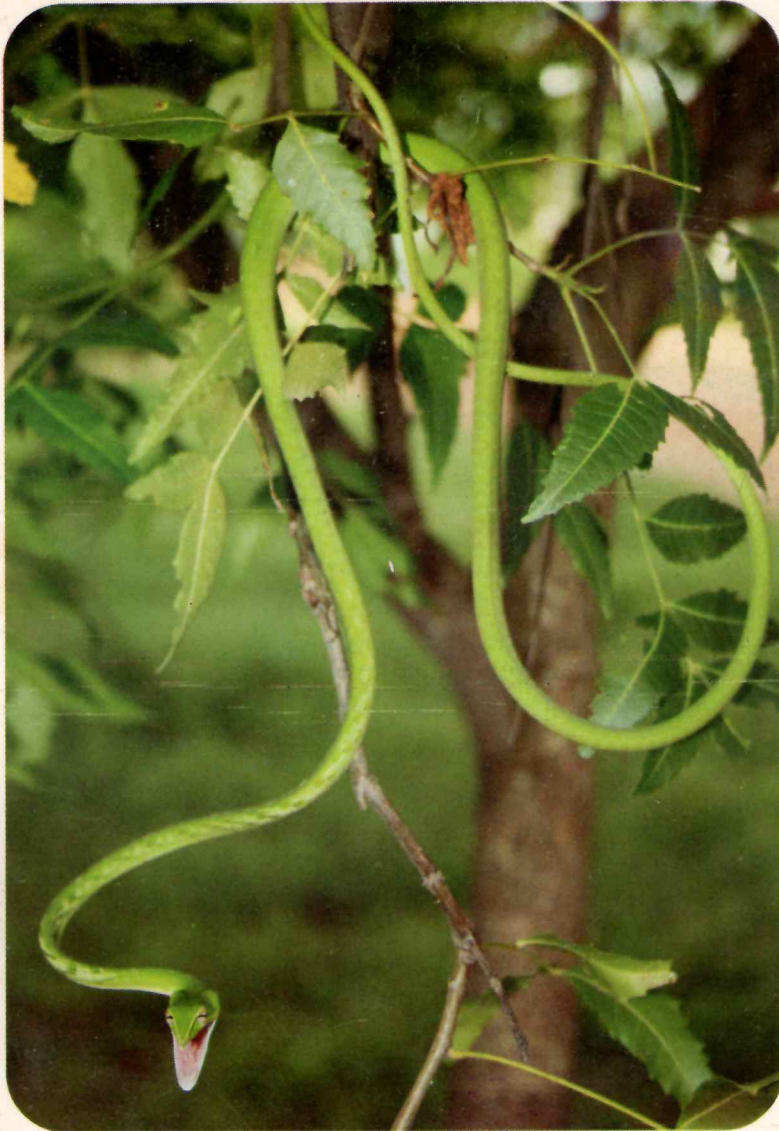
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No.

Vol.-II Issue -1

January - March 2008



Quarterly Journal
Q of the Chennai Snake Park Trust

Annual subscription : Individual – Rs. 75/- . Institution – Rs.150/-.

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Cover

The common vine snake (*Ahaetulla nasuta*) – Threat display.

See Pages 1 - 6

Photo : S.R. Ganesh

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The Snake

Gem-bright and patterned coils you weave,
A living stream of reasoned flesh and bone
Through the familiar grass, and then you leave
Ancestral markings on the sand, beside some stone:
More delicate than spider webs, or tiger's bristles,
Your tongue's twin tips flick earthward – smell and taste
What there is need to, amid twigs and thistles –
Something to feed upon, or love, or flee in haste.
Superb, unmindful of the Scripture's Curse,
You thread your ancient way triumphantly,
Around man's ignorance (save a few) and nurse
No hatred in your calm fluidity.
That day is pleasant, if some pathway leads
To your bright beauty, flowing through the reeds.

— P.H.W. Bachmann (1949)

quoted by Carl Kauffeld : *Snake-The Keeper and the Kept*(1969)

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The Snake

Gen-bright and patterned coils, you weave,
A living stream of rapturous flesh and bone
Through the familiar grass and then you leave
Ancestral markings on the sand, beside some stone
More delicate than spider webs, or just a trail
Your tongue's twin tip flicks eastward - snail and taste
What there is need to, ambivalent and hostile -
Something to feed upon, or just to die in haste
Superb, unimpaired of the Scripture's Curse
You tread your ancient way, unimpeded,
Around man's footstep (save a few) and nurse
No hatred in your calm fluidity -
That day is pleasant, if some pathway leads
To your bright beauty, flowing through the reeds

— Bill W. Bachmann (1949)

quoted by Carl K. Ruffell - Snake: The Knees and the Kiss (1999)

Cover

Photo: S.R. Ganesan

Cobra

Volume : II Issue 1

January - March 2008

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“THE SNAKE THAT PECKS AT THE EYE”

B. Vijayaraghavan

Chairman

Chennai Snake Park Trust

Rajbhavan Post, Chennai - 600 022

The common vine snake (*Ahaetulla nasuta*) or the whip snake, as it is sometimes called, is a more than three feet long — reaching even over six feet, at times — slender, bright green snake found moving about during day time on low bushes and trees with utmost felicity. It is often seen in gardens even in urban surroundings. It occurs throughout India except in the North West and the Gangetic basin. Outside India, it is found in Sri Lanka, Bangladesh, Myanmar and South East Asia. Apart from its general appearance which is quite fascinating, it has many interesting features. Firstly, its head is unusually long and pointed almost resembling a bird's beak. Secondly, it has an equally unusual elongated fleshy nasal appendage at the end of its snout. Thirdly, while, in most snakes, the pupil of the eye is round (in diurnal species) or elliptical-vertical (in nocturnal species), in the vine snake, the pupil is horizontal. It is believed that this gives the snake a three-dimensional vision and helps it in hunting its prey among the foliage. Fourthly, its eyes are so designed as to have a range of vision considerably more than in other snakes — something like 330° which is just 30° short of a full circle. Wall* says : “The pupil is horizontal and elongate in outline with a slight constriction near its middle. This horizontal outline endows this snake with a very remarkable range of vision. The forward setting of the eye, together with its elongate pupil, and the prominent furrow in the face in front permit an unrestricted range of vision anteriorly, and the elongation forward of the pupil also admits of rays of light impinging upon the retina from a point far behind the eye. Proximately, I estimate the range of vision as extending through an arc of 330°”. Fifthly, it has an interesting threat display. When alarmed, it raises its head and forebody, dilates the forebody bringing into view black and white patterns, opens its jaws wide and grotesquely spreads out its mouth sideways. All these contortions of body and face and its huge pink gape make the snake look most fearsome.

* F. Wall : “A Popular Treatise on the Common Indian Snakes”. *Journal of the Bombay Natural History Society* Vol.XVI No.4 (1905-1914).

If further threatened, it will not hesitate to strike. (It will also strike without this warning display). For all this bluff, it is a rather harmless snake as far as humans and large animals are concerned. It has no venom and its toxic saliva which can paralyze its prey of lizards, frogs, small birds and mice, can only cause some mild local reaction, if at all, in humans.

Even so, it is much feared in parts of its range, in South India and Sri Lanka, for its reputation that it will peck at the eye of the beholder. For this reason, it is called the 'eye-pecking snake' (*kankuthi pāmbu*) in Tamil and Malayalam. Its name in Sinhalese is *ehetulla* meaning 'eye plucker' and it is this which is the origin of its scientific name *Ahaetulla*. Whether a similar belief or similar sobriquet exists in other parts of its range is not known.

Some herpetologists would admit that there is some truth in this though they are not sure how much while others would dismiss this as just one of those snake legends of which there is no dearth anywhere in the world.

The following observations may throw some light (or darkness?) on the subject.

An early comprehensive account was by Frank Wall, an acknowledged authority on the snakes of India and Sri Lanka. He had published masterly accounts of 48 species of Indian snakes in a series of 26 papers which appeared in the *Journal of the Bombay Natural History Society* under the title "A Popular Treatise on the Common Indian Snakes". In the very first paper in this series which appeared in Vol.XVI No.4 of the Journal in 1905, he had dealt with the common vine snake. In this he had said that, when freshly caught, it "repeatedly strikes at anyone confronting it". He quoted one E.E. Green as saying that a captive specimen "will strike at blindly often in the direction of the face of the opponent", and, again, that "it repeatedly struck at his (Green's) face though it would not take any notice of his hand. It also struck repeatedly at the eye-piece of a pair of binoculars". Green was evidently a person knowledgeable about the snakes of Sri Lanka. Wall had had discussions with him on various snakes and had found his notes "excellent" and the information furnished by him "most valuable". He had quoted Green on not less than 22 different snakes in these papers. Green's observations on the common vine snake, therefore, merit serious attention. Wall also quoted Finn to the effect that

“when holding two specimens, [he] was bitten by one that struck at his eye”. The quote is seen to be from the *Journal of the Asiatic Society of Bengal* (1898) (I presume this is Frank Finn(1868-1932), the British ornithologist, who had done some work on the birds of India). Finn had added that two punctures were subsequently observed on the upper and one on the lower lid of his eye and, rubbing his eye, he removed a tooth from the lower lid. Finn’s is perhaps, the earliest published account. Wall had repeated these observations in his well-documented and eminently readable *Snakes of Ceylon* (1921). K.G. Gharpurey’s 1935 book *The Snakes of India*, later re-published as *The Snakes of India and Pakistan*, stated: “Indians and Sinhalese believe that [the common vine snake] strikes always at the eyes and at no other part of the person facing it”. Being only hearsay, this has little evidentiary value. Malcolm Smith had personal experience of this snake. He had said in his *The Fauna of British India – Serpentes* (1943) that “in [his] garden in Bangkok where it was common, [he] often caught it and placed it among the flowers on the table.... there it would remain almost motionless, turning its head from side to side”. Smith added: “When handled, it has a peculiar habit of watching one’s face and suddenly making a dart at it, aiming usually for the eyes”. In the *Journal of the Bombay Natural History Society* vol.68 (3) (1971), Paul S. Soderberg of Tempe, Arizona, USA, confirmed the observations of Malcolm Smith from his own experience based on captive specimens. He added “...when handled, it has the peculiar habit of watching one’s face and suddenly making a dart at it aiming actually for the eyes”. P.J. Deoras had said in *Snakes of India* (1965) that “the snake tries to aim at the eyes”. Beni Charan Mahendra, another well-known authority on Indian snakes, quoted the observation of Smith without any comments. Evidently, even as recently as 1983, when Mahendra’s book (*The Handbook of the Snakes of India, Ceylon, Burma, Bangladesh and Pakistan*) was published he had no reason to question the veracity of Smith’s observations. In 1983, J.C. Daniel published his *The Book of Indian Reptiles and Amphibians* in which he said matter-of-factly: “The habit of striking at the eye of its opponent, the only object in movement in a tree snake’s view, is noted in the common name for the snake in Tamil which translates as ‘eye pecking snake’. In the revised version of this book published in 2002, this passage underwent no change.

Anslem De Silva, the well-known herpetologist of Sri Lanka, said about this snake that “there are records of it attacking the eye”(Paper in *The Snake* vol.8 (1976)

Thus, there is a substantial body of published material in support of the belief that the snake pecks at the eye. Notwithstanding this, in discussions among knowledgeable people, the general tendency is to dismiss this as a foolish belief. The only *published* statement I could find in support of this contrary view was by Romulus Whitaker. In his 1978 book *Common Indian Snakes*, he said: ‘The vine snake is *accused* of poking one’s eyes [emphasis added] The vine snake can inflict a painful (but harmless) bite on a finger or even a nose, but no one has ever received an eye injury’. (He seems to have overlooked some of the published accounts quoted above, particularly, Finn’s). The same is his position in the revised edition of this book published as recently as in 2006. In the *Journal of the Bombay Natural History Society* vol.67 (1) 1970, he had said: “...while handling a green whip snake...it made a sudden jab at my face (which is a *common habit of this species*)[emphasis added] and made a quick bite on the tip of my nose”.

To sum up, there is common ground in the observation that, when the snake is handled or the face brought close to it, it is likely to lunge at the face. But there is some divergence of opinion on whether it will actually aim at the eyes. The matter certainly calls for further study.

In this context, we will do well to note that yet another kind of snake, the spitting cobras of Africa, Myanmar, and South and South East Asia are known to spit venom into the eyes of a perceived predator, whether man or animal, with unerring precision *. There has been some doubt whether the snake really aims at the eyes or whether the stream of venom forcibly ejected from the functionally designed fangs in the open mouth of the snake with its hood spread (in rare instances, without spreading the hood) and looking upward hits the eye of the man or animal by chance. I remember seeing a tele-presentation on this snake by the noted herpetologist Mark O’Shea. Experiments were conducted by him and a colleague of his on the spitting behaviour of the snake. It was seen that if a person approaches the snake with his eyes masked but with eye-shaped patterns in felt pasted on the middle of his trunk, the snake aimed at the false ‘eyes’ and not at the head, which goes to show that it was the design of the ‘eye’ that evoked the response from the snake. Though the experiments were described as ‘inconclusive’, the evidence, to

* For more on this, see the author’s paper entitled “Are there spitting cobras in India?” in *Cobra* Vol.61 (2005).



the extent seen, was pretty convincing: the aggressive reaction was towards the eyes or eye-shaped designs.

Though not directly relevant to the subject under discussion, we may also briefly note the predominant role played by the remarkably life-like eye-designs in a whole lot of butterflies and moths and fishes and, at least, two species of birds.

The most spectacular examples are provided by some of the butterflies and moths. The black spots of varying sizes on their wings may or may not be surrounded by a white or light-coloured ring (in the latter case, the resemblance to the eye becoming even closer), and may be on the forewing or the hindwing or both and may be one on either wing or more than one. When the eye-spots are large, they may scare off a predator which may mistake them to be the eyes of a large creature and may give the insect a wide berth or, at least, startle the predator for a brief moment giving the insect enough time to fly away. If the 'eyes' are close together, the predator may mistake the hind portion of the insect to be the head and attack it. The insect may then escape sure death, if only with a broken wing. When the eye-spots are numerous as in some species, it is not clear what kind of a response will be evoked in a predator, but, judging by the scheme of natural selection, it must be a response that favours the survival of the species. Among Indian species of butterflies, some examples are the bushbrowns (*Mycalesis* spp.), the tree browns (*Lethe* spp.), the threerings, fourrings, and fiverings (*Ypthima* spp.), the evening browns (*Melanitis* spp.), the pansies (*Precis* spp.), the walls (*Parage* spp.), the Arguses (*Erebia* spp.), the common cyclop (*Erites falcipennis*), the yellow and white 'owls' (*Neorine* spp.) and the 'peacocks' and lime butterflies (*Papilio* spp.).

In the common cerulean (*Jamides celeno*), found throughout India, and in certain other species, the deception is taken a step forward. On the underside of each hindwing is an eye-spot which is prominent when the butterfly sits with wings folded. But what is more striking is that just in front of the eye-spots are two filament-like 'tails' resembling the antennae. So much so, the rear can easily be mistaken for the head.

It is not the butterflies and moths alone but, sometimes, their caterpillars too have very prominent sinister-looking eye-spots that can easily put off any predator.

The same is the case with some fishes. Examples from India are the emperor angel fish (*Pomacanthodes imperator*), the orange chromide (*Etroplus maculatus*), the moorish idol (*Zanclus cornutus*), *Puntius conchoni*, *Gudusia chapra*, *Ompok bimaculatus*, *Siganus oramin* etc. There are even more impressive cases elsewhere, like the red drum (*Sciaenops ocellata*), the pumpkinseed (*Lepomis gibbosus*), the ring-tailed pike cichlid (*Crenicichla savatilis*), the dories (Family *Zeidae*), the red sea bream (*Pagellus bogarovera*) the butterfly fishes (Family *Chaetodontidae*) etc. In some of the butterfly fishes which have the eye-spots near the tail, the deception is accentuated by the head being made inconspicuous by a dark line that runs through it and breaks the pattern, thus the rear end looking more like the head to a predator.

In birds, the only similar case seems to be the pearl-spotted owlet (*Glaucidium purlatum*) of Southern Africa which has two false 'eyes' at the back of the head. In interaction with a predator, the purpose here may be similar to that in butterflies, moths and fishes as explained above.

The other instance in birds, though not similar to the ones mentioned above, is the multitude of beautiful eye designs that adorn the feathers of the peacock. The purpose of the ocellated train is entirely different, namely, as an aid to courtship behaviour and sexual selection.

The intent of this digression is just to point out that the eye motif has diverse roles in certain species in the animal kingdom as a means of 'startle display', deception, deflection, repulsion, attraction or aggression.

That brings us back to the question: Is 'the snake that pecks at the eye' fact or fiction? Do the eyes of the person confronting the vine snake trigger an aggressive reaction aimed at his eyes? I do not know. But I know one thing for sure: in matters concerning many snakes, a stubborn disbelief is as injurious to the discovery of truth as a blind belief.

CHECKLIST OF THE REPTILES OF THE EASTERN GHATS, INDIA

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Introduction

Information on the reptiles of the Eastern Ghats, spread over the States of Orissa, Andhra Pradesh and Tamil Nadu, is scanty. Some 59 species and 12 subspecies including seven endemic forms are reported from the high hills, gorges, valleys, rivers and dense forests of the *ghats*. Since the publication of M.A. Smith's 1931, 1935, 1943 volumes, our knowledge of the reptile fauna of the Eastern Ghats has been enriched by the publications of Daniel (1986), Dutta and Acharjyo (1990), McCann (1945), Murthy (1982, 1985, 1986), Sanyal (1993) and Sharma (1969, 1971). However, no consolidated account of the reptile fauna has been published. What is more, there is not even a checklist. It is likely that more species may be discovered in the course of the ongoing and future exploration of the *ghats*. The present checklist is, therefore, offered to serve as a ready source of information for the herpetological workers and to facilitate the faunal assessment in an attempt to initiate conservation measures to protect the rare, unique and endangered reptiles of the Eastern Ghats.

Checklist

Class : Reptila

Order : Crocodylia

Crocodiles

Family Crocodylidae

1. *Crocodylus palustris* Lesson, 1831. Mugger
Family Gavialidae
2. *Gavialis gangeticus* (Gmelin, 1789). Gharial
Order Testudines
Turtles and Tortoises
Family Bataguridae
3. *Kachuga tentoria tentoria* (Gray, 1834). Peninsular tent turtle.
4. *Melanochelys trijuga trijuga* (Schweigger, 1812). Peninsular black turtle.
Family Testudinidae
5. *Geochelone elegans* (Schoepff, 1795). Indian star tortoise.
6. *Aspideretes gangeticus* (Cuvier, 1825). Indian softshell turtle.
7. *Aspideretes leithii* (Gray, 1872). Deccan softshell turtle.
8. *Chitra indica* (Gray, 1831). Narrow-headed softshell turtle

Order : squamata

Suborder : Sauria (Lizards)

Family Eublepharidae

9. *Eublepharis hardwickii* Gray, 1827. East Indian leopard gecko.
Family Gekkonidae
10. * *Calodactylodes aureus* (Beddome, 1870). Golden gecko.
Endemic to Eastern Ghats.
11. * *Geckoella jeyporensis* (Beddome, 1877). Jeypore ground gecko.
Endemic to Eastern Ghats.
12. *Hemidactylus brookii* (Gray, 1845). Spotted house gecko.
13. *Hemidactylus frenatus* Dumeril & Bibron, 1836. South Asian house gecko.
14. *Hemidactylus leschenaultii* Dumeril & Bibron, 1836. Bark gecko.
15. *Hemidactylus maculatus* Dumeril & Bibron, 1836. Giant spotted gecko.
16. *Hemidactylus subtriadrus* Jerdon, 1853. Jerdon's gecko.

17. *Hemidactylus triedrus triedrus* (Daudin, 1802). Blotched gecko.
Family Agamidae
18. *Calotes versicolor* (Daudin, 1802). Indian garden lizard.
19. *Psammophilus blanfordanus* (Stoliczka, 1870). Peninsular dwarf rock agama.
20. *Psammophilus dorsalis* (Gray, 1831). Peninsular rock agama.
21. *Sitana ponticeriana* Cuvier, 1844. Fan-throated lizard.
Family Chamaeleonidae
22. *Chamaeleo zeylanicus* Laurenti, 1768. Indian chameleon.
Family Scincidae
23. * *Barkudia insularis* Annandale, 1917. Barkuda limbless skink.
Endemic to Eastern Ghats.
24. *Lygosoma albopunctata* (Gray, 1846). White-spotted garden skink.
25. * *Lygosoma ashwamedhi* (Sharma, 1969). Asamedha garden skink.
Endemic to Eastern Ghats.
26. *Lygosoma punctatus* (Gmelin, 1799). Common dotted garden skink.
27. *Mabuya bibronii* (Gray, 1838). Seashore skink.
28. *Mabuya carinata carinata* (Schneider, 1801). Common skink.
29. *Mabuya macularius macularius* (Blyth, 1853). Bronze grass skink.
30. * *Mabuya nagarjuni* Sharma, 1969. Nagarjuna hill grass skink.
Endemic to Eastern Ghats.
31. *Mabuya trivittata* (Hardwicke & Gray, 1827). Three-striped skink.
32. *Sepsophis punctatus* Beddome, 1870. Spotted limbless skink.
Family Lacertidae
33. *Ophisops leschenaultia leschenaultia* (Milne – Edwards, 1829). Leschenault's lacrata.
Family Varanidae
34. *Varanus bengalensis* (Daudin, 1802). Indian monitor.
35. *Varanus flavescens* (Hardwicke & Gray, 1827). Yellow monitor.
36. *Varanus salvator salvator* (Laurenti, 1768). Water monitor.
Suborder Serpentes (Snakes)
Family Typhlopidae
37. *Ramphotyphlops braminus* (Daudian, 1803). Common blind snake.
38. *Typhlops acutus* (Dumeril & Bibron, 1844). Beaked blind snake.

39. *Typhlops beddomei* Boulenger, 1890. Beddome's blind snake.
40. *Typhlops porectus* Stoliczka, 1871. Slender blind snake
- Family Uropeltidae
41. *Uropeltis ceylanicus* Cuvier, 1829. Kerala shieldtail.
Endemic to India
(Eastern and Western Ghats).
42. *Uropeltis ellioti* (Gray, 1858). Elliot's shieldtail,
Endemic to India.
(Eastern and Western Ghats)
- Family Boidae
43. *Eryx conica conica* (Schneider, 1801). Common sand boa.
44. *Eryx johnii johnii* (Russell, 1801). Red sand boa.
45. *Python molurus molurus* (Linnaeus, 1758). Indian python.
- Family Colubridae
46. *Ahaetulla nasutus* (Lacepede, 1789). Common vine snake.
47. *Amphiesma stolata* (Linnaeus, 1758). Buff-striped keelback.
48. *Atretitum schistosum* (Daudin, 1803). Olivaceous keelback.
49. *Boiga ceylonensis* (Gunther, 1858). Sri Lankan cat snake.
50. *Boiga forsteni* (Dumeril, Bibnon & Dumeril, 1854). Forsten's Cat snake
51. *Boiga trigonatus trigonatus* (Schneider, 1802). Common cat snake.
52. * *Coluber bholanathi* Sharma, 1976. Nagarjunasagar racer.
Endemic to Eastern Ghats.
53. *Chrysopelea ornata ornata* (Shaw, 1802). Indian 'flying' snake.
54. *Dendrelaphis tristis* (Daudin, 1803). Common bronzeback tree snake.
55. *Elaphe helena helena* (Daudin, 1803). Common trinket snake.
56. *Elaphe radiata* (Schlegel, 1837). Copperhead.
57. *Enhydris enhydris* (Schneider, 1799). Common smooth water snake.
58. *Lycodon aulicus* (Linnaeus, 1758). Common wolf snake
59. *Lycodon jara* (Shaw, 1802). Yellow specked wolf snake.
60. *Lycodon travancoricus* (Beddome, 187). Travacore wolf snake.

- | | |
|--|---|
| 61. <i>Macropisthodon plumbicolor plumbicolor</i>
(Cantor, 1839). | Green keelback |
| 62. <i>Oligodon arnensis</i> (Shaw, 1802). | Banded kukri snake. |
| 63. <i>Xenochrophis piscator piscator</i> (Schneider, 1799). | Common water snake. |
| 64. <i>Bungarus caeruleus</i> (Schneider, 1801). | Common krait. |
| 65. <i>Bungarus fasciatus</i> (Schneider, 1801). | Banded krait. |
| 66. * <i>Calliophis beddomei</i> Smith, 1943. | Beddome's Coral snake.
Endemic to Eastern Ghats. |
| 67. <i>Naja naja</i> (Linnaeus, 1758). | Common cobra. |
| 68. <i>Ophiophagus hannah</i> (Cantor, 1836).
Family Viperidae | King cobra. |
| 69. <i>Daboia russelii russelii</i> (Shaw & Nodder, 1797). | Russell's viper. |
| 70. <i>Echis carinatus carinatus</i> (Schneider, 1801). | Saw-scaled viper. |
| 71. <i>Trimeresurus gramineus</i> (Shaw, 1802). | Bamboo pit viper. |

* Endemic to Eastern Ghats

Summary

A checklist of 59 species and 12 subspecies of the reptiles of the Eastern Ghats referable to 46 genera included in 16 families are presented with their English common names. Remarks on the seven species endemic to the *ghats* are added.

Acknowledgements

We are grateful to the Zoological Survey of India which continues to be the source of inspiration and motivation for our work on the reptiles of India.

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TRANSLOCATION OF SNAKES FROM THE NTPC CAMPUS AT ALAPPUZHA, KERALA, TO THE KONNI RESERVE FOREST IN KERALA

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Abstract

A total of 53 snakes were caught from the Campus of NTPC(National Thermal Power Corporation) at Alappuzha, Kerala, spread over 700 acres with the help of 11 Irulas of the ISCICS (Irula Snake Catcher's Industrial Co-operative Society), Vadanemmeli Village, Kancheepuram Dist., Tamil Nadu. All the snakes were released 70 km away in the Konni Reserve Forest as suggested by the Kerala Forest Department. The operation lasted for 10 days from 25/01/08 to 03/02/08. Study of habitat preference of different snake species in human-altered ecosystem and man-snake conflict regarding this operation are dealt with in the paper.

Introduction

Irula members of ISCICS had caught a total of 103 snakes from NTPC Campus, Alappuzha, Kerala in 2005 and helped in their translocation to the Konni Reserve forest under the supervision of the local Forest Department. Recently, the same activity was repeated there from 25th January to 3rd February, 2008 (Table:2) by 11 Irulas. This time, an effort was made to create awareness towards snakes among the inhabitants of the Campus at the end of the operation. The abundance, diversity and spatial distribution of the snake species in a human-altered habitat were highlighted. This kind of a study would be beneficial for further research as well as for formulating effective conservation and management priorities for threatened taxa.

Study area and methods

The NTPC Campus is situated at 9° 23' N and 76° 44' E in Alappuzha district in Kerala. It has a total area of about 700 acres including different sectors like Plant, H type offices, Permanent Township(PTS), Temporary Township(TTS), CISF quarters and Pump house. All these areas including BPCL (Bharat Petroleum Corporation Limited) were covered for snake catching. The main NTPC block including H type offices and Plant is situated adjacent to a backwater and 2 kms away from the sea. This area comprises almost 60% of the operational area and rest of the places i.e., residential settlements(PTS, TTS and CISF quarters) and BPCL are close to the highway. Pump house is situated at Muttom which is about 10 kms from the main block and is in a low-lying area with water bodies, sparse vegetation and cultivation.

Fieldwork was done from 9:00 hrs to 17:30 hrs daily. Rock and brick piles, cement blocks, rubbish, heaps of cut plants and grass were turned up to verify the presence of snakes. Each thicket was disturbed manually and checked for the movement of disturbed snakes. Snakes were also searched for after noticing various secondary evidences like shed skin, scat, movement trail and body impression at burrow mouth. The snakes were caught one by one by hand and transferred immediately inside cotton bags. After finishing the fieldwork, all the captured snakes were transferred to mud pots. The pots were provided with water and the pot mouths were tightly covered with cotton cloth and tied.

Area of release of snakes

All the snakes were released inside the Konni Reserve Forest (9° 26' N; 76° 91' E) at 17:00 hrs .It was 70 km away from the NTPC Campus . This entailed a journey of 3 hrs by car. The release was done at about 4km away from the road and along a riverbank. The whole operation was performed as per suggestions of the local Forest Department officials and under their supervision.

Results

The total number of snakes caught was about half of what was caught in a similar operation in 2005. The total catch then was 103 whereas it is 53 in the present operation. There has been considerable decline in all the species other than common wolf snake (*Lycodon aulicus*) and complete absence of common krait *Bungarus caeruleus* and common trinket snake *Coelognathus helena helena*.(Table1) Seven different kinds of habitats were noticed to be preferred by the snakes (Table 4). Maximum abundance as well as maximum diversity of species were in housing adjacent areas with plantation and wild vegetation (Table 3).A total of 28 snakes of 4 different species were recorded from here and 27 were non-venomous. Rat snake being the most abundant species in the Campus, found in maximum number, i.e. 18 from this habitat (Table 3). Next abundant was common wolf snake also showed the same trend and a total number of 7 was recorded from here (Table 4). Moreover, this habitat supported 2 Checkered keelbacks. One Russell's viper was caught from here after it accidentally entered the building adjacent to a dry drain in search of prey. The movement trail for this snake was traced and it confirmed the snake's arrival from outside through the holes in the boundary wall.

Three accidental catches inside houses are not mentioned here

Russell's viper was the most abundant venomous snake in the campus found invariably in habitats with thick wild vegetation cover having high humidity and low temperature. The habitat for common cobra was observed to be close to water bodies and rice fields (Table 4). The natural vegetation grown next to the backwater supported a good number of non-venomous snakes (Table 4). The painted bronzeback tree snake, was discovered resting on shrubs grown over a cut tree trunk in the open

ground with plantation (Table 3). A total of 43 snakes were found in areas facing frequent human interference, even at 2mt distance from the snake.

Table 1: Comparison of the snake catch details in 2005(25/05/05-03/06/05) and 2008(25/01/08-03/02/08)

Common Name	Scientific Name	Total no of snake catch	
		2005	2008
Rat snake	<i>Ptyas mucosa</i>	55	29
Checkered keelback	<i>Xenocrophis piscator</i>	21	3
Common wolf snake	<i>Lycodon aulicus</i>	1	12
Painted bronzeback tree snake	<i>Dendrelaphis pictus</i>	0	1
Common trinket snake	<i>Coelognathus helena</i>	2	0
Common cobra	<i>Naja naja</i>	0	1
Common krait	<i>Bungarus caeruleus</i>	11	0
Russell's viper	<i>Daboia russelii</i>	13	7
Total		103	53

Table 2: Datewise availability of different species of snakes in 2008

Date	Snake species caught	Total no. of snakes caught
25/01/08	<i>L.aulicus, P.mucosa</i>	9
26/01/08	<i>L.aulicus, P.mucosa</i>	7
27/01/08	<i>P.mucosa, L.aulicus, D.russelii</i>	7
28/01/08	<i>P.mucosa, L.aulicus, D.russelii, X.piscator</i>	6
29/01/08	<i>P.mucosa, X.piscator</i>	9
30/01/08	<i>P.mucosa</i>	3
31/01/08	<i>P.mucosa, D.russelii, N.naja</i>	5
1/2/2008	<i>P.mucosa, D.russelii, D.pictus</i>	4
2/2/2008	<i>P.mucosa, D.russelii</i>	3
3/2/2008	No snakes found	0
Total		53

Table 3 Availability of different species of snakes in different areas of the Campus

Common Name	Scientific Name	BPCL	CISF	Muttom		Pmpths	Plant	PTS	TTS	Total
				Htype						
Russell's viper	<i>Daboia russelli</i>	2	1	1	0	0	0	1	2	7
Common cobra	<i>Naja naja</i>	0	0	0	1	0	0	0	0	1
Rat snake	<i>Ptyas mucosa</i>	2	0	3	1	10	3	10	3	29
Common wolf snake	<i>Lycodon aulicus</i>	0	0	5	0	0	0	5	2	12
Checkered keelbacks	<i>Xenocrophis piscator</i>	0	0	1	0	2	0	0	0	3
Paintd bronzeback tree snake	<i>Dendrelaphis pictus</i>	1	0	0	0	0	0	0	0	1
Total		5	1	10	2	12	7	16	7	53

Table 4: Availability of different species of snakes at different habitats in the Campus

Habitat of snakes	<i>X.piscator</i>	<i>L.aulicus</i>	<i>D.pictus</i>	<i>P.mucosa</i>	<i>D.russelli</i>	<i>N.naja</i>	Total
Housing adjacent areas wt plantation & wild vegetation	2	7	0	18	1	0	28
Open ground with tree plantation	0	0	1	3	0	0	4
Pump house surrounding lowlands with water &rice field	0	0	0	1	0	1	2
Walkway side by lowland with thick vegetation	0	0	0	1	2	0	3
Thick vegetation with tall grass	0	0	0	3	2	0	5
Thick vegetation with tall grass & coconut trees	0	0	0	1	0	0	1
Water body adjacent vegetation	1	5	0	1	0	0	7
Total	3	12	1	28	5	1	50

Discussion

The number of common kraits was high i.e., 11 in 2005 (Table:1). The exact reason for complete absence of this species in the present catches, is not known. A major reason can be seasonal variation in the operational timing. Earlier it was from 25th May to 3rd June whereas the present work was performed from 24th January to 3rd February.

Just before commencing our work and even while the work was in progress grass-cutting and vegetation clearing were observed in the Campus. These might have caused temporary movement of the snakes into the other side of the boundary wall through the holes in the wall.

A rat snake with freshly cut tail was caught and probably the grass-cutting machine was responsible for the injury.

As the study area is closely adjacent to water sources, three different guilds were observed in the snake community in the Campus i.e, **terrestrial** comprised of rat snake, common wolf snake, Russell's viper and common cobra; **arboreal** -painted bronze back tree snake and **aquatic** -checkered keelback . The healthiest population structure was shown by the terrestrial guild. Moreover, this guild maintained a close association with the inhabitants of the areas, reflecting their preparedness to adapt to an altered habitat as well as inconspicuousness due to cryptic colouration and sedentary nature. Higher abundance of snakes is often observed in human-infested areas than pristine forests for superabundance of prey like rodent and amphibians. Two out of three opportunistic catches inside housing were Russell's Viper which undoubtedly entered there in search of prey.

This kind of habitat was often observed to be closely associated with the housings in many areas in the Campus. Hindu mythology has somehow protected malicious killing of cobra but the scenario is different for Russell's viper. Conversation with local people revealed many instances when the latter species were discovered and killed immediately. Conservation for this species is required there as it is a vulnerable one and categorized in Schedule II in wildlife Protection Act 1972 (Amendment Act, 2002). For the common wolf snake, its resemblance to the common krait creates unnecessary fear among people, which again results in instant killing of this beautiful non-venomous snake. Proper awareness regarding

the identification of the common venomous snake species and their non-venomous mimics is really important from this point of view.

The increased number of rat snakes reflected the understanding of the people of the species' usefulness as destroyers of rodents and this is the reason for this most successful symbiotic species close to any human settlement.

Habitat destruction as well as the snakes' preference for human-altered habitat are the major reasons for snake-human conflict anywhere. Snakes are one of the useful components of our ecosystem. Being the most efficient rodent controller, snakes help to save our grains. Even considering prevailing high rodent densities, ten snakes of the size of rat snake on a hectare of land would provide significant control of rodent numbers, consuming about 160 rodents per month (Whitaker, 1985). Rats are often reported as carriers of many diseases. Unnecessary eradication of snakes from our countryside will increase the population of rats. This will be hundred times more harmful to us than the fear of probable snakebite which rarely happens. This campus is not having any snakebite record for the last five years. Any conservation strategy for a vulnerable animal like the snake badly needs involvement of local people who have only a poor knowledge of the concerned taxa.

Translocation could be life-saving for the snakes caught from the campus but success of translocation lies in further investigation regarding sustainability of the animals inside the forest (Dodd and Seigel, 1991). Reserve forests are having less fear of habitat loss and the snakes will be saved from destruction by men but it is a moot question to what extent snake species which have a symbiotic relationship with men such as the rat snake may find the translocation to be to their advantage.

Acknowledgements

We are thankful to Mr Elangovan, General Manager and Mr. A.Siluvai Pragasam, Special Officer, ISCICS for permitting us for the above work. Our kind acknowledgement to the Warden, Konni Forest Department. Thanks to the local officers of NTPC for their timely help in many instances. We are thankful to Romulus Whitaker for helping in identification. We express our gratitude to D. Chinnayan, Kuttaiyan, P. Gopal, C. Sanmugam, P. Perumal, C. Varadan, N. Natarajan, C. Mutthu, D. Ramesh, C. Thangaraj and S. Jaykumar - all the 11 members of ISCICS who participated in the operation.



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**ON THE OCCURRENCE OF SAW-SCALED VIPER
(*ECHIS CARINATUS*) AT PERINGAVU HILLS,
MALAPPURAM DISTRICT, KERALA**

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Echis (Merrem, 1820), meaning 'viper' in Greek, is a pantropical viper genus found in dry arid habitats of Africa, the middle East, Central Asia, India and Sri Lanka. So far eight species have been reported in this genus namely *E. carinatus* (Schneider), *E. coloratus* Gunther, *E. hughesi* Cherlin, *E. jogeri* Cherlin, *E. leucogaster* Roman, *E. megalcephalus* Cherlin, *E. ocellatus* Stemmler and *E. pyramidum* Geoffroy Saint-hilaire. Among these, *E. carinatus* (Schneider, 1801), which was formerly reported from the Indian sub-continent as *Pseudoboa carinata* (Schneider), is the first described species of the genus.

E. carinatus is considered as the smallest of the poisonous snakes in India (Whitaker, 2000). It produces a sizzling sound by rubbing scales (stridulation) of its body. They are generally crepuscular and nocturnal, hiding during day time under rocks, fissures, fallen rotted logs, etc. in shrubby and sandy habitats. The movement is mainly by 'sidewinding' in sandy habitats. This snake is very aggressive and strikes readily at the smallest provocation (Daniel, 2002). This nature, combined with its virulent haemotoxic venom makes it very dangerous, despite its small size.

Five sub-species of *E. carinatus* have been described so far from the Indian sub-continent. They are, *E. c. carinatus* (Schneider, 1801), *E. c. sinhaleyus* (Deraniyagala, 1951), *E. c. sochureki* (Stemmler, 1969), *E. c. astolae* (Mertens, 1970) and *E. c. multisquamatus* (Cherlin, 1981). Among these, only *E. c. carinatus* has so far been reported from South India.

Wall (1908) gives its distribution as, 'throughout a large area of Indian Peninsula'. However, he says that it does not occur in the narrow tract between the hills and the Malabar coast, South of Karwar. Smith (1943) too considered the species absent in the coastal strip West of the Western Ghats, South of Karwar. Adiyodi (1961) reported its occurrence in Kozhikode district in north Kerala. Daniel (1983) mentioned that it was not recorded in the erstwhile Cochin and Travancore areas of Kerala. But Jaleel (1967) had reported it from Kottappara reserve in Travancore (Ernakulam district). The species is also reported from Chinnar Wildlife Sanctuary, Idukki district (Jahas et al, 1996 and Abraham et al, 1999), Parambikulam Wildlife Sanctuary, Palakkad district (Radhakrishnan, 1996) and Vadakkancherry Forest range in Thrissur district (Radhakrishnan (1997)) of Kerala. Many of these findings are not mentioned by Easa & Ramachandran (2004) in their recent compilation work on reptiles of Kerala.

On 13.10.2007 one of my (KK) students located a saw-scaled viper from Peringavu Hills, Malappuram district at an altitude of 120 ft above msl. It is a hilly laterite terrain and the snake was resting beneath a rock. On irritation, it started the characteristic 'stridulation' producing rasping sounds. Very often it lashed out as a released spring to bite. The specimen was 35 x 2 cm in size, pale brown in colour with dark-edged whitish spots and a narrow dull white undulating white line along both sides of the body. Underside was cream coloured with several brown spots. Head had a dull white arrow shaped mark and a faint stripe running from the eye to the angle of the jaw. The present discovery of this deadly snake, perhaps the first one from this district, affirms the continuity of its distribution throughout the Western Ghat ranges of Kerala, both on the western and eastern slopes covering the districts of Kozhikode, Malappuram, Thrissur, Palakkad, Ernakulam and Idukki districts. The species is locally called 'Churutta' or 'Churattamandali' owing to its peculiar resting posture. The specimen is deposited at Zoological Survey of India, Western Ghats Field Research Station, Kozhikode, Kerala (ZSI/WGFRS/IR/V.No.1982).

Acknowledgements

The authors are grateful to the Director, Zoological Survey of India, Kolkata and Sri.C.Radhakrishnan, Scientists-F & Additional Director, Zoological Survey of India, Western Ghats Field Research Station, Kozhikode, Kerala for encouragement and facilities. We are also indebted to Mr. Muhammed Saeed (student of the first author) and his friends for locating the specimen.

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RANDOM HARVEST

The 'hidden' legs

One theory about the origin of snakes is that they evolved from terrestrial lizards and, in the course of evolution, they lost their limbs. All traces of the forelimbs and the pectoral girdle have disappeared. But some of the primitive species – the boas, the pythons and the blind snakes – still have remnants of the pelvis and the hindlimbs which do not look like limbs at all.

The *Times of India* of 14 Apr. 2008 reports the discovery of a 92 million-years-old fossil of a two-legged snake in Lebanon even though only one leg was imprinted on the surface of the rock. Researchers at the European Light Source (ESRF) in Grenoble, France, confirmed by X-rays that the creature had its other leg buried in the rock. The 85 cm long creature has been named *Eupodophis descouensi*.

The ancient Indians thought that the snake does have limbs but they are hidden from human sight. That is why one of the names for the snake in Sanskrit is *goodapâdah*— one with hidden legs.

There is an interesting saying in Tamil, *Pāmbinkāl pāmbariyum*, meaning “a snake’s legs only a snake can see”. This proverb is often used in the metaphorical sense that only persons with similar traits can recognize these in one another.

But, the proverb is, perhaps, capable of a different interpretation also. Though the obvious meaning of *kāl* is ‘leg’, the word also means ‘way, path’. See *The Tamil Lexicon*, University of Madras, 1982. The proverb could then mean that “a snake knows the way another snake has gone”. That makes sense and conforms to a common observation which is the basis for the superstition that if a snake is killed, its mate will soon appear to take revenge. A snake is wont to follow another of the opposite sex by means of the scent trail left by the musk glands.



The venomous nexus

A report in *The Week* of 20 Jan. 2008 says that snake venom worth more than Rs.30 Lakhs in the black market was seized by the Forest department in Thiruvananthapuram and Kannur districts of Kerala. "The seizures hint at a possible cross-border nexus that could be using snake poison to make narcotic substances" within the country and abroad. The persons arrested are suspected to have linkages with illegal snake breeders.

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Value addition to golf balls

Do not be surprised if you hear of four golf balls being auctioned to raise funds for a wildlife sanctuary on the Australian east coast. So, what's so special about these golf balls? They had been surgically extracted from a python which had swallowed them mistaking them for eggs. The python found on a golf course has been named Augusta after a celebrated U.S. golf course. *The Hindu Business Line* of 8 Jan. 2008 which gives this information adds that the successful bidder will also get the 'before and after' photographs of Augusta and the X-ray pictures. Without its autograph, I presume.

Ø Ø Ø

Do snakes dream?

No. Dreaming sleep is found only in the higher mammals and birds. Snakes see no dreams. Behavioural scientists say so. See Desmond Morris: *Animal Watching*. Don't ask me how they know.

Ø Ø Ø

'Charming' the king cobra

Snake 'charming' using the king cobra is an infrequently practiced art — unlike with the common cobra. *The New Indian Express* of 8 Oct. 2006 carried a

report, complete with a photograph, on a snake 'charmer' in Thailand kissing the reared-up hood of a king cobra 19 times in an attempt to set a world record. "One by one [nineteen king cobras] were released onto a stage set up in the Thai beach resort town [of Pattaya] as the snake charmer, Khum Chaibuddee, kissed [the top of the reared-up head of] each beast...". The previous record in the Guinness Book was 11 kisses. This record was set by an American in 1999.

In *Men and Snakes* (1965), Ramona and Desmond Morris give a graphic account of a similar feat performed by a Burmese woman. A photograph accompanies this.

When a common cobra raises its hood and it is made to concentrate on something in front of it, it is possible to safely touch the rear of its hood by slowly bringing a hand behind it. What is noteworthy in the king cobra episodes is that, in both the cases mentioned above, the 'charmer' stands in front, bends over the snake, and then kisses it on the snout!

Ø Ø Ø

* Lucky We!

The snake has vertebrae which may be as numerous as over 400 depending on the species.

In contrast to this, the adult human has a mere 26 vertebrae. Doesn't that give us cause to rejoice, considering the high incidence of vertebrae-related ailments like cervical spondylitis, lumbar spondylitis, lordosis, kyphosis, slipped disc and so on?

Ø Ø Ø

Prolific egg-layers

Among Indian snakes, the most prolific egg-layers are the following:-

Reticulated python (*Python reticulatus*) : Upto 124 eggs in one clutch.

Indian rock python (*Python molurus*) : Upto 107 eggs in one clutch.

Burmese python (*Python m. bivittatus*) : Upto 107 eggs in one clutch.
Checked keelback (*Xenochrophis piscator*): Upto 90 eggs in one clutch.

Ø Ø Ø

Why should we protect snakes?

The textbook answer is that they play an important role in destroying vermin like rats and other agricultural pests. True and not true. This is a narrow view posited on the arrogant assumption that man's interests are supreme and all other denizens on earth, plant or animal, have their relevance only so long as they contribute unreservedly to our own material welfare. Snakes deserve to be protected for their own sake. These splendidly endowed creatures in command of faculties denied to us, some of which are beyond our understanding and some, perhaps, even beyond our imagination, have a significant place in life on this planet that we smugly call 'ours' but which certainly is not ours alone.

- B. Vijayaraghavan

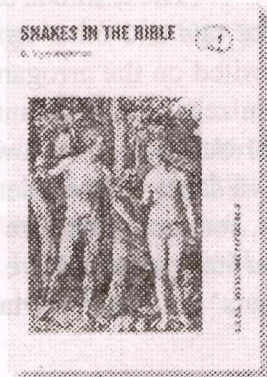
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- | | |
|-----------------------------------|---|
| 1. Place of publication | Chennai Snake Park Trust
Rajbhavan Post, Chennai 600 022.
Tamilnadu. |
| 2. Periodicity of its publication | Quarterly |
| 3. Printer's Name | N. Arunachalam |
| Nationality | Indian |
| Address | 16, Ramalingam Nagar, Kottivakkam,
Chennai 600 041, Tamilnadu |
| 4. Publisher's Name | R. Rajarathinam |
| Nationality | Indian |
| Address | 11/6 A, Fourth Main Road, Gangai Nagar,
Velachery, Chennai 600 042, Tamilnadu |
| 5. Editor's Name | Dr. G. Thirumalai |
| Nationality | Indian |
| Address | Zoological Survey Of India,
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I, R. Rajarathinam, hereby declare that the particulars given above are true to the best of my knowledge and belief.

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1. Place of publication
 Chennai South Park Trust
 Rajbhavan Post, Chennai 600 022
 Tamilnadu

2. Periodicity of its publication
 Quarterly

3. Town or Village
 N. Arambakkam

4. Nationality
 Indian

5. Address
 112 A, Fountain Road, Gangan Nayan
 / Chennai 600 042, Tamilnadu

6. Editor's Name
 Dr. S. Srinivasan

7. Nationality
 Indian

8. Address
 Ecological Survey Office
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Individual – Rs. 75/-

Institution – Rs.150/-

by MO/DD in favour of
“Chennai Snake Park Trust”
Payable at Chennai.

Chennai Snake Park Trust
Rajbhavan Post
Chennai – 600 022. India.

Registered with the Registrar Office of Newspapers for India
(Ministry of Information and Broadcasting)
Registration No. TNENG/2007/19859
(vide letter dated 28.05.2007 of the Registrar of Newspapers for India)

Printer : **N. Arunachalam**, Students Offset Services
Shop No. 3, Apex Chambers, 20, Thiagaraya Road, Pondy Bazar, Chennai - 600 017.
Publisher : **R. Rajarathinam** on behalf of Chennai Snake Park Trust. Published by Chennai Snake
Park Trust, Rajbhavan Post, Chennai - 600 022
Editor : **Dr. G. Thirumalai**
