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## **SNAKEBITES IN MADURAI DISTRICT, TAMILNADU – A HOSPITAL RECORD SURVEY**

**T. Ramesh**

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I collected information on snakebites in Usilampatti area, Tamil Nadu during 2008-09, for a period of two years by surveying hospital records. Govt. Hospitals and health centres in Usilampatti were approached for getting details of cases admitted during the said period, as snakebite patients confirmed with snake envenomations. I accompanied and interacted with many patients and with the cooperation and help of the doctors in the respective hospitals, gleaned pertinent information on their bite histories. No records of suspected snakebite cases or snakebites by non-venomous snakes were obtained. Snake species responsible for snakebites were gleaned from direct verbal interaction with the patients / attenders, seeing the dead snakes or snake photos gathered by the patient / attenders, information as deduced by the treating doctors. Because this compilation solely banks upon hospital records, cases that never turned up at hospitals will necessarily be left out.

In all, a total of 198 confirmed envenomation cases (Tables 1-4) by the Big Four venomous snakes were obtained. This includes 39 bite cases from spectacled cobra (*Naja naja*), 14 bite cases from common krait (*Bungarus caeruleus*), 77 bite cases from Russell's viper (*Daboia russelii*) and 68 bite cases from saw-scaled viper (*Echis carinatus*). The age of the victims ranged from 7-85 years. Of the 198 patients, 125 were males and 73 were females. Their time taken to reach the hospital after the bite ranged from 5-350 minutes. Their blood clotting time ranged from 4-22 minutes. The patients were discharged from hospital after a treatment schedule of 1-22 days post-admission. The number of vials of anti-snake venom serum administered to the patients ranged from 2-31 vials.

The details of snakebite cases for each of the four species are compiled and tabulated as follows (Abbreviations: SU summer; M1 southwest monsoon; M2 northeast monsoon; PM post monsoon; M male; F female; U unknown; N.D. no data).

**Table 1.** Spectacled cobra bites (n=39) from Govt. Hospitals in Usilampatti during 2008-09

Site of accident	Season	Patient's age (years)	Patient's Gender	Blood clotting time (m)	Reached hospital in (hrs.)	No. of ASV vials given	No. of days in hospital
Farmland (18)	SU (15)	< 20 (4)	M (23)	< 10 (10)	< ½ (5)	0-5 (11)	< 3 (21)
Bush belt (18)	M1 (15)	21-40 (21)	F (16)	11-15 (23)	½ -2 (11)	6-15 (24)	4-7 (14)
Buildings (1)	M2 (3)	41-60 (11)	U (0)	16-20 (4)	2-3 (9)	> 16 (24)	8-14 (3)
Wetland (3)	PM (6)	> 61 (3)		> 21 (2)	> 3 (2)	N.D. (12)	> 14 (1)

**Table 2.** Krait bites (n=14) from Govt. Hospitals in Usilampatti during 2008-09

Site of accident	Season	Patient's age (years)	Patient's Gender	Blood clotting time (m)	Reached hospital in (hrs.)	No. of ASV vials given	No. of days in hospital
Farmland (8)	SU (6)	< 20 (3)	M (8)	< 10 (5)	< ½ (3)	0-5 (4)	< 3 (6)
Bush belt (2)	M1 (4)	21-40 (4)	F (6)	11-15 (8)	½ -2 (7)	6-15 (10)	4-7 (8)
Buildings (2)	M2 (1)	41-60 (5)	U (0)	16-20 (1)	2-3 (2)	> 16 (0)	8-14 (0)
Wetland (2)	PM (3)	> 61 (2)		> 21 (0)	> 3 (2)	N.D. (0)	> 14 (0)

**Table 3** Russell's viper bites (n=77) from Govt. Hospitals in Usilampatti during 2008-09

Site of accident	Season	Patient's age (years)	Patient's Gender	Blood clotting time (m)	Reached hospital in (hrs.)	No. of ASV vials given	No. of days in hospital
Farmland (37)	SU (20)	< 20 (11)	M (43)	< 10 (28)	< ½ (16)	0-5 (30)	< 3 (46)
Bush belt (16)	M1 (34)	21-40 (37)	F (33)	11-15 (35)	½ -2 (34)	6-15 (37)	4-7 (31)
Buildings (20)	M2 (7)	41-60 (26)	U (1)	16-20 (9)	2-3 (2)	> 16 (5)	8-14 (0)
Wetland (4)	PM (16)	> 61 (3)		> 21 (5)	N.D. (25)	N.D. (5)	> 14 (0)

**Table 4.** Saw-scaled viper bites (n=68) from Govt. Hospitals, Usilampatti during 2008-09

Site of accident	Season	Patient's age (years)	Patient's Gender	Blood clotting time (m)	Reached hospital in (hrs.)	No. of ASV vials given	No. of days in hospital
Farmland (33)	SU (23)	< 20 (18)	M (50)	< 10 (28)	< ½ (15)	0-5 (27)	< 3 (37)
Bush belt (24)	M1 (26)	21-40 (25)	F (18)	11-15 (31)	½ -2 (33)	6-15 (37)	4-7 (26)
Buildings (8)	M2 (12)	41-60 (19)	U (0)	16-20 (9)	2-3 (2)	> 16 (3)	8-14 (4)
Wetland (3)	PM (13)	> 61 (6)		> 21 (0)	N.D. (18)	N.D. (1)	> 14 (1)



Of these 198 cases, 3 resulted in death, one each by the Big Four species except the krait. All these deaths happened during mid-April 2008, where the patients (M1, F2, 14-35 yrs.) reached the hospital after 1-2¼ hours after the bite and received 4-6 vials of anti-snake venom serum. The maximum no. of cases admitted in one day was 12 and happened on 29th Sept. 2009. Of these 12 admissions, 3 were of spectacled cobra bites, 3 were of saw-scaled viper bites and 6 were of Russell's viper bites. It is noteworthy to mention here that as a 2 year study revealed 198 venomous bite cases, it can be surmised that on an average 100 cases register with these hospitals in a year. Most of the bites were by that of the vipers – Russell's viper 39%, saw-scaled viper 34%, while the elapid bite reports were meager: spectacled cobra 20% and the common krait 7%.

Such compilations of snakebite statistics data from hospitals across Tamil Nadu are the need of the hour. It is hoped that this work will prompt similar works elsewhere in future.

## NESTING AND MORTALITY OF OLIVE RIDLEY SEA TURTLES IN KALPAKKAM COAST, TAMIL NADU

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### Introduction

There is a marine reptile that visits the Chennai coast during the months of December-March. This is the olive ridley sea turtle (*Lepidochelys olivacea*) which travels long distances to breed and nest in the beach. There is a mention of turtle nesting among *Ipomoea* sp. in *Tamil Sangam* literature during 4<sup>th</sup> AD (Sanjeevaraj, 1958). Laying close to 150 eggs, its survival rate to adulthood is rather meager though with a high fecundity rate. Whitaker (1974) did the first survey in Chennai during the winter of 1973 between Adyar River and Kalpakkam. The survey indicated the pressing need for conserving the olive ridley along the Chennai coast, which resulted in setting up of the first sea turtle hatchery in India by Madras Snake Park Trust (MSPT) along the Chennai coastline. Hatchery management included collection of eggs, relocation of nests and release of hatchlings. Nests can be easily located by the presence of distinct tracks left by the lower shell called plastron in the sand by the nesting female.

All sea turtles of India are protected, but it is difficult to enforce the law since there is widespread poverty in the region, which makes sea turtles, their eggs and derived products an attractive source of income. Human overpopulation has resulted in the colonization of many sea turtle nesting beaches, especially on islands (Kar and Satish 1982). Currently five species - Green turtle (*Chelonia mydas*), Loggerhead (*Caretta caretta*), Hawksbill (*Eretmochelys imbricata*), Leatherback (*Dermochelys coriacea*) and Olive ridley are recorded in Indian waters. Presently all species are listed in the IUCN Red list as endangered or vulnerable. Sea Turtles are large marine reptiles that have survived for at least 120 million years. The olive ridley is the smallest sea turtle of all and is known to nest in Indian coasts (Subramanian, 2001).

Nesting has been reported in the stretch between Mamallapuram and Pondicherry in the Tamil Nadu state (Bhupathy and Saravanan, 2002). There has been a reduction in the nesting along the Pandy stretch when compared to the Chennai coast (Banugopan and Davidar, 1999). Mamallapuram located 40 km south of Chennai (Madras) on the East Coast road is an important tourist spot in

Tamil Nadu. Pondicherry is also located on the coast. Gahirmatha, a part of the Bhitarkanika Sanctuary in Orissa has the largest sea turtle rookery in the world, with estimated 1,00,000 to 5,00,000 nesting there annually (Bustard, 1976). and the stretch of beach between Mamallapuram and Pondicherry is a mediocre nesting habitat when compared to the mass nesting or Arribada at Gahiramatha in Orissa. Nesting and mortality of olive ridley sea turtle was studied in 2000 – 2001. They have remarkable life styles, which make them fascinating to both professional biologists and wildlife enthusiasts. Their trans-oceanic migrations, their ability to instinctively locate their nesting grounds when they mature, the diving abilities of leatherbacks, the underwater hibernation of loggerheads, all these have riveted the attention of biologists (Shanker et al., 2003). The olive ridley is the smallest of the seven species of sea turtles that have been reported so far, globally (Pritchard and Mortimer, 1999).

**Aim:** To study the nesting and mortality olive ridley sea turtles in the coast of Mamallapuram – Pondicherry coast.

**Study Area:** A 50 km stretch of sandy beach between Kalpakkam and Marakkanam was chosen as the study area for intensive monitoring. The reason for choosing this area for intensive study is because it has large stretches of nesting beaches. Five sectors have been marked using Global positioning systems (GPS).

Sectors	Location	Sector (Start)	Sector (End)
	Satras	12° 31' 25.4" N	80° 10' 2.4" E
I	Aalikippam	12° 26' 14.6" N	80° 2' 24.6" E
II	Paramakazhani	12° 21' 56.5" N	80° 05' 2.7" E
III	Paniyurperiakuppam	12° 17' 35.3" N	80° 01' 48.4" E
IV	Kaipanikuppam	12° 12' 53" N	79° 59' 6.2" E
V	Komanchavadi	12° 8' 13" N	79° 56' 1.5" E

*Spinifex* sp. (Ravanna's moustache), *Cassurina*, *Pandanas* sp., *Ipomea* sp., are the common vegetation recorded. At certain parts *Spinifex* and *Ipomea* cover the entire area between high tide line and the beach. Lots of fishing hamlets are present in the area. The fishermen use wooden boats with motor to catch fish by nets. Several fishing methods are used. When a turtle gets caught in the nets it has no way for respiration hence it drowns. Turtles get caught mainly in fishing nets meant for large Rays. The fishing activity by traditional fishermen and commercial trawlers are creating lots of stress to adult turtles.

**Study Period:** The study period was from January to mid-April in 2004 but additional data was also collected during summer. The first sample for each sector was collected between 05-01-2004 to 24-01-2004. Some random observations were also done and noted down. Observations were made mainly in the mornings.

**Methodology:** The study area that falls between Kalpakkam and Pondicherry is a 50 km stretch of sandy beach. This continuous stretch of 50 km was selected using GPS and was divided into five sectors. Each sector is of 10-km length. Each sector will be patrolled on foot in the mornings to observe for sea turtle nesting activity and the presence of any dead carcasses. The dead turtles were identified as those of olive ridley by the touching of Nuchal in contact with the vertebral. One sector was covered on one day. Each sector was covered once in fifteen days. The dead turtles were marked with paint to avoid repetition. If there is nesting all the parameters like the distance from the high tide line, the distance from the nearest fishing village, the state of the nest will be recorded. All details will be recorded in data sheets that are provided by the Coordinator of the projects. Observations were carried out between 6.00 a.m. to 2.00 p.m.

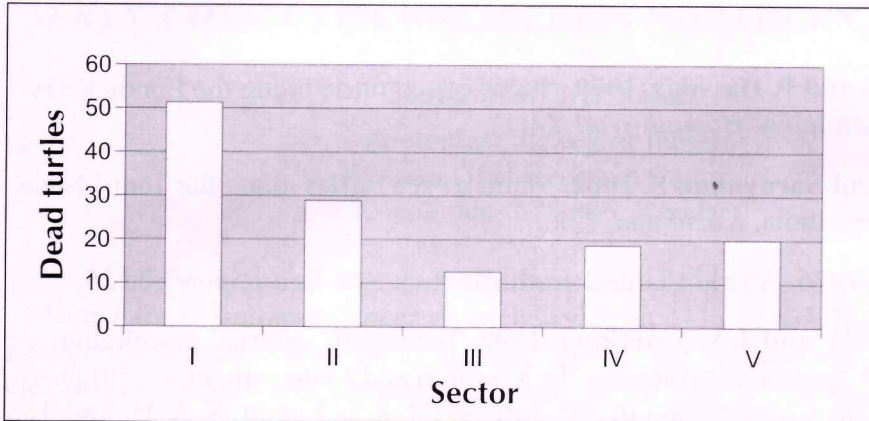
**Results: Nesting and Mortality:** A total of 36 nests were recorded during the fortnightly sampling from January to March 2004, and peak nesting was recorded in the first fortnight of March. These include four juvenile carcasses of Green turtle (*Chelonia mydas*) and 136 carcasses of Olive Ridelys Average turtle nests/10 km/day was 1.2 and estimated turtle nests for the entire season (January-March) was 540 (10.8 nests /km, Table 1). This is an exploitation of the nesting data the 36 nests observed, 25 (69.4%) were found depredated. Among the depredated nests, jackal and domestic dog contributed 54.2% and 33.3% respectively. Inhabitants of the area pilfered about 12.5 % of the nests.

Native communities such as Irulas consume turtle eggs occasionally. Turtle mortality was mainly due to drowning and collusion with fishing gears as fresh carcasses had injuries and prolapsed internal organs. Peak mortality of turtles was observed during January, which reduced gradually during the end of the season i.e. in the first week of March. No signs of turtle activity were seen in the last weeks of March. No nesting was observed then. Fishermen reported seeing hatchlings during the end of the March survey. The nesting was at its peak between Jan 15<sup>th</sup> and March 15<sup>th</sup>. This is the intensive nesting season. No peaks were observed but there was equal distribution of nests.

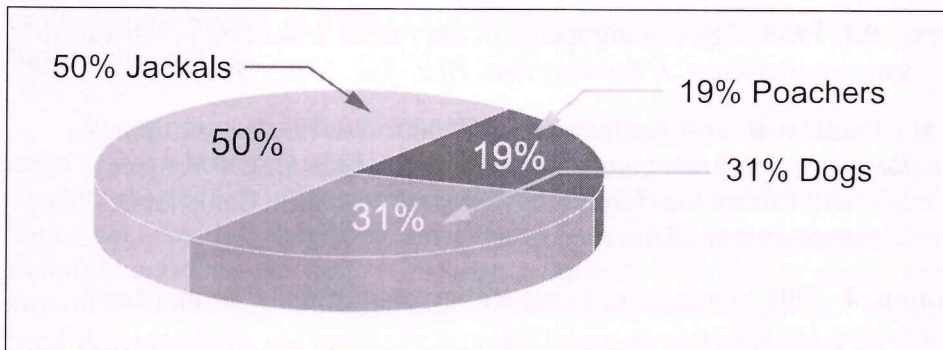
**Table 1.** Mortality of sea turtles

Months	Nests in a sample of 10 km	Nests/day/10 km
January I	3	0.6
January II	6	1.2
Feb I	7	1.4
Feb II	8	1.8
Mar I	14	2.8
Mar II	0	0
Total	38	7.8

**Figure 1.** No. of dead turtles



**Figure 2.** Predation of nests



Carcasses of 134 olive ridleys and four green turtle (*Chelonia mydas*) were observed during this investigation. Turtle mortality was mainly due to drowning and collusion with fishing gears as fresh carcasses had injuries and prolapsed internal organs. Peak mortality of turtles was observed during January, which reduced gradually

Of the 38 nests, 25 (65.8 %) were found poached (both by humans and natural predators) and the rest were found intact with clear signs of nesting. The predator is identified by the telltale signs left behind. If it is a human predator the chamber will be present. Jackals leave their pugmarks and have characteristic way of raiding eggs. Dogs normally take nests near villages. Human predators are professional poachers who walk at night to poach eggs. Jackals are not found near human habitation but feral dogs near villages raid eggs.

### References

- Banugopan K. and P. Davidar. 1999.** Status of sea turtle along the Pondicherry coast, India. *Hamadrayad* 24(1):
- Bhupathy S. and Saravanan S. 2002.** Status of sea turtles along the Tamil Nadu coast, India, *Kachhapa*, (7): .
- Bustard, H.R. 1976.** World's largest sea turtle rookery? *Tigerpaper* 3(3):25.
- Pritchard, P.C.H. and J.A. Mortimer. 1999.** Taxonomy, external morphology, and species identification. In Research and Management Techniques for the Conservation of Sea Turtles. Ed. K.L. Eckert, K.A. Bjorndal, F.A. Abreu-Grobois, M. Donnelly. IUCN/ SSC *Marine Turtle Specialist Group Publication* No. 4.
- Sanjeevaraj, P.J. 1958.** Egg-Laying habits of sea turtles described in the Tamil sangam literature. *J. Bombay Nat. Hist. Soc.* 55(2): 361-363.
- Shanker, K., Pandav, B. and Andrews, H. V. 2003.** *Sea turtle conservation: Research and Management techniques.* A GOI-UNDP Project Manual. Centre for Herpetology/Madras crocodile Bank Trust, Mammalapuram, Tami Nadu,
- Subramanian, J. 2001.** A survey of Olive Ridley sea turtle in Chennai coast. *Cobra* 44: 1-3.
- Whitaker, R. 1997.** A note on sea turtles of Madras. *Indian Forester*, 103 (11): .

## **AN INSTANCE OF DICEPHALY IN COMMON SAND BOA *ERYX CONICUS* (SCHNEIDER) IN NORTHERN KERALA**

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A dicephalic or two-headed Common Sand Boa (*Eryx conicus*) snake was collected from Kottapally, near Ayancherry town (11° 62' 63"N, 75° 67' 41"E), Kozhikode district, Kerala on 15th June 2013 by the Municipality workers, while cleaning a culvert. It was a hatchling of about 15 cm length, from tip of the tail to the tip of the snout of each head. Initially the snake was fed with small earth worms and soil arthropods. Further, they were fed with small House Geckoes (*Hemidactylus* spp.). Subsequently on 17th June 2013, the specimen was handed over to the museum of Zoological Survey of India (ZSI), Western Ghats Regional Centre, Kozhikode for further observation.

In captivity, both the heads were moving and functional, but right head was more active when compared to the left. Movement was also sluggish and most of the time the species was hidden under the dried leaf. We tried with earthworms and larger house geckoes, but they took small hatchlings of House Geckoes (*Hemidactylus frenatus*) and Day Geckoes (*Cnemaspis littoralis*), locally available prey species around. At times they showed their tongue flicking behavior, mostly by the right side head. After ten days, the specimen found to be weakened and finally on 1<sup>st</sup> July, on 15<sup>th</sup> day of its captivity, it died. The dead specimen measured about 30cm in body length. The right head was slightly bigger and more functional than other.



Common Sand Boa is a common snake species found throughout India, Pakistan, Nepal, Bangladesh and Sri Lanka (Whitaker & Captain, 2008). It is one of the commonest snakes in the coastal tracts of northern Kerala. They normally breed before the onset of monsoon. The hatchlings would be noted mainly during rainy season.

Dicephalic or two-headed animals, due to their rarity and malformation, are a subject of scientific interest and curiosity. The most commonly observed and reported two-headed animals are snakes and turtles. Many cases of dicephaly in snakes were reported from the world. Wallach (2007) comprehensively reviewed 950 cases of dicephalic cases reported from the world.

There were many report cases of two headed snakes in India. A thorough review by Whitaker (1971), mentioned about records of two-headedness in Dog-faced Water snake (*Cereberus rhynchops*) from Chennai city, Tamil Nadu; Checkered Keelback (*Xenochrophis piscator*) from Nagercoil, Tamil Nadu; Common Sand Boa (*Eryx conicus*) from Shimoga district in Karnataka. Further, Editor (1971) of the Journal of Bombay Natural History Society supplemented the note with the records of two headed Wolf Snake (*Lycodon aulicus*), Indian Cobra (*Naja naja*) and Russel's Viper (*Daboia russelii*) from India. Similarly, Mitra (1994), reported a case of newly born Russel's Viper (*Daboia russelli*) had two heads and lived for only 23 days in captivity at Calcutta Snake Park, West Bengal. Subsequently, Acharjyo & Patnaik (1996) reported a two-headed Checkered Keelback water snake (*Xenochrophis piscator*) from Odisha, but it survived for only two weeks. The above review reveals that the species normally do not survive long after birth. The maximum life span ever attained by a two headed snake was Black Rat Snake of America, survived for about 20 years in captivity (Mayell, 2002).

### Acknowledgments

The author is grateful to Dr. Kalilash Chandra, Director, Zoological Survey of India, Kolkata and Dr P.M. Sureshan, Officer-in-Charge, ZSI, Calicut for facilities and encouragements. Thanks are also due to Shri. Prasanth, G.K of Ayancherry for locating the snake.



## References

- Acharjyo, L.N. & Patnaik, S.K. (1996).** Notes on Two-headed Snakes. *Cobra*. Vol. 25: 16-17.
- Deraniyagala, P. E. P. (1958).** A double headed Russell's Viper. *Spolia Zeylanica*, 28(2), 167-168.
- Editors. (1971).** *Journal of the Bombay Natural History Society*. 68(2): 462.
- Mayell, H. (2002).** Life is confusing for Two-headed Snakes. *National Geography News*. March, 22, 2002.
- Mitra, D. (1994).** The Birth of Double headed Russel's Viper. *Zoos'Print Journal* IX (11): 22.
- Wallach, V. (2007).** Axial Bifurcation and Duplication in Snakes. Part I. A Synopsis of Authentic and Anecdotal Cases. *Bulletin of the Maryland Herpetological Society*. Vol. 43(2): 57- 95.
- Whitaker, R. (1971).** Notes on Indian Snakes-I. *Journal of the Bombay Natural History Society*. 68(2): 461-463.
- Whitaker, R & Captain, A. (2008).** *Snakes of India. The Field Guide*. Draco Books. Chennai. 383pp.

**BREEDING COLORS OF MALE COMMON GARDEN  
LIZARD *CALOTES VERSICOLOR* (DAUDIN)  
IN HIMACHAL PRADESH, INDIA**

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The Common Garden Lizard *Calotes versicolor* (Daudin, 1802) is a well known common arboreal lizard of India which breeds from April to September (Daniel 2002). During breeding season, excited males acquire brilliant breeding colors and become most pugnacious and aggressive towards other males present in vicinity. The head, shoulder, part of the forelegs and gular pouch turn bright scarlet or crimson with black patches on the sides of the throat (Daniel 2002, Smith 1935, Tikader & Sharma 1992). On the basis of variations and spread of scarlet or crimson and black colors on various body parts of male *C. versicolor*, Sharma (2001,2007,2012 & 2015) has identified six color morphs, five from Rajasthan and one from Karnataka and Andhra Pradesh as following:

**Table1** : various color morphs identified during previous studies

S.No.	Name of color morph	State of occurrence	Reference
1	Jaipur color morph	Rajasthan	Sharma, 2001
2	Udaipur color morph	Rajasthan	Sharma, 2001
3	Alwar color morph	Rajasthan	Sharma, 2007
4	Rayalseema color morph	Karnataka and Andhra Pradesh	Sharma, 2012
5	Bikaner color morph	Rajasthan	Sharma, 2015
6	Jaisalmer color morph	Rajasthan	Sharma, 2015

Recently, on June 30, 2019 while on a tour of Chail hill station in Himachal Pradesh, we observed a different color morph of male *C. versicolor*. Chail is around 44 kilometer from Shimla at an elevation around 2,250m above MSL.

### **The color pattern of Chail morph:**

In this morph, scarlet color appears on head, gular pouch, upper part of fore limbs and thorax. The black patch confined to swollen checks, side of neck and extended up to posterior end of the gular pouch. When seen from sides, it passes just below the tympanum and edge of lower jaw. A distinct smaller black patch is seen towards lower half of eye rim area. Upper tip of pupil makes the upper limits of this patch. Towards posterior side, it project towards tympanum but doesn't touch it (Fig.1 and Photo 1). Rest part of thorax, lumber regions, abdomen, hind legs and tail are of dull whitish color, with this observation, so far seven color morphs have been seen in various parts of the country.

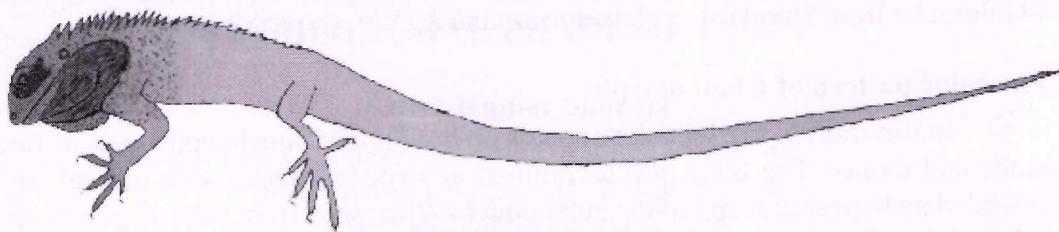
### **Acknowledgement**

The authors are very grateful to Sh. Rupesh Bhavsar and Foundation for Ecological Security to help in the study.

### **References**

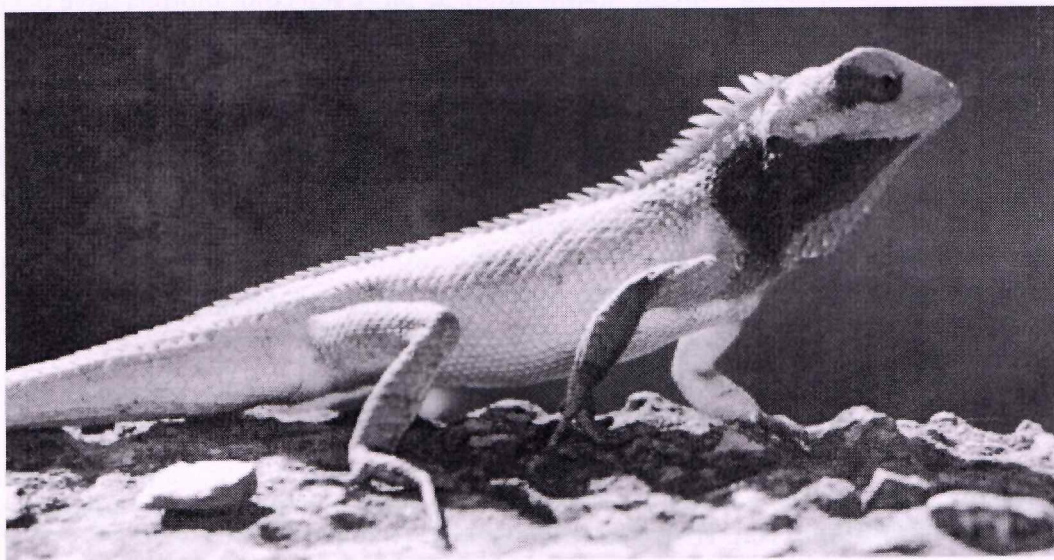
- Daniael, J.C. (2002).** The Book of Indian Reptiles and Amphibians. Bombay Natural History Society and Oxford University Press.
- Sharma, S.K. (2001).** Difference in breeding coloration in *Calotes versicolor* of the southern and northern Aravallis in Rajasthan. *J. Bomb. Nat. Hist. Soc.* 98 (1): 121-122.
- Sharma, S.K. (2007).** Further notes on breeding color in male *Calotes versicolor* *J. Bomb. Nat. Hist. Soc.* 104 (1): 102-103.
- Sharma, S.K. (2012).** Breeding color of male Common Garden Lizard *Calotes versicolor* (Daudin) in South India. *Cobra IV* (1): 23-26.
- Sharma, S.K. (2015).** Notes on two new breeding color morphs of male Common Garden Lizard *Calotes versicolor* (Daudin) from western Rajasthan. *Cobra IX* (2): 25-30.
- Smith, M.A. (1935).** The fauna of British India. Raeptilia and Amphibia. Vol. II, Sauria. Taylor and Francis Red Lion Court, Fleet Street, London.
- Tikader, B.K. and R.C. Sharma (1992).** Handbook Indian Lizards. Zoological Survey of India, Calcutta.

**Fig. 1:** Color morph of male Common Garden Lizard from Cail.



(Dotted portion having crimson-red color and shaded parts having black color. Rest parts possess whitish color)

**Photo 1:** Color morph of male Common Garden Lizard from Cail.



## STATUS AND OCCUPANCY OF NIGIRI SALEA SALEA HORSFIELDII OUTSIDE PROTECTED AREAS AROUND UDHAGAMANDALAM

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### Introduction

Agamid lizards serve as indicators of the health of the environment as their primary prey are insects. They effectively control otherwise would impact pests, who otherwise would impact our crops (Vasudevan and Sondhi 2010). The most significant threat that lizards face is habitat destruction, fragmentation, grazing, horticulture, agricultural practices, tourism and road kills due to vehicular traffic. The Western Ghats has an endemic genus of agamid, namely *Salea* with two species *Salea anamallayana* and *Salea horsfieldi*. The genus *Salea* is restricted to the high hills – Nilgiris and Anamalai & Palni hills in Tamil Nadu state (Bhupathy and Kannan, 1997). Hence an attempt was made to know the present status, distribution, micro and macro habitat usage of one such species – the Nilgiri Salea *Salea horsfieldii* which is an endemic agamid lizard distributed only in the Upper Nilgiris.

### Study Area

Field work was done in and around Ootacamund or Udhagamandalam (in native dialect) which is the major historical human settlement that sprawls over an area of 36 sq km in the Nilgiri District, Tamil Nadu. It is situated at an altitude of 2,240 meters above sea level. Four areas were randomly selected to assess the present status and distribution pattern of Nilgiri Salea *Salea horsfieldii* outside protected areas: namely Poomandu (Kandal) near boat house, Forest Gate, Government Arts College and its surroundings near Stone house, all located. In the Upper Nilgiris, the climate is cold and humid with pines, blue gum (*Eucalyptus globulosus*) and cypress trees. Many of these sampling sites are currently covered with extensive human habitations though they all have both native and exotic vegetation patches, providing a more or less marginal habitat for reptiles.

## Materials and Methods

- (I) Visual Encounter Survey: This method involved searching for the lizards in an area or habitat (Campbell & Chirstman 1982) and recording all animals visible on the surface (Corn and Bury, 1990). Surveys were carried out in each locality during 09:00–12:00 hrs and 16:00–19:00 hrs searching for the target species from July 2011 to February 2012 outside protected areas of Ooty.
- (ii) Transect Sampling: Transect sampling is ideal for studying elevational gradients from low lands to uplands depending on the area of the study site mark the transects on the map of the study area. Totally 3 transects line were laid in each study area during the study period and the data was collected.

## Results

**Population density:** During the study period between July 2011 to February 2012 for a period of 8 months, a total of 44 individuals were recorded (Table 1), which included 15 (34%) males, 8 (18.2%) females, 8 (18.2%) sub adults and 13(29.5%) young ones.

**Area wise distribution:** A maximum of 21 (47.7%) individuals were recorded in Stone house area followed by 7(15.9%) in Forest Gate, Poomandu and 4 (90%) in Rajbhavan areas. A minimum of 4 (90%) individuals were recorded in other areas such as Missionary hills, Fingerpost, Summer house colony areas of Ooty. During the study period in Stone house area totally 15 individuals were noticed. Among this, males 9 (60%) followed by 9 young ones, sub adults accounted for 2 (25%) and only 1 female (12.5%) was recorded. Likewise, in Forest Gate, 2 males were recorded followed by 3 sub adults and 1 female and a young one respectively. Almost same trend was noticed in Poomandu area but in Rajbhavan and other areas, females were recorded in higher number than male and sub adults.

**Seasonal distribution pattern:** Season wise density of lizards showed that a maximum of 24 (54.5%) was recorded during the winter season between November–February, followed by 20 (45.4%) during rainy season, between July–October.

**Month wise data on sightings:** Information gathered during the month between July to February indicated that highest number of 8 (18.1%) was recorded during November followed by 4 (9.09%) in December and 3 (68%) in January and 2(45%) in February. In Stone house, Forest gate and Poomandu 4 and 6 number of lizards

were recorded during July. Lowest number of individuals was recorded during the month of December.

#### **Microhabitat utilization :**

Among the 44 sightings, most were recorded on the shrub followed by basking on the bushes and on the *Eupatorium glandulosum* and under trees. The lizards were mostly active during morning hours than the evening hours. They were mostly noticed while basking on vegetation during the study period. Various activities such as moving, basking, feeding were noticed. Mostly they were associated with thick and green vegetation in the open area where sunlight is enough for basking.

#### **Size composition :**

The morphometric measurements which were recorded from live lizards in and outside protected areas of Ooty are given as follows. The measurements taken were total Body Length, Head Length, Head Width, Tail Length. The total length of males ranged from 7.8-28.0 with a mean of 18.6 and SD of 7.17 (N=15). The females total length varied from 10.0-24.7 with a mean of 18.2 and DS of 5.5 (N=8). The head length of males ranged from 1.0-2.5 with a mean of and SD of 0.6 (N=15). The females head length varied from 1.0-2.5 with a mean of 1.5 and DS of 0.46 (N=8). The head width of males ranged from 0.5-1.2 with a mean of 0.86 and SD of 0.2 (N=15). The females head width varied from 0.5-1.5 with a mean of 0.9 and SD of 0.34 (N=8). The tail length of males ranged from 4.2-16.5 with a mean of 10.9 and SD of 4.8 (N=5). The females tail length varied from 6.4-17.0 with a mean of 11.2 and SD of 4.3 (N=8).

#### **Discussion**

Raddar *et al.* (2005) in their study on Indian rock lizard *Psammophilus dorsalis* give a detailed note on sex ratio and role of evolution of population size. They also report a skewed sex ratio that female is biased with a remarkable sexual dimorphism (size and colour) and interesting differences in perch selection among the sexes. Rajkumar *et al.* (2003) in their study on fan-throated lizard *Sitana ponticeriana* gives the comparative studies on the interrelationship among the, maternal body size of *S. ponticeriana*. They also describe about the clutch size which is of about 7 to 19 and the internal clutches are large than the Potential next clutch. The clutch size and mass were positively correlated with maternal body size i.e. with snout vent length, but not with maternal body condition. The maternal snout vent length also influences the egg mass and egg volume.

Erik *et al.* (2008) in their study on an exotic viviparous agamid lizard *Niveoscincus ocellatus* experimented for climate effect on offspring across seven fields of different temperature in the population. The authors found that long time thermal condition may affect the population dynamics. Rajkumar (2006) in his study on the Southern rock lizard *Psammophilus dorsalis* deals with the communication pattern and its habitat. About 30 free ranging lizards were observed for 18 months and studied for communication or signaling. The result revealed signals by push-ups (heard bobbing), dorsal fluttering, extension of legs, gular sac and raising the tail. Push-ups were performed by both sexes and that dorsal flattening is done as an alarm response when raptors fly over head. The male with extended gular sac and arched-up back uses these gestures for courtship display to attract females.

The population of agamids plays a major role in pest control. The population dynamic of Agamids are given by many researches world wide Rajkumar *et al.* (2005) conducts a survey on a population density, microhabitat use and activity pattern of the Indian rock lizard, *Psammophilus dorsalis* and states that the distribution of *Psammophilus dorsalis* in the rocky regions of Karnataka state. He has under gone a research in these lizards for 18 months and has given its distribution facts. In his studies he states that the males occupies the hill tops and they are dominant over females. Rajkumar (2006) discusses about the life history of the garden lizard *Calotes versicolor* seeks to explain patterns of variation among geographically widespread populations of some species to understand their ecology and adaptations and is widespread, extensively studied. The life history traits of *Calotes versicolor* are compared to understand variation in life history with reference to their geographical distributions.

*Salea horsfieldi* is an agamid lizard endemic to higher altitudes of Nilgiris found only above 1700 meters. As there is no elaborate work done on *Salea horsfieldi* this work was conducted to find out the occupancy, density and sex characterization. The population of adults were characterized by female-biased sex ratio. In the Indian rock lizard *Psammophilus dorsalis* males are larger than the females and gorgeous with nuptial colour during breeding season, while the females are mottled and difficult to distinguish from stones (Radder *et al.* 2005). Here in the altitude of Nilgiris the male is larger than the females in body size with 95 mm body length 250 mm as tail length making 345 mm as total length (Smith 1935) and females are smaller than the male with 75 mm body length 200 mm tail length making 275 mm as total body length (Smith 1935). During breeding season the males are clearly evident with dark brown and white colour whereas the females turn green merging with the vegetation that they inhabit.

## References

- Anon. 1991.** The Indian Wildlife Protection Act 1972. Natraj publishers, Dehra Dun.
- Aruna, C.H, Reddy, T.B. and M.V. Subbarao. 1993.** Feeding ecology of *Psammophilus blanfordanus*. *J. Bombay Nat. Hist. Soc.* 90 (2): 295-296.
- Bhatti, U.S. Bhatti, S.K. and S.S. Bhatti 1987.** Vegetation in the food content of garden lizard *Calotes versicolor*. *J. Bombay Nat. Hist. Soc.* 84 (3): 692-693.
- Bhupathy, S and P.Kannan 1997.** Status of Agamid lizards in the Western Ghats of Tamil Nadu. SACON Technical Report No.5 Salim Ali centre for Ornithology and Natural History, Coimbatore.
- Cambell, H.W. and S.P. Christman 1982.** Herpetological communities. Wildlife Research Report 13. US Department of the Interior and Fish and Wildlife Service. Washington D.C. pp 193-200.
- Corn, P.S. and R.B. Bury 1990.** Sampling methods for terrestrial amphibians and reptiles. US Department of Agriculture, Forest Service, General Technical Report PNW-GTR-256.
- Daniel. J.C. 2002.** The book of Indian reptiles and Amphibians. Bombay Natural History Society, India.
- Das, I. 1994.** The Reptiles of south Asia: Checklist and distributional summary. *Hamadryad* 19:15-40.
- Das, I. 2002.** Photographic guide to snakes and other reptiles of India. New Holland Publishers, UK.
- Honegger, R.E. 1979.** Red Data Book. Vol.3 Amphibia and Reptilia IUCN, 1110 Morges, Switzerland.
- Inger, R.F., Shaffer, H.B., Koshy M. & Bakde 1984.** A report on a Collection of amphibians and reptiles from the Ponmudi, Kerala, South India. *J. Bombay Nat. Hist. Soc.* 81(2): 406-427.
- Ishwar N.M. Ravichellam and Ajithkumar. 2001.** Distribution of forest floor Reptiles in the rain forest of Kalakad Mundanthurai Tiger, Reserve South India. *Current Science*, 80(3): 423-418.
- Ishwar, N.M and Das, I. 1998.** Rediscovery of *Calotes andamanensis* Boulenger, 1891 and reassessment of the type locality. *J. Bombay Nat. Soc.* 95:514-515.

- Kalaiarasan.V and P.Kannan. 1994.** Range extension of southern green lizard (*Calotes calotes* Linn., 1758) *Cobra*, 15: 14.
- Kannan, P. and V. Kalaiarasan, 2005.** A note on breeding biology of agamid lizards, *Cobra*, 61:21-24.
- Karthikeyan, S.1993.** On the breeding of the green calotes *Calotes calotes*. *J. Bombay Nat. Hist. Soc.* 90: 295.
- Kastle,W., Schleich, H.H. and K.B. Shah. 1993.** Contributions to the biology of *Japalura tricarinata* and *J. polygonata* (Sauria: Agamidae). *J. Bombay Nat. Hist. Soc.* 90(2): 223-262.
- Malhotra, A. and K.Davis 1991.** A report on a herpetological survey of the Srivilliputtur Reserve Forest, Tamil Nadu. *J. Bombay Nat. Hist. Soc.* 90(2):223-262.
- Murthy, T.S.N.1980.** Recent rediscovery of the rare agamid lizard *Otoctyptis beddomii*. *J. Bombay Nat. Hist. Soc.* 77(2):343-344.
- Pianka, E.R.1977.** Reptilian species diversity. In: Gans, C. and Tinkle, D.W. (Eds.), *Biology of the Reptilia*. Vol.7. Academic press, London. pp.1-34.
- Porter, R. 1972.** *Herpetology*. W.B. Saunders company, Philadelphia, USA.
- Radder S.R. 2006.** An overview of geographic variation in the life history traits of the tropical agamid lizard *Calotes versicolor*. *Current Science*, 91(5):
- \_\_\_\_\_.
- Radder S.R. and B.A. Shanbhag. 2003.** Interrelationships among reproductive traits of female lizard, *Sitana ponticeriana* (Cuvier). *Current Science*, 85 : 189-291.
- Rodger, W.A and H.S. Panwar 1988.** Planning a protected Area net work in India vol.1. Wild life Institute of India, Dehra Dun.
- Subbarao, M.V.1974.** Behaviour of the Agamid garden lizard *Calotes versicolor*. *J. Bombay Nat. Hist. Soc.* 71(1):148-149.
- Vasudevan, K. and S. Sondhi. 2010.** Amphibians and Reptiles of Uttarakhand, India. Wildlife Institute of India, Dehra Dun.
- Vyas, R.1995.** Breeding record of *Calotes rouxi* (Dumeril and Bibron). *Zoos print* 10(7):36-38.

**SNAKE ENCOUNTERS ON ALANGAYAM –  
JAMUNAMARATHUR GHAT ROAD IN KAVALUR RANGE,  
JAVVADHU HILLS, TAMIL NADU**

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Snakes are a group of animals that are quite misunderstood and feared by people. Not many studies have been done on snakes in India, especially about human-mediated road mortalities. The Javvadhu hills are ranges that form part of the Eastern Ghats in Vellore and Thiruvannamalai districts of Tamil Nadu. Over 30 species of snakes have been reported from this under-explored region (Ganesh & Arumugam, 2015, 2016; Ganesh et al., 2018). From 2016 to 2019, across a three year period, I photo-documented all the snakes that I sighted on Ghat roads during my field excursion duty in Kavalur Range (12.578°N, 78.808°E; 570 m asl), where motorable Ghat road extends from Alangayam to Jamunamarathur (and on to Polur). The snakes were identified using field guides (Daniel, 2002; Das, 2002; Ganesh, 2015; Whitaker & Captain, 2004). Only snakes that were sighted on roads, either live or dead, are enumerated here.

**Table 1.** Details of snake species (\* venomous) sighted in Kavalur Ghat road

Species	Species	Dead	Live
Common Sand boa	<i>Eryx conicus</i>	0	1
Red sand boa	<i>Eryx johnii</i>	1	1
Indian rock python	<i>Python molurus</i>	1	0
Vine snake	<i>Ahaetulla</i> sp.	0	1
Forsten's Cat snake	<i>Boiga forsteni</i>	1	0
Indian Cat snake	<i>Boiga trigonata</i>	1	0
Ceylon flying snake	<i>Chrysopelea taprobanica</i>	0	1
Trinket snake	<i>Coelognathus helena</i>	1	1
Indian Reed snake	<i>Liopeltis calamaria</i>	0	1
Slender Wolf snake	<i>Lycodon anamallensis</i>	0	1
Banded kukri	<i>Oligodon arnensis</i>	1	0
Russell's kukri	<i>Oligodon taeniolatus</i>	2	0
Black-headed snake	<i>Sibynophis subpunctatus</i>	1	0
Olive keel back	<i>Atretium schistosum</i>	1	0
Checkered keelback	<i>Xenochrophis psicator</i>	1	0
Common krait*	<i>Bungarus caeruleus</i>	3	0
Spectacled Cobra*	<i>Naja naja</i>	2	1
Russell's viper*	<i>Daboia russelii</i>	1	1
Total spp. 18		17	9

A total of 18 species of snakes were documented on the Ghat roads. This includes snakes present in six families: Erycidae, Pythonidae, Viperidae, Elapidae, Natricidae and Colubridae. As can be seen from Table 1, the most frequently sighted snake on roads is the common krait (*Bungarus caeruleus*) – a highly venomous, strictly nocturnal snake that often basks on warm bitumen tar roads during night.

Among venomous snakes, two other species, the spectacled cobra (*Naja naja*) and the Russell's viper (*Daboia russelii*) were also seen on roads, both dead and alive. The endangered Indian python (*Python molurus*) is the largest of all Indian snakes and yet, surprisingly, was represented by roadkills. Burrowing snakes (*Eryx*), aquatic snakes (*Atretium*, *Xenochrophis*) and even arboreal snakes (*Chrysopelea*, *Ahaetulla*) were recorded as road kills or seen crossing the roads.

Also, a common species, the rat snake (*Ptyas mchuosa*) was not encountered on roads, perhaps because of its wary habits of avoiding humans. Among the recorded



snake species some such as the Forsten's cat snake (*Boiga forsteni*), Ceylon flying snake (*Chrysopelea taprobanica*), Indian reed snake (*Liopeltis calamaria*) and Black-headed snake (*Sibynophis subpunctatus*), were rare, range-restricted ones.

Apart from the afore-mentioned 18 snake species, many others were also previously known or sighted from this range (Ganesh & Arumugam, 2016; Ganesh et al., 2018; my pers. obs.). Some were previously recorded on roads in Javvadhu hills (e.g. shieldtail snakes *Uropeltis spp.* by Ganesh & Arumugam, 2015) but were not recorded during the present observation and vice versa (e.g. the Big Four venomous snakes, in this work). This could possibly be attributed to different altitudinal section of Ghat roads sampled, as some snakes (e.g. Uropeltids) are partial to higher, wet forested hill slopes.

This preliminary study has some implications on the detrimental effects of road traffic on snakes (and other wildlife). It would substantiate some potential moves of curtailing / regulating the traffic extent and timing and by increasing speed-breakers as well as wildlife-crossing signage boards along such eco-sensitive roadways for boosting wildlife conservation.

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## References

- Daniel, J. C. (2002).** *The book of Indian reptiles and amphibians*. Bombay Natural History Society, Oxford Press, India.
- Das, I. (2002).** *A photographic guide to snakes and other reptiles of India*. New Holland Publishers, UK.
- Ganesh, S.R. (2015).** An illustrated guide to common Indian amphibians and reptiles. Chennai Snake Park Trust, India.
- Ganesh, S. R., & Arumugam, M. (2015).** Microhabitat use and abundance estimates of under storey herpetofauna in the highlands of southern Eastern Ghats, India, with observations on roadkill mortalities. *Asian Journal of Conservation Biology*, 4(2): 143-150.
- Ganesh, S. R., & Arumugam, M. (2016).** Species richness of montane herpetofauna of southern Eastern Ghats, India: a historical resume and a descriptive checklist. *Russian Journal of Herpetology*, 23(1):7-24.
- Ganesh, S.R., A. Kalaimani, P. Karthik, N. Baskaran, R. Nagarajan & S.R.Chandramouli (2018).** Herpetofauna of Southern Eastern Ghats, India – II From Western Ghats to Coromandel Coast. *Asian Journal of Conservation Biology*, 7 (1): 28-45.
- Whitaker, R. & Captain, A. (2004).** *Snakes of India – the field guide*. Draco Books, Chengelpet, India.



#### FORM IV

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