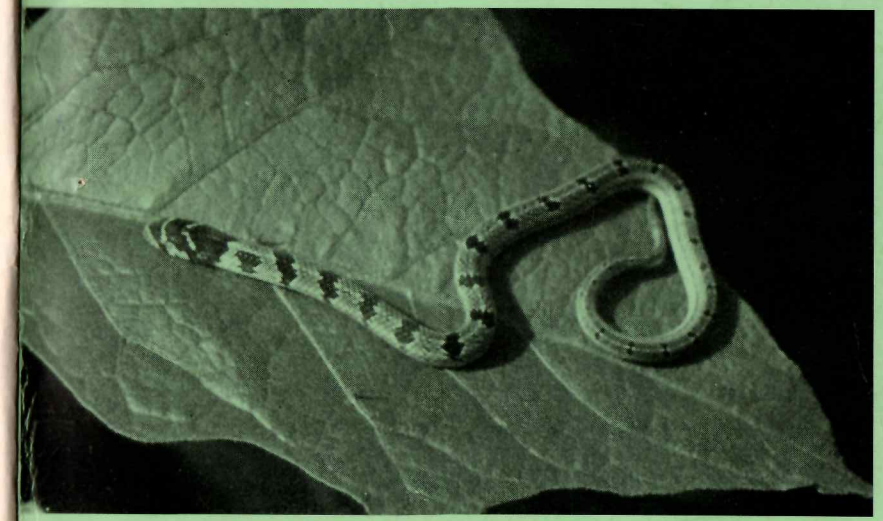
Cobra

Volume - 51 January - March 2003



CHENNAI SNAKE PARK TRUST

Quarterly Newsletter of the Chennai Snake Park Trust

Cover

Russells Kukri snake (*Oligodon taeniolatus*)

The common kukri snake found all over India, mostly in stone piles and crevices. Feeds on geckos, lizards and skinks.

Photo : **K. Ramachandr**

"This spiritual elation and response to nature is man's generic mark"

- Robert Bridges
(Testament of Beauty)

Cobra

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Erratum

In vol. 50 (Oct - Dec. 2002), the name of Satish Kumar Sharma, Range Forest Officer, Phulwari Wildlife Sanctuary, Udaipur - 307 025, the first author of the article "Occurrence of the Common Tree Frog *Polypedates maculatus* (Gray, 1834) in Banswara District of Rajasthan State" was omitted by oversight. The error is regretted.

- Editor

STUDIES ON THE AMPHIBIAN FAUNA OF INDIRA GANDHI WILDLIFE SANCTUARY AT ULANDY RANGE, TAMIL NADU

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ABSTRACT

The paper discusses the amphibian fauna of Indira Gandhi Wildlife Sanctuary of Tamil Nadu (studied at Ulandy range 76 sq.km. of the sanctuary). Visual Encounter Survey method of Hayer *et al.*(1994) was employed for the survey by systematically sampling 10 x 10m study plots from January to March 2002. Survey was also made in all water bodies in this range. The microhabitat preference was also recorded by direct sighting. The species richness and diversity indices with reference to different habitats were calculated using the STAT ECOL computer package. 17 species of amphibians under 3 families were recorded during the study period. Highest number of species was recorded in the wet evergreen forest along with greater diversity of amphibians in this habitat.

KEYWORDS

Amphibia, Western Ghats, Indira Gandhi Wildlife Sanctuary, Species diversity, Species richness, Microhabitat, Visual Encounter Survey, Bufonidae, Ranidae, Rhachophoridae.

Amphibians have high species richness and endemism in India with

two major centres of distribution, North - East India and Western Ghats. The diversity of amphibian species in India has been described by many investigators (McCann, 1938; Taylor, 1961; Daniel and Sekar, 1989; Inger and Dutta, 1986; Dutta 1997 Karthikeyan et al., 2001) and the number of species continues to increase due to more of field studies. Out of 216 species in India, 120 species occur in the Western Ghats with 93 endemics. BCPP - CAMP (2001) reported 205 species of amphibians in India, out of which 29 are endemics and 76 are non-endemics.

STUDY AREA

The Indira Gandhi Wildlife Sanctuary is situated in Coimbatore district of Tamil Nadu. It lies between latitude 10°13' - 10° 33' N and longitude 76° 49' - 77° 21' E. It covers about 958 sq. km. Area. The terrain is undulating with varying elevations between 340 and 500 mts MSL. Rainfall varies from 500-5000mm. The present study was confined to the Ulandy range of this sanctuary.

VEGETATION

The vegetation of the sanctuary is a broad spectrum of dry deciduous forests, moist deciduous forests, thorn forests, evergreen forests, savannah forests, montane grasslands and man-made plantations of teak. This classification was done by the forest department of Tamil Nadu. Common weeds like *Lantana* and *Eupatorium* were found spread out in many parts of the sanctuary.

METHODOLOGY

Visual Encounter Survey (VES) method of Hayer *et al.* (1994) was employed for the survey of the amphibian population. 10 x 10m study plots were systematically sampled from January to March 2002. Survey was also made in all the important water bodies, streams and checkdams. The microhabitat preference of the amphibians was also recorded. The

amphibians were identified using the diagnostic keys given by Sathyamurthy, (1967); Daniel, (1963, 1967, 1975); Dutta, (1985); Kaushik Deuti, (1995) and Ranjit Daniels, (1995). Species were identified at ZSI Chennai and Chennai Snake Park. The species richness and diversity indices were calculated using the statistical computer package SPIDERS.BAS OF STATECOL (Ludwig and Reynolds 1988).

OBSERVATIONS AND RESULTS

A total of 17 species of amphibians were recorded in the present study consisting of a single species of Bufonidae, 9 species of Ranidae, 6 species of Rhacophoridae and one unidentified species in two different habitats (Table 1). Highest number of species was recorded in the wet evergreen forest (16) followed by Teak plantation (11). Of these, *Micrixalus fuscus, Nyctibatrachus major, Polypedatus pseudocruciger, Philautus glandulosus, Philautus leucorhinus and Philautus pulcherrimus* were endemic to Western Ghats and constitute 35.29% of total amphibian species. *Bufo melanostictus, Rana beddomi, Rana temporalis, Limnonectus brevipalmata, Euphlyctis cyanophlyctis, Limnonectus keralensis, Philautus beddomi, Philautus glandulosus, Philautus elegans, Philautus pulcherrimus* were common in wet evergreen forests and teak plantations. Of the 2,976 sightings, 1569 were recorded in the wet evergreen forests and 1,407 in teak plantations. The microhabitat observed were on the floor, on water, on rocks, on stones, on leaves, on moss or algae, under fallen leaves, under stones, under logs, under soil, edge of the bank, among dried leaves, among fallen leaves in grassland and in crevices. The richness indices were found to be high in Wet Evergreen Forests followed by teak plantations. The Shannon-Weiner index indicates wet evergreen forest as the most diverse habitat (2.04) followed by teak plantations (1.38).

ACKNOWLEDGEMENT

We thank the Chief Wildlife Warden, Govt. of Tamil Nadu for granting permission to do the work in the sanctuary. We thank the warden Thiru. V.Ganesan, I.F.S., Indira Gandhi WLS & NP for his guidance. We

thank Dr.Ravichandran, (ZSI) Chennai and Dr.Ranjit Daniels, (Chennai Snake Park) Chennai for the species identification. We thank the Conservation International - DAPTF for financial assistance for this study.

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Sl. No.	Species	W.E.F	T.P
I	**FAMILY BUFONIDAE**		
1	*Bufo melanostictus*	+	+
II	**FAMILY RANIDAE**		
2	*Rana beddomii*	+	+
3	*Rana temporalis*	+	+
4	*Limnonectes brevipalmata**	+	+
5	*Euphlyctis cyanophlyctis*	+	+
6	*Limnonetes keralensis*	+	+
7	*Limnonectes limnocharis*	+	-
8	*Micrixalus fuscus*	+	-
9	*Nyctibatrachus major*	+	-
10	*Nyctibatrachus sp.,**	+	-

Sl. No.	Species	W.E.F	T.P
III	**FAMILY RHACHOPHORIDAE**		
11	*Polypedatus pseudocrucriger*	+	-
12	*Philatus beddomii*	+	+
13	*Philatus glandulosus*	+	+
14	*Philatus elegans*	+	+
15	*Philatus leucorhinus*	+	-
16	*Philatus pulcherrimus*	+	+
17	Unidentified	-	+
	Total	16	11

+ Present - Absent W.E.F = Wet Evergreen Forest T.P. = Teak Plantation * = Doubtful.

LONGEVITY OF INDIAN SNAKES

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The longevity of snakes varies from species to species, other things being equal. The general experience is that large snakes tend to live longer than smaller ones. Ernst C.H. and Zug G.R., however, say that "contrary to expectations ... small-bodied species were not found to have shorter life-spans than large-bodied species".

No data are available on the longevity of snakes in the wild. Some data are available with reference to captive snakes in zoos and personal collections.

Generally speaking, snakes in captivity are likely to live longer than in the wild because of freedom from predators, regular availability of food and prompt medical care. While this may be true of snakes born in captivity, it may not be so in the case of snakes captured from the wild and reared in captivity. This is so for many reasons. Firstly, the snake caught from the wild may already be advanced in age and there is no method to estimate its age at the time of capture. Secondly, the snake captured may be suffering from some illness or the other the symptoms of which may not be apparent except in the case of tumours, infestation with ectoparasites, external injury etc. Thirdly, translocation from the wild to a new environment and captive conditions always involves an element of stress.

Published literature has very little information on longevity in individual species. The following account on Indian species has been compiled from the available literature.

Data on longevity of snakes

Sl. No.	Species Name	Longevity	Reference
1	Common sand boa	26 years 10 months	Slavens F.L. (1989)
	Eryx conicus	13 years 10 months	Whitaker R. (1978)
2	Red sand boa	23 years 4 months	Slavens F.L. (1989)
	Eryx johnii		
3	Burmese Rock Python	28 years 3 months	Slavens F.L. (1989)
	Python molurus bivttatus		
4	Indian python		
	Python molurus	13 years	Anonymous (1957)
	molurus	22 years 3 months	Daniel J.C. (2000)
		34 years 2 months	Slavens F.L. (1989)
		31 years	Burton J.A. (1998)
		31 years 1 month	Engelman W.E.& Obst, F.J. (1981)
		19 years	Wall. Frank (Quoting Gunther, 1921)
		34 years 2 months	Whitaker R. (1978)
5	Reticulated Python	26 years 9 months	Slavens F.L. (1989)
	Python reticulatus		
6	Rat snake	11 years	Daniel J.C. (2002)
	Ptyas mucosus	11 years 1 month	Slavens F.L. (1989)
		10 years 7 months	Whitaker R. (1978)
7	Checkered keelback	7 years 10 months	Slavens F.L. (1989)
	Xenochrophis piscator		
8	Common cat snake	8 years 2months	Slavens F.L. (1989)
	Boiga trigonata		
9	Flying snake	6 years 7 months	Slavens F.L. (1989)
	Chrysopelea ornata		
10	Krait	17 years 5 months	Slavens F.L. (1989)
	Bungarus caeruleus		
11	Banded Krait	14 years	Engelman W.B and F. J. Obst (1981)
	Bungarus fasciatus	11 years 6 months	Slavens F.L. (1989)
		11 years 6 months	Whitaker R. (1978)
12	Common cobra	17 years 3 months	Slavens F.L. (1989)
	Naja naja	20 years 2 months	Honegger R.E (1969)
		6 years	Anonymous (1957)
		21 years 6 months	Whitaker R. (1978)
13	Monocellate cobra	24 years 8 months	Slavens F.L. (1989)
	Naja kaouthia		
14	Black cobra	19 years 4 months	Slavens F.L. (1989)
	Naja oxiana		
15	King cobra	21 years 9 months	Slavens F.L. (1989)
	Ophiophagus hannah		
16	Yellow sea snake	2 years 1 month	Slavens F.L. (1989)
	Pelamis platurus		
17	Hook-nosed sea snake	4 years	Ernst C.H. & R.G.Zug (1996)
	Enhydrina schistosa		
18	Saw-scaled viper	11 years 10 months	Slavens F.L. (1989)
	Echis carinatus	10 years 3 months	Whitake R. (1978)
19	Russell's viper	11 years 7 months	Slavens F.L. (1989)
	Vipera russelli		
20	Bamboo pit viper	6 years 2 months	Slavens F.L. (1989)
	Trimeresurs gramineus		

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A BENEFICIAL AND LUCRATIVE OCCUPATION FOR THE IRULAS

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The Iurla tribals are found mainly in the Southern States of India such as Andhra Pradesh, Karnataka and Tamilnadu. They are traditionally forest dwellers and hunter - gatherers. Their skill in catching animals, especially snakes, is remarkable.

The Irulas in Chengalpattu District, Tamil Nadu alone numbered some 46,000 according to the 1991 census. There was a time when their main source of livelihood was catching snakes and selling their skins to trade for manufacture of various fancy goods and for export. In 1968 the export of snake skin from India was estimated as worth nearly rupees eleven crores.

While the ready market for snake skins within the country and outside proved to be very remunerative for the Irulas, the large-scale capture of snakes to meet the demands of trade resulted in rapid depletion of snake population and severe damage to the environment since snakes play a very vital role in keeping down the rodent population. The enactment of the Wildlife (Protection) Act in1972 put a brake on this indiscriminate destruction of snakes. But it also meant that a traditional source of livelihood for the Irulas was put in jeopardy.

In this context it was also important to note that there had always been great demand for snake venom from the pharmaceutical industry. Anti-snake venom prepared from the blood plasma of horses injected with snake venom is the only known scientific remedy against snakebite which is estimated to cause some 20,000 deaths in India annually. Snake venom is also in demand from laboratories doing research on medicines for a variety of illnesses such as multiple sclerosis, cancer etc.

It was against this background that in 1978 the Irula Snake Catchers' Industrial Cooperative Society was established near Mahabalipuram in Tamil Nadu which has a sizeable Irula population in the vicinity.

The Society is registered under the Tamil Nadu Cooperative Societies Act and has at present 342 members. Membership is exclusively for Irula tribals.

The main objective of the Society is to extract venom from the big four i.e. cobra (*Naja naja*), krait (*Bungarus caeruleus*), Russell's viper (*Vipera russelli*) and saw scaled viper (*Echis carinatus*). The Society is fully equipped with facilities necessary for lyophilization by which the liquid venom is converted into crystals with a high degree of purity.

The average yield of lyophilised powder venom from one snake in one extraction is 90 mg for cobra, 50 mg for Russell's viper, 6 mg for krait and 1 mg for saw scaled viper.

The Society is licensed under the Wildlife (Protection) Act section 12 (d) to catch snakes for extraction of venom.

Venom is extracted once in a week. After four extractions, the milked snakes are released into the wild. Since the venom extraction is done carefully by trained tribals, mortalities are negligible or nil. Therefore, this scheme poses no danger to the conservation of snakes.

Table No.1 gives the relevant figure for the block of 12 years from 1990-91 to 2001-02.

Particulars	Cobra	Krait	Russell's viper	Saw scaled viper
Opening Stock as on 1.4.90	4	513	4	2174
Snakes caught from 90-91 to 2001-2002	8577	16972	8209	49739
Total stock	8581	17485	8213	51913
Snakes Death from 90-91 to 2001-2002	59 (0.68%)	554 (3.16%)	63 (0.76%)	1206 (2.32%)
Snakes released from 90-91 to 2001-2002	8522	16931	8150	50707

The table would show that the mortality rate during captivity for venom extraction is very minimal i.e. 0.68 to 3.16%.

The venom production in the last twelve years is given in table No.2.

Table 2. Quantity of venom produced in the last twelve years (in grams)

Sl.No	Year	Cobra	Krait	Russells viper	Saw scaled viper
1.	1990-91	–	63.860	–	17.090
2.	1991-92	–	47.920	–	16.123
3.	1992-93	40.420	10.430	16.810	1.630
4.	1993-94	338.506	23.020	86.770	3.970
5.	1994-95	199.940	36.060	197.715	9.265
6.	1995-96	515.240	34.520	210.800	39.030
7.	1996-97	613.094	27.275	467.070	29.640
8.	1997-98	416.080	44.345	304.570	19.260
9.	1998-99	426.160	34.270	335.970	51.690
10.	1999-2000	237.795	41.760	157.430	34.970
11.	2000-2001	159.700	40.915	91.670	35.105
12.	2001-2002	121.595	80.915	98.605	26.830
	Total	**3,113.530**	**485.290**	**1967.410**	**284.603**

SPECIFICATION OF SNAKE VENOM (Freeze dried)

Common Cobra (*Naja naja*)	Minimum lethal dose for18 gms mouse not more than 0.010 mg.
Common Krait (*Bungarus caeruleus*)	Minimum lethal dose for 18 gms mouse not more than 0.003 mg.
Russell's Viper (*Vipera russelli*)	Minimum lethal dose for 18 gms mouse not more than 0.008 mg.
Saw scaled viper (*Echis carinatus*)	Minimum lethal dose for 18 gms mouse not more than 0.012 mg.

Most of the venom is supplied to the Haffkine Bio-pharmaceutical Corporation Ltd., Mumbai, the Central Research Institute, Kasauli and the King Institute, Guindy, Chennai for preparation anti-snake venom. Apart from this, supplies are also made for research purposes to various Universities and like bodies. During the last twelve years, the Society sold 2030 gms of Cobra venom, 434 gms of krait venom, 1753 gms of Russell's viper venom and 344 gms of saw scaled viper venom.

The sale price of venom is at present Rs.7,500 per gram for cobra and Russell's viper and Rs.25,000 per gram for krait and saw scaled viper

Since the Society is primarily meant for the benefit of its members, a liberal pricing policy is adopted in purchasing snakes captured by the members. This fetches a member Rs.3,000 to 4,000 per month. While this ploughs back to the members the possible profits, keeping the actual profits at the end of the year to the minimum necessary, it also ensures that earnings of individual members are linked to their performance. The Society thus functions in the spirit of a true cooperative.

The members also earn by supplying live feed (rats) to the Society. In addition, the members get an annual bonus of 50% and various monetary and other benefits from the Society.

The Society has been working at a profit continuously for the last ten years, is entirely self-sufficient and does not get any loan or grant from any source.

The Irula Snake Catchers' Industrial Cooperative Society Ltd. is a unique and successful venture in the country in the rehabilitation of tribals.

TAXIDERMY WITH SNAKE-SLOUGH

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During field study at Hosangadi, a place in the Western Ghats, situated at 13°.53' to 13°.40' south latitude and 74° .53' to 75°.05' east longitude, a snake's shed skin was found. It was entire and smelled fresh. The slough was carefully collected, rolled and carried to our laboratory at Dharwar, Karnataka, where it was stuffed.

The snake was identified studying the details of scalation and body measurements and by reference to authors like Daniel (1983) and Smith (1943). The slough was identified as that of a rat snake (*Ptyas mucosus*). It measured 9.6 feet; diameter of head 12.5 cm, trunk 17.0 cm and tail 2.3 cm.

Before stuffing, the slough was spread on the table carefully and a ventral cut was made. A metal wire of the length of the slough was taken and around it cloth and cotton was wound in keeping with the diameter of the slough at various points. The slough was put round it and fixed with transparent cellotape ventrally. To preserve it from tearing and also to protect it from pests it was varnished twice. After drying, the stuffed slough was placed on a wooden stand and exhibited at the Karnatak Science College's Zoology museum.

CATCHING A SNAKE WITH *MANTRAS* IN NEEMUCH DISTRICT, MADHYA PRADESH

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In January 2003 I was a zoology lecturer in Government Graduate College, Neemuch, Jawad District in northern M.P. (latitude 24°1.5' N and 75° E and an altitude of 488m ASL.) During my stay, I came in contact with a young photographer who is also a snake-catcher and was reputed to catch snakes with *mantras* or incantations. Whenever he receives a call, he goes to the spot, takes 4-5 ml of water and chants some *mantras* and sprinkles the water on the snake's body. Soon the snake becomes very docile and then he catches the snake with his bare hands.

After observing him at work, I found him to be a skilful and deft snake-catcher, alive to the ways of snakes of different species. The *mantras* were meant not for the snake but for those watching him. As in many other parts of India, the people of Jawad also believe that snakes can be caught with *mantras*.

Recently, I had a call for a rescue. I went to the house and found a harmless trinket snake (*Elaphe helena*), a metre long. I caught the snake easily, all the while chanting an incantation. Actually, I was repeating over and over again the words "Wow! What a beautiful *Elaphe helena*". The crowd was suitably impressed.

ACKNOWLEDGEMENTS

I am thankful to my student Ms. Sunita Sen and Mr.Purushotam Somani of Jawad District, Neemuch M.P.

RANDOM HARVEST

The kiss of life

A report in the *Hindu Business Line* of 13 Apr. 2003 quotes a news item in *The Sun* on how Claire Farina of Lydney, Gloncestershire, a vet's nurse, saved the life of a 5 foot non-poisonous pet snake by blowing into the reptile's mouth after it stopped breathing during an operation. The snake was a Californian king snake.

'White' salty

Two somewhat mutually contradictory news items appeared in the *New Indian Express* of 5th June 2003 and *India Today* of 23rd June 2003 on an 'albino' crocodile in the Bhitarkanika Wildlife Sanctuary. We wrote to the Principal Chief Conservator of Forests and Chief Wildlife Warden, Orissa, to ascertain the facts and were informed as follows:

The partially white female saltwater crocodile (*Crocodylus porosus*), localy known as *sankhua* (meaning conch colour), has been reared in captivity at the Saltwater Crocodile Research and Conservation Centre, Dangmal, in Bhitarkanika Wildlife Sanctuary and National Park since 1975. This is not an albino. Attempts at providing her with a male partner for breeding on three successive occasions did not succeed since she killed all the three males. She also got badly injured in the process. Since 1985, she has been laying infertile eggs once in two or three years.

During the breeding season (November to May), she does not show inclination to feed and her behaviour becomes erratic probably due to stress for want of a partner. It is, therefore, proposed to release her into the Bhitarkanika river system inside the sanctuary where she may behave normally and find a compatible mate by herself.

In this river system there is a very small population of about ten partially white crocodiles.

Where fact ceases and fancy begins

Myths about snakes are many. But here is one few would have heard. It is found in the celebrated Diary of Samuel Pepys under date Feb.4th 1661-62: "..... Discoursing on the nature of serpents, (one Mr.Templer) told us (that serpents) do feed upon larks which they take thus: They observe when the lark is soared to the highest, and crawl till they come to be just underneath them; and there they place themselves with their mouth uppermost, and there, as is conceived, they do inject poison upon the bird; for the bird do suddenly come down again in the course of a circle, and falls directly into the mouth of the serpent".(*Sic*)

As happens often, this is a mixture of fact and fancy. The factual part is the well-known parachuting breeding display of certain species of larks. Salim Ali and Dillon Ripley vividly describe this behaviour of the ashy-crowned sparrow lark (*Eremopterix grisea)* found in India: "Male has a very spectacular song-flight and aerial display. From his perch on a stone on the ground, he soars up vertically for 30 metres or so to hover in wide circles and sing in the typical skylark pattern. On completion of the song, the performer nose-dives perpendicularly for a distance with wings pressed to the sides. At the bottom of the dive, he suddenly pulls round to face the sky, and using the momentum aided by a few rapid wing-beats,

zooms up a few metres once more. On the crest of the wave he reverses to repeat the nose-dive and descends a step lower, and so on ..... Just when perilously near to crashing, he opens his wings and flattens out to alight airily on a clod or stone."

Similar behaviour occurs in the British species such as the skylark *Alauda arvensis* and the Calandra lark *Melanocorypha calandra* which should have been observed by the original author of the account quoted by Pepys. The coincidental presence of a snake in the grass and the myth that the snake's stare mesmerizes its victims might have made his fancy soar.

– B. Vijayaraghavan.

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AIMS AND OBJECTIVES OF

CHENNAI SNAKE PARK TRUST

i) To maintain and display a captive collection of snakes and other reptiles as a means of education of the public.

ii) To undertake captive breeding of vulnerable species of snakes and other reptiles.

iii) To promote knowledge on snakes, and other reptiles and amphibians and dispel the erroneous beliefs about them.

iv) To aid and assist research on reptiles and amphibians.

v) To provide facilities for the identification and classification of snakes and other reptiles and amphibians and, for this purpose, maintain a museum of study collections.

vi) To maintain a library of books and other literature on reptiles and amphibians.

vii) To publish scientific and semi-scientific literature on snakes and other reptiles and amphibians.

viii) To undertake survey on the distribution and status of snakes and other reptiles and amphibians.

ix) To provide consultancy services on snakes and other reptiles.

x) To provide a common forum for interaction among amateur scientists and friends of reptiles and amphibians.