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FAUNA **of** **GOA**



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FAUNA OF GOA

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REPTILIA

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INTRODUCTION

State of Goa is more famous, nationally as well as internationally, for tourism rather than for its rich faunal components surviving in the varied ecosystems ranging from marine to mountainous habitats. However, scientists, naturalists and amateurs were keen in studying the reptilian fauna of this region since long time. Because the small sized-state exhibits varied habitat diversity ranging from marine ecosystem on west coast side to heavily forested mountainous tracts of Central Western Ghats on eastern side. Such habitat diversity in a smaller area has resulted in expression of spectacular faunal diversity.

Earlier scientists and naturalists have recorded reptilian species in their isolated reports based on the intensive surveys carried out in this region by them over a period of time (Smith, 1931, 1935, 1943; Daniel, 1983; Murthy, 1985; Tikader and Sharma, 1985, 1992, Sharma, 1976, 1998, 2002, 2003; Das, 1995; Pradhan, 1997a; Nalawade, 1998; Whitaker and Captain, 2004 and many others). Sharma published taxonomic account on lizards (2002) and snakes (2003) of India which includes his studies on the reptilian material collected from Goa State by various scientists and deposited in ZSI, WRS, Pune. He has also published a separate account on reptiles of Goa in 1976 based on the faunistic survey conducted by him in 1969. Present article is based on the valuable information contributed in past by these dedicated workers.

State of Goa has been very well surveyed in

past by number of scientists from Zoological Survey of India and Bombay Natural History Society. Further, the state falls within the jurisdiction of Western Regional Station, Pune, since its inception in 1960. Number of survey parties have visited and surveyed the state from faunal point of view. However, unfortunately, no consolidated account on the reptilian diversity from State of Goa is available. Hence, an attempt has been made in the present article to report updated information on the reptilian species and subspecies from the entire State of Goa. Present account is based on the material collected during the project period as well as in the past by various scientists, species sighted during the project period and also on the account based on bibliographic records. In addition to the above list of references, Ahmed and Dasgupta (1992), Gayen (1999) and many others were also consulted which have been mentioned at relevant places.

SYSTEMATIC LIST OF REPTILIAN SPECIES REPORTED FROM STATE OF GOA

(*Asteriks indicates species actually collected and/or
sighted during the project period)

Phylum CHORDATA

Class REPTILIA

Order LORICATA (CROCODLLIA)

Family CROCODLLIDAE

1. Indian or Marsh Crocodile, Mugger :
Crocodylus palustris Lesson

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Order TESTUDINES (CHELONIA)

Suborder CRYPTODIRA

Family CHELONIIDAE

2. Loggerhead Sea Turtle : *Caretta caretta* (Linnaeus)
3. Green Sea Turtle : *Chelonia mydas* (Linnaeus)
4. Hawksbill Sea Turtle or Tortoise Shell Turtle : *Eretmochelys imbricata* (Linnaeus)
5. Olive Ridley Turtle : *Lepidochelys olivacea* (Linnaeus)

Family DERMOCHELYIDAE

6. Leatherback Sea Turtle : *Dermochelys coriacea* (Linnaeus)

Family EMYDIDAE (BATAGURIDAE)

- *7. Indian Snail-Eating Turtle : *Melanochelys trijuga* (Schweigger)

Family TESTUDINIDAE

8. Star Tortoise or Indian Starred Tortoise : *Geochelone elegans* (Schoepff)

Family TRIONYCHIDAE

- *9. Southern Flap-shelled Turtle : *Lissemys punctata granosa* (Lacepede)
10. Peninsular Soft-Shelled or Leith's Softshelled Turtle : *Trionyx leithi* Gray = *Aspideretes leithii* (Gray)

Order SQUAMATA

Suborder SAURIA (LACERTILIA)

Family GEKKONIDAE

11. South Indian Rock Gecko : *Cyratodactylus collegallensis* (Beddome)
12. North Malabar Rock Gecko : *Cyratodactylus dekkannensis* (Gunther)
- *13. South Malabar Rock Gecko : *Cyratodactylus albofasciatus* (Boulenger)
14. North Kanara Hill Palli : *Cnemaspis kandiana* (Kelaart)
- *15. Goa Forest Palli : *Cnemaspis goaensis* Sharma
16. Dark Spotted Giant Gecko : *Hemidactylus maculatus* (Dum. & Bibr.)

17. Blotched Gecko : *Hemidactylus triedrus* (Daudin)

- *18. Spotted House Gecko : *Hemidactylus brooki* Gray

- *19. Prashad Brown Gecko : *Hemidactylus prashadi* Smith

20. Reticulated Gecko : *Hemidactylus reticulatus* Beddome

- *21. Ticticky House Gecko : *Hemidactylus frenatus* Schlegel

22. Common Bark Gecko : *Hemidactylus leschenaulti* Dum. & Bibr.

- *23. Yellow-Bellied House Gecko : *Hemidactylus flaviviridis* Ruppell

Family AGAMIDAE

- *24. South Indian Flying Dragon or Flying Lizard : *Draco dussumieri* Dum. & Bibr.

- *25. India Fan-Throated Lizard : *Sitana ponticeriana* Cuvier

- *26. Indian Garden Lizard : *Calotes versicolor* (Daudin)

- *27. Matheran Olive-Brown Calotes : *Calotes rouxi* Dum. & Bibr.

28. Olive Brown Rock Lizard : *Psammophilus dorsalis* (Gray)

Family CHAMAELEONIDAE

- *29. Indian Chamaeleon : *Chamaeleo zeylanicus* Laurenti

Family SCINCIDAE

- *30. Allapalli Forest Skink : *Mabuya allapallensis* Schmidt

- *31. Bornzy Grass Skink : *Mabuya macularia* (Blyth)

- *32. Common Indian Skink : *Mabuya carinata* (Schneider)

33. Beddom's South Indian Skink : *Mabuya beddomii* (Jerdon)

- *34. Five Striped Skink : *Mabuya trivittata* (Hardwicke & Gray)

- *35. Dotted Garden Skink : *Riopa punctata* (Linnaeus)

- *36. Malabar Dotted Skink : *Riopa guentheri* (Peters)

37. Golden-Brown Four-toed Skink : *Riopa lineata* (Gray)

*38. Goanese Bronze Skink : *Riopa goaensis* Sharma

Family LACERTIDAE

* 39. Beddom's Snake-Eyed Lacerta : *Ophisops beddomii* (Jerdon)

Family VARANIDAE

*40. Common Indian Monitor Lizard : *Varanus bengalensis* (Daudin)

Suborder SERPENTES (Ophidia)

Family TYPHLOPIDAE

*41. Common Worm or Blind Snake : *Ramphotyphlops braminus* (Daudin) = *Typhlops braminus* (Daudin)

42. Slender Worm Snake : *Typhlops porrectus* Stoliczka

*43. Beaked Worm or Blind Snake : *Typhlops acutus* (Dum. & Bibr.) = *Gryptotyphlops acutus* (Dum. & Bibr.)

Family UROPELTIDAE

44. Travancore Melanophidium or Pied-belly Shieldtail Snake : *Melanophidium punctatum* Beddome

45. Elliot's Uropeltis or Shieldtail Snake : *Uropeltis ellioti* (Gray)

46. Peter's Uropeltis or Mahrrata rougtail Snake : *Uropeltis macrolepis* (Peters)

47. Cuvier's Uropeltis or Kerala Shieldtail Snake : *Uropeltis ceylanicus* Cuvier

48. Bombay Hills Uropeltis or Phipsoni rougtail Snake : *Uropeltis phipsoni* (Mason)

49. Myhendra Mountain Uropeltis or Barred shieldtail Snake : *Uropeltis myhendrae* (Beddome)

Family BOIDAE

*50. Indian Python or Rock Python : *Python molurus* (Linnaeus)

*51. Common or Russel's Sand Boa : *Eryx conicus* (Schneider) = *Gongylophis conicus* (Schneider)

52. Indian or Red Sand or John's Sand Boa : *Eryx johani johani* (Russell)

53. Whitaker's Boa : *Eryx whitakeri* I. Das

Family ACROCHORDIDAE

*54. Elephant Trunk or Indian Wart or File Snake : *Chersydrus granulatus* (Scneider) = *Acrochordus granulatus* (Scneider)

Family COLUBRIDAE

Subfamily COLUBRINAE

*55. Common Trinket Snake : *Elaphe helena* (Daudin) = *Coelognathus helena* (Daudin)

*56. Indian Rat Snake or Dhaman : *Ptyas mucosus* (Linnaeus)

57. Banded Racer : *Argyrogena fasciolatus* (Shaw)

*58. Russell's Kukri Snake : *Oligodon taeniolatus* (Jerdon)

*59. Common Kukri Snake : *Oligodon armensis* (Shaw)

*60. Painted Bronzeback Tree snake : *Dendrelaphis pictus* (Gmelin) = *Ahaetulla ahaetulla* (Linnaeus)

*61. Nilgiri Olive-Brown Black-Blotched or Large-eyed Bronzeback Tree snake : *Dendrelaphis grandoculis* (Boulenger) = *Ahaetulla grandoculis* (Boulenger)

62. Common Bronze-Back Tree Snake : *Dendrelaphis tristis* (Daudin)

*63. Golden Tree or Ornate Flying Snake : *Chrysopelea ornata* (Shaw)

64. Travancore Wolf Snake : *Lycodon travancoricus* (Beddome)

65. Northern or Barred Wolf Snake : *Lycodon striatus* (Shaw)

*66. Common Wolf Snake : *Lycodon aulicus* (Linnaeus)

67. Light Brown or Dumeril's Black-headed Snake : *Sibynophis subpunctatus* (Dum. & Bibr.)

*68. Striped Keelback : *Amphiesma stolata* (Linnaeus) = *Natrix stolata* (Linnaeus)

- *69. Beddom's Olive-Brown Keelback : *Amphiesma beddomei* (Gunther) = *Natrix beddomei* (Gunther)
- 70. Green or Hill Keelback : *Amphiesma monticola* (Jerdon)
- *71. Checkered Keelback : *Xenochrophis piscator* (Schneider) = *Natrix piscator* (Schneider)
- *72. Green Keelback : *Macropisthodon plumbicolor* (Cantor)
- *73. Indian Gamma or Common Cat Snake : *Boiga trigonata* (Schneider)
- 74. Ceylon Cat Snake : *Boiga ceylonensis* (Gunther)
- 75. Reddish Peninsular Cat Snake : *Boiga forsteni* (Dum. & Bibr.)
- *76. Common Green Whip or Vine Snake : *Ahaetulla nasutus* Lacep.
- *77. Brown Whip or Vine Snake : *Ahaetulla pulverulentus* (Dum. & Bibr.)

Subfamily HOMALOPSINAE

- 78. Glossy Marsh Snake : *Gerardia prevostiana* (Eydoux and Gervais)
- 79. Siebold's Smooth-scaled Water Snake : *Enhydris sieboldi* (Schlegel)
- 80. Dog-faced Water Snake : *Cerberus rhynchops* (Schneider).

Family ELAPIDAE

- *81. Common Indian Krait : *Bungarus caeruleus* (Schneider)
- 82. Slender Coral Snake : *Callophis melanurus* (Shaw)
- 83. Striped Coral Snake : *Callophis nigrescens* (Gunther)
- *84. Spectacled Indian Cobra : *Naja naja naja* (Linnaeus)
- 85. King Cobra or Hamadryad : *Ophiophagus hannah* (Cantor)

Family HYDROPHIIDAE

- *86. Hook-nosed Sea Snake : *Enhydrina schistosa* (Daudin)
- 87. Yellow Sea Snake : *Hydrophis spiralis* (Shaw)

- 88. Annulated Sea Snake : *Hydrophis cyanocinctus* (Daudin)
- 89. Pale-Grayish or Cochin Banded Sea Snake : *Hydrophis ornatus* (Gray)
- *90. Many Toothed or Malacca Sea Snake : *Hydrophis caeruleus* (Shaw)
- 91. Bombay Sea Snake : *Hydrophis mamillaris* (Daudin)
- 92. Grayish-Black White-Bellied Sea Snake : *Hydrophis fasciatus* (Schneider)
- *93. Short Sea Snake : *Lapemis curtus* (Shaw)
- 94. Common Small Headed Sea Snake : *Microcephalophis gracilis* (Shaw)
- 95. Pelagic or Black & Yellow Sea Snake : *Pelamis platurus* (Linnaeus)

Family VIPERIDAE

Subfamily VIPERINAE

- *96. Russell's Viper or Daboia : *Vipera russelli* (Shaw) = *Daboia russelii* (Shaw)
- *97. Saw-scaled Viper or Phoorsa : *Echis carinatus* (Schneider)

Subfamily CROTALINAE

- 98. Hump-nosed Pit Viper : *Hypnale (Agkistrodon) hypnale* (Merrem)
- *99. Bamboo Pit Viper : *Trimeresurus gramineus* (Shaw)
- 100. Greenish Malabar Pit Viper : *Trimeresurus malabaricus* (Jerdon)

SPECIES-WISE SYSTEMATIC ACCOUNT OF REPTILES OF GOA STATE

Phylum CHORDATA

Class REPTILIA

Class Reptilia is represented in Goa State by following three out of four orders of living reptiles.

1. Loricata (Crocodylia) : Includes Crocodiles, Gharials, Alligators etc.
2. Testudines : Includes Turtles, Tortoises and Terrapins
3. Squamata : Includes Lizards and Snakes

Order LORICATA (CROCODYLIA)

Order Loricata (Crocodylia) contains a single family, Crocodylidae.

Family CROCODYLIDAE

Family Crocodylidae is represented by a single species under Genus *Crocodylus* in Goa State.

1. *Crocodylus palustris* Lesson

1763. *Crocodylus palustris* Lesson, in *Belong. Voy. Ind. or, zool.*, : 305.

Common name : English : Marsh Crocodile, Indian Crocodile.

Diagnostic Characters : Crocodiles are the largest modern living reptiles. They are closely related with dinosaurs. Crocodiles are characterized by lizard like characters viz. long body and tail with short limbs. The back is covered with thick rectangular horny, partially ossified plates known as scutes or scales. They are sharply raised and arranged in 16-17 transverse and 4-6 longitudinal rows. Ventral plates are smooth and smaller in size. The broad snout is elongated with number of teeth inside. Fourth tooth of the lower jaw is laid into a notch in the upper jaw. The area is open at the sides so that the fourth tooth of the lower jaw is visible when the snout is closed. The skin over the snout is firmly fused to the skull. The valved nostrils are placed on the upper surface of the snout. Crocodiles are the exceptional reptiles for possessing flapped external ears. Tongue is entirely attached to the floor of the mouth and can barely be moved. Eyes with third transparent eyelid, (Nictitating membrane) permitting limited underwater vision. The pupil is vertical. Tail is compressed with two series of flattened vertical scales merging and continuing as a single row to the tip. There are four distinct post-orbital plates just behind the head. Forelegs with five fingers and hindlegs with four webbed toes. Body rarely reaches upto 5 m in length and 1.6 m. in girth. Crocodiles are dorsally olive with specklings of black in colour which is more evident in young ones. They are white or yellowish white below.

Locality : There are unaunthetic reports of crocodile sighting in Goa and adjoining areas of Maharashtra State.

Distribution : Practically throughout India.

Habitat : Crocodiles are true amphibious in behaviour and show structural adaptations for a successful aquatic life. They are excellent swimmers and they inhabit rivers, lakes and other large water bodies on plains and upto 600 m altitude in Indian subcontinent. They are now well spread in the Indian river systems. They are true carnivorous in feeding habits. They are oviparous and lay oval and hard shelled eggs buried in the soil for incubation.

Status : IUCN : Vulnerable (CAMP Report, 1998), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule : I Part : II; CITES Appendix : I, Red Data Book on Indian Animals (Anonymous, 1994) : Endangered.

Remarks : The species is known to be hunted for trade for skin and body parts in domestic as well as international markets (Pradhan, 1997). Sometimes even the live specimens are traded illegally.

Order TESTUDINES (CHELONIA)

Order Testudines (Chelonia) includes turtles (marine and fresh-water, both), tortoises and terrapins. It is represented in Goa State by a single suborder Cryptodira.

Suborder CRYPTODIRA

Suborder Cryptodira is represented by five families in Goa State.

Key to the families of the suborder CRYPTODIRA

1. Digits elongated, flattened and bound together, limbs paddle-shaped 2
- Digits neither elongated nor flattened or bound together. Limbs not paddle-shaped but with distinct toes 3
2. Limbs clawless, feet scaleless and carapace

- covered with smooth skin and plastron with seven prominent longitudinal keels
..... DERMOCHELYIDAE
- Limbs with one or two claws, feet with scales and carapace covered with epidermal horny shields CHELONIIDAE
3. Forelimbs semi-paddle-shaped and carapace covered with smooth skin. Edge of the carapace flexible TRIONYCHIDAE
 - Forelimbs paddle-shaped and carapace covered with horny shields. Edge of the carapace not flexible 4
 4. Limbs paddle-shaped but more or less flattened. Digits webbed. With 4-5 claws and carapace covered with horny shields or its skin bears many projections giving it a rough appearance. Top of head covered with smooth skin or with its posterior part divided into shields EMYDIDAE (Bataguridae)
 - Limbs more or less cylindrical. The hindlimbs club-shaped or elephantine. Digits not webbed but free. Upper part of head shielded. Plastron with 12 shields. Pectoral shield forming front part of bridge TESTUDINIDAE
2. Coastal shields 4 on each side, imbricated horny scutes, two pairs of prefrontal scutes between the eyes, nuchal not in contact with the first coastal on each side, snout elongated and narrow, bony alveolar surface of upper jaw with a single sharp crested ridge, jaws are hooked, premaxilla not toothed, 2 claws are present on each flipper, carapace brown with deep brown markings, neck light orange in colour *Eretmochelys imbricata*
 - Coastal shields 5 or more on each side, horny scutes not imbricate, nuchal in contact with the first coastal on each side, snout comparatively short and broad, bony alveolar surface of upper jaw smooth or with a rounded ridge, premaxilla toothed 3
 3. Coastal shields 5-9 (generally 6-7) on each side, plastron with 4 pairs of inframarginals on bridge, each inframarginal provided with pores on hinder margin, maxilla separated by vomer, single claw present on each flipper. Dorsal colour grey, while plastron yellow in colour *Lepidochelys olivacea*
 - Coastal shields 5 on each side, plastron with 3 pairs of inframarginals on bridge, no pores on hinder margin of inframarginals, maxillae in contact with each other, Dorsal colour brown or reddish brown. Carapace brownish red with light spots, while plastron yellow with orange spots *Caretta caretta*

Family CHELONIIDAE

Family Cheloniidae contains marine turtles and it is represented by four species under four genera in Goa State.

Key to the species and genera of the family CHELONIIDAE

1. Horny scutes on carapace non-overlapping, coastal shields 4 on each side, one pair of prefrontal scutes between the eyes, jaws not hooked, upper jaw blunt, single claw present on each flipper, carapace greenish with violet marking, skin on neck yellow or creamish..
..... *Chelonia mydas*
 - Coastal shields 4-9 on each side, two pairs of prefrontal scutes between the eyes, horny edge of lower jaw smooth or feebly dentate, bony alveolar surface of upper jaw smooth or with a sharp crested ridge 2

2. *Caretta caretta* (Linnaeus)

1758. *Testudo caretta* Linnaeus, *Systema Nature*, Ed. 10 T. I : 197.

Common name : English : Loggerhead Sea Turtle.

Diagnostic Characters : Loggerhead Sea Turtle is a large cosmopolitan species with elongated carapace, somewhat serrated and tapering posteriorly. The species gets the name from its big head, which may reach upto 30 cms in length in adult specimens. It is one of the largest amongst the marine turtle species. The species may attain the length of 2.7 metres and weight of 385 kilograms. Length of carapace upto 1.14 m. The

turtle has a pronounced beak and large brown eyes. Coastal scutes are generally five on each side. Coastal 1 touching the nuchal. Central scutes are also five in a row. Number of coastal and neural shields may vary. Plastron consists of paired gular, humeral, pectoral, abdominal, femoral and anal shields. Inframarginals are in 3 pairs, enlarged and devoid of pores on hinder margin. Marginal shields 27 in number. Two claws are present on each flipper. Tail extremely short. General colouration is brown or red brown; carapace is brownish-red with light spots, eyes are brown and the flippers are grey brown.

Locality : Loggerhead Sea Turtle is found in all the temperate and sub-tropical oceans of the world. It is circumglobal in distribution. These turtles have been recorded from the waters of Indian coast (Sharma, 1998, Anonymous, 1994).

Distribution Elsewhere : All the temperate and sub-tropical oceans of the world.

Habitat : Nesting is seasonal (Varying between May to January at different coasts) and generally the nests are constructed at night. Slow stride movements by flippers in four-legged manner of these turtles on shores are magnificent. Clutch size of eggs varies between 60-200. Incubation in sand takes 55-66 days. Female can remigrate to the same beach for laying eggs at 2-3 year intervals. Loggerheads are fully carnivorous feeding mainly on benthic invertebrates such as mollusks, crustaceans, sponges, jelly-fish, fish seaurchins and starfish..

Status : IUCN : Lower risk-Near threatened (CAMP Report, 1998), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule : I Part : II; CITES Appendix : I, Red Data Book on Indian Animals (Anonymous, 1994) : Endangered.

Remarks : The eggs of Loggerhead Turtle are much sought after and relished, while carapaces are used in the preparation of crude ornaments. The turtle is exploited for meat, eggs and for making local articles in many countries including India (Anonymous, 1994).

3. *Chelonia mydas* (Linnaeus)

1758. *Testudo mydas* Linnaeus, *Systema Nature*, Ed. 10th T. I : 197.

Common name : English : Green Sea Turtle.

Diagnostic Characters : The Green Sea Turtle is one of the largest of the hard-shelled species of marine turtles possessing marked variations in size, weight and carapace shape in its various populations spread over the globe. The species gets the name from the colour of its green fatty tissues. It possesses flat, smooth, heart shaped streamlined body. Head small and round as compared to body. The species may attain carapace length upto 155cm (Range 100-155cm) and weight of 135-175 kilograms. Carapace never completely ossified. It is arched in adults. It may be occasionally feebly keeled on lateral sides. Snout short and jaws not hooked. Dorsal shields juxtaposed. Coastal scutes four on each side, central scute five, while marginal shields 25. Plastron consists of six pairs of shields with a single intergular and a series of intermarginal shields. Head covered with symmetrical shields and one pair of prefrontal shields. Neither the head nor legs can be pulled under the shell. The flippers are long and each is provided with a single claw. Tail short as compared to the body. The carapace is dark blue black in hatchlings, while green, olive, brown or buff in adults. The flippers are grey-green. Edges of the head scales pale in most cases. Older shells look brownish. Semi-adult turtles look attractive and are called sunrays because of the beautiful brown and yellow shades on the dorsal shield. Limbs yellow with dark patch on each limb. Ventrums yellowish.

Locality : The Green Sea Turtle is circumtropical in distribution and is found to nest in all the tropical and sub-tropical oceans of the world. Nearest record, as reported by Das (1995), is from Mumbai coast.

Distribution Elsewhere : All the tropical and sub-tropical oceans of the world.

Habitat : The Green Sea turtle is common around oceanic islands and coasts with wide sandy beaches. It is unique amongst all the marine turtles

in being mainly herbivorous, highly migratory with well-developed homing abilities. It may frequent inshore estuarine, coastal and reef-system habitats with less than 25 metres depth. Remote islands are favoured for selecting nesting sites, though it may use mainland beaches as well. Nesting is seasonal and takes place at night (Varying between May to July at different coasts). Females congregate in large numbers on these beaches between June and November to lay eggs. Each breeding female is known to lay 350-600 eggs annually. Average clutch size is 110. Incubation in sand takes 40-91 days. Adult Green Sea Turtle feeds mainly submerged marine algae, sea weeds and grasses, while hatchling is adapted to deal with wider range of food organisms including molluscs, crustaceans, jelly fish, fishes and even the plant material.

Status : IUCN : Endangered (CAMP Report, 1998), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule : I Part : II; CITES Appendix : I, Red Data Book on Indian Animals (Anonymous, 1994) : Endangered.

Remarks : Human predation on Green Sea Turtle is very heavy. It is a most valued reptile of commercial importance for its palatable protein rich meat. Its flesh is also considered to be source of famous "Turtle soup" The flesh and eggs of Green Sea Turtle form a part of staple diet for the natives in several parts of the world (Anonymous, 1994).

4. *Eretmochelys imbricata* (Linnaeus)

1766. *Testudo imbricata* Linnaeus, *Systema Nature*, Ed. 12th T. I. : 350.

Common name : English : Hawksbill Sea Turtle or Tortoise Shell Turtle.

Diagnostic Characters : The Hawksbill Sea Turtle is one of the small-sized but most colourful marine turtle. Beautiful yellow motteling on rich brown background distinguishes the species from other marine turtle species. Head narrow with distinct scales on it and snout tappers to a point. Its powerful ridged jaws resembling hawks bill help in breaking open molluscs, crabs and other

hard animals. The jaws also help in pulling out such animals from crevices of rocks and coral reefs. Premaxilla deeply excavated and not toothed terminally. Jaws strongly hooked. Carapace is narrowly heart-shaped, elongated with keel on the last four vertebrals. It is strongly serrated behind. Scutes on its shell thicker and strongly overlapping in the young but later the edges come to lie side by side. Dorsal scute horny and strongly imbricated. However, they are juxtaposed in the very advanced stage of age. The species may attain length upto 100 cm (Average 60-65 cm, Range 60-100 cm) and maximum weight of 140 Kg. (Range 60-120 Kg). Coastal scutes are four on each side, central scutes five, while marginal shields 25. Coastal I not in contact with nuchal. Vertebrals wider than long. Plastron consists of six pairs of shields with a single intergular and a series of intermarginal shields. Head covered with symmetrical shields and two pairs of prefrontal shields. Neither the head nor legs can be pulled under the shell. The flippers are long and each is provided with two claws. Tail short as compared to the body. Juveniles black above, while blackish below. The carapace may be amber-coloured or greenish with violet markings or dark brown to black with yellow mottlings, and in all cases with radiating brown or black streaks on the scutes. Flippers dark brown, while plastron yellow, orange or reddish brown in colour. Neck is yellow or creamish. Shields of head and limbs are dark brown with yellow borders.

Locality : The Hawksbill Sea Turtle is circumtropical in distribution and is found to nest on the beaches of tropical and sub-tropical zones of Pacific, Atlantic and Indian oceans. Nearest isolated record, as reported by Das (1995), is from off Elephanta Caves, Mumbai.

Distribution Elsewhere : Tropical and sub-tropical zones of Pacific, Atlantic and Indian oceans.

Habitat : The Hawksbill Sea Turtle is common in warm seas around oceanic islands and coasts with wide sandy nesting beaches. Nesting is sporadic and takes place at night. It frequents

rocky coastal embankments and coral reefs with shallow vegetated bottoms as well as bays and lagoons with muddy bottoms lacking widespread submerged vegetation. It is a non-migratory species covering only short distances in search of food. Long distance migration is undertaken by the species very scantily. The hind flippers are primarily used for steering and for excavation of the nest. Breeding season is correlated with the onset of northwest monsoon and it starts from latter part of August and lasts till end of February (Peak from October to January). Each breeding female is known to lay 96-182 eggs per clutch at nest depth of 12-20 cm during daytime. Clutch size varies from population to population. Generally 2-4 clutches are laid in one season with a re-nesting interval of around 15-19 days. Adult Hawksbill Sea Turtle is entirely omnivorous. Food mainly consists of a great variety of items such as sponges, ascidians, echinoderms, coelenterates, ectoprocts, bryozoans, gastropods, bivalve mollusks, barnacles, crustaceans, soft corals and fishes. Vegetarian diet includes seaweeds, marine angiosperms and fruits of mangrove plants. (Anonymous, 1994).

Status : IUCN : Endangered (CAMP Report, 1998), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule : I Part : II (As *Eretmochelys imbricate unbriscata*); CITES Appendix : I, Red Data Book on Indian Animals (Anonymous, 1994) : Endangered.

Remarks : Indiscriminate exploitation of Hawksbill Sea Turtle for the horny shields or keratin layer of its shell for making attractive articles such as jewellery, curios and even furnitures is on extremely large scale. Another major threat to the survival of the species is due to increasing tourist trade. Killing of hatchlings and young ones for making beautiful curios for the tourists has created a devastating and direct effect on the various populations within the distributional range. Habitat destructions and loss of nesting grounds on beaches is also an additional threat to the survival of the species in some countries (Anonymous, 1994).

5. *Lepidochelys olivacea* (Linnaeus)

1829. *Chelonia olivacea* Eschscholtz. *Zool. Atlas*, 1 3.

Common name : English : Olive Ridley Turtle.

Diagnostic Characters : The Olive Ridley Turtle is a small marine turtle with a broad fairly raised but flat top carapace. Carapace length varies between 56.5 and 75 cm and it is devoid of any keels. Its posterior margin is serrated. Head large and triangular in shape with large orbits. Head is covered with symmetrical shields with two pairs of prefrontal. Coastal scutes are 5-9 on either side. Central scutes 8-9, while marginal shields 27-29 with mid marginals much wider. Plastron consists of six pairs of shields with variable intergular (Single, double or even absent). Four pairs of inframarginal scutes present. Distinct pores present on the inframarginals. Upper jaw hooked but without a ridge. The species may attain length upto 100cm (Average 60-65 cm, Range 60-100 cm) and maximum weight of 140Kg. (Range 60-120 Kg)., Coastal I in contact with broad nuchal. Vertebrae I and V wider than long, while II, III and IV longer than broad. The flippers are long and each is provided with a single claw. The carapace is olive grey, head grey brown, shields yellow white, plastron creamy yellow and flipper edges light yellow brown in colour.

Locality : The Olive Ridley Turtle is wide in distribution and is found to nest on the beaches of tropical and sub-tropical zones of Pacific, South Atlantic and Indian oceans. Minor nesting ground of Olive Ridley Turtle has been reported from Goa coast (Anonymous, 1994, Das, 1995).

Distribution : Indian oceans.

Elsewhere : Tropical coastal waters of Pacific, South Atlantic.

Habitat : The Olive Ridley Turtle is common and widely distributed in tropical waters. The typical nesting occurs mainly on the mainland beaches all over the world. Nesting takes place at night. It is capable of foraging at relatively great depth (upto 150 metres or even more) in neritic waters. It undertakes long journeys in search of feeding grounds. General breeding season starts

from September and lasts till March. Each breeding female is known to lay 96-182 eggs per clutch at nest depth of 12-20 cm during daytime. Clutch size varies from region to region. It varies between 79 and 201 in India. Incubation period ranges between 46-63 days. Hatching success of eggs and survival of hatchlings are very poor due to large-scale predation by birds, mammals reptiles and other organisms such as ghost crabs, dipteran flies, fungi and bacteria. Olive Ridley Turtle feeds mainly on benthic crustaceans, larger planktonic organisms and marine algae. It also cherishes variety of items such as sessile and pelagic tunicates, jellyfishes, small invertebrates and fishes. (Anonymous, 1994).

Status : IUCN : Endangered (CAMP Report, 1998), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule : I Part : II; CITES Appendix : I, Red Data Book on Indian Animals (Anonymous, 1994) : Endangered.

Remarks : Indiscriminate exploitation of Olive Ridley Turtle eggs from mass nesting beaches and also due to poaching of nesting females and predation of juveniles is a matter of serious concern from conservation point of view. It is creating a devastating and direct effect on the various populations within the distributional range. (Anonymous, 1994). Habitat destructions and loss of nesting grounds on beaches is also an additional threat to the survival of the species. Das and Kar (1990 : As cited in Anonymous, 1994) have carried out some pioneering research on different aspects of biology of Olive Ridley Turtle in Orissa.

Family DERMOCHELYIDAE

Family Dermochelyidae is represented by a single species, *Dermochelys coriacea* (Linnaeus), under Genus *Dermochelys* in Goa State.

6. *Dermochelys coriacea* (Linnaeus)

1766. *Testudo coriacea* Linnaeus, *Syst. Nat.*, 12 : 350.

Common name : English : Leatherback Sea Turtle.

Diagnostic Characters : The Leatherback Sea Turtle is the largest and heaviest of all the living turtles and tortoises of the world. Its body shape is somewhat triangular with elongated carapace which is devoid of any hornified epidermal structures. However, hatchlings and young ones possess body and limbs covered with small irregular polygonal shields. The top and sides of the young ones covered with symmetrical plates. The carapace in adults tapers to a point posteriorly and is covered with ridged, smooth rubber-like leathery skin. There are in all seven strong, nodular and longitudinal ridges. Carapace length varies between 140-200 cm. Jaws are sharp edged but without any flattened horny plates. Head large and neck massive. Limbs are paddle shaped but clawless. Front flippers extremely long and powerful. Hind flippers are broad and connected to the tail by a fold of thick skin. Tail short. The species may attain maximum weight of 725 Kg. (Range 400-725 Kg). The carapace is slaty black with white spots, plastron a mixture of pink, white and black. Adult females with crown of head provided with a pink spot. Tail Black in colour.

Locality : The Leatherback sea Turtle is wide in distribution and is found to nest on the beaches of the tropical seas of Pacific, Atlantic and Indian oceans. Minor nesting ground of Leatherback sea Turtle has been reported from Goa coast (Anonymous, 1994, Das, 1995).

Distribution Elsewhere : Leatherback sea Turtle is circumglobal in distribution and is known to inhabit tropical waters of Pacific, Atlantic and Indian oceans.

Habitat : The Leatherback sea Turtle is truly a pelagic species and comes to shore only for nesting. It is believed to dive upto 1200 m below the surface. Counter current circulatory system in the limbs enables the species to wander in the freezing waters. It is a powerful swimmer with a strong instinct for migration and prefers to live in open sea. It prefers to nest on the mainland beaches rather than on island beaches. Nesting takes place at night. It migrates from tropical waters for foraging widely in the northern

temperate waters for its primary food, jelly fish (*Physalia utricus*). Its diet also includes tunicates, fish, mollusc, shrimp, crab and some other marine animals. Nesting season is between March and February. It breeds 3-4 times in a year, but the peak is during May to July. Re-migration takes place at the interval of 2-3 years. Each breeding female is known to lay 80-85 eggs per clutch. Several clutches are laid during the year. Incubation period ranges between 56-70 days. Hatching success of eggs and survival rate of hatchlings vary between 63-70% due to predation by birds, mammals, reptiles (Monitor Lizard) and other organisms such as ghost crabs. Sharks devour adults. (Anonymous, 1994).

Status : IUCN : Endangered (CAMP Report, 1998), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule : I Part : II; CITES Appendix : I, Red Data Book on Indian Animals (Anonymous, 1994) : Endangered.

Remarks : Indiscriminate killing and consumption of Leatherback sea Turtle eggs and adults are matter of serious concern from conservation point of view. Flesh and eggs are extensively used for extraction of oil and also as shark bait. It is creating a devastating and direct effect on the various populations within the distributional range (Anonymous, 1994). Habitat destructions and disturbance near nesting grounds on beaches are also responsible for the decline in population densities.

Family EMYDIDAE (BATAGURIDAE)

Family Emydidae (Bataguridae) is represented by a single subspecies/species, *Melanochelys trijuga trijuga* (Schweigger), under Genus *Melanochelys* in Goa State.

*7. *Melanochelys trijuga trijuga* (Schweigger)

1814. *Emys trijuga* Schweigger, *Prodr. Mong. Chel.* 41.

Common name : English : Indian snail eating turtle.

Diagnostic Characters : Turtles and tortoises are easily recognised from all other animals by

their characteristic bony shell consisting of two parts : the carapace above and the plastron below. A suture along the flanks between the fore and hindlimbs joins both. The shell has regularly arranged horny shields above, while bony plates on inner side. Indian snail eating turtle is moderate in size (23 cm +). Head is somewhat small, snout shorter than the orbit. It is covered with smooth skin, which is divided into large shields on top, while carapace covered with horny shields. Vertebral shields hexagonal and short sided posteriorly. Upper jaw feebly notched in the middle. Snout slightly projecting beyond the lower jaw. Carapace is moderately depressed, tricarinate with lateral margins slightly reverted. Digits of the fingers completely webbed, limbs paddle-shaped but with more or less flattened 4-5 claws. Tail very short. Dorsum light brown in juveniles, while dark brown to blackish in colour in adults. Plastron has a yellow margin, which reduces in width at the advancement of the age. Head is greyish or olivaceous with yellow or pink reticulations which are more prominent on sides. The markings become obscure in later age.

Locality : R.C. Sharma has collected four specimens from Nagae River, Goa (Sharma, 1976).

Distribution : Tikader and Sharma (1985) and Sharma (2000) have recorded the distribution of the subspecies from Goa, Karnataka, Kerala, Maharashtra and Tamil Nadu. It inhabits central part of Indian peninsula.

Habitat : Indian snail eating turtle is mainly aquatic and vegetarian in habit. It is a commonest widely distributed terrapin preferring to live in slow flowing or sedentary water. Young ones are more thoroughly aquatic than the adults. They are seen basking on rocks and logs. Several individuals may live together in a safe hideout under rocks or in holes near banks. They are also seen in the trunks of submerged trees. They swim in a manner in which each limb paddles independently.

Status : The subspecies is endemic within Indian limits. Sharma (2000) reports its status as Indeterminate or possibly vulnerable, while CAMP

Report (1998) records its status as Lower risk-least concern.

Remarks : Though Gayen (1999) has reported the species under Family *Bataguridae*, *Melanochelys trijuga trijuga* (Schweigger) has been retained in Family *Emydidae* following Sharma (2000). Sharma (2000) reports that main threat to the survival of the subspecies is due to large scale exploitation of eggs and adults for food and habitat destruction.

Family TESTUDINIDAE

Family Testudinidae is represented by a single species, *Geochelone elegans* (Schoepff), under Genus *Geochelone* in Goa State.

8. *Geochelone elegans* (Schoepff)

1792. *Testudo elegans* Schoepff, *Hist. Tes.* p. 111 pl. xxv.

Common name : English : Star Tortoise or Indian starred Tortoise, Land Tortoise.

Diagnostic Characters : It is a small tortoise in which the length of a largest female reaches upto 25 cm. Carapace length reaches 280 mm. Males are much smaller. Carapace is elongated and highly dome-shaped and possesses conspicuous hump. Head with small irregular shields. Nuchal shield absent. Vertebral shields five in number. First vertebral longer than broad. Four coastals. Plastron is large truncated or notched anteriorly. Hind limbs cylindrical and club-shaped possessing five claws. Tail moderately long and ends in spur like scute. Shell is black above. Colour pattern is distinctive. Each vertebral shield has a yellow coloured central areola with yellow streaks radiating over from areola giving a *star-like* appearance. The plastron has black rays on a yellow background. However the markings become obscure in later age. Head and limbs yellowish with darker markings.

Locality : Tikader and Sharma (1985) and Sharma (2000) have reported the distribution of starred tortoise from Peninsular India including Goa State.

Distribution : Das (1995) has reported the

distribution of starred tortoise from Indian subcontinent including India.

Elsewhere : Pakistan and Sri Lanka.

Habitat : The species, a land tortoise, prefers to live in varied habitats ranging from sandy tracts to rocky and grassy areas with plenty of vegetations. It is also found along coastal scrublands and desert tracts of India. The species is largely crepuscular in habit, spending rest of the time under cover. It remains dormant during cold season, while its activity is at its peak during monsoon season. Though omnivorous in habit, but also inclined to be vegetarian.

Status : Daniel (1983) reported the status of starred tortoise as not uncommon species in its distributional range, while Sharma (2000) considers its status as indeterminate. CAMP Report (1998) has recorded its status as Vulnerable; Indian Wildlife (Protection) Act (1972, as amended upto 2002). Schedule : Schedule : IV; CITES Appendix : Appendix II.

Remarks : Sharma (2000) reports that the threat to the survival of the species can be due to habitat loss.

Family TRIONYCHIDAE

Family Trionychidae contains soft-shelled turtles and it is represented by two species under two separate genera in Goa State.

Key to the species and genera of the family TRIONYCHIDAE

1. Carapace covered with skin, horny mandibles concealed under fleshy lips, three claws on each limb, cutaneous femoral flaps present on plastron. Prominent patches of wart-like structures on anterior part of carapace absent *Lissemys punctata granosa*
- Carapace covered with skin, horny mandibles exposed with no fleshy lips, 4-5 claws on each limb, cutaneous femoral flaps absent on plastron. Prominent patches of wart-like structures on anterior part of carapace present *Trionyx leithi* = *Aspideretes leithii*

***9. *Lissemys punctata granosa* (Schoepff)**

1792. *Testudo granosa* Schoepff, *Hist. Tes.* p. 127, pl. xxx A & B.

Common name : English : Southern flap-shelled turtle.

Diagnostic Characters : Family Trionychidae comprises soft-shelled freshwater or mud turtles in which entire head and neck region is retractile. Though carapace and plastron are devoid of any epidermal shields, a continuous layer of soft skin covers them. The sides of hinder portion of the carapace are flexible. Neck exceedingly long but flexible. Forelimbs fully webbed and semi paddle shaped with only three claws on each foot. Elongated phalanges, plastron with soft, semicircular flaps which enable the turtle to conceal completely the retracted hind feet. Marginal bones present. First marginal bone smaller than second. Carapace without any definite pattern, yellow spots absent. Snout comparatively short. Carapace brown or blackish, head with black longitudinal lines, which are more prominent in juveniles. Size of carapace can grow upto 230 mm in length and 170 mm. in breadth. Ectoplastral callosity on plastron is very large in the adult individuals and in certain specimens it is in contact with the hyo-hypo-plastral callosities.

Locality : R.C. Sharma has collected one juvenile specimen for the first time from Canacona-Ponda Road, Goa (Sharma, 1976).

External Distribution : Peninsular India south of Ganges.

Habitat : The southern flap-shelled turtle prefers to live in ponds and tanks with muddy bottoms and embankments. They may or may not be connected with any river system. The species is carnivorous in habit and likes to feed on fish, frogs, snails etc. It is very ferocious in nature and can bite instantly even on gentle handling.

Status : Daniel (1983) reports status of southern flap-shelled turtle as common, while Sharma (2000) states that its status is suspected to be threatened on account of large scale killing for flesh and eggs and also due to habitat distructions.

Indian Wildlife (Protection) Act, 1972 (as amended upto 2002), Schedule : Schedule : I Part II (*Lissemys punctata*).

Remarks : Sharma (2000) suspects threat to the survival of the species due to urbanisation on nesting sites. Though Das (1995) and Anonymous (1994) have considered *L. punctata punctata* (Lacep.) as a subspecies from southern peninsular India, the southern Indian flap-shelled turtle has been retained here as *L. punctata granosa* (Schoepff) as per Tikader and Sharma (1985) and Sharma (1976, 1998 and 2000).

10. *Trionyx leithi* Gray

1872. *Trionyx leithi*, Gray, *Ann. Mag. Nat. Hist.*, (4)X : 334

Common name : English : Peninsular or Deccan Soft-shelled turtle or Leith's Softshell Turtle.

Diagnostic Characters : A large sized soft-shelled turtle reaching slightly above 50 cm. in length. This species is quite similar to *Trionyx gangeticus* except that *Trionyx leithi* possesses a bony snout longer than the orbit diameter, flat alveolar surface of upper jaw, flat mandibular symphysis etc. Carapace olive-green in colour with lighter vermiculations. Head greenish. Black longitudinal streaks from between eyes to nape with side streaks often present. They may be entire or broken up. The young ones possess four eye-spots or ocelli on the disc. Ventrums whitish.

Locality : Das (1995) and Sharma (1998) report that Leith's Softshell Turtle is restricted to peninsular India only in distribution. Nearest isolated known records, as reported by Das (1995), are from Satara in Maharashtra State and Sharavati Wildlife Sanctuary in Karnataka State.

Distribution : Sharma (2000) has reported the distribution of the species from Ganga and all other river systems of peninsular India upto Chennai. He has also recorded the species from southeastern districts of Gujarat.

Habitat : A perfectly aquatic species which can also be seen basking on sandy banks or resting in shallow water with its head projecting out of water surface. It inhabits deep turbid rivers, canals,

marshes, ponds and lakes. The species is a scavenger and also omnivorous in behaviour.

Status : The species is endemic within Indian limits. Sharma (2000) suspects the status of *Trionyx leithi* as endangered on account of excessive killings of adult specimens for flesh and eggs for food. Indian Wildlife (Protection) Act, 1972 (As amended upto 2002). Schedule : Schedule : IV, IUCN Category as per CAMP Report (1998) : Vulnerable (for *Aspideretes leithii* = *Trionyx leithii*).

Remarks : Though Das (1995) and Gayen (1999) have reported merger of *Trionyx* in Genus *Aspideretes*, Genus *Trionyx* has been retained in the present communication following Tikader and Sharma (1985) and Sharma (1998, 2000).

Order SQUAMATA

Order Squamata includes diversified range of reptilian species comprising gecko, lizard, chameleon, skink, monitor lizard, blind snakes and snake species. It is represented by two suborders in Goa State (1) Sauria (Lacertilia) & (2) Serpentes (Ophidia).

Key to the suborders of Order SQUAMATA

1. Limbs, external ear openings and eyelids present. The two halves of the lower jaw fused and cannot move independently
..... SAURIA (LACERTILIA)
(Ex : Gecko, lizard, chameleon, skink and monitor lizards)
2. Limbs, external ear openings and eyelids absent. The two halves of the lower jaw are not fused but are united by ligaments only and hence can move independently.
..... SERPENTES (OPHIDIA)
(Ex : Blind snake, python, boa and venomous and non-venomous snakes)

Suborder SAURIA (LACERTILIA)

Suborder Sauria (Lacertilia) is represented by six families in Goa State.

Key to the families of the suborder Sauria (Lacertilia)

1. Body dorsoventrally flat covered with granule-like imbricate scales, no symmetrical shields on the top of head. The digits are with adhesive pads. Eyes are devoid of movable lids. Transperant membrane on eyeball. Teeth emerging from the side of jaws (Pleurodont). Tounge is fleshy, short, broad, nicked anteriorly, with villose papillae and protrusible. Skull is devoid of temporal and postorbital arcades. Vertebrae amphicoelous.
..... GEKKONIDAE
2. Body dorsoventrally or laterally compressed, covered with imbricate scales, no symmetrical shields on the top of head. The digits are without any adhesive pads. Eyes are with movable lids. Teeth emerging from the side of jaws (Pleurodont) and situated on the summit of the jaws (Acrodont). They are differentiated into incisors, canines and molars. Tounge is short, broad, smooth covered with villose papillae and not protrusible. Skull is with temporal and postorbital arcades Vertebrae amphicoelous.
..... AGAMIDAE
3. Body laterally compressed, covered with flat, rounded granular scales or tubercles. The digits are without any adhesive pads. Eyes are large and move independently. Upper and lower eyelids are joined forming a complete ring around the eye with a small aperture at the centre. The feet possess the digits permanently opposed in groups of two or three and are modified to form a clasping organs. Teeth are small, triangular and situated on the summit of the jaws (Acrodont). Tounge is club shaped, sticky at the tip and extensible upto the distance of 15 cm for catching insects. Skull is with temporal and postorbital arcades. Ear devoid of tympanum.....
..... CHAMAELEONIDAE
4. Body is circular in cross section, covered with cycloid overlapping scales. Osteoderms are present under the scales of head and body.

Symmetrical shields present on the top of head. Legs short or may be absent in many species. Lower eyelid with transparent disc. Teeth emerging from the side of jaws (Pleurodont). Tongue is short, feebly nicked in front. It is covered with scale like papillae. Skull is with temporal arcade only

..... SCINCIDAE

5. Body is dorsoventrally flat, covered with scales. Scales on the head with osteoderms fused with the top of the skull. No osteoderm plates on the body. Legs are very well developed. Teeth emerging from the side of jaws (Pleurodont). Tongue is long and forked anteriorly. It is covered with scale like papillae. Skull is with, both, temporal and postorbital arcades

..... LACERTIDAE

6. Body stout dorsoventrally compressed, covered with small scales generally without osteoderms. Head is typically long. Tail is also very long and laterally compressed. Legs are very well developed. Teeth large, pointed and emerging from the side of jaws (Pleurodont). Tongue is very long, smooth, retractile and forked anteriorly. Skull is with complete temporal and incomplete postorbital arcades

..... VARANIDAE

Family GEKKONIDAE

Family Gekkonidae includes gecko species and it is represented by three genera in Goa State.

Key to the genera of the Family GEKKONIDAE

- I. Digits feebly dilate 2
 2. Digits angularly bent. Pupil vertical.....
 *Cyrtodactylus*
 – Digits angularly bent. Pupil round
 *Cnemaspis*
 II. Digits strongly dilated *Hemidactylus*

Genus *Cyrtodactylus*

Genus *Cyrtodactylus* is represented by three species in Goa State.

Key to the species of Genus *Cyrtodactylus*

- I. Dorsal scales smaller than the ventral scales
 *Cyrtodactylus collegalensis*
 II. Dorsal scales larger than the ventral scales ..
2
 2. Dorsum is reddish-brown with white transverse bands
 *Cyrtodactylus dekkanensis*
 – Dorsum is brown with deep yellow cross bars
 *Cyrtodactylus albofasciatus*

11. *Cyrtodactylus collegalensis* (Beddome)

1870. *Gymnodactylus collegalensis* Beddome. *Madras Month. J. Med. Sci.* ii : 173

Common name : English : South Indian Rock Gecko.

Diagnostic Characters : Suborder Sauria (lizards) under order *Squamata* can be defined as the reptiles with well developed limbs and girdles. Some species might have lost their limbs and acquired long bodies, but they possess vestiges of pectoral and pelvic girdles. Majority of them are covered with horny epidermal scales and possess eyes with movable eyelids. Pupils of the eyes vertical. The species under family *Gekkonidae* are characterized by possession of dilated pentadactyle digits (adhesive digital pads). The pads help in increase in efficiency of climbing and/or resting on vertical surfaces. Head and body depressed, rostral broad with a cleft above. In *Cyrtodactylus* dorsum is devoid of enlarged rounded tubercles. Dorsal scales smaller than the ventral scales. Digits feebly dilated, clawed and cylindrical. Two or three distal phalanges strongly compressed laterally and form a strong dorsoventral curve (bend) between last and next to last phalanx. Underside of the digits is with a row of distinct transverse plates. Tail not tapering abruptly behind the vent. Pupil vertical. *Cyrtodactylus collegalensis* possesses two main colour forms. (i) Dorsum with four dark brown, black-margined cross bands. One across the nape reaching upto the eyes. One just behind the shoulder. One at the middle of the back. Fourth

one is at the base of the tail. Dorsal part of the head, lips and throat profusely spotted with brown. Belly is light brown. The bands are broader than the interspaces between them. (ii) Dorsum is light brown to grey, with series of large, rounded black-margined spots arranged in pairs. In some specimens smaller-sized irregularly arranged brown spots may be present on dorsal side of back and tail. Head and body length : 46-52 mm, Tail length : 42-46 mm.

Locality : Hilly districts of Southern India South of Lat. 13°N. including Goa State

Distribution : Hilly districts of Southern India.

Elsewhere : Sri Lanka.

Habitat : *Cyrtodactylus collegalensis* is a gecko species of the forest. It is an arboreal and insectivorous species found under the tree barks. It is available at lower elevations also.

Status : Sharma (2002) reports status of the species as vulnerable on account of habitat destruction particularly at lower elevations where forests are being cut indiscriminately; IUCN Category as per CAMP Report (1998) : Data Deficient (As *Geckoella collegalensis*).

Remarks : Nil.

12. *Cyrtodactylus dekkanensis* (Gunther)

1864. *Gymnodactylus dekkanensis* Gunther, Rept. Brit. Ind. : 115, pl. 12 Fig. E.

Common name : English : North Malabar Rock Gecko.

Diagnostic Characters : Suborder Sauria (lizards) under order Squamata can be defined as the reptiles with well developed limbs and girdles. The species under family Gekkonidae are characterized by possession of dilated pentadactyle digits (adhesive digital pads). However, in *Cyrtodactylus* pentadactyle digits are feebly dilated. Pupils of the eyes vertical. Dorsum is devoid of tubercles. Digits clawed and cylindrical. Two or three distal phalanges strongly compressed laterally and form a strong dorsoventral curve (bend) between last and next to last phalanx. Underside of the digits is with a

row of distinct transverse plates. *Cyrtodactylus dekkanensis* is a moderately large gecko. It is reddish-brown in colour above with narrow white brown-edged transverse bars on the back and tail. Curved black streak starts from the nape and reaches upto eyes. Ventrums white in colour. Head is large in comparison to the body with a prominent snout covered above with small rounded scales. Body is depressed, flattened dorsoventrally with no lateral folds. Dorsum with larger somewhat quadrangular, juxtaposed scales forming regular transverse series. Belly scales much larger than the dorsal scales. Hind limbs reach the axilla. Tail feebly swollen at the base and tapers to a point. It is covered above with small juxtaposed scales and rows of enlarged tubercles. Males without any preanal or femoral pores. Head and body length : 47-85 mm, Tail length : 34-80 mm.

Locality : Hilly districts of Western Ghats including Goa State. Nearest collection locality as reported by Sharma (2002) is Helvak, Koyana Valley in Maharashtra State.

Distribution : Western Ghats in India.

Habitat : *Cyrtodactylus dekkanensis* is a gecko species of hilly forest. It is a terrestrial, insectivorous and nocturnal species.

Status : Sharma (2002) reports status of the species as rare; IUCN Category as per CAMP Report (1998) : Vulnerable (As *Geckoella dekkanensis*).

Remarks : Nil.

*13. *Cyrtodactylus albofasciatus* (Boulenger)

1885. *Gymnodactylus albofasciatus* Boulenger, Cat. Liz. Brit. Mus. i : 37, pl. 4, Fig. 3.

Common name : English : South Malabar Rock Gecko.

Diagnostic Characters : The *Cyrtodactylus* species under family Gekkonidae possess feebly dilated pentadactyle digits. *Cyrtodactylus albofasciatus* is a moderately large gecko. It has a brilliant coloration with alternate black and deep yellow transverse bars all the dorsum when alive. A curved black streak emerges from the nape and

reaches upto eyes. Pupils of the eyes vertical. Ventrums white in colour. Head is slightly larger in comparison to the body with a prominent acute snout covered above with small rounded intermixed with large scales at the nape. Body is depressed, flattened dorsoventrally with no lateral folds. Dorsum with less uniform scales. It is a mixture of small irregular scales with number of large and rounded subtriangular tubercles. Belly with feebly keeled scales. Hind limbs reach the axilla. Tail slightly swollen at the base and tapers to a point. It is covered above with small-juxtaposed scales and rows of enlarged tubercles. Males without any preanal or femoral pores. Head and body length : 49-63 mm, Tail length : 38-57 mm.

Locality : R.C. Sharma has collected one specimen from Molem, Goa State (Sharma, 1976, Identified as *Gymnodactylus albofasciatus* Boulenger).

Distribution : Western Ghats in Goa and Karnataka States in India. Appears to be Western Ghat endemic species.

Habitat : *Cyrtodactylus albofasciatus* is a gecko species of the forest. It is a terrestrial, nocturnal and a most secretive species of the forests. Hides under stones and logs during day time. Makes croaking sound when disturbed.

Status : Sharma (2002) reports status of the species as rare; IUCN Category as per CAMP Report (1998) : Not Listed.

Remarks : First collection record from Goa State reported by Sharma (1976).

Genus *Cnemaspis*

Genus *Cnemaspis* is represented by two species in Goa State.

Key to the species of Genus *Cnemaspis*

1. Sides provided with small spinose projecting tubercles. Ventral neck scales keeled; 2-4 preanal pores; 3-6 femoral pores on each side *Cnemaspis kandiana*
- Sides provided with small spinose projecting

tubercles. Ventral neck scales feebly keeled; 2 or 3 preanal pores; 2-4 femoral pores on each side *Cnemaspis goaensis*

14. *Cnemaspis kandiana* (Kelaart)

1852. *Gymnodactylus kandianus* Kelaart, *Prod. Fauna Zeyl.* : 186.

Common name : English : North Kanara Hill Palli.

Diagnostic Characters : Suborder Sauria (lizards) under order Squamata can be defined as the reptiles with well developed limbs and girdles. Majority of them are covered with horny epidermal scales and possess eyes with movable eyelids. The *Cnemaspis* species under family Gekkonidae possess feebly dilated pentadactyle digits. Pupils of the eyes round. *Cnemaspis kandiana* is a small brown gecko with transversely arranged variegations and a faint vertebral stripes or spots. Throat dark brown, while ventrum light brown. Tubercles on the flanks are white. Head is covered above with minute keeled scales, which are largest on the snout. Dorsal surface is with small granular, slightly keeled scales intermixed with larger rounded tubercles. Digits feebly dilated, clawed and cylindrical. Flanks with small, widely separated, spine-like tubercles. Scales under neck are large and keeled, while those on the belly are smooth and rarely keeled. Hind limbs reach the axilla or slightly beyond. Digits elongated and clawed. Subdigital lamellae large. The plates beneath the basal phalanges are 3-5 in number, usually large. Tail slightly longer than Head and Body, cylindrical covered dorsally with small keeled scales and clusters of large tubercles. Males with 2-4 preanal on each side and 3-5 femoral pores. Head and Body length : 36-40 mm, Tail length : 40-44 mm.,

Locality : Hilly districts of Southern Western ghats in India including Goa State. Nearest collection localities as reported by Sharma (2002) are Mahabaleshwar in Maharashtra State and Kanara and Jog Falls in Karnataka State.

Distribution : Hilly districts of Southern India, Andaman Islands.

Elsewhere : Sri Lanka and Sumatra (Sharma, 2002).

Habitat : *Cnemaspis kandiana* is a gecko species of the forest. However it may enter in houses also. It is available at lower elevations also.

Status : Sharma (2002) reports status of the species as common throughout its range; IUCN Category as per CAMP Report (1998) : Lower Risk- Least Concern.

Remarks : Nil.

*15. *Cnemaspis goaensis* Sharma

1976. *Cnemaspis goaensis* Sharma, *Rec. zool. Surv. India*, **71** : 152.

Common name : English : Goa Forest Palli.

Diagnostic Characters : Suborder Sauria (lizards) under order Squamata can be defined as the reptiles with well developed limbs and girdles. Majority of them are covered with horny epidermal scales and possess eyes with movable eyelids. The *Cnemaspis* species under family Gekkonidae possess feebly dilated pentadactyle digits. *Cnemaspis goaensis* is a small brown gecko with W-shaped dark brown marks on the back (Two on neck, six on the space between the forelimbs and hind limbs). Tail with light and dark narrow annuli above. Head, limbs and flanks variegated with lighter and darker markings. Head and throat densely spotted with black on ventral side. Flanks with small, widely separated, spine-shaped tubercles. Ventral scales imbricate and those under the neck are feebly keeled, while those on the belly are smooth. Snout obtuse. A few dark lines emerging from eyes and extending to the cheeks. Head is covered above with small and granular keeled scales, which are intermixed with a few larger tubercles. Digits feebly dilated, clawed and cylindrical. They are with conspicuous dark bars. Hind limbs reach the axilla. Digits elongated and clawed. Subdigital lamellae large. The plates beneath the basal phalanges are 2-5 in number, usually large. Tail longer than Head and Body, cylindrical covered above with small keeled scales and a series of six large, pointed white tubercles. Ventrally tail possess large, imbricate

feebly keeled scales. Males with 2-3 preanal and 2-4 femoral pores on each side. Measurements of Holotype Head and Body length : 30.00 mm, Tail length : 41.00 mm.

Locality : R.C. Sharma has collected six specimens from Canacona (Poinguinim), Goa State (Sharma, 1976)

Distribution : Not known so far (Sharma, 2002).

Habitat : *Cnemaspis goaensis* is a nocturnal and insectivorous gecko species. It was collected from under stones (Sharma, 2002).

Status : An Indian Endemic species. Sharma (2002) reports status of the species as rare and indeterminate; IUCN Category as per CAMP Report (1998) : Critically Endangered.

Remarks : *Cnemaspis goaensis* is a new species (*sp. nova*) described by Sharma (1976).

Genus *Hemidactylus*

Genus *Hemidactylus* is represented by eight species in Goa State.

Key to the species of Genus *Hemidactylus*

1. Back with large number of strongly keeled tubercles, arranged in longitudinal series. Free distal phalanx of inner digit is half as long as the dilated portion.
 1. Lamellae under the digits are in a transverse series. 11-13 Lamellae under the fourth toe. Males with 19-25 femoral pores on each side *Hemidactylus maculatus*
 2. Lamellae under the digits are in oblique series. 7-16 lamellae under the fourth toe. Males with preano-femoral pores only.
 - a) Back with very large tubercle like scales; digits free, 7-10 lamellae under the fourth toe; back with a pattern of strongly defined large brown saddles; males with 6-14 preanofemoral pores *Hemidactylus triedrus*
 - b) Back with large tubercles; digits free, 8-10 lamellae under the fourth toe; dorsum is with

small dark spots or blotches; males with 7-16 preanofemoral pores. ... *Hemidactylus brooki*

c) Back with moderately large tubercles; digits webbed at the base, 10 oblique lamellae under the fourth toe; dorsum brownish-grey with faint narrow white cross bars; males with 17-20 preanofemoral pores

..... *Hemidactylus prashadi*

3. Lamellae under the digits are in a semi-transverse series; 8-10 lamellae under the fourth toe. Males with preanal pores only. Free distal phalanx of inner digit not even half as long as the dilated portion.

Back with granular scales mixed with erect conical tubercles; digits free, 8-10 lamellae under the fourth toe; dorsum is with dark reticulations; males with 6-12 preanal pores.

..... *Hemidactylus reticulatus*

- II. Back with smaller number of rounded, smooth or feebly keeled, irregularly arranged tubercles. Tail without lateral dentition.

1. Inner toe less than half of length of second toe; Males with a continuous series of 23-33 preano-femoral pores

..... *Hemidactylus frenatus*

2. Inner toe more than half of length of second toe; Males with 10-20 femoral pores on each side. 9-12 lamellae under the fourth toe; Tail with enlarged tubercles above, swollen at the base

..... *Hemidactylus leschenaulti*.

3. Inner toe more than half of length of second toe; Males with 5-7 femoral pores on each side. 11-15 lamellae under the fourth toe; Tail with enlarged tubercles above, swollen at the base

..... *Hemidactylus flaviviridis*

16. *Hemidactylus maculatus* Dumeril & Bibron

1836. *Hemidactylus maculatus* Dumeril & Bibron *Erp. Gen.* iii : 358.

Common name : English : Rock Gecko or Dark spotted Giant Gecko.

Diagnostic Characters : Easily distinguishing gecko by its large size and colouration patterns.

Dorsum brown with dark-brown spots, undulating with transverse bars and streaks. Tail banded alternately with dark and white bands. Belly dirty white. Sub-adults brilliantly coloured. Head large and prominent with a bulging on the tip of the snout. Eyes moderately large with vertical pupil. Small ear opening. Head covered with small granular scales intermixed with large conical tubercles. Upper labials 10-12, while lower labials 9-10 in number Hind limbs just reach axilla. Digits are free and moderately dilated. Digital transverse lamellae straight and smooth; 9-10 under first toe, while 10-13 under the fourth toe. Tail clearly longer than head and body, slightly depressed and verticillate. Male with 19-25 femoral pores on each side. Head and Body length : 83-122 mm, Tail length : 90-130 mm.

Locality : Western Ghats including Goa State (Pradhan, 1997 and Sharma, 2002). Nearest collection localities as reported by Sharma (2002) are Panchgani in Maharashtra State and Malabar Coast in Kerala State.

Distribution : Western Ghats and parts of Tinnevely Hills, Ramnad and Salem districts in Tamil Nadu. (Sharma, 2002).

Habitat : Usually inhabits the crevices, caves and other such structures in rocks. Occasionally seen on the rough outer walls of the buildings and on trees. A carnivorous species feeding on variety of arthropods, small lizards including juveniles of its own and other species of geckos, worm snakes and earthworms. Breeds during March to July.

Status : Endemic species within Indian limits. Sharma (2000) reports status of *Hemidactylus maculatus* as common in the distribution range. IUCN category as per CAMP report (1998) : Lower-risk least concern.

Remarks : *Hemidactylus maculatus* is a most pugnacious species and bites savagely on rough handling.

17. *Hemidactylus triedrus* Daudin

1802. *Gecko triedrus* Daudin, *Hist. Nat. Rept.*, 4 : 155

Common name : English : Blotched Gecko.

Diagnostic characters : This is a large and colourful gecko. Dorsum is somewhat yellowish with brownish or pinkish or greenish tinge and with numerous scattered white tubercles all over. Back with four large rich-brown or olive green white edged saddle shaped cross bars or bands between the head and hind limbs. Supra-ocular region is greenish. Head is with one or two yellow stripes behind the eye and a yellow streak across the nape. Ventral side is light pink in the young ones, while it turns white or yellow with a reddish tinge in adults. The dorsum becomes faint with advancement of age in very old specimens. Tail possesses alternate dark-brown and white bands or bars throughout the life. Head is large and prominent with a bulging on the tip of the snout. Eyes are moderately large with vertical pupils. Head is covered with minute granular scales intermixed with larger keeled tubercles. Dorsum is covered with small, irregular scales and very large trihedral tubercles arranged in 16-18 regular longitudinal rows. Ventrums are with large smooth rounded subimbricate scales. Mental shield is large subtriangular and two times longer than the adjoining labials. Upper labials 8-10, while lower labials 7-8 in number. Hind limbs just reach the axilla. Digits are free and moderately dilated with slightly oblique lamellae. 6-7 under the first toe, while 7-8 under the fourth toe. Tail is longer than head and body, slightly depressed but oval in cross section. Tail is covered above with small, irregular, pointed scales and series of 4 or 6 large, keeled pointed tubercles. Male with 6-14 preanofemoral pores on each side briefly interrupted mesially generally with a single scale only. Standard length : 65-80 mm, Tail length : 63-90 mm.

Locality : Western Ghats including Goa State. Nearest collection locality as reported by Sharma (2002) is Satara district in Maharashtra State.

Distribution : Peninsular and Western India.

Elsewhere : Sri Lanka and West Pakistan (Sharma, 2002).

Habitat : The blotched gecko is nocturnal, docile and insectivorous preferring to live in semi-

arid rocky as well as flat sandy but moderately moist area with plentiful of scrubby vegetation. Suitable abodes are rodent and lizard burrows, crevices in trees, rocks dam walls etc. It emerges out from its hide out at dusk. The species feeds on variety of arthropods such as beetles, moths, bugs, spiders, termites, crickets etc. The species has been recorded upto 400 metres altitude. Breeding season is from May to July.

Status : Sharma (2000) reports status of *Hemidactylus triedrus* as common in the distribution range. IUCN category as per CAMP report (1998) : Lower-risk least concern.

Remarks : In Pakistan *Hemidactylus triedrus* was found to be feeding on its young ones. When provoked, it exhibits a defensive attitude (Sharma, 2002).

*18. *Hemidactylus brooki* Gray

1845. *Hemidactylus brooki* Gray, Cat. Liz. Brit. Mus., 153.

Common name : English : Spotted House Gecko.

Diagnostic Characters : All lizards under Sub-order Sauria can be defined as the reptiles with well developed limbs and girdles. Majority of them are covered with horny epidermal scales and possess eyes with movable eyelids. The species under family Gekkonidae are characterized by possession of strongly dilated pentadactyle digits (adhesive digital pads). Body is dorsoventrally flat, covered with large number of strongly keeled tubercles or granule like imbricate scales with no symmetrical shields on top of the head. Dorsum with small granular scales mixed with conical, keeled tubercles which are arranged in 16-20 longitudinal rows. Ventrums scales are smooth, rounded and imbricate. Tongue is broad, fleshy, short, and protrusible with villose papillae. Eyes are moderately large with vertical pupils. Hindlimbs not reaching upto the axilla. Head large ovate and prominent, eyes moderately large with a vertical pupil. Head is covered with small granular and larger scales. Upper labials 8-12, while lower labials with 7-9 scales. Male with 6-16 preanal -femoral pores on each side. Digits

are free, moderately dilated with 5-6 oblique lamellae under the first and 6-10 under the fourth toe. Depressed and verticillate tail, which is swollen at the base, is much longer than head and body in length. Dorsum with small dark and light brown spots or blotches. Ground colour brown or grey above, while dirty white below. Sometimes there is a dark streak along the sides of the head. Head and body length : 14-60 mm, Tail length : 17-75 mm.

Locality : Specimens have been collected from Margoa, Valpoi, Molem, Panjim, Ponda and many other localities in Goa by Sharma (2002) and by different ZSI parties in past.

Distribution : Widely distributed in whole of India.

Elsewhere : Other parts of the world.

Habitat : *H. brooki* is the common house gecko preferring to live under the stones, beneath the wooden logs, also seen in rocky areas in dense forest and even in buildings in urban areas. Mostly insectivorous in habit but can grab gastropods, isopods and even seeds of some wild plants.

Status : Sharma (2000) reports status of the species as very common in its wide range of distribution; IUCN Category as per CAMP Report (1998) : Lower-risk-least concern.

Remarks : Sharma (1976) reported first collection record of this species from Goa State.

*19. *Hemidactylus prashadi* Smith

1935. *Hemidactylus prashadi* Smith, *Fauna Brit. Ind.*, 2 : 92.

Common name : Prasad Brown Gecko.

Diagnostic Characters : The species under family Gekkonidae are characterized by possession of strongly dilated pentadactyle digits (adhesive digital pads). Body is dorsoventrally flat. Dorsum is covered with small granular scales intermixed with quite larger subtriangular tubercles which are arranged in regular longitudinal rows. Ventrals are smooth, rounded and sub-imbricate. Gular region is with small granular scales. There is a distinct lateral fold in this large sized gecko

species. There are 35-40 scales are present across mid-body between the lateral folds. The gecko is grayish-brown in colour with a faint white band on the complete dorsum including tail. Young ones are more prominently coloured with 7-8 whitish cross bars/spots with darker margins. Hindlimbs are hardly reaching to the axilla. Head is slightly large with circular ear opening and prominent, eyes moderately large with a vertical pupil. Head is covered with small granular scales and larger convex scales are present on the occiput region. Here they are intermixed with larger and rounded tubercles. Eyes are moderately large with vertical pupil. Upper labials 11-12, while lower labials with 9-11 scales. Mental shield is large, subtriangular and twice in size than the adjoining labials in length. Male with 17-20 preano-femoral pores on each side separated mesially by three scales. Digits are distinctly webbed at the base and moderately dilated with 8 oblique lamellae under the first and 10 under the fourth toe. Depressed and verticillate tail which is swollen at the base is much longer than head and body in length. It is round in cross section. Dorsum with small dark and light brown spots or blotches. Ground colour brown or grey above, while dirty white below. Sometimes there is a dark streak along the sides of the head. Head and body length : 51-95 mm, Tail length : 71-123 mm.

Locality : Specimens have been collected from Canacona, Nayawada village, Kandal rubber plantation etc. in Goa by Sharma (2002).

Distribution : Karwar and Jog falls in India.

Habitat : *H. prashadi* specimens were collected from the crevices in the walls of old deserted buildings. The abode of this species was observed to be shared by wolf snake and pit-viper (Sharma, 2002). It is an insectivorous and nocturnal species in habit, while docile and gentle in disposition.

Status : Sharma (2000) reports status of the species as Indeterminate; IUCN Category as per CAMP Report (1998) : Endangered. Endemic to Western Ghats.

Remarks : Sharma (1976) reported first record of this species from Goa State. Giri and Bauer

(2006) have reported further extension of range of distribution of this species northwards upto Ratnagiri in Maharashtra State.

20. *Hemidactylus reticulatus* Beddome

1870. *Hemidactylus reticulatus* Beddome, *Madras Month. J. Med. Sci.* i : 33.

Common name : English : Reticulated Gecko.

Diagnostic Characters : Reticulated Gecko is a brown gecko possessing a network of brownish-blue lines on its dorsum. *Hemidactylus reticulatus* possesses all the characters mentioned earlier for the Family Gekkonidae. However, most of the dorsal tubercles in *H. reticulatus* are white, while throat possesses brown markings and ventrum white. Head small and bulged, while snout rounded with small and sub-circular ear-openings. Upper labials 9-10, while lower 7-8 in number. Dorsum with small-keeled scales mixed with large, sharply pointed keeled tubercles. Ventrums with smooth and round imbricate scales. The hind limbs just reach the axilla, digits short, free and moderately dilated. Free distal phalange of innermost digit quite short. Lamellae under digits are in semi-transverse series. 4-6 lamellae under the first and 8-10 lamellae under the fourth toe. Tail verticillate and slightly longer than Head and Body in length. Male with an angular series of 6-12 pre-anal pores. Head and Body length : 21-60 mm; Tail : 30-65 mm.

Locality : Southern India including Goa State. Nearest collection locality as reported by Sharma (2002) is Chickmanglur in Karnataka State.

Distribution : Andhra Pradesh, Karnataka and further southwards in South India.

Habitat : Not much is known about the habitat of *H. reticulatus* except that they are found under stones in rocky areas or from in rocky crevices. The species is nocturnal and insectivorous.

Status : Endemic species within Indian limits. Tikader and Sharma (1992) report status of *H. reticulatus* as indeterminate in the distribution range; IUCN category as per CAMP report (1998) : Lower risk-near threatened.

Remarks : Nil.

*21. *Hemidactylus frenatus* Schlegel

1836. *Hemidactylus frenatus* Schlegel, *Erp. Gen.*, 3 : 366.

Common name : English : Ticticky House Gecko.

Diagnostic Characters : A small gecko possessing different shades of brown with grey colour on dorsal side. Some may possess very faint brown longitudinal stripes on dorsum. A dark streak emerges generally from near the eyes and extends down upto the groin. Belly whitish or light yellow, while tail may be reddish in colour. Head quite large covered above with small granular scales, which become large on snout. Ear-opening sub-circular. Upper labials 10-12 and lower labials 8-10 in number. Mental shield large and with two pairs of post mental shields of equal size. Dorsum with small granular scales usually intermixed with scattered, rounded faintly keeled tubercles. Ventrums with smooth rounded imbricate scales. Hindlimbs not reaching the axilla. Digits free and moderately dilated. First digit smallest. Oblique lamellae under the first toe 4-5 and 9-10 under fourth toe. Tail slightly longer than Head and Body, feebly depressed, verticillate, covered above with small scales and series of six enlarged pointed tubercles. Under side of the tail with a median series of transversely enlarged scales with continuous series of 26-36 preanofemoral pores. Head and body length : 40-60 mm, Tail length : 39-65 mm.

Locality : Six specimens have been collected from Canacona, Valpoi and Dhavan village in Goa by Sharma (2002). Smith (1935) and Tikader and Sharma (1992) reported the extent of distribution of this species throughout peninsular India.

Distribution : Peninsular India, West Bengal, Andaman and Nicobar Islands.

Habitat : The species is terrestrial, insectivorous and nocturnal preferring to live in the crevices of tree trunks, deserted houses, gardens and many other various types of habitats.

Status : Ahmed and Dasgupta (1992) and Tikader and Sharma (1992) reported the status of *H. frenatus* as abundant and widely distributed

species; IUCN category as per CAMP report (1998) : Lower risk-least concern.

Remarks : Nil.

22. *Hemidactylus leschenaulti* Dumeril & Bibron

1836. *Hemidactylus leschenaulti* Dumeril & Bibron *Erp. Gen.*, iii : 364.

Common name : English : Common Bark Gecko.

Diagnostic Characters : A large ashy grey coloured gecko with undulating crossbars or rhomboidal spots on the dorsal side. A black stripe emerges from behind the eye and extends upto the flanks. Belly whitish in colour. Head large with a broad snout. Head covered with small granular scales, which becomes quite large near the snout. Ear opening subcircular. Upper labials 10-10 in number. Mental shield quite large and subtriangular in shape. Two pairs of post-mantles, inner pair larger than the outer pairs. Nostril is situated between rostrals. Dorsum is covered with small granular scales intermixed with few larger, rounded and feebly keeled tubercles. Ventrums covered with smooth, round and subimbricate scales. Hindlimbs hardly reach the axilla. Digits are free moderately dilated with slightly oblique or more transverse lamellae. 6-7 lamellae under the first toe, while 9-11 under the fourth toe. Tail almost equal to Head and Body, but strongly depressed and swollen at the base in adults. It is verticillate and flat beneath. It is covered above with small scales and series of 6 enlarged pointed tubercles. Male with 10-17 femoral pores on each side. Head and Body length : 32-83 mm; Tail length : 31-83 mm.

Locality : Smith (1935), Tikader and Sharma (1992) and Ahmed and Dasgupta (1992) reported the extent of the distribution of this species throughout peninsular India.

Distribution : Peninsular India and West Bengal in Eastern India.

Habitat : The species is arboreal, nocturnal and insectivorous. Its favourable abodes includes under barks of large trees of banyan, tamarind,

mango etc. During daytime they hide under the bark and crevices of these trees.

Status : Abundant (Tikader and Sharma, 1992), Common (Daniel, 1983); IUCN Category as per CAMP Report (1998) : Lower risk-least concern.

Remarks : Daniel (1983) reports that the dark grey colour of this gecko with wavy bands on the back merges with the colour of the tree bark and hence becomes difficult to locate it.

* 23. *Hemidactylus flaviviridis* Ruppell

1835. *Hemidactylus flaviviridis* Ruppell, *Neue Wirb. Faun. Abyss.* : 18 pl. vi fig. 2.

Common name : English : Yellow bellied house Gecko.

Diagnostic characters : A large sized and robust gecko with a pale-grey or greenish-grey to olive coloured dorsum. There are wavy and dark cross bands on the dorsal side. Belly yellowish. Head is large with a broad snout. Ear-opening subcircular. There are minute granules on the head, but they are more prominent and large on the snout. Upper labials 12-15 and lower labials 10-12. Mental shield large and subtriangular. Rostral broad. Dorsum covered with small granular scales intermixed with very few large, round and feebly keeled tubercles. Ventrums with smooth imbricate scales. Hindlimbs just reach the axilla. Digits are free and moderately dilated with oblique lamellae. 7-10 lamellae under the first toe (This character separates *H. flaviviridis* from the remaining *Hemidactylus* species). 11-14 lamellae under the fourth toe. Tail length is almost equal to the head and body length. Tail strongly depressed and swollen at the base, flat beneath and verticillate. Male with 5-7 femoral pores on each side. Head and Body length : 42-90 mm, Tail length : 38-90 mm.

Locality : ZSI Survey parties sighted live specimens in Molem, Bondala and Valpoi Rest Houses during the project period.

Distribution : Whole of India.

Habitat : A commensal species usually seen on the inside walls of houses and buildings. Most

agile, pugnacious, excellent climber and normally a nocturnal and an insectivorous species. Makes voice like a chirp of a small bird.

Status : Most common (Tikader and Sharma, 1992), IUCN category as per CAMP report (1998) : Lower-risk-least concern.

Remarks : Widely distributed in North India above 20° N.

Family AGAMIDAE

Family Agamidae is represented five species under four genera in Goa State.

Key to the genera of the Family AGAMIDAE

- I. A wing-like expansion is present on the much extended ribs **Draco**
- II. Wing-like expansion absent and ribs normal 2
2. Body not depressed. Dorsal crest present 3
- Body is depressed and dorsal crest absent . 4
3. i) Only four toes are present **Sitana**
ii) Five toes present **Calotes**
4. Body is depressed and dorsal crest absent **Psammophilus**

Genus *Draco*

Genus *Draco* is represented by a single species in Goa State.

*24. *Draco dussumieri* Dum. & Bibr.

1837. *Draco dussumieri* Dum. & Bibr. *Erp. Gen.*, 4 : 456.

Common name : English : South Indian Flying Dragon or Lizard.

Diagnostic characters : Body with a large, lateral, wing-like membrane or patagia is supported by six ribs which are very much extended. Wings are expanded when the lizard is gliding from tree to tree. When the lizard is at

rest or climbing on a tree in search of food, the wings are folded back along the sides of the body and are hardly distinguishable from the body. A gular appendage and a lateral flap on either side of the throat are present. Gular pouch is usually much larger in males than in females. Head is moderately large with a broad snout. Dorsal scales on the head are unequal and strongly keeled. Presence of a conical scale at the posterior part of the orbit is also a characteristic feature. Nostrils directed vertically upwards. Tympanum is necked. Colouration is grayish brown, ashy-brown to brownish black. Back is provided with darker circular spots. Ventrums are grayish with a series of large black-margined spots. Throat is light blue with numerous black spots. Upper labials 10-12. Dorsum is covered with unequal smooth to feebly keeled scales. Ventrums with strongly keeled scales. Forelimbs are longer and can be stretched slightly beyond the snout. Hindlimbs reach the axilla. Tail is longer than head and body in length. Head and Body length : 95 mm, Tail length : 135 mm.

Locality : Specimens have been collected from Molem sanctuary region. in Goa by ZSI Survey parties in past and also during the project period.

Distribution : Peninsular India.

Habitat : Specimens have been seen in coconut, betel, areanut and even teak plantations in thick forests up to the elevation of 1500 m. The species is absolutely arboreal, most agile and gliding lizard. Insectivorous species. Pre-mating combats are common in males.

Status : Indeterminate (Tikader and Sharma, 1992), IUCN category as per CAMP report (1998) : Lower-risk- Near Threatened.

Remarks : Nil.

Genus *Sitana*

Genus *Sitana* is represented by a single species in Goa State.

* 25. *Sitana ponticeriana* Cuvier

1844. *Sitana ponticeriana* Cuvier. *Guerin. Icon. Reg. Anim. Rept.* : pl. x fig. 2.

Common name : English : Indian fan throated lizard.

Diagnostic characters : All members of the family Agamidae are characterised by possession of digits of the feet without any adhesive pads, eyes with movable eyelids, body dorsoventrally or laterally compressed and covered with imbricate scales. Tongue broad and short but not protrusible. Skull with temporal and postorbital arcades. Genus *Sitana* under family Agamidae is recognized by possession of four toes only, by absence of femoral pores, ribs normal and not extended and finally body normal and not depressed. Four toes on each foot separates *Sitana* from all other agamid lizard species possessing five toes on each foot. *Sitana ponticeriana* is a small agamid lizard, brown above with a series of dark brown black margined, rhomboidal, vertebral spots on the back. The throat fan in male is brilliantly coloured in red, blue and black. Belly whitish. Body compressed with no dorsal crest. Head scales unequal in size. Scales strongly keeled. Limbs long with strongly keeled scales. Fourth toe longest, while fifth toe absent. Tail is extremely longer than the head and body. Males with a low nuchal crest and a large folding gular appendage. Head and Body length : 40-80 mm, tail length : 60-170 mm.

Locality : ZSI Survey parties have sighted live specimens in Molem, Bondala and Valpoi sanctuary areas in Goa state during the project period.

Distribution : Whole of India excluding region east of Ganges in Eastern India.

Habitat : Fan throated lizard inhabits practically all biotopes except perhaps the heavy rainfall forests and the deserts. Preferred habitat is scrub and sandy country. Terrestrial, ground dwelling and diurnal agamid lizard feeding mainly on ants and small insects. A fast and graceful runner.

Status : Very common (Daniel, 1983 and Tikader and Sharma, 1992); IUCN category as per CAMP report (1998) : Lower risk-least concern.

Remarks : Nil.

Genus *Calotes*

Genus *Calotes* is represented by two species under a single genus in Goa State.

Key to the species of the Genus *Calotes*

- I. No fold or pit in front of the shoulder
..... *Calotes versicolor*
- II. A long fold is present in front of the shoulder which extends across the throat
..... *Calotes rouxi*

*26. *Calotes versicolor* (Daudin)

1802. *Agama versicolor* Daudin, *Hist. Nat. Rept.* iii : 395 pl. xlv.

Common name : English : Indian garden lizard.

Diagnostic characters : These agamid lizards are with compressed body, five toes, exposed tympanum, and equal-sized dorsal scales, which are arranged regularly. Dorsal crest present. Tail comparatively long and slender, in males swollen at the base. Femoral and preanal pores are absent. No fold or pit in front of the shoulder. Two erect and separated spines above the tympanum. Long snout. Dorsal colour lightly brown greyish, transverse spots on back and sides. Dark streak from eyes. Males with gular sac. Limbs long and well developed. Digits long, slender and strongly clawed. 10-13 upper labials, while 11-14 lower labials. Body scales keeled and imbricate with pointed tips. Scales in 37-47 rows at mid-body. Head and Body length : 86-129 mm; tail length : 300-350 mm.

Locality : Number of specimens have been collected from different areas such as Fatorpa, Dudhsagar waterfalls, Cortalim, Margoan, Molem, Durgini Hills, Asavana Village, Dhavan Village, Canacona etc. during various surveys conducted at different times by ZSI Survey parties (Sharma, 1976).

Distribution : Practically whole of India.

Habitat : Arboreal species in true sense. Diurnal and insectivorous lizard of the gardens, hedges, scrub land and forests. Most plentiful in

the vicinity of streams, riversides, desert oases etc. These lizards are excellent climbers. Their prehensile toes and long tail help them in balancing the body for such arboreal life.

Status : Most common species throughout its range (Daniel, 1983, Sharma, 2000), IUCN category as per CAMP report (1998) : Lower risk-Near Threatened in Central India. (For *Calotes versicolor versicolor* (Daudin).

Remarks : Nil.

* 27. *Calotes rouxi* Dum. & Bibr.

1837. *Calotes rouxi* Dumeril and Bibron, *Erp. Gen.*, iv : 407.

Common name : English : Forest Calotes or Matheran olive-Brown calotes.

Diagnostic characters : The body of the forest calotes species is comparatively smaller than *versicolor*. *C. rouxi* can be distinguished by the presence of a distinct dark fold across the neck in front of the shoulder and by presence of two slender spines on each side of the back of the head. Normally brown in colour with patterns on the back. It is easily confused with young *versicolor*. Head, nape and gular pouch red. Side of head and neck banded with brown. Dark brown lines radiate from the eye. During the breeding season the head and a narrow strip along the mid back of the male turn bright brick red contrasting distinctly with that of the rest of the body. Head scales unequal in size and strongly keeled. 9-10 labials on both the sides. Limbs are moderately developed, slender in size with fourth toe longer than the third toe. Hind limbs reach the temple. Tail slender but long and slightly compressed. Dorsal body scales keeled, the upper rows pointing upwards and backwards, while the lower rows pointing backwards and downwards. Ventral scales strongly keeled. 50-60 rows of scales in the middle of the body. Head and Body length : 29-77 mm; Tail length : 49-170 mm.

Locality : Number of specimens have been collected and, or sighted from different areas such as Dudhsagar waterfalls, Cortalim, Margoan, Molem, Ponda, Dhavan Village, Canacona etc.

during various surveys conducted at different times by ZSI Survey parties (Sharma, 1976).

Distribution : Peninsular India (Daniel, 1983).

Habitat : Forest dwelling arboreal species. Insectivorous and diurnal in habit.

Status : Though widely distributed, the species is vulnerable on account of habitat destruction (Sharma, 2000). The species is, however, endemic within Indian limits. IUCN category as per CAMP report (1998) : Lower risk-Near threatened.

Remarks : Nil.

28. *Psammophilus dorsalis* (Gray)

1831. *Agama dorsalis* Gray, in *Griffith Anim. King.* 9, Syn. : 56.

Common name : English : Olive Brown rock lizard.

Diagnostic characters : Body of the olive brown rock agamid lizard is feebly depressed with tympanum exposed and throat with a deep transverse fold. Cheeks swollen in the adult males. Head is very large, elongated and flat. Limbs are very strong and covered with uniform keeled scales. Preanal scales are absent in males. Gular sac absent. Nuchal and dorsal crest are indicated by a ridge of the enlarged scales. Head scales unequal, smooth or sometimes obtusely keeled. Body covered with uniform comparatively small and feebly keeled scales in adults (Strongly keeled in juveniles). Scales in the middle of the body 115-150. All scales pointing upwards and backwards. Labials 10-13. *P. dorsalis* is olive-brown or pale-brownish in dorsal colouration in young ones and females, while pale-brownish in adult males. Series of white elongated spots on sides and back present. Lips yellowish brown. Ventrums yellowish. Throat speckled with gray. Hind-limb reaches the ear or orbit. Tail long, slender and slightly compressed. Dorsal scales on the tail are larger than the ventral scales. Tail swollen at the base in males. Head and Body length : 100 mm; Tail length : 200 mm.

Locality : Smith (1935), Tikader and Sharma (1992) and Sharma (2002) reported the extent of

the distribution of this species south of 16°N in peninsular India including Goa State. Nearest collection locality as reported by Sharma (2002) is Malabar Coast in Karnataka State.

Distribution : Karnataka, Nilgiri and Nallamalai Hills, South Arcot, Bangalore.

Habitat : Absolutely rock dwelling, living in the crevices and holes in rocks upto 700 metres. Agile, insectivorous and diurnal lizard.

Status : In abundance (Tikader and Sharma, 1992). IUCN category as per CAMP report (1998) : Lower risk-Near threatened.

Remarks : Nil

Family CHAMAELEONIDAE

Family Chamaeleonidae is represented by a single species in Goa State.

* 29. *Chamaeleo zeylanicus* Laurenti

1768. *Chamaeleo zeylanicus* Laurenti, *Syn. Rept.* : 46.

Common name : English : Indian chameleon.

Diagnostic characters : Chamaeleon family includes highly specialized arboreal, insectivorous and diurnal lizards. The body is laterally compressed. There is a caque on top of the head. Anterodorsal crest is most prominent, which bends slightly on posterior side. Dorsal crest low serrated. The skin is granular suitable for quick and extensive changes in colour. Teeth compressed, small, triangular, tricuspid, uniform and acrodont. The tongue is club shaped, sticky at the tip and can quickly extend to a distance upto 15-20 cms. for catching insect preys. The feet are with digits permanently opposed in groups of two and three for grasping. Claws simple. The tail is long and prehensile. Eyes are large and move independently. Both the eyelids are fused and form a complete ring around the eye leaving a small opening at the centre. Ears devoid of tympanum and tympanic cavity. Basic colour is green but can change rapidly and camouflage with the surrounding. Male with a spur like process. Head and Body length : 175 mm; Tail length : 200 mm.

Locality : Sighted two live specimens in Bhagwan Mahawir Sanctuary, Molem, and Bondla sanctuary by ZSI survey parties during the project period.

Distribution : Peninsular India.

Habitat : Strictly arboreal, diurnal and insectivorous. Perfectly adapted for an arboreal existence and also for its feeding habits. Its movements are deliberate and slow. Chamaeleon prefers thick-forested areas but is uncommon in very heavy rainfall regions. In semi-desert regions it is found in hedges and shrubs.

Status : Endangered in India on account of habitat loss (Sharma, 2000), Wildlife (Protection) Act 1972 (as amended upto 2002) Schedule : Schedule : II (*Chameleo calauratus**); IUCN category as per CAMP Report (1998) : Vulnerable, CITES Appendix : Appendix II.

Remarks : The chameleon can increase its striking range by supporting itself on its hindlimbs and tail independently and reaching out with the body. On the ground its walk is slow and stilted, each leg being waved in a curious action before being set on the ground. The whole effort looks like a walk of sick patient. * *Chameleo calcaratus* has been synonomised with *Chamaeleo zeylanicus* Laurenti (Smith, 1933).

Family SCINCIDAE

Family Scincidae is represented by two genera in Goa State.

Key to the genera of the Family SCINCIDAE

- I. Limbs well developed and strong. Pterygoid bones are not touching one another *Mabuya*
- II. Limbs short, weak and vestigial or even absent. Pterygoid bones in contact with one another *Riopa*

Genus *Mabuya*

Genus *Mabuya* is represented by five species in Goa State.

Key to the species of the Genus *Mabuya*

1. 28-30 scales around the middle of the body; dorsal scales with 5-9 strong keels; 12-17 lamellae under the fourth toe. *M. macularia*
2. 26-30 scales around the middle of the body; dorsal scales with 3-7 strong keels; 15-18 lamellae under the fourth toe *M. allapallensis*
3. 30-34 scales around the middle of the body; dorsal scales with 5-7 moderate keels; 14-18 lamellae under the fourth toe. .. *M. carinata*
4. 30-32 scales around the middle of the body; dorsal scales with 3-5 feeble keels; 12-15 strongly keeled lamellae under the fourth toe. Back with 4 dark longitudinal stripes *M. beddomii*
5. 34-36 scales around the middle of the body; dorsal scales with 5-7 moderate keels; 13-14 lamellae under the fourth toe. Back with 5 broad, black edged yellowish-white longitudinal stripes..... *M. trivittata*

* 30. *Mabuya allapallensis* Schmidt

1926. *Mabuya allapallensis* Schmidt, *Pub. Field. Mus. Nat. Hist. (Zool)*, Chicago, **12** : 170.

Common name : English : Allapalli forest skink.

Diagnostic characters : Species under family *Scincidae* possess subcylindrical and almost circular elongated body, which is covered with cycloid overlapping scales. There is no marked distinction between the head and body. They are continuous without any evidence of neck. Body, limbs and tail are protected with osteoderms. 26-30 scales round the middle of the body. Dorsal and lateral scales are almost equal, each with 3-7 distinct strongly marked keels. Ventrums with very feeble keel-like markings. Union of palatine bones takes place at the midline of the palate, while pterygoid bones are not touching one another. Supranasals present and widely separated. Limbs short but strongly developed. The complete ground colour of this skink is very dark brown with

black spots between neck and base of the tail. There is a white line from the upper lip to the shoulders. Belly is greenish white. Prefrontals markedly separated. Post-frontals absent. Ear opening almost circular. Digits moderately long and with 15-18 obtusely keeled lamellae beneath the fourth toe. Hindlimb not reaching the elbow. Standard Head and Body length 24-50 mm; Tail length : 32-64 mm.

Locality : Number of specimens have been collected from Canacona, Molem, Asavana Village, Kandal rubber plantations and Ponda regions in Goa state by the ZSI survey parties in past (Sharma, 1976).

Distribution : Andhra Pradesh, Bihar, Karnataka and Madhya Pradesh in India.

Habitat : Terrestrial, diurnal and insectivorous generally seen in rocky open areas in deciduous forests.

Status : *Mabuya allapallensis* is an endemic species in India. Indeterminate (Tikader and Sharma, 1992). IUCN category as per CAMP report (1998) : Endangered.

Remarks : Nil.

* 31. *Mabuya macularia* (Blyth)

1853. *Euprepes macularius* Blyth, *J. Asiat. Soc. Beng.*, xxii : 652.

Common name : English : Little skink, Bronzy Grass skink.

Diagnostic characters : Little skink possesses all the characters mentioned for the family *Scincidae* and Genus *Mabuya*. In addition, it possesses scaly lower eyelids. There are 28-30 scales round the middle of the body. Dorsal scales with 5-9 strong keels. 12-17 lamellae under the fourth toe. Snout to vent length not exceeding 75 mm. The colour pattern of this widely distributed species varies greatly. However, the general body colour is brown with or without longitudinally arranged spots. Sometimes the skink is brown olive or bronzy in colour. Light dorsolateral stripe is always present. Standard Head and Body length : 60-75 mm. Tail length : 110-140 mm.

Locality : Sharma (1976) reported collection of this species from Ponda region. This is a first collection record from Goa State.

Distribution : Peninsular India.

Habitat : Forested areas of India. Basically terrestrial, diurnal, insectivorous and oviparous skink.

Status : Very common (Daniel, 1983, and Sharma, 2002), IUCN category as per CAMP Report (1998) : Lower risk-least concern (As *Mabuya macularius*).

Remarks : Nil.

*** 32. *Mabuya carinata* (Schneider)**

1801. *Scincus carinatus* Schneider, *Hist. Amphib ii* : 183.

Common name : English : Common Indian skink, Common skink, and Brahminy skink.

Diagnostic characters : Common skink possesses all the characters of Family Scincidae and genus *Mabuya*. In addition it possesses scaly lower eyelids. Dorsal scales moderately keeled with only 5-7 keels on each scale. 30-34 scales round the middle of the body. 14-18 lamellae under the toe. Common skink is olivaceous brown or shining bronze in colour dorsally. Back and anterodorsal portion of the tail is with dark-brown to black spots or longitudinal lines along the lateral margin of the scales. Laterally the skink is dark brown. Two somewhat lighter dorsolateral stripes present. Limbs very well developed. Supranasal shields on the head just touching or separated from one another. Frontonasal broader than long. Prefrontals in contact with each other. Ear opening circular. Standard Head and Body length : 125 mm, Tail length : 165 mm.

Locality : Number of specimens have been collected and/or sighted from areas such as Margaon, Molem, Valpoi, Nayavada Village, Ponda, Bondla, Mormugoa etc. in Goa State by ZSI survey parties in past and also during the project period.

Distribution : Peninsular India.

Habitat : Terrestrial, diurnal, insectivorous and

oviparous. One of the commensal species. Almost at home in semi-urban and forest areas. Primarily ground dweller. Actively searches through ground litter for prey. It is more often heard than seen.

Status : Very common (Daniel, 1983, Tikader and Sharma, 1992 and Sharma, 2002), IUCN category as per CAMP Report (1998) : Lower risk-near threatened.

Remarks : Nil.

33. *Mabuya beddomii* (Jerdon)

1870. *Euprepes beddomii*, Jerdon, *P. Asiat. Soc. Beng* 73

Common name : English : Beddom's South Indian skink, Common skink, and Brahminy skink.

Diagnostic characters : Beddom's South Indian Skink possesses characters of the Family Scincidae and genus *Mabuya*. In addition it possesses scaly lower eyelids. Further, it has 30-32 scales round the middle of the body, dorsal scales with 3-5 feeble keels, 12-15 strongly keeled lamellae under the fourth toe and back with 4 dark brown longitudinal stripes running all along the body length upto the base of the tail. A broad stripe is present on the lateral side of the head. Belly whitish. Supranasals and prefrontals are in contact with each other. Ear opening circular. Digits moderately long. Hind limbs can reach upto the wrist. Standard Head and Body length : 55 mm. Tail length : 115 mm.

Locality : Smith (1933) and Tikader and Sharma (1992) have reported occurrence of this species in Peninsular India including Goa State. The nearest collection localities reported by Sharma (2002) are Hills of Malabar coast and Karnataka State.

Distribution : Peninsular India.

Habitat : Terrestrial, diurnal and insectivorous. Not much is known about its habit and habitat.

Status : Rare due to habitat loss (Tikader and Sharma, 1992), IUCN category as per CAMP Report (1998) : Lower risk-least concern.

Remarks : Nil.

***34. *Mabuya trivittata* (Hardwicke & Gray)**

1827. *Tiliqua trivittata* Hardwicke & Gray, *Zool. Jour.* iii : 227..

Common name : English : Five striped skink.

Diagnostic Characters : Five striped skink possesses all the characters of Family Scincidae and Genus *Mabuya* mentioned earlier. In addition it possesses scaly lower eyelids. 34-36 scales round middle of the body. Dorsal scales with 5-7 moderate keels. 13-14 lamelle under the fourth toe. Back with five broad black edged yellowish white longitudinal stripes. The stripes extend the whole length of the body upto the base of the tail. Vertebral and dorso-lateral stripes most prominent. Supranasals and prefrontals in contact with one another. Ear opening is almost circular. The hind limbs reach to the wrist. Standard Head and Body length : 80 mm; Tail length : 80 mm.

Locality : Smith (1933) and Tikader and Sharma (1992) reported wide occurrence of this species from Central and South India and consider it as endemic to these region only. ZSI survey parties sighted the species in Molem and Dudhsagar regions of Goa State during the project period.

Distribution : Central and Southern peninsular India.

Habitat : Terrestrial, ground dwelling reported from forested as well as urban areas. Insectivorous and diurnal species.

Status : Endemic to Central and Southern India, Indeterminate (Tikader and Sharma, 1992), IUCN category as per CAMP Report (1998) : Lower risk-least concern.

Remarks : Nil.

Genus *Riopa*

Genus *Riopa* is represented by four species in Goa State.

Key to the species of the Genus *Riopa*

- I. Lower eyelid is scaly *R. goaensis*
- II. Lower eyelid is with a semi-transparent disc.
..... A

A. With five fingers and five toes 1.

1. 24-28 scales around the middle of the body; 62-76 rows of scales down middle of back between parietals and hind-limbs. *R. punctata*
2. 24-26 scales around the middle of the body; 87-100 rows of scales down middle of back between parietals and hind-limbs.
..... *R. guentheri*

B. With five fingers and four toes ... *R. lineata*

*** 35. *Riopa punctata* (Linnaeus)**

1799. *Lacerta punctata* Linnaeus, *Syst. Nat.*, : 369.

Common name : English : Dotted Garden skink, Snake skink.

Diagnostic characters : Dotted Garden skink or snake skink possesses all the characters of family Scincidae mentioned earlier. However, in Genus *Riopa* the palatine bones are united in the middle of the palate, pterygoid bones in contact, limbs short and weak and body snake like. Lower eyelid with semitransparent disc. *R. punctata* possesses five fingers and five toes; 24-28 scales round the body, 62-76 rows of scales down middle of back between the parietals and hindlimbs. The dorsum is brown with each scale having dark basal spot forming longitudinal series. In Juveniles and subadults the spots are confluent into 4-6 lines down the back. A yellow dorsolateral stripe start from the snout. Tail in subadults red in colour. Snout obtusely pointed. Small ear openings. 7 upper labials, body scales smooth and digits long with fourth toe longer than the third. 11-14 keeled lamellae under the fourth toe. Tail swollen at the base and slightly longer than head and body. Standard Head and Body length : 86 mm.; and Tail length : 92 mm.

Locality : One specimen has been collected from Canacona-Ponda road in Goa State by R. C. Sharma (Sharma, 1976) in past.

Distribution : Almost whole of India.

Habitat : Generally ground dwelling, insectivorous and oviparous. It lives in damp soil and under fallen leaves or logs.

Status : Most common (Sharma, 2000) IUCN category as per CAMP Report (1998) : Lower risk least concern. (*Lygosoma punctatus* (Gmelin) = *Riopa punctatus* (Linnaeus)).

Remarks : Though Gayen (1999) and some others have considered to keep dark spotted garden skink in *Lygosoma punctata* (Gmelin), it has been retained here in *Riopa punctata* (Linnaeus) only following keys and observations reported by Smith (1935), Daniel (1983), Tikader and Sharma (1992), Ahmed and Dasgupta (1992) and Sharma (2000).

***36. *Riopa guentheri* (Peters)**

1831. *Eumeces guentheri* Peters, *Sitz. Ges. Nat. Berlin* : 36.

Common name : English : Malabar dotted skink.

Diagnostic characters : Malabar dotted skink possesses all the characters mentioned earlier for family Scincidae and genus *Riopa*. Most of the characters of *Riopa punctata* are seen in *Riopa guentheri* except that there are 87- 100 rows of scales down middle of back between the parietals and hindlimbs and body more elongated. Frontal length is equal to the combined length of fronto-parietals and interparietal. Digits shorter with fourth toe slightly longer than the third. Standard length : 110 mm.

Locality : One specimen has been collected from Canacona area in Goa State by R. C. Sharma (Sharma, 1976) in past. This is the first collection record from Goa State reported by Sharma (1976).

Distribution : Western and Central India.

Habitat : Terrestrial, ground dwelling, subterrenian diurnal, insectivorous and oviparous. Generally seen in dry and moist deciduous as well as evergreen forests.

Status : Endemic species. Not common (Tikader and Sharma, 1992), IUCN category as per CAMP Report (1998) : Lower risk near threatened (*Lygosoma guentheri* (Peters) = *Riopa guentheri* (Peters)).

Remarks : Some authors have considered to treat this species as *Lygosoma guentheri* (Peters)

(CAMP REPORT, 1998), However, malabar dotted skink has been treated here as *Riopa guntheri* (Peters) based on keys and observations reported for the Genus *Riopa* by Smith (1935), Daniel (1983), Tikader and Sharma (1992) and Sharma (2000). The species appears to be endemic to Western and Central India.

37. *Riopa lineata* (Gray)

1839. *Chamela lineata* Gray, *Ann. Mag. Nat. Hist.*, 2 : 333.

Common name : English : Golden-Brown four-toed skink.

Diagnostic characters : Golden-Brown four-toed skink possesses all the characters mentioned earlier for family Scincidae and genus *Riopa*. Most of the characters of *Riopa punctata* are seen in *Riopa lineata* except that *lineata* possesses four toes instead of five toes. There are 22 scales round the middle of the body and 104-110 rows of scales down middle of back between the parietals and hindlimbs. Limbs are very weak. Body is much elongated but size is smaller. Lower eyelids are with an undivided semi-transparent disc. Supranasal is entire. Frontal is smaller than the single fronto-parietal. The dorsum is golden brown with dark brown dots forming distinct longitudinal lines. Standard length : 53 mm.

Locality : Smith (1935), Tikader and Sharma (1992) and Sharma (2002) reported the distribution of this species south of Bombay upto North Kanara in Western India including Goa State. Nearest collection locality as reported by Sharma (2002) is North Kanara in Karnataka State.

Distribution : Northern Western India including Maharashtra to Karnataka states (CAMP Report, 1998).

Habitat : Terrestrial, ground dwelling, subterrenian diurnal, insectivorous and oviparous. Generally seen in dry deciduous forests, scrub-jungle as well as in semi-evergreen forests.

Status : Endemic species. Not common, Rare and Indeterminate (Tikader and Sharma, 1992). IUCN category as per CAMP Report (1998) : Lower risk near threatened (*Lygosoma lineata* (Gray) = *Riopa lineata* (Gray)).

Remarks : Some authors have considered to treat this species as *Lygosoma lineata* (Gray) (CAMP REPORT, 1998), However, malabar dotted skink has been treated here as *Riopa lineata* (Gray) based on keys and observations reported for the Genus *Riopa* by Smith (1935), Daniel (1983), Tikader and Sharma (1992) and Sharma (2000). The species is endemic to Western India.

***38. *Riopa goaensis* Sharma**

1976. *Riopa goaensis* Sharma, *Rec. zool. Surv. India*, **71** : 157.

Common name : English : Goanese Bronze skink.

Diagnostic characters : Goanese Bronze skink possesses all the characters mentioned earlier for family Scincidae and genus *Riopa*. Most distinctive character of *Riopa goaensis* is the possession of scaly lower eyelids with a large semi-transparent scale in the center. There are 30 scales round the middle of the body and 64 rows of scales down middle of back between the parietals and hindlimbs. Head is small with obtuse snout. Body is much elongated but size is smaller. Lower eyelids are with an undivided semi-transparent disc. Supranasal is entire in contact with one another behind the rostral. Frontal is larger than the fronto-parietal and interparietals together. Digits long. Fourth toe longer than the third. 13 lamellae under the fourth toe. Tail thick at the base and smaller than the head and body. The dorsum is dark brown to blackish with a black dorso-lateral streak beginning from canthus rostralis to the almost end of the tail. Lower surface light brown. Back and sides densely spotted with brown. Standard length : 53 mm, Tail length 49 mm.

Locality : One specimen has been collected from Molem area in Goa State by R. C. Sharma (Sharma, 1976) in past. This is a new species record reported from Goa State by Sharma (1976).

Distribution : Known only from the type locality (Sharma, 1976).

Habitat : Terrestrial, diurnal, insectivorous and oviparous.

Status : Endemic species. Rare (Tikader and Sharma, 1992), IUCN category as per CAMP Report (1998) : Data Deficient (*Lygosoma goaensis* (Sharma) = *Riopa goaensis* (Sharma)).

Remarks : Some authors have considered to treat this species as *Lygosoma goaensis* (Sharma) (CAMP REPORT, 1998), However, the Goa bronze skink has been treated here as *Riopa goaensis* (Sharma) based on keys and observations reported for the Genus *Riopa* by Tikader and Sharma (1992) and Sharma (2000). The species is endemic to Western India.

Family LACERTIDAE

Family *Lacertidae* is represented by a single species in Goa State.

*** 39. *Ophisops beddomei* (Jerdon)**

1870. *Ophisops jerdoni* Blyth. *J. Asiat. Soc. Beng.*, **xxii** : 653.

Common name : English : Beddom's snake eyed lacerta.

Diagnostic characters : Body dorsoventrally flat covered with scales. There are osteoderms on the head. They are fused with top of the skull. Legs very well developed. Teeth are pleurodont. Tongue long and forked anteriorly covered with scales like papilla. Temporal and post-orbital arcades present. Dorsal scales are pointed, strongly keeled and overlapping. No distinct collar is present. A fold is present in front of the shoulder. Lower eyelid with a large semitransparent disc completely fused with the upper eyelid (which is extremely small or vestigial). This species resembles with *O. jerdoni* in many respects including scalation, colouration etc. but differs in following aspects. Upper lateral light-brown stripe is missing, two or three fronto-nasals are in transverse series, one or two shields etc generally separate prefrontals from one another. Upper head-shields are keeled and striated. 26-32 scales round the middle of the body. Dorsum is olive-brown, golden or grayish. Belly yellowish white. Digits with sharply keeled scales beneath. Hind limb reaches the anthumeral fold or in males between the fold and ear. 8-13 femoral pores on each side.

Head and Body length : 34 mm; Tail length : 60 mm.

Locality : One specimen has been collected from Molem area of Goa State by Sharma in 1976. This is a first collection record from Goa State.

Distribution : Endemic to Western Ghats in India.

Habitat : Terrestrial diurnal and insectivorous species. Prefers grassy patches. Also found in deciduous, moist-deciduous and evergreen forests.

Status : Indeterminate but not endangered (Tikader and Sharma, 1992), IUCN Category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : Nil.

Family VARANIDAE

*40. *Varanus bengalensis* (Daudin)

1802. *Tupinambis bengalensis* Daudin, *Hist. nat. Rept.*, 3 : 67.

Common name : English : Common Indian monitor, Monitor lizard, and Indian monitor.

Diagnostic Characters : Monitor lizards are distinguished by their long and flattened body, long and laterally compressed tail, long neck and extremely elongated, slender and forked tongue. Tongue smooth and retractile like that of a snake. All monitors show uniformity in structure, which is not seen in other orders of lizards. Body stout, covered with small scales and without osteoderms. Teeth large, pointed, acute, recurved and pleurodont. Ventral scales arranged in regular rows. Limbs well developed and digits armed with very strong claws. The colour of the Indian monitor is dark brown. The young ones possess pale ring spots and blackish cross bars. Crown scales characteristically large. The snout is convex terminally, nostrils are placed as oblique slits midway between the eyes and the end of the muzzle. Preanal pores present. Head and Body length : 72-75 cms. and Tail length : 90-100 cms.

Locality : Three specimens have been collected from Dhavan Village, Valpoi and Canacona areas

in Goa State by ZSI survey parties in past. One specimen was sighted in Bondla area during the project period.

Distribution : Whole of India.

Habitat : The Indian monitor is widely distributed and lives in all biotopes from evergreen forests to the fringes of desert. It is terrestrial and ground dwelling. Diurnal and fossorial in habit. It occupies burrows, dense clump of vegetation, hollows of trees, cracks and crevices. Graceful in movement, good climber and swimmer.

Status : The population is alarmingly dwindling throughout the country due to excessive exploitation of the adults for meat and skin (Tikader and Sharma, 1992). Indian Wildlife (Protection) Act 1972 (as amended upto 1991) : Schedule II Part II, CITES : Appendix I, Red Data Book (1994) : Endangered, IUCN category as per CAMP Report (1998) : Vulnerable.

Remarks : As per Central Zoo Authority records live specimens of this species are present in 26 Indian zoos. The species is involved in illegal trade at national as well as international level (Pradhan, 1997).

Suborder SERPENTES (Ophidia)

Suborder *Serpentes* (Ophidia) is represented by seven families in Goa State.

Key to the families of the suborder Serpentes (Ophidia)

- I. Eyes vestigial covered over by shields. Body worm-like, covered with uniform scales. Very short tail. (Blind Snakes) .. TYPHLOPIDAE
- II. Eyes exposed and well developed. Serpentine body. Median row of ventral scales more or less distinctly enlarged, usually forming transverse shields. Tail not very short. (Python, Boa, and other snakes) I
 1. Vestiges of hind-limbs present in the form of claw-like spurs, situated usually on each side of the vent. Body overall bulky. (Python and Boa) BOIDAE
 - Vestiges of hind-limbs totally absent. Overall

- body not bulky but slender, round and snake-like 2
2. No poison fangs in front of the mouth. (Non-Venomous snakes) 3
- A pair of poison fangs present in front of the mouth. (Venomous Snakes) 4
3. Ventral scales scarcely broader than the adjacent scales. Tail extremely short and blunt ending obtusely covered with thick modified, rough file like shield scales. (Rough Shieldtail snakes; Non-Venomous) UROPELTIDAE
- Ventral shields are distinct. Ventral scales nearly or quite as broad as those on body. Tail cylindrical, long and pointed. Premaxillary teeth absent. (Non-Venomous colubrine snakes) COLUBRIDAE
- No Ventral shields present. Complete body is covered with small granular or tuberculate juxtaposed scales ACROCHORDIDAE
4. Maxillary bone with teeth behind the poison fangs. Tail cylindrical. Pupil round. Ventrals nearly or quite as broad as the body. (Krait and Cobra) ELAPIDAE
- Maxillary bone with teeth behind the poison fangs. Tail vertically compressed, puddle shaped.. Pupil round. (Marine snakes) HYDROPHIIDAE
- Maxillary bone very short bearing only poison fang. Tail cylindrical. Pupil vertical. Ventrals nearly or quite as broad as the body. (Vipers) VIPERIDAE

Family TYPHLOPIDAE

Family Typhlopidae contains blind or worm snakes and it is represented by two genera in Goa State.

Key to the genera of the family TYPHLOPIDAE from Goa State

1. Maximum length upto 200 mm only. Scales round the body are 20. 290-320 transverse row of scales along the body length. Total

length of the snake is between 30-45 times of the diameter of its body

..... ***Rhamphotyphlops***

- Maximum length not less than 200 mm. Scales round the body are 18-34. 400-500 transverse row of scales along the body length. Total length of the snake is between 40-60 times of the diameter of its body ***Typhlops***

Genus ***Rhamphotyphlops***

Genus *Ramphotyphlops* is represented by a single species in Goa State.

*41. ***Ramphotyphlops braminus*** (Daudin)

1803. *Eryx braminus* Daudin, *Hist. nat. Rept.*, 7 : 279.

Common name : English : Common Blind snake, Worm snake.

Diagnostic characters : Order Squamata has two Suborders, Serpentes (Ophidia) or Snakes and Sauria (Lacertilia) or lizards. Snakes can easily be distinguished from lizards by a combination of characters. Absence of limbs and girdles, eyelids and external ear openings are some of these characters. Body elongated and snake like. There is an absence of fusion between the two halves of lower jaw but are united by ligaments only. They can move independently. The body is covered with ungranulated cycloid scales. Nictitating membrane and a transparent spectacle are well developed over the eyes. Tongue retractile and acts as an olfactory organ. Teeth are pointed, sharp and recurved. Most of the skull bones except those in palatal region are flexible. Left lung is either rudimentary or absent. Locomotion is effected by lateral undulation of dorsal musculature. Vestiges of pelvis are present in family Typhlopidae. Prefrontal and nasal bones are in articulation in the family. Coronoid bone present. Maxillary bones loosely attached and bear teeth. Typhlopoid snakes are worm like cylindrical bodied snakes covered uniformly with cycloid scales. Eyes minute but distinct, covered by enlarged ocular shield like scales. Mouth small and ventrally situated. Mandibles (lower jaws) devoid of teeth. *Ramphotyphlops* is an annelid

worm like burrowing snake whose head is not differentiated from the tubular body. Tail quite short and bears terminal spinous hook which helps in locomotion. Nasal bones not in contact with each other behind the rostral. Nostrils are in lateral position. 20 scales round the body. 290-320 transverse row of scales along the body length. Total length of the snake is between 30-45 times of the diameter of its body. Dorsal colouration varies from brown to black. While ventrum is light brown. Snout, anal portion and tail tips are somewhite whitish. Standard total length 100-138 mm and never more than 200 mm.

Locality : Five specimens have been collected by the ZSI survey party in past (Sharma, 1976). This is the first collection record from Goa State.

Distribution : Whole of India.

Habitat : Usually leads solitary life, but occasionally seen in aggregations in rotting wood. Prefers to live beneath soil, stones, debris, and barks of rotten wood. An active burrower but slow mover above the ground. Often seen inside houses. Preyed upon by other snake spp.

Status : Fairly common in the distributional range (Sharma, 2003). Indian Wildlife (Protection) Act 1972 (as amended upto 2002), Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : Nil.

Genus *Typhlops*

Genus *Typhlops* is represented by a two species in Goa State.

Key to the species of the Genus *Typhlops* from Goa State

1. Maximum length upto 290 mm only rarely exceeds in length. Scales round the body are 18. 400-440 transverse row of scales along the body length. Total length of the snake is between 50-60 times of the diameter of its body *Typhlops porrectus*
- Largest species amongst the worm snakes. Maximum length reaches upto 600 mm. Scales

round the body are 28-34. 450-500 transverse row of scales along the body length. Total length of the snake is between 40-60 times of the diameter of its body *Typhlops acutus*

42. *Typhlops porrectus* Stoliczka

1871. *Typhlops porrectus* Stoliczka. J. A. S. Beng., 40 426 pl. 25, figs. 1-4.

Common name : English : Slender Worm snake.

Diagnostic characters : Serpentes (Ophidia) or snakes can easily be distinguished by a combination of characters such as total absence of limbs and girdles, eyelids and external ear openings etc. Body always elongated and snake like. The body is covered with ungranulated cycloid scales. Nictitating membrane and a transparent spectacle are well developed over the eyes. Teeth are pointed, sharp and recurved. Most of the skull bones except those in palatal region are flexible. Vestiges of pelvis are present in Family *Typhlopidae*. Prefrontal and nasal bones are in articulation in the family. Coronoid bone present. Maxillary bones loosely attached and bear teeth. Typhlopoid snakes are worm like cylindrical bodied snakes covered uniformly with cycloid scales. Eyes minute but distinct, covered by enlarged ocular shield like scales. Mouth small and ventrally situated. Mandibles (lower jaws) devoid of teeth. *Typhlops* is an annelid worm like burrowing snake. Tail quite short and bears terminal spinous hook which helps in locomotion. Nasal bones not in contact with each other behind the rostral. Nostrils are in lateral position. 18 scales round the body. 400-440 transverse row of scales along the body length. Total length of the snake is between 50-60 times of the diameter of its body. Dorsal colouration varies from brown to blackish. While ventrum is light brown or still paler. Snout, chin and anal portion are generally whitish. Standard total length upto 290 mm and never more.

Locality : Sharma (2000 and 2003) reported the distribution of this species throughout India including Goa State.

Distribution : Whole of India.

Habitat : Usually leads solitary subterranean life. Prefers to hide under stones, debris, and barks of rotten wood. Lives in association with various small insects like earwigs, silverfish and spiders (Sharma, 2003).

Status : Fairly common in the distributional range (Sharma, 2003). Indian Wildlife (Protection) Act 1972 (as amended upto 2002), Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : Nil.

***43. *Typhlops acutus* (Dum. & Bibr.)**

1844. *Onychocephalus acutus* Dumeril & Bibron, *Erp. Gen.*, 6 : 333.

Common name : English : Beaked Blind snake.

Diagnostic characters : Beaked blind snake possesses all the characters of family Typhlopidae and Genus *Typhlops*. However beaked blind snake has nasal bones in contact with one another behind rostral, which is very large covering large part of the head. Moreover snout is strongly pointed, hooked and projecting strongly with sharp horizontal edge. Nostrils inferior. 26-28 scales round the body. Tail ending in a small spine. Colouration brown above while pale below. This is the largest of all the blind snakes. Total length between 450 mm to 600 mm.

Locality : One specimen has been collected from Ponda by the ZSI survey party in past (Sharma, 1976). Smith (1943), Daniel (1983) and Ahmed and Dasgupta (1992) have reported wide occurrence of this species in the region south of Ganges in peninsular India above 16° Latitude. The species is endemic to the peninsular Indian region. This is the first collection record from Goa State.

Distribution : Endemic to peninsular India from Gangetic plains to 16° Latitude.

Habitat : Habit and habitat similar to that of *Rhamphotyphlops braminus*. However, beaked blind snake is believed to feed on worms also.

Status : Uncommon in its range of distribution

(Sharma, 2003), Indian Wildlife (Protection) Act 1972 (as amended upto 1991) Schedule : Schedule : IV.

Remarks : The species appears to be rare south of Latitude 16° N. Whitaker and Captain (2004) have considered treating this species as *Grypotyphlops acutus*. However, the Beaked worm snake has been treated here as *Typhlops acutus* (Dum. and Bibr.) based on keys and observations reported for the species by Smith (1935) and Sharma (1976, 2000 and 2003). The species is endemic to Western India.

Family UROPELTIDAE

Family Uropeltidae contains Rough tailed or shieldtail uropeltid snakes and it is represented by two genera in Goa State.

**Key to the genera of the family
UROPELTIDAE from Goa State**

1. A mentle groove present. *Melanophidium*
- Mentle groove absent *Uropeltis*

Genus *Melanophidium*

Genus *Melanophidium* is represented by a single species in Goa State.

44. *Melanophidium punctatum* Beddome

1871. *Melanophidium punctatum* Beddome, *Madras Monthly J. Med. Sci.*, : 401.

Common name : English : rough tailed snake or Pied-belly shieldtail snake or Travancore *Melanophidium* snake.

Diagnostic characters : Serpentes (Ophidia) or snakes can easily be distinguished by a combination of characters such as total absence of limbs and girdles, eyelids and external ear openings etc. Head is not distinct from neck in family Uropeltidae. Snout is obtusely pointed. The body is short, cylindrical and is covered with smooth scales. Ventral scales are slightly larger than dorsal scales. Tail is quite short with its

terminal end portion transformed into a large, file like naked shield, a characteristic feature of the family. Tail tip bears a scute with a lateral or superior ridges. Most of the skull bones except those in palatal region are flexible. Vestiges of pelvis may be present in family Uropeltidae. Presence of a mentle groove is a characteristic feature of the genus *Melanophidium*. Eyes minute but distinct, covered by enlarged ocular shield like scales. Mouth small and ventrally situated. Suture between the ocular and frontal shields is less than 1/3rd the length of the frontal shield. Ventrals and outer 2-3 body scale rows are white and bear a central black spot on each scale. 15 scales round the body. Dorsal colouration is black, while ventrum is white. Standard total length upto 560 mm. Diameter of the body of fully grown adult is between 14-16 mm. Ventral shields are 180-198 in number and almost two times broader than the adjacent scales. Subcaudal scales between 11-18.

Locality : Sharma (2003) and Whitaker and Captain (2004) reported the distribution of this species in Goa State (Locality : Telewady).

Distribution : Maharashtra, Kerala and Tamil Nadu (Annamalai Hills) in Western Ghats. The species is endemic to Western Ghats.

Habitat : The species is generally seen at higher altitude between 1200-1500 m. Usually leads subterraenean life in hard clay mixed soil (CAMP Report, 1998). Generally lives in semi-evergreen forests and tea plantations in southern states. Feeds on earthworms (Whitaker and Captain, 2004).

Status : Available in sufficient number (Sharma, 2003) and rare (Whitaker and Captain, 2004). Indian Wildlife (Protection) Act 1972 (as amended upto 2002), Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Vulnerable.

Remarks : Locality Telewady mentioned erraneously in Goa State by Sharma (2003) and Whitaker and Captain (2004) is perhaps actually Talewadi on Goa-Karnataka Border in Karnataka State as rightly mentioned by Murthy (1985).

Genus *Uropeltis*

Genus *Uropeltis* is represented by six species in Goa State.

Key to the species of the Genus *Uropeltis* from Goa State

1. Truncated oblique upper part of tail small, convex (Not flat) and is covered with thickened, multicarinate scales.....
.....*Uropeltis ellioti*
Truncated oblique upper part of tail large, flat and concave and is covered with thickened bi-, tri- or multicarinate scales 2
2. Scales in 15 rows. *Uropeltis macrolepis*
Scales in 17 rows 1
- I. Visible rostral portion not or not much longer than its distance from the front shield.
..... *Uropeltis ceylanicus*
Visible rostral portion is distinctly longer than its distance from the front shield. i
- i. A yellow line along each lateral aspect of the front portion of the body. Ventral shields : 138-157..... *Uropeltis phipsoni*
Ventrums is yellowish with dark spots or cross Bars. Ventral shields : 138-157.....
..... *Uropeltis myhendrac*

45. *Uropeltis ellioti* (Gray)

1858. *Uropeltis ellioti* Gray, *Proc. Zool. Soc.*, 5 262

Common name : English : Elliot's *Uropeltis* or Elliot's Shieldtail Snake

Diagnostic characters : Uropeltid or shieldtailed snakes can be distinguished by a combination of characters such as total absence of limbs, eyelids and external ear openings etc. Head is not distinct from neck in the family Uropeltidae. Snout is obtusely and sharply pointed. The body is short, cylindrical and is covered with smooth scales. Ventral scales are slightly larger than the dorsal scales. Tail is quite short with its terminal end portion transformed into a large, file like naked shield, a characteristic feature of the

family. Truncated oblique upper part of the tail large, flat and concave and is covered with thickened bi-, tri- or multicarinate scales. Tail tip bears a scute with a lateral or superior ridges. Vestiges of pelvis may be present. Mentle groove is absent in genus *Uropeltis*. Eyes distinct with round pupil. Mouth small and ventrally situated. Rostral is separating the nasals for most of their length. 17 scales round the body. Dorsal colouration is glossy dark brown black with or without small yellow spots scattered all over the body with larger ones on the ventral side. There is a distinct yellow line along sides of the neck and a broad yellow stripe on each side of the tail. The stripes join by a cross bar at the anal region. Standard total length upto 260 mm. Ventral shields are 144-176 scales. Subcaudal scales are between 5-11, paired.

Locality : Sharma (2000, 2003) and Whitaker and Captain (2004) reported the distribution of this species in Goa State. The Nearest collection locality recorded by Whitaker and Captain (2004) appears to be close to Goa State border.

Distribution : Gujrat, Maharashtra, Kerala and Tamil Nadu in Western Ghats, while Andhra Pradesh and Tamil Nadu in Eastern Ghats (Sharma, 2003). Appears to be Western and Eastern Ghats endemic species.

Habitat : Usually leads fossorial life. (CAMP Report, 1998). Generally lives in wet evergreen, semi-evergreen and dry deciduous forests. Feeds mainly on earthworms. Mostly nocturnal, agile and insectivorous species hiding under loose sand, mud, dead wooden log and in decaying forest leaf litter. Females bear live young ones. Predators include raptors, wild boar and other snake species (Whitaker and Captain, 2004).

Status : Indian endemic species. Rare (Sharma, 2003) and common (Whitaker and Captain, 2004). Indian Wildlife (Protection) Act 1972 (as amended upto 2002), Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : Nil.

46. *Uropeltis macrolepis* (Peters)

1861. *Uropeltis macrolepis* Peters, *Serp. Fam. Uropelt.*, : 904.

Common name : English : Peter's Uropeltis or Large scaled Shieldtail or Mahrrata rough-tail Snake.

Diagnostic Characters : Uropeltid or shieldtail snakes can be distinguished by a combination of characters such as total absence of limbs, eyelids and external ear openings etc. Head is not distinct from neck in the family Uropeltidae. Snout is rounded. The body is short, cylindrical and is covered with smooth scales. Loreal scale absent. Tail is very short and appears to be cut at a slant ending in two small points that are side by side. Truncated oblique upper part of the tail large, flat and concave and is covered with thickened bi-, tri- or multicarinate scales. Upper scales on tail rough and keeled. Vestiges of pelvis may be present. Mentle groove is absent in genus *Uropeltis*. Eyes distinct with round pupil. 15 scales round the body. This is a moderately large-sized uropeltid snake. Dorsal colouration is glossy dark blackish brown or dark purpleish brown with each scale with a light margin. A short and broad yellow or orange stripe on lips and sides of neck that later breaks up and continues as large spots on either side of the forebody. Belly scales usually unmarked. There is a broad yellow stripe on each side of the tail. The stripes join by a cross bar at the anal region. Standard total length upto 300 mm. Ventral shields with 125-140 scales. Subcaudal scales are between 7-10, paired.

Locality : Sharma (2000, 2003) and Whitaker and Captain (2004) reported the distribution of this species in Goa State. The Nearest collection locality recorded by Whitaker and Captain (2004) is Amboli in Western Ghats close to Goa State border.

Distribution : Western Ghats (Sharma, 2003 and Whitaker and Captain, 2004). Western Ghats endemic species.

Habitat : Usually leads fossorial life (CAMP Report, 1998) Inoffensive burrower. Generally

lives in secondary, semi-evergreen, and deciduous forests. Feeds mainly on earthworms. Mostly nocturnal, agile and insectivorous species hiding under stones and dead wooden logs. Predators include wild boar and other snake species (Whitaker and Captain, 2004).

Status : Western Ghats endemic species. Quite common particularly in rainy season (Sharma, 2003) and common (Whitaker and Captain, 2004). Indian Wildlife (Protection) Act 1972 (as amended upto 2002), Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Vulnerable.

Remarks : Nil.

47. *Uropeltis ceylanicus* Cuvier

1829. *Uropeltis ceylanicus* Cuvier, *Reg. Anim.*, 2nd Ed. : 76.

Common name : English : Cuvier's Uropeltis or Kerala Shieldtail Snake

Diagnostic characters : Uropeltid or shieldtail snakes can be distinguished by a combination of characters such as total absence of limbs, eyelids, external ear openings etc and by characteristic presence of thickened, flat, rough, multicarinate file like scales on the dorsal side of the end portion of the tail. Head is not distinct from neck and vestiges of pelvis may be present in family Uropeltidae. Mentle groove is absent in genus *Uropeltis*. The moderately large sized snake possesses obtusely pointed snout. The body is short, cylindrical and is covered with smooth scales. Tail is very short and appears to be cut at a slant ending in two small points that are side by side. Truncated oblique upper part of the tail large, flat and concave and is covered with thickened bi-, tri- or multicarinate scales forming a distinct disc. 17 scales round the body. Dorsal colouration is uniformly blackish or brownish. Some individual may possess transversely arranged spots. A yellow lateral stripe is also present in few individuals. Belly scales may be yellowish with or without dark brown or black spots or entirely brown or black. There is a broad yellow stripe on each side of the tail. Standard total length upto 455 mm with diameter of the body 15 mm. Ventral shields 119-146 scales. Subcaudal scales are between 8-12, paired.

Locality : Smith (1935) and Sharma (2000, 2003) reported the distribution of this species in Goa State (Castle Rock).

Distribution : Western Ghats (Smith, 1935 and Sharma, 2003). Western Ghats endemic species.

Habitat : Usually leads fossorial life (CAMP Report, 1998). Generally lives in secondary vegetation (Plantation) and evergreen forests. Mostly nocturnal, agile and insectivorous species hiding under stones and dead wooden logs.

Status : Western Ghats endemic species. Most common in its distributional range (Sharma, 2003). Indian Wildlife (Protection) Act 1972 (as amended upto 2002), Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-least concern.

Remarks : Nil.

48. *Uropeltis phipsoni* (Mason)

1864. *Silybura phipsonii* Mason, *Ann. Mag. Nat. Hist.*, (6) : 184.

Common name : English : Bombay Hills Uropeltis or Phipsoni rough-tail Snake.

Diagnostic Characters : Uropeltid or shieldtail snakes can be distinguished by a combination of characters such as total absence of limbs, eyelids and external ear openings etc. and by characteristic presence of thickened, flat, rough, multicarinate file like scales on the dorsal side of the end portion of the tail. Head is not distinct from neck but is narrower than neck. Vestiges of pelvis may be present. Mentle groove is absent in genus *Uropeltis*. Snout is obtusely pointed. The body is short, cylindrical and is covered with smooth scales. Loreal scale absent. Visible rostral portion is distinctly longer than its distance from the front shield. Tail is very short and appears to be cut at a slant ending in two small points that are side by side. Truncated oblique upper part of the tail large, flat and concave and is covered with thickened bi-, tri- or multicarinate scales. 17 scales round the body. This is a moderate-sized uropeltid snake. Dorsal colouration is glossy brown or purplish brown with or without yellow molting or dots.

Lip scales partly yellow. A short and thin yellow line from behind mouth runs along sides of neck and forebody that later breaks up and continues as spots further back. Belly scales coloured like back sometimes with a few very small, faint yellow spots. There is a broad yellow stripe on each side of the tail. The stripes join by a cross bar at the anal region. Standard total length upto 280 mm with a diameter of the body 9mm. Ventral shields with 138-157 scales. Subcaudal scales are between 7-12, paired.

Locality : Sharma (2000, 2003) and Whitaker and Captain (2004) reported the distribution of this species in Western Ghats including Goa State. The Nearest collection locality recorded by Whitaker and Captain (2004) is Belgaon close to Goa State border.

Distribution : Western Ghats (Sharma, 2003 and Whitaker and Captain, 2004). Western Ghats endemic species.

Habitat : Usually leads fossorial life (CAMP Report, 1998). A docile snake. Generally lives in evergreen, semi-evergreen deciduous and secondary forests. Feeds mainly on earthworms. Active above ground after heavy rains. Predators include birds and wild boar (Whitaker and Captain, 2004).

Status : Western Ghats endemic species. Rare (Sharma, 2003) and common (Whitaker and Captain, 2004). Indian Wildlife (Protection) Act 1972 (as amended upto 2002), Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : Nil.

49. *Uropeltis myhendrae* (Beddome)

1886. *Silybura myhendrae* Mason, Ann. Mag. Nat. Hist., (5)xvii : 15.

Common name : English : Myhendra Mountain Uropeltis or Barred shieldtail Snake.

Diagnostic characters : Uropeltid or shieldtail snakes can be distinguished by a combination of characters such as total absence of limbs, eyelids and external ear openings etc. and by characteristic

presence of thickened, flat, rough, multicarinate file like scales on the dorsal side of the end portion of the tail. Head is not distinct from neck but is narrower than neck and vestiges of pelvis may be present in the family. Mentle groove is absent in genus *Uropeltis*. Snout is obtusely pointed. The body is short, cylindrical and is covered with smooth scales. Loreal scale absent. Visible rostral portion is distinctly longer than its distance from the front shield. Tail is very short and appears to be cut at a slant ending in two small points that are side by side. Truncated oblique upper part of the tail large, flat and concave and is covered with thickened bi-, tri- or multicarinate scales. 17 scales round the body. This is a fairly large-sized uropeltid snake. In morphology and scale characteristics it is quite similar to *U. phipsonii* but differs in size (540 mm), diameter (17 mm) and colouration. Dorsal colouration is purplish brown. Each scale bears a yellowish posterior border forming more or less distinct transverse cross bars, particularly on the anterior part of the body. Ventrums are yellowish and thickly spotted or barred with brown or black. In exceptional cases some individuals may possess darker annulations of same colour as that of the back. Standard total length upto 540 mm with a diameter of the body 17 mm. Ventral shields with 139-156 scales. Subcaudal scales are between 6-8, paired.

Locality : Smith (1935), Sharma (2000, 2003) and CAMP Report (1998) reported the distribution of this species in Western Ghats including Goa State.

Distribution : Western Ghats (Sharma, 2003 and CAMP Report, 1998). Western Ghats South of Goa. Western Ghat endemic species.

Habitat : Usually leads fossorial life (CAMP Report, 1998). Nothing much is known about the habit and habitat of this species.

Status : Western Ghats endemic species. Undeterminate (Sharma, 2003). Indian Wildlife (Protection) Act 1972 (as amended upto 2002), Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Data Deficient.

Remarks : Nil.

Family BOIDAE

Family Boidae contains Pythons and Boas and is represented by two genera in Goa State.

Key to the genera of the family BOIDAE from Goa State

1. Supraorbital bone is present; teeth present on the premaxilla; head is with large symmetrical shields and labial scales are pitted ... *Python*
- Supraorbital bone is absent; No teeth present on premaxilla; head is covered with small scale-like shields and labial scales are not pitted *Eryx*

Genus *Python*

Genus *Python* is represented by a single species in Goa State.

*50. *Python molurus* (Linnaeus)

1758. *Coluber molurus* Linnaeus, Syst. Nat. 10th Ed. : 225.

Common name : English : Indian rock python.

Diagnostic Characters : Indian rock python possesses all the characters mentioned earlier for the Suborder Serpentes. All snakes in the Family Boidae possess teeth in both the jaws, prominent eyes and vestiges of hindlimbs. This family comprises the largest living snakes, the pythons and boas. Some of them reach to a length of about 10 metres. The snake species of this family are easy to identify due their large size and presence of typical colouration pattern. The sensory pits on the rostral and first two labials distinguish python from all other Indian snakes. Its maximum length is 7 m. and weight 85 kg. The head is quite distinct from the neck and possesses symmetrical shields on top. Costals are smooth and arranged in 60-75 rows, centrals (Large transversely enlarged plates) 245-270 and caudals in 60-72 pairs. Comparatively small eyes with vertical pupils. The body is covered with small, smooth scales. The skull is with ectopterygoid, supratemporal and other palatal bones. Supratemporal articulates with the cranium like a

scale. Quadrate bones fully suspending. Ground colour greyish, whitish or yellowish in adults. A dark streak from eye to nostril found in young one may be retained in adult forms. On the back of the head and the nape is a large lance-shaped mark with a pale centre. The body with a series of large, roughly quadrate patches from neck to tail dorsally. The patches are centrally of the same colour as the general body colour and are broadly outlined with black. Two smaller rows of markings occur to the side of the median row. In freshly moulded specimen the dorsal patches are highly iridescent giving bluish and amethystine hues in certain lights.

Locality : ZSI survey party during project period sighted one live specimen in the thick forest of Bhagawan Mahaveer Sanctuary, Molem.

Distribution : Peninsular India.

Habitat : Normally a forest dweller occurring in dense as well as in open forests with rock outcrops. Python is a terrestrial, arboreal and carnivorous snake. Feeds on mammals, bird and reptilian species. Coiling and constrictions by python resulting in suffocation kills sometimes animals of larger size.

Status : Vulnerable Sharma (2000) and not uncommon (Daniel, 1983). IUCN category as per CAMP Report (1998) : Lower risk-Near threatened, Indian Wildlife (Protection) Act (1972 as amended upto 2002) Schedule : Schedule : I Part : II, CITES : Appendix : I, Red Data Book (1994) : Endangered.

Remarks : The survival of the species is in danger due to illegal trade for skin, body parts and live animals at national and international level (Pradhan, 1997).

Genus *Eryx*

Genus *Eryx* is represented by three species in Goa State.

Key to the species of the Genus *Eryx* from Goa State

1. Scales on head and tail strongly keeled. Tail pointed *Eryx conicus*

- Scales on head and tail weakly keeled and smooth Tail blunt and round 2.
- 2. Mentle groove present. Body colour, though variable, uniform without any distinct blotches. *Eryx johnii*
- Mentle groove absent. Body colour brown with darker brown coloured blotches *Eryx whitakeri*

***51. *Eryx conicus* (Schneider)**

1801. *Boa conica* Schneider, *Hist. Amphibia*, ii : 268

Common name : English : Common or Russell's sand Boa, Russell's Earth Boa.

Diagnostic Characters : Russell's sand/Earth Boa possesses all the characters mentioned for suborder : Serpentes, family Boidae and genus *Eryx*. However, mental groove is absent and tail end is pointed in Russell's sand/Earth Boa. Moreover, Head is slightly distinct from neck. Rostral about two times broader than head. All scales except nasals and internasals on head are small. A markedly stout snake. Body short and heavy. Scales on head and tail strongly keeled. Tail short and tapering so rapidly that it is conical in shape. Total length not exceeding 950 mm. Body scales are 40-55 in number, ventral scales 161-196 and subcaudals 16-24. Anal is small and undivided. Hemipenis is not forked. Dorsal colouration is yellowish, brownish or grayish mixed with a dorsal series of dark brown black-edged spots. Flanks mottled brown varying in shades. Just above vent on each side is a small curved claw-like process directed backwards in the female, which indicates the termination of the rudimentary hindlimb. It is well developed in males. The skin is rough on the back owing to the keeled scales.

Locality : ZSI survey party has sighted one live specimen in Bondla wildlife sanctuary during the project period.

Distribution : Whole of India.

Habitat : Terrestrial and arboreal. Generally considered as a snake of arid areas, but is also found in multiparous habitats. It is marginally

commensal as well. *Eryx conicus* is a dull creature but with uncertain temperament. It is also speedy burrower. However, its life is not fully subterranean. Feeds on small rodents, birds and frogs. It kills its victim by constriction.

Status : Common in the distributional range (Daniel, 1983; Sharma, 2003 and Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972 as amended upto 2002) Schedule : Schedule : IV, IUCN category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : The species is traded illegally for body parts and live individuals at domestic level (Pradhan, 1997). As per CAMP Workshop Report (1998) there is a threat to the survival of the species due to loss of habitat, human interference and illegal trade. Whitaker and Captain (2004) have kept this species under Genus *Gongylophis*. However, it has been retained here as *Eryx conicus* only following Sharma (2000, 2003) and CAMP report (1998).

52. *Eryx johnii* (Russell)

1801. *Boa johnii* Russell, *Ind. Serp.*, ii : 18 & 20.

Common name : English : Indian Sand Boa, John's sand Boa, Red Sand Boa, Black Earth boa, Stump-tailed Sand Boa.

Diagnostic Characters : Indian sand Boa or John's sand Boa possesses all the characters mentioned earlier for the family Boidae. However, supraorbital bone is absent, teeth are absent on premaxillary bone, head covered with small scale-like shields and labial scales are normal and not with pits in John's sand Boa. The body of the snake is cylindrical and robust which suddenly tapers immediately after vent. Scales on head and tail weakly keeled and smooth. Tail ends abruptly into blunt shield. Head not distinct from neck. Snout broad, nostrils opening like a slit. Eyes distinct, small and with vertically elliptical pupil. Ventral scales do not cover the whole width of the ventrum. Subcaudals not divided. Mental groove present. Adults uniform light brown, or dark olivaceous brown in colour with or without fine dark reticulations arranged to form crossbars.

Markings when present conspicuous posteriorly only. Ventral side lighter. Young ones are brick red or sandy red in colour. Back with dark blotches or ruddy-brown crossbars. Adults approximately 1 metre in length (Males : 980 mm, Females : 1080 mm). Scales rows on middle of the body 51-67 (Scales feebly keeled), ventrals in males 193-212 and in females 198-215; anal shield is small and undivided, caudals in males 28-40 and in females 29-34.

Locality : Daniel (1983), Das (1991), Sharma (2003) and Whitaker and Captain (2004) have reported wide occurrence of this species in the Indian subcontinent.

Distribution : Whole of India.

Habitat : Burrowing snakes preferring to live in and around croplands, scrublands and different types of forests. The snake possesses gentler temperament with inoffensive behavior. It is a speedy burrower. Feeds mainly on small rodents killing them by constriction.

Status : Common in distributional range (Daniel, 1983, Sharma 2003 and Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972 as amended upto 2002) : Schedule : Schedule : IV, IUCN category as per CAMP Workshop(1998) : Lower risk-least concern.

Remarks : Sometimes live snake is used in street-shows by snake charmers (Pradhan, 1997).

53. *Eryx whitakeri* I. Das

1991. *Eryx whitakeri*, Das. I., *J. Bombay nat. Hist. Soc.*, 88 : 92-97.

Common name : English : Whitaker's Boa.

Diagnostic characters : Whitaker's Boa, a recently described new species by Das (1991) possesses all the characters mentioned earlier for the family Boidae. However, supraorbital bone is absent, teeth are absent on premaxillary bone, head covered with small scale like shields and labial scales are normal and not with pits. The body of this medium sized snake is cylindrical and robust which suddenly tapers immediately after vent.

Scales on head and tail weakly keeled and smooth. Tail ends abruptly into blunt shield. Head not distinct from neck. Snout broad, nostrils opening like a slit. Eyes distinct small and with vertical pupil. Ventral scales do not cover the whole width of the ventrum. Subcaudals entire. Mental groove absent. Adults brown blotched with darker brown in colour. Similar to common sand Boa except that Whitaker's Boa possesses abruptly ending blunt, rounded and smooth scaled tail. Ventral side lighter. Overall appearance of Whitaker's Boa is smooth, while that of Common sand Boa is rough. Adults approximately 790 cm -1 metre in length Scales rows on middle of the body 50-54 (Scales feebly keeled), ventrals scales : 201-213; caudals 18-25, entire.

Locality : Das (1991) and Whitaker and Captain (2004) have reported wide occurrence of this species in the Western Ghats including Goa State. Western Ghat endemic species.

Distribution : Western Ghats in India.

Habitat : Poorly known snake species. Appears to be nocturnal and occasionally arboreal preferring to live in scrubland, deciduous, west coast forests. The snake has been found in areas of heavy rainfall. Feeds on small rodents and Brook's Geckos in captivity.

Status : Common in distributional range (Das, 1991 and Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972 as amended upto 2002) : Schedule : Schedule : IV IUCN category as per CAMP Workshop(1998) : Vulnerable.

Remarks : Whitaker's Boa has not been listed in Sharma (2003).

Family ACROCHORDIDAE

Family Acrochordidae is represented by a single species under the genus *Chersydrus*. Though Sharma (1976), CAMP Report (1998) and Whitaker and Captain (2004) have maintained the generic name *Acrochordus*, the name *Chersydrus* has been retained here following the systematic arrangement given in Murthy (1985), Sharma (2000) and Sharma (2003).

Genus *Chersydrus* (= *Acrochordus*)

Genus *Acrochordus* is represented by a single species in Goa State.

***54. *Chersydrus granulatus* (Sneider) =
Acrochordus granulatus (Sneider)**

1799. *Hydrus granulatus*, Schneider. *Hist. Amphib.*, 1 : 243.

Common name : English : Elephant Trunk or Indian Wart or File Snake.

Diagnostic characters : Indian Wart or File Snake possesses scales, which are small, juxtaposed or subimbricate and generally granular. Ventral scales are slightly larger than the dorsal scales. Body is slightly flattened on lateral aspects. Head is distinctly broader than the neck. The body of this fairly large-sized snake is cylindrical stout and robust covered with loose skin. Tail is short and prehensile. Eyes moderately large with vertically elliptical pupils and absolutely lateral in position. Head is covered with small granular scales. Upwardly pointed nostrils with valves are quite close and enclosed in nasal shields. They are situated on the upper surface of the snout. Ventral shields are not present. General body colouration is dark grey or some what blackish with whitish annulation all over the body. The white rings are quite distinct in juveniles, but as the age increases the colour fades. The annulations are more prominent on dorsal side. Dorsal side of the head is dark grey with lighter spots. A fold of loose skin is available along the middle of the belly which is covered with small spine bearing scales. Posterior portion of the body and tail strongly compressed. Hemipenis is forked for more than half the length. Adults approximately 1100 mm in length. Tail Length 66 mm. Scales on middle of the body 100; 8-11 scales on a line between the eyes. 14-22 supralabials.

Locality : One specimen has been collected from Panjim sea beach area of Goa State by Sharma in 1976.

Distribution : Shallow coastal and estuarine waters of India.

Habitat : Extremely sluggish snakes inhabiting

mainly estuarine and shallow coastal waters throughout the range. Feeds mainly on fishes. A docile snake and do not make any attempt to bite. Viviparous species giving birth to 6-12 young ones at a time.

Status : Fairly common in distributional range (Sharma, 2000, 2003) and uncommon (Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972 as amended upto 2002) : Schedule : Schedule : IV, IUCN category as per CAMP Workshop (1998) : Lower risk-Near threatened (For *Acrochordus granulatus*).

Remarks : Skin of this snake is traded in the local market (CAMP Report, 1998).

Family COLUBRIDAE

Family Colubridae is represented by two subfamilies in Goa State.

**Key to the Subfamilies of the Family
COLUBRIDAE**

1. Maxillary teeth solid (Aglypha). Anterior part with solid teeth, but 2 or 3 posterior teeth are grooved. Nostrils not valvular, usually lateral. Scales imbricate COLUBRINAE
- Last 2 or 3 maxillary teeth enlarged and grooved (Ophlathoglypha). Nostrils valvular, situated on the upper surface of the snout. Scales may be smooth, striated or strongly keeled. Ventrals narrow HOMALOPSINAE

Subfamily COLUBRINAE

Subfamily Colubrinae is represented by twelve genera in Goa State.

**Key to the Genera of the Subfamily
COLUBRINAE**

- (I) All the teeth solid and not grooved (Aglypha)
- (A) Hypapophyses not developed on the posterior dorsal vertebrae
- (i) Posterior maxillary teeth are longest but not grooved

1. Maxillary teeth 19 or less, last 2 or 3 are generally largest and separated from the other by a distinct diastema; subocular one or more; scales in 19-23 rows, smooth, head shields entire; head distinct from the neck. *Argyrogena*
 2. Maxillary teeth 28 or less, enlarge gradually and form a continuous series; scales in 15-17 rows, slightly keeled, head shields entire; head distinct from the neck; body scales smooth or keeled on the median rows *Ptyas*
 3. Maxillary teeth 16 or less, posterior strongly enlarged and compressed; scales in 13-21 rows, smooth, head shields normal; or reduced in number head may not be or scarcely distinct from the neck; rostral large, extend well on the upper surface of the snout *Oligodon*
- (ii) Maxillary teeth are subequal. Pupil round or horizontal.
1. Scales in 19-27 rows, with apical pits. Pupil round *Elaphe* = *Coelognathus*
 2. Scales in 13 or 15 rows, smooth. Pupil round. *Dendrelaphis*
 3. Scales in 13 or 15 rows, oblique. Vertebrae are enlarged; ventrals and caudals with a suture like lateral keel and notch on each side. Pupil horizontal *Ahaetulla*
- (iii) Some of the anterior maxillary teeth are enlarged and fang like. Pupil vertically elliptical. Scales in 15-19 rows.
1. Maxillary bone strongly arched. Scales in 15-17 rows, smooth or feebly keeled. Subcaudals divided *Lycodon*
- (B) Hypapophyses developed throughout the vertebral column and represented on the posterior dorsal vertebrae by a more or less developed crest or tubercle projecting below the centrum.
- (i) Dentary bone has got a loose attachment to the apex of the articular and freely movable on it; 30-50 teeth equal in size; scales in 17 rows *Sibynophis*
- (ii) Dentary bone either not having a loose attachment or having a slight attachment to the apex of the articular and as such slightly movable on it; generally less than 30 teeth.
1. Posterior maxillary teeth longest; maxillary teeth 11-18 followed by a pair of very large fangs; two internasals; pupil round; scales are strongly keeled, in 25-27 rows *Macropisthodon*
 2. Maxillary teeth are unequal; maxillary teeth 19-35 in number; head distinct from the neck; nostrils lateral; scales keeled, in 19 rows; hemipenis and sulci spermaticus simple *Amphiesma*
 3. Maxillary teeth are equal; 20-25 in number; head quite distinct from the neck; nostril is in the nasal pointing upward; scales strongly keeled, in 19 rows; hemipenis and sulci spermaticus forked *Xenochrophis*
- (II) Last two or three maxillary teeth are grooved.
- (i) Pupil round. Maxillary teeth are 18-20 in number; scales in 17 rows *Chrysopelea*
- (ii) Pupil vertical. Maxillary teeth are 10-14 in number; scales in 19-29 rows *Boiga*

Genus *Elaphe* (= *Coelognathus*)

Though Whitaker and Captain (2004) have maintained the generic name *Coelognathus*, the name *Elaphe* has been retained here following the systematic arrangement given in Murthy (1985), Sharma (2000) and Sharma (2003) Genus *Elaphe* is represented by a single species in Goa State.

*55. *Elaphe helena* (Daudin) = *Coelognathus helena* (Daudin)

1803. *Coluber helena* Daudin, *Hist. nat. Rept.* iv : 277

Common name : English : Trinket Snake,
Common Trinket Snake.

Diagnostic Characters : Since trinket snake is a snake, it possesses all the characters mentioned earlier for suborder Serpentes. Presence of prominent eyes, normal teeth in both the jaws.

maxillary teeth and absence of poisonous fang are typical characters of family Colubridae. This is a large family comprising roughly more than 2500 species and subspecies of arboreal, burrowing, terrestrial and aquatic snakes belonging to 250 genera. They exhibit extreme diversity in size, shape and colour. Nostrils not valvular, usually lateral. Scales imbricate. A mental groove present. Ventral shields distinct. All teeth solid and not grooved. Hypapophyses absent on the posterior dorsal vertebrae. Posterior maxillary teeth not longest and all submaxillary teeth subequal. Pupil round. Scales in 19 to 27 rows with apical pits. *Elaphe helena* is with elongated and cylindrical body and also with head quite distinct from the neck. Dorsal colour brown of varying degree of intensity. An oblique streak from eye to lip. Forebody for some length ornamented with ocellated crossbars of a pattern peculiar to this snake. The patterns gradually disappear at distal end. There is usually a 'V' shaped conspicuous mark on nape. Finally broad dark coloured stripes on sides replaces crossbars on the body and extend upto tip of the tail. Total length never exceeds 1700 mm in length. Tail length around 181 mm. Posterior body scales keeled. Ventrals 217-265, subcaudals 73-100 paired and anal single.

Locality : Sharma (1976) collected one live specimen from Valpoi in 1969, while ZSI Survey party near Madgaon sighted another specimen during project period. This is the first collection record reported from Goa State.

Distribution : Throughout India.

Habitat : Usually found in or at the periphery of forest. Sometimes seen in human habitats also. It is a snake, which becomes aggressive when disturbed. Prefers diet of mammalian, lizard and even snake species when hungry. Though the snake coils round the prey, it does not constrict.

Status : Fairly Common in its area of occurrence (Daniel, 1983 and Sharma, 2003). Indian Wildlife (Protection) Act (1972 as amended upto 2002) Schedule : Schedule : IV, IUCN category as per CAMP Report (1998) : Lower risk- near threatened.

Remarks : Trinket snake has been collected from the urban areas also (WRS, ZSI, Collection).

Genus *Ptyas*

Genus *Ptyas* is represented by a single species in Goa State.

*56. *Ptyas mucosus* (Linnaeus)

1758. *Coluber mucosus* Linnaeus, *Mus. Ad. Frid.*, 1 : 37

Common name : English : Indian rat Snake, Dhaman.

Diagnostic Characters : Rat snake or Dhaman, being a snake possesses all the key characters mentioned for the suborder Serpentes and family Colubridae. However, the characteristic feature of genus *Ptyas* is there is no marked development of hypophyses on the posterior dorsal vertebrae. Posterior maxillary teeth longest and not grooved. Maxillary teeth 28 or less. They enlarge gradually and form a continuous series. Dorsal scales in 15-17 rows and slightly keeled. Head shields entire. Head distinct from the neck. Genus *Ptyas* includes long, cylindrical and slender snakes with most agile body. Eyes large with round pupil. Snout obtusely pointed. Dorsal colouration is olivaceous brown, sometimes as dark as sepia or light mustard yellow. Scales on the posterior part are irregularly margined with black colour forming reticulate pattern. There is a tendency of formation of black crossbars. Lip scales margined with black. Belly greyish white or dirty white or yellowish in colour.

Locality : ZSI survey parties have reported sighting of live specimens from Molem, Bondla and Valpoi areas of Goa State during the project period. Sharma (1976) collected five specimens from Canacona region in 1969, which is the first collection record reported from Goa State.

Distribution : Whole of India and Andaman Islands.

Habitat : Terrestrial, semi-arboreal, semi-aquatic snake essentially seen on plains but recorded upto the altitude of 1800 m. Diurnal in habit, living in variety of habitats. Eclectic in diet.

Rat is not a staple diet of the snake as suggested by its popular name. It's preferred diet includes frogs, toads, lizards, birds and small vertebrates including rats and mice.

Status : Though common in its range of distribution, the rat snake is subjected to the commercial exploitation on account of its large-scale killing for skin and meat (Daniel, 1983, Pradhan, 1997, Sharma, 2000). Indian Wildlife (Protection) Act (1972 as emended upto 2002) Schedule : Schedule II (Part II), CITES Appendix : Appendix II, IUCN category as per CAMP report (1998) : Lower risk-Near threatened.

Remarks : Killing of rat snakes on large scales for its skin is a real threat to the survival of the sub-species. Rat snake skin is involved in illegal local, domestic and international trade (Pradhan, 1997). Some communities in different parts of the country eat the snake. There is a persistent erraneous belief amongst illiterates that rat snake is the male of a Cobra. An unusual behavior seen in rat snake is a "Combat Dance" between the two males which twine around each other on the ground as well as when half erect. The "act" appears to be a part of mating behavior.

Genus *Argyrogena*

Genus *Argyrogena* is represented by a single species in Goa State.

57. *Argyrogena fasciolatus* (Shaw)

1802. *Coluber fasciolatus* Shaw, (based on Russell, 1796 p. 26, pl. 21).

Common name : English : Banded racer, Fasciolated rat snake.

Diagnostic Characters : Banded racer or fasciolated rat snake possesses all the characters mentioned for the family Colubridae. However, hypapophyses not developed on the posterior dorsal vertebrae. Posterior maxillary teeth long but not grooved. Maxillary teeth 19 or less. Subocular one or more. Scales in 19-23 rows smooth and with apical pits. Head shields entire. Head distinct from the neck. Ventral shields enlarged and rounded or obtusely angulate

laterally, 185-234 in number. The snakes of this genus are elongated and cylindrical. Eyes large with round pupil. Many specimens with a lateral keel. Tail moderately long. Banded racer is a diurnal snake reaching to a length of 1350 mm. Anal shield divided. Hemipenis is devoid of spines. Dorsal colouration brown, cinnamon to greyish brown. Posterior part of the body with faint crossbars or spots, which gradually disappears towards the tail. Head is beautifully coloured with light and dark olive and two white spots on parietal shields on either side of the interparietal suture. Ventrums are whitish or yellowish.

Locality : Daniel (1983), Das (1991), Sharma (2003) and Whitaker and Captain (2004) have reported wide occurrence of this species in the Indian subcontinent including Goa State.

Distribution : Peninsular India, north to Himalaya and east to West Bengal.

Habitat : Terrestrial, preferring to live in scrub jungle, arid grassland, open forest tracts and urban areas. Diurnal. Found in rodent burrows, rock piles and heavy bushes. A plucky and aggressive snake when disturbed. Becomes tame in captivity. Feeds on small mammals and amphibians.

Status : Common in the range of distribution (Daniel, 1983 and Sharma, 2003). Uncommon (Whitaker and Captain, 2004). Indian Wildlife (Protection) Act (1972 as amended upto 2002) Schedule : Schedule IV, IUCN category as per CAMP Report 1998 : Lower risk-Near threatened.

Remarks : When disturbed, it raises its body and tries to flatten the neck like a cobra.

Genus *Oligodon*

Genus *Oligodon* is represented by two species in Goa State.

Key to the species of the Genus *Oligodon* from Goa State

1. Scales in 13-15 rows at mid-body. Head with typical markings modified by confluence. ...
..... *Oligodon taeniolatus*

2. Scales in 17 rows at mid-body. Head with three chevrons, separate from one another.
..... *Oligodon arnensis*

***58. *Oligodon taeniolatus* (Jerdon)**

1853. *Coronella taeniolata*, Jerdon, J.A.S. Bengal, xxii : 528.

Common name : English : Streaked kukri snake, Russell's or variegated kukri snake.

Diagnostic Characters : Streaked kukri snake possesses all the characters mentioned for the suborder Serpentes and family Colubridae. However, in genus *Oligodon* all teeth are solid and not grooved, hypapophyses on posterior dorsal vertebrae not developed. Kukri snakes are short bodied but stout snakes with cylindrical shape. Head not distinguished from neck. Snout short, blunt and obtusely rounded with much enlarged rostral. Eye distinct with round pupil. Maxillary teeth 6-7. Body scale smooth and devoid of any pits. Ventral shields round. Length of the body never exceeds 650 mm. Diameter uniform from neck to vent. Scales at mid-body in 15 rows. Ventral shields 158-218, subcaudal 29-56 and anal shield divided. Hemipenis forked and spinose extending upto 11th caudal plate. Dorsal colour variable from light brown to blackish-brown to buff with narrow cross bars or transverse spots, which may be round or elongate. Ventrums yellowish or grayish. A dark band across the head at the level of eyes is present. Nape with W-shaped dark collar. Variegation, if present, confined to flanks. Name kukri has been suggested due to presence of broad blade-like and peculiar shaped posterior maxillary teeth. Variegated kukri snake is the only snake species found on plains of Indian peninsular which has 15 scales rows throughout the length of the body and which possesses divided anal shield.

Locality : Sharma (1976) collected three specimens from Canacona region in 1969, which is the first collection record reported from Goa State.

Distribution : Whole of India.

Habitat : Though the species is a hill form, it

is not uncommon near human habitation. Largely diurnal snake of variety of forests. Fond of basking in sun, on rock or grass. Feeds mainly on eggs of other reptiles and frogs spawn. Generally quite docile, but will flatten body and strike sideways when provoked (Whitaker and Captain, 2004).

Status : Fairly Common snake species Sharma, 2003 and uncommon (Whitaker and Captain, 2004)); Indian Wildlife (Protection) Act (1972 as amended upto 2002) Schedule : Schedule IV, IUCN Category as per CAMP Report (1998) : Lower risk-Near threatened (for *Oligodon taeniolatus fasciatus* (Gunther) which has been merged in *Oligodon taeniolatus*).

Remarks : As per CAMP Workshop Report (1998) there is a threat to the survival of the species due to loss of habitat and human interference.

***59. *Oligodon arnensis* (Shaw)**

1802. *Coluber arnensis*, Shaw, Gen. Zool. iii : 526.

Common name : English : Russel's kukri snake, common kukri snake.

Diagnostic Characters : Common Kukri snake possesses all the characters mentioned for Family Colubridae and genus *Oligodon*. Like variegated Kukri Snake, common kukri snake never exceeds 650 mm in total length including tail length. Hemipenis is not forked but spinose and extends upto the 8th caudal plate only. Maxillary teeth in the range of 8-11 in number. Snout short and blunt. Nostril present in elongated nasal partly separating internasal. Rostral large. Scales in 17 : 17 : 15 rows. Head depressed. 4-5 infralabials. Body short, smooth and cylindrical. Colour reddish or greyish brown with series of black bands. Ventrums whitish, sometimes with faint spots. Head with chevron shaped mark. Common kukri snake differs from other kukri snakes by presence of divided anal shield, presence of loreal, 7 supralabials and more than 40 caudals. Back with black bars narrow but distinctly outlined with whitish or pale yellow colouration. Black bands breaks on the flanks into streaks. Number of bands varying.

Locality : Sharma (1976) reported collection of one specimen from Ponda region in 1969, which is the first collection record reported from Goa State.

Distribution : Peninsular India.

Habitat : Chiefly snake of plains however may be seen upto altitude of 1620 m. Terrestrial and diurnal in behavior preferring to live in variety of forests. Generally seen in rainy season. Not uncommon in the vicinity of human habitation, where it is seen in masonry of the old walls of the building. Found in termite mounds, caves, crevices, tree holes and old houses. It can easily climb. It possesses sharp, flattened, and curved teeth. Feeds chiefly on reptile eggs but also likes mice and other small mammalian species.

Status : Fairly common (Sharma, 2003 and Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-least concern.

Remarks : When alarmed, it inflates its body to a remarkable degree and some specimens also flatten the posterior part of the head making the head broader than usual.

Genus *Dendrelaphis*

Genus *Dendrelaphis* is represented by three species in Goa State.

Key to the species of the Genus *Dendrelaphis* from Goa State

1. Eye very large, as long as its distance from the rostral shield; no black temporal stripe; no lateral stripes on the body; tail with 3 black lines *Dendrelaphis grandoculis*
2. Eye as long as its distance between it and nostrils; a more or less distinct temporal stripe; a light lateral band on the body... i
 - i. Vertebral row of scales starting directly behind the distal end of the parietal suture and thence gradually enlarged; posterior maxillary teeth usually shorter than the others; the 5th and 6th supralabials touching the eye *Dendrelaphis tristis*

- ii. Vertebral row of single enlarged scales starting much behind the posterior border of the parietal suture and abruptly enlarged, seemingly by the fusion of two nuchal scales enlarged; posterior maxillary teeth longer than the others; 4th supralabial slightly touching the eye, while 5th and 6th touching the eye *Dendrelaphis pictus*

***60. *Dendrelaphis pictus* (Gmelin)**
(= *Ahaetulla ahaetulla* (Linnaeus))

1789. *Coluber pictus*, Gmelin, *Syst. Nat.*, i : 1116.

Common name : Painted Bronzeback Bronzeback Tree snake.

Diagnostic Characters : Painted Bronze –Back Tree Snake possesses all the characters mentioned for family colubridae. Painted Bronze Back is a long, slender and smooth-scaled snake with its head distinctly broader than the neck. Snout bluntly rounded. Eyes large with round pupil. Tail very long thin wire-like. Dorsal colouration is bronze-brown or purplish brown. Ventrums are creamy white, greenish, yellowish or bluish. A yellow or cream-coloured, black bordered stripe on the flank along scale rows 1 and 2. Head is with a black temporal stripe which extends to the neck where it generally breaks up into oblique bars. Upper lip and lower jaw is yellow or white. In certain cases the markings are reduced, the yellow flank stripe is absent or merely indicated and the black stripe is reduced to spots edging the scales. Ventral and tail scales have outer edges keeled. Vertebral scales are distinctly enlarged than the outer scales. Painted Bronze-Back Tree snake reaches to a maximum length upto 1100 mm. with tail length of 365 mm in males, while 1220 mm and 400mm respectively in females. Body scales are in 15 : 15 : 11 or 9 rows. Ventral shields with 163-211, subcaudals 112-174. Anal shield is divided. Hemipenis is quite long and undivided. Maxillary teeth 23-28 in number with the last one being largest.

Locality : Sharma (1976) reported collection of three specimens from Molem and Canacona regions in 1969, which is the first collection record

reported from Goa State. However, he has determined them as *Ahaetulla ahaetulla* (Linnaeus) which has been synonymised in *Dendrelaphis pictus* (Gmelin) (Smith, 1943). Same view has been followed, later, by Sharma (2000 & 2003).

Distribution : Southern India.

Habitat : Terrestrial, diurnal and arboreal in behavior preferring to live in low bushes and trees in scrub to moist-deciduous forests. It is a very agile, extremely fast, and strong climber species. Can leap from branch to branch. It descends to the ground only to capture food which consists of frogs, toads, small lizards, small snakes birds and their eggs and even insects.

Status : Fairly Common (Sharma, 2003, Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Not Evaluated.

Remarks : The southern Indian population has been considered as *Dendrelaphis pictus pictus* (Gmelin).

***61. *Dendrelaphis grandoculis* (Boulenger)**
(= *Ahaetulla grandoculis* (Boulenger))

1890. *Dendrophis grandoculis*, Boulenger, *F.B.I.* : 337.

Common name : Nilgiri Olive-Brown Black-Blotched or Large-eyed Bronzeback Tree snake.

Diagnostic characters : Large-eyed Bronzeback Tree Snake possesses all the characters mentioned for family Colubridae and genus *Dendrelaphis*. This is also a long, slender and smooth-scaled snake with its head distinctly broader than the neck and slightly flattened body. Snout bluntly rounded. Eyes very large with round pupil as long as its distance from the rostral shield. Black temporal stripe and lateral stripes on the body totally absent though tail possesses 3 black lines. Tail very long thin wire-like. Dorsal colouration is olive brown with small black irregularly placed blotches. Vertebral scale feebly enlarged. Ventrums are pale brown in front and darker behind, sometimes with small black spots on the

sides. Ventral and tail scales have outer edges sharply keeled. Large-eyed Bronzeback Tree Snake reaches to a maximum length upto 1280 mm. with tail length of 350mm. Body scales are in 15 : 15 : 11 or 9 oblique rows. Ventral shields are 167-189, with subcaudals 117-124, paired. Anal shield is divided. Maxillary teeth 31-33 in number with the last one being largest.

Locality : Sharma (1976) reported collection of two specimens from Valpoi region in 1969, which is the first collection record reported from Goa State. However, he has determined them as *Ahaetulla grandoculis* (Boulenger) which has been synonymised in *Dendrelaphis grandoculis* (Boulenger) (Smith, 1943). Same view has been followed, later, by Sharma (2000 & 2003).

Distribution : Southern Western Ghats in India. This is an Indian Endemic species. Further, collection of *D. grandoculis* from Goa State as reported by Sharma (1976) shows the extension of range of distribution in Western Ghats upto Goa State.

Habitat : Diurnal and arboreal in behavior preferring to live in low bushes and trees in scrub to moist-deciduous forests. It is comparatively a slower moving snake species but a good climber. Can leap from branch to branch. It descends to the ground only to capture food, which consists of frogs, toads, small lizards, small snakes birds and their eggs and even insects.

Status : Rare (Sharma, 2003) and Uncommon (Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Vulnerable.

Remarks : Nil.

62. *Dendrelaphis tristis* (Daudin)

1803. *Coluber tristis*, Daudin, *Hist. Nat. Rept.*, 6 : 430.

Common name : Common Bronze-Back Tree Snake.

Diagnostic Characters : Bronze-Back Tree Snake possesses all the characters mentioned for

Family Colubridae. Bronze Back is a long, slender and smooth-scaled snake with its head distinctly broader than the neck. Snout bluntly rounded. Eyes large with round pupil. Tail very long thin wire-like. Dorsal colouration is bronzy, brownish or purplish brown. Ventrums are greenish, yellowish or grayish. Lateral aspect is with a buff or yellowish band, covering the two outer scale rows. Head is with a feeble black temporal stripe which extends to the neck where it generally breaks up into vertical bars. Upper lip is yellow. Vertebral scales are feebly enlarged, slightly narrower than the outer scales. Bronze-Back Tree snake reaches to a maximum length of 1700 mm. Females are larger than the males. Body scales are in 15 : 15 : 11 or 9 rows. Ventral shields with 163-205, subcaudals 105-150. Anal shield is divided. Hemipenis extends up to the 8th caudal plate, undivided Maxillary teeth 17-22 in number.

Locality : Daniel (1983), Das (1991), Sharma (2003) and Whitaker and Captain (2004) have reported wide occurrence of this species in the peninsular Indian region including Goa State.

Distribution : Peninsular India, north to Gujarat and east to West Bengal.

Habitat : The species is seen from sea level to the altitude of 2000 m. Terrestrial, diurnal and arboreal in behavior preferring to live in bushes and trees in scrub to moist-deciduous forests. It is very agile, strong climber, shy, timid species. Can leap from branch to branch. It descends to the ground only to capture food which consists of frogs, toads, small lizards, birds and their eggs and even insects. Generally seen in rainy season.

Status : Vulnerable on account of habitat destruction (Sharma, 2003) and Common (Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-least concern.

Remarks : Nil.

Genus *Chrysopelea*

Genus *Chrysopelea* is represented by a single species in Goa State.

*63. *Chrysopelea ornata* (Shaw)

1802. *Coluber ornatus*, Shaw, *Gen. Zool.*, iii : 477.

Common name : English : Golden Tree snake, Ornate Flying snake.

Diagnostic Characters : Golden Tree or Ornate Flying snake possesses all the characters mentioned for family Colubridae. It is a long and slender snake. It possesses last two or three maxillary teeth grooved. Head elongate, snout squarish with large eyes. Pupil round. The maximum length reaches upto 1100 mm including a very long tail. Hemipenis is undivided but composed of many folds and extends upto the 34th caudal plate. Maxillary teeth in the range of 18-20 in number. Scales in 17 rows in middle. Scales in 15 : 17 : 14 rows. Ventral shields with 207-230 subcaudals 118-138 and divided anal shield. Dorsal colouration most variable but generally with red or orange spots or markings. There is a longitudinal series of oval or flower shaped vertebral flecks which are, in some individuals, separated from one another by a pair of black crossbars. Black head has yellow crossbars and spots. Lateral aspects are greenish. Each scale is with a black marginal tinge and with a black median streak. Subcaudal shields are generally with black flecks. They may unite in some individuals to form two longitudinal lines. Body scales are feebly keeled.

Locality : Sharma (1976) collected two specimens from Valpoi and Canancona regions in 1969, which is the first collection record reported from Goa State.

Distribution : Western Ghats and Eastern India from Uttar Pradesh, Bihar and Orissa onwards.

Habitat : Golden Tree Snake is a most agile, bold, diurnal, arboreal and forest dwelling snake with tremendous climbing and gliding power. It prefers to live in bushy to moist-deciduous and evergreen forests. Glides in the air by extending ribs and pulling in underside. It virtually swims through the air. It covers the distance of 4 feet in the air. It has also been reported from close to human habitations (Sharma, 2003), Feeds on

lizards, mammals, birds, snakes and insects.

Status : Vulnerable due to habitat loss (Sharma, 2003) and uncommon (Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : Nil.

Genus *Lycodon*

Genus *Lycodon* is represented by three species in Goa State.

Key to the species of the Genus *Lycodon* from Goa State

1. Anal undivided. Back with light crossbars which are never pure white
..... *Lycodon travancoricus*
Anal divided. Back with crossbars which include white colouration 2
2. Supralabials 9; annals 1 or 2; loreal usually in broad contact with the internasals.
..... *Lycodon aulicus*
Supralabials 8; annals 2; loreal usually just in touch with the internasals
..... *Lycodon striatus*

64. *Lycodon travancoricus* (Beddome)

1870. *Cercaspis travancoricus* Beddome, *Madras Month. J. Med. Sci.*, ii : 169.

Common name : English : Travancore Wolf snake.

Diagnostic Characters : Travancore Wolf snake possesses all the characters mentioned for the family Colubridae. The snake species under Genus *Lycodon* are small to medium in size with elongated body and flat head which is slightly broader than neck. Nostrils situated between two nasals. All the teeth are solid and not grooved. Some of the anterior maxillary teeth are enlarged and fang like. Eyes are entirely black. Subcaudals (64-76) divided but some may be entire. Loreal 1 not touching internasal. Wolf snake is slender

bodied smooth-scaled snake. Total length is about 600-625 mm including tail (Length 120-125 mm). Snout broad and projects beyond the lower jaw. Dorsal body scale smooth and they are in 17 : 17 : 15 rows. Ventral shields 176-206, angulated laterally. Anal shield undivided. Hemipenis extends upto 12th subcaudal plate, forked at the tip. Narrower part of the hemipenis is spinous. Dorsal colouration is purplish brown or black with yellow cross bars forked on sides and as such enclosing triangular dark spots. Ventrums uniformly white.

Locality : Smith (1943), Sharma (2003) and Whitaker and Captain (2004) have recorded Western Ghats including Goa State as the locality for this species. Nearest collection locality is Khanapur in Karnataka State (CAMP Report, 1998). Indian endemic species.

Distribution : Western Ghats as far north as Matheran in Maharashtra State. Also recorded from Tamil Nadu, Andhra Pradesh, Orissa and Madhya Pradesh in India.

Habitat : Nocturnal species, usually found in the hills. They are often met with in the houses and hide in masonry or beneath stones or any convenient hide out. Feeds on skinks, geckos and frogs. A gentle snake usually does not bite while handling.

Status : Common (Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : Nil.

65. *Lycodon striatus* (Shaw)

1802. *Coluber striatus* Shaw, *Genl. Zool.* iii : 527.

Common name : English : Shaw's wolf snake, Northern Wolf snake, and Barred wolf snake.

Diagnostic characters : Barred or Shaw's wolf snake possesses all the characters mentioned earlier for the family Colubridae and genus *Lycodon*. *Lycodon striatus* resembles very closely the common wolf snake in body characters and

habits. It is a small snake (430 mm. in length) and is distinguished from *L. aulicus* by the presence of 8 supralabials and less number of ventral shields (172-214) and caudals (35-58). Ventral shields are strongly angulated laterally. Subcaudal shields are 57-80; anal is divided. Rostral much broader than high. Colour dark brown or black above with 11-18 white or yellowish crossbars on body, which divide on sides to enclose triangular spots of ground colour on body. Belly and upper lip white. Hemipenis extends upto 10th subcaudal plate, forked at the tip. Most of the organ has longitudinal folds, which possess less distinct spines.

Locality : Smith (1943), Sharma (2003) and Whitaker and Captain (2004) have recorded whole of India as the distribution for this species.

Distribution : Whole of India excluding Northeast India.

Habitat : The habit and habitat are similar like those of common wolf snake or rather any wolf snake. However, it is a timid snake, which hides its head beneath its coil, if disturbed.

Status : Not common (Sharma, 2003) and Common (Whitaker and Captain, 2004) Indian Wildlife (Protection) Act (1972 as amended upto 2002) Schedule : Schedule : IV; IUCN Category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : Nil.

*66. *Lycodon aulicus* (Linn.)

1754. *Coluber aulicus* Linnaeus, Mus. Adolph. Frider., 1 : 29 Pl. 12. Fig. 2.

Common name : English : Common wolf snake.

Diagnostic characters : Common Wolf snake possesses all the characters mentioned earlier for family Colubridae and genus *Lycodon*. Common wolf snake, *Lycodon aulicus* possesses 17 scale rows at mid body, loreal touching internasals, nasal touching 1st and 2nd labial. Nine supralabials. Body scales are smooth and in 17 : 17 : 15 rows with strongly angulated ventral shields, which are 172-

224 in number. Subcaudals 56-80 in number. Total length does not exceed 950 mm. The snout spatulate and well beyond lower jaw. Anal shield mostly divided rarely single. Hemipenis extends upto 10th caudal plate. Dorsal ground colouration brown or grayish with white or yellow crossbars, ventrum whitish and upper lip white with or without brown spots. Colouration and markings in wolf snakes, in general, variable. There is usually a collar or two blotches of white or yellow colour on occiput. Sometimes specimens without any markings and uniform brown colour may also occur.

Locality : Sharma (1976) collected five specimens from Valpoi and Nayawada regions in 1969, which is the first collection record reported from Goa State.

Distribution : Whole of India.

Habitat : The species prefers to live in and around human habitations and is strictly nocturnal. Generally found in caves, wells, stone piles, hollow trees etc. They are also excellent climbers capable of going up almost smooth vertical surface. Common wolf snake prefers lizards of Gecko family but can consume small animals including mice and skinks also.

Status : Most common snake throughout its range (Daniel, 1983, Sharma, 2003 and Whitaker and Captain, 2004). Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV, IUCN category as per CAMP Report : Lower risk-least concern.

Remarks : A lively snake, ready to strike instantly when provoked. But is can soon get accustomed to being handled in captivity. The readiness with which it bites and its habit of living in houses make this snake responsible for a large number of snake bite cases.

Genus *Sibynophis*

Genus *Sibynophis* is represented by a single species in Goa State.

67. *Sibynophis subpunctatus* (Dum. & Bibr.)

1854. *Oligodon subpunctatus* Dum. & Bibr. Erp. Gen., 7 : 58.

Common name : Light Brown or Dumeril's Black-headed Snake.

Diagnostic Characters : Dumeril's Black-headed snake possesses all the characters mentioned earlier for family Colubridae. In genus *Sibynophis* all the teeth are solid and not grooved. Hypophyses developed throughout the vertebral column represented on the posterior dorsal vertebrae by a more or less developed crest or tubercle projecting below the centrum. 30-50 teeth closely set and equal in size. Head slightly differentiated from the neck. Eyes large with round pupil. Dumeril's Black-headed snake, *Sibynophis subpunctatus* possesses 17 scale rows at mid body. Nine supralabials. Body scales are smooth and in 17 : 17 : 17 rows with round ventral shields, which are 151-215 in number. Subcaudals 42-76 in number and are paired. Total length does not exceed 460 mm. Tail long and gradually tapering. Anal shield divided. Hemipenis extends upto 8th or 9th subcaudal plate. Dorsal colouration is light brown with dorso-median series of tiny black spots. Sides of body often grey. Ventrums greenish yellow. Ventral scales with black dots on each side. Head and nape are dark brown to black in colour. Lips are yellowish. A yellow transverse bar is present between the eyes. Two broad yellow bars form a border to the dark area of the nape.

Locality : Smith (1943), Sharma (2003) and Whitaker and Captain (2004) have recorded peninsular India as the distribution for this species including Goa State (CAMP Report, 1998). The Type locality Malabar is not very far from the state border in south.

Distribution : Peninsular India.

Habitat : This is a terrestrial, rock dwelling, diurnal snake feeding on small lizards, skinks and smaller snakes. May also be seen under leaf litter, stones or dead wood (logs) in dry or moist-deciduous forests.

Status : Vulnerable (Sharma, 2003) and Uncommon (Whitaker and Captain, 2004). Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV, IUCN category as per CAMP Report : Lower risk-Near threatened.

Remarks : Sharma (2003) reports vulnerable status for this species due loss of habitat.

Genus *Amphiesma*

Genus *Amphiesma* is represented by three species in Goa State.

Key to the species of the Genus *Amphiesma* from Goa State

1. Two light horizontal stripes down the back till the tip of the tail.
..... *Amphiesma stolata*=*Amphiesma stolatum*=*Natrix stolata* (Linnaeus)
- No light horizontal stripes down the back...
..... 2.
2. Coastal scales with bidentate tips. Labials yellow with black margins. An oblique black-edged streak from the eye to the gape
..... *Amphiesma beddomei* = *Natrix beddomei* (Gunther)
- Coastal scales with rounded margins. Lip scales below the eye without stripes. A white or yellow transverse line across the back to head. A white dot on each side of the frontal *Amphiesma monticola*

*68. *Amphiesma stolata* (Linnaeus)
= *Natrix stolata* (Linnaeus)

1758. *Coluber stolatus* Linnaeus, *Syst. Nat.*, : 219.

Common name : English : Striped keelback, buff striped keelback snake.

Diagnostic Characters : Striped keelback snake is a slender bodied, elongated snake with head quite distinct from the neck. It possesses all the Characters mentioned for the family Colubridae. Hypapophyses developed throughout the vertebral column and represented on the posterior dorsal vertebrae by a more or less developed crest or tubercle projecting below the centrum. Maxillary teeth are unequal 21-24 in number with last two enlarged. Nostrils lateral, scales in 19 rows. Striped keelback is also distinguished by the nasals not touching the 2nd supralabial, rostral touching 6 shields and single anterior temporal. The buff

stripes along the sides are also distinct. Eyes large with round pupil flecked with gold. Tongue, dull orange, black tipped. The striped keelback reaches to a length of about 550 mm. Ventral shields in the range of 118-161; while subcaudals in 48-89 shields, paired. Anal shield divided. Hemipenis simple and extends upto the 8th caudal plate, forked at the anterior tip. Spines present on the complete organ except the basal part. Dorsal colouration is olivaceous or olive brown or somewhat greenish with a pair of pale yellow stripes, which sometimes break up into spots in the anterior region of the body. Belly white with some scattered black spots. There is a black V shaped mark on the neck. Black streaks present in front of and below the eye.

Locality : Sharma (1976) reported collection of three specimens (Determined as *Natrix stolata*, which has been synonymised with *Amphiesma stolata* (Sharma, 2003) from Molem and Canacona regions of Goa State in 1969. This is the first collection record reported from Goa State.

Distribution : Throughout India.

Habitat : Terrestrial and semi-aquatic preferring to live in fields, grassy and cultivated areas of open country during the rains. Its choice of habitat is directly related with its food. Often hides in holes in the ground or in masonry of drains and culverts. Essentially diurnal. It feeds mainly on frogs and toads, but also can take small lizards and rodents

Status : Most common snake in its range. (Sharma 2003 and Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV, IUCN Category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : Two distinct colour varieties occur in India. The typical form occurs throughout India (Daniel, 1983).

*69. *Amphiesma beddomei* (Gunther)
= *Natrix beddomei* (Gunther)

1864. *Tropidontus beddomei*, Gunther, *Rep. Brit. Ind.*, : 269.

Common name : English : Beddom's Keelback or Beddom's Olive-Brown Keelback snake

Diagnostic characters : Beddom's keelback snake is a slender bodied, elongated snake with head quite broader than the neck. It possesses all the Characters mentioned for the family Colubridae. Hypapophyses developed throughout the vertebral column and represented on the posterior dorsal vertebrae by a more or less developed crest or tubercle projecting below the centrum. Maxillary teeth are unequal in number with last two enlarged. Nostrils lateral, body scales in 19 rows at midbody. The dorsal scales are distinctly keeled. Beddome's keelback is characterized by the absence of the buff stripes along the sides. Eyes large with round pupil flecked with gold. The Beddome's keelback reaches to a length of about 525 mm with tail length of 140mm in males, while females are longer in length than the males. (Total length : 690 mm with tail length : 210 mm). Ventral shields in the range of 140-150; while subcaudals in 62-82 shields, paired. Coastal scales with bidentate tips. Anal shield divided. Hemipenis simple and extends upto the 12th caudal plate, forked at the anterior tip. Dorsal colouration is olivaceous or olive brown. With a series of yellow spots each one between the two black spots or short transverse bars along each side of the back. Belly whitish with with or without closely dotted spots. Labials are yellow, the sutures are edged with black. There is a distinct obliquely placed yellow, black-edged streak from the eye to the gape.

Locality : Sharma (1976) reported collection of one specimen (Determined as *Natrix beddomei*, which has been synonymised with *Amphiesma beddomei* (Sharma, 2003) from Canacona region of Goa State in 1969. This is the first collection record reported from Goa State.

Distribution : Western Ghats from Maharashtra to South Kerala. Western Ghats endemic species.

Habitat : A forest species semi-aquatic preferring to live at the altitudinal range from 3000-7000 Ft. Found near stream sides of high rainfall areas. Mostly diurnal. It feeds mainly on frogs and small toads.

Status : Fairly Common snake in its range. (Sharma 2003 and Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV, IUCN Category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : Nil.

**70. *Amphiesma monticola* (Jerdon)
= *Natrix monticola* (Jerdon)**

1864. *Tropidontus monticolus*, Jerdon, J.A.S. Bengal : xxii : 530.

Common name : English : Green or Hill Keelback snake.

Diagnostic characters : Green or Hill Keelback snake is a slender bodied, elongated snake with head quite broader than the neck. It possesses all the Characters mentioned for the family Colubridae and the genus *Amphiesma*. Hypapophyses developed throughout the vertebral column and represented on the posterior dorsal vertebrae by a more or less developed crest or tubercle projecting below the centrum. Maxillary teeth are unequal in number with last two enlarged. Nostrils lateral, body scales in 19 rows at midbody. The dorsal scales are distinctly keeled. The Hill keelback snake is characterized by the absence of the buff stripes along the sides. Eyes large with round pupil flecked. The Hill Keelback reaches to a length of about 380 mm with tail length of 118 mm in males, while females are longer in length than the males. (Total length : 475 mm with tail length : 150 mm). Ventral shields in the range of 132-145; while subcaudals in 78-92 shields, paired. Coastal scales with rounded margins. Anal shield divided. Hemipenis simple and extends upto the 9th caudal plate, forked at the anterior tip. Dorsal colouration is olive brown or greenish with broad black cross-bands or big squarish spots. Top of the head is reddish-brown. Scales around the eyes whitish or yellow Belly whitish with with or without closely dotted spots. Lip scales below the eye without any stripes. A white or yellow transverse line across the back to head. There is a white dot on each side of the frontal.

Locality : Smith (1943), Sharma (2003) and Whitaker and Captain (2004) have recorded Western Ghats as the distributional range for this species from Goa State to South Kerala. The nearest collection locality is Talewadi in Belgaon Dist. Karnataka.

Distribution : Western Ghats from Goa to South Kerala. Western Ghats endemic species.

Habitat : A forest species. Diurnal. Found near stream sides of high rainfall areas. It feeds mainly on frogs and small toads.

Status : Rare (Sharma 2003) and uncommon (Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV, IUCN Category as per CAMP Report (1998) : Vulnerable.

Remarks : *Natrix monticola* (Jerdon) reported by Smith (1943) has been synonymised in *Amphiesma monticola* (Jerdon) (Sharma, 2003).

Genus *Xenochrophis*

Genus *Xenochrophis* is represented by a single species in Goa State.

***71. *Xenochrophis piscator* (Schneider)**

1799. *Hydrus piscator* Schneider, Hist. Amph., : 247.

Common name : English : Checkered Keelback snake.

Diagnostic characters : Checkered Keelback snake possesses all the characters mentioned for suborder Serpentes and family Colubridae. Keelback snake belonging to genus *Xenochrophis* comprises fresh water snakes with cylindrical body, head quite distinct from the neck, snout long and eyes moderately large with round pupil. Nostril dorsolateral and pierced into a single nasal, which is directed outwardly upward. Hypapophyses developed throughout the vertebral column and represented on the posterior dorsal vertebrae by a more or less developed crest or tubercle projecting below the centrum. *X. piscator* is distinguished by a combination of characters like scale round the body at midway in 19 rows.

Scales somewhat round but strongly keeled, 4th or 5th supralabials touching eye, presence of a pair of internasals and undivided anal shield. Tail one-third to one fourth of total length. Ventrals 122-158 and subcaudals 60-97. Hemipenis and sulci spermaticus are forked. The colour of the dorsum is much variable, and may be yellowish, olive, light green and grey brown with reddish tinge with five rows of small light black spots, bars which are generally narrower than the interspaces. The arrangement of spots/bars looks like a checkerboard pattern, hence the name, checkered keelback. Head olive brown above with two oblique black streaks, one above and one behind the eye. Ventrums white or yellowish.

Locality : Sharma (1976) reported collection of ten specimens (Determined as *Natrix piscator*, which has been synonymised with *Xenochrophis piscator* (Sharma, 2003) from Molem, Durgini Hills, Vasco-de-Gama, Margaon and Canacona regions of Goa State in 1969. This is the first collection record reported from Goa State. ZSI survey party sighted one live specimen in Bondla sanctuary during the project period.

Distribution : Throughout India.

Habitat : Semi-aquatic preferring to live in the vicinity of fresh water bodies. Frequents tanks, paddy fields, pools and rivers. Active by day as well as night. Aggressive in nature when threatened or cornered. When excited, may mimic the posture of a cobra.

Status : Commonest snake of India (Sharma, 2003 and Whitaker and Captain, 2004)). Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule II Part II, CITES : Appendix II, IUCN category as per CAMP Report (1998) : Lower risk-Least concern.

Remarks : Most active and vicious amongst Indian snakes. Strikes rapidly and with great determination holding on tenaciously. However, its temperament varies depending upon the situations. The secretion of the large parotid glands is fatal to small mammals, birds, lizards and frogs, but has no effect on man and large mammals.

Genus *Macropisthodon*

Genus *Macropisthodon* is represented by a single species in Goa State.

*72. *Macropisthodon plumbicolor* (Cantor)

1839. *Tropidonotus plumbicolour* Cantor, *Proc. Zool. Soc. London* : 54.

Common name : English : Green Keelback snake.

Diagnostic characters : Green Keelback snake possesses all the characters mentioned earlier for the suborder Serpentes and family Colubridae. It is a stout bodied snake reaching to a maximum length of 580 mm in males and 775 mm in females. Head distinct from the neck. Eye moderately large with round pupil. Tail short. Frontal shield in contact with six surrounding shields. The shields on the head distinguish it immediately from the green pit viper and presence of round pupil from green whip snakes. Body scales in 21-27 rows strongly keeled. Ventral shields 144-162, subcaudal shields divided in males (34-48 in number). Anal shield divided. Hemipenis reaches upto the 15th caudal plate. Dorsal colouration greenish with yellow tinge or olive green with faint irregular black crosses lines. Dorsal aspect of head is with two black inverted V-shaped marks. Ventrums is whitish gray or dark gray with black spots. Juveniles may have very well defined black chevron on the nape with its angle pointed forward. Following the chevron is a broad gorget of bright yellow or orange. A black streak from eye to gape present.

Locality : Sharma (1976) reported collection of three specimens from Dhavan village region of Goa State in 1969. This is the first collection record reported from Goa State.

Distribution : Throughout India except Ganges Valley.

Habitat : A hill species frequenting grass and low vegetation. Nocturnal and crepuscular. Found in green as well as open deciduous forest. Terrestrial, diurnal and carnivorous in habit. A singularly gentle and inoffensive snake. Feeds

more or less exclusively on the common toad but occasionally take other amphibians and lizards. Secretion of large parotid glands is toxic to frogs and toad.

Status : Common throughout its range (Sharma, 2003), and Uncommon (Whitaker and Captain, 2004) Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : When provoked, it erects its forebody and flattens its neck like a cobra, hence it is called as “green cobra” in Tamil.

Genus *Boiga*

Genus *Boiga* is represented by three species in Goa State.

Key to the species of the Genus *Boiga* from Goa State

- I. Preocular single, not reaching the upper surface of the head *Boiga trigonata*
- II. Preocular 1-3, the upper one reaching the dorsal surface of the head. 1
 1. Nape with a dark blotch or transverse bar, sometimes broken up; scales in 19-21 (23) rows *Boiga ceylonensis*
 - Nape with three longitudinal stripes, the middle one extending forward on the top of the head upto frontal. Scales in 25-29 rows *Boiga forsteni*

*73. *Boiga trigonata* (Schneider)

1802. *Coluber trigonatus* Schneider, *Bechst. transl. Lacep* iv : 256 pl. XI fig. 1.

Common name : English : Indian Gamma or cat snake.

Diagnostic characters : Indian Gamma snake possesses all the characters mentioned for suborder Serpentes and family Colubridae. Hypapophyses present on the posterior dorsal vertebrae. Maxillary teeth solid, subequal and 8-10 in number. Last two-three maxillary teeth large and grooved. Teeth

present on the palatine bone. They are strongly enlarged. Body scales smooth and arranged in oblique fashion. Genus *Boiga* includes large distinctly triangular headed snakes with laterally compressed body, large eyes with vertical pupils and duplex retina. Tail moderately long, anal shield undivided. Pits and tubercles present on head trunk scales. Scales with apical pits and in 21 : 21 : 15 oblique rows, smooth. Preocular single, not reaching the upper surface of the head. Subcaudal shields paired. Ventrals 206-256, Subcaudals 75-96, paired. Anal entire. Hemipenis divided but not forked and reaches upto 10, 11, 12th caudal shields. Cat snake reaches to length of about 1000 mm in males and 1200 mm in females. Dorsal colouration grayish brown with two alternating series of large rounded or oval dark brown light edged spots. There are two other series of much smaller spots on lateral sides of the body. Dorsal side of head is with two broad dark brown or black longitudinal stripes diverging posteriorly. Nape with longitudinal mark. Stripe emerging from the eye reaches the angle of the mouth. Ventrums whitish spotted with brown.

Locality : Sharma (1976) reported collection of four specimens from Dhavan village, Ponda and Canacra regions of Goa State in 1969. This is the first collection record reported from Goa State.

Distribution : Peninsular India.

Habitat : Essentially arboreal frequenting bushes, scrubs or trees. Usually close to the ground. Also seen in different types of forests, plantations and rural human settlements. Nocturnal in behaviour. Feeds on almost anything it can capture with preference for garden and other lizards. Killing done by constriction.

Status : Common throughout its range (Sharma, 2003, Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule : IV, IUCN Category as per CAMP Report (1998) : Lower risk-least concern.

Remarks : Cat snakes are always ready to act offensively on the least provocation. Its striking

poisture is characteristic. Head and forebody are erected well off the ground with remaining body forming a loop of eight. Head poised in the middle. Prior to striking, the erected part is swayed forward and backward. The colour and markings of cat snakes bear close resemblance to those of *Echis carinatus*. But two species can be easily separated by the absence of head shields in viper. The secretion of the parotid gland of cat snake is lethal to lizards and highly toxic to mice.

74. *Boiga ceylonensis* (Gunther)

1858. *Dipsadomorphus ceylonensis* Gunther, *Cat. Col. Sn. Brit. Mus.*, iv : 176.

Common name : English : Ceylon Cat Snake.

Diagnostic characters : Ceylon Cat snake possesses all the characters mentioned for family Colubridae and genus *Boiga*. Hypapophyses present on the posterior dorsal vertebrae. Maxillary teeth solid, subequal and 12-13+2 in number. Last two-three maxillary teeth are large and grooved. Body scales smooth and arranged in oblique fashion. Genus *Boiga* includes large distinctly triangular headed snakes with laterally compressed body, large eyes with vertical pupils and duplex retina. Tail long, anal shield undivided. Body scales in 19 or 21 or 23 : 19 : 15 or 13 oblique rows, smooth. Preocular 1-3, the upper one reaching the dorsal surface of the head. Vertebral scales distinctly enlarged and hexagonal. Subcaudal shields paired. Ventrals 209-267, Subcaudals 90-133, paired. Anal entire. Hemipenis divided but not forked and reaches upto 10-12th caudal shields. Cat snake reaches the length of about 1020 mm in males with tail length 240mm and 1315 mm and 255mm respectively in females. Dorsal colouration pale grayish or yellowish brown on the back with a series of dark brown or black spots on the vertebral column. Sometimes there may be short, oblique backward pointing streaks originating from the spots. Dorsal side of head is with two broad dark brown or black longitudinal stripes diverging posteriorly. Nape with a dark blotch or transverse bar, sometimes broken up. Ventrums white or yellow usually with dark brown or black spots.

Locality : Smith (1943), Sharma (2003) and Whitaker and Captain (2004) have recorded Western Ghats including Goa State as the distributional range for this species from Maharashtra State to Kerala. Whitaker and Captain (2004) reported collection of a specimen from Goa State.

Distribution : Western and Eastern Ghats and Andaman Islands in India.

Elsewhere : Sri Lanka.

Habitat : Essentially arboreal frequenting bushes, scrubs or trees. Usually close to the ground. Also seen in different types of forests, plantations and rural human settlements. Nocturnal in behaviour. Feeds on almost anything it can capture with preference for garden and other lizards. Killing done by constriction. Mild venom can paralyze small preys.

Status : Common throughout its range (Sharma, 2003, Whitaker and Captain, 2004). Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule : IV, IUCN Category as per CAMP Report (1998) : Data Deficient (For *Boiga beddomei* (Wall, 1909) which has actually been synonymised in *Boiga ceylonensis* (Gunther, 1858) by Smith, (1945), Murthy, (1985) and Sharma (2000, 2003).

Remarks : Cat snakes are always ready to act offensively on the least provocation. Its striking poisture is characteristic. Head and forebody are erected well off the ground with remaining body forming a loop of eight. Head poised in the middle. Prior to striking, the erected part is swayed forward and backward. Smith (1985), Murthy, (1985) and Sharma, (2000 & 2003) have synonymised *Boiga beddomei* (Wall, 1909) in *Boiga ceylonensis* (Gunther, 1858). Same view has been adopted here as well.

75. *Boiga forsteni* (Dum. & Bibr.)

1854. *Triglyphodon forsteni*. Dum. & Bibr., *Erp. Gen.*, 7 : 1077.

Common name : English : Reddish Peninsular Cat Snake; Forsten's Cat Snake.

Diagnostic characters : Reddish Peninsular Cat snake possesses all the characters mentioned for family Colubridae and genus *Boiga*. Hypapophyses present on the posterior dorsal vertebrae. Maxillary teeth solid, subequal and 9-12 in number. Last one maxillary tooth is the large and grooved. Body scales smooth and arranged in oblique fashion. Genus *Boiga* includes large distinctly triangular headed snakes with laterally compressed body, large eyes with vertical pupils and duplex retina. Tail long, anal shield undivided. Body scales in 25 or 27 : 27 or 29 or 31 : 15 or 17 oblique rows, smooth. Preocular 1-3, the upper one reaching the dorsal surface of the head. Vertebral scales feebly or strongly enlarged and hexagonal. Subcaudal shields paired. Ventrals 254-272 with distinct lateral keel; Subcaudals 102-119, paired. Anal entire. Hemipenis reaches upto 12th caudal shields. Cat snake reaches the length of about 2150 mm in males and 2312 mm in females. Dorsal colouration uniformly brown or reddish-brown with regular angular black spots or cross bars and white spots in between them on the back. This type of colour pattern is more distinct on the anterior part of the body. Posteriorly it may be replaced by the chequered pattern. Black stripes present on the head emerging from the frontal shield and reaches upto the nape. Two more stripes are present on the sides of the nape. A dark black-coloured stripe starts from eye and reaches the angle of the mouth. The darker specimens may have their labials marked with distinct black spots on the sutures. Specimens with another colour form have also been noticed. They possess nearly uniform reddish-brown back with dull yellow markings. Plain or light coloured forms possess spotless whitish underside, while the darker forms possess belly scales heavily spotted with brown or black.

Locality : Smith (1943), Sharma (2003) and Whitaker and Captain (2004) have recorded Western Ghats including Goa State as the distribution for this species from Gujrat to Kerala.

Distribution : Western Ghats and other parts in northern, western and eastern in India.

Elsewhere : Sri Lanka.

Habitat : Essentially arboreal frequenting bushes, scrubs or trees. Usually close to the ground. Also seen in different types of forests, plantations and rural human settlements. Nocturnal in behaviour. Feeds on almost anything it can capture with preference for garden and other lizards. Killing done by constriction.

Status : Common throughout its range (Sharma, 2003, Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule : IV, IUCN Category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : Similar as those mentioned in previous Cat Snake species.

Genus *Ahaetulla*

Genus *Ahaetulla* is represented by two species in Goa State.

Key to the species of the Genus *Ahaetulla* from Goa State.

1. Dermal appendage without any median groove. It is formed by the rostral shield covered above by number of small scales ...
..... *Ahaetulla pulverulentus*
- Dermal appendage with a median groove above. It is formed almost entirely by the rostral shield sometimes with small scales at the base *Ahaetulla nasutus*

*76. *Ahaetulla nasutus* Lacepede

1789. *Coluber nasutus* Lacepede, *Hist. Nat. Serp.*, i : 100 and ii 277 pl. 4, fig. 2.

Common name : English : Common green whip snake, Common vine snake.

Diagnostic Characters : Common green whip snake or common vine snake possesses all the characters mentioned for the family Colubridae. Genus *Ahaetulla* possesses subequal maxillary teeth, horizontal pupil, obliquely placed scales in 13-15 rows and enlarged vertebrae. The snake is very long with compressed body measuring to a length of almost 1855 mm in males, while 2660

mm in females. Head is elongated and distinct from neck. Canthus rostrals quite long. A dermal appendage with a median groove above is formed almost entirely by the enlarged rostral shield sometimes with small scales at the base. Concave loreals, quite large eyes and long tail. Snout long acuminate terminating in a dermal beak shaped appendage. Body scales smooth in 15 : 15 : 11 rows. Vertebral rows larger than other dorsal rows. Ventral shields 166-207, laterally notched, while sub-caudal shields 156-180 in males and 135-152 in females. Anal shield divided. Dorsal colouration verdant green, while ventral side is pale with greenish tinge. A thin white or yellow line separating upper body scales from ventrals is present. The interstitial skin is black and white in colour forming oblique lines, which are most distinct on the anterior half of the body. Many individuals exhibit remarkable colour variations, as they may be coloured in yellow, brown or buff dorsally. Whip snake reaches 1855 mm. length in males, while 2600 mm in females. Hemipenis is short and not forked.

Locality : Sharma (1976) reported collection of 11 specimens from Nayawada village, Durgini Hills, Ponda and Canacona regions of Goa State in 1969. This is the first collection record reported from Goa State. The specimens were identified as *Dryophis nasutus* (Lacep.) by him. However, they have been redesignated, later, as *Ahaetulla nasutus* (Lacep.) by him (Sharma, 2000 & 2003). ZSI Survey party sighted one live specimen in Bondla Wildlife Sanctuary during the project period.

Distribution : Peninsular India.

Habitat : Common green whip snake prefers to live in scrub jungle, dry deciduous, mixed deciduous and evergreen forest also. The snake is arboreal and diurnal in habit. One escapes its sight due to its camouflaging colouration. An elegant snake with wonderful speedy movements. Though gentle in behavior, it could be fierce when caught. When alarmed, it rears its head and forebody and the dilation of the forebody brings into prominence the black and white chequering skin. Feeds on small mammals, birds, lizards and occasionally other snakes and frogs.

Status : Common in the range of distribution (Daniel, 1983 and Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule : IV, IUCN category as per CAMP Report, 1998 : Lower risk-Near threatened.

Remarks : Common Vine Snake, *Dryophis nasutus* (Lacep.), of Smith (1943) and Sharma (1976) has been synonymised in *Ahaetulla nasutus* (Lacep.) (Murthy, 1985, Sharma, 2000 & 2003 and Whitaker and Captain, 2004). Sharma (2003) feels that the status of the species is vulnerable due to habitat loss. The whip snake is mildly poisonous. The symptoms are like that of Cobra bite. Even though there is no effect of poison in man, it may occasionally cause swelling and numbness around the bitten area. Common green whip snake closely resembles green or bamboo pit viper in colouration.

***77. *Ahaetulla pulverulentus* (Dum. & Bibr.)**

1854. *Dryinus pulverulentus*, Dum. & Bibr., *Erp. Gen.* vii : 812.

Common name : English : Brown Whip or Vine Snake

Diagnostic characters : Brown Whip snake or brown vine snake possesses all the characters mentioned for the family Colubridae and genus *Ahaetulla*. Brown Whip Snake also possesses horizontal pupil, obliquely placed scales in 13-15 rows and enlarged vertebrae. The snake is very long with compressed body measuring to a length of almost 1600 mm in males, while 2450 mm in females. Head is elongated and distinct from neck. Canthus rostrals quite long. The species is quite similar to *A. nasutus* in number of respects. However, there is a fairly long dermal appendage without any median formed almost entirely by the enlarged rostral shield covered above on the tip with several small scales. Concave loreals, quite large eyes and long tail. Snout long acuminate terminating in a swollen tip. Body scales smooth in 15 : 15 : 13 oblique rows. Ventral shields 182-203, laterally notched, while sub-caudal shields 169-208 paired. Anal shield divided.

Dorsal colouration is grayish or brownish, powdered with brown and with black transverse or oblique spots above. A dark brown rhomboidal spot is present on top of the head and a brown stripe on either side passes through the eye. Hemipenis is short and not forked.

Locality : Sharma (1976) reported collection of 3 specimens from Dhavan village and Canacoe regions of Goa State in 1969. This is the first collection record reported from Goa State. The specimens were identified as *Dryophis pulverulentus* (Dum. & Bibr.) by him. However, they have been redesignated, later, as *Ahaetulla pulverulentus* (Dum. & Bibr.) by him (Sharma, 2000 & 2003). Same name has been retained by Whitaker and Captain (2004).

Distribution : Gujarat and further south in Western Ghats in India.

Elsewhere : Sri Lanka.

Habitat : Brown whip snake prefers to live in plains as well as in the hills. The snake is mainly arboreal and diurnal in habit. An elegant snake with wonderful speedy movements. Though gentle in behavior, it could be fierce when caught. Feeds on small mammals, birds, lizards and occasionally other snakes and frogs.

Status : Vulnerable (Sharma, 2003). Uncommon in the distributional range (Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule : IV, IUCN category as per CAMP Report, 1998 : Lower risk-Near threatened.

Remarks : Brown Vine Snake, *Dryophis pulverulentus* (Dum. & Bibr.) of Smith (1943) and Sharma (1976) has been synonymised in *Ahaetulla pulverulentus* (Dum. & Bibr.) (Murthy, 1985, Sharma, 2000 & 2003 and Whitaker and Captain, 2004). Sharma (2003) feel that the status of the species is vulnerable due to habitat loss. The whip snake is mildly poisonous. The symptoms are like that of Cobra bite. Even though there is no effect of poison in man, it may occasionally cause swelling and numbness around the bitten area.

Subfamily HOMALOPSINAE

Subfamily Homalopsinae is represented by three genera in Goa State.

Key to the Genera of the Subfamily HOMALOPSINAE

- I. Nasal shields in contact with one another ... 1
 - 1. Parietals well developed; scales smooth *Enhydris*
 - 2. Parietals more or less broken; scales keeled *Cerberus*
- II. Nasal shields separated by internasals *Gerardia*

Genus *Gerardia*

Genus *Gerardia* is represented by a single species in Goa State.

78. *Gerardia prevostiana* (Eydoux and Gervais)

1832-1837. *Coluber*(*Homalophis*) *prevostianus*. Eydoux & Gervais. *Guer.Mag. Zool.*, : CL3 : 5.

Common name : Glossy Marsh Snake.

Diagnostic characters : Glossy Marsh snake possesses all the characters mentioned earlier for family Colubridae and subfamily Homalopsinae. In genus *Gerardia* ventrals are well developed and not keeled. A single internasal shield separates well-developed nasal shields. Head slightly broader than the neck and it is covered with large shields. Eyes small with vertical pupil and situated high on the head. Glossy marsh snake is stout bodied aquatic snake with moderately long tail, dentition well developed with maxillary bone extending beyond the palatine with 11-13 teeth. Hypapophysis are present throughout the vertebral column. It possesses 17 : 17 : 15 (Rarely 13) scale rows with smooth scales. Seven supralabials. Ventral shields are 144-157 in number. Subcaudals 29-36 in number and are paired. Total length does not exceed 587 mm. Tail is quite short. Anal shield divided. Single loreal present. Dorsal colouration

is uniform gray, brown or olive back with a distinct ivory white or pale yellow lateral stripe from lip scales to tip of the tail. Ventrums whitish with dark margins. In many individuals it may be entirely gray.

Locality : Smith (1943), Sharma (2003) and Whitaker and Captain (2003) have recorded coastal and tidal river parts of India including Goa State as the distributional range for this species.

Distribution : Coastal and tidal river of India and adjacent countries.

Habitat : This is an aquatic nocturnal snake, excellent swimmer and moves rapidly in mud. Found in mudflats, estuaries and mangrove swamps. Often lives in mud lobster holes and/or under rocks near the shoreline. Feeds on freshly moulted crabs, frogs and toads. Viviparous species (Whitaker and Captain, 2004).

Status : Common (Sharma, 2003) and uncommon (Whitaker and Captain, 2004). Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : Mildly venomous (Whitaker and Captain, 2004).

Genus *Enhydris*

Genus *Enhydris* is represented by a single species in Goa State.

79. *Enhydris sieboldi* (Schlegel)

1837. *Homalopsis sieboldii* Schlegel. *Phys. Serp.*, ii : 349.

Common name : Siebold's Smooth-scaled Water Snake.

Diagnostic characters : Siebold's Smooth-scaled water snake possesses all the characters mentioned earlier for family Colubridae and subfamily Homalopsinae. Species under Subfamily Homalopsinae possess last 2 or 3 maxillary teeth enlarged and grooved. Nostrils valvular, situated on the upper surface of the snout.

Siebold's Smooth-scaled water snake is a stout bodied, smooth-scaled snake with head slightly broader than neck, depressed scarcely distinct from the latter. In genus *Enhydris* ventrals are well developed and not keeled. Parietals are also well developed and not fragmented. Head slightly differentiated from the neck. Eyes small with vertically elliptical pupil. The nasal cleft extending from the nostrils to the first supralabial. Loreal present. Siebold's Smooth-scaled Water Snake possesses 27 or 29 (rarely 33 rows) scale rows at mid body. 7-8 supralabials. Body scales are smooth and ventral shields are 143-158 in number. Subcaudals 43-56 in number and are paired. Internasals two. Total length does not exceed 780 mm. Tail long and gradually tapering with its length upto 110mm. Anal shield divided. Dorsal colouration is Pale brown or off-white with very broad, closely spaced dark brown or dull olive green, squarish, black edged marks that are much broader than the pale cross lines. A series of roundish spots on each side alternating with the dorsal spots. Top of head has three bold, dark brown stripes that converge or join between the eyes. Underside white with black checks or pale brown mottled with dark green.

Locality : Smith (1943) and Sharma (2003) have recorded many parts of northern, eastern and western India including Goa State under the distribution for this species (CAMP Report, 1998).

Distribution : Many parts of northern, eastern, central and western India in India.

Habitat : This is an aquatic diurnal snake active during morning hours and generally found in or close to rivers or water bodies. Burrows deep into mud. Feeds on frogs, toads and fishes.

Status : Uncommon (Sharma, 2003) and rare (Whitaker and Captain, 2004). Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV, IUCN category as per CAMP Report : Lower risk-Near threatened.

Remarks : Mildly venomous (Whitaker and Captain, 2004). Old records of distribution of this species from western India need confirmation from the present status.

Genus *Cerberus*

Genus *Cerberus* is represented by a single species in Goa State.

80. *Cerberus rhynchops* (Schneider)

1799. *Hydrus rhynchops* Schneider. *Hist. Amphib.*, 1 : 246.

Common name : Dog-faced Water Snake.

Diagnostic characters : Dog-faced water snake possesses all the characters mentioned earlier for family Colubridae and subfamily Homalopsinae. In genus *Cerberus* ventrals are well developed and not keeled. Parietal are also well developed but fragmented. Head with broken up shields slightly differentiated from the neck. Eyes small with elliptical pupil. Dog-faced snake is stout bodied aquatic snake with moderately long tail, well developed dentition (Maxillary teeth 12-17), nostrils situated on the upper surface of the snout and hypapophysis present throughout the vertebral column. Dog-faced water Snake possesses 23 or 25 (rarely 21 or 27 rows) scale rows at mid body. The body scales strongly keeled. 9-10 supralabials. Ventral shields are 143-158 in number. Subcaudals 49-72 in number and are paired. Internasals two. Total length does not exceed 850 mm in males and 1180 mm in females. Tail long and gradually tapering. Anal shield divided. Dorsal colouration is slaty-gray, brown or olive with a darker pattern of cross bars or spots, sometimes faint pattern, on the back. A black streak passes through the eye on to the neck. Belly white or yellow with black checks or it may be plain dark gray. The outer side of belly with three scale rows generally yellow in colour.

Locality : Smith (1943), Sharma (2003) and Whitaker and Captain (2003) have recorded coastal and tidal river parts of India including Goa State under the distribution for this species.

Distribution : Coastal and tidal river parts of India and adjacent countries.

Habitat : This is an aquatic nocturnal snake, excellent swimmer and moves rapidly in mud. Found in mudflats, estuaries, mangrove swamps and even in paddy fields several Kms. Often lives

in crab holes and/or under rocks near the shoreline. Feeds on frogs, toads and fishes.

Status : Fairly common (Sharma, 2003 and Whitaker and Captain, 2004). Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule II (Part II), IUCN category as per CAMP Report : Lower risk-Near threatened.

Remarks : Mildly venomous (Whitaker and Captain, 2004)

Family ELAPIDAE

Family Elapidae (Proteroglypha : Grooved fang after two solid teeth in the upper jaw) is represented by four genera in Goa State.

Key to the Genera of the Family ELAPIDAE

Scales disposed obliquely, particularly on the neck, which has more scale-rows than the mid-body and is distensible into a hood. 3rd supralabial touch the eye & the posterior nasal. 1

Scales not obliquely disposed, particularly on the neck, which is normal. Number of scale rows remains same throughout the body starting from the neck 2

1. Scales in 19 – 27 rows at mid-body. Occipital shields absent *Naja*

Scales in 15 rows at mid-body. A Pair of large occipital shields present *Ophiophagus*

2. Subcaudals all or most of them are single. Vertebral row of scales strongly enlarged. 3rd supralabial not touching the posterior nasal. *Bungarus*

Subcaudals are paired. Vertebral row of scales normal and not enlarged. 3rd supralabial touching the nasal or/and nasal suture *Callophis*

Genus *Bungarus*

Genus *Bungarus* is represented by a single species in Goa State.

***81. *Bungarus caeruleus* (Schneider)**

1801. *Pseudoboa caerulea*, Schneider, *Hist. Amphib.*, ii : 284.

Common name : English : Common Indian Krait.

Diagnostic characters : Common Krait possesses all the characters of suborder Serpentes. However, snake species under family Elapidae are venomous in nature. Anterior most maxillary teeth enlarged, recurved and grooved or tubercular. These teeth act as fangs to inject poisonous secretion of modified parotid glands into victim's body. Poison fangs are present in front of the mouth. Maxillary bone is with teeth behind the fangs. Tail cylindrical, loreal absent, pupil round, and ventrals almost as broad as the width of the body. Elapidae is a family of terrestrial and arboreal deadly poisonous snakes. The family includes kraits, cobras and coral snakes. Kraits are long and slender bodied snakes with cylindrical body. Tail is not long but cylindrical and tapering to a point. Head not quite distinct from the neck. Eye small with round pupil. Poison fangs are fixed and followed after a wide gap by 2-3 small teeth. Scales round the body are in 15-17 rows. Ventral shields 194-234 and subcaudals entire and 42-52 in number. Vertebral row of scales enlarged into hexagonal shape. Hemipenis extends upto 6-9th caudal plate. Dorsal colouration is shining jet black to dark brown with a series of 3-9 vertebral spots on neck and anterior most part of the body followed by 38-56 narrow transverse bands or spots, generally in pairs. Upper labials are yellowish or whitish. Ventrums whitish.

Locality : Sharma (1976) reported collection of 3 specimens from Ponda and Canacona regions of Goa State in 1969. This is the first collection record reported from Goa State. ZSI survey party sighted one specimen in Bondla region during the project period.

Distribution : Peninsular India.

Habitat : Kraits inhabit a wide range of biotopes in its range of distribution. It inhabits fields, low scrub jungles and open forest. They are even seen in human habitation seeking shelter

in houses. Nocturnal in behaviour placid in temperament. They are also frequently found near or in water. Krait feeds mainly on snakes including other kraits. Young ones feed more or less exclusively on blind snakes. Frogs, lizards and small mammals are also preferred;

Status : Common in the range (Daniel, 1983 and Whitaker and Captain, 2004). Becoming rare on account of habitat loss (Sharma, 2000) and illegal trade of its skin (Pradhan, 1997). Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule IV, IUCN category as per CAMP Report (1998) Lower risk-Near threatened.

Remarks : One of the deadliest among the poisonous snakes of the world and it can kill adult human being in minutes. The lethal dose for man is considered to be equivalent of 1 mgm of dried poison. Poison is neurotoxic. Basically, shy in nature. It bites only when provoked. Harvest, human interference and trade are some of the threats to the survival of the species. Kraits are killed for skins for illegal trade (Pradhan, 1997).

Genus *Callophis*

Genus *Callophis* is represented by two species in Goa State.

Key to the species of the Genus *Callophis* from Goa State.

1. Supralabials six *Callophis melanurus*
- Supralabials seven *Callophis nigrescens*

82. *Callophis melanurus* (Shaw)

1802. *Coluber melanurus*, Shaw, *Gen. Zool.*, iii : 552.

Common name : English : Slender Coral snake.

Diagnostic characters : Slender Coral snake possesses all the characters of suborder Serpentes and family Elapidae. All snake species under genus *Callophis* are poisonous and are popularly known as coral snakes. They possess cylindrical and elongated body with almost same diameter from head to anus. Head not distinct from neck. Head shields normal. Eyes small with round pupil. This

85. *Ophiophagus hannah* (Cantor)

1831. *Hamadryas hannah*, Cantor. *Asiat. Res.*, Xix : 187.

Common name : English : King Cobra or Hamadryad.

Diagnostic characters : King Cobra possesses all the characters mentioned for suborder Serpentes and family Elapidae. Genus *Ophiophagus*, King cobra, includes deadly poisonous snakes with anterior ribs elongated in the neck region. Neck can be expanded into a hood; a three minute but solid teeth are present on maxilla behind the fangs. The monotypic genus comprises the largest of the poisonous snakes reaching to a length of 4620 mm, popularly known as King Cobra or Hamadryad. A pair of large occipital shields is in contact with each other behind parietals. Nostrils are large bordered by two nasals and a internasal. Body scales oval, smooth and arranged in an oblique fashion, particularly in the anterior half of the body. Seven supralabials present. Subcaudal shields are divided. Head is broader than neck. Hood longer and narrower than that of other cobras. Eyes moderately large with round pupil. Scales in 17 to 19 : 15 : 15 rows and are smooth. Loreal absent. Ventral shields 215-270, while subcaudals are 80-120 in number. Hemipenis is very long and deeply forked extending upto 30th caudal plate or even beyond. Dorsal colouration gray, black, dark olive green or yellowish-brown, usually with white or yellowish cross-bands. Bands on head, if present, are L shaped. Young ones are black with narrow white or yellow bands that encircle the body and tail. Head scales, in paler forms, are often edged with black. Throat is generally with light-yellow or cream coloured.

Locality : Smith (1943), Daniel, (1983) and Sharma (2003) have reported the distribution of this species from Western Ghats including Goa State, eastern and northeastern India (Whitaker and Captain (2004). Even the forest Dept. authorities have reported its occurrence in Molem region of Goa State.

Distribution : Western Ghats including Goa

State, eastern and north-eastern India (Whitaker and Captain (2004).

Habitat : The snake is diurnal, very pugnacious and aggressive inhabiting the rocky, bushy areas, grasslands in dense forest of heavy rainfall. Estuarine mangrove swamps are also preferred. Can climb on a tree with remarkable agility. Eclectic habit. Frequently found near water, strong swimmer. When alarmed, it adopts popular pose with erect forebody and flat hood. It can raise its 1/3rd body. Makes hissing sound. Sometimes the poison is ejected as a spray for quite a long distance by a forceful thrust (Spitting by Cobra). The King Cobra feeds on other poisonous snakes such as cobras, kraits and its own kind. It can also devour other larger non-poisonous snakes and monitor lizards. It is the only snake species in which females construct nests of leaves and twigs for breeding purpose.

Status : The population has been reduced drastically on account of habitat destructions and is now extremely vulnerable (Daniel, 1983 and Sharma, 2003). Whitaker and Captain (2004) have also reported rare status for King cobra. Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule II Part II, CITES Appendix : II; IUCN Category as per CAMP Report(1998) : Lower risk-Near threatened.

Remarks : King Cobra venom is much less toxic than other cobras. However, it can inject huge quantities at a time (upto 7 ml.). The Cobra bite is not fatal at all times. The effect depends on the quantity of venom injected, natural resistance of victim and various other factors.

Family HYDROPHIIDAE

Family Hydrophiidae ((Proteroglypha : 1-4 solid teeth before enlarged fangs in the upper jaw), which includes marine snake species, is represented by five genera in Goa State.

Key to the Genera of the Family HYDROPHIIDAE

- I. Ventrals are generally entire and distinct throughout A

II. Ventral shields are generally divided by a medial longitudinal fissure (Except quite anteriorly) or are vestigial (Smaller than adjoining dorsal scales or absolutely missing).
..... B

A. Mental shield is elongate; partly concealed in a groove in the symphysis; ventral shields are uniform in size; 3-5 maxillary teeth present.
..... *Enhydrina*

Mental shield is normal; ventral shields are uniform in size; 1-8 maxillary teeth present.
..... *Hydrophis*

B. Ventral shields are quite distinct in anterior part, but are smaller or even missing in the posterior portion. Poison fangs are followed after an interval by 3 to 6 solid teeth; 33-43 juxtaposed, hexagonal or squarish scales round the thickest part of the body; lower 3-4 rows are larger than the others *Lapemis*

Ventral shields are entire in the anterior part, but are divided by a medial longitudinal fissure in the posterior part; maxillary bone extends forward as far as or little further than the palatine bone. Poison fangs are followed after an interval by 5 or 6 solid teeth; 30-36 juxtaposed or hexagonal scales round the thickest part of the body. All dorsal scales are normal in size *Microcephalophis*

Ventral shields are very small divided by a median longitudinal furrow in the posterior part; maxillary bone never extend beyond the palatine bone. Poison fangs are followed after an interval by 7 or 11 solid teeth; 49-67 scales juxtaposed, squarish or hexagonal round the thickest part of the body. All dorsal scales are normal in size *Pelamis*

Genus *Enhydrina*

Genus *Enhydrina* is represented by a single species in Goa State.

*86. *Enhydrina schistosa* (Daudin)

1803. *Hydrophis schistosus*, Daudin. *Hist. Nat. Rept.* 7 : 386.

Common name : English : Hook-nosed Sea Snake.

Diagnostic characters : Hook-nosed sea snake possesses all the characters mentioned for Suborder *Serpentes* and Family *Hydrophiidae*. In fact all the species under *Hydrophiidae* are marine and possess maxillary bone with teeth behind the poison fangs. Tail vertically compressed and puddle shaped. Pupil round. Genus *Enhydrina*, Hook-nosed sea snake, includes deadly poisonous snakes with elongated compressed body. Ventral shields are generally entire and distinct throughout. Head shields regular and entire. Mental shield is narrow and elongate; partly concealed in a groove. Scale at tip of the snout extends downwards and looks like a beak or "Hook-Nose" 3-5 maxillary teeth present. Maxillary bone never extends beyond the palatine bone. Nostrils are superior; nasal shield in contact with one another. Body scales are imbricate or subimbricate with short central keels on them. Males with 40-52 scale rows on neck and 49-60 on body, while females with 42-55 scale rows on neck and 51-66 around thickest part of the body. Hemipenis is forked for about half its length. The monotypic genus reaches to a maximum length of 1580 mm (Range : 1100-1200 mm), Eyes moderately large. Ventral shields are 239-354 in number, distinct throughout, slightly broader than the adjoining scales. Preanal shields are feebly enlarged. Dorsal colouration is gray or grayish with bluish tinge with dark gray or black annulation, which are broadest on the dorsum. Upper surface of head pale gray unbanded or faintly banded. Ventrums whitish or yellowish white.

Locality : Sharma (1976) reported collection of one specimen from Panjim sea beach region of Goa State in 1969. This is the first collection record reported from Goa State.

Distribution : Coastal waters of India.

Elsewhere : Pakistan, Sri Lanka and Bangladesh (Whitaker and Captain (2004).

Habitat : The most common of sea snake species. Excellent swimmer. Active by day and night. Usually found in shallow coastal and estuarine

waters. Capable of staying underwater for longer periods. Feeds chiefly on fishes and crustaceans. Activity is generally guided by tides. Avoids strong tides.

Status : Fairly common (Daniel, 1983, Sharma, 2003 and Whitaker and Captain (2004). Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV; IUCN Category as per CAMP Report (1998) : Data Deficient.

Remarks : Venom of Hook-Nosed Sea Snake is 4 to 10 times more potent than cobra venom. However, the bites are rare.

Genus *Hydrophis*

Genus *Hydrophis* is represented by six species in Goa State.

Key to the species of the Genus *Hydrophis* from Goa State

1. Parietals not touching the postoculars; 14-18 maxillary teeth behind the poison fangs.
..... *Hydrophis caerulescens*
- Parietals touching the postoculars; maxillary teeth behind the poison fangs always less than 14 in number 2
2. Coastals with short bi- or tri dentate keels; small, wedge-shaped scales (cuneates) present on the oral border between the infralabials after the 2nd or 3rd
..... *Hydrophis cyanocinctus*
- Coastals with a round central tubercle or a short median keels, sometimes smooth or feebly keeled. Cuneates either absent or only 1 or 2 present A
- A. Posterior pair of sublinguals ill developed, separated by scales. *Hydrophis ornatus*
- Both the pairs of sublinguals well-developed. The posterior ones are in contact with each other or separated by scales. a
- a. Scales on the thickest part of the body with rounded or bluntly pointed tips distinctly or feebly imbricate *Hydrophis spiralis*

- Scales on the thickest part of the body are hexagonal, sub-quadrangular in shape, juxtaposed or feebly imbricate i
- i. Normally one anterior temporal. 5-6 maxillary teeth behind poison fangs. Body with lateral spots or cross bars *Hydrophis fasciatus*
- 2 or 3 anterior temporals. 8-10 maxillary teeth behind poison fangs. Body with 44-55 broad black bands on the body
..... *Hydrophis mamillaris*

87. *Hydrophis spiralis* (Shaw)

1802. *Hydrus spiralis*, Shaw. *Genl. Zool.*, iii : 564.

Common name : English : Yellow Sea Snake.

Diagnostic characters : Yellow sea snake possesses all the characters mentioned for suborder Serpentes and family Hydrophiidae. In fact all the species under Hydrophiidae are marine and possess maxillary bone with teeth behind the poison fangs. Tail vertically compressed and puddle shaped. Pupil round. Genus *Hydrophis*, Yellow sea snake, includes deadly poisonous snakes with elongated compressed body. In *Hydrophis spiralis* ventrals are generally entire, distinct throughout and uniform in size. Mental shield is normal. 1-8 maxillary teeth present behind the poison fangs. Parietals touching the postoculars. Coastals with a round central tubercle or a short median keels, sometimes smooth or feebly keeled. Cuneates either absent or only 1 or 2 present. Both the pairs of sublinguals well developed. The posterior ones are in contact with each other or separated by scales. Scales on the thickest part of the body with rounded or bluntly pointed tips distinctly or feebly imbricate. Dorsal colouration is yellowish or yellowish-green or golden-yellow. Dorsal scales with narrow black margins. Flanks and ventral surface are pinkish white. There are about 44-48 black annulation on the whole body, which are widest on the vertebral region and become narrow on the flanks and ventrum. The annuli are narrower than the interspaces and contain several light coloured scales. Tail is with 4-7 bands. Head is moderately large and is yellow in adults. Chin and throat are

white to pale gold. The thickest posterior part is almost two times or more than the diameter of the neck. Eyes are quite small. 25-31 scale rows on the neck, while 33-46 on the thickest part of the body. Ventral shields are 295-362 in number, distinct throughout and twice as broad as the adjacent scales. Scales are feebly imbricate or smooth or with central tubercles or short keels. Preanal shields are enlarged. Hemipenis is forked near the tip. Total length generally reaches upto 1760mm in males, while 1950 mm in females.

Locality : Smith (1943), Daniel, (1983) and Sharma (2003) have reported the distribution of this species from coastal waters of India including Goa State.

Distribution : Coastal waters of India, (Sharma, 2003).

Habitat : The snake is most pugnacious and bites readily without provocation. It is mainly a fish eater.

Status : Fairly common (Daniel, 1983 and Sharma, 2003). Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV; IUCN Category as per CAMP Report (1998) : Data Deficient (For *Leicocephalophis spiralis* (Shaw)).

Remarks : *Hydrophis spiralis* (Shaw) (= *Leicocephalophis spiralis* (Shaw)) has been retained here following Sharma (2003).

88. *Hydrophis cyanocinctus* (Daudin)

1803. *Hydrophis cyanocinctus*, Daudin. *Hist. Nat. Rept.*, vii : 383.

Common name : English : Annulated Sea Snake.

Diagnostic characters : Annulated sea snake possesses all the characters mentioned for suborder Serpentes and family Hydrophiidae. In fact all the species under Hydrophiidae are marine and possess maxillary bone with teeth behind the poison fangs. Tail vertically compressed and puddle shaped. Pupil round. Genus *Hydrophis* includes deadly poisonous snakes with elongated compressed body. Mental shield is normal. 5-6

maxillary teeth present behind the poison fangs. Parietals touching the postoculars. In *Hydrophis cyanocinctus* ventrals are generally small but distinct throughout and uniform in size. Coastals with short bi- or tri dentate keels; small, wedge-shaped scales (cuneates) present on the oral border between the infralabials after the 2nd or 3rd. Scales on the thickest part of the body imbricate throughout with a central keel, which may break up in series of 2-3 tubercles. Body is not slender anteriorly, compressed posteriorly. The thickest posterior part is almost 2-2½ times more than the diameter of the neck. Eyes are quite small. 25-35 scale rows on the neck, while 37-47 on the thickest part of the body. Ventral shields are 290-390 in number, distinct throughout and anteriorly twice as broad as the adjacent dorsal scales, while little less posteriorly. Dorsal colouration is dirty white, pale greenish or yellow. Dorsal scales with narrow black margins. Flanks and ventral surface are pale yellow. There are about 50-75 sooty black cross-bands (Narrower on the sides) on the whole body, which are widest on the vertebral region and become narrow on the flanks and ventrum. Bands may form complete rings. Tail is darker than the colour of the body and is with 6-9 bands. Head is moderately large and is black, dark or pale olive-brown in adults. Preanal shields are much enlarged. Hemipenis is forked near the tip. Total length generally reaches upto 1630 mm in males, while 2020 mm in females.

Locality : Smith (1943), Sharma (2003) and Whitaker and Captain (2004) have reported the distribution of this species from coastal waters of India including Goa State.

Distribution : Coastal waters of India and adjacent countries (Sharma, 2003 and Whitaker and Captain, 2004).

Habitat : Generally found in shallow mangrove swamps or washed ashore, but has also been recorded swimming 12-20 miles off the coast. Able to crawl slowly on the land. Adult can lift its head above the ground. Piscivorous in habit. Most dangerous species and bites readily without provocation. Bites have been proved fatal.

Status : Fairly common (Sharma, 2003) and uncommon (Whitaker and Captain, 2004) Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV; IUCN Category as per CAMP Report (1998) : Data Deficient (For *Leicocephalophis cyanocincta* (Daudin)).

Remarks : *Hydrophis cyanocinctus* (Daudin) (= *Leicocephalophis cyanocincta* (Daudin)) has been retained here following Sharma (2003) and Whitaker and Captain (2004).

89. *Hydrophis ornatus* (Gray)

1842. *Aturia ornata*, Gray. *Zool Misc.* : 61.

Common Name : English : Pale-Grayish or Cochin Banded Sea Snake.

Diagnostic characters : Cochin Banded sea snake possesses all the characters mentioned for suborder Serpentes and family Hydrophiidae. Species under Hydrophiidae are marine and possess maxillary bone with teeth behind the poison fangs. Tail vertically compressed and puddle shaped. Pupil round. Genus *Hydrophis* includes deadly poisonous snakes with elongated compressed body. Mental shield is normal. 10-13 maxillary teeth present behind the poison fangs. Parietals touching the postoculars. In *Hydrophis ornatus* coastals with a round central tubercle or a short median keels, sometimes smooth or feebly keeled. Cuneates either absent or only 1 or 2 present. Posterior pair of sublinguals ill developed, separated by scales. In *Hydrophis ornatus* ventrals distinct from adjacent scales throughout and uniform in size. Scales sub-imbricate or juxtaposed, with a central tubercle or short keel. Body is robust and markedly elongated with its diameter greatest posteriorly. Eyes large with round pupils. Scales in 33-45 rows on the body in males and 39-55 in females, decreasing by 4 to 12 rows on neck. Ventral shields are 209-260 in males, 236-312 in females distinct throughout. Dorsal colouration is pale grayish or olivaceous or almost white above, with broad dark bars or rhomboidal spots separated by narrow interspaces. Cross bands may end abruptly on sides of the body. Ventral surface is yellowish or whitish. Head

is moderately large and is blackish or olive with yellowish-white markings on snout and sides. Hemipenis is forked near the tip. Total length generally reaches upto 1065 mm in males, while 940 mm in females.

Locality : Smith (1943), Sharma (2003) and Whitaker and Captain (2004) have reported the distribution of this species from the coastal waters of India including Goa State.

Distribution : Coastal waters of India and adjacent countries (Sharma, 2003 and Whitaker and Captain, 2004).

Habitat : Active at night. Prefers shallow waters. Swims very well, but helpless on land. Sometimes stranded on beaches in stormy weather. Piscivorous in habit. Venom most toxic and bites readily without provocation. Bites have been proved fatal.

Status : Fairly common (Sharma, 2003) and rare (Whitaker and Captain, 2004) Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV.

Remarks : IUCN status of *Hydrophis ornatus* (Gray) has not been assessed during the CAMP Workshop (1998).

*90. *Hydrophis caeruleus* (Shaw)

1802. *Hydrus caeruleus*, Shaw. *Genl. Zool.*, iii : 561.

Common Name : English : Many Toothed or Malacca Sea Snake.

Diagnostic characters : Malacca sea snake possesses all the characters mentioned for suborder Serpentes and family Hydrophiidae. Species under Hydrophiidae are marine and possess maxillary bone with teeth behind the poison fangs. Tail vertically compressed and puddle shaped. Pupil round. Genus *Hydrophis* includes deadly poisonous snakes with elongated compressed body. Mental shield is normal. In *Hydrophis caeruleus* parietals not touching the postoculars. 14-18 maxillary teeth behind the poison fangs. The body is not much slender anteriorly, but compressed posteriorly. Its greatest

diameter being 2-3 times that of the neck. Head is moderately small. Eyes moderately large and entirely black. Scales sub-imbricate or juxtaposed, with a central tubercle or short keel. Body is robust and markedly elongated with its diameter greatest posteriorly. Scales in 31-43 rows on the neck and 38-54 on the body. The posterior scales are subimbricate and with the truncated tips. Scales strongly keeled. Ventral shields are 253-334 in number and are distinct throughout. Dorsal colouration is bluish gray with 40-60 broad bands, almost two times broader than the interspaces between them at the anterior portion of the snake. These bands taper towards the ventral portion where they may be complete or incomplete on the thicker part of the body. Ventral surface is yellowish or whitish. Head is small and is black or dark gray, sometimes with yellowish-whitish mark behind the eye. Hemipenis is forked near the tip. Total length generally reaches upto 920 mm in males, while slightly more than 800 mm in females.

Locality : Sharma (1976) reported collection of twelve specimens from Panjim sea beach region of Goa State in 1969. This is the first collection record reported from Goa State.

Distribution : Coastal waters between Mumbai and Karwar and from Chennai northwards to the mouth of the Ganges on the east coast of India and adjacent countries (Sharma, 2003 and Whitaker and Captain, 2004).

Habitat : Active at night. Prefers shallow waters. Swims very well, but helpless on land. Found in estuarine areas and mangroves. Piscivorous in habit. Inoffensive but will bite on provocation. Venom toxic. Bites have been proved fatal.

Status : Fairly common (Daniel, 1983 and Sharma, 2003) and uncommon (Whitaker and Captain, 2004) Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV. IUCN Category as per CAMP Report (1998) : Data Deficient.

Remarks : Nil.

91. *Hydrophis mamillaris* (Daudin)

1803. *Anguis mamillaris*, Daudin. *Hist. Nat. Rept.*, 7 : 34.

Common Name : English : Bombay Sea Snake.

Diagnostic Characters : Bombay sea snake possesses all the characters mentioned for suborder Serpentes and family Hydrophiidae. All the species under Hydrophiidae are marine and possess maxillary bone with teeth behind the poison fangs. Tail vertically compressed and puddle shaped. Pupil round. Genus *Hydrophis* includes deadly poisonous snakes with elongated compressed body. Mental shield is normal. Parietals touching the postoculars. Coastals with a round central tubercle or a short median keels, sometimes smooth or feebly keeled. Cuneates either absent or only 1 or 2 present. Both the pairs of sublinguals well developed. The posterior ones are in contact with each other or separated by scales. Scales on the thickest part of the body are hexagonal, subquadrangular in shape, juxtaposed or feebly imbricate. In *Hydrophis mamillaris* there are 2 or 3 anterior temporals and 8-10 maxillary teeth behind poison fangs. Body with 44-55 broad black bands on the body. Head is small. The body is slender anteriorly, but compressed posteriorly. Its greatest diameter being 3-4 times that of the neck. Eyes moderately large and entirely black. In *Hydrophis mamillaris* ventrals distinct from adjacent scales throughout and uniform in size. Body is robust and markedly elongated with its diameter greatest posteriorly. Ventral shields are 302-390 in number, distinct throughout and bicarinate. Dorsal colouration is yellowish or grayish with 44-55 broad black bands on the body, almost two times broader than the interspaces between them. These bands expand dorsally and in most individuals they are connected along the ventral line. Ventral surface is yellowish or whitish. Head is small and is black or sometimes with yellow streak on the temporal region. Hemipenis is forked near the tip. Total length generally reaches upto 870 mm in males, while slightly more than 895 mm in females.

Locality : Smith (1943) and Sharma (2003) have reported the distribution of this species from the coastal waters of India including Goa State.

Distribution : Coastal waters of India and adjacent countries (Sharma, 2003).

Habitat : Found in shallow sandy tidal pools with rocky substratum. Also found in mangrove creeks. Piscivorous in habit. Venom toxic. Bites have been proved fatal.

Status : Rare (Sharma, 2003), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV.

Remarks : Nil.

92. *Hydrophis fasciatus* (Schneider)

1799. *Hydrus fasciatus*, Schneider. *Hist. Amphib.*, i : 240.

Common Name : English : Grayish-Black White-Bellied Sea Snake.

Diagnostic characters : Grayish-Black White-Bellied Sea Snake possesses all the characters mentioned for suborder Serpentes and family Hydrophiidae. Species under Hydrophiidae are marine and possess maxillary bone with teeth behind the poison fangs. Tail vertically compressed and puddle shaped. Pupil round. Genus *Hydrophis* includes deadly poisonous snakes with elongated compressed body. Mental shield is normal. Coastals with a round central tubercle or a short median keels, sometimes smooth or feebly keeled. Cuneates either absent or only 1 or 2 present. Both the pairs of sublinguals well developed. The posterior ones are in contact with each other or separated by scales. Scales on the thickest part of the body are hexagonal, subquadrangular in shape, juxtaposed or feebly imbricate. Parietals touching the postoculars. In *Hydrophis fasciatus* there is only one anterior temporal and 5-6 maxillary teeth behind poison fangs. In this species head, neck and anterior part of the body are black to dark olive, with pale yellowish oval spots on the sides or connected as dorsal bars. Posteriorly grayish above, whitish below, with dark rhomboidal spots which may extend down the sides of the body and form complete annuli in the young. Ventrals are distinct from adjacent scales throughout and uniform in size, bicarinate. Hemipenis is forked near the tip. Total length generally reaches upto

1110 mm with tail 100 mm in males, while slightly more than 990 mm with tail 75 mm in females.

Locality : Smith (1943) and Sharma (2003) have reported the distribution of this species from the coastal waters of India including Goa State.

Distribution : Coastal waters of India and adjacent countries (Sharma, 2003).

Habitat : Found in shallow sandy tidal pools with rocky substratum. Also found in mangrove creeks. Piscivorous in habit. Venom toxic. Bites have been proved fatal.

Status : Common throughout its range (Sharma, 2003), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV.

Remarks : Nil.

Genus *Lapemis*

Genus *Lapemis* is represented by a single species in Goa State.

*93. *Lapemis curtus* (Shaw)

1802. *Hydrus curtus*, Shaw. *Genl. Zool.*, iii : 562.

Common Name : English : Short Sea Snake.

Diagnostic characters : Short Sea Snake possesses all the characters mentioned for suborder Serpentes and family Hydrophiidae. In fact species under Hydrophiidae are marine and possess maxillary bone with teeth behind the poison fangs. Tail vertically compressed and puddle shaped. Genus *Lapemis* includes deadly poisonous snakes with short but compressed body. Mental shield is normal. Ventral shields are quite distinct in anterior part, but are smaller or even missing in the posterior portion. Poison fangs are followed after an interval by 3 to 6 solid maxillary teeth. 33-43 juxtaposed, hexagonal or squarish scales round the thickest part of the body. Lower 3-4 rows of scales are larger than the others. Its greatest diameter is being 2 times that of the neck. Head is moderately large and blunt, but is not broader than the neck. Head shields are entire, but parietals are broken up into irregular small scales. Nostrils are in superior

position. Nasal shields are in contact with each other. Scales sub-imbricate with a central tubercle or short 1 or 2 keels on scales of lower rows (They may be strongly spinous in adult males). Body is robust and stout with its diameter greatest posteriorly. 28-31 scale rows on the neck in males and 31-35 in the females, while 33-39 scales on the body of the males and 36-43 in females. Ventral shields are 154-168 in number. Dorsal colouration is greenish brown or gray above with 35-50 narrow, darker gray or black, ill-defined cross bands that taper to a point on each side of the body near belly. At times some of these bands form complete bands around the body. Dark gray head is, sometimes, with a curved yellow mark. Ventral surface is whitish. Hemipenis is forked near the tip. Total length generally reaches upto 950 mm.

Locality : Sharma (1976) reported collection of five specimens from Kolva and Canacona sea beach regions of Goa State in 1969. This is the first collection record reported from Goa State.

Distribution : Coastal waters of India and adjacent countries (Sharma, 2003 and Whitaker and Captain, 2004).

Habitat : Active at night. Prefers shallow rocky coastal waters and estuaries. Swims well, but can crawl slowly on land. Often caught in fishing nets. Piscivorous in habit. Inoffensive but will bite on provocation. Venom toxic. Bites have been proved fatal.

Status : Quite common (Sharma, 2003) and uncommon (Whitaker and Captain, 2004) Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV.

Remarks : Nil.

Genus *Microcephalophis*

Genus *Microcephalophis* is represented by a single species in Goa State.

94. *Microcephalophis gracilis* (Shaw)

1802. *Hydrus gracilis*. Shaw. *Genl. Zool.*, iii : 560.

Common Name : English : Common Small Headed Sea Snake.

Diagnostic characters : Common Small Headed Sea Snake possesses all the characters mentioned for suborder Serpentes and family Hydrophiidae. In fact species under Hydrophiidae are marine and possess maxillary bone with teeth behind the poison fangs. Tail vertically compressed and puddle shaped. Pupil round. Genus *Microcephalophis* includes deadly poisonous snakes with elongated compressed body. Ventral shields are entire in the anterior part, but are divided by a medial longitudinal fissure in the posterior part. Maxillary bone extends forward as far as or a little beyond the palatine bone. Poison fangs are followed after an interval by 5 or 6 solid teeth. Head shields are entire, nostrils are superior, nasals are in contact with each other and 30-36 juxtaposed or hexagonal scales round the thickest part of the body. 1st and 2nd supralabials touching the nasals. Prefrontal is not touching the 3rd supralabial. All dorsal scales are normal in size Ventrals 212-360 in number. They are entire on the anterior part of the body and broader than the adjoining dorsal scales. But in the posterior region these are completely divided by a median furrow. The two halves being opposed to one another and alternating. The body is very long and most slender anteriorly and extremely compressed posteriorly. Its greatest diameter is between 4-5 times than the diameter of the neck. Snout distinctly projects out beyond the lower jaw. Eyes moderately large. Head is very small in comparison to the body, which is somewhat elongated. Dorsal colouration of young is blackish with a series of whitish dorsal bands or oval spots on lateral sides on the slender portion of the body. Posterior part is completely covered with 40-60 bands. In adults these markings become dull and the whole dorsum looks grayish. Ventrals are paler. Head is olivaceous or yellowish. 17-23 scale rows are present on the neck, 29-43 on the body (Increase by 12-16). The posterior body scales are hexagonal, juxtaposed, and broader than long, with 2-3 very small tubercles, one behind another. The lower most rows of the scales a little larger than the others and bear very prominent tubercles or dental keels in adults. Hemipenis is forked near the tip. Total length generally reaches upto 1050

mm in males, while slightly more, 1120mm, in females.

Locality : Smith (1943) and Sharma (2000, 2003) have reported the distribution of this species from the coastal waters of India including Goa State.

Distribution : Coastal waters of India and adjacent countries (Sharma, 2000, 2003).

Habitat : Marine snakes most agile in water but helpless on ground. Generally found in mangrove swamps. Piscivorous in habit. Viviparous. Venom toxic. Bites have been proved fatal.

Status : Fairly Common (Sharma, 2000, 2003), Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV. IUCN Category as per CAMP Report (1998) : Data Deficient.

Remarks : Nil.

Genus *Pelamis*

Genus *Pelamis* is represented by a single species in Goa State.

95. *Pelamis platurus* (Linnaeus)

1766. *Anguish platurus*, Linnaeus. *Syst. Nat.* Ed. 12 : 391.

Common Name : English : Pelagic or Black & Yellow Sea Snake or Yellow-Bellied Sea Snake.

Diagnostic characters : Black & Yellow Sea Snake possesses all the characters mentioned for suborder Serpentes and family Hydrophiidae. In fact all the species under Hydrophiidae are marine and possess maxillary bone with teeth behind the poison fangs. Tail vertically compressed and puddle shaped. Pupil round. Genus *Pelamis* includes deadly poisonous snakes with elongated compressed body. Ventral shields are very small divided by a median longitudinal furrow in the posterior part. Maxillary bone never extends beyond the palatine bone. Poison fangs are followed after an interval by 7 or 11 solid teeth. 49-67 scales juxtaposed, squarish or hexagonal round the thickest part of the body. All dorsal scales are normal in size. Head shields are entire, nostrils are superior, and nasals are in contact

with each other, body is short but very stout covered with rows of 49-67 juxtaposed or hexagonal or squarish scales round the thickest part of the body. All dorsal scales are normal in size. Ventrals 264-406 in number. The body is not very long but is much compressed. Its greatest diameter is more than two times than that of the neck. Eyes moderately large and entirely black. Head is narrow and snout is elongated. Head and body is black or blue black above, "canary yellow" on sides and underside. Edge between the two colours mostly straight, but becomes wavy on hinder part of the body. Tail white with large black spots. Marks on the upper edge of the tail alternate with those on the lower edge. However there are number of colour variations reported such as black above brown or yellow with yellow stripes etc. Yellow may appear brown at the time of moulting. The lowermost rows of the scales a little larger than the others and bear very prominent 2-3 tubercles or dental keels in adults. Hemipenis is forked near the tip. Total length generally reaches upto 800 mm in males, while slightly more, 970 mm, in females.

Locality : Smith (1943), Sharma (2000, 2003) and Whitaker and Captain (2004) have reported the distribution of this species from the coastal waters of India including Goa State.

Distribution : Coastal waters of India and adjacent countries (Sharma, 2000, 2003).

Habitat : Pelagic snakes most docile and swift swimmers in water. Drifts like a stick. Helpless on land. Surface feeder. Piscivorous in habit. Viviparous. Venom toxic. Bites have been proved fatal.

Status : Fairly Common (Sharma, 2000, 2003) and uncommon (Whitaker and Captain, 2004). Indian Wildlife (Protection) Act (1972, as amended upto 2002) Schedule : Schedule IV.

Remarks : Nil.

Family VIPERIDAE

Family Viperidae (Solenoglypha : No solid teeth in front of the fangs. All solid teeth behind

the fangs in upper jaw) is represented by two subfamilies in Goa State.

Key to the Subfamilies of the Family VIPERIDAE

1. Without any deep depression; the loreal pit is between the eye and the nostril; maxillary bone not hollowed out..... VIPERINAE (True Vipers)
- With a deep depression between the eye and the nostril, the loreal pit, on each side of the snout formed by the hollowing out of the maxillary bone ... CROTALINAE (Pit-Vipers)

Subfamily VIPERINAE

Subfamily *Viperinae* is represented by two genera in Goa State.

Key to the Genera of the Subfamily VIPERINAE

1. Subcaudals single. Keels of lateral scales strongly serrated. Size small *Echis*
2. Subcaudals paired. Keels of lateral scales without any serration. Size large *Vipera*

Genus *Vipera*

Genus *Vipera* is represented by a single species in Goa State.

*96. *Vipera russelli* (Shaw)
= *Daboia russelii* (Shaw)

1797. *Coluber russelli* Shaw, *Nat. Misc.*, viii : 291.

Common Name : English : Russell's viper or Daboia.

Diagnostic characters : Viper species under family Viperidae possess all the characters mentioned for the suborder Serpentes. However, coronoid bone is absent, poison fangs are present in upper jaw, maxillary bone is quite short bearing fangs only, pupil elliptically vertical and ventrals almost as broad as the body in family Viperidae. Poison fangs are large, erectile and tube like. Anterior skull bones flexible. Head is quite distinct

from the neck and covered with small scales. Eyes not in contact with the labials. There is no pit between eye and nostril, which is lateral in position in Genus *Vipera*. Dorsal body scales strongly keeled but not serrated in Russell's viper. Subcaudals divided, tail short. Head rather long and wider than neck. Snout bluntly pointed. Rostral about twice as high as wide. Body stout dorsoventrally flattened. Scales in 25-29 : 27-33 : 21-23 rows, ventral shields 153-180, subcaudals 41 in males and 64 in females. Dorsal ground colour brown of varying shades with three series of large ovate spots, one vertebral and two costal. Spots brown in the centre surrounded successively by black and white or buff. Smaller spots may occur between the dorsal and side spots. Head with distinct dark patch behind. A dark stripe from eye to lip. A conspicuous white, buff or pink line from gape converges to form a V above snout. Belly white, whitish or yellowish with a few dark half moon marks on the margins of the anterior ventral. Maximum length of Russell's viper reaches upto 1500 mm.

Locality : Sharma (1976) reported collection of one specimen from Phonda region of Goa State in 1969. This is the first collection record reported from Goa State. ZSI survey party sighted one live specimen in Valpoi region of Goa State during the project period.

Distribution : Whole of India (Sharma, 2000, 2003 and Whitaker and Captain, 2004 for *Daboia russelii*).

Habitat : Widely distributed but prefers open country. Russell's viper has been recorded upto 2100 m. in other parts of the country. Normally sluggish and does not strike readily unless irritated. It bites with great malice. The fangs are movable and can be erected when the mouth is open. Viper's poison apparatus is also called as "Nature's hypodermic syringe" All viper species are viviparous. The poison acts as a depressor of the vasomotor centre and a destroyer of the blood targeting R.B.C. The lethal dose is about 42 mgm for an adult human being.

Status : The species is abundant in some areas.

uncommon or rare or even missing in other areas (Daniel, 1983 and Sharma, 2000, 2003). Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule II, Part II; IUCN Category as per CAMP Report (1998) : Lower risk-Near threatened (for *Daboia russelii*).

Remarks : Nocturnal in behaviour. Feeds mainly on rodents, but diet also include small mammals, birds, lizards, amphibians etc. The young are often cannibalistic. CAMP Report (1998), Gayen (1999) and Whitaker and Captain (2004) consider Russell's viper as a species under another genus *Daboia* (*Daboia russelii*). However, the species has been treated here as *Vipera russelii* (Shaw) following Smith (1945) Sharma (2000 and 2003). Russell's viper is being killed indiscriminately on a very large scale for their skins for illegal trade in local, domestic and international market (Pradhan, 1997).

Genus *Echis*

Genus *Echis* is represented by a single species in Goa State.

*97. *Echis carinatus* (Schneider)

1801. *Pseudoboa carinata* Schneider, *Hist. Amphibia*, ii : 285.

Common Name : English : Saw-scaled viper or Phoorsa.

Diagnostic characters : Saw-scaled viper possesses all characters mentioned earlier for suborder Serpentes and family Viperidae. Saw-scaled viper is distinguished from other Indian snakes by the absence of shields on head, broad ventrals covering the whole belly and possession of undivided subcaudals. Body cylindrical, short and stout. Nostrils small and dorsolateral in position directing upwards. Head very distinct from neck. Eyes moderately large with vertical pupil. Maximum length of phoorsa snake is about 760 mm. Scales are small elongated and strongly keeled. Mostly the keels are serrated on the flanks. They are arranged in 25-29 : 27-37 : 21-27 rows. Two outermost rows are largest. Ventral shields 132-185, while subcaudals 23-39 in number.

Hemipenis is deeply forked and bears spines all over. Colour and pattern varies considerably. Pale brown, buff or tawny with dark brown or even blackish markings in the form of dark edged spots in a vertebral series connected to a light coloured inverted 'U' or 'V' shaped flank marks enclosing a dark area connected to each other forming a wavy line. Dorsum is with 28-36 spots. There is a cruciform or trident shaped mark on the head. Whitish below, uniform or spotted with brown. Poison fangs of saw-scaled viper are remarkably large for its size. The almond shaped poison glands are placed behind the eyes.

Locality : Sharma (1976) reported collection of forty specimens from Valpoi, Canacona, Dhavan Village, and Ponda regions of Goa State in 1969. This is the first collection record reported from Goa State. One specimen was collected from Bondla Wildlife Sanctuary region by ZSI Survey party during the project period.

Distribution : Widely distributed in India except in Bengal and North East India (Sharma, 2000, 2003 and Whitaker and Captain, 2004).

Habitat : Terrestrial mainly inhabits arid and open broken scrub country. Fairly common along west coast area. An alert little snake. It is diurnal in habit and a good climber. It readily bites with smallest provocation. The striking posture is characteristic, a double coil in the form of a loop of figure '8' with its head in the centre. The hissing noise is produced due to friction of serrated scales on the flanks. Feeds largely on centipedes, scorpions, larger insects, mice, skinks, geckos and frogs.

Status : Common throughout its range (Daniel, 1983, Sharma, 2003 and Whitaker and Captain, 2004)), Indian Wildlife (Protection) Act (1972 as amended upto 1991) Schedule : Schedule IV, IUCN category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : Poison of saw-scaled viper is supposed to be five times toxic as cobra venom and 16 times toxic of Russell's viper's venom. The lethal dose for man is believed to be 5 mgm. The poison destroys blood cells and lining of blood

vessels. Saw-scaled vipers are killed indiscriminately on a very large scale for illegal trade of their skins (Pradhan, 1997).

Subfamily CROTALINAE

Subfamily Crotalinae is represented by two genera in Goa State.

Key to the Genera of the Subfamily CROTALINAE

- I. Top of head is with large symmetrical shields paired (Agkistrodon)..... *Hypnale*
 Head covered completely with small scales *Trimeresurus*

Genus *Hypnale* (Agkistrodon)

Genus *Hypnale* (Agkistrodon) is represented by a single species in Goa State.

98. *Hypnale* (Agkistrodon) *hypnale* (Merrem)

1820. *Cophias hypnale* Merrem, Syst. Amph. : 155.

Common Name : English : Hump-nosed Pit Viper.

Diagnostic characters : Hump-nosed Pit Viper possesses all the characters mentioned earlier for family Viperidae. Presence of deep pits between the preoculars and the loreal formed due to hollowing out of the maxillary bone on lateral sides of the face is the characteristic feature of all the pit viper species and separates them from all other groups of snakes. Top of the head is with large symmetrical shields. Snout acutely pointed and turned up at the end. A frontal is bounded on each side by a supraocular and followed by internasals. Prefrontals many a times are paired. Eyes are moderately large with vertical pupil. Triangular head is distinctly flattened and appears unduly broad owing to constricted neck. Body stout. Tail short tapering and prehensile. The length of Hump-nosed Pit Viper reaches upto 385 mm. in males and 545 mm in females. Scales of the body are in 17 : 17 : 17 or 15 rows and they are smooth or feebly keeled on posterior side. Scales on head are small, subequal, subimbricate and

smooth. Ventral shields 138-157. Subcaudals 32-46 paired or some of them may be single. Hemipenis forked extended upto 15th caudal plate. Dorsal colouration is grayish or brownish of various shades and moultings. A series of ovate dark coastal spots always present. Tip of the tail often yellowish or reddish. Underside is gray, yellow or brown with darker spots.

Locality : Smith (1943), Daniel (1983), Sharma (2000, 2003) and Whitaker and Captain (2004) have reported occurrence of this species in Western Ghats upto Lat. 16°N. Nearest locality is Castle Rock on Goa-Karnataka border (Whitaker and Captain, 2004).

Distribution : Western Ghats in India.

Elsewhere : Sri Lanka.

Habitat : Terrestrial, arboreal, nocturnal ascending low bushes. It's a snake of hill forests of evergreen, moist deciduous and dry deciduous types. Also found in plantation areas. Feeds mainly on small mammals, birds, lizards and frogs. It's venom action is quite toxic and painful. No information is available on human fatalities due to its bites.

Status : Common (Sharma, 2000, 2003 Whitaker and Captain, 2004), Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : IV, IUCN category as per CAMP Report : Lower risk-Near threatened.

Remarks : The threat to the survival of species is due to habitat loss for urbanisation.

Genus *Trimeresurus*

Genus *Trimeresurus* is represented by two species in Goa State.

Key to the species of the Genus *Trimeresurus* from Goa State.

- I. Supraocular (Scale above eye) divided into 2 or 3 pieces by transverse sutures or their margins indented by the adjacent scales.
 *Trimeresurus malabaricus*
 – Supraocular not divided
 *Trimeresurus gramineus*

***99. *Trimeresurus gramineus* (Shaw)**

1802. *Coluber gramineus* Shaw, *Genl. Zool.*, iii : 420.

Common Name : English : Bamboo Pit viper.

Diagnostic characters : Bamboo pit viper possesses all the characters mentioned earlier for family Viperidae. Presence of deep pits between the preoculars and the loreal on lateral sides of the face is the characteristic feature of all the pit viper species and separates them from all other groups of snakes. The head is flattened and appears unduly broad owing to constricted neck. Body stout. Tail short tapering and prehensile. The length of bamboo pit viper reaches upto 745 mm. in males and 935 in females. Snout two times as long as the diameter of the eye, which is moderately large with vertical pupil. Iris golden. Scales of the body are in 21 : 21 : 15 rows and they are smooth or feebly keeled on posterior side. Scales on head are small, subequal, subimbricate and smooth. Supraocular not divided. Ventral shields 145-175 in males and 164-177 in females. Subcaudals 55 -71 in males and 57-62 in females. Hemipenis forked extended upto 11th to 12th caudal plate. Dorsal colouration grassy green and uniform or sometimes with small dark brown spots. Ventral side glossy white, yellow or greenish extending upto throat, chin and upper lip. A well-defined white, bluish or yellowish line on flank usually present. Black or blackish markings on the head.

Locality : Sharma (1976) reported collection of one specimen from Molem region of Goa State in 1969. This is the first collection record reported from Goa State.

Distribution : Peninsular India, South of Lat. 22° N. Indian endemic species.

Habitat : Terrestrial, arboreal and nocturnal. It's a snake of hill forests. Frequents low vegetation showing marked preference for bamboo. When provoked, it anchors itself firmly by its tail and hind body to a branch and takes shape of 'S' with rest of the body. Feeds mainly on small mammals, birds and lizards. Its venom action is feeble but painful. No information is available on lethal dose.

Status : Not uncommon in its range of distribution (Sharma, 2003) and Common (Whitaker and Captain, 2004). Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : IV, IUCN category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : The threat to the survival of species is due to habitat loss for urbanisation.

100. *Trimeresurus malabaricus* (Jerdon)

1854. *Trigonocephalus (Cophias) malabaricus* Jerdon, *J. A. S. Bengal*, xxii : 523.

Common Name : English : Greenish Malabar Pit Viper

Diagnostic Characters : Malabar Pit Viper possesses all the characters mentioned earlier for family Viperidae. Presence of deep pits between the preoculars and the loreal on lateral sides of the face is the characteristic feature of all the pit viper species and separates them from all other groups of snakes. The head is flattened and appears unduly broad owing to constricted neck. Body stout. Tail short tapering and prehensile. The length of Malabar Pit Viper reaches upto 550 mm. and tail upto 100mm in males and 790 mm and 130 mm respectively in females. Eyes are moderately large with vertical pupil. Iris golden. Scales of the body are in 21 or 23 : 21 (Rarely 19) : 15 or 17 rows and they are smooth or feebly keeled on posterior side. Scales on head are small, subequal, subimbricate and smooth. Supraocular (Scale above eye) divided into 2 or 3 pieces by transverse sutures or their margins indented by the adjacent scales. Ventral shields 143-158 in males and 136-159 in females. Subcaudals 50-63 in males and 44-54 in females all divided. Anal entire. Hemipenis forked extended 12th caudal plate. Colouration pattern variable changing with the season and with faint markings. Typically green, olive, brown or reddish brown dorsal side with prominent brown/black spots that may join to form zigzag pattern. Flanks coarsely dappled with buff. There may be scattered yellow spots on sides. Ventral side greenish or yellowish or even grayish white.

Locality : Smith (1943), Daniel (1983) and Sharma (2000, 2003) have reported occurrence of this species from Western Ghats including Goa State. Nearest sighting locality is Castle Rock near Goa-Karnataka border (Whitaker and Captain, 2004).

Distribution : Western Ghats endemic species.

Habitat : Terrestrial, arboreal and nocturnal. Generally found at the altitudes between 2000 to 7000 Ft. It's a snake of hill forests. Frequents low vegetation and trees or on rocks- seen often near stream edges and pools. It is capable of fast strike. Feeds mainly on small mammals, birds and lizards. Its venom action is feeble but painful. No information is available on lethal dose.

Status : Common in its range of distribution (Sharma, 2003 and Whitaker and Captain, 2004). Indian Wildlife (Protection) Act (1972, as amended upto 1991) Schedule : Schedule : IV, IUCN category as per CAMP Report (1998) : Lower risk-Near threatened.

Remarks : The threat to the survival of species is due to habitat loss for urbanisation.

DISCUSSION

Systematic list of reptilian species given above reports occurrence of 100 reptilian species/subspecies in the entire region of Goa State. Half of these (50) have been collected and/or sighted by ZSI survey parties which visited Goa State during project period between 1991-1996 and even by those which have visited Goa State before the project period, while remaining half (50) have been included in the list on the basis of the literature consulted. Sharma (1976) has enumerated a first comprehensive account of 46 reptilian species reported from Goa State on the basis of the considerable collections made by ZSI survey parties during 1966-1969, which has formed the base of the present updation.

The list includes systematic account on the every species of one crocodile family (One species), five turtle/tortoise families (Includes Two Marine Turtle families. (Total 9 species), six lizard

families (Includes 30 species) and eight snake families (Includes one family of marine snake species (Total 10 species) and one family of venomous snakes (10 species). Total 60 snake species) have been reported from Goa State. The list clearly indicates excellent herpetofaunal diversity in such a small but ecosystem diversified state. Serpentine species diversity is quite noteworthy.

The present account reports a total of 100 species belonging to 57 genera under 20 families of 4 suborders in three reptilian orders. The present updated systematic account includes about 38 species, which have been recorded from the state for the first time by Sharma (1976). The reptilian endemism in India and Western Ghats is equally worth mentioning. About 24 Indian endemic reptilian species, which includes 12 Western Ghats endemics, have been reported from Goa State in the present account. Thus about 24% of the reptilian fauna of Goa State is endemic to India and half of the Indian endemics reported from the state are the Western Ghats endemics. Two turtle, eleven lizard and eleven snakes species represent the endemic species. Five species of Genus *Uropeltis* are either Indian or Western Ghats endemic.

The Indian Endemic including Western Ghats endemic reptilian species are :

Order TESTUDINES (Chekibua)

Family EMYDIDAE (Bataguridae)

1. Indian Snail -Eating Turtle : *Melanocheilus trijuga* (Schweigger)

Family TRIONYCHIDAE

2. Peninsular Soft-Shelled or Leith's Softshelled Turtle : *Trionyx leithi* Gray = *Aspideretes leithii* (Gray).

Order SQUAMATA

Suborder SAURIA (Lacertilia)

Family GEKKONIDAE

3. Goa Forest Palli : *Cnemaspis goaensis* Sharma.
4. Dark Spotted Giant Gecko : *Hemidactylus maculatus* (Dum. & Bibr.)

- *5. Prashad Brown Gecko : *Hemidactylus prashadi* Smith.

6. Reticulated Gecko : *Hemidactylus reticulatus* Beddome.

Family AGAMIDAE

7. Matheran Olive-Brown Calotes : *Calotes rouxi* Dum. & Bibr.

Family SCINCIDAE

8. Allapalli Forest Skink : *Mabuya allapallensis* Schmidt.

9. Five Striped Skink : *Mabuya trivittata* (Hardwicke & Gray)

10. Malabar Dotted Skink : *Riopa guentheri* (Peters).

11. Golden-Brown Four-toed Skink : *Riopa lineata* (Gray).

- *12. Goanese Bronze Skink : *Riopa goaensis* Sharma.

Family LACERTIDAE

- *13. Beddom's Snake-Eyed Lacerta : *Ophisops beddomii* (Jerdon)

Suborder SERPENTES (Ophidia)

Family UROPELTIDAE

- *14. Travancore Melanophidium or Pied-belly Shieldtail Snake : *Melanophidium punctatum* Beddome.

15. Elliot's Uropeltis or Shieldtail Snake : *Uropeltis ellioti* (Gray).

- *16. Peter's Uropeltis or Mahratta roughtail Snake : *Uropeltis macrolepis* (Peters).

- *17. Cuvier's Uropeltis or Kerala Shieldtail Snake : *Uropeltis ceylanicus* Cuvier

- *18. Bombay Hills Uropeltis or Phipsoni roughtail Snake : *Uropeltis phipsoni* (Mason).

- *19. Myhendra Mountain Uropeltis or Barred shieldtail Snake : *Uropeltis myhendrae* (Beddome)

Family BOIDAE

- *20. Whitaker's Boa : *Eryx whitakeri* I. Das

Family COLUBRIDAE

Subfamily COLUBRINAE

- *21. Beddom's Olive-Brown Keelback : *Amphiesma beddomei* (Gunther) = *Natrix beddomei* (Gunther)

- *22. Green or Hill Keelback : *Amphiesma monticola* (Jerdon).

Family ELAPIDAE

23. Striped Coral Snake : *Callophis nigrescens* (Gunther).

Family VIPERIDAE

Subfamily CROTALINAE

- *24. Greenish Malabar Pit Viper : *Trimeresurus malabaricus* (Jerdon)

Species marked with astericks * above are Western Ghats endemic species.

Following lizard species from Goa State have been described as new to the science (Sharma, 1976) :

1. *Cnemaspis goaensis* Sharma and
2. *Riopa goaensis* Sharma

Further, Sharma (1976) has confirmed the species validity of *Mabuya allapallensis* reported from this region.

When conservation status of the reptilian species under Indian Wildlife (Protection) Act (1972)(as amended upto 2002) was studied, it was seen that 60 species/subspecies out of 100 (60%) have been included in some or other schedules of Indian Wildlife (Protection) Act. Eight species (One Marsh crocodile, six marine turtle and one snake species) have been included in Schedule I. Two lizard and six snake species have been listed in Schedule II Part II, while two turtle and 45 snake species find their place in Schedule IV. All snake families, which include these 45 species, have been listed in Schedule IV. Seven reptilian species fall under the threatened categories of IUCN, while four are Vulnerable and the rest are either Lower risk-Near Threatened, Lower risk-Least Concern or Data Deficient species. Under

CITES Regulations, seven reptilian species figure in Appendix I while six species find their place in Appendix II.

Finally following conclusions can be drawn :

1. State of Goa can boast of excellent reptilian species diversity (100 species belonging to 57 genera under 20 families of 4 suborders in three reptilian orders).
2. It can also boast of a fairly good representation of Indian/Western Ghats endemic reptilian species (24 species).
3. Two lizard species described as new to the

science by Sharma (1976) were collected by him from this state.

4. Fairly large number of reptilian species (60 species) have been included under some or other Wildlife (Protection) Act (1972, as amended upto 2002) Schedules.

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