

## A SYNOPSIS OF THE REPTILES OF GUJARAT, WESTERN INDIA

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(with two text-figures)

**ABSTRACT.-** This paper deals with the reptile fauna of Gujarat State, and is primarily based on a collection made by the author during the Gujarat survey between 1989-1993. Information from earlier collections from Gujarat in the Zoological Survey of India, have also been included, as are data from the literature. To increase the usefulness of the paper, species that have ranges approaching the State have also been included. Altogether, 66 species in 50 genera and 18 families that are known from Gujarat have been dealt with in this report. Keys, diagnostic characters, measurements and distributional notes have been incorporated in the paper. Two squamate species, *Hemidactylus triedrus* and *Lygosoma lineata* are being reported for the first time from Gujarat.

**KEY WORDS.-** Reptiles, Gujarat, India, systematic list, biodiversity, keys.

### INTRODUCTION

The western Indian State of Gujarat, comprising a land area of approximately 200,000 km<sup>2</sup>, is situated along the west coast of India (coordinates 20° 01' - 27° 07' N; 68° 84' - 70° 04' E). The area is bounded by the Arabian Sea in the west, Pakistan in the north, Rajasthan in the north-east, Madhya Pradesh in the south-east and Maharashtra to the south. On the basis of terrain attributes such as geology, ecology and topography, the state of Gujarat can be divided into the following geomorphological divisions:

- North-eastern crystalline hills
- Trappian highlands of south Gujarat
- Rocky tableland of Kachchh and Saurashtra
- Arid and semi-arid plains of north Gujarat
- The Rann of Kachchh
- Alluvial plains of central Gujarat
- Uplands of south Gujarat
- Coastal areas

These diverse ecological conditions promote high levels of biodiversity in the State. The long coastline of Gujarat and other geomorphic divisions, have a distinctive flora and fauna. The annual rainfall and temperature show significant

variation from 400-800 mm and 40-50° C, respectively. Forest area comprises 10% of the total land area of Gujarat.

On the Subcontinent, the records of the Asiatic lion (*Panthera leo persica*) and Asian wild ass (*Equus hemionus khur*) are restricted to this state. Among reptiles, *Cyrtodactylus kachhensis kachhensis* and *Hemidactylus porbandarensis* are endemic to Gujarat. About a seventh the reptile fauna of India have been recorded from Gujarat.

Prior to the establishment of the Zoological Survey of India in 1916, little work was carried out on the reptiles of Gujarat. Acharya (1933), Bhaskar (1981), Daniel and Shull (1963), Frazier (1989), Smith (1931, 1935, 1943), Sharma (1981, 1982), Vyas (1989a; 1989b; 1994) and Vyas and Patel (1990), provided data on the fauna. However, information on the fauna is largely limited to notes on anecdotal observations on natural history or checklists.

The present work is an inventory of the reptile fauna of the State of Gujarat. Material for this study was collected by the author between 1989-1993, as well as the older collections preserved in the National Zoological Collection,

Zoological Survey of India (ZSI), Calcutta. Altogether, 66 species belonging to 50 genera and 18 families are being reported. The paper lists current scientific name, diagnostic characters, distribution, measurements and key for the identification of all 66 species of reptiles reported from Gujarat.

#### MATERIALS AND METHODS

Aquatic forms were collected with cast nets and fishing hooks. Terrestrial and arboreal forms were collected by hand or with forceps. The reptiles reported in this paper have been collected by staff members of the Zoological Survey of India. Specimens were killed using chloroform and fixed in 5% formalin solution. An incision on the abdomen was made in case of large specimens, and small specimens were injected with a 10% formalin solution inside the abdomen, for fixation of viscera. The fixed material along with labels containing data on locality, altitude, habitat, date of collection and name of collector, were packed and kept in 5% formalin solution. The material was unpacked in the laboratory, washed in water and preserved in 95% ethanol.

Where no material has been mentioned, data on species have been derived from the literature.

#### SYSTEMATIC ACCOUNT

CLASS: REPTILIA

ORDER: CROCODYLIA

FAMILY: CROCODYLIDAE

GENUS: *Crocodylus* Gronovius, 1763

*Crocodylus palustris* Lesson, 1834:

Description: Snout broad, without lachrymal ridges, 1-1/3 to 1-1/2 times as long as broad at base. A row of four distinct, sharply raised, post-occipitals, dorsal scutes in 16-17 transverse rows and four, sometimes six longitudinal series of bony plates embedded in skin. Ventrally, skin lacks armour. Fingers webbed at base.

Distribution: This species inhabits rivers, lakes and other large waterbodies throughout the Indian region. According to Vyas (1994), it occurs in all major river systems and large reservoirs of Gujarat State. It also occurs in Nepal, Pakistan, Bangladesh and Sri Lanka.

ORDER: TESTUDINES

SUBORDER: CRYPTODIRA

Key to families:

1. Limb clawless . . . . . Dermochelyidae
- 1'. Limb clawed . . . . . 2.
2. Shell covered with smooth skin . . . . .  
. . . . . Trionychidae
- 2'. Shell covered with horny skin . . . . . 3.
3. Limbs paddle-shaped . . . . . Chelonidae
- 3'. Limbs not paddle-shaped . . . . . 4.
4. Limbs flattened, digits webbed . . . . .  
. . . . . Bataguridae
- 4'. Limbs not flattened, digits free . . . . .  
. . . . . Testudinidae

FAMILY: DERMOCHELYIDAE

GENUS: *Dermochelys* Blainville, 1816

*Dermochelys coriacea* (Linnaeus, 1766):

Description: Body and limbs of hatchlings covered with polygonal shields; 6 longitudinal ridges on carapace and 5 on plastron; top and sides of head covered with symmetrical scutes; body covered with smooth skin in adult. Beak on upper jaw with 'w' shaped cusp. Limbs paddle-shaped and clawless; forelimbs large. Tail short. Dorsal colour black with pale yellow or white spots; paler below.

Distribution: Gujarat, Goa, Kerala, Tamil Nadu, Andhra Pradesh, Lakshadweep, Andaman and Nicobar Islands. A cosmopolitan species.

FAMILY: CHELONIIDAE

Key to genera:

- Four pairs of pleural shields. . . . . *Chelonia*
- Five or more pairs of pleural shields . . . . .  
. . . . . *Lepidochelys*

GENUS: *Chelonia* Brongniart, 1800

*Chelonia mydas* (Linnaeus, 1758):

Description: Snout short, upper jaw blunt, descending perpendicularly from nostril without hook; tomium of lower jaw serrated, that of upper jaw with strong vertical ridges on upper surface; forelimbs single-clawed and with large scales. Carapace heart-shaped or oval, with pairs of pleurals. Vertebrae broader than long. Colour marbled olive above, with darker spots or streaks, paler below.

Distribution: Gujarat, Maharashtra, Kerala, Lakshadweep, Tamil Nadu, Andhra Pradesh, Andaman and Nicobar Islands. A cosmopolitan species.

GENUS: *Lepidochelys* Fitzinger, 1843

*Lepidochelys olivacea* (Eschscholtz, 1829):

Description: Carapace broad, almost heart-shaped, fairly raised, flat topped; posterior marginals serrated; 5-9 pairs of pleurals; 12-14 pairs of marginals; a broad nuchal touching first pleural; five or more coastals; marginals 27, rarely 25. Carapace of juveniles with three distinct keels; inframarginals pores distinct. Head small, triangular; four prefrontal scales on forehead; upper jaw hooked but without ridge. Adult olive-brown above, yellowish below.

Distribution: Gulf of Kachchh in Gujarat. It is also recorded from the coasts of Maharashtra,

Goa, Kerala, Tamil Nadu, Andhra Pradesh, Orissa, Andaman and Nicobar Islands. A cosmopolitan species.

FAMILY: TESTUDINIDAE

GENUS: *Geochelone* Fitzinger, 1835

*Geochelone elegans* (Schoepff, 1792):

Material examined: Banaskantha District. ZSI 25041, near Rasarpur Village, 20 km from Palanpur. 20.9.1993.

Measurements: Carapace length 55 mm, carapace width 52 mm. Shell height 38 mm.

Description: Carapace oblong when viewed from above in adults, to almost round in juveniles. Nuchal absent; all vertebrals, except first, which is as long as broad, are broader than long; 12th marginals united, bridge with a single axillary and inguinal scute on each side. Head moderate in size, its anterior bulging and some-

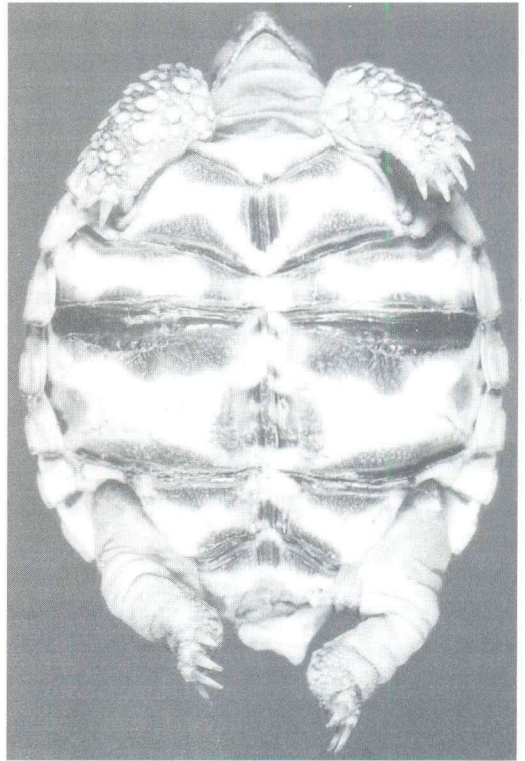
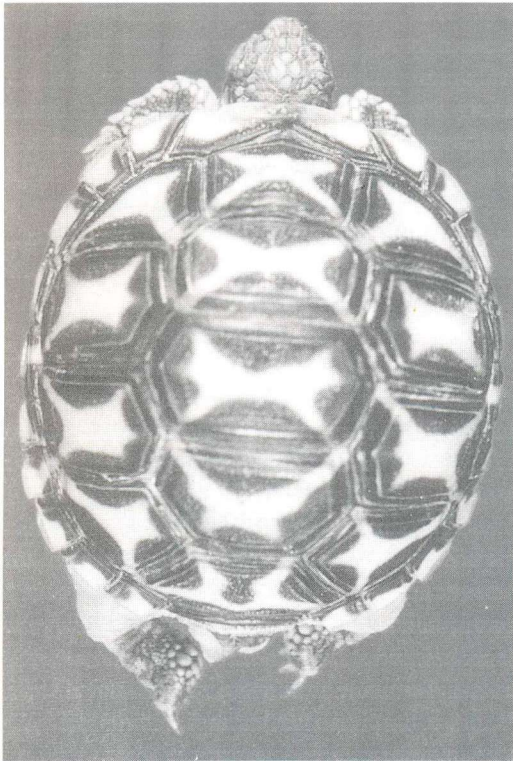


FIGURE 1: *Geochelone elegans* (ZSI 25041) in dorsal (left) and ventral (right) views.

what convex; upper jaw slightly tricuspid. Skin on forehead divided into small irregular shields. Tail moderately long and terminating in a spur-like scute; shell black above, each vertebral and coastal shield with a yellow areola, from which radiate as many as eight streaks, producing a starred pattern which is continuous over marginals to plastron. Heads and limbs yellow, more or less spotted with dark brown or black.

Distribution: Gujarat, found also in other districts, according to reports. Elsewhere-Rajasthan, Karnataka, Andhra Pradesh, Tamil Nadu, Madhya Pradesh. Outside India- Pakistan and Sri Lanka.

#### FAMILY: TRIONYCHIDAE

Key to genera:

Marginal bones absent; no cutaneous plastral flaps; snout long . . . . . *Aspideretes*

Marginal bones present; cutaneous plastral flaps present; snout short . . . . . *Lissemys*

GENUS: *Aspideretes* Gray, 1872

*Aspideretes gangeticus* (Cuvier, 1824):

Description: Carapace low and oval. Head comparatively large and broad with dorso-laterally situated eye; elongated proboscis. Limbs with three claws. Tail short. Carapace dull olive green with irregular dark reticulation, plastron ivory white. Head greenish, with black longitudinal streak from between eyes and nape; three oblique black streaks on sides; 4-6 eye-like markings on back of juveniles.

Distribution: Gujarat, Punjab, Rajasthan, Orissa, Bihar, Uttar Pradesh. Outside India- Pakistan, Nepal and Sri Lanka.

GENUS: *Lissemys* Smith, 1931

*Lissemys punctata punctata* (Bonnaterre, 1788):

Material examined: Kachhh District, ZSI 25040, Gudver Nabhoi Forest area, 28. 9. 1993. ZSI 25046, Bachau, 26. 9. 1993. Rajkot District, 1 ex., Rajkot. Coll. D. Sood.

Measurements: Carapace length 60-150 mm; carapace width 55-100 mm; shell depth 35-65 mm.

Description: Carapace broadly oval in adults; circular in juveniles. Head moderately large, snout short, its length less than eye diameter; carapace and plastron covered with skin; callosities finely granulated. Lateral and hind portion of carapace flexible. Plastron with soft semi-circular flaps, which conceal retracted hindlimbs. Plastron with seven callosities. Limbs fully webbed, three clawed. Tail short. Olive-brown above, with numerous black-bordered yellow spots, irregularly arranged, with a light yellow rim.

Distribution: Gujarat, Punjab, Rajasthan, Maharashtra, Madhya Pradesh, Karnataka, Tamil Nadu, Andhra Pradesh, Orissa, Bihar West Bengal, Andaman Islands. Outside India-Pakistan, Nepal, Sri Lanka, Bangladesh and Myanmar.

#### FAMILY: BATAGURIDAE

Key to genera:

Vertebral shield short-sided anteriorly . . . . .

. . . . . *Kachuga*

Vertebral shield short-sided posteriorly . . . . .

. . . . . *Melanochelys*

GENUS: *Kachuga* Gray, 1869

Key to species:

Head patterned with a broad red or orange crescentic band . . . . . *tecta*

Head without crescentic band . . . . . *tentoria*

*Kachuga tecta* (Bell, in Gray, 1831):

Description: Carapace elevated, oval with a prominent vertebral keel that is spiked especially on third shield, hind margin of carapace not or feebly serrated. Nuchal usually broadest behind. Head moderate, patterned with a broad red crescentic band, snout shorter than orbit, pointed and slightly projecting beyond lower jaw; upper jaw unnotched. Digits fully webbed; limbs with transversely enlarged scales. Colour olive brown above, with a red keel, below pinkish-yellow; each scute with 2-3 black blotches. Head black on top; temporal regions often with a yellow 'v'-shaped mark; limbs dark olive, with yellow spots.

Distribution: Gujarat. Elsewhere- Punjab, Madhya Pradesh, Uttar Pradesh, Bihar, West Bengal, Assam, Meghalaya, Arunachal Pradesh. Outside India- Pakistan, Nepal and Bangladesh.

*Kachuga tentoria circumdata* (Mertens, 1969):

Description: Carapace elevated, oval with distinct vertebral keel that is spiked especially on vertebral 3; vertebral 3 and 4 longer than wide, vertebral 5 wider than long, vertebral 1 longer than wide; plastron truncated anteriorly, notched posteriorly. Head patterned without crescentic band, snout pointed, skin at back of forehead with irregular scales; upper jaw unnotched, vertebral shields short-sided anteriorly. Limbs are with fully and broadly webbed digits and have transversely enlarged scales. Colour olive-brown above with a reddish keel; pink ring along peripheral-marginal juncture, yellowish below with a single black blotch on each scute. Two curved pink bands on middle of forehead; pink broken band behind eye.

Distribution: Gujarat, Madhya Pradesh and Uttar Pradesh.

GENUS: *Melanochelys* Gray, 1869

*Melanochelys trijuga* (Schweigger, 1814):

Description: Head moderately small, snout shorter than orbit, slightly projecting beyond lower jaw, upper jaw notched at middle. Vertebral shields short-sided posteriorly. Carapace elongated, fairly elevated in adults, depressed in juveniles, tricarinate; posterior marginals feebly serrated; nuchal small, triangular. Head greyish-olive with yellow or pink reticulations which are most prominent on sides.

Distribution: This subspecies is distributed in Gujarat, Maharashtra, Karnataka, Tamil Nadu and Andhra Pradesh.

ORDER: SQUAMATA

SUBORDER: SAURIA

Key to families:

- 1. Tongue slender, forked. . . . . Varanidae
- 1'. Tongue not slender nor forked. . . . . 2.
- 2. Top of head with symmetrical shield . . . 3.

- 2'. Top of head without symmetrical shield. . . . . 4.
- 3. Body not covered with osteodermal plates, femoral pores absent . . . . . Scincidae
- 3'. Body covered with osteodermal plates, femoral pores present . . . . . Lacertidae
- 4. Tail prehensile . . . . . Chamaeleonidae
- 4'. Tail not prehensile. . . . . 5.
- 5. Dorsal scales imbricate; pupil rounded . . . . . Agamidae
- 5'. Dorsal scales not imbricate; pupil a narrow slit. . . . . 6.
- 6. Eyes with movable eyelids; digits dilated . . . . . Gekkonidae
- 6'. Eyes with movable eyelids; digits not dilated . . . . . Eublepharidae

FAMILY: EUBLEPHARIDAE

GENUS: *Eublepharis* Gray, 1827

*Eublepharis fuscus* (Börner, 1981):

Description: Eyelid movable, body stout, back with small juxtaposed scales intermixed with enlarged tubercles, limbs short, tail shorter than head and body, swollen at base, eight supralabials, 42 midbody scale rows, males with 10 preanal pores, femoral pores absent.

Distribution: This species (which has been misidentified with *Eublepharus macularius* in the older literature) occurs from Gujarat and Maharashtra to northern Karnataka.

FAMILY: GEKKONIDAE

Key to genera:

- 1. Eyelids movable . . . . . *Eublepharis*
- 1'. Eyelids immovable . . . . . 2.
- 2. Digits strongly dilated . . . . . *Hemidactylus*
- 2'. Digits not dilated . . . . . *Cyrtodactylus*

GENUS: *Cyrtodactylus* Gray, 1827

*Cyrtodactylus kachhensis kachhensis* (Stoliczka, 1872):

Material examined: Kachchh District, ZSI 25011, near Khatri Talaw, 10 km from Bhuj, 28.9.1993.

Measurements: Snout to vent 35 mm, tail 40 mm.

Description: Head moderately large, depressed, covered with minute granular scales in-

termixed with large tubercles; eye large, ear opening smaller than pupil, a vertical slit. 10 upper labials and 8 lower labials. Body dorsoventrally flattened, with distinct lateral fold; dorsal scales composed of 12 rows of smaller subtriheadral tubercles intermixed with small granular scales; belly covered with large rounded imbricate scales; digits long, slender, not dilated; toes elongate; subdigital lamellae well developed. Tail slightly depressed. A male with 6 preanal pores. Colour grey; dark black spots on back arranged irregularly; cream below.

Distribution: Gujarat. Elsewhere- Pakistan.

GENUS: *Hemidactylus* Gray, 1825

Key to species:

1. Enlarged dorsal tubercles numerous, strongly keeled, arranged in regular longitudinal series . . . . . 2.
- 1'. Enlarged dorsal tubercles not numerous, feebly keeled, not regularly by arranged . . . 3.
2. Free distal phalanx of inner digit at least half as dilated portion . . . . . 4.
- 2'. Free distal phalanx of inner digit not half as long as dilated portion . . . . . *porbandarensis*
3. Dorsal tubercles large, back with dark cross bars . . . . . *triedrus*
- 3'. Dorsal tubercles large, back with dark spots . . . . . *brookii*
4. 9-11 lamellae under fourth toe; 10-17 femoral pores on each side . . . . . *leschenaultii*
- 4'. 11-14 lamellae under fourth toe; 5-7 femoral pores on each side . . . . . *flaviviridis*

*Hemidactylus triedrus* (Daudin, 1802):

Material examined: Surat District, ZSI 24583, Jamwala, 17.12.1962. Coll. B. Biswas.

Measurements: Snout to vent 55 mm; tail broken.

Description: Head rather large; snout obtusely pointed. 9 (8-10) upper and 7 lower labials; nostril between rostral and small scales. Back with small irregular scales with large triheadral tubercles arranged in 16 (16-18 regular longitudinal rows. Digits with 6 (6-7 lamellae under first and 8-9 (7-10) under fourth toe. Back with olive green and white edged crossbars. Belly white with a reddish tinge.

Distribution: Gujarat, Andhra Pradesh, Kerala, Tamil Nadu, Karnataka, Maharashtra, Rajasthan, Pakistan and Sri Lanka.

*Hemidactylus brookii* Gray, 1845:

Material examined: Banaskantha District, ZSI 25030, Palanpur, 19.9.93. Bhabnagar District, ZSI 24879, Songadh, 21.9.89, Bharuch District, ZSI 24911, Dediapara Forest Rest House, 23.3.92. Jamnagar District, ZSI 24886, Khambalia, 45 km west of Jamnagar town, 2.9.89. ZSI 24884, Sasangir, 15.9.89. ZSI unreg., Willingdon Dam area, 10.9.89. Kheda District. ZSI 24926, Radhanag Village, 28.11.92. ZSI 24928, Nagra Village, 30.11.92. ZSI 24951, Andhera Village 29.11.92, Rajkot District. ZSI 24887, Chotila, ca. 49 km east of Rajkot, 5.9.89. ZSI 24888, Gondal, ca 36 km south of Rajkot town, 7.9.89. Vadodara District, ZSI 24899, in and around Baroda town, 29.3.92. Surat District ZSI 23165, Chaodwadi, 8.12.62. Coll. B. Biswas. ZSI 24581, Gamwala, 3, 15 & 17.12.62. Coll. B. Biswas. ZSI 24582, Jasadha, 9.2.58. Coll. B. Biswas. ZSI 24898, Amroli, 4 km from Surat town, 18.73.92. ZSI 24914, Ukai Dam site, Sonogodh, 15.3.92.

Measurements: Snout to vent 22-45 mm, tail 25-53 mm.

Description: Head moderately large, snout obtusely pointed; 8-10 upper and 7-9 lower labials; 5-6 lamellae under first toe and 7-10 under fourth. Back with conical tubercles arranged in a regular series. Colour brown or grey with dark spots, whitish below. Male with 14-24 preano-femoral pores.

Distribution: Throughout the Indian region. Outside India- south-east Asia, southern China, and northern Africa.

*Hemidactylus leschenaultii* (Duméril & Bibron, 1836):

Material examined: Banaskantha District, ZSI 25036, Hibatpur Forest Nursery 18.9.1993. Surat District, ZSI 24904, Raniamba, Sonogadh, 14.3.1993. The Dang District, ZSI 24892, Mahal, 12.3.1992.

Measurements: Snout to vent 52-56 mm; tail 60-62 mm.

Description: Body stout with lateral folds, upper labials 10-12, lower labials 8-10. Body dorsally covered with fine granules intermixed with small tubercles irregularly scattered. Scales on belly small, rounded, imbricate; 9-11 lamellae under fourth toe, 6-7 under first; 10-17 femoral pores on each side in males. Grey above and white below. Back with conspicuous wavy crossbars. A dark line from eye to ear.

Distribution: Peninsular India, Rajasthan, West Bengal. Outside India- Pakistan and Sri Lanka.

*Hemidactylus flaviviridis* Rüppel, 1835:

Material examined: Ahmedabad District, ZSI 24922, Dhandhuka, 3.12.1992. Banaskantha District, ZSI 25031 & 25035, Palanpur, 18.9.1993. Dihiguda Village, Radhanpur, 22.9.1993. Bharuch District, ZSI 24912, Dediapara, Forest Rest House, 23.3.1992. Junagad District, ZSI 24890, Willingdon Dam site, 10.9.1989. Rajkot District, ZSI 24877, Kalawad, ca. 5 km W Rajkot, 6.9.1989. Sabarkantha District, ZSI 25003, Vijaynagar, ca. 78 km from Himatnagar. 12.9.1993. Surat District, ZSI 24903, Raniamba, Sonegadh, 14.3.1992, ZSI 24915, Ukaj Dam site, 15.3.1993. The Dang District, ZSI 24916, Mahal, 12.3.1992.

Measurements: Snout to vent 50-80 mm; tail 45- 80 mm.

Description. Moderately large house gecko with 12-15 upper and 10-12 lower labials, 7-10 lamellae under first and 11-14 under fourth toe. Tail swollen at base, body greyish above with five indistinct greenish-brown bands edged with white posteriorly. Belly white, scales with minute black dots.

Distribution: This species occurs from the shores of the Red Sea and around the coasts of the Arabian Peninsula and Iran, across northern India to West Bengal and south to the vicinity of Mumbai.

*Hemidactylus porbandarensis* Sharma, 1981:

Description: Body slender, slightly depressed snout obtusely pointed, longer than distance between eye and ear opening, which is one third of

diameter of eye; upper labials 9-11 and lower labials 7-8; mental large, triangular, two times adjacent labials; two pairs postmentals, inner pair two times larger than outer one; rostral broader than high. Back with small irregular scales and with 16-17 longitudinal series of more or less rounded or oval tubercles; flat, rounded imbricate scales below; 5-6 lamellae under first toe and 9-10 under fourth. Tail moderately depressed, verticillate; upper portion covered with round smooth or feebly keeled scales and a series of 6 strongly keeled pointed tubercles. Males with a series of 6 preanal pores.

Distribution: Porbandar, Junagadh District of Gujarat.

FAMILY: AGAMIDAE

Key to genera:

- 1. Femoral pores absent . . . . . 2.
- 1'. Femoral pores present . . . . . *Uromastix*
- 2. Four toes . . . . . *Sitana*
- 2'. Five toes. . . . . 3.
- 3. Body not depressed . . . . . *Calotes*
- 3'. Body depressed . . . . . *Laudakia*

GENUS: *Sitana* Cuvier, 1829

*Sitana ponticeriana* Cuvier, 1829:

Material examined: Ahmedabad District, ZSI 20221, Ahmedabad, 11.11.1928. Coll. J. J. Asana; ZSI 24946, Koleswar Village, ca. 14 km Ahmedabad Railway Station, 16.12.1992; Banaskantha District: ZSI 25025, Rasarpur Village, 20 km W Palanpur, 20.9.1993; ZSI 25029, Palanpur; 19.9.1993; ZSI 25038, Hibatpur Forest Nursery, 18.9.1993; Bharuch District: ZSI 24896, Kokam Village, Dediapara, 21.3.1922; ZSI 24906, Dediapara; 22.3.1992; ZSI 24919; Natagam Village, Dediapara, 23.3.1992; Junagad District, ZSI 24885, Sasangir, 15.9.1989; Kachchh District; ZSI 6335-8; Kachchh, July, 1872; F. Stoliczka; ZSI 25014, Dagapara Village, 29.9.1993; ZSI 25020, Nakhatrana, ca. 50 km Bhuj, 29.9.1993; Mehsana District; ZSI 24990, Khedwa Forest Nursery, 10 km Mehsana, 1.10.1993; ZSI 24991; Linch Forest Nursery; ZSI 25024, Jagudan Forest Nursery, Mehsana, 2.10.1993; Panchmahal District, ZSI 24901, Dahod, 27.3.1992; ZSI

24908, Lunwada Forest Rest House, Godhra, 25.3.1993; Rajkot District, ZSI 24873, Rajkot, 8.9.1989; Sabarkantha District, ZSI 24981, Khed-brahma, 16.9.1993; ZSI 25010, Dhaliwali, ca. 58 km from Himatnagar, 11.9.1993; Surat District, ZSI 24894, Raniamba, Sonegadh, 16.3.1992; Dangs District, ZSI 24918, Mahal, 13.3.1992.

Measurements: Snout to vent 18-55 mm; tail 25-130 mm.

Description: A small lizard, easily distinguished from other agamids by having four toes. Body compressed, dorsal scales pointing backwards and upwards, strongly keeled, no dorsal crest. Male with gular pouch; tail long. Dorsally light or dark-brown with a series of dark-brown, black-edged rhomboidal spots on back; belly whitish.

Distribution: Nearly the whole of India up to the limit of the Ganga River in the east. Outside India- Sri Lanka and Nepal.

GENUS: *Calotes* Rafinesque, 1815

Key to species:

Scales on side of body pointing backward and upward; no fold in front of shoulder . . . . .

. . . . . *versicolor*

Scales on side of body pointing backward and downward; a fold in front of shoulder . . . . .

. . . . . *rouxii*

*Calotes versicolor* (Daudin, 1802):

Material examined: Ahmedabad District, ZSI 24947, Kaleswar Village, 16.12.199. Banaskantha District, ZSI 25028, Palanpur, 19.9.1993. Junagad District, ZSI 24870, Verabal 17.9.1989; ZSI 24883, Dared Village, 1.9.1989, Kachchh District, ZSI 25039, Gudkar Navoi Forest, Bhuj, 28.9.1993, ZSI 25043; Bachaw, 16.9.1993. Kheda District, ZSI 24876, Kalwad, ca. 52 km from Rajkot town, 6.9.1989; ZSI 24925, Radhanag Village 28.11.1992. Mehsena District, ZSI 24984, Jagudan Forest Nursery, 2.10.1992. Sabarkantha District, ZSI 25009, Dhalwali, ca. 58 km from Himatnagar, 11.9.1993, ZSI 25032, Forest at Dhenda, Himatnagar, 13.9.1993. Surendra Nagar District, ZSI 24920, Latuda Forest Nursery,

7.12.1992, ZSI 24929, Dhrangodrah, 12.12.1992. Surat District, ZSI 23642, Chhodawadi, 6.12.1962. Coll. B. Biswas. The Dang District, ZSI 24893, Mahal, 12.3.1992. Valsad District, ZSI 24902, Dharampur, 9.3.1992.

Measurements: Snout to vent 24-110 mm; tail 47-250 mm.

Description: Body compressed laterally, head oval, dorsonuchal crest well developed in the male, two distinct spines on each side of head above tympanum, no gular pouch, no fold in front of shoulder. Tail long, rounded. Greyish brown above with dark transverse bars; belly whitish. Juveniles with light dorsolateral stripes which enclose transverse black spots. The species exhibits considerable colour variation.

Distribution: Widely distributed throughout the south Asian region and most of south-east Asia.

*Calotes rouxii* Duméril & Bibron, 1837:

Description: Head moderately large; forehead concave; head scales unequal; two small separated spines on the back of head; diameter of tympanum half of orbit. Dorsal scales keeled, lower rows pointing backwards and downwards; 50-60 scales round middle of body; gular sac minute, absent in female; a long oblique, curved fold in front of shoulder. Limbs moderate, slender; fourth finger a little longer than third; fourth toe distinctly longer than third. Tail slightly flattened. Colour olive-brown above; a dark band along side of head on to neck; upper part of head, neck and gular pouch red; dark lines radiating from eye; belly brown.

Distribution: Gujarat and western coastal areas from Mumbai to Kerala.

GENUS: *Laudakia* Gray, 1845

*Laudakia minor* (Hardwicke & Gray, 1827):

Description: Body slightly depressed, but head not depressed; head scale large, unequal strongly keeled two or a group of spines above tympanum. Dorsal scale keeled, imbricate and 48-58 around body. Ventrals smaller and less keeled than dorsals. An oblique fold in front of shoulder. Tail short, rounded. Colour yellow-



ish-brown with three rows of dark brown spots on back and tail base. A white streak on each side of nape.

Distribution: From the valley of the Ganga in Uttar Pradesh, to the Indus Valley in the west Kachchh District in Kathiawar, Gujarat.

GENUS: *Uromastix* Merrem, 1820

*Uromastix hardwickii* Gray, 1827:

Material examined: Surendra Nagar District, ZSI 24954, 25 km from Muli towards Sara Road, 8. 12. 1992.

Measurements: Snout to vent 125 mm, tail 115 mm.

Description: Body depressed, dorsal scales small, smooth; ventrals slightly larger, smooth; no crest, nostril large; tympanum large, deeply sunk, vertically oval; enlarged scales in each side of jar, parallel to infralabials; skin on neck very loose. Tail thick at base, depressed, cross series of spinose scales on tail. Yellowish-brown with dark spots.

Distribution: Gujarat, Uttar Pradesh, Rajasthan. Outside India- Pakistan.

FAMILY CHAMAELEONIDE

GENUS: *Chamaeleo* Laurenti, 1768

*Chamaeleo zeylanicus* Laurenti, 1768:

Description: Body compressed laterally. Skull strongly ossified; a casque on top of head. Body covered with granular scales; a prominent canthal and supraorbital crest, the latter continued backwards as a ridge of enlarged tubercles along side of head and then curving upwards to meet parietal crest; no rostral appendages. Eye large, pupil opening a small aperture, tympanum absent; tongue extensile, club-shaped at tip. Forelimbs modified for grasping and digits in two opposed sets, two directed away from and three towards body; number is reversed in arrangement of foot. Tail prehensile. Green, varying in shade from pale green to almost black. Tail often banded.

Distribution: Kachchh (Gujarat). Elsewhere-Indian Peninsula up to the drainage of the Ganga in the east. Outside India- Pakistan and Sri Lanka.

FAMILY: SCINCIDAE

Key to genera:

- 1. Palatine bones meeting on midline of palate. . . . . 2.
- 1'. Palatine bones separated at median line of palate . . . . . *Ophiomorus*
- 2. Pterygoid bones separated, palatal notch reaching towards level of centre of eye . . . . . *Mabuya*
- 2'. Pterygoid bones not separated, palatal notch not reaching level of centre of eye . . . . . 3.
- 3. Tympanum not exposed . . . . . *Ablepharus*
- 3'. Tympanum exposed . . . . . *Lygosoma*

GENUS: *Mabuya* Rafinesque, 1815

Key to species:

- Fronto-nasal broader than long . . . . . *carinata*
- Front-nasal not broader than long. . . . . *macularia*

*Mabuya carinata* (Schneider, 1801):

Material examined: Ahmedabad District, ZSI 24923, Dhanduka, 3.12.1994; ZSI 24938, Ahmedabad, 15.12.1992; ZSI 24938, Rojka Village, 5.12.1992; ZSI 24939, Chharodia Village, Dhanduka, 4. 12. 1992. Sabarkantha District, ZSI 25004, Vijaynagar, ca. 78 km from Himatnagar, 12.9.1993, ZSI 25008, Dhalwali, ca. 58 km from Himatnagar, 11.9.93. Surat District, ZSI 24897, Amroli, 4 km from Surat town, 18.3.1993.

Measurements: Snout to vent 40-95 mm; tail 35-90 mm.

Description: Head shields arranged symmetrically; a single pair of nuchals. Frontonasal broader than long. Dorsal and lateral scales subequal with 3 or 5 distinct keels; 30-34 scales round body. Digits moderately long, with smooth or obtuse keeled lamellae, from 14-18 under fourth toe. Juveniles dark bronze above with yellow lateral band from snout to base of tail. Adult, light bronze above with 4-6 rows of black dots on back. A light band from behind eye to base of tail. Belly white or yellow.

Distribution: Widely distributed in the Indian peninsula, Bengal, Assam. Outside India- Sri Lanka, Nepal and Bangladesh.

*Mabuya macularia* (Blyth, 1853):

Material examined: Ahmedabad District, ZSI 24940, Chharodia Village, Dhanduka 14.12.1992; ZSI 24949, Koleswar Village, 14 km from Ahmedabad Railway Station 16.12.1992. Banaskantha District, ZSI 25026, Rasarpur Village, 20 km from West of Palanpur, 20.9.1993; ZSI 25027, Palanpur 19.9.1993; ZSI 25037, Hibatpur Forest Nursery 18.9.1993. Bharuch District; ZSI 24895, Kokan Village, Dediapara 2.9.1992. Khambat, 1.12.1992; ZSI 24953, Andhera Village, 29.12.1992. Junagad District, ZSI 24179, Somnath, 15.2.1975. Coll. V. D. Srivastava. Kachchh District, ZSI 24988, Bachaw, 24.9.1993; ZSI 25013, Bhuj, 28.9.1993. ZSI 25018, Degapara, 29.9.1993; ZSI 25019, Nakhatrana, Bhuj 29.9.1993; ZSI 25042, Bachaw 26.9.1993. Kheda District, ZSI 24941, Khedwa Forest Nursery, 1.10.1993. 24985, Jagudan Forest Nursery 2.10.1993; ZSI 24992, Mehsana District, Linch Forest Nursery, 2.10.1993; ZSI 25006, Mehsna, 3.10.1993. Sabarkantha District, ZSI 25007, Dhalwadi, ca. 58 km from Himatnagar. 11.9.1993. Surat District; ZSI 19746, Surat, 19. 11. 1917. Coll. T. B. Fletcher. Surendra Nagar District; ZSI 24934, Ramul Forest Nursery, 7. 12. 1992; ZSI 24932, Khareswar Village, 10. 12. 1992; Dang District; ZSI 24917, Mahal, 12. 2. 1993.

Measurements: Snout to vent 28-60 mm; tail 32-90 mm.

Description: Head small; snout short, not depressed; eye small; frontonasal not broader than long; ear opening oval, slightly smaller than eye. 6 or 7 upper and 7 lower labials. 28-30 scales round middle of body. Dorsal scales 5-7 low keels; lateral scales smooth; 12-17 lamellae under fourth toe. Tail round. Colouration variable. Brown, with or without spots. Flanks dark brown with white spots.

Distribution: Widely distributed throughout India. Outside India- Thailand, Malaysia, Vietnam, Myanmar, Pakistan, Sri Lanka and eastern China.

GENUS: *Ablepharus* Fitzinger, 1823

*Ablepharus grayanus* Stoliczka, 1872:

Material examined: Kachchh District, ZSI 25015, near Khatri Talaw, 10 km from Bhuj town, 28. 9. 1993.

Measurements: Snout to vent 30 mm; tail- 30 mm.

Description: Size small; snout short, supranasals absent, lower eyelid with large transparent disc; upper composed of three scales; ear-opening absent; 20 scales round middle of body, dorsal scales largest. Limbs short, pentadactyle. Tail with enlarged plates. Body olive-green above with shining metallic lustre. A light stripe from supraciliary edge to tail base. Tail pinkish.

Distribution: Gujarat, Rajasthan. Outside India- Pakistan.

GENUS: *Lygosoma* Hardwicke & Gray, 1827

Key to species:

1. Lower eyelid scaly . . . . . *albopunctata*
- 1'. Lower eyelid not scaly, with an undivided transparent disc . . . . . 2.
2. Five fingers, five toes . . . . . *punctata*
- 2'. Four fingers, four toes . . . . . *lineata*

*Lygosoma albopunctata* Gray, 1846:

Material examined: Kheda District, ZSI 24942, Khambat, 2.12.1992; ZSI 24952, Andhera Village, 29.11.1992; ZSI 20390, Gujarat. Coll. J. J. Asana.

Measurements: Snout to vent 35-45 mm; tail 40-50 mm.

Description: Limbs reduced; body elongated, snake-like. Lower eyelid scaly; nuchal indistinct. Ear opening distinct with 1-2 minute lobules on anterior margin. Tympanum deeply sunk. Body scales subequal or dorsal scales a little larger than laterals, 12-15 lamellae under fourth toe. Tail thick at base. Brownish-red above, each scale with a distinct dark spot, forming longitudinal series. Yellowish-white below.

Distribution: This species is being recorded from Gujarat for the first time. Widely distributed in India, from Kerala, Andhra Pradesh, Madhya Pradesh, Uttar Pradesh, Bihar, Orissa, Bengal and Assam. Outside India- Nepal.

*Lygosoma punctata* (Gmelin, 1799):

Material examined: Ahmedabad District, ZSI 24924, Dhanduka, 3.12.1992. Kheda District, ZSI 24927, Radhanag Village, 28.11.1992. Surat District; ZSI 19863, Surat, 2.8.1917. Coll. T. B. Fletcher.

Description: Elongated, snake-like body with five fingers and five toes. Lower eyelid with undivided transparent disc. Body scales smooth, 24-26 scales round middle of body and 62-76 scales down middle of back. Limbs reduced, fourth toe quite longer than third, 11-14 lamellae under fourth toe. Tail thick at base. Colour, brown above, each scale with a dark spot forming a longitudinal series; belly yellowish-white.

Distribution: The whole of India, except the north-east. Outside India- Sri Lanka and Indo-China.

*Lygosoma lineata* Gray, 1839:

Material examined: Valsad District, ZSI 25047, near Naomibohai Village, 9 km from Dharampur, 10.3.1992.

Measurements: Snout to vent 60 mm; tail 65 mm.

Description: Size smaller but with a relatively more elongated body. Lower eyelid with an undivided transparent disc. 22 scales round middle of body; 106 scales down middle of back. Limbs short, with four fingers and four toes, third and fourth toes subequal; 8 lamellae under fourth toe. Golden brown above with black dots forming prominent longitudinal lines.

Distribution: It is recorded for the first time from Gujarat. Elsewhere- Maharashtra and Karnataka.

GENUS. *Ophiomorus* Duméril & Bibron, 1839.

*Ophiomorus tridactylus* (Blyth, 1855):

Description: Snout pointed, with angular labial edge; frontonasal large; prefrontals separated; frontonasal broader than long; frontal large, 3-4 supraoculars; parietals narrow, not touching interparietal, lower eyelid with large transparent disc; 6 supralabials, fifth largest; no ear-opening. Body elongated; 22 smooth scales round middle of body. Pale brown or uniform cream dorsally; longitudinal series of brown dots on back sometimes present; a dorsolateral brown stripe on each side from nostril through eye.

Distribution: Katchchh in Gujarat, Rajasthan. Outside India- Pakistan, Afghanistan and Iran.

FAMILY: LACERTIDAE

Key to genera:

- Nostril touching first labial . . . . . *Acanthodactylus*
- Nostril not touching first labial . . . . . *Ophisops*

GENUS: *Acanthodactylus* Wiegmann, 1834

*Acanthodactylus cantoris* Günther, 1864:

Description: Snout acuminate, nasal shields swollen, in contact with one another; nostril between two nasals and first labial; fronto-nasal single; prefrontals in contact with one another; frontal long, narrow, with a median groove; 4 supraoculars; interparietal small; no occipital shield; subocular not bordering mouth, separated from it by fifth and sixth supralabials; temporal scales keeled; ear opening with a well marked denticulation upon anterior border, lower eyelid scaly; collar distinct; median dorsal scales large,

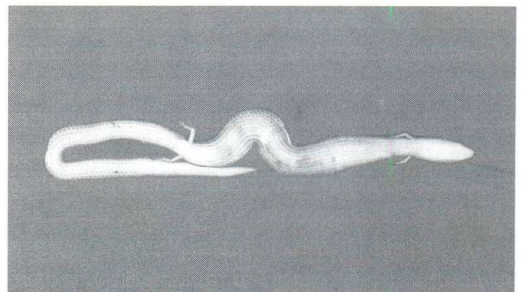
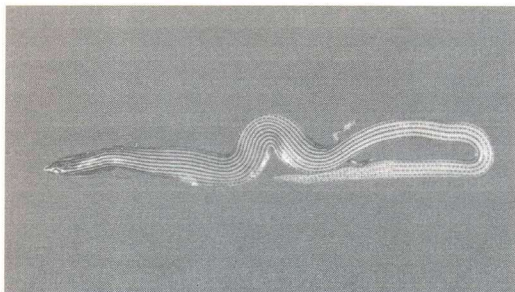


FIGURE 2: *Lygosoma lineata* (ZSI 25047) in dorsal (left) and ventral (right) views.

strongly keeled, imbricate; 26-36 dorsal scales across middle of body; ventral scales in regular longitudinal and transverse series; two large preanal plates, one in front of other. Fourth toe with well-developed lateral denticulation. Subcaudals large. Juveniles with black and white streaks; five white streaks on nape, 4 or 5 on middle of back and 3 at base of tail; a light lateral denticulated streak between ear and terminating at groin; head with black symmetrical markings. Limbs with large round light spots. Lower parts white.

Distribution: Gujarat, Uttar Pradesh, Rajasthan, Haryana and Punjab. Outside India: Pakistan, Iraq, Afghanistan, Iran and Saudi Arabia.

GENUS: *Ophisops* Ménétries, 1832

Key to species:

Upper head-shield smooth . . . . . *microlepis*

Upper head-shield not smooth . . . . . *jerdoni*

*Ophisops microlepis* Blanford, 1870:

Material examined: Ahmedabad District, ZSI 24948, Koleswar Village, 14 km from Ahmedabad Railway Station 16.12.1992. Jungagad District, ZSI 24881, Dared Village, 1.9.1989; Kachchh District, ZSI 5182-83 & 5186, Kachchh, Coll. F. Stoliczka; ZSI 25017 & 25021, Dagapan Village and Nikhatrana, Bhuj on 29.9.1992, ZSI 25012, near Khatri Talaw, Bhuj 28.9.1993; Rajkot District, ZSI 24874, 8.9.1989. Sabarkantha District, ZSI 24982, Khedbrahma 16.9.1993. Surendra Nagar District, ZSI 24921, Latuda Forest Nursery and ZSI 24936, Ramul Forest Nursery on 7.12.1992, ZSI 24944, Nayaka Dam site, 7.12.1992.

Description: Snout elongate, pointed, upper head shield smooth; nostril between upper and lower nasal; one frontonasal; interparietal long and narrow; temporal scale keeled; tympanic shield large, smooth; dorsal scales rhomboidal, almost equal except outermost rows, in oblique longitudinal series converging towards vertebral line; much smaller than subcaudals; 56 scales round middle of body; ventrals in 6 longitudinal rows; 14 femoral pores on each side, colour olive-green or brown above a light dorso-lateral

stripe starts from supraciliary edge and ends at base of tail, bordered above with black spots, a second stripe less distinct, passes along upper lip to base of hindlimb; belly greenish-white.

Distribution: Gujarat Madhya Pradesh, Rajasthan and Bihar.

*Ophisops jerdoni* Blyth, 1853:

Material examined: Ahmedabad District, ZSI 19823, Ahmedabad, 5.5.1920, Coll. J. Asana; Bhabnagar District, ZSI 24880, Songadh, 30 km from Bhabnagar town, 21.9.1989. Jamnagar District; ZSI 24180-81, Dwarka, 18 & 19.2.1975. Coll. V. D. Srivastava, ZSI 23641, Okha, 16.12.1973, Coll. S. K. Gupta, Kachchh District, ZSI 5184, Kachchh, 1871. Coll. (?); Surat District, ZSI 24580, Jamwali, ZSI unreg., 17.12.1962. Coll. B. Biswas. Surendra Nagar District, ZSI 24930, Dhrangodrah, 12.12.1992.

Measurements: Snout to vent 18-55 mm; tail 45-130 mm.

Description: Upper head shield strongly keeled, nostril in a large anterior nasal, ear-opening oval a little smaller than eye; gular fold weakly developed, bordered by scales of irregular size; occipital well developed, in contact with interparietal; dorsal scales keeled, imbricate, 28-35 round middle of body; preanal plate large; 7-12 femoral pores on each side. Colour dark olive above and whitish below. Two lemon coloured stripes on flanks which enclose dark transverse bars on middle of back.

Distribution: Gujarat as mentioned in the material. Elsewhere- Rajasthan, Maharashtra, Madhya Pradesh, Andhra Pradesh and Tamil Nadu.

FAMILY: VARANIDAE

GENUS: *Varanus* Merrem, 1820

*Varanus bengalensis* (Daudin, 1802):

Description: Head long and narrow, covered with small scales, snout pointed and convex at end. Nostril with oblique slit nearer to eye than to tip of snout; scales on crown larger than nuchals; abdominal scales smooth; body scales granular; teeth acute and sharp; tongue long, forked. Limbs strong; digits elongate. Tail long, compressed. Juveniles dark olive above with numer-

ous light spots or ocelli alternating with dark bars and whitish on undersides with dark transverse bars sometimes broken up into spots. Adult brownish or olive with blackish dots on back; lower parts yellow mottled with black.

Distribution: The whole of India. Outside India- Myanmar, Nepal, Pakistan, Iran and southern Uzbekistan.

SUBORDER: SERPENTES

FAMILY: TYPHLOPIDAE

Key to genera:

Nasal suture terminating at edge of preocular . . . . . *Ramphotyphlops*

Nasal suture not terminating at edge of preocular . . . . . *Typhlops*

GENUS: *Ramphotyphlops* Fitzinger, 1943

*Ramphotyphlops braminus* (Daudin, 1803):

Material examined: Ahmedabad District, ZSI 18712, Ahmedabad, 16.5.1912. Coll. I. Bainbrige Heycher; ZSI 19204 & 19206, Ahmedabad, 16.6.1920. Coll. J. Asana. Bharuch District, ZSI 24905, Dediapara, 22.3.1992. Junagad District, ZSI 24955, Junagad, 14.2.1975. Coll. V. D. Srivastava. Surendra Nagar District, ZSI 24945, Nayaka Dam site, 7.12.1992.

Measurements: Total length 100-138 mm.

Description: Head bluntly rounded. Eyes indistinct, rostral large, snout rounded; 4 upper labials, last two in contact with ocular. Nasal suture terminating at edge of preocular. Body uniformly cylindrical. Tail very short ending in a small, sharp, stiff point. Scales lightly polished, 20 scales round body. Colour brown or blackish-brown above, lighter below; snout anal region and tip of tail pale.

Distribution: Throughout the Oriental region, Africa, México and New Guinea.

GENUS: *Typhlops* Duméril & Bibron, 1844

Key to species:

Snout rounded . . . . . *porreectus*

Snout pointed . . . . . *acutus*

*Typhlops porreectus* Stoliczka, 1871:

Description: Snout rounded, strongly projecting; nostril in lateral position; nasal partially divided; ocular and preocular shorter than posterior nasal; eyes indistinct; lower edge of ocular wedged in between third and fourth labials; prefrontal in contact with rostral; tail ending in a five point. 18 scales round body. Colour dorsally blackish-brown, ventral parts paler; anal region cream.

Distribution: Gujarat (Porbandar); Punjab, Uttar Pradesh, Maharashtra, Karnataka, Kerala, Orissa, Bihar, West Bengal. Outside India- Pakistan, Sri Lanka and Myanmar.

*Typhlops acutus* Duméril & Bibron, 1844:

Material examined: Ahmedabad District, ZSI 19205, Ahmedabad, 16.6.1920. Coll. J. J. Asana.

Description: Snout pointed and hooked, projecting with sharp horizontal edge; nostril inferior; rostral large, covering most of head above. About 30 scales round body. Colour brown above, paler below; each scale paler at centre.

Distribution: Peninsular India, rarer south of latitude 16° N.

FAMILY: BOIDAE

Key to genera:

A supraorbital bone; teeth on premaxilla; head covered with large shields; labials pitted . . . . . *Python*.

No supraorbital bone; no teeth on premaxilla; head covered with small shields; labials not pitted. . . . . *Eryx*

GENUS: *Python* Daudin, 1803

*Python molurus* (Linnaeus, 1758):

Description: Head flattened with a long snout, neck distinct; head covered with large shields; labials pitted. Nostril large, directed upwards and situated high on snout. Rostral and first two labials with sensory pits. Eyes small, pupil vertical, iris flecked with gold; chin with mental groove. Tail short and prehensile, tapering abruptly. Colour greyish, or yellowish-cream in adults, and in juveniles often a pretty shade of pink. A dark streak from eye to nostril in juveniles; marking sometimes persists in adults. A

conspicuous dark, oblique band from eye to neck. On back of head and nape, a large lance-shaped mark with a pale centre, often fading anteriorly in adults. Body with a series of large, roughly quadrate patches from neck to tail dorsally.

Distribution: Gujarat (no specific records, but likely to occur in the state). Elsewhere- Peninsular India from Sind to Pakistan to Bengal; Sri Lanka.

GENUS: *Eryx* Daudin, 1803.

Key to species:

- Mental groove present; tail blunt . . . . .  
 . . . . . *johnii johnii*
- Mental groove absent; tail pointed . . . . .  
 . . . . . *conicus*

*Eryx conicus* (Schneider, 1801):

Description: Head slightly distinct from neck. Rostral about two times broader than high; mental groove absent. Nostril slit-like, between two nasals and internasals. Head covered with small obtusely keeled scales, 8-10 scales across forehead between eyes; 10-15 scales round eye. Upper labials 11-13; lower labials 14-17. Body robust; dorsal scales keeled, 40-55 rows. Tail very short and bluntly pointed. Colour yellowish, brownish or greyish above, with a dorsal series of large dark brown, black-edged spots, usually confluent with one another to form a zig-zag stripe; lower parts yellowing or whitish; outer scale-rows with small brown spots.

Distribution: Likely to occur in Gujarat, from where there are at present no confirmed records. The species is distributed from the foothills of the Himalayas to the extreme south of India and from Pakistan in the west to Bengal in the east. Also, Sri Lanka.

*Eryx johnii johnii* (Russell, 1801):

Material examined: A specimen was observed by the author near the Forest Rest House at Dediapara, Bharuch District on 22.3.1992.

Measurements: Standard length one metre.

Description: Head not distinct from neck; snout broad, wedge-shaped, rostral shield wide and heavy; nostril slit-like, between enlarged

nasals; upper labials 9-12, lower labials 13-18; mental groove present; no chin shield; eye small, completely surrounded by 9-12 small scales; pupil vertically elliptical. Body robust, cylindrical, slightly tapering; scale small, smooth. Tail short, blunt, rounded at tip and in general form similar to head. Colour sandy grey or yellowish above, scales edged with dark brown or entirely brown above; uniform or with more or less distinct dark transverse bands; lower parts whitish, spotted with dark brown or almost entirely brown.

Distribution: Gujarat. Elsewhere: Rajasthan, Punjab, Uttar Pradesh and Andhra Pradesh. Outside India- Pakistan.

FAMILY: COLUBRIDAE

Key to subfamilies:

- Nostril not valvular . . . . . Colubrinae
- Nostril valvular . . . . . Homalopsinae

SUBFAMILY: COLUBRINAE

Key to subfamily:

- 1. All the teeth solid, not grooved . . . . . 2.
- 1'. All teeth are not solid, last 2 or 3 maxillary teeth grooved . . . . . 10.
- 2. Hypapophyses present throughout vertebral column . . . . . 3.
- 2'. Hypapophyses absent on posterior dorsal vertebrae . . . . . 5.
- 3. Maxillary teeth equal . . . . . *Xenochrophis*
- 3'. Maxillary teeth not equal . . . . . 4.
- 4. Scales in 25-27 rows . . . . . *Macropisthodon*
- 4'. Scales in 15-19 rows . . . . . *Amphiesma*
- 5. Posterior maxillary teeth longest . . . . . 6.
- 5'. Posterior maxillary teeth not longest . . . . . 8.
- 6. Head elongate, distinct from neck . . . . . 7.
- 6'. Head short, not distinct from neck . . . . .  
 . . . . . *Oligodon*
- 7. Maxillary teeth 13-18. . . . . *Argyrogena*
- 7'. Maxillary teeth 20-28 . . . . . *Ptyas*
- 8. All maxillary teeth subequal . . . . . 9.
- 8'. Some maxillary teeth elongated and fang-like . . . . . *Lycodon*
- 9. Scales in 19-27 rows . . . . . *Elaphe*
- 9'. Scales in 13-15 rows . . . . . *Dendrelaphis*
- 10. Pupil round . . . . . *Psammophis*
- 10'. Pupil vertical. . . . . *Boiga*

GENUS: *Elaphe* Fitzinger, 1833

*Elaphe helena* (Daudin, 1803):

Description: Body elongate, cylindrical; head distinct; neck more or less elongate. Teeth solid; anterior maxillary teeth largest; snout twice of eye length; prefrontals twice internasals; loreal slightly longer than high; upper labials 9 or 10; 5th or 6th touching eye; 5th or 7th in contact with temporals. Eye large, pupil round. Scales in 19-27 rows and distinctly keeled on posterior of body and tail, ventrals 217-265 angulate laterally, subcaudals 73-100. Anal single. Colour light or dark-brown above with dark-brown or black cross bars containing white ocelli, prominent anteriorly and laterally. Hind part of body brown above with broad stripe on each side; a black vertical streak below eye and behind it an oblique one; lower parts yellow.

Distribution: Likely to occur in Gujarat. Known from peninsular India, Rajasthan, Punjab, Uttar Pradesh, Bengal, Assam. Outside India- Pakistan and Sri Lanka.

GENUS: *Ptyas* Fitzinger, 1843

*Ptyas mucosus* (Linnaeus, 1758):

Material examined: Junagad District, ZSI 24869, Verabal, 17.9.1989.

Measurements: Snout to vent 44 mm; tail 170 mm.

Description: Maxillary teeth 20-28. Head long, distinctly wider than neck, snout bluntly pointed; rostral higher than long; nostril between nasals and first upper labials; 3 loreals, 2 preoculars, 2 postoculars, 8 upper labials, 4th and 5th touching eye; 9 lower labials. Eyes large. Scales 17 rows on middle of body. Body robust, compressed, tapering towards both ends. Tail cylindrical, about one-fourth of total length. Colour olivaceous-brown or dark olive-brown. Scales on posterior irregularly margined with black, forming a reticulate pattern sometimes cross-banded. Lips and ventral scales margined with black. Belly greyish-cream.

Distribution: Throughout the south Asian region. Outside the region- from Afghanistan and Turkestan to southern China and Indo-China.

GENUS: *Argyrogena* Werner, 1924

*Argyrogena fasciolatus* (Shaw, 1802):

Description: Head distinct from neck. Maxillary teeth 12-14; snout strongly projecting; rostral larger than high; nostril between two nasals; loreal squarish; one large perocular, usually touching frontal; 2 postoculars; posterior genials longer and narrower than anterior; temporals 2 + 3 or 3 + 3; 8 supralabials, 4th and 5th touching eye, 5th highest and touching lower anterior temporal. Scales smooth, 21 or 23 round midbody; ventral 197-225, subcaudals 77-92, anals 2. Body colour light or dark brown in juveniles, ornamented with narrow cross-bars on anterior half of body; posterior part with indistinct dark cross-bars or spots which gradually fade towards tail; head above with light and dark olive, two white spots, one on each side or interparietal suture, lower parts whitish or yellowish.

Distribution: Gujarat and throughout India, except in the north-west. Outside India- The Sri Lankan record needs verification.

GENUS: *Oligodon* Boie, 1817

Key to species:

- Hemipenis forked; maxillary teeth 6-7 . . . . . *taeniolatus*
- Hemipenis not forked; maxillary teeth 8-11 . . . . . *arnensis*

*Oligodon taeniolatus* (Jerdon, 1853):

Description: Hemipenis forked, Maxillary teeth 6 or 7 in numbers. Head short not distinct from neck, snout blunt; rostral large; higher than wide and extending posteriorly, almost separating internasals; nostril between nasals; loreal present; one preocular; two postoculars, sometimes three; 7 supralabials, 3rd and 4th touching eye; 7 or 8 lower, labials. Body slender or almost uniform diameter from neck to vent. Dorsal scales in 15 rows at midbody. Colour pattern variable according to locality. Light brown to buff above with narrow black transverse cross-bars or large black spots. There are two black streaks on nape. Ventral whitish, sometimes with lateral spots.

Distribution: Peninsular India, including Gujarat. The range extends from Bihar to south-

ern Pakistan. Outside India- Sri Lanka and Pakistan.

*Oligodon arnensis* (Shaw, 1802):

Description: Hemipenis not forked; maxillary teeth 8-11 in numbers. Snout short and blunt; nostril in an elongated nasal; rostral large, partly separating internasals; 7 supralabials, 3rd and 4th touching eye, loreal frequently united with prefrontal; 1 preoculars and 2 postoculars; scales in 17 rows. Head depressed. Body cylindrical, short and smooth. Tail short. Colour reddish or greyish-brown with a series black bands; lower parts whitish, sometimes with faint spots.

Distribution: May occur in Gujarat. Elsewhere- throughout India. Outside India- Pakistan, Nepal, Bangladesh and Sri Lanka.

GENUS: *Dendrelaphis* Boulenger, 1890

*Dendrelaphis tristis* (Daudin, 1803):

Description: Maxillary teeth 17-22, posterior smallest. Head distinct from neck; snout broadly rounded; nostril between two nasals, rostral broader than high; frontal bell-shaped, internasals shorter than prefrontals; loreal elongated twice as long as high; 1 preocular, 2 postoculars, temporal 2 + 2, 9 supralabials, 5th and 6th touching eye. Scales in 15:15:11 rows. Ventrals 163-197, subcaudals 108-145, anals 2. Colour bronze brown or purplish-brown above light greyish, greenish or yellowish below; a buff flank stripe along outer two scale rows, edged with black upper lip and eye margined with yellow.

Distribution: Likely to occur in Gujarat. Elsewhere- throughout India. Outside India- Pakistan and Sri Lanka.

GENUS: *Lycodon* Boie, 1826

Key to species:

Ventrals angulate laterally; 9 supralabials . . .  
 . . . . . *aulicus*  
 Ventrals not angulate laterally; 8 supralabials .  
 . . . . . *striatus*

*Lycodon aulicus* (Linnaeus, 1758):

Description: Snout more or less spatulate and projecting beyond lower jaw, rostral much

broader than high, anterior and posterior nasals subequal; internasals much shorter than prefrontals; loreal in contact with internasal, not touching eye; 1 preocular; 9 supralabials; 3rd, 4th and 5th touching eye; 17 scales at mid body; ventrals 172-214 strongly angulate laterally; subcaudal 57-80; anal 2. Colour brown or greyish-brown above, with 12-19 white crossbars which expand laterally or bifurcate, enclosing triangular patches; a triangular whitish blotch on each side of occiput. Upper lip immaculate white or spotted with brown.

Distribution: Likely to occur in Gujarat. Elsewhere- the whole of southern Asia, including Maldives, Sri Lanka and Nepal, besides Myanmar, Indo-China, south China, the Malay Peninsula, Indonesia and the Philippines.

*Lycodon striatus* (Shaw, 1802):

Description: Snout projecting beyond lower jaw, rostral much broader than high; anterior nasal usually larger than posterior; internasals much shorter than prefrontals; loreal in contact with internasal, not touching eye; 1 preocular, 8 supralabials, 3rd, 4th and 5th touching eye; 1 scales round midbody, ventrals 165-195 not angulate laterally; caudal 45-58; anal 2. Colour dark brown or black above with 11-18 white or yellowish crossbars on body which divide on sides to enclose triangular spots of body; belly and upper lip white.

Distribution: Likely to occur in Gujarat. Elsewhere- throughout India, westwards up to Iran and Bihar in the the east; Sri Lanka.

GENUS: *Macropisthodon* Boulenger, 1893

*Macropisthodon plumbicolor* (Cantor, 1839):

Material examined: ZSI 19203 (head only) Ahmedabad, Coll. J. J. Asana.

Description: Head rather broad and short; nostril between two nasals; internasals as long as or nearly as long as prefrontals; loreal united with lower preocular, 2 preocular and 3 or 4 postoculars; 7 supralabials, 3rd and 4th touching eye. 25 scales around body and strongly keeled. Eye moderately large, iris greenish gold. Tail short. Bright green above, white below, with an



indistinct pattern of crossbars on back, belly greyish-white.

Distribution: Throughout India, except the valley of the Ganga and the extreme north. Outside India- Sri Lanka.

GENUS: *Amphiesma* Duméril, Bibron & Duméril, 1854

*Amphiesma stolatum* (Linnaeus, 1758):

Description: Internasal broadly truncate anteriorly; nostril slightly directed upwards; nasals not touching 2nd upper labials; rostral slightly directed upwards; nasals not touching 2nd upper labials; rostral touching 6 shields; a single anterior temporal; 8 supralabials, 3rd, 4th and 5th touching eye; scales 15-19 rows, strongly keeled, except in outer rows which are smooth. Colour olivaceous-brown. A pair of conspicuous buff stripes covering one whole or two half rows of scales from neck to tip of tail; head olivaceous-brown, whitish yellowish or orange on tips; belly white, with some small scattered black spots.

Distribution: The whole of India. It may occur in the Andaman Islands and Gujarat. Elsewhere- Bangladesh, Sri Lanka, Pakistan, south China and Indo-China.

GENUS: *Xenochrophis* Günther, 1864

*Xenochrophis piscator* (Schneider, 1799):

Material examined: Junagad District, ZSI 24871, Manderada, 18.9.1989. Kachchh District, ZSI 19207, Kandala, July 1919. Coll. R. B. S. Sewell.

Measurements: Snout to vent 250 mm, tail 95 mm.

Description: Head slightly flattened, distinct from neck; snout bluntly pointed; rostral wider than high; internasals distinctly narrowed anteriorly; nostril between nasals; single large loreal; eye moderate with round pupil; 9 supralabials, 4th and 5th touching eye 6th excluded by lowest postocular. Body stout; scales in 19 rows, more or less distinctly keeled, except in outer one or two rows, which are smooth. Colour yellowish or olivaceous above, with black spots quincuncially arranged; head olive-brown above with two oblique black streaks, one below, other

behind eye. Dorsal spots arranged in five series, together forming a chess board pattern. Belly cream.

Distribution: Throughout the south Asian region, from Balochistan to northern Myanmar.

GENUS: *Boiga* Fitzinger, 1826

*Boiga trigonata* (Schneider, 1802):

Description: Head triangular, much distinct from neck, rather flat; rostral strongly concave below, slightly wider than high; nostril large, between nasals; loreal present; eye large, with vertically elliptical pupil; 1 preocular and 2 postoculars, 8 supralabials, 3rd, 4th and 5th touching eye; scales in 21:21:15 rows. Ground colour yellowish-brown, sandy or fawn, uniform or mottled with darker shades. Dorsally a series of dark Y-shaped marks which meet at centre and resemble arrowheads. Markings fade before or at vent. Head with a pair of lung-shaped brown patches often bordered with black. A narrow dark streak from behind eye to gape. Belly cream.

Distribution: May occur in Gujarat. Elsewhere- the whole of peninsular India up to Assam in the east. Outside India- Pakistan and Sri Lanka.

GENUS: *Psammophis* Fitzinger, 1826

Key to species:

Anal divided . . . . . *condanarus*  
 Anal not divided . . . . . *leithi*

*Psammophis condanarus* (Merrem, 1820):

Description: Upper head sheild not protuberant; nasal incomplected, divided a suture only from nostril to labial; preocular not in contact with frontal; 2 postoculars; 1 anterior and 2 or 3 posterior temporals, 8 or 9 supralabials, 4th and 5th touching eye; 11 lower labials; scales 17:17:13 rows; head oval; pupil round; tail long; anal divided. Dorsum pale olive to brassy, streaked alternately with distinct nut-brown and greenish olive or buff stripes; belly sulphur or primrose yellow.

Distribution: Gujarat (Kachchh). Elsewhere: Maharashtra, Madhya Pradesh, Uttar Pradesh,

Punjab, Bihar, Bengal, Orissa, Andhra Pradesh. Outside India- Pakistan.

*Psammophis leithii* Günther, 1869:

Description. Maxillary teeth 11-12. Rostral broader than high; internasals half to two-third of prefrontals; frontal long and narrow and in contact with preocular; loreal region concave, loreal twice as long as high; temporals 1 + 2; 8 supralabials 4th and 5th touching eye; 5 lower labials with anterior genials; scales 17:17:13 rows. Colour yellowish-brown above with four dark-brown longitudinal stripes; a dark longitudinal stripe on top of head. Anal not divided.

Distribution: Gujarat (Kachchh). Elsewhere- Jammu and Kashmir, Punjab, Rajasthan, Maharashtra and Uttar Pradesh. Outside India- Pakistan.

#### SUBFAMILY: HOMAOPSINAE

Key to genera:

Nasal shields in contact with one another . . . . .  
 . . . . . *Cerberus*  
 Nasal shields not in contact with one another . . . . .  
 . . . . . *Gerardia*

GENUS: *Cerberus* Cuvier, 1829

*Cerberus rynchops* (Schneider, 1799):

Description: Snout broadly rounded; nostril connected by suture first labial; internasal divided by a longitudinal suture; frontal roken into small scales, anterior half distinct; loreal large; 1 preocular, 1 postocular and 2 suboculars. 9-10 supralabials 5th and 6th below eye, 2 or 3 horizontally divided. Scales striated and strongly keeled in 23-25 rows. Head pear-shaped. Eye small, pupil vertical. Tail short rather compressed at base, rapidly tapering to a point. Back grey with numerous black cross bars, which are obscure in fore part but prominent on hind side. Belly pale yellowish with conspicuous black blotches on crossbars.

Distribution: An estuarine species found in Gujarat. Elsewhere- coasts of India and tidal rivers from Sind to Chittagong (Bangladesh) and eastward to northern Australia.

GENUS: *Gerardia* Gray, 1849

*Gerardia prevostiana* Eydoux & Gervais, 1837:

Description: Nasal separated by internasal; frontal much broader than supraocular; 1 preocular and 2 postoculars; loreal not in contact with internasal. 7 supralabials, 4th touching eye. Dorsal scale subequal. Tail short. Colour dark grey above and cream below.

Distribution: Gujarat. Elsewhere- coasts and tidal rivers of India. Outside India- Sri Lanka, Myanmar, west coast of the Malay Peninsula.

#### FAMILY: ELAPIDAE

Key to genera:

Maxillary bone extending forward beyond palatine . . . . . *Naja*  
 Maxillary bone not extending forward beyond palatine . . . . . *Bungarus*

GENUS: *Bungarus* Daudin, 1803

*Bungarus caeruleus* (Schneider, 1801):

Description: Head flat distinct from neck; snout blunt; rostral slightly wider than high; nostril between nasals; eye small, pupil round; loreal absent; 1 preocular and 2 postoculars; 1 anterior and 2 posterior temporals; 7 supralabials, 3rd and 4th touching eye; 8 lower labials. Body cylindrical; scales in 15 rows on midbody; vertebral scales enlarged and hexagonal. Tail ending in a point. Colour lustrous black or bluish-black above with paired narrow white crossbars, arranged more or less distinctly in pairs, sometimes breaking up into spots in anterior part of body.

Distribution: Likely to occur in Gujarat. Elsewhere- throughout India up to Bengal in the east and Andhra Pradesh in the south. Outside India- Pakistan, Sri Lanka, Nepal and Bangladesh.

GENUS: *Naja* Laurenti, 1768

*Naja naja* (Linnaeus, 1758):

Material examined: ZSI 23046, Bata, Gujarat, Coll. Unknown. 6.8.1965.

Measurements: Snout to vent, 1200 mm; tail 175 mm.

Description: Maxillary bone extending forward beyond palatine. Head depressed with

short rounded snout; nostril large; pupil round; 1 preocular and 3 postoculars; 7 supralabials; 3rd largest, touching both nasal and eye; 8 lower labials; small triangular shield (cuncate) between 4th and 5th lower labial at oral margin; scales rows across widest part of hood usually 25 and 13-15 rows anterior to vent. Extremely variable in colouration and markings. The subspecies once recognised on the basis of hood pattern have now been elevated to species status. One of them has a spectacle-like marking on the hood (*Naja naja*). It is yellowish or brownish to black above and whitish-yellow below.

Distribution: Throughout the south Asian region. Outside India- Bangladesh, Nepal, Sri Lanka and Pakistan.

FAMILY: HYDROPHIIDAE

Key to genera:

- 1. Ventrals distinct throughout and normally entire . . . . . 2.
- 1'. Ventrals not so distinct throughout and not entire but divided by a median longitudinal furrow. . . . . 3.
- 2. Mental shield elongate; 3-5 maxillary teeth . . . . . *Enhydrina*
- 2'. Mental shield normal; 1-18 maxillary teeth . . . . . *Hydrophis*
- 3. Head very small, body long and slender anteriorly. . . . . *Microcephalophis*
- 3'. Head not small, body not long and slender anteriorly . . . . . 4.
- 4. Ventrals well developed . . . . . *Lapemis*
- 4'. Ventrals not developed, divided by a median longitudinal furrow. . . . . *Pelamis*

GENUS: *Enhydrina* Gray 1849

*Enhydrina schistosa* (Daudin, 1803):

Description: Head moderate size, slightly distinct from neck; rostral wider than high, with prominent, median downward prolongation giving a beak-like profile; mental elongate; 1 preocular and 1 or 2 postoculars; 4 well differentiated anterior upper labials, last two usually in contact with eye, followed by 3-5 small, wedge-shaped shields; 9 labials. All head shields densely studded with fine tubercles. Body moderately stout, laterally compressed. Iris dull

green. Colouration variable; juveniles bluish or bluish-grey with well marked black rings often broadened vertebrally. Bands disappear entirely or partially with age.

Distribution: Likely to occur in Gujarat. Elsewhere- abundant on both coasts of the Indian peninsula. It also occurs in coastal waters from the Persian Gulf to New Guinea.

GENUS: *Microcephalophis* Lesson, 1834

*Microcephalophis cantoris* (Günther, 1864):

Description: Head very small, elongate; body long and very slender anteriorly, posterior parts very much compressed, its greatest diameter 3-5 times from neck. Snout projecting beyond lower jaw; eye moderate. Rostral large; frontal small; 6 supralabials, 2nd and 3rd in contact with prefrontal 3rd and 4th touching eye. 23-25 scale-rows on neck, 41-48 on thickest part of body; ventral 404-468, entire in slender part divided in thicker part of body. Hemipenis forked near tip and spinose throughout. Dark olive or greyish anteriorly with yellow crossbars. Head black in juveniles, greyish or yellowish-green in adults.

Distribution: West coast of India (Gujarat coast) and on the east coast from Orissa, West Bengal and Bangladesh.

GENUS: *Hydrophis* Latreille, 1802

Key to species:

- 8-13 maxillary teeth . . . . . *lapemoides*
- 14-18 maxillary teeth . . . . . *caerulescens*

*Hydrophis lapemoides* (Gray, 1849):

Description: Maxillary teeth 8-11. Head and eye moderate. Body robust. Nostrils superior; nasals in contact with one another; 1 preocular and 2 or 3 postoculars; 8 supralabials, 2nd in contact with prefrontal, 3rd and 4th or 3rd-5th touching eye; 4 infralabials in contact with genials; 29-35 scale-rows on neck and 43-51 on thickest part of body; ventrals distinct throughout. Yellowish or whitish in juveniles with 33-43 black bands strongly dilated dorsally; head black with yellow curved mark. Markings become paler with growth, eventually disappearing completely on ventrum.

Distribution: Indian coast; Persian Gulf. May occur along the Gujarat coast.

*Hydrophis caeruleus* (Shaw, 1802):

Description: 14-18 maxillary teeth behind poison fangs. Head not reduced; anterior parts of body not very slender; posterior parts compressed, greatest diameter of body 2-3 times that of neck; eye moderate; 7-8 supralabials, 2nd in contact with prefrontals 3rd and 4th touching eye. 31-43 scale-rows on neck 38-54 on body, all strongly keeled. 253-334 distinct ventral scales throughout body. Hemipenis forked close to tip. Bluish-grey above, yellowish-white below, with from 40-60 dark bands, about twice as broad as their interspaces on forepart of body. Head black in juveniles, dark grey in adults.

Distribution: Throughout the Indian coast from Gujarat in the western coast, to Bengal in the east. Outside India- Myanmar and the Gulf of Siam.

GENUS: *Lapemis* Gray, 1835

*Lapemis curtus* (Shaw, 1802):

Material examined: Junagad District, ZSI 22561, Verabal; Jan-Feb. 1964; Col. A. Danial; ZSI 22577, Verabal; Feb.- March, 1970; Coll. A. K. Nagbhusanam; ZSI 22571, Gujarat coast; 12.12.1971; Col. K. V. Surya Rao.

Measurements: Snout to vent 400-750 mm.

Description: Head large, body short; diameter of neck half or more than half greatest body diameter; eye moderate; frontal as long as or shorter than its distance from rostral; 1 preocular and 1 or 2 postoculars; 7 supralabials, 2nd normally in contact with prefrontal. Olive-green, turning up to pale yellow above with 15-55 ill-defined, dark greenish-brown crossbars, the first on nape.

Distribution: Malabar and Coromandel coasts of India, including Visakhapatnam. The species range extends from the Persian Gulf to Indo-Malaya.

GENUS: *Pelamis* Daudin, 1803

*Pelamis platurus* (Linnaeus, 1766)

Material examined: Junagad District, ZSI 23512, Subash Nagar Beach, Porbandar, Gujarat, 28.8.1992, Coll. K. V. Subba Rao.

Measurements: Snout to vent 40 mm.

Description: Maxillary bone not extending forward as far as palatine, 7-11 maxillary teeth. Head narrow, head shield entire; nasals in contact with one another; frontal large; 1 or 2 preoculars and 2 or 3 postoculars; temporal small, 2 or 3 anterior; 7 or 8 supralabials, 2<sup>nd</sup> in contact with prefrontal, 4th and 5th below eye; anterior pair of genials distinct and separated by small scales; 49-67 rows of scales on thickest part of body. Colouration variable, usually black above and yellow or brown below.

Distribution: This sea snake is widely distributed globally, being common in the Indo-Australian seas. It is also found in the Bay of Bengal.

FAMILY: VIPERIDAE

Key to genera:

- Nostril in a large nasal; lateral scales in straight rows . . . . . *Daboia*
- Nostril in a divided nasal; lateral scales in oblique series . . . . . *Echis*

GENUS: *Daboia* Gray, 1842

*Daboia russelii* (Shaw & Nodder, 1797):

Description: Head rather long, wider than neck; snout bluntly pointed; rostral about twice as high as wide; nostril large, crescent-shaped, in a large nasal shield; supraocular entire; 11 upper labials, separated from eye by three rows of scales; 14 lower labials; head covered with small scales and without any shield; scales strongly keeled and 27-33 at midbody. Body stout and dorso-ventrally flattened, dorsal scales in straight rows. Three longitudinal rows of reddish-brown or dark brown rings with black or black and white edges forming a chainline pattern on back and sides. Head with dark patch behind. A dark streak, margined with white, pink or buff behind eye. A dark stripe from eye to labials.

Distribution: Likely to occur in Gujarat. The typical subspecies occurs throughout India, from the plains to the hills at 3,000 m. Outside India-

Pakistan, Bangladesh and Sri Lanka. Other sub-species are known from south-east Asia.

GENUS: *Echis*, Merrem, 1820

*Echis carinata* (Schneider, 1801):

Material examined: Junagad District, ZSI 24891, Willingdon Dam site, 10.9.1989. Panchmahal District, ZSI 24907, around Forest Rest House Lunwada, Godrat 25.3.1992. Rajkot District, ZSI 24872, Rajkot, 8.9.89. Surendra Nagar District; ZSI 24933, Khareswar Village, 10.12.1992.

Measurements: Snout to vent 380 mm; tail 45 mm.

Description: Head short, distinctly wider than neck; snout blunt; rostral about twice as wide as high; nostril in divided nasal shield; eye surrounded by 10-15 small scales exclusive of supraocular; 3-4 scales between nasal and eye; temporal small, keeled, except lowermost row; 10-12 upper labials, 4th usually largest; scales 25-29, 27-37 and 21-27 rows, outermost rows largest. Colour pattern varies considerably in form of dark-edged spots in a vertebral series connected to a light coloured inverted U- or V-shaped flank mark, enclosing a dark area connected to each other and forming a wavy flank line. Whitish below, uniform or spotted with brown.

Distribution: The whole of India south of the Ganga. Outside India-Pakistan and Sri Lanka.

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