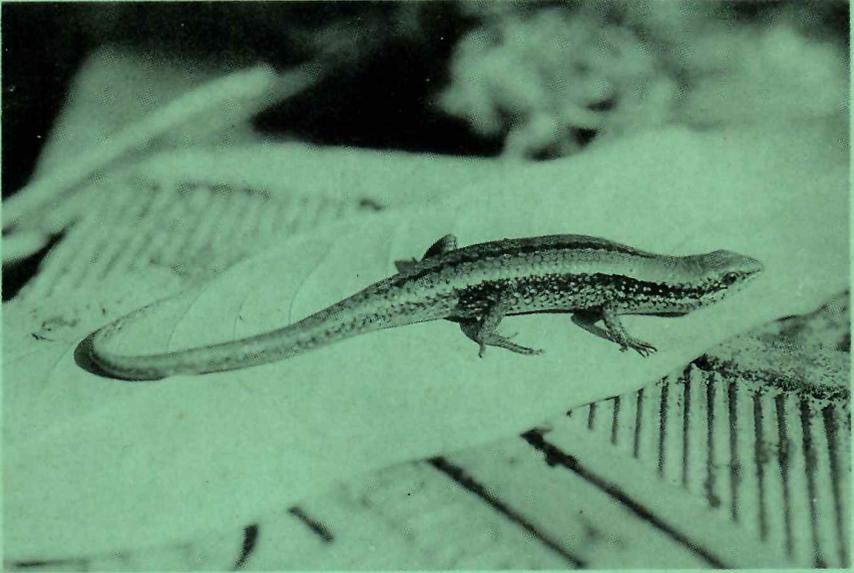


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of the Chennai Snake Park Trust

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Cover

Mabuya clivicola

Originally described from Ponmudi Hills. See page 14 - 18

Photo : J. Thomas & P.S. Easa

*And, truly, I reiterate, nothing's small!
No lily-muffled hum of a summer bee,
But finds some coupling with the spinning stars,
No pebble at your foot, but proves a sphere,
No chaffinch but implies the cherubim.*

Elizabeth Browning.

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Cobra invites articles and short notes on reptiles and amphibians, their ecology, biology, natural history, conservation or other aspects. These may be of scientific or popular interest. Black and white photographs are also welcome.

Please send your contributions to the Editor, Cobra, Chennai Snake Park Trust, Rajbhavan Post, Chennai 600 022.

A Field Guide to the Frogs and Toads of the Western Ghats, India :

Part III*

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Family Rhacophoridae

(Treefrogs, Flying or Gliding frogs and Bushfrogs)

The family Rhacophoridae is restricted in distribution to the Old World. A few more than 180 living species have been described till now.

These are very small to large frogs with the tips of digits enlarged into discs. Most species are arboreal and generally nocturnal. Direct and indirect development are known in the family. Tadpoles have been classified as Type IV.

Two subfamilies viz., Philautinae (Bushfrogs) and Rhacophorinae (Flying or Gliding and Treefrogs) are represented in the Western Ghats. Philautine frogs are generally very small to small. Tadpoles develop in tree holes and streams. Direct development is known in this group. Rhacophorine frogs are generally medium to large (exceptionally very small to small). Eggs are laid in foam nests overhanging water. Tadpoles drop into water where the development is completed.

* Part I appeared in *Cobra* Vol. 27 (Jan. - Mar.1997) and
Part II appeared in *Cobra* Vol. 28 (April - June 1997)



Philautus beddomii

Beddome's Green Bushfrog

Adult Size : Very small.

Description of Adult: Uniform greenish above. Thighs colourless except for a green stripe along the upper surface. Rather similar to *P. femoralis*. The green extending to the feet.

Snout rounded. Tympanum hidden. Feet 1/2 webbed; much less than *P. femoralis*. A fold from eye to shoulder.

Range : Endemic. Southern Kerala and Anamalai Hills.
Altitude : Between 1300-1500 m ASL.

Philautus bombayensis

Bombay Bushfrog

Adult Size : Very small-small.

Description of Adult : Very similar to *P. signatus*.

Toes 1/2 webbed.

Range : Endemic. Northern Western Ghats
(Goa and Maharashtra).

Philautus chalazodes

White-spotted Green Bushfrog

Adult Size : Very small.

Description of Adult: Uniform green above. The tubercles are white. White below.

Nostril nearer to the tip of snout than eye. Tympanum hidden. Toes 1/2 webbed. Discs well-developed. Dorsal skin smooth. A slight fold from eye to shoulder. Granular below.

Range : Endemic. Southern Kerala.



Philautus charius

Sesachar's Bushfrog

Adult Size : Very Small.

Description of Adult: Bright yellow-dark brown. Dark hour glass shaped mark from between eyes till the vent. Conspicuous chevron shaped mark on vent. Lower lip white with dark cross bars. Black line between eye and shoulder laterally bordered below by white. Limbs cross-barred. White below with brown flecks. Dark spots on sides of body joining the largest of white bars on legs when limbs are flexed into normal resting position.

Snout sharp. Tympanum distinct (1/3 diameter of eye). Toes 1/3- 1/2 webbed. Discs on fingers large.

Habitat : Evergreen forests.

Range : Southern Western Ghats from Kalakkadu and Ponmudi Hills up to Karnataka (Kottigehar).

Altitude : Up to 1300 m ASL.

Philautus crnri (=longicrus)

Longlegged Bushfrog

Adult Size : Very small.

Description of Adult: Olive brown. Thighs with cross bars. Dark line from heel to the foot. Under parts white. Very long hind limbs. Toes 1/2 webbed. Discs on fingers not very marked. Tympanum 1/2 diameter of eye. Dorsal skin with faint folds.

Range : Endemic. Kemphole (Karnataka).

Philautus elegans

Crimson Bushfrog

Adult Size : Very small.

Description of Adult: Crimson above. A concave dark streak between



eyelids. Sides of body black. Tympanum red. Posterior part of upper lip white. Lower lip with brown and black spots. Belly yellow. Limbs with dark markings. Thighs pinkish. Posterior border of thighs with black and white spots. Tympanum 1/2 diameter of eye. Toes less than 1/2 webbed.

Range : Endemic. Kottigehar (Karnataka).

Philautus femoralis

Plain Green Bushfrog

Adult Size : Very small.

Description of Adult: Invariably leaf green with yellow sides. Occasionally with black spots on back. Colour changes to brown with cream dorsolateral stripes or spots. White below. Slender with short rounded snout. Dorsal skin smooth. Tympanum barely visible. Toes 1-2 to 3/4 webbed. Discs on fingers well developed.

Habitat : Secondary and disturbed forests in grass and undergrowth.

Range : Endemic. Southern Western Ghats from Kerala up to Uttara Kannada (Karnataka).

Altitude : Up to 900 m ASL.

Philautus flaviventris

Yellowbellied Bushfrog

Adult Size : Small.

Description of Adult: Dark brown above with round yellow spots or brown with darker vermiculations or spots. Read side of thighs dark brown with round yellow spots. Lower parts yellow, marbled with brown. Skin smooth above. A fold from eye to shoulder. Nostril nearer the tip of snout than eye. Tympanum indistinct. Toes 1/2 webbed.

Range : Endemic. Kerala.



Philautus glandulosus

Roughskinned Bushfrog

Adult Size : Small.

Description of Adult: Dark purplish brown above with or without indistinct markings. Or greyish brown with symmetrical darker or lighter markings. White below or spotted with brown. Dorsal skin smooth or with fine tubercles. Sides and underparts, granular. Nostril equidistant from the eye and snout. Tympanum hidden. Toes webbed at base.

Habitat : Sholas. Occasionally entering bathrooms.

Range : Endemic. Hills of Kerala (Anamalais) and Tamilnadu (Nilgiris). Maharashtra.

Altitude : Up to over 2000 m ASL.

Philautus hassanensis (=montanus)

Hassan Bushfrog

Adult Size : Small.

Description of Adult: Bright red-brownish with or without white spots on body. Brown on throat and chest. Yellow belly. Dark bars on thighs meet into creating 'eye-spots' when seen from below. Discs on fingers and toes rather small; smaller on toes. Toes 2/3 webbed. Skin smooth with a faint 'V' shaped fold between the eyes extending to hindneck.

Range : Endemic. Hills of Kemphole (Karnataka).

Philautus kottigeharensis

Kottigehar Bushfrog

Adult Size : Very small.

Description of Adult: Deep bronze above and along the sides. Limbs barred. Discs on fingers and toes dark on both sides. Web dark and folded toes look characteristically black. Underparts bronze-orange-yellow. Sides white or yellow. Tympanum 1/2 diameter of eye. Discs on finger tips

large. Hind limbs long. Toes with well developed web reaching the discs.

Range : Endemic. Kottigehar (Karnataka).

Philautus leucorhinus

Whitenosed Bushfrog

Adult Size : Very small to small.

Description of Adult: Pale yellowish brown or olive brown above. A dark band through eyes. A large hexagonal or triangular white spot on tip of snout. A dark band between eyes and another arched one on each side of the back. A pale vertebral band and in some cases extending along the hind limbs. Throat dotted with brown. Sometimes quite dark with a white median line. Very similar to *P. temporalis*. Tympanum distinct; 1/2 diameter of eye. Nostril nearer the tip of snout than eye. Toes 1/2 or 1/3 webbed.

Range : Endemic. South Western Ghats up to Goa.

Philautus melanensis

Black Bushfrog

Adult Size : Very small to small.

Description of Adult: Black above. Thighs pale yellow with black bars. Yellow below. Skin occasionally with longitudinal folds and white warts. Under parts with large tubercles. Tympanum 2/3 diameter of eye. Finger discs large. Toes largely without web.

Range : Endemic. Kemphole, Karnataka.

Philautus naraiensis

Narayana's Bushfrog

Adult Size : Very small to small.

Description of Adult: Brownish red. Thigh and tibia feebly barred or marbled. Under parts buff or white. Tympanum 1/2 diameter of eye. Fingers and toes short with rather small discs. Discs smaller on first two

fingers than on the rest. Web on toes extends to the discs on at least the first two toes.

Range : Endemic. Kottigehar (Karnataka).

Philautus nasutus

Sharpnosed Bushfrog

Adult Size : Very small.

Description of Adult: Grey above clouded darker. Sides of head darker-blackish. Limbs with dark cross bars. Lower parts spotted with brown. Snout pointed. Nostril nearer tip of snout than eye. Tympanum distinct. Toes less than 1/2 webbed. Discs as large as tympanum. Dorsally bears very small warts or granular lines. A narrow whitish granular raised line along the middle of head and neck. Granular below.

Range : Hills of Kerala. Srilanka.

Philautus pulcherrimus

Pretty Bushfrog

Adult Size : Very small.

Description of Adult: Leaf green above with 2-3 large green spots on fore arms. A purplish brown streak from snout and along the sides. Sides of head white or with purplish spots. Limbs colourless. Thighs with a median thin dark green line. Tibia fully green. White below. Male with external vocal sac. Tympanum indistinct. Fingers with rudiment of web. Toes 1/2 to 2/3 webbed. Skin smooth above. Granular below.

Range : Endemic. Kempholey (Karnataka) and Silent Valley (Kerala).

Altitude : Up to 1000 m ASL.

Philautus signatus

Castanet Bushfrog

Adult Size : Very small to small.

Description of Adult: Pale brown dorsally. Dark 'X' mark on back



prominent. Sides of head with small yellow spots. Groin and anterior surface of thigh vermiculated with black or brown. Rear of thigh yellow green with black reticulations. Iris silvery with blue along its dorsal margin.

Stocky and robust with extremely large and protruding eyes. Snout pointed. Nostril nearer snout than to eye. Tympanum hidden. Toes less than 1/2 webbed. Discs on fingers and toes well developed.

Habitat : Grassy patches.

Range : Endemic. South Western Ghats (Kerala and Tamilnadu).

Altitude : Up to 2000 m ASL.

Philautus swamianus

Ramaswamy's Bushfrog

Adult Size : Very small to small.

Description of Adult: Uniformly bluish above. Hind limbs barred. White glandular spots along the sides. Throat pale buff. Chest marbled. Abdomen white. Ventral portions of thighs pinkish. Foot and discs bronzed. Tympanum partly visible. Finger discs large. Web on toes extend up to discs.

Range : Endemic. Kottigehar (Karnataka).

Philautus temporalis

Plain Coloured Bushfrog

Adult Size : Very small.

Description of Adult: Sandy to reddish brown above. Dark brown streak from behind eyes through tympanum and shoulders. Hour glass pattern on back occasional. Slender. Snout pointed. Tympanum distinct; 1/2 diameter of eye. Feet 1/3 webbed.

Habitat : Secondary-evergreen forests.

Range : Endemic. South Western Ghats.

Altitude : Up to 900 m ASL. May be higher up in the hills (Kodaikanal).



Philautus travancoricus

Travancore Bushfrog

Adult Size : Small.

Description of Adult: Cream coloured above with minute black dots. Larger black dots on back and on tibia. A black streak from shoulder to shoulder along the snout, eyes and nostrils. A black streak on either sides of the anterior half of back. A narrow band along the upper surface of thigh. Belly white. Nostril much nearer the end of snout than to eye. Tympanum hidden. Toes 1/3 webbed. Skin smooth above. Granular below.

Range : Endemic. Southern Kerala (Bodanaiknur).

Philautus variabilis

Tinkling Frog or Variable Bushfrog

Adult Size : Very small to small.

Description of Adult: Colour variable. Light to dark brown above with or without a dark brown inverted 'V' pattern on back from about the fore limbs to groin. Sometimes grey with darker reticulation above. Sometimes green with faint mottling. A dark band between eyes may be present. Groin and lateral parts of thigh marked darker. Thighs distinctly cross-barred. White below, flecked with black. Stocky. Discs on fingers and toes large. Rudimentary webbing between fingers. Toes 2/3 to 1/2 webbed.

Call : A loud metallic 'tink; tink-tink'; hence the common English name.

Range : Ponmudi Hills (Kerala), Palani and Nilgiris (Tamilnadu) and Kempholey (Karnataka). Shevroys (Eastern Ghats). Srilanka.

Altitude : Up to 2000 m ASL.



Polypedates cruciger

Ceylonese Treefrog

Adult Size : Medium.

Description of Adult: Fawn-yellow with a dark hour glass mark from between eyes till mid back. The ends of the hour glass are tridented. Rear sides of thighs marbled bright yellow and chocolate brown. Limbs faintly cross barred. White below.

Slender. Limbs longer than *P. maculatus*. Tympanum 3/4 diameter of eye.

- Habits : Nocturnal. Calls from thin branches at low heights. Aggregates around stagnant pools for breeding where several males can be seen at a time.
- Call : Loud. 'Tree-chuck'; 'tre-chuck-chuck' with pauses. Some times a series of 'kreaks'.
- Habitat : Open forests, plantations and dense evergreen forests.
- Range : South Western Ghats from Kanyakumari to Anamalais and Dakshina Kannada, Sri Lanka.
- Altitude : 200-1000 m ASL.

Polypedates leucomystax

Bamboo Treefrog

Adult Size : Medium.

Description of Adult: Light brown-tan with few dark parallel lines on back. Pale whitish below. Generally resembling *P. maculatus*.

Tympanum as large as eye. Toes almost fully webbed and extending till about the tip of fourth toe. Fingers without a trace of webbing. A prominent 'W' mark on hindneck caused by the cranial bone visible at rest.

- Habitat : Secondary and evergreen forests.
- Range : Karnataka southwards. Indian subcontinent, Southeast Asia and Japan.



Polypedates maculatus

Chunam or Common Treefrog

Adult Size : Medium.

Description of Adult: Colour variable from almost plain white-fawn to yellowish-brown with darker markings. Dark line from snout through eyes and along the sides. Rear side of hind limbs marbled yellow and brown. White below.

Toes 1/2 webbed. Web extends till about half length of fourth toe. Tympanum distinct (more than 1/2 diameter of eye).

- Habits : A commensal of humans entering living quarters frequently.
- Call : A loud 'ta-ta-tak-tak'. More commonly a low rumbling 'da-da-da-da' or 'do-do-do-do'. Choruses sound like distant fireworks (softer).
- Habitat : Urban to secondary forests.
- Range : Entire Western Ghats. Indian subcontinent. Srilanka.
- Altitude : Up to 2000 m ASL.

Polypedates pleurostictus

Spotted Green Treefrog

Adult Size : Medium.

Description : Greenish or golden yellow above with large golden-black blotches. Groin and sides of thighs purplish brown with yellow marbling. Limbs with dark cross bars.

Fingers less than 1/2 webbed (often entirely free of webbing). A strong fold from eye to shoulder.

- Range : Endemic. Nilgiris, Palanis, Anamalais and North Kerala.
- Altitude : Up to over 2000 m ASL.



Rhacophorus calcadensis

Kalakad Gliding Frog

Adult Size : Small.

Description of Adult : Reddish brown.

Fingers more than 1/2 webbed. Upper surface with small warts.

Range : Endemic. Kalakkadu (southern Tamilnadu).

Remarks : The single specimen based on which the species has been described is not available in India.

Rhacophorus lateralis

Small or Winged Gliding Frog.

Adult Size : Very small to small.

Description of Adult: Greenish with fine dark spots on head. Limbs cross-barred. White streak on each side from eye till groin.

Small size and long slender limbs. A distinct lateral extension of skin from shoulder to hand along fore limbs. Fingers 1/2 webbed. Toes fully webbed. Tympanum large.

Range : Endemic. Kerala.

Altitude : 900 m ASL.

Remarks : This species is described from a single immature specimen. A second small specimen is available at the ZSI Madras. Whether the above described size is adult size is not clear.

Rhacophorus malabaricus

Malabar Flying Frog

Adult Size : Medium-large.

Description of Adult: Bright green with or without darker markings. Markings usually absent or occur as mere spots. Web between fingers and toes bright orange-crimson. White below.



Fingers and toes almost fully webbed.

Habits : Calls from high canopy often resting on leaves. Glides long distances between trees. Occasionally enters homes.

Call : A loud 'tak-tak-tak' or 'tak-tak-tarik'.

Habitat : Secondary to dense evergreen forests and plantations.

Range : Endemic. Western Ghats south of Maharashtra.

Altitude : Sea level up to over 1000 m ASL.

(concluded).



Reptile Fauna of Peechi-Vazhani Wildlife Sanctuary

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The Western Ghats are considered to be very rich in reptile fauna. About 93 species are reported to be endemic to this region (Swengel, 1990 & 1993). However, reptiles have been the least studied group. Locality specific studies on the reptile fauna is comparatively less and information on the distribution of species is scant.

Peechi-Vazhani Wildlife Sanctuary is situated in Trichur district (between 76° 15' E and 76° 27' E long and 10° 30' N and 10° 42' N latitude) and is about 125 km² in extent. The Sanctuary is contiguous with Chimmomy Wildlife Sanctuary on the east and the forests of Palghat on the north. The continuity of Peechi Forest Range with the Vazhani side is lost due to the National Highway 47. The terrain is undulating and the altitude varies from 100m to 941m above msl. The area is having a reservoir of the Peechi Dam. The vegetation could be broadly classified as tropical wet evergreen, semi-evergreen and moist deciduous forests. The man made forests are the plantations of teak and bombax.



Bupathy and Choudhury (1995) recorded Travancore Tortoise and Das (1995) mentions the occurrence of Indian Flapshell Turtle and Forest Cane Turtle in Peechi. But for these, there had not been any concerted attempt to record the reptile fauna of Peechi-Vazhani Wildlife Sanctuary. A survey was conducted by visiting different parts of the Sanctuary during the months of November, 1996 - March, 1997. Smith (1933, 1995 & 1943), Tikader and Sharma (1992) and Murthy (1990) were referred for conformation of identifications.

Thirty one species of reptiles were recorded from Peechi area during the survey (Table 1). Of these, six species viz. *Indotestudo forsteni*, *Draco dussumieri*, *Calotes rouxi*, *Calotes elliotti*, *Cnemaspis waynadensis* and *Ristella beddomii* are endemic to Western Ghats.

Mabuya clivicola was originally described from Ponmudi area (Inger *et al* 1984). Three specimens of the species were collected from Kalluchal and Anakuzhi areas of Peechi at an altituds between 148 m and 250 m . The species was found to be very common in the area. This is the second report of the species after its description and first record of the range extension further north in Western Ghats. The morphometric measurements (in mm) and counts of the three specimens from Peechi are given below.

Parameters	I	II	III
Snout - vent length	52.00	46.00	42.00
Head to ear opening	11.00	11.00	11.00
Head width	10.00	09.00	08.00
Axilla - groin	31.00	26.00	21.00
Scale rows	28	28	28
Ventrals	43	46	45
Scale under fourth toe	17	15	17



The Cane turtle and Flapshell turtle reported earlier from the area could not be located this time. However, enquiries reveal the occurrence in the area. Observation of the rare gecko, *Cyrtodactylus collegalensis* from Peechi needs special mention. The present findings indicate that the Peechi area of Peechi-Vazhani Wildlife Sanctuary is an abode of a rich diversity of reptilian fauna.

Acknowledgment

The authors are grateful to the Wildlife Warden, Asst. Wildlife Warden and the field staff of Peechi Wildlife Division for their cooperation and assistance.

**Table I : List of reptiles in Peechi range of
Peechi-Vazhani Wildlife Sanctuary**

Family : Emydidae

1. *Melanochelys trijuga* (Schweiger)

Family : Testudinidae

2. *Indotestudo fosteni* (Boulenger)

Family : Gekkonidae

3. *Cnemaspis kandiana* (Kelart)
4. *C. wynadensis* (Beddome)
5. *Hemidactylus frenatus* Schlegel
6. *H. triedrus* (Daudin)
7. *Cyrtodactylus collegalensis* (Beddome)

Family : Agamidae

8. *Draco dussumieri* Dum. & Bib.
9. *Calotes versicolor* (Daudin). *nemoricola* Jerdon
10. *Calotes calotes* Linnaeus
11. *Calotes rouxi* Dum. & Bib.
12. *Calotes elliotti* Guenther
13. *Psammophilus blanfordanus* (Stoliczka)



Family : Chamaeleonidae

14. *Chamaeleon zeylanicus* Laurenti

Family : Scincidae

15. *Mabuya macularia* (Blyth)
16. *Mabuya carinata* (Schneider)
17. *Mabuya clivicola* Inger *et al*
18. *Sphenomorphus dussumieri* (Dum and Bib)
19. *Ristella beddomii* Boulenger

Family : Varanidae

20. *Varanus bengalensis* (Daudin)

Family : Boidae

21. *Python molurus* (Linnaeus)

Family : Colubridae

22. *Ptyas mucosus* (Linnaeus)
23. *Oligodon taeniolatus* Wall
24. *Lycodon travancoricus* (Beddome)
25. *Xenochrophis piscator* (Schneider)
26. *Ahaetulla nasutus* (Lacepede)
27. *Dendrelaphis tristis* (Daudin)

Family : Elapidae

28. *Naja naja* (Linnaeus)
29. *Ophiophagus hannah* (Cantor)

Family : Viperidae

30. *Trimeresurus malabaricus* (Jerdon)
31. *Hypnale hypnale* (Merrcm)



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Range Extension of some Indian Amphibians

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The distribution of the amphibian fauna of India is poorly known. Inger and Dutta (1986) prepared the first list of Indian amphibians and commented on their state-wise distribution. Chanda and Gosh (1988) and Das (1990) included some species that were left out by Inger and Dutta. Subsequently, Dutta (1992) revised the earlier list by Inger and Dutta and updated the distribution record of the species. But still, the distribution of some species were overlooked. Here, I report of the range extensions of 63 more species within the Indian Union.

Species	Known Range (Dutta 1992)	Extension of Range
Order : Apoda		
Family : Ichthyophiidae		
1. <i>Ichthyophis bombayensis</i> Taylor, 1960	Maharashtra, Gujarat.	Karnataka (Krishnamurthy 1996)
2. <i>Ichthyophis malabarensis</i> Taylor, 1960	Kerala	Karnataka (Balakrishna, Gundappa and Sakunthala, 1983) (Krishnamurthy 1996)
3. <i>Uraeotyphlus narayani</i> Seshachar, 1939	Kerala	Karnataka (Balakrishna, Gundappa and Sakunthala, 1982) (Krishnamurthy 1996)

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Order : Anura
Family : Pelobatidae

4. *Scutigera sikimensis* (Blyth, 1854) Sikim, West Bengal Meghalaya (Chanda, 1991)

Family : Bufonidae

5. *Bufo beddomii* Gunther, 1875 Kerala Karnataka (Uttangi, 1989) (Krishnamurthy, 1996) Maharashtra (Ravichandran and Pillai, 1990)
6. *Bufo hololius* Gunther, 1875 Kerala Karnataka (Daniels, 1991) (Krishnamurthy, 1996) Andhra Pradesh (Pillai and Ravichandran, 1991) (Sarkar, Chandra and Ray, 1993)
7. *Bufo microtypanum* Boulenger, 1882 Kerala Tamil Nadu (Sekar, 1991) (Ravichandran, 1996) Karnataka (Daniels, 1991) Maharashtra (Yazdani and Mahabal, 1976) (Sekar, 1991)
8. *Bufo parietalis* Boulenger, 1882 Kerala Karnataka (Daniels, 1991) Maharashtra (Yazdani and Mahabal, 1976)
9. *Pedostibes kempii* Boulenger, 1919 Meghalaya Mizoram (Chanda, 1992)

Family : Hylidae

10. *Hyla annectans* Jerdon, 1870 Meghalaya Assam Nagaland (Chanda, 1991) Mizoram (Chanda, 1992)

Family : Mycrohylidae

11. *Kaloula pulchra* Gray, 1831 Assam, West Bengal, Bihar, Orissa, Madhya Pradesh, Karnataka, Tamil Nadu Kerala (Sekar, 1991) Gujarat (Naik, Vinod and Patel, 1993)
12. *Microhyla berdmorei* (Blyth, 1855) Meghalaya Assam (Chnda, 1991) Mizoram (Chnda, 1991) Arunachal Pradesh (Chnda, 1992)

13. *Microhyla rubra* Jerdon, 1854 Assam, West Bengal Karnataka, Kerala, Tamil Nadu Gujarat (Vyas, 1996) Maharashtra (Ravichandran and Pillai, 1990) (Kamble and Ghate, 1994) Andhra Pradesh (Sekar, 1991) Sarkar, Chandra and Ray, 1993)
14. *Ramanella montana* (Jerdon, 1854) Tamil Nadu, Kerala, Maharashtra, Gujarat Karnataka (Sekar, 1991) (Krishnamurthy, 1996) Goa (Sekar, 1991)
15. *Ramanella variegata* (Stoliczka, 1872) Kerala, Tamil Nadu, Karnataka, Madhya Pradesh, West Bengal, Orissa Maharashtra (Sekar, 1991) Andhra Pradesh (Murthy, 1967), Sarkar, Chandra and Ray, 1993)
16. *Uperodon globulosus* (Gunther, 1854) Assam, West Bengal Bihar, Orissa, Madhya Pradesh, Maharashtra, Guajrat, Karnataka Goa (Sekar, 1991) Kerala (George and Alex, 1995)
17. *Uperodon systoma* (Schneider, 1799) Kerala, Tamil Nadu, Karnataka, Orissa, West Bengal, Uttar Pradesh, Himachal Pradesh, Rajasthan Gujarat (Naik, 1984) (Vyas, 1996) Andhra Pradesh (Sekar, 1991) Sarkar, Chandra and Ray, 1993), Bihar (Venkateswarlu and Murthy, 1972)

Family : Ranidae

18. *Amolops afghanus* (Gunther, 1858) Sikkim, West Bengal, Meghalaya, Arunachal Pradesh Assam (Pillai and Chanda, 1976), Nagaland (Chanda, 1992), Mizoram (Chanda, 1991), Manipur (Chanda, 1992), Tripura (Chanda 1992)
19. *Amolops formosus* (Gunther, 1875) Sikkim, West Bengal, Meghalaya, Himachal Pradesh Punjab (Chanda, 1991)
20. *Indirana beddomii* (Gunther, 1876) Kerala, Maharashtra Tamil Nadu (Daniel and Sekar, 1989), Karnataka (Abdulali and Daniel, 1954) (Daniels and Sekar, 1989) (Daniels, 1991)
21. *Indirana leithii* (Boulenger, 1888) Kerala, Maharashtra, Guajrat, Madhya Pradesh Tamil Nadu (Sekar, 1991) Karnataka (Daniels, 1991) (Krishnamurthy, 1996)



22. *Indirana leptodactylus* Kerala Tamil Nadu (Daniel and Sekar, 1989), Karnataka (Daniel and Sekar, 1989), (Uttangi, 1989)
23. *Indirana semipalmatus* Kerala Tamil Nadu (Daniel and Sekar, 1989), Karnataka (Krishnamurthy, 1996)
24. *Limnonectes brevipalmata* Kerala, Tamil Nadu Karnataka (Sekar, 1991)
25. *Limnonectes cancrivorus* Madhya Pradesh Andaman (Sekar, 1990) (Pillai, 1991)
26. *Limnonectes keralensis* Kerala Tamil Nadu (Daniel, 1975) (Sekar, 1991), Ravichandran, 1996), Karnataka (Uttangi, 1989), (Sekar, 1991) (Daniels, 1991), Goa (Sekar, 1991), Maharashtra (Ravichandran and Pillai, 1990), (Daniels, 1991) Gujarat (Naik and Vinod, 1993), (Vyas, 1996)
27. *Limnonectes kuhlii* Assam, Meghalaya Arunachal Pradesh (Sekar and Sanyal, 1985) (Chanda, 1992)
28. *Limnonectes mawphlangensis* West Bengal, Meghalaya, Manipur Mizoram (Chanda, 1992)
29. *Limnonectes murthii* Kerala Tamil Nadu (Pillai, 1979) Karnataka (Daniels, 1992)
30. *Limnonectes syhadrensis* Maharashtra Orissa (Dutta and Acharjyo, 1995), Goa (Sekar, 1991)
31. *Micrixalus opisthorhodus* Kerala Karnataka (Uttangi, 1989) Tamil Nadu (Ravichandran 1996)
32. *Micrixalus saxicola* Kerala Karnataka (Uttangi, 1989) (Daniels, 1991)
33. *Nyctibatrachus aliciae* Kerala Karnataka (Daniels, 1991) Tamil Nadu (Ravichandran 1996)



34. *Nyctibatrachus humayuni* Maharashtra, Karnataka Goa (Sekar, 1991)
35. *Nyctibatrachus major* Kerala, Tamil Nadu Karnataka (Daniels, 1991) (Krishnamurthy, 1996)
36. *Occidozyga hexadactylus* Kerala, Tamil Nadu, Goa, Karnataka, Maharashtra, Andhra Pradesh, Orissa, West Bengal, Gujarat, Rajasthan Punjab (Daniel, 1975) Tripura (Chanda, 1991) Andaman Islands (Sekar, 1990)
37. *Rana alticola* Meghalaya, Sikkim Assam (Pillai & Chanda, 1976), West Bengal (Chanda, 1991), Tripura (Chanda, 1992)
38. *Rana aurantiaca* Kerala, Karnataka Tamil Nadu (Ravichandran, 1996)
39. *Rana curtipes* Kerala, Karnataka Tamil Nadu Daniel & Sekar 1989), (Ravichandran 1996)
40. *Rana danieli* Meghalaya Assam (Chanda, 1991) Arunachal Pradesh (Chanda 1992), West Bengal (Deuti 1996)
41. *Rana gerbillus* Meghalaya, Assam, West Bengal Arunachal Pradesh (Pillai & Chanda, 1976), Mizoram (Chanda, 1986)
42. *Rana liebigii* Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh, Sikkim, West Bengal Arunachal Pradesh (Pillai & Chanda, 1976)
43. *Rana malabarica* Kerala, Maharashtra, Goa, Madhya Pradesh, Gujarat Karnataka (Uttangi, 1989) (Sekar, 1991) (Daniels, 1991) Tamil Nadu (Ravichandran 1996)
44. *Rana nicobariensis* Nicobar Islands, Assam West Bengal (Sekar, Biswas & Ray 1992)
45. *Tomopterna breviceps* Tamil Nadu, Karnataka, Kerala, Andhra Pradesh, Maharashtra, Gujrat, Rajasthan, Orissa, Bihar Madhya Pradesh (Sekar, 1991) Uttar Pradesh (Chopra, 1977) Himachal Pradesh (Tilak & Mehta, 1977) West Bengal (Sekar 1984)



46. *Tomopterna dobsonii* (Boulenger, 1882) Tamil Nadu, Karnataka, Maharashtra (Dutta, 1986) Andhra Pradesh
47. *Tomopterna rufescens* (Jerdon, 1854) Kerala, Maharashtra Karnataka (Uttangi, 1989) (Sekar, 1991), Goa (Sekar, 1991)
- Family : Rhacophoridae**
48. *Philautus andersonii* (Ahl, 1927) Assam, Meghalaya Arunachal Pradesh (Chanda, 1991)
49. *Philautus annandalii* (Boulenger, 1906) West Bengal, Assam, Meghalaya Arunachal Pradesh (Chanda, 1992)
50. *Philautus beddomii* (Gunther, 1875) Kerala Tamil Nadu (Ravichandran, 1996)
51. *Philautus bombayensis* (Annandale, 1919) Maharashtra, Karnataka Goa (Sekar, 1991)
52. *Philautus chalazodes* (Gunther, 1875) Tamil Nadu, Kerala Karnataka (Sekar, 1991)
53. *Philautus charius* Rao, 1937 Kerala, Karnataka Tamil Nadu (Daniels, 1992)
54. *Philautus femoralis* (Gunther, 1864) Kerala Karnataka (Daniels, 1991) Tamil Nadu (Ravichandran, 1996)
55. *Philautus leucorhinus* (Lichtenstein & Martens, 1856) Kerala, Karnataka Goa (Sekar, 1991)
56. *Philautus temporalis* (Gunther, 1864) Kerala Karnataka (Daniels, 1991)
57. *Philautus variabilis* (Gunther, 1858) Andhra Pradesh, Kerala, Tamil Nadu Karnataka (Sekar, 1991)
58. *Polypedates leucomystax* (Gravenhorst, 1829) Sikkim, West Bengal, Assam, Meghalaya, Arunachal Pradesh, Manipur, Gujrat, Madhya Pradesh Nagaland (Chanda, 1991) Mizoram (Chanda, 1992) Tripura (Mansukhani & Sekar 1981), (Chanda, 1992)
59. *Rhacophorus bipunctatus* Ahl, 1927 Meghalaya, Arunachal Pradesh Assam (Chanda, 1992) Nagaland (Chanda, 1992) Manipur (Chanda, 1992) Tripura (Chanda, 1992)



60. *Rhacophorus malabaricus* Kerala, Karnataka, Goa Tamil Nadu (Sekar, 1991) Jerdon, 1870
61. *Rhacophorus maximus* Gunther, 1858 West Bengal, Assam, Meghalaya, Arunachal Pradesh Nagaland (Chanda, 1992) Mizoram (Chanda, 1992) Manipur (Chanda, 1992)
62. *Rhacophorus taeniatus* Boulenger, 1906 Bihar Uttar Pradesh (Ray, 1991)
63. *Rhacophorus tuberculatus* West Bengal, Assam Arunachal Pradesh (Chanda, 1992)

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A Comparative Account of the species of the genus *Ansonia* (Bufonidae : Anura : Amphibia)

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The genus *Ansonia* Stoliczka (1870) of the amphibian family Bufonidae is distributed over southern India, Malay Peninsula, Tioman island, Bornio and Mindanao, Philippines (Inger, 1960) and is represented by nineteen species in its range. In India, the genus is known by 3 species. They are, *Ansonia ornata* Gunther, (1875) known from Brahmagiri Hills in Coorg, Karnataka. *Ansonia rubigina* Pillai and Pattabiraman, (1981) from Silent Valley, Kerala and *Ansonia kamblei* Ravichandran and Pillai, (1990) from Jeur in Sholapur district, Maharashtra. *Ansonia meghalaya* described by Yazdani and Chanda (1971) from Meghalaya has subsequently been transferred to the genus *Bufoides* Pillai and Yazdani (1973) as its type species.

Genus *Ansonia* is separable from other genera of Bufonidae found in India, namely, *Bufo*, *Bufoides* and *Pedostibes* by the absence of cranial ridges and parotid glands coupled with the presence of tympanum. The tadpoles of *Ansonia* develop in torrential streams and have large sucker-like oral discs.

The three species of *Ansonia* hitherto known from India are compared in the table below and a key to the identification of species provided.

Table - I : Comparison of the species of *Ansonia* known from India

	<i>A. ornata</i>	<i>A. rubigina</i>	<i>A. kamblei</i>
Nature of tympanum	Distinct; half the diameter of eye.	Distinct; a little less than half the diameter of eye.	Indistinct vertically oval and diameter half the length of eye.
Length of first finger in comparison with the second.	shorter than second.	shorter than second.	about the same length as second.
Length of tibio-tarsal articulation	reaches to between eye & tip of snout.	not reaching tympanum.	not reaching tympanum.
Extent of webbing of toes	Almost fully webbed	Almost fully webbed	about half webbed
Tuberculation on skin of back	finely granular on anterior half only	beset with uniform tubercles all over	covered with small tubercles and a few larger ones on either side of the median line
Colouration in life	dorsum black with greyish head or with greyish spots on the head and a grey dorsal line; ventrally black with bright	dorsum brick red coloured; ventrally brownish black with vermiform patterns in bright orange on throat and	dorsum dark grey a reddish brown oval patch between the eyes; ventrally light brownish; throat speckled with a median reddish brown



yellow spots
spots of same colour on chest, belly and underside of thighs
area; breast and anterior belly mottled with brown.

Key to the identification of species of the genus *Ansonia* known from India. :

1. First finger shorter than second; toes almost fully webbed; tympanum distinct; head without a reddish-brown oval patch between the eye 2

First finger about the same length as the second; toes about half webbed; tympanum indistinct; head with reddish-brown oval patch between the eyes.....*kamblei*

2. Tibio-tarsal articulation reaches to between eye and tip of snout; dorsum greyish in colour and finally granular on anterior half only..... *ornata*

Tibio-tarsal articulation not reaching tympanum; dorsum brick - red in colour and breast with uniform tubercles all over...*rubigina*

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Food Habits of Captive Snakes

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Unlike other animals, snakes feed on live prey. Generally, snakes feed on a wide range of prey items such as fishes, frogs, toads, geckos, agamids, skinks, snakes, birds, mice, rats and, sometimes, small mammals.

Because of their low metabolic rates, intake of food by snakes is very small. Sometimes, snakes will starve for prolonged periods. Although zoos keep various species of snakes, knowledge on their feeding is often lacking. A zoo can keep larger carnivores easily, since the food items such as beef, mutton, chicken etc., can be procured directly from the market. But in India items which the snakes feed on are not readily available in the market. For this, the zoos must have expert keepers who can collect the appropriate live feed from the wild.

Another important point is that zoos must acquire captive born/reared snakes. But, it is difficult to acquire captive bred snakes in India, since only a few zoos/parks breed snakes. If a zoo collects snakes from the wild, these should be provided with a variety of prey items initially. A detailed account of snake's prey items follows.



Sand Boas : In India there are three species of sand boas, *Eryx johni*, *Eryx conicus* and *Eryx whitakeri*. These snakes are fossorial in nature, mainly feeding on rat and mice. Rarely they feed on squirrels and birds. Boas require about 2-3 rats-mice per week.

Pythons : There is only one rock python (*Python molurus*) commonly exhibited in Indian zoos. The other python, reticulated python (*Python reticulatus*) is rarely exhibited in zoos. Generally pythons can be fed with one chicken once a week. Other food items are bandicoots and rabbits. During feeding, all pythons should be separated, otherwise there will be competition between snakes in seizing the prey which leads to death due to strangulation.

Pythons are prolific breeders. The young pythons readily take their first feed after first sloughing. Young pythons should be fed day-old mice/rats till the first year. 2-3 year old pythons feed on week-old chicks or rats. If more than 4 feet, pythons are fed with small chicks or rats.

Arboreal Snakes : Arboreal snakes such as green snake, tree snake and flying snake generally feed on geckos, agamids, tree frogs, calotes and some birds. Collecting tree geckos and lizards is very difficult. However these snake species can easily be trained to take small *Calotes versicolor*, *Sitana ponticerina*, geckos such as *H. brooki*, *H. frenatus* which are common in houses and *H. leschenaultii* (tree geckos) and small frogs. Full grown snakes can be given 5-7 lizards per week.

Small terrestrial snakes : The smaller snakes such as kukri snakes, wolf snakes and cat snakes are fed on common geckos and fanthroated lizards (*Sitana ponticerina*). These snakes can devour 2-3 lizards in a week. Trinket snakes normally feed on 3-5 mice in a week.

Medium sized terrestrial snakes : Food of rat snake is varied. It feeds on frogs, lizards, rats, squirrels, birds and sometimes smaller snakes. These snakes are very delicate, and need vast open space to take food. This snake can be offered rat, mice, frogs or chicks at two-day intervals.



All the cobras (monocellate, binocellate and acellate) normally prefer rats and chicks. These are provided with an interval of three days.

Both banded and common kraits prefer to take smaller snakes such as striped keelback, checkered keelback and olive keelback. To find small snakes as feed is difficult. So it is better feed kraits with mice and rat pups.

Russell's viper food is very similar to that of cobra. In captivity this snake feeds on rats and day-old chicks. Due to smaller size the sawscaled viper can be fed with fanthroated lizards and mice/rat pups. Pit vipers such as bamboo pit viper, malabar pit viper, largescaled pit viper, horseshoe pit viper prefer to feed on frogs and lizards.

Water snakes : Water snakes such as checkered keelback, olive keelback, green keelback and striped keelback can be provided with small live freshwater fishes and frogs twice a week. Ornamental fish can also be provided.

Forced feeding : Snakes that are too weak or too stubborn to feed by themselves may be force-fed. Force-feeding is the insertion of food into the stomach through the mouth. It is commonly done by using dull forceps or pencil to push food into the oesophagus, then gently massaging the food with hands into the stomach located about one-third of the distance from head to the base of the tail.

Another method of force feeding is to use a 10cc hypodermic syringe and one to two feet of plastic tube. The tube is gently pushed down the snake's throat to a distance of about one-third its body length. Fill the syringe half way with liver extract or raw egg and vitamins.

General instructions :

1. Prey items for diurnal snakes like green snake, tree snake etc. should be given at day time, For nocturnal snakes prey items should be given during evening time and leftovers should be removed in the morning.



2. Food should not be given to snakes which are in sloughing condition.
3. Some snakes feed on different prey items. So the prey items should be changed regularly.
4. Prey items should be given at regular intervals. If snake refuses to feed other than when in moulting condition, immediate veterinary care should be obtained.
5. Frequent handling should be avoided after feeding. It may lead to regurgitation.
6. Cannibalism has been observed during feeding. So snakes should be separated during feeding time.



Conservation Assessment and Management Plan (CAMP) Workshop on Indian Amphibians, Bhubaneswar, 22-26 April, 1997.

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The first ever CAMP workshop on amphibians in India was held in Bhubaneswar from 22 to 26 of April, 1997. Dr. S.K. Dutta hosted the workshop which was held in the Institute of Cooperative Management. About 30 participants from different parts of India attended the workshop. Major objective of the workshop was to make an assessment of the conservation status of all amphibian species in India, using the revised Red List categories of the IUCN as the criteria.

Over a period of four days the participants, in two working groups, filled up taxon data sheets on all the 206 species reported from India and assigned them into the revised IUCN categories. The latter was based on information provided in the taxon data sheets on range and area of occupancy, past or projected decline in population and habitat, extent of population fragmentation, number of mature individuals and probability of extinction. The key reference and source materials were listed for each species. The participants also assessed the major threats to the species, the need for population and habitat viability analysis (PHVA) and captive breeding, and the major conservation requirements. The taxon data sheets and the assigned IUCN categories were reviewed by the whole group at the end of the workshop. The first draft of the assessment is getting ready and would be sent to the participants for comments before it is finalised a month from now. The following are, therefore, the tentative conclusions of the workshop.



In the absence of any information on population size or its decline, almost all species were categorised on the basis of their range and area of occupancy, extent of population fragmentation, and trends in the decline of habitat area or quality. A total of 60 species were classified as data deficient. These included species of uncertain taxonomic status, and of uncertain locality and habitat description.

Among the 90 species endemic to the Western Ghats, none were Critically Endangered (CE), 10 were Endangered (EN), 14 were Vulnerable (VU). Among the 36 species confined to the northeast India, 9 were CR, 7 were EN and 2 were VU. Among the 74 species that have a wider distribution (in India as well as outside) 13 were EN and 2 were VU. Many of critically endangered and endangered are species that have been described from only one or two localities, and have not been sighted in spite of general herpetofaunal surveys in the same and nearby areas. Many of the vulnerable species are more widely distributed, but are suspected to have experienced decline in their specific habitats.

Among the major threats identified are obviously habitat loss and fragmentation, changes in agriculture practices in forest areas (e.g. for caecilians), pollution, and capture from wild population for food, medicinal use and experimentation. Among the recommendations suggested are taxonomic studies on some species, survey of little known and infrequently sighted species, monitoring of abundant species that are suspected to be declining, life history studies to assess the habitat requirements of adults and tadpoles, habitat management, and captive breeding of critically endangered and endangered species.

In a special session Dr. S.K. Dutta and Dr. Indraneil Das explained to the participants the rationale behind the recent taxonomic revision of amphibians. The problems faced by the field biologists by recent revisions were put forth by many participants. Dr. Dutta and Dr. Das offered their taxonomic expertise to the field biologists. The workshop was also an opportunity to test the application of the revised IUCN Red List criteria and the CAMP process. The very shallow information base on which the assessment was done was a matter of concern to everybody. The habitat was used as the surrogate in most cases, even when there was only a single record of the species. The participants, however, felt



that it was best to apply the precautionary principle, as recommended by the IUCN, and use the existing information to classify the species, rather than to consider them as Data Deficient. Moreover, this also provides us with a rare opportunity for the inclusion of the conservation status of amphibians, based on the best information available with us now, in the Wildlife Protection Act which is being revised. This would channel better protection to those species that are suspected to be in need of it, and focus our survey and funding efforts.

Many participants felt that the revised IUCN criteria does not address some issues that are specific to amphibians. These include different life stages with different habitat needs, microhabitat selection, long term population fluctuations, and difficulties in making population assessment. A major outcome of the workshop was the finding that there was a lot more information on Indian amphibians than the participants thought there was. Most of the information that is needed for conservation assessment is not, and never would be, published. This information or knowledge has accrued from many years of painstaking field research. The CAMP workshop is a process by which this information can be taped and discussed. The end product is a statement of the conservation status of Indian amphibians which is a consensus among almost all the amphibian specialists, making use of the best information that is available with them. This is being done for the first time in India and it is hoped that the ongoing revision of the Wildlife Protection Act would incorporate this.

The success of the workshop is due to the hospitality shown by Dr. S.K. Dutta and participation from institutions such as Zoological Survey of India and many individuals.

The CAMP workshop on amphibians is the third of seven such workshops that is being organised in different parts of India to prioritise species for conservation action. Workshop on medicinal plants took place in Lucknow in January, and the one on soil invertebrates of south India in Chennai in February. The remaining workshops would be held in Coimbatore in May (Reptiles), Goa in July (Mangrove Organisms), Bangalore in August (Mammals) and Lucknow in September (Fresh Water Fishes). This project, called the Endangered Species Prioritisation Project,



come under the Biodiversity Conservation Prioritisation Project of The WWF-India, funded by USAID. The Salim Ali Centre for Ornithology and Natural History, Coimbatore, is the local coordinator of the project, and the Zoo Outreach Organisation/CBSG, Coimbatore, are the CAMP organisers and facilitators.



Random Harvest

The Turtle and the Ant

In the September 1997 issue of *Herpetological Review*, Dean G. Mccurdy and Thomas B. Herman have written on putative anting behaviour in wood turtles. It is well-known that birds sometimes use ants to remove ectoparasites. Soothing of skin irritation caused by moulting and inhibition of fungal and bacterial growth are two other possible functions. Anting behaviour has been observed in recent times in some vertebrates including primates and turtles and other reptiles

The authors have referred to evidence collected by them in Canada of an association between wood turtles (*Clemmys insculpata*) and the ant *Formica* sp. The turtles were observed to rest on ant mounds and allow themselves to be covered by ants for sometime before moving away. Interestingly, the ant *Formica* sp. is from the same 'group' involved in anting associations with birds.

Frog rediscovered

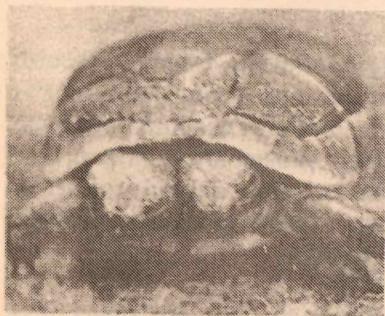
A note in the April 1997 issue of the *Journal of the Bombay Natural History Society* by Karthikeyan Vasudevan of the Wildlife Institute of India gives an account of the rediscovery of the black microhylid frog (*Melanobatrachus indicus*). The species was first described by Beddome in 1878 based on specimens collected from Anamalais and the Ghat ranges to its south, in the Western Ghats, South India. Subsequent to this, the only sighting recorded is the one by Karthikeyan Vasudevan in Kakachi in the Kalakad - Mundanthurai Tiger Reserve of the South-Western Ghats in Tamil Nadu, India. A photograph of the frog accompanies the note.



Oddities

Occurrence of double-headed snakes has been reported off and on. A photograph of one such freak checkered keelback was published in *Cobra* Vol. 25. July - September 1996.

The Indian Express of the 8th November 1997 carried a photograph of a two-headed turtle born on 3rd September 1997 at the Natural History Museum, Geneva.



In the context of a discussion on macro-mutations, Richard Dawkins, the author of the international best seller *The Selfish Gene* (1976), in his book *Climbing Mount Improbable* (1996) had published a photograph of a toad with eyes in the roof of its mouth. The accompanying narration was worded rather cautiously; "The toad is said by the photographer, Scott Gardner of the *Hamilton Spectator*, to have been found by two girls in their garden in Hamilton, Ontario. He says that they put it on the kitchen table for him to photograph. It had no eyes at all on the outside of its head. When it opened its mouth, Mr. Gardner said, it seemed to become more aware of its surroundings. He said that it was taken for examination to the Veterinary Department of Guelph University, but I have not so far discovered any full report on it."

B. Vijayaraghavan

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