Cobra

Volume - 62 October - December 2005

CHENNAI SNAKE PARK TRUST

Quarterly Journal of the Chennai Snake Park Trust

Cover

Reticulated python (*Python reticulatus*)

In India, known with certainty only in the Nicobar Islands. Probably in northeast India also, but this needs confirmation. Also, throughout southeast Asia.

Average length : 10 - 20 feet. The largest snake in the world. Feeds mostly on mammals, sometimes on birds and large lizards.

Photo : **R.R. Chari**

The song of the turtle

(A hatchling sea-turtle finds its way to the sea)

"Enduring and ageless, unaware of life's song,
The turtle struggled, not knowing where it belonged.

It overcame the sun's hot rays streaming in low,
The gulls circled above, and fish circled below.
It overcame the beach's hot sands underneath,
Always beckoning, time, that age old thief.

Still, a soundless voice encouraged each paddled step,
And patiently the sea stood as the turtle crept.
Calling with foaming softness, the waves ebbed and flowed.
At last! With a swoosh, its voyage began in tow.

Weightless as the currents carried turtle along,
Enduring and ageless, now aware of life's song".

– Audrey Yoshiyama.

(From *Voice of the Turtle* Nov.2005
Newsletter of the San Diego Turtle & Tortoise Society)

AIMS AND OBJECTIVES OF

CHENNAI SNAKE PARK TRUST

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

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

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

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

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

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

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

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

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

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

Cobra

Volume - 62 October - December 2005

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Cobra, the quarterly journal of the Chennai Snake Park Trust, invites articles and 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.

All manuscripts must be sent in hard copy or on a floppy disk or CD-Rom to the Editor, *Cobra*, Chennai Snake Park Trust, Rajbhavan Post, Chennai – 600 022. Or through email to cspt1972@md5.vsnl.net.in

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by aad infinitum, alwarpet, chennai 600 018

THE WEB IN ANURANS (AMPHIBIA)

Rosamma Mathew and **Nibedita Sen**
Eastern Regional Station
Zoological Survey of India
Shillong- 793 003

Introduction

Anurans–from the Greek work 'anurous' meaning tailless–form an order comprising of frogs and toads in the class amphibia. As of today, there are 29 families, 352 genera and 4837 species world wide (Frost, 2004). Though one may be able to tell a frog from a toad, it is not always possible to differentiate the large number of anuran species at a glance from external appearance. Traditionally, family and generic level identification of anurans is based on internal skeletal characters. Species level identification is based mostly on visible external morphological characters supported by field studies related to ecological and behavioural aspects. The important external morphological characters used in identification of frogs and toads are as follows:-

i) Presence or absence of teeth on jaws and palate.
ii) Shape of vomerine ridge,
iii) Shape and nature of tongue,
iv) Shape of eye and pupil,
v) Tympanum, its size and nature,
vi) Nostril, its position,
vii) Presence or absence of cranial crest and canthal ridge, its shape and colouration,
viii) Skin colouration, texture- like folds, tubercles, pores, warts, spines etc.
ix) Presence or absence of macroglands like parotid, femoral, rectal, humeral, supra-brachial etc.
x) Proportionate body measurements,
xi) Presence or absence of intercalary ossicle, discs, grooves, metacarpel and metatarsal tubercles, dermal fold and web on digits.

A survey of amphibian literature (Boulenger, 1882; Chanda, 1994, 2002; Daniel, 1997; Frost, 2004; Roonwal and Kripalani, 1961) suggests that the presence, absence or extent of web on digits forms an important factor in anuran identification. The presence of web is expressed as occurring free, rudimentary, minute, at base, partly, 1/4th, 1/3rd,1/2, 2/3rd, 2/5th,3/4th, full, complete, or full but leaving 1 to 3 distal phalanges free. These descriptions and the pictures given with them may not always agree and we may come across contradictory expressions at times. A more accurate description of the web is done by pointing out the position of the web in relation to the subarticular tubercles as quoted here:- "webbing free on inner and outer edges of toe I and on inner edge of toe II; on outer edge of toe II, webbing is between disk and distal subarticular tubercle; on inner edge of toe III, webbing is between penultimate and distal subarticular tubercle; on outer edge of toe III, webbing is to distal subarticular tubercle; on inner aspect of toe IV, webbing is to penultimate subarticular tubercle, reaching base of disk as a narrow sheath; on inner edge of toe V, webbing reaches distal subarticular tubercle, reaching base of disk as narrow sheath; and on outer edge of toe V, is a narrow sheath of skin reaching to base of disk" (Das, 1998).

Web formula (I 1-1½-1, II 1-1½, III 1-2, IV 2½-1 V) (Fig.1 Annemarie Ohler,2003, personal communication) also explains the web character.

We studied the web of the various families from the material and literature available to us. In this paper we wish to focus on the various types of web in anurans with the help of illustrations (not to scale) (Plates I, II, III, IV, V, and VI). It is expected to help, at least to some extent, in species identification. Named drawings are of the material studied by us, the rest is from the literature. We have also tried to assemble the species systematically under particular category based on web pattern (Table I and II)where in 0/0 means no web on forelimb or hind limb,0/1 means fore limb free, hind limb fully webbed; partly/1 means forelimb partly webbed and hind fully webbed, and so on. One may find the same species under different categories as observed in literature. Illustrations are done by N.Sen.

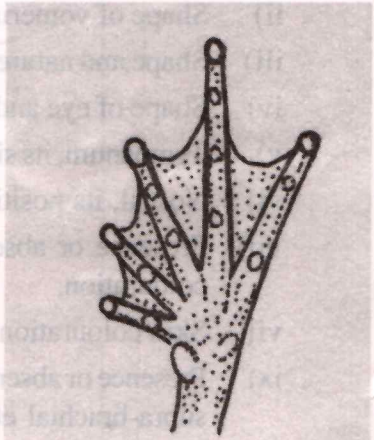


Fig - 1

PLATE – I

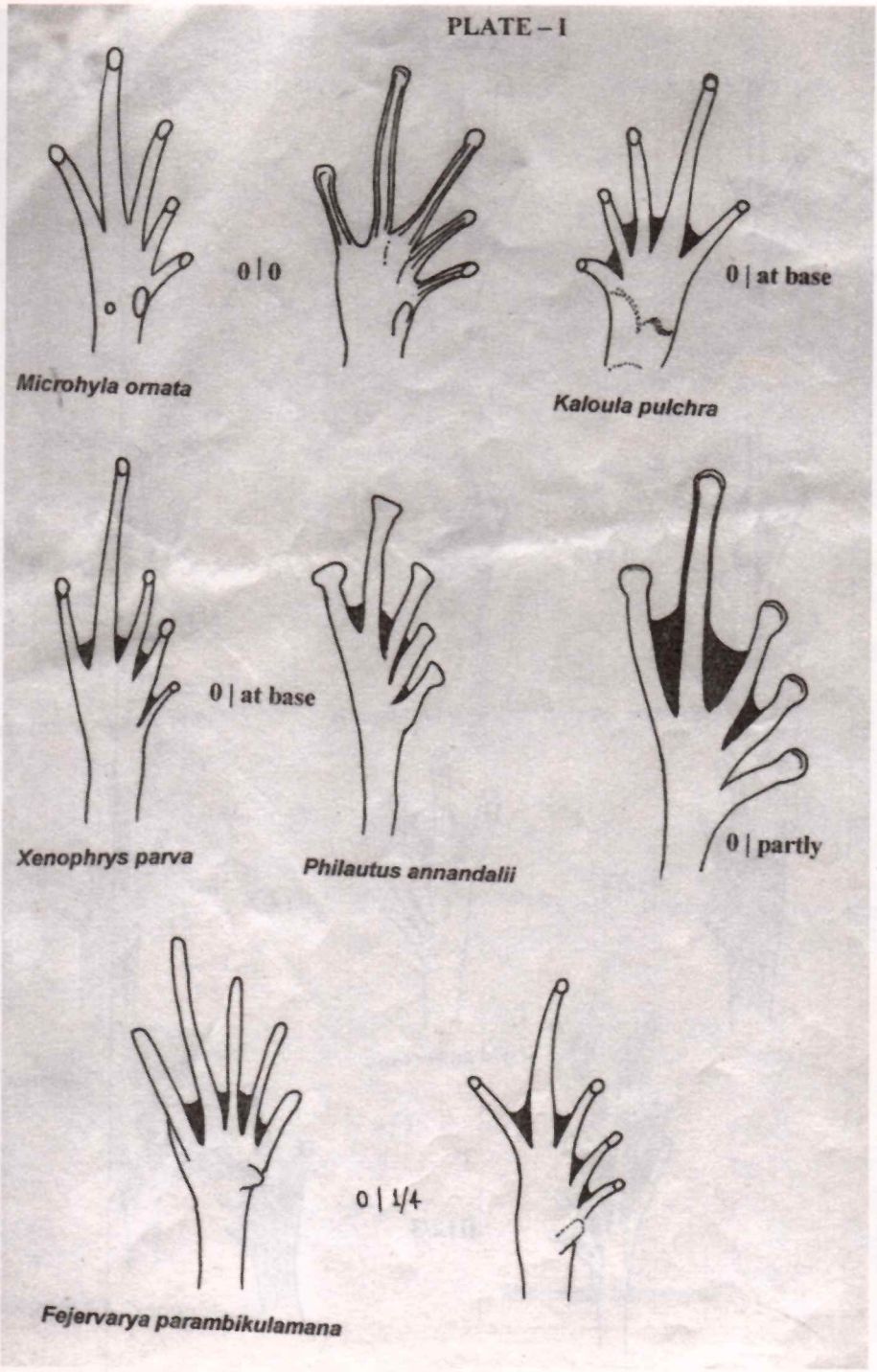

0 | 0
0 | at base
Microhyla ornata
Kaloula pulchra
0 | at base
Xenophrys parva
Philautus annandalii
0 | partly
0 | 1/4
Fejervarya parambikulamana

PLATE – II

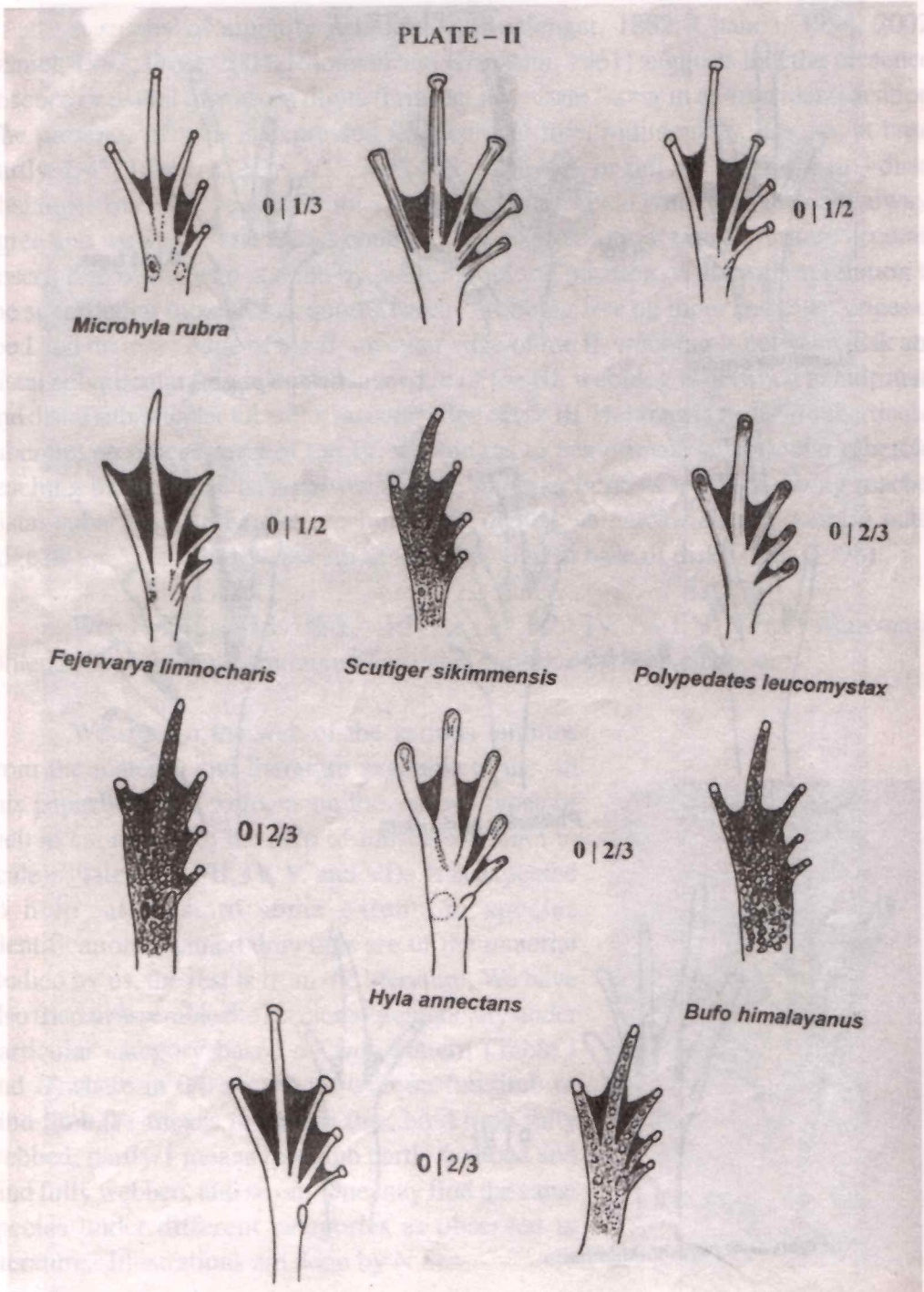

0 | 1/3
0 | 1/2
Microhyla rubra
0 | 1/2
0 | 2/3
Fejervarya limnocharis
Scutiger sikimmensis
Polypedates leucomystax
0 | 2/3
0 | 2/3
Hyla annectans
Bufo himalayanus
0 | 2/3

PLATE – III

0|2/3

Rana leptoglossa

Rana erythraea

0 | 3/4

Bufo melanostictus

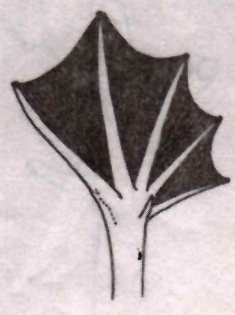
0 | 3/4

Limnonectes laticeps

Limnonectes mawphlangensis

0 | 1

Hoplobatrachus tigerinus



0 | 1

Euphlyctis cyanophlyctis

Microhyla berdmorei

PLATE – IV

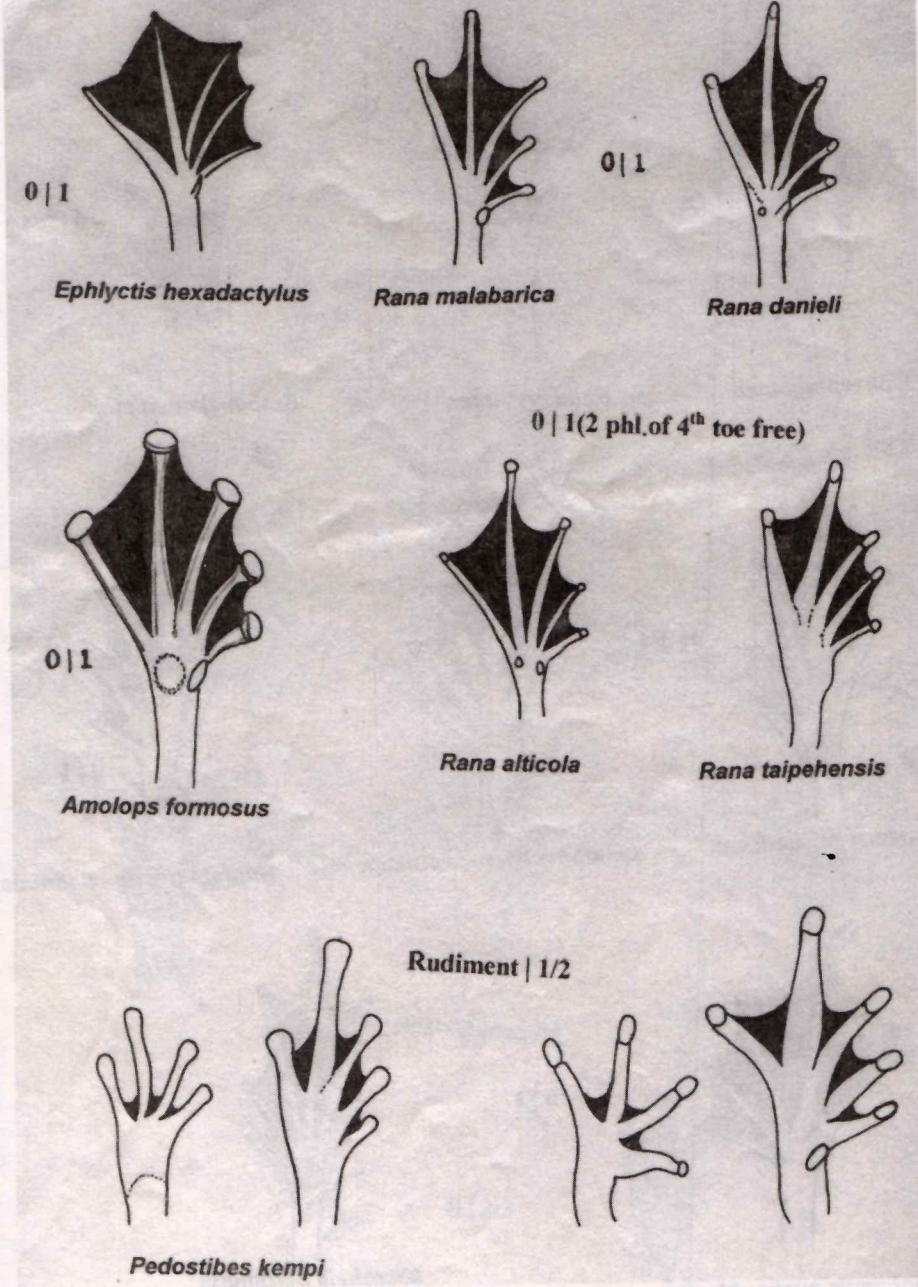
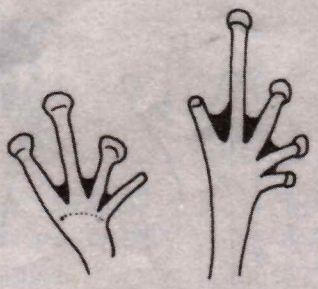
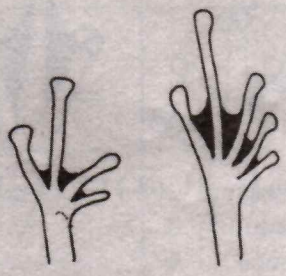

0 | 1
Ephlyctis hexadactylus
Rana malabarica
0 | 1
Rana danieli
0 | 1(2 phl.of 4th toe free)
0 | 1
Amolops formosus
Rana alticola
Rana taipehensis
Rudiment | 1/2
Pedostibes kempi

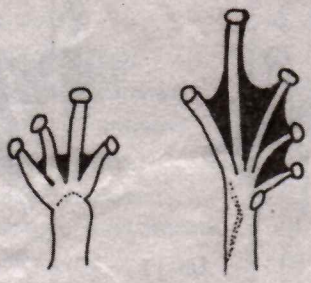
PLATE – V



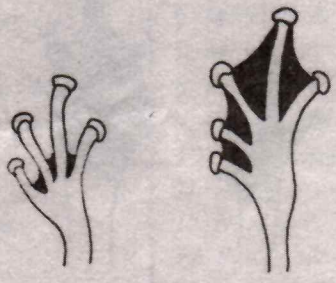
Rudiment | 1/3



Rudiment | 2/3

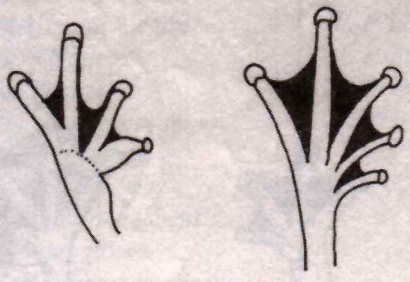


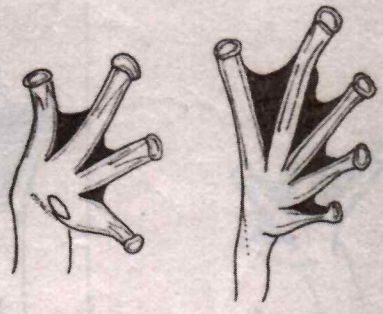
Occidozyga borealis
Rudiment | 1



At base | 1

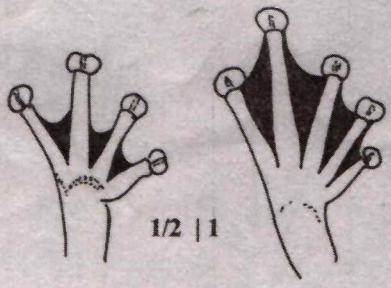
1/2 | 3/4



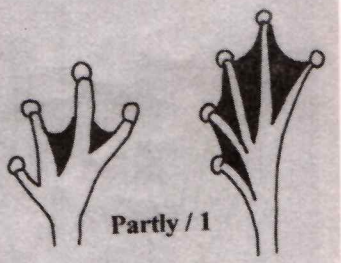


Chirixalus cherrapunjiae

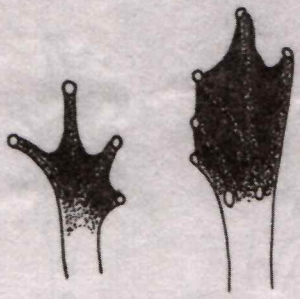
PLATE- VI



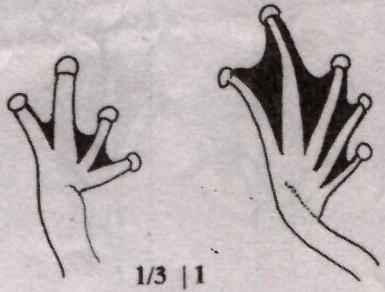
1/2 | 1



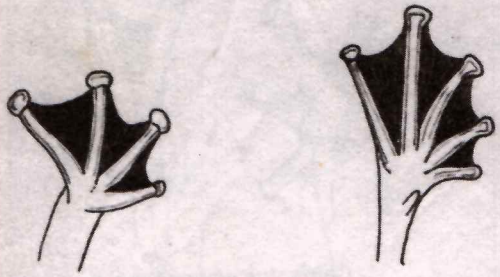
Partly / 1



Bufoides meghalayanus
Rudiment | 1

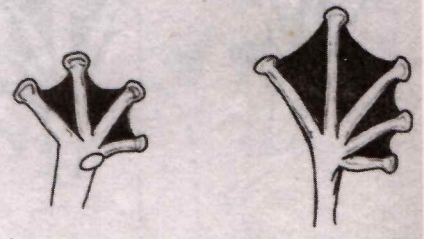


1/3 | 1



1 / 1

Rhacophorus maximus



Rhacophorus bipunctatus

TAB
TABLE SHOWING LIST OF SPECI

0 / 0	0 / at base	0 / partly	
1. Bufo brevirostris *2. Xenophrys parva* *3. X. robusta* *4. Kaloula pulchra* *5. Microhyla inoranata* *6. M. ornate* *7. Ramanella anamalaiensis* *8. R. minor* *9. R. triangularis* *10. Uperodon globulosus* *11. Nyctibatrachus minor* *12. Philautus melanensis* *13. P. shillongensis*	*1. Bufo fergusoni* *2. B. hololius* *3. B. koyanayensis* *4. B. silentvalleyensis* *5. Xenophrys kempii* *6. X. parva* *7. X. robusta* *8. Kalophrynus orangensis* *9. Kaloula baleata* *10. K. pulchra* *11. Microhyla chakrapanii* *12. M. heymonsi* *13. M. ornate* *14. Ramanella mormorata* *15. R. variegate* *16. Uperodon systoma* *17. Fejervarya rufescens* *18. Indirana phrynoderma* *19. Micrixalus gadgili* *20. Nyctibatrachus beddomii* *21. Sphaeroteca dobsoni* *22. Tomopterna rolandi* *23. Philautus andersoni* *24. P. annandalii* *25. P. garo* *26. P. glandulosus* *27. P. kempiae* *28. P. parkeri* *29. P. pulcherrimus*	*1. Scutiger occidentalis* *2. Fejervarya sauriceps* *3. Indirana leptodactyla* *4. Micrixalus nudis* *5. Rana charlesdarwini* *6. R. malabarica* *7. Philautus melanensis* *8. P. sanctisilvaticus*	

LE – I
ES WITH VARIOUS WEB PATTERNS

0 / web upto disc atleast in 1st & 2nd digits	0 / 1/4	0 / 1/3
1. *Micrixalus narainensis*	1. *Ramanella anamalaiensis* 2. *Fejervarya parambikulamana* 3. *Indirana diplosticta* 4. *I. Leptodactyla* 5. *I. Phrynoderma* 6. *Nyctibatrachus beddomii*	1. *Melanobatrachus indicus* 2. *Kaloula baleata* 3. *Microhyla rubra* 4. *Ramanella montana* 5. *Fejervarya brevipalmata* 6. *Indirana diplosticta* 7. *I. leptodactyla* 8. *Limnonectes hascheanus* 9. *Micrixalus silvaticus* 10. *Sphaeroteca leucorhynchus* 11. *Philautus bombayensis* 12. *P. charius* 13. *P. leucorhinus* 14. *P. punctatus* 15. *P. temporalis* 16. *P. travancoricus*

TABL
TABLE SHOWING LIST OF SPECIES

0 / 1/2	0 / 2/3	0 / 3/4	
1. *Ansonia kamblei*	1. *Bufo himalayanus*	1. *Bufo melanostictus*	1.
2. *Bufo camortensis*	2. *B. latastii*	2. *Indirana brachytarsus*	2.
3. *B. fergusoni*	3. *B. stomaticus*	3. *I. tenuilingua*	3.
4. *B. melanostictus*	4. *Hyla annectans*	4. *Limnonectes laticeps*	4.
5. *B. microtympanum*	5. *Fejervarya nicobariensis*	5. *L. mawphlangensis*	5.
6. *B. parietalis*	6. *Indirana beddomii*	6. *Micrixalus fuscus*	6.
7. *Pedostibes kempi*	7. *I. Leithi*	7. *M. nudis*	7.
8. *Leptobrachium smithi*	8. *Limnonectes mawlyndipi*	8. *M. opisthorhodus*	8.
9. *Scutiger sikimmensis*	9. *Nyctibatrachus deccanensis*	9. *M. thampii*	9.
10. *Microhyla rubra*	10. *N. major*	10. *Nyctibatrachus aliciae*	10.
11. *Ramanella montana*	11. *Paa blanfordiii*	11. *N. humayuni*	11.
12. *Fejervarya brevipalmata*	12. *Rana aurantiaca*	12. *N. Major*	12.
13. *F. limnocharis*	13. *R. erythraea*	13. *Paa annandalii*	13.
14. *F. murthii*	14. *R. leptoglossa*	14. *P. blanfordii*	14.
15. *F. nicobariensis*	15. *Chirixalus doriae*	15. *Nyctixalus moloch*	15.
16. *F. sauriceps*	16. *C. shyamrupus*	16. *Philautus femoralis*	16.
17. *F. syhadrensis*	17. *C. simus*	17. *P. travancoricus*	17.
18. *Indirana semipalmata*	18. *Nyctixalus moloch*		18.
19. *Limnonectes hascheanus*	19. *Philautus femoralis*		19.
20. *Micrixalus elegans*	20. *P. hassanensis*		20.
21. *M. silvaticus*	21. *P. pulcherrimus*		21.
22. *M. thampii*	22. *P. variabilis*		22.
23. *Nyctibatrachus major*	23. *Polypedates naso*		23.
24. *N. deccanensis*			24.
25. *N. sanctipalustris*			25.
26. *Rana barmoachensis*			26.
27. *R. leptoglossa*			27.
28. *Sphaeroteca breviceps*			28.
29. *S. dobsoni*			29.
30. *S. leucorhynchus*			30.
31. *Chirixalus vittatus*			31.

TABLE – I
'ECIES WITH VARIOUS WEB PATTERNS

	0 / 1	0 / 1 (2 phalenges of 4th toe free)	0 / not fully webbed
	1. Ansonia ornate *2. A. rubigina* *3. Bufo beddomii* *4. B. microtympanum* *5. Bufoides meghalayana* *6. Microhyla berdomorei* *7. Amolops chakrataensis* *8. A. formosus* *9. A. gerbillus* *10. A. himalayanus* *11. A. jaunsari* *12. A. marmoratus* *13. A. monticola* *14. Euphlyctis cyanophlyctis* *15. E. ghoshi* *16. E. hexadactylus* *17. Fejervarya andamanensis* *18. F. cancrivora* *19. F. keralensis* *20. Hoplobatrachus crassus* *21. H. tigerinus* *22. Limnonectes doriae* *23. L. kuhlii* *24. L. laticeps* *25. Micrixalus fuscus* *26. M. herrei* *27. M. kottigeharensis* *28. M. opisthorhodus* *29. M. saxicola* *30. M. swamianus* *31. Nyctibatrachus hussaini*	*1. Hoplobatrachus tigerinus* *2. Paa annandalii* *3. Rana alticola* *4. R. taipehensis* *5. R. intermedius*	*1. Paa mokokchungensis*

TAI

TABLE SHOWING LIST OF SPECI

0 / 1/2	0 / 2/3	0 / 3/4	
32. Philautus beddomi *33. P. bombayensis* *34. P. chalazodes* *35. P. charius* *36. P. elegans* *37. P. femoralis* *38. P. flaviventris* *39. P. leucorhinus* *40. P. longicrus* *41. P. nasutus* *42. P. namdaphaensis* *43. P. pulcherrimus* *44. P. signatus* *45. P. variabilis* *46. Polypedates maculates* *47. P. taeniatus* *48. Theloderma asperum*			

Rudiment / 1/2	Rudiment / 1/3	Rudiment / 2/3	
1. Pedostibes kempi *2. Philautus microdiscus* *3. Polypedates taeniatus*	*1. Philautus jerdonii* *2. P. leucorhinus*	*1. Fejervarya nicobariensis* *2. Philautus dubius* *3. P. jerdonii* *4. P. variabilis* *5. Polypedates insularis* *6. P. leucomystax*	*1.* *2.* *3.* *4.* *5.* *6.* *7.* *8.* *9.*

TABLE – I
ECIES WITH VARIOUS WEB PATTERNS

0 / 1	0 / 1 (2 phalenges of 4th toe free)	0 / not fully webbed
32. Paa mokokchungensis *33. P. liebigii* *34. P. sternosignata* *35. P. vicina* *36. Pterorana khare* *37. Occidozyga lima* *38. Rana alticola* *39. R. curtipes* *40. R. danieli* *41. R. garoensis* *42. R. livida* *43. R. malabarica* *44. R. mawphlangensis* *45. R. temporalis* *46. R. taipehensis* *47. Polypedates leucomystax*		

Rudiment / 1	At base / 1	Half / 3/4
1. Chaparana sikimensis *2. Occidozyga borealis* *3. Paa annandalii* *4. Pterorana khare* *5. Polypedates insularis* *6. P. leucomystax* *7. P. maculates* *8. P. naso* *9. Rhacophorus pleurostictus*	*1. Pedostibes tuberculosus*	*1. Chirixalus cherrapunjiae*

Half / 1	Partly / 1/4
1. Rhacophorus calcadensis *2. R. lateralis*	*1. Philautus shillongensis*

	Partly / 1	1 / 1
	1. Rhacophorus namdaphaensis	*1. Rhacophorus bipunctatus* *2. R. calcadensis* *3. R. lateralis* *4. R. malabaricus* *5. R. maximus* *6. R. pseudomalabaricus* *7. R. tuberculatus*

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TABLE – II

LIST OF AMPHIBIAN SPECIES WITH VARIOUS WEB PATTERNS

Sl.No.	Name of the species	Web pattern
	BUFONIDAE	
1.	*Ansonia kamblei* Ravichandran and Pillai	0 \ 1/2
2.	*Ansonia glandulosa* Iskandar and Mumpuni	0 \ at base
3.	*Ansonia ornate* Gunther	0 \ 1
4.	*Ansonia rubigina* Pillai and Pattabiraman	0 \ 1
5.	*Bufo beddomii* Gunther	0 \ 1
6.	*Bufo brevirostris* Rao	0 \ 0
7.	*Bufo camortensis* Mansukhani and Sarkar	0 \ 1/2
8.	*Bufo fergusonii* Boulenger	0 \ at base, 0 \ 1/2
9.	*Bufo himalayanus* Gunther	0 \ 2/3
10.	*Bufo hololius* Gunther	0 \ at base
11.	*Bufo koynayensis* Soman	0 \ at base
12.	*Bufo latastii* Boulenger	0 \ 2/3
13.	*Bufo melanostictus* Schneider	0 \ 1/2 , 0 \ 3/4
14.	*Bufo microtympanum* Boulenger	0 \ 1/2 , 0 \ 1
15.	*Bufo parietalis* Boulenger	0 \ 1/2
16.	*Bufo silentvalleyensis* Pillai	0 \ at base
17.	*Bufo stomaticus* Lutken	0 \ 2/3
18.	*Bufoides meghalayanus* (Yazdani and Chanda)	0 \ 1, 1/3 \ 1
19.	*Pedostibes kempi* (Boulenger)	0 \ 1/2, Rudiment \ 1/2
20.	*Pedostibes tuberculosus* Gunther	At base \ 1
	HYLIDAE	
21.	*Hyla annectans* (Jerdon)	0 \ 2/3
	MEGOPHRYIDAE	
22.	*Leptobrachium smithi* Matsui,Nabhitabhata & Panha	0 \ 1/2
23.	*Scutiger occidentalis* Dubois	0 \ partly
24.	*Scutiger sikimmensis* (Blyth)	0 \ 1/2
25.	*Xenophrys kempii* (Annandale)	0 \ at base
26.	*Xenophrys parva* (Boulenger)	0 \ 0
27.	*Xenophrys robusta* (Boulenger)	0 \ 0
	MICROHYLIDAE	
28.	*Melanobatrachus indicus* Beddome	0 \ 1/3
29.	*Kalophrynus orangensis* Dutta, Ahmed & Das	0 \ at base
30.	*Kaloula baleata* (Muller)	0 \ at base, 0 \ 1/3
31.	*Kaloula pulchra* Gray	0 \ at base, 0 \ 0

TABLE – II

LIST OF AMPHIBIAN SPECIES WITH VARIOUS WEB PATTERNS

Sl.No.	Name of the species	Web pattern
	BUFONIDAE	
1.	*Ansonia kamblei* Ravichandran and Pillai	0 \ 1/2
2.	*Ansonia glandulosa* Iskandar and Mumpuni	0 \ at base
3.	*Ansonia ornate* Gunther	0 \ 1
4.	*Ansonia rubigina* Pillai and Pattabiraman	0 \ 1
5.	*Bufo beddomii* Gunther	0 \ 1
6.	*Bufo brevirostris* Rao	0 \ 0
7.	*Bufo camortensis* Mansukhani and Sarkar	0 \ 1/2
8.	*Bufo fergusonii* Boulenger	0 \ at base, 0 \ 1/2
9.	*Bufo himalayanus* Gunther	0 \ 2/3
10.	*Bufo hololius* Gunther	0 \ at base
11.	*Bufo koynayensis* Soman	0 \ at base
12.	*Bufo latastii* Boulenger	0 \ 2/3
13.	*Bufo melanostictus* Schneider	0 \ 1/2 , 0 \ 3/4
14.	*Bufo microtympanum* Boulenger	0 \ 1/2 , 0 \ 1
15.	*Bufo parietalis* Boulenger	0 \ 1/2
16.	*Bufo silentvalleyensis* Pillai	0 \ at base
17.	*Bufo stomaticus* Lutken	0 \ 2/3
18.	*Bufoides meghalayanus* (Yazdani and Chanda)	0 \ 1, 1/3 \ 1
19.	*Pedostibes kempi* (Boulenger)	0 \ 1/2, Rudiment \ 1/2
20.	*Pedostibes tuberculosus* Gunther	At base \ 1
	HYLIDAE	
21.	*Hyla annectans* (Jerdon)	0 \ 2/3
	MEGOPHRYIDAE	
22.	*Leptobrachium smithi* Matsui,Nabhitabhata & Panha	0 \ 1/2
23.	*Scutiger occidentalis* Dubois	0 \ partly
24.	*Scutiger sikimmensis* (Blyth)	0 \ 1/2
25.	*Xenophrys kempii* (Annandale)	0 \ at base
26.	*Xenophrys parva* (Boulenger)	0 \ 0
27.	*Xenophrys robusta* (Boulenger)	0 \ 0
	MICROHYLIDAE	
28.	*Melanobatrachus indicus* Beddome	0 \ 1/3
29.	*Kalophrynus orangensis* Dutta, Ahmed & Das	0 \ at base
30.	*Kaloula baleata* (Muller)	0 \ at base, 0 \ 1/3
31.	*Kaloula pulchra* Gray	0 \ at base, 0 \ 0

Sl.No.	Name of the species	Web pattern
	MICROHYLIDAE	
32.	*Microhyla berdmorei* (Blyth)	0 \ 1
33.	*Microhyla chakrapanii* Pillai	0 \ at base
34.	*Microhyla heymonsi* Vogt	0 \ at base
35.	*Microhyla inornata*(Boulenger)	0 \ 0
36.	*Microhyla ornate* (Dumeril and Bibron)	0 \ at base, 0 \ 0
37.	*Microhyla rubra* (Jerdon)	0 \ 1/3, 0 \ 1/2
38.	*Ramanella anamalaiensis* Rao	0 \ 1/4
39.	*Ramanella minor* Rao	0 \ 0
40.	*Ramanella montana* (Jerdon)	0 \ 1/3, 0 \ 1/2
41.	*Ramanella mormorata* Rao	0 \ at base
42.	*Ramanella triangularis* (Gunther)	0 \ 0
43.	*Ramanella variegate* (Stoliczka)	0 \ at base
44.	*Uperodon globulosus* (Gunther)	0 \ 0
45.	*Uperodon systoma* (Schneider)	0 \ at base
	RANIDAE	
46.	*Amolops chakrataensis* Ray	0 \ 1
47.	*Amolops formosus* (Gunther)	0 \ 1
48.	*Amolops gerbillus* (Annandale)	0 \ 1
49.	*Amolops himalayanus* (Boulenger)	0 \ 1
50.	*Amolops jaunsari* Ray	0 \ 1
51.	*Amolops marmoratus* (Blyth)	0 \ 1
52.	*Amolops monticola* (Anderson)	0 \ 1
53.	*Chaparana sikimensis* (Jerdon)	Rudiment \ 1
54.	*Euphlyctis cyanophlyctis* (Schneider)	0 \ 1
55.	*Euphlyctis ghoshi* (Chanda)	0 \ 1
56.	*Euphlyctis hexadactylus* (Lesson)	0 \ 1
57.	*Fejervarya andamanensis* (Stoliczka)	0 \ 1
58.	*Fejervarya brevipalmata* (Peters)	0 \ 1/3, 0 \ 1/2
59.	*Fejervarya cancrivora* (Gravenhorst)	0 \ 1
60.	*Fejervarya keralensis* (Dubois)	0 \ 1
61.	*Fejervarya limnocharis* (Gravenhorst)	0 \ 1/2
62.	*Fejervarya murthii* (Pillai)	0 \ 1/2
63.	*Fejervarya nicobrariensis* (Stoliczka)	0 \ 1/2, 0 \ 1/3, Rudiment \ 2/3
64.	*Fejervarya parambikulamana* (Rao)	0 \ 1/4
65.	*Fejervarya rufescens* (Jerdon)	0 \ at base
66.	*Fejervarya sauriceps* (Rao)	0 \ partly
67.	*Fejervarya syhadrensis* (Dubois)	0 \ 1/2

Sl.No.	Name of the species	Web pattern
	RANIDAE	
68.	*Hoplobatrachus crassus* (Jerdon)	0 \ 1
69.	*Hoplobatrachus tigerinus* (Daudin)	0 \ 1, 0 \ 1 (2 phl of 4th toe free)
70.	*Indirana beddomii* (Gunther)	0 \ 2/3
71.	*Indirana brachytarsus* (Gunther)	0 \ 3/4
72.	*Indirana diplosticta* (Gunther)	0 \ 1/4, 0 \ 1/3
73.	*Indirana leithii* (Boulenger)	0 \ 2/3
74.	*Indirana leptodactyla* (Boulenger)	0 \ partly, 0 \ 1/4, 0 \ 1/3
75.	*Indirana phrynoderma* (Boulenger)	0 \ at base, 0 \ 1/4
76.	*Indirana semipalmata* (Rao)	0 \ 1/2
77.	*Indirana tenuilingua* (Rao)	0 \ 1/4
78.	*Limnonectes doriae* (Boulenger)	0 \ 1
79.	*Limnonectes hascheanus* (Stoliczka)	0 \ 1/3, 0 \ 1/2
80.	*Limnonectes kuhlii* (Tschudi)	0 \ 1
81.	*Limnonectes laticeps* (Boulenger)	0 \ 3/4, 0 \ 1
82.	*Limnonectes mawlyndipi* (Chanda)	0 \ 2/3
83.	*Limnonectes mawphlangensis* (Pillai and Chanda)	0 \ 3/4, 0 \ 1
84.	*Micrixalus elegans* (Rao)	0 \ 1/2
85.	*Micrixalus fuscus* (Boulenger)	0 \ 3/4, 0 \ 1
86.	*Micrixalus gadgili* Pillai and Pattabiraman	0 \ at base
87.	*Micrixalus herrei* Myers	0 \ 1
88.	*Micrixalus kottigeharensis* (Rao)	0 \ 1
89.	*Micrixalus narainensis* (Rao)	0 \ web upto disc atleast in 1st&2nd digits
90.	*Micrixalus nudis* Pillai	0 \ partly, 0 \ 3/4
91.	*Micrixalus opisthorhodus* (Gunther)	0 \ 3/4, 0 \ 1
92.	*Micrixalus saxicola* Jerdon	0 \ 1
93.	*Micrixalus silvaticus* (Boulenger)	0 \ 1/3, 0 \ 1/2
94.	*Micrixalus swamianus* (Rao)	0 \ 1
95.	*Micrixalus thampii* Pillai	0 \ 1/2, 0 \ 3/4
96.	*Nyctibatrachus aliciae* Inger, Shaffer, Koshy and Bakde	0 \ 3/4
97.	*Nyctibatrachus beddomii* (Boulenger)	0 \ at base, 0 \ 1/4
98.	*Nyctibatrachus deccanensis* Dubois	0 \ 1/2, 0 \ 2/3
99.	*Nyctibatrachus humayuni* Bhaduri and Kripalani	0 \ 3/4
100.	*Nyctibatrachus hussaini* Krishnamurthy,Reddy & Gururaja	0 \ 1
101.	*Nyctibatrachus major* Boulenger	0 \ 1/2, 0 \ 2/3, 0 \ 3/4
102.	*Nyctibatrachus minor* Inger, Shaffer, Koshy and Bakde	0 \ 0
103.	*Nyctibatrachus sanctipalustris* Rao	0 \ 1/2
104.	*Occidozyga borealis* (Annandale)	Rudiment \ 1 (except 1st and 5th digits)
105.	*Occidozyga lima* (Gravenhorst)	0 \ 1
106.	*Paa annandalii* (Boulenger)	0 \ 3/4, 0 \ 1 (2 phl of 4th toe free), Rudiment\1

Sl.No.	Name of the species	Web pattern
	RANIDAE	
107.	*Paa blanfordi* (Boulenger)	0 \ 2/3, 0 \ 3/4
108.	*Paa leibigii* (Gunther)	0 \ 1
109.	*Paa mokokchungensis* (Das and Chanda)	0 \ not fully webbed, 0 / 1
110.	*Paa sternosignata* (Murray)	0 \ 1
111.	*Paa vicina* (Stoliczka)	0 \ 1
112.	*Pterorana khare* Kiyasetuo & Khare	0 \ 1
113.	*Rana alticola* Boulenger	0 \ 1, 0 \ 1 (2 phl of 4th toe free)
114.	*Rana aurantiaca* Boulenger	0 \ 2/3
115.	*Rana barmoachensis* Khan & Tasnim	0 \ 1/2
116.	*Rana charlesdarwini* Das	0 \ partly
117.	*Rana curtipes* Jerdon	0 \ 1
118.	*Rana danieli* Pillai and Chanda	0 \ 1
119.	*Rana erythraea* (Schlegel)	0 \ 2/3
120.	*Rana garoensis* Boulenger	0 \ 1
121.	*Rana intermedius* Rao	0 \ 1 (except 4th, 5th toes)
122.	*Rana leptoglossa* (Cope)	0 \ 1/2, 0 \ 2/3
123.	*Rana livida* (Blyth)	0 \ 1
124.	*Rana malabarica* Tschudi	0 \ partly, 0 \ 1
125.	*Rana taipehensis* Van Denburgh	0 \ 1 (2 phl of 4th toe free)
126.	*Rana temporalis* (Gunther)	0 \ 1
127.	*Sphaeroteca breviceps* (Schneider)	0 \ partly, 0 \1/2
128.	*Sphaeroteca dobsoni* (Boulenger)	0 \ at base, 0 \ 1/2
129.	*Sphaeroteca leucorhynchus* (Rao)	0 \ 1/3, 0 \ 1/2
130.	*Tomopterna rolandi* (Dubois)	0 \ at base
	RHACOPHORIDAE	
131.	*Chirixalus cherrapunjiae* (Roonwal & Kripalani)	0 \ 1/2, 0 \ 3/4
132.	*Chirixalus doriae* Boulenger	0 \ 2/3
133.	*Chirixalus shyamrupus* (Chanda & Ghosh)	0 \ 2/3
134.	*Chirixalus simus* Annandale	0 \ 2/3
135.	*Chirixalus vittatus* (Boulenger)	0 \ ½
136.	*Nyctixalus moloch* (Annandale)	0 \ 2/3, 0 \ 3/4
137.	*Philautus andersoni* (Ahl)	0 \ at base
138.	*Philautus annandalii* (Boulenger)	0 \ at base
139.	*Philautus beddomii* (Gunther)	0 \ 1/2
140.	*Philautus bombayensis* (Annandale)	0 \ 1/3, 0 \ 1/2
141.	*Philautus chalazodes* (Gunther)	0 \ 1/2
142.	*Philautus charius* Rao	0 \ 1/3, 0 \ 1/2
143.	*Philautus dubius* (Boulenger)	Rudiment \ 2/3
144.	*Philautus elegans* Rao	0 \ 1/2
145.	*Philautus femoralis* (Gunther)	0 \ 1/2, 0 \ 2/3, 0 \ 3/4

Sl.No.	Name of the species	Web pattern
	RHACOPHORIDAE	
146.	*Philautus flaviventris* (Boulenger)	0 \ 1/2
147.	*Philautus garo* (Boulenger)	0 \ at base
148.	*Philautus glandulosus* (Jerdon)	0 \ at base
149.	*Philautus jerdonii* (Gunther)	Rudiment \ 1/3, Rudiment \ 2/3
150.	*Philautus hassanensis* Dutta	0 \ 2/3
151.	*Philautus kempiae* (Boulenger)	0 \ at base
152.	*Philautus leucorhinus* (Lichtenstein and Martens)	0 \ 1/3, 0 \1/2, Rudiment \ 1/3
153.	*Philautus longicrus* Rao	0 \ 1/2
154.	*Philautus melanensis* Rao	0 \ 0, 0 \ partly
155.	*Philautus microdiscus* (Annandale)	Rudiment \ 1/2
156.	*Philautus namdaphaensis* Sarkar and Sanyal	0 \ 1/2
157.	*Philautus nasutus* (Gunther)	0 \ 1/2
158.	*Philautus parkeri* (Ahl)	0 \ at base
159.	*Philautus pulcherrimus* (Ahl)	0 \ at base, 0 \ 1/2, 0 \ 2/3
160.	*Philautus punctatus* (Anderson)	0 \ 1/3
161.	*Philautus sanctisilvaticus* Das and Chanda	0 \ partly
162.	*Philautus shillongensis* Pillai and Chanda	0 \ 0, partly \ 1/4
163.	*Philautus signatus* (Boulenger)	0 \ 1/2
164.	*Philautus temporalis* (Gunther)	0 \ 1/3
165.	*Philautus travancoricus* (Boulenger)	0 \ 1/3, 0 \ 3/4
166.	*Philautus variabilis* (Gunther)	0 \ 1/2, 0 \ 2/3, Rudiment \ 2/3
167.	*Polypedates insularis* Das	Rudiment \ 2/3, Rudiment\1(except 4th toe)
168.	*Polypedates leucomystax* (Gravenhorst)	0 \ 1, Rudiment \ 2/3, Rudiment\1
169.	*Polypedates maculates* (Gray)	0 \ 1/2, Rudiment \ 1
170.	*Polypedates naso* (Annandale)	0 \ 2/3, Rudiment \ 1
171.	*Polypedates taeniatus* (Boulenger)	0 \ 1/2, Rudiment / 1/2
172.	*Rhacophorus bipunctatus* (Ahl)	1 / 1
173.	*Rhacophorus calcadensis* (Ahl)	1/2 \ 1, 1 / 1
174.	*Rhacophorus lateralis* Boulenger	1/2 \ 1, 1 / 1
175.	*Rhacophorus malabaricus* Jerdon	1 \ 1
176.	*Rhacophorus maximus* Gunther	1 \ 1
177.	*Rhacophorus namdaphaensis* Sarkar and Sanyal	Partly \ 1
178.	*Rhacophorus pseudomalabaricus* Vasudevan & Dutta	1 \ 1
179.	*Rhacophorus tuberculatus* (Anderson)	1 \ 1
180.	*Rhacophorus pleurostictus* (Gunther)	Rudiment \ 1
181.	*Theloderma asperum* (Boulenger)	0 \ 1/2

RECORD OF MANDARIN TRINKET SNAKE (*EUPREPIOPHIS MANDARINUS*) (CANTOR) AND ASSAM SNAIL EATER (*PAREAS MONTICOLA*) (CANTOR) (COLUBRIDAE: SERPENTES) FROM NAGALAND, INDIA

Rosamma Mathew
Eastern Regional Station
Zoological Survey of India
Risa Colony, Shillong – 793 003

Key words:
VR/ERS/ZSI – Vertebrata/Reptilia/Eastern Regional Station/Zoological Survey of India.

Whitaker and Captain (2004) gave an account of the Mandarin trinket snake, *Euprepiophis mandarinus* (Cantor) along with a colour picture. They have given its distribution in Changlang district of eastern Arunachal Pradesh between 500m – 3000m and have assessed its status as 'rare'.

I collected two specimens, both males, of this species (on consecutive days) from Zunheboto district of Nagaland (Alt. 1715m, Latitude N 25° 58' 45.1", Longitude E 94° 30' 24".0) on 10th and 11th (Alt.1782m, Latitude N. 25° 57' 35.04", Longitude E 94° 29' 35.04") of August 2005. These had been run over by vehicles and were picked up from the road (Zunheboto to Kohima) in Zunheboto district. The larger of the two specimens had retained the yellow colour within the dorsal markings. The smaller specimen collected on 11th had yellow colour faded to dark as observed in specimens preserved in formalin. Though damaged, the detailed scale characters including that on the head could be studied to confirm their identity. However, had it not been for the true-to-life colour picture of this species given by Whitaker and Captain in their *Snakes of India, The field Guide*, the identification would have been difficult. As stated by them, this snake could easily be mistaken for an *Oligodon* species because of its head pattern. The specimens are registered VR/ERS/ZSI/206 and 207.

Scalation

VR/ERS/ZSI/206: Scales in 21 rows; Ventrals 230; Subcaudals 69;Anal 2; Supralabials 7 (3rd and 4th touching eye); Preocular 1; Postocular 2; temporals 1+2. Dorsal marking on the body numbering 30, on tail 11. total length 1200mm, tail 210mmm.

VR/ERS/ZSI/207: Same as the above specimen except Ventral count is 224; and subcaudal count is 72. dorsal markings on the body 31, on tail 10. Total length 582mm; tail 97mm.

Picking up two dead specimens from the road on consecutive days would mean that the species is not uncommon in Nagaland. Incidentally Nagaland has the highest ratio of vehicle owners (1 vehicle for 11 people) in the country as per news paper report.

A *Pareas monticola* (Cantor) specimen was also picked up from some 50 metres away from the collection spot of the second specimen on 11th August, 2005. This too was a road-kill without much damage. It is registered VR/ERS/ZSI/220. Ao *et. al.* (2004) reported 41 species of snakes from Nagaland and the presently reported two species were not among them.

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RECORD OF *KALOULA PULCHRA* (GRAY, 1831) FROM MIZORAM, NORTH EAST INDIA WITH NOTES ON ITS BURROWING BEHAVIOUR

Saipari Sailo, B. Kharbuli and **R.N.K.Hooroo**
Department of Zoology
North Eastern Hill University
Shillong – 793 022
Meghalaya
E-mail: spsailo@yahoo.co.in

Introduction

Microhylids usually are small, but some attain snout-vent lengths of about 100 mm. The body shape varies from small headed to globular and toad-like animals to arboreal frogs with expanded tips of the digits. More than 95% of burrowing Anura dig hind feet first into the soil, a pattern unique to frogs among terrestrial vertebrates. *Kaloula pulchra* belongs to the family Microhylidae, the narrow-mouthed frogs, of the order Anura. It is also commonly known as painted bullfrog, chubby frog, Asian bullfrog, Malaysian painted frog, among others. It was first reported from India by Romer (1949) from Nagaland state, North Eastern India. It was subsequently reported from Tinsukia and Cachar District, Assam state, North Eastern India (Dutta, 1997; Dey *et. al.*, 2000) and also Cherrapunjee, East Khasi Hills District, Meghalaya, (Hooroo *et. al.*, 2002). It is also found in West Bengal, Orisa, Bihar, Madhya Pradesh, Karnataka, Tamil Nadu and Kerala. In the present survey, this frog is being recorded in the state of Mizoram which is in the North Eastern part of India (21°51' N - 24°53' N latitudes and 92°16' E - 93°26' E longitudes). The burrowing behaviour of *Kaloula pulchra* is also observed in the present study.

Methodology

Field survey was conducted from 2003-2004 in Mizoram at Sihhmui (33°48'38.5"N Latitude and 92°39'09.8"E Longitude) which is located in Aizawl district. The elevation of Sihhmui is 197 msl. The environmental factors like temperature and humidity at the time of collection were also recorded. One specimen was deposited at ZSI Shillong (Regd. No VA/ERS/ZSI/572) and morphometric measurement was taken with the help of Vernier calipers and ruler.

Results and Discussion

During the one-year survey it was found that *Kaloula pulchra* emerges just after a pre-monsoon shower. Specimens of the frog were collected during June 2004 from a slightly damp area located at Sihhmui, Aizawl district, Mizoram. The air and water temperature at the time of collection was 23° C and 26° C respectively and humidity 75%. One pair was seen in amplexus at the time of collection. The frog shows distinct sexual dimorphism, the female being larger than the male and also the neck region of the male is darker in colour in comparison to the female. All specimens show a dark brown dorsum with a yellowish brown patch extending from the tip of snout between eyes on either side of body up to the trunk, ventral surface uniformly colored in females but throat region is darker in males. Head wider than long, snout obtusely pointed, nostrils closer to the tip of snout than to eyes, tympanum indistinct; interorbital space greater than internasal width. Forelimbs slender, fingers free, tips of fingers dilated. First finger shorter than second, third finger longest, longer than snout, subarticular tubercles small and moderately prominent. Hindlimbs long, tibiotarsal articulation reaching shoulder, heels do not overlap when hindlimbs folded at right angle to the body. Tibia three and a half times as long as broad, toes with rudimentary webbing, tips of toes dilated; subarticular tubercles small; both inner and outer metatarsal tubercles present. The morphometric measurements were recorded with the help of vernier calipers and ruler and shown in Table 1.

Kaloula pulchra is nocturnal and fossorial. During the field survey, it was observed that they burrow into the cooler soil (temperature 22°C-25°C) to avoid extreme heat, and reappear with the onset of the monsoon. They emerge late in the evening to forage even in the dry season, but it is especially abundant after the rain begins. They can burrow for several feet underground if the upper surface dries out too much. It may stay in its burrow for some weeks or even months, until the next

good rain comes. At night, they come out to feed much later in dry weather than in wet. They usually hide underground during the daylight hours. This frog has a well developed metatarsal tubercles and, for burrowing, uses its hindlimbs to push the soil to either side as it shuffles backward into the soil and burrows within a minute. Their toes have adhesive tips which are adapted for both the underground and climbing lifestyles. It was also found that the frog, when disturbed, inflates its body like a balloon.

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Table 1: Morphometric measurements (in mm) of adult *Kaloula pulchra* collected from Mizoram, North East India.

No.	Morphometric measurements	Adult Male			Adult Female
1.	Total length	63	64	56	69
2.	Length of head	13	13	13	13
3.	Width of head	20	20	20	29
4.	Length of snout	6	6.5	6	7
5.	Maximum length of eye	5	5	5	8
6.	Interorbital space	6	7.5	8	8
7.	Length of arm	38	41	39	43
8.	Length of hand	19	21	20	23
9.	Length of 1st finger	11.5	13	11	13
10.	Length of 2nd finger	14	15	12	17
11.	Length of 3rd finger	19	21	20	23
12.	Length of 4th finger	16	18	17	19
13.	Length of leg	72	73	70	78
14.	Length of foot	26	28	25	29
15.	Length of 1st toe	9	12	9	13
16.	Length of 2nd toe	14	14.5	12	17
17.	Length of 3rd toe	19	20	18	23
18.	Length of 4th toe	26	28	25	29
19.	Length of 5th toe	15.5	16	15	20
20.	Length of tibia	25	26	25	27

SOME OBSERVATION ON *POLYPEDATES LEUCOMYSTAX* (GRAVENHORST, 1829) (ANURA : RHACOPHORIDAE) IN URBAN AREAS

Rakesh Soud
Department of Ecology and Environmental science,
Assam University
Silchar – 788 011
Assam
E-mail: assam_rhino@rediffmail.com
and

Raju Das
Nature's Foster
P.O. Box No.41,
Bongaigaon – 783 380
Assam
E-mail: rajuda@sancharnet.in

Polypedates leucomystax (Gravenhorst, 1829) is a widely distributed species, being recorded from India to south east Asia (Dutta, 1997). Within this range, it inhabits in both urban and semi-urban and semi-evergreen forest areas. In the forested areas they live on insect prey. Some differences were observed in the feeding habits of the species in urban areas during a year long field study on the amphibians of Bongaigoan district, Assam.

Polypedates leucomystax is common in semi-ruban areas especially near human habitation with extensive gardens. In the low lands of urban areas, which stores seasonal rainwater, herbs and other miscellaneous vegetation grow profusely and become an ideal habitat for the species. The species is often seen in gardens near the vicinity of water sources. It frequently enters bathrooms and other moist and dark parts of the house.

During the day, it hides in or within any suitable place and emerges in the dark in search of food. Apart from its natural habitat, it also shows some deflections in feeding sites in the urban areas. In urban areas the species was observed to feed on the insects attracted to lights, street lamps, sometimes even at a height of 12 feet on streetlights which is quite remarkable.

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RANDOM HARVEST

Lonesome George

It is the only known surviving example of *Geochelone elephantopus abingdoni,* one of the 11 remaining races of the Galapagos giant tortoise. It came from the small island of Pinta located in the north of the Galapagos archipelago.

The Galapagos tortoises were heavily hunted in the 19th century by the visiting whalers and sealers who found them a substantial, long lasting and convenient source of meat to be carried alive in their ships on their long voyages. To compound their misery, goats introduced into the island ate up much of the vegetation on which the tortoises depended for their food. Before long, this race of Galapagos giant tortoise was believed to have become extinct.

Then in 1971, National Park wardens came upon a solitary specimen of the race left on the island. It was rescued and transferred to the Charles Darwin Research Station on nearby Santa Cruz island in the same archipelago. Attempts to crossbreed this with other races of the same species have failed so far.

The U.S. actor George Goebel, who used to call himself 'Lonesome George', was the inspiration for the tragically appropriate name given to this solitary specimen.

The Park authorities are hoping that some individuals of the same race, including females, might still be found on Pinta and might have escaped notice so far, in which case there is still hope for George and for the Park authorities, not to mention the cause of conservation.

(Source: An article by the Charles Darwin Foundation for the Galapagos islands republished in *Voice of the Turtle* 16:10 Nov.2005. Newsletter of San Diego Turtle and Tortoise Society.)

* * *

Ancient Harriet

Harriet, a giant Galapagos tortoise kept in a zoo in Canberra, Australia, is reputed to be the world's oldest known animal. While there is some dispute over Harriet's exact age and the claim that she was brought from the Galapagos Islands by Charles Darwin, DNA evidence suggests that she was born before the famed naturalist's 1835 expedition, which would make her at least 170. For more than a century, Harriet was believed to be a male and went by the name Harry.

(Source: *Time*. Nov. 28, 2005)

Oversized baby

The largest snake in captivity is 'Baby', a Burmese python (*Python molurus bivittatus*), found in Serpent Safari, north of Chicago. It has been recently measured at 27 ft. long, so says a report in *Reptile* magazine.

(Source: *The Monitor*, Newsletter of the Hoosier Herpetological Society 16:7 July 2005.)

* * *

Unfair exchange

The *Hindu Business Line* of 27th May 2005 reports, quoting Reuters, that an Albanian fisherman has incurred the wrath of animal lovers by swapping a leatherback turtle weighing 806 kg (average weight of the species : 650 kgs) caught in his net for a used Mercedes offered by an Italian fish trader. The turtle was reportedly shipped to a zoo in Rome.

The director of the Albanian Natural Science Museum, Idriz Haxhhiu, who, under a U.N. support programme, has personally rescued some 450 turtles caught in fishing nets, has taken serious exception to this removal of an endangered turtle from the Albanian waters.

* * *

Hop, skip and 'pop!'

Aesop's fables tell the story of a bullfrog that, in a misguided attempt to impress a bull, puffed itself up more and more until it burst.

But it is not known what prompted the toads in a Hamburg pond to put on a similar performance. *The Hindu* of 6th May 2005 carried an item which stated that 1000 toads in a Hamburg pond "have puffed up and exploded ... in recent weeks". Analysis of the pond's water and the remains of the toads gave no clue as to the cause for this strange happening. "This phenomenon really doesn't seem to have appeared anywhere before", said Janne kloepper of the Hamburg - based Institute for Hygiene and Environment.

* * *

The irresponsible animal lovers

Cases are reported sometimes, more particularly from the West, of snake-lovers adopting baby pythons as pets little realizing that the cute, adorable creature will one day become a large, unmanageable python. The better-informed of the owners then gift them to a zoo. But there are also the irresponsible ones who quietly release them into some nearby vegetation hoping that everything will be all right. But everything will not be all right because the snake may be in danger of being killed by packs of stray dogs or by frightened or mischievous humans or by speeding vehicles. Equally, the snake may pose a danger to wandering domestic pets or poultry or even little children.

Writing in the Aug. 2005 issue of *The Monitor,* Newsletter of the Hoosier Herpetological Society, Ed Ferrer invites attention to "apparently irresponsible" people in Florida releasing their unwanted Burmese pythons into the Everglades resulting in a thriving population of these alien pythons there. From the mid-1990s to 2003, more than 50 Burmese pythons have been caught in the Park. Officials are currently training a dog, a beagle, named 'Python Pete', to track down the snakes by smell.

Similarly, the *New Indian Express* of 25th June 2005 carried a report from Cypress of wildlife wardens trying to track down crocodiles let loose in a popular tourist nature spot by their previous owners.

* * *

Egg-eater

In 'Random Harvest' in vol.61 (July-Sept.2005) of *Cobra*, a reference had been made, based on a news report, to the discovery of the remains of an Indian egg-eater snake (*Elachistodon westermanni*), a species not sighted since the early 1900s, in Wardha district of Maharashtra. A scientific paper on this authored by Ashok Captain, Frank Tillack, Andreas Gumprecht and Parag Dandge has appeared in the *Russian Journal of Herpetology* vol.12, No.2, 2005.

- B. Vijayaraghavan.

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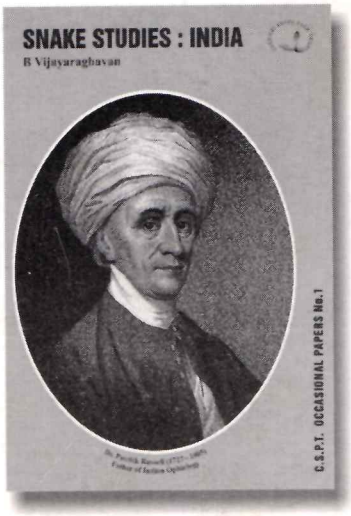

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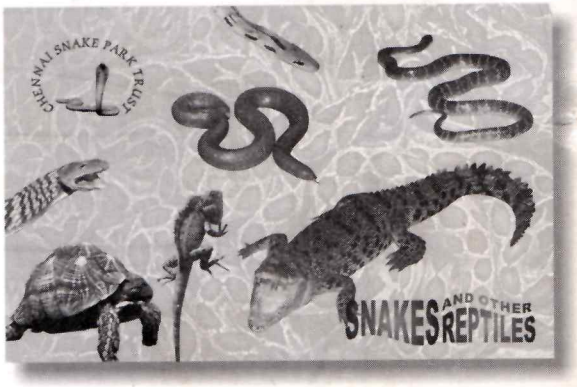

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