

TAXONOMIC AND ECOLOGICAL STUDIES ON THE  
AMPHIBIANS OF ANDAMAN AND NICOBAR  
ISLANDS, INDIA.

By

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INTRODUCTION

There is very little information about the amphibian fauna of Andaman and Nicobar Islands. Only a few isolated records and description of some new species by Stoliczka (1870), Boulenger (1890 and 1920), Annandale (1917), Smith (1941), Cherchi (1954), Pillai (1977), Mansukhani and Sarkar (1980) and Abdulali (1982) are available on the amphibians of the area. Whitaker (1978) in his cyclostyled list of herpetofauna of the Andamans merely listed some amphibians with no details.

This is the first account of amphibians of Andaman and Nicobar Islands with authentic taxonomic and ecological details. For these, material Collected from different islands of Andaman and Nicobar (between latitudes 5°40' and 14°15' N and longitudes 92°10' and 93°30' E) by eighteen surveys undertaken by both departmental and outside scientists have been taken into account for the study. As a result of this study 847 examples of anurans (679 adults and 168 tadpoles) belonging to four families, four genera and fourteen species have been determined. It includes two species of anurans namely, *Rana tigerina* and *Rana hexadactyla* which are determined by Dr. R. S. Pillai, Deputy Director, of this department, and deposited in the Collection of Andaman and Nicobar Regional Station of Zoological Survey of India. Apart from these, four species namely, *Kaloula baleata ghoshi*, *Microhyla chakrapani*, *Microhyla inornata* and *Rana hascheana* have been added to this paper to complete the list of amphibians of the area.

*List of Surveys from which material for study were obtained.*

Name of Survey	Year	Leader of Survey Party or Collector.
Andaman Survey	1930	Mr. D. D. Mukherjee
-Do-	1952	Dr. H. C. Roy
Andaman & Nicobar Survey	1959	Dr. K. K. Tiwari
Little Andaman Survey	1961	Dr. A. Daniel
Andaman & Nicobar Survey	1964	Dr. B. S. Lamba
Great Nicobar Survey	1966	Dr. A. Daniel
Andaman & Nicobar Survey	1969	Dr. T. D. Soota
-Do-	1970 &	
	1972	Dr. A. G. K. Menon
-Do-	1970 &	
	1971	Dr. B. K. Tikader
-Do-	1972	Dr. A. K. Mukherjee
Andaman Survey	1972	Dr. A. K. Mondal
Andaman & Nicobar Survey	1972	Dr. K. Reddiah
-Do-	1974-75	Dr. S. K. Bhattacharya
-Do-	1975-76	Dr. P. K. Maiti
-Do-	1976	Mr. H. Abdulali
-Do-	1977	Dr. K. K. Tiwari
-Do-	1979-80	Mr. M. K. Dev Roy
Andaman Survey	1982	Dr. S. Chakrabarti

## SYSTEMATIC ACCOUNT

Class : AMPHIBIA

Order : ANURA

Family 1 BUFONIDAE

Genus 1. **Bufo** Laurenti, 1768

Family Bufonidae is represented in Andaman and Nicobar Islands by two species of the genus **Bufo**, which can be distinguished by the following key.

More than $3\frac{1}{2}$ penultimate phalanges of the 4th. toe free, skin with numerous well-developed spiny warts. ...	<i>melanostictus</i>
$2\frac{1}{2}$ to 3 penultimate phalanges of the 4th toe free, skin with a few less developed spiny warts. ...	<i>camortensis</i>

1. **Bufo melanostictus** Schneider  
(Common Indian Toad)

1799. *Bufo melanostictus* Schneider, *Hist. Amph.* 1 : 216.

*Material* : 234 toads and 3 tadpoles. Collected from Andaman (Port Blair, Junglighat, Baratang, Wright Myo, Mount Harriet Range, Chiriatapu, Ross Island, Long Island, Interview Island, Rangat, Mayabunder, Diglipur); Little Andaman (Laitora, Tokoibrea, Kwata-in-Kwage); Car Nicobar (Kakana, Yelyanum, Tee-top); Great Nicobar (Campbell bay area, Galathea river area, Casuarina bay area, Lonna's hut Banana point, Magar nullah, Agricultural Farm, Jogindranagar). Collections have been made during the months of January to June,

*Distribution* : Andaman and Nicobar, as mentioned above. Smith (1941) recorded it from Andaman and Nicobars. *Elsewhere*, Main land of India, Pakistan, Bangla Desh, Sri Lanka, Burma, South, China and Malaysia.

*Remarks* : Big sized toad. The largest one from Andaman and Nicobar measures 122 mm. from snout to vent. Examples from Andaman, Little Andaman and Great Nicobar are stout with thick warty skin, while representatives from Car Nicobar possess elongated shape of body with less warty skin. In the months of February-March, 1969 these toads were found in good number under the street lamps in Port Blair and Mayabunder. In Car Nicobar they were found in abundance around the Nicobarese huts.

2. **Bufo camortensis** Mansukhani and Sarkar  
(Camorta Toad)

1980. *Bufo camortensis* Mansukani and Sarkar, *Bull. Zool. Surv. India* 3 (1 & 2) : 97-101.

*Material* : 34 toads (excluding Types). Collected from Nicobars (Camorta and Car Nicobar) during January, March, April, October and December.

*Distribution* : This species has so far been known from its type locality (Camorta and Nan Cowry of Nicobar Islands). Now its range is being extended upto Car Nicobar by

recording it from Malacca, Kakana, Kynuka, Chukchucha, Arong and Kimus of Car Nicobar. Abdulali (1982) reports that these toads are available in Katchal Island, Central Nicobars.

*Remarks* : Medium sized toad. The largest one from Camorta measures 90 mm. from snout to vent. Abdulali (1982) records that in life "they were strikingly paler than the common Toad (*Bufo melanostictus* Schneider) and drew further attention by attempting to climb on to the tussocks of grass in their efforts to escape. When caught, they felt very cold to the touch, another character which appeared to separate them from *melanostictus*".

#### Family II. MICROHYLIDAE

This family is represented in Andaman and Nicobar by two genera which can be distinguished by the following key :

Clavicle absent ; procoracoid present, but confined to the mesial end of the coracoid and not reaching the scapula. Maxillary and Vomerine teeth absent ...	Genus <i>Kaloula</i>
Clavicle and procoracoid absent. Maxillary teeth absent. ...	Genus <i>Microhyla</i>

#### Genus 2. *Kaloula* Gray, 1831

#### 3. *Kaloula baleata ghoshi* Cherchi (Ghosh's Painted Frog)

1954. *Kaloula baleata ghoshi* Cherchi, *Doriana*, 1 (47) : 1-4.

*Material*,—The subspecies has so far been recorded from Little Andaman Island only.

#### Genus 3. *Microhyla* Tschudi, 1838.

*Genus Microhyla* is represented by four species in Andaman and Nicobar, which can be distinguish by the following key :

1. Toes webbed. ...	2
Toes not webbed. ...	<i>inornata</i>
2. Toes with distinct discs. ...	3
Toes without discs. ...	<i>ornata</i>

3. Fingers not dilated into discs, a fine mid-dorsal white line from snout to vent, and sharply defined ( )-shaped dark spots at the centre of dorsum absent. ... *chakrapani*
- Fingers dilated into small terminal discs, a fine mid-dorsal white line from snout to vent, and sharply defined ( )—shaped dark spots at the centre of dorsum present. ... *heymonsi*

#### 4. *Microhyla inornata* Boulenger

1890. *Microhyla inornata* Boulenger, *Proc. Zool. Soc. London*, p. 37.

*Material* : Pillai (1977) records it on a juvenile grog (10mm from snout to vent) from South-Point, Port Blair, Andaman.

*Distribution* : Andaman and Nicobar,—as mentioned above.

*Elsewhere* : Burma, Thailand, Vietnam, Malaysia and Sumatra.

#### 5. *Microhyla ornata* (Dumeril and Bibron) (Ornate Microhylid)

1841. *Engystoma ornatum* Dumeril and Bibron, *Erpet. Gen.*, 8 : 745.

*Material* : 28 frogs. Collected from Andamans, Port Blair (Dairy farm, Zoo-Garden, Juuglighat), Humphryung, Baratang and Mayabunder. Collection have been made during January to April.

*Distribution* : Andaman and Nicobar, as mentined above. It is being recorded for the first time from Andaman.

*Elsewhere* : It is a widely distributed species in the mainland of India. Also Sri Lanka, Burma, South China, South-East Asia and Taiwan.

*Remarks* : Small sized frog. The largest one from Andaman measures 23 mm. from snout to vent. In March/April, 1969 these tiny frogs are found to be busy with mating call near the edge of water both in Port Blair and Mayabunder. They are nocturnal in habit and found under stone and inside crevices during the day, but not with the

association of *Rana limnocharis* and other frogs. The examples from South Andamans are with stout physique in general, but three examples collected from Mayabunder are with slender physique. Dorsum more or less smooth and reddish-brown with darker patches. Ventrums smooth and brownish with darker spots on the throat and breast. Tibiotarsal articulation of four examples from Port Blair and three examples from Mayabunder reaches beyond the eye.

#### 6. *Microhyla chakrapani* Pillai

1977. *Microhyla chakrapani* Pillai, *Proc. Indian Acad. Sci.*, 86B (2) : 135-138

*Material* : This species has been described on a single adult male frog from Mayabunder, North Andaman and the specimen is still in author's disposal. I have not seen the specimen.

#### 7. *Microhyla heymonsi* Vogt

1911. *Microhyla heymonsi* Vogt, *Sitzber, Ges. Natf. Fr. Berlin*, : 181.

*Material* : 1 frog. Collected from Campbell Bay, Great Nicobar, 25.iv.1966. Coll. A. Daniel.

*Distribution* : Andaman and Nicobar. As mentioned above. It is recorded for the first time from the area. *Elsewhere* : Taiwan, South China, Hainan, Tonkin, Thailand, Vietnam, Malaysia, Nias and Sumatra.

*Remarks* : Small sized frog measuring 19 mm. from snout to vent. The specimen has been collected on ground. The specimen tallies the species in all the characters except in glandular fold from the posterior corner of the eye to the forelimb, which is not clear in the specimen. The tibiotarsal articulation reaches the end of the snout in the specimen.

### Family III. RANIDAE

#### Genus 4. *Rana* Linnaeus, 1766.

Family Ranidae is represented in Andaman and Nicobar Islands by seven species and two sub-species/varieties of the genus *Rana*, which can be distinguished by the following key.

1.	Toes webbed upto the tips	...	<i>hexadactyla</i>
	Toes webbed not upto the tips.	...	2
2.	Tips of toes swollen or pointed, but not with discs.	...	3
	Tips of toes with discs.	...	6
3.	Toes entirely webbed almost near the tips.	...	<i>tigerina</i>
	Toes not entirely webbed.	...	4
4.	Generally one penultimate phalange of fourth toe free, no outer metatarsal tubercle.	...	<i>cancrivora</i>
	Generally more than two penultimate phalanges of fourth toe free, an outer metatarsal tubercle generally present....		5
5.	Dorsal surface of the head and body not rich in chestnut-brown Colour.	...	<i>imnocharis</i>
	Dorsal surface of head and body rich in chestnut-brown colour.	...	<i>andamanensis</i>
6.	When adult, a broad/moderately broad and prominent glandular dorso-lateral fold from above the tympanum to the hip present.	...	7
	When adult, a broad/moderately broad and prominent glandular dorso-lateral fold from above the tympanum to the hip absent	...	8
7.	Tibia as long as or shorter than foot. A small outer metatarsal tubercle very rarely present	...	<i>erythraea</i>
	Tibia usually longer than foot, never shorter. A round outer metatarsal tubercle present	...	<i>nicobariensis</i>
8.	Nostril much nearer to the end of the snout than the eye. Tips of fingers obtuse or slightly swollen at the end, not dilated into discs	...	<i>macrodon</i> var. <i>blythii</i>
	Nostril nearly equidistant from the eye and the tip of the snout. Tips of fingers normally dilated into very small discs ..		9
9.	Toes 3/4 to nearly entirely webbed, 1 or 2 phalanges of the 4th toe free	...	<i>doriae</i>
	Toes 1/3 to 1/2 webbed, 3 phalanges of the 4th toe free	...	<i>hascheana</i>

8. **Rana hexadactyla** Lesson  
(Pond Frog)

1834. *Rana hexadactyla* Lesson, in Belang, *Voy, Indian or., Rept.*  
: 331.

*Material* : 1 frog, Collected from Carbyn's Cave, Andaman, 6.ii.1980. Coll. K. K. Tiwari.

*Distribution* : Andaman and Nicobar : As mentioned above. It is being recorded for the first time from Andaman.

*Elsewhere* : Indian Mainland and Sri Lanka.

*Remarks* : The specimen is in the disposal of Andaman and Nicobar Regional Station of Zoological Survey of India at Port Blair.

9. **Rana tigerina** Daudin  
(Indian Bull Frog)

1803, *Rana tigerina* Daudin, *Hist. Rain. Gren, Crap.*, : 64.

*Material* : 1 frog. Collected from Krishna Nagar, Have-lock, Andaman, 10.iv.1980. Coll. H. L. Das.

*Distribution* : Andaman and Nicobar : As mentioned above. *Elsewhere* : Indian Mainland, Nepal, Burma, Thailand, South China and Taiwan.

*Remarks* : The specimen is in the disposal of Andaman and Nicobar Regional Station of Zoological Survey of India, Port Blair.

10. **Rana cancrivora** Gravenhorst  
(Crab-eating Frog)

1829. *Rana cancrivora* Gravenhorst, *Deiic. Mus. zool, Vratisl.*, 1 : 41.

*Material* : 1 frog. Wright Myo, South Andaman, 20.iv.1977. Coll. K. K. Tiwari.

*Distribution* : Andaman and Nicobar : As mentioned above. The species is being recorded for the first time from the area. *Elsewhere* : Malaysia, Philippines, Thailand, Borneo, Java and Sumatra.

*Remarks* : Medium sized frog. The specimen measures 74 mm. from snout to vent. It possesses the following remarkable characters. Tibio-tarsal articulation reaches anterior border of eye. Toes not completely webbed, two



penultimate phalanges of fourth-toe free. Dorsum smooth with no longitudinal fold and brownish with light darker spots. Ventrums smooth and dull whitish in colour. Skin on dorsum is loose, and with lateral flaps, breadth of which at the middle of the body in preserved specimen is about 6-7 mm. These lateral flaps run from behind the eye to the vent, on both the sides of the body.

### 11. *Rana limnocharis* Boie (Paddy-field Frog)

1835. *Rana limnocharis* Boie Wiegmann, *N. Acta. Ac. Leop. Carol.*, 16 (1) : 255.

*Material* : 279 frogs and 165 tadpoles. Collected from Andaman (Port Blair, Humphrygunj, Interview Island, Baratang Island, Mayabunder), Car Nicobar (I. A. F. Camp), Great Nicobar (Campbell Bay). Collections were made during the months of January to July.

*Distribution* : Andaman and Nicobar : As mentioned above. Only one example is being recorded here from Car Nicobar. The species is being recorded for the first time from Andaman and Nicobar Islands.

*Elsewhere* : Mainland of India, Eastern Asia from Pakistan, Nepal, Sri Lanka and China to Japan,

*Remarks* : Medium sized frog. The largest one from Great Nicobar measures 59 mm. (from Andaman 52 mm.) from snout to vent.

In March/April 1969 I got the opportunity to survey the Islands of Andaman and Car Nicobar and found that these frogs are very common on moist grassy land, open drains and inside the ditches at Port Blair and Mayabunder. They are nocturnal in habit and have been collected under stones and inside crevices.

In general, these frogs from Andamans are with stouter physique. Variations are found on the external characters. Seven examples out of thirty collected from Dairy farm (Port Blair) in 1969 possess reddish-brown mid-dorsal broad stripe from snout to vent, but others do not have. Most of the

examples are with stout fore limbs that possess thick palmer pads and highly developed subarticular tubercles. Upper skins of some frogs are thickly tuberculated. Inner metatarsal tubercles of most of the examples are well developed and strong, so the frogs might be possessing digging habits. Dorsum rough and darker. Ventrums smooth and reddish-brown, pinkish tinge on the undersurface of the hind limbs.

Examples from Great Nicobar possess the following remarkable characters. Body elongated; head a little broader than long; web reaches to the base of the third penultimate phalange of the hind limb. Inner metatarsal tubercle distinct, oval, not digging-form; outer metatarsal tubercle nearly indistinct. Skin on dorsum smooth with a few elongated warts followed by some small tubercles; ventrum smooth with the lower part of belly slightly tuberculated. Darker above with a few dull whitish spots behind the head, mid-dorsal yellowish stripe absent; throat and undersurface of lower lip spotted with chocolate, belly brownish.

### 12. *Rana andamanensis* Stoliczka

1870. *Rana gracilis*, var *andamanensis* Stoliczka, *J. Asiat. Soc. Bengal*, 39 : 143.

*Material* : 11 frogs. Collected from Andaman (Port Blair and Baratang Island) during January to April.

*Distribution* : Andaman and Nicobar : As mentioned above.

*Remarks* : It is closely allied to *Rana limnocharis* excepting its chocolate-brown dorsal surface which is demarcated laterally by darker coloration. Sometimes a lateral fold, often interrupted, separates the two areas of different colorations.

At Port Blair these frogs are found to roam in association with *Rana limnocharis* at night and spend in the same crevices in daytime.

### 13. *Rana erythraea* (Schlegel) (Leaping Frog)

1837. *Hyla erythraea* Schlegel, *Abbild.* : 27.

*Material* : 12 frogs, Campbell Bay, Great Nicobar, 27.iii.1977. Coll. K. K. Tiwari.

*Distribution* : Andaman and Nicobar : As mentioned above. It is being recorded for the first time from the area.

*Elsewhere* : Indian Mainland and South-east Asia including Borneo and Sumatra.

*Remarks* : Medium sized frog. Largest one from great Nicobar measures 50 mm. from snout to vent. In general the specimens from the area are with darker dorsum. The white-yellow dorsolateral folds are not very prominent as in the mainland forms.

The specimens have been collected from a hill stream puddle with aquatic vegetations.

#### 14. *Rana nicobariensis* (Stoliczka) (Nicobar Frog)

1870. *Hylorana nicobariensis* Stoliczka, *J. Asiat. Soc. Bengal*, 39 : 150.

*Material* : 57 frogs. Collected from Car Nicobar : 1 ex., Yelyanum Forest, 10.iii.1969 ; 8 ex., Forest area, 13.iii.1969 ; 29 ex., Dense Forest, Ca. 2 km. South-east of Tee-top, 15.iii.1969. All coll. T. D. Soota & A. K. Sarkar. 13 ex., Tee-top, 23.ii.1972, A. K. Mukherjee. 4 ex., -.ii.1976, H. Abdulali. 2 ex., Campbell Bay, Great Nicobar, 27.iii.1977, K. K. Tiwari.

*Distribution* : Andaman and Nicobar,—As mentioned above. *Elsewhere* : Sumatra, Malaysia, Borneo, Mentavei and Java.

*Remarks* : Medium sized frog. The largest one from Great Nicobar measures 52 mm. from snout to vent. The frogs are soft and delicate bodied. At Car Nicobar in March 1969 author found them in good number hopping on moist ground wrapped with rotton leaves inside deep forest. The area is shaded with thick canopy made by lofty trees where penetration of sunlight is very poor. As a result the frogs could not be traced properly even in a bright sunny-day. In life the frogs are not veay active, and they are darker

in colour. Dorso-lateral glandular folds of the examples from Great Nicobar are feebly prominent.

15. ***Rana macrodon* var. *blythii* Boulenger**

1920. *Rana macrodon* var. *blythii* Boulenger, *Rec. Indian Mus.*, 20 : 43.

*Material* : 1 frog, Tribeni Nullah, Campbell Bay, Great Nicobar, 30.iii.1977, Coll. K. K. Tiwari.

*Distribution* : Andaman and Nicobar : As mentioned above. It is being recorded for the first time from the area and as well as from India too. *Elsewhere* : Burma, Thailand, Sumatra, Borneo, Philippines.

*Remarks* : Medium sized frog. The specimen measures 56 mm. from snout to vent. It has been collected from a marshy nullah with water weeds.

16. ***Rana doriae* Boulenger**

1887. *Rana doriae*, Boulenger, *Ann. Mus. Genov.* 5 (2) : 482.

*Material* : 16 frogs. Collected from Andaman : 2 ex., Andaman, 15.ix.1870, coll. F. Stoliczka. 2 ex., 3.i.1873, coll. Dobson & Wood-mason. 3 ex., Thick jungle, West of Mount Harriate, South Andaman, -.xi.1923, coll. N. Annandale. 1 ex., Rutland Island, 6 km. from Chiriatapu, 19.vii.1972 ; 4 ex., Wright Mayo, S. Andaman, 25-26.vii.1972. All coll. A. K. Mondal. Nicobar : 1 ex., 15.ix.1870, coll. F. Stoliczka. Great Nicobar : 3 ex., Campbell Bay, 27.iii.1977, coll. K. K. Tiwari.

*Distribution* : Andaman and Nicobar,—As mentioned above. *Elsewhere* : Tenasserim, Thailand and Malaysia.

*Remarks* : Medium sized frog. The largest one from Andaman measures 57 mm. (from Great Nicobar 49 mm.) from snout to vent. Toes of the frogs from Andamans 2/3 webbed, and with small but distinct disc at the tips, two penultimate phalanges of the fourth toe mostly free. Two examples from Andaman are with smooth skin possessing very thin and faint elongated interrupted warts, while others are with warty skin, of which two examples possess broad yellow-

wish mid-dorsal stripe. Colouration of the specimens is dark-greyish above and deep brownish below.

Most of the specimens have been collected from marshy areas of the deep forests in South Andaman.

17. ***Rana hascheana*** (Stoliczka)

1870. *Polypcdates hascheanus* Stoliczka, *J. Asiat Soc. Bengal*, 39 : 147.

*Distribution* : Andamans. Also Malaysia.

*Remarks* : I have got no specimen in my disposal. Boulenger (1920) separated one of the types of *Rana gracilis* var. *andamanensis* Stoliczka, 1870 and referred to this species.

Family IV. RHACOPHORIDAE

This family is represented in Andaman and Nicobar by one species of the genus *Rhacophorus*.

Genus 5. ***Rhacophorus*** Kuhl, 1827.

18. ***Rhacophorus leucomystax*** (Kuhl)  
(Tree Frog)

1829. *Hyla leucomystax* Kuhl in : C. Gravenhorst, *Delic. Mus. vrbatislav*, : 26.

*Material* : 1 ex., Campbell Bay, Great Nicobar, 6.iii.1966, coll. A. Daniel. 2 ex., Campbell Bay, Great Nicobar, 27.iii. 1977, coll. K. K. Tiwari.

*Distribution* : Andaman and Nicobar : As mentioned above. It is being recorded for the first time from the area, *Elsewhere* : Indian Mainland and South-east Asia including South China.

*Remarks* : Medium sized frog. Largest one from Great Nicobar measures 70 mm. from snout to vent. In general, the specimens from the area are with smooth dorsum. Belly and skin around the vent granulated. Specimen collected by Dr. Daniel is light-brownish in colour and with some chocolate spots on the dorsum. But the examples collected by Dr. Tiwari are with darker dorsum, and dull brownish ventrum with a few darker spots on the gular region.

## SUMMARY

This paper deals with the Amphibian fauna of Andaman and Nicobar Island based on the collections mainly made by various survey-parties of the Zoological Survey of India. It consists of 847 examples of Anurans (Frogs and Toads) belonging to four families, four genera and eighteen species (including three species/subspecies of the family Microhylidae described by Dr. Pillai and Dr. Cherchi, and one species of the genus *Rana* described by Stoliczka). Of these, *Microhyla ornata*, *Microhyla heymonsi*, *Rana cancrivora*, *Rana limnocharis*, *Rana erythraea*, *Rana macrodon* var. *blythii* and *Reacophorus leucomystax* are recorded for the first time from Andaman and Nicobar Islanas, and *Rana macrodon* var. *blythii* for the first time from Indian soil too.

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Amphibians of Andaman and Nicobar Islands are only represented by the order Anura.

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