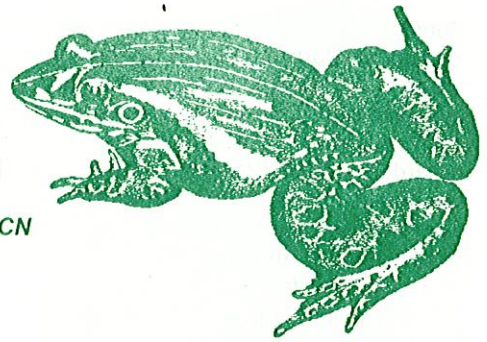


FROG LEG

Newsletter of the Declining Amphibian Populations Task Force, South Asia
Regional Network of the Declining Amphibian Populations Task Force, SSC, IUCN

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Stream amphibian assemblages in the rainforests of Kalakad Mundanthurai Tiger Reserve, southern India

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This study is part of an ongoing project in the southern Western Ghats aimed at understanding the effects of rainforest fragmentation on the biological diversity. During September '96 to August 1997 the objective of the study was to identify factors which affect amphibian diversity in the contiguous forest in Kalakad-Mundanthurai Tiger Reserve (KMTR). KMTR encompasses the only contiguous rainforest (area ca.300 sq. km) in the southern Western Ghats.

I sampled leaf litter amphibians using 'quadrats', stream amphibians using 'visual encounter surveys' and for arboreal amphibians using 'audio survey'. Opportunistic sightings of species were also recorded. A total of nine hundred, 5x5 m quadrates, 63 stream surveys of six sites (two in each drainage) and 34 hours of call recordings were carried out in an altitude range of 700 to 1200 m. Samples were stratified to represent three drainages (Sengaltheri, Kakachi and Kannikatti) and three seasons (south west monsoon, north east monsoon and summer). During the study period 32 species were recorded in the rainforests of KMTR. Species richness and abundance among stream amphibians was highest during the south-west monsoon (June-September) in the three drainages. I used correspondence analysis to demonstrate separation of the drainages based on their species composition. The microhabitats occupied by stream amphibians *Nyctibatrachus major*, *N. aliciae*, *N. sanctipalustris*, *Micrixalus saxicola* and *Rana temporalis* were different, but, the streams in the three drainages did not differ in the availability of microhabitats. This suggests that availability of microhabitats in the three drainages did not explain the difference I observed in amphibian distribution. Further, Sorensen's index of species overlap between sites showed weak

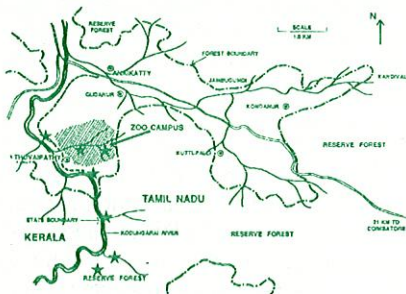
negative correlations with increasing distance and difference in altitude. Even after controlling for this, the species overlap between drainages (Mean=0.32, SD=0.17) was significantly lower than within drainages (Mean=0.92, SD=0.07; ANOVA, $F=14.9$, $P<0.01$).

Earlier studies in the region demonstrated that species overlapped least among hill ranges. This study suggests that amphibian assemblages change across drainages within a hill range. Hence, it is hypothesized that the low species overlap among drainages is the rea-

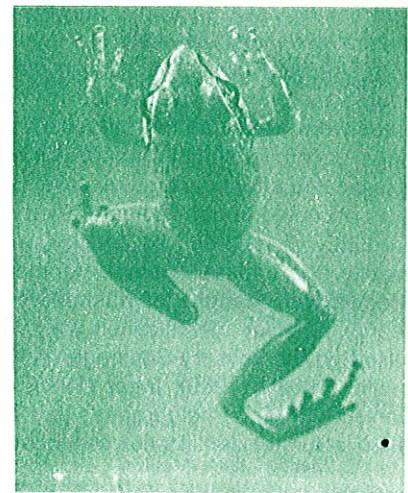
son for the high amphibian species richness in the Western Ghats, but low richness in any locality. The amphibian fauna of KMTR would be a subset of the species richness in the entire Western Ghats. The high endemism of amphibians in the Western Ghats (76% out of 120 species) could be due to the collective representation of such locality factors. During the second phase of this study, forest fragments in Anamalais will be sampled for effect of area and disturbance on the amphibian diversity and the hypothesis on the distribution of stream amphibians will be tested.

Amphibian fauna of Coimbatore Zoological Park Site in Anaikatty and nearby areas in the Western Ghats

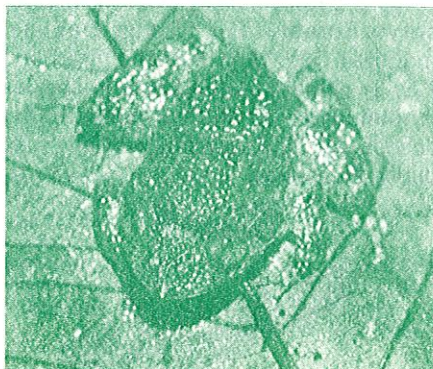
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Coimbatore Zoo site and the area surveyed in the Western Ghats



Indirana beddomei



Nyctibatrachus aliciae



Rana temporalis

Surveys of the amphibians of Coimbatore Zoological Park (CZP) site and nearby areas of disturbed and undisturbed habitats were carried out during March-August 1997. A total of 19 frogs and toads was recorded. In undisturbed areas many rare, semi-aquatic and terrestrial species were present, most of them belonging to family Ranidae. In disturbed areas, most of the species found were common and not very much sensitive to habitat variations.

Study site

Preliminary surveys were carried out at CZP site and along the Kodungarai River in Anaikatty (11°6'N, 76°45'E) [Figure 1] and nearby areas (i.e. Sholayur and Mukkali) in the Western Ghats, southern India. The site lies in the catchment area in the Perinaickenpalayam Reserve Forest, between altitude 600-700 m above sea level. The ambient temperature ranges from 22°C to 35°C during day time. The average annual rainfall at the locality is around 1,200 mm. While the dense thorn forest dominate the reserve forest area, the zoo site is barren, except for thickets of bamboo, *Dendrocalamus strictus*, *Jatropha*, *Pongamia* and *Zizyphus*, along the dry nullah.

Survey methods

In March to August 1997, amphibians were surveyed during day and night searches. Night searches were done by using torch-light. During visual encounter surveys and quadrat sampling [5x5 meters] (Heyer *et al.* 1994), decaying leaf litter, fallen leaves, boulders along the river, sand in moist areas were examined for refuges. During visual encounter surveys individuals were also located after hearing their calls. Field work occupied about 62 hours. Every individual was recorded by species, date, locality and habitat. A small number of species were caught for husbandry research. Species identification was done based on the keys by Boulenger (1890), Daniel (1963 & 1989), Inger (1986) and Daniels (1997). Photographs were also taken for further identification confirmation.

Results and discussion

A total of 19 species belonging to 3 families were recorded (Table 1). Of these 2 were Microhylids, 3 Bufonids and 14 Ranids. At least 7 of the 19 species are endemic to the Western Ghats. Of the total number of species Microhylids *Micohyla rubra* and *Uperodon systoma* were exclusively found at CZP site along the nullah and reserve forest boundary. *Bufo beddomei* was found at Mukkali in evergreen forest areas and *Bufo fergusoni* in moist deciduous forest in Sholayur and *Bufo melanostictus* at CZP site. In case of endemic Ranids *Indirana beddomei* and *Indirana brachytarsus* were found at CZP

site and the rest from evergreen forest of Mukkali.

The habitat types in the study areas fall into the following categories.

FOREST TYPES

1. Tropical Wet Evergreen Forest

HABITAT TYPES

- a. Forest
- b. Riverine
2. Moist Deciduous
 - a. Disturbed Forest
 - b. Riverine For.
3. Thorn Forest
 - a. Kodungarai Forest
 - b. Ravine
 - c. CZP site
 - i. nullah
 - ii. planted areas
 - iii. man made wells

The preliminary results suggest that species richness and abundance of amphibian species was close to moist areas at CZP site and Anaikatty. The *Bufo melanostictus* was seen common in dry areas. Both endemic frogs were found along the Kodungarai river in disturbed habitat. The remainder five endemic frogs seem to depend upon moist deciduous and evergreen forest. The mukkali region shows richness of endemism. The observations also reveals that amphibian species in disturbed environment supports the idea that they may adapt to altered environment.

The possible threat to amphibian species in surveyed area may be removal of topsoil in large quantity by brick industries, use of chemical fertilizers and pesticides and human interference (cutting of trees) in the reserve forest which ultimately results in habitat loss.

Acknowledgement

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Table 1. Status of amphibian species recorded during field surveys at Coimbatore Zoological Park site and nearby area during March-August 1997.

Species	Status*
<i>Bufo melanostictus</i>	LRnt
<i>Bufo beddomei</i> *	LRlc
<i>Bufo fergusoni</i>	LRlc
<i>Micohyla rubra</i>	LRnt
<i>Uperodon systoma</i>	LRnt
<i>Euphlyctis cyanophlyctis</i>	LRnt
<i>Euphlyctis hexadactylus</i>	LRnt
<i>Hoplobatrachus crassus</i>	LRnt
<i>Indirana beddomei</i> *	VU
<i>Indirana leptodactyla</i> *	LRnt
<i>Indirana semipalmata</i> *	VU
<i>Indirana leptodactyla</i> *	LRnt
<i>Indirana brachytarsus</i> *	VU
<i>Limnonectes keralensis</i>	VU
<i>Limnonectes rufescens</i>	LRnt
<i>Nyctibatrachus aliciae</i> *	• VU
<i>Rana temporalis</i>	NE
<i>Tomopterna rolandae</i>	Lrnt
<i>Rana sp.</i>	??

* - Endemic to Western Ghats

VU - Vulnerable, LRnt - Lower Risk near threatened, LRlc - Lower Risk least concern.

(The status assessment were given, using the IUCN Red List Criteria, from the recently conducted Conservation Assessment and Management Plan (CAMP) Workshop held for Amphibians of India).



Amphibian Resource List for South Asia

This list includes all known amphibian researchers in south Asia. There are 131 amphibian researchers from within south Asia and 8 foreigners who have either studied or are studying amphibian fauna or are working towards their conservation in the region. Some of these researchers may currently not be involved in amphibian studies but have had studied in the past and are willing to take up work in the future. Also included are names of foreign researchers who have had some experience in studying amphibian of the region, either field work or taxonomy.

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