# Anurans Collected in West Malaysia

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*Abstract.* - Distributional records and natural history notes are given for anurans collected in West Malaysia 1976. *Rana baramica* was observed when it was caught by an *Ahaetulla nasuta* (Serpentes: Colubridae). *Rhacophorus leucomystax*, *Limnonectes limnocharis* and *Microhyla heymonsi* were all found at night on September 16-17, when they were spawning in shallow ditches, formed by the wheels of a truck. *Amolops larutensis* were day active and occurred in the shadow, among stones in a forest stream, particularly close to water falls and rapids. Several white foam nests with a diameter of 5-7 cm were deposited on the same stones just above the water surface on August 27. Other species observed were *Bufo melanostictus*, *Bufo asper*, *Leptobrachium hasseltii*, *Kaloula pulchra*, *Limnonectes laticeps*, *Limnonectes macrodon*, *Rana erythraea*, *Rana glandulosa*, *Rana nicobariensis*, and *Rhacophorus prominanus*.

*Key words*: Amphibia, Anura, West Malaysia.


Figure 1. West Malaysia: The collecting sites are marked with a dot (•). Scale bar = 100 km.

## Introduction

The amphibian fauna of peninsular Malaysia is covered by some books (Berry 1975; Boulenger 1912; Smith 1930) and articles published thereafter (e.g., Arak 1984; Dring 1979; Kiew 1979; Inger 1980a, b; Lim 1990). New species have been described in the area during the last decades, e.g., *Kalophrynus palmatissimus* Kiew, 1984b, *Rana malesiana* Kiew, 1984c and *Rhacophorus tunkui* Kiew, 1987, which indicates that much more work still remains to be done. Most of the existing publications deal with systematics. The fauna is rich and contains many interesting species, however, most of them are not studied in detail according to aspects of their distribution, natural history and ecology.

The nature in Malaysia is now undergoing radical and large-scale changes. Most of them are effects of an increasing human population, industrialization, changes of the vegetation over large areas, and the massive use of biocides (Aiken and Leigh 1992; Cranbrook 1988; Cubitt and Payne 1990; Yussof 1987). These factors probably threaten the amphibians (Kiew 1984a) in similar ways as, e.g., the fish fauna (M. Zakaria-Ismail 1994; Ng et al. 1994; Rösler 1988). An increased field work is therefore motivated, so that the degree of habitat destruction is documented and necessary conservation measures can be done. This contribution contains some notes on the geographical distribution and natural history of several amphibians collected in Malaysia 1976.

## Material and Methods

Collecting sites are listed in Table 1, and marked on the map (Fig. 1). The positions were plotted from the map of Malaysia, published by the Director of National Mapping, Malaysia, 1976, series 1307, edition 5-PPNM, sheet 1, scale 1:760,000. The specimens were preserved in formalin, identified by the use of Berry (1975), verified by Dr. Lim Boo-Liat, and deposited at Department of Medical Ecology, Institute

Table 1. Sampling stations.

| | |
|---|---|
| Field Study Center, University of Malaysia, Ulu Gombak, Selangor | 101°45'E; 3°17'N |
| Biological Field Station, Kota Tinggi, Johore | 103°50'E; 1°50'N |
| Kuala Brang, Trengganu | 103°01'E; 5°04'N |
| Kuin, about 4 miles SW of Marang, Trengganu | 103°10'E; 5°09'N |
| Bukit Besar, Kuala Trengganu, Trengganu | 103°07'E; 5°20'N |
| Malacca Youth Hostel, 9 miles north of Malacca city | 102°10'E; 2°14'N |
| Portugese settlement, Malacca | 102°17'E; 2°10'N |
| Kuala Lumpur Youth Hostel, Jalan Ipoh, Kuala Lumpur, Selangor | 101°44'E; 3°09'N |

for Medical Research in Kuala Lumpur, Malaysia. The nomenclature follows Frost (1986) and later changes summarized by Duellman (1993).

## Results

### *Bufo melanostictus* Schneider, 1799

Malacca Youth Hostel, July 29, 1976 (3 specimens); Portugese settlement, Malacca, July 29, 1976 (1 specimen); Kuala Lumpur Youth Hostel, August 5, 1976 (1 specimen), and September 29, 1976 (4 specimens). All specimens were found in urban areas or other environments affected by human activities.

### *Bufo asper* Gravenhorst, 1829

Kuala Brang, August 27, 1976 (1 adult specimen), and August 28, 1976. (1 juvenile specimen); Field Study Center of the University of Malaysia, Gombak, September 14, 1976 (1 juvenile specimen). Several other adult specimens, except the collected one, were observed in the day, sitting on rocks 2-3 m above a small river. They were very shy and jumped into the water when disturbed, but returned to their rocks, within 10-30 minutes. The juvenile specimens were collected on the ground at night.

### *Leptobrachium hasselti* Tschudi, 1838

Kuin, August 24, 1976 (1 specimen). It was found on the ground close to a stream in a primary forest.

### *Kaloula pulchra* Gray, 1831

Kuala Lumpur Youth Hostel, August 6, 1976. (1 specimen).

### *Microhyla heymonsi* Vogt, 1911

Kuala Brang, August 26, 1976 (1 specimen); Field Study Center of the University of Malaysia, Gombak, September 17, 1976 (6 specimens). The specimen from Kuala Brang was jumping in the leaf litter of an open secondary forest. The specimens from Gombak were 3 pairs in amplexus found in shallow ditches between 8.30 and 10.30 p.m.

### *Amolops larutensis* (Boulenger, 1899)

Kuala Brang, August 27, 1976 (13 specimens). The frogs were active in the day, jumping in the shadow between the stones (Fig. 2) in a rapid stream particularly close to waterfalls (Fig. 4), and disappeared in the water when disturbed. Several white foam nests with a diameter of 5-7 cm were found on the same stones, just above the water level (Fig. 3).

### *Limnonectes laticeps* (Boulenger, 1882)

Field Study Center of the University of Malaysia, Gombak, September 17, 1976 (1 specimen). It was found in the day, jumping in the leaf litter in a primary forest not far from a stream.

### *Limnonectes limnocharis* (Boie, 1835)

Portugese Settlement, Malacca, July 30, 1976 (5 specimens); Kuin, August 23, 1976 (3 specimens); Kuala Brang, August 25, 1976 (1 specimen) and August 28, 1976 (3 specimens); Bukit Besar, Kuala Trengganu, September 27, 1976 (1 specimens); Field Study Center of the University of Malaysia, Gombak, September 17, 1976 (8 specimens); Biological Field Station, Kota Tinggi, September 20, 1976 (1 specimens). They were all found in areas affected by human activities. The 8 specimens from Gombak were males, actively croaking in water filled ditches.

Figure 2. *Amolops larutensis*, Kuala Brang, Trengganu. The day active frog jumped in the shadow among the stones in a stream.

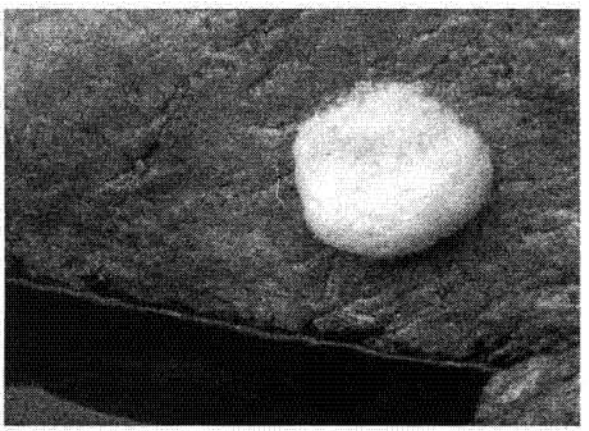

Figure 3. Egg mass of *Amolops larutensis*, Kuala Brang, Trengganu

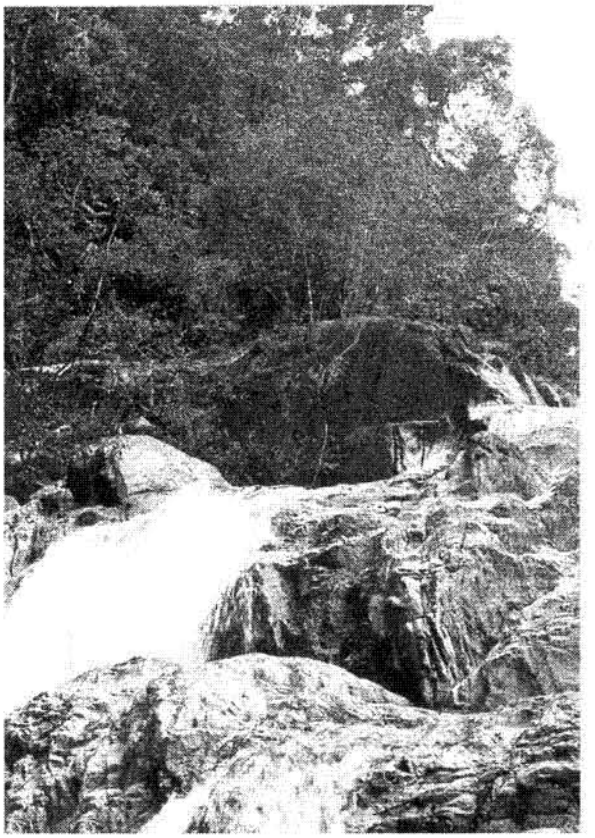

Figure 4. Habitat for *Amolops larutensis*, Kuala Brang, Trengganu.

Figure 6. *Rana macrodon*, lateral view, the same individual as in Fig. 5

Figure 5. *Rana macrodon*, dorsal view, Trengganu, Kuin.

### *Limnonectes macrodon* (Duméril and Bibron, 1841)

Kuin, August 23, 1976 (2 specimens). They were found at night, sitting on stones in a small stream in a primary forest (Figs. 5-6).

### *Rana baramica* Boettger, 1901

Kuin, August 24, 1976 (1 specimen). The specimen was observed when it was caught by the colubrid snake *Ahaetulla nasuta* (Lacepede, 1789), in a primary forest close to a stream.

### *Rana erythraea* (Schlegel, 1837)

Bukit Besar, Kuala Trengganu, August 29, 1976 (1 specimen), and September 27, 1976 (1 specimen); Biological Field Station, Kota Tinggi, September 20, 1976 (4 specimens). All specimens were found in the dense vegetation in shallow lakes, some of them also populated with fish.

### *Rana glandulosa* Boulenger, 1882

Biological Field Station, Kota Tinggi, September 20, 1976 (2 specimens). They were found in a logged, swampy area with a dense, secondary vegetation.

### *Rana nicobariensis* (Stoliczka, 1870)

Biological Field Station, Kota Tinggi, September 20, 1976 (2 specimens). They were found croaking at night, in a logged, swampy area with dense, secondary vegetation. They climbed up in the vegetation, 0.5-1 m above the ground.

### *Rhacophorus leucomystax* (Boie, 1829)

Field Study Center of the University of Malaysia, Gombak, September 16, 1976 (29 specimens), and September 17, 1976 (34 specimens); Biological Field Station, Kota Tinggi, September 21, 1976 (3 specimens), and September 22, 1976 (1 specimen). The specimens from Gombak were found in small water-filled pits or wheel tracks, or in the vegetation above them. Several pairs were found in amplexus, and yellow foam nests with whitish eggs were found on the water surface, or on the vegetation about 10 cm above the surface (Fig. 7).

### *Rhacophorus prominanus* Smith, 1924

Kuala Brang, August 27, 1976 (1 specimen). It was found in primary forest, close to a little river.

## Discussion

The identity of *Limnonectes macrodon* has been uncertain (Kiew 1978). Kiew (1984c) described a closely related species, *Rana malesiana* (now *Limnonectes malesianus* according to Duellman 1993) earlier confused with *L. macrodon*. The species found by me is *L. macrodon* (Kiew 1984c; Frost 1985) (Fig. 5-6).

Some aspects on the reproduction in *Amolops larutensis* are mentioned, seemingly for the first time, since no information was found in the literature. The reproduction in *Microhyla heymonsi* is studied by Berry (1964) in Singapore and occurs during all times of the year. Additional information is given by Pope (1931). The reproductive pattern of *Rhacophorus leucomystax* varies within its large distributional area. Berry (1964) and Flower (1899) note that they seem to breed at almost all times of the year in Singapore and Malaysia, but Zeller (1960) reported a synchronous periodicity in the reproduction in Java, and Kiyasetuo and Khare (1986) found it to have an annual breeding cycle, with spawning in June, in northeastern India. The reproduction has also been reported by Yorke (1983), Arak (1984), Feng and Narins (1991).

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