

STUDIES ON SURVEY OF FROGS AND TOADS OF
KOHIMA, NAGALAND, AND CERTAIN ASPECTS
OF ECOBIOLOGY AND DEVELOPMENT OF
Rhacophorus leucomystax (KUHL)

Abstract

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ABSTRACT

The thesis includes a survey and systematics of anuran fauna of Kohima, Nagaland and a detailed study of certain aspects of ecobiology of Rhacophorus leucomystax, a common frog species of this region. The thesis has 7 chapters, first 2 arranged in Part I and the other 5 in Part II.

PART I : SURVEY AND SYSTEMATICS

CHAPTER 1 : STUDY SITE AND SURVEY

A description of the study sites at Kohima and surrounding areas (altitude 183-2440 m a.s.l.) has been provided. The frogs were collected from ^{the} following places: (1) Central Kohima, (2) Phezou, (3) Dzünarü, (4) Science College and neighbouring areas, (5) Jakhama, (6) Rükhroma, (7) Dzüku, (8) Medziphema and (9) Dimapur. The survey was continued from 1981 to 1985. In all, 21 anuran species have been collected.

CHAPTER 2 : SYSTEMATICS

Taxonomic descriptions of the 21 species have been provided with a key for their easy identification and notes on their habit, habitat and their distribution, they include 2 new records, 1 new genus and 3 new species. The species described are listed below.

Suborder : Anomocoela

Family : Pelobatidae

Subfamily : Megophryinae

1. Megophrys monticola Kuhl and Van Hasselt, 1822.
2. Megophrys boettgeri (Boulenger, 1899).
3. Megophrys dzünarü sp. nov.

Suborder : Procoela
Family : Bufonidae
Subfamily : Bufoninae

1. Bufo melanostictus Schneider, 1799

Family : Hylidae
Subfamily : Hylinae

1. Hyla annectens (Jerdon, 1870).

Suborder : Diplasiocoela
Family : Ranidae
Subfamily : Raninae

1. Amolops afghanus (Günther, 1858).
2. Rana mawphlangensis Pillai and Chanda, 1977.
3. Rana nagalandsis sp. nov.
4. Rana liebigii Günther, 1860.
5. Rana verrucosa Günther, 1875.
6. Rana cyanophlyctis Schneider, 1799.
7. Rana limnocharis Wiegmann, 1835.
8. Rana tigrina Daudin, 1803.
9. Pterorana khare gen. and sp. nov.

Family : Rhacophoridae
Subfamily : Rhacophorinae

1. Rhacophorus leucomystax (Kuhl, 1929).
2. Rhacophorus reinwardtii (Schlegel, 1837).
3. Rhacophorus nigropalmatus Boulenger, 1895.
4. Rhacophorus bisacculus Taylor, 1962 (new record).
5. Chirixalus vittatus (Boulenger, 1887) (new record).

Subfamily : Philautinae

1. Philautus annandalei (Boulenger, 1906).

Family : Microhylidae

Subfamily : Microhylinae

1. Microhyla ornata (Dumeril and Bibron, 1841).

PART II : ECOBIOLOGY AND DEVELOPMENT OF RHACOPHORUS LEUCOMYSTAX

CHAPTER 3 : MORPHOMETRIC ANALYSIS AND ANNUAL BREEDING CYCLE.

This chapter deals with morphometric analysis and annual breeding cycle of the population of Rhacophorus leucomystax a common frog of Kohima, Nagaland. The snout-vent length of the males ranges between 38-65 mm and that of females 40-75 mm, the body weight of males 5.0-18.2 gm and that of females 5.5-37.95 gm. There are typical stripes on the dorsal side, spotted with interorbital cross-bars, broken striped and an X-shaped mark behind the eyes. Absolute measurements of 18 body parts and 8 ratios of selected parts have been provided. The annual breeding cycle of this species has 4 periods.

- (1) Emerging and pre-breeding period (April-May). During this period, the frogs emerge from hibernation and live in bamboo plantation.
- (2) Spawning and breeding (June-July). This is the period of chorusing, courtship, amplexus and breeding in the pools.
- (3) Postbreeding and entering (August-November). During this period the frogs are seen to live on banana plants and trees, and by the end of this period they start undergoing hibernation.
- (4) Hibernation (December-March). During this period, they undergo hibernation under the forest litters.

CHAPTER 4 : BREEDING BEHAVIOUR AND POPULATION DYNAMICS

This chapter deals with observations on breeding behaviour and population dynamics on Rhacophorus leucomystax at the breeding site. The frogs swarm and go to the pools on early summer evening preferably after rain in early moon phases. They show courtship and amplexus, make foamy nests around and deposit eggs. Embryonic development occurs in the nests and postembryonic development in the pool water. Though, large number of frogs are collected in summer, they can be collected in almost equally good number even in winter during hibernation from below the forest litters. During other periods they remain distributed on trees.

CHAPTER 5 : FOOD AND FEEDING HABITS

This chapter includes an analysis of the diet of Rhacophorus leucomystax. The food intake was highest during breeding period and lowest during hibernation period. The food items were taken out from the stomach and analysed every month. Varieties of items were recorded but arachnids and insects (particularly isopterans, coleopterans and orthopterans) formed high percentage. The frog takes food even during hibernation though the volume of food intake was lowest during this period.

CHAPTER 6 : PITUITARY-GONADAL CYCLE

This chapter includes a study of behaviour of acidophils, basophils and chromophobes of the pars distalis during annual breeding cycle of Rhacophorus leucomystax. The basophils (gonadotrophic cells) were found to be in high numbers during late hibernation and pre-breeding periods whereas, acidophils (somatotrophic

cells) were high during other periods. Thus, a direct relationship was noted between maturity of gonads and the cellular behaviour of pars distalis and the levels of hormones released from these during different periods.

CHAPTER 7 : NORMAL TABLE OF DEVELOPMENT

The seventh and the last chapter includes a normal table of development of Rhacophorus leucomystax. The development has been divided into 46 stages: Fertilization 2, Cleavage and blastulation 9, Gastrulation 5, Neurulation 3, Tail bud and gill formation 8, Operculum fold formation 5, Hindlimb bud 5, Toes indentation 4, and metamorphosis 5. Hatching occurs within 3 to 4 days and larvae metamorphose into young froglet in 57 to 58 days.

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