



A MANUAL FOR AMPHIBIAN FIELD STUDIES

**BAKO NATIONAL PARK
3–4 SEPTEMBER 2016**



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Front cover: Short-nosed Tree Frog (*Rhacophorus gauni*).

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Foreword

Field excursions are among the best platforms for the public to learn scientific concepts in a fun and laid-back environment. They will be able to make *in situ* observations and learn what is being practiced locally, rather than reading from textbooks which usually emphasize on general examples from other countries.

People always regard scientific field observation as a difficult task, needing a lot of memorization. In reality, it is fun to learn! Through this workshop, we hope that the often negative perceptions some have towards difficult field observations will change. This one-day workshop is proposed for nature lovers and park rangers to experience techniques of scientific field observations.

With adequate facilitation by UNIMAS lecturers, postgraduate students and Sarawak Forestry staff, including park manager and rangers, it is hoped that participants will be inspired to learn more about frogs, as well as disseminate knowledge to the general public and actively participate in building a 'green nation'.

The Editors

INTRODUCTION

Amphibians are a group of animals that can live both in water and on land. *Amphi* means dual, *bios* refers to life, thus, amphibians in *Greek* means dual life. The tailed amphibians are salamanders and newts, while the more familiar tailless amphibians form a group of animals called the Anura. Members of the Anura include frogs and toad.

Frogs generally have smooth skin and long legs for jumping. Toads, on the other hand, have rounded bodies and shorter legs than frogs. Many toads also have large warts, on their backs and they progress via a series of hops. Frogs are characterized by obvious external traits, i.e., stout body, tailless, two pairs of limbs, four fingers, five toes, large eyes with eyelids, and usually, a large mouth. On Borneo, frogs and toads are represented by seven families comprising Bombinatoridae, Dicroglossidae, Megophryidae, Ranidae, Rhacophoridae, Microhylidae and Bufonidae. There are at least 180 described species of Bornean frogs to date and every year, new species are described. There are two major ecological groups of frogs on Borneo, based on their general habitats and habits, i) 'town or kampong' category, i.e., species tolerant of human activities and disturbed areas and ii) forested category, i.e., species that are confined to forests or forest edges (Inger & Stuebing 2005).

Bako National Park (1°41'15.93"N 110°25'53.61"E) lies on a rocky headland, the Muara Tebas Peninsula, about 30 km north of Kuching City. The Park consists of eight vegetation types; Kerangas forest, open shrubland, mixed dipterocarp forest, riverine forest, mangrove forest, beach forest, cliff vegetation and cultivated land and secondary vegetation (Hazebroek & Kassim 2001). Past surveys have shown that there were at least 15 species of frogs that occur in the area, and associated with four types of vegetation (including Kerangas, mangrove, riverine, beach and mixed dipterocarp forest).

In this activity, participants will learn how to identify an adult frog at the level of the family, in addition to making observations on frogs at a field site and photograph live frogs in nature.

Objective

1. Identifying a frog or toad
2. 'Frogging' and photographing frogs

Materials:

1. Live frog/toad
2. Manual
3. Camera

Instruction: Circle or fill in the blank with the CORRECT answer(s).

Activity 1: Morphology and Reproduction

To determine a **frog's gender**, look at the digits or fingers. A male frog usually has thick pads on its "thumbs," which is an external difference between the sexes, as shown in the diagram below. Male frogs are usually smaller than female frogs.

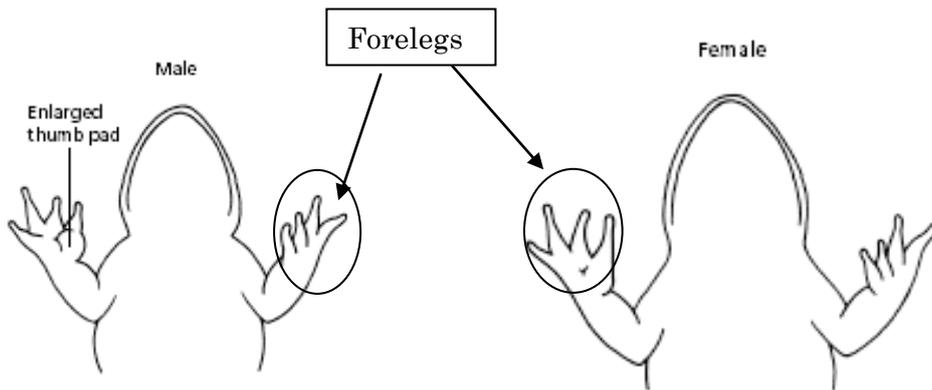


Figure 1. Finger of a male and female frog

1. Examine a frog/toad.

Question: Identify the gender (sexes) of the given specimen.

Answer: MALE / FEMALE

2. Based on the illustration below (Figure 2), circle the location of nuptial pad (thumb pad) and vocal sac of the frog/toad.

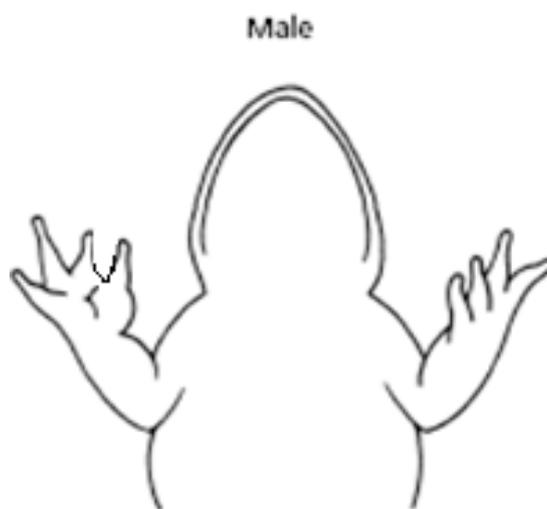


Figure 2

3. Search for a female frog around the activity area. Look at its belly- is it enlarged? Enlarged belly implies that the female is ready to breed.

Question: Is the given female frog ready for breeding?
 Answer: YES / NO

Activity 2: Who am I?

Adult

Use a field guide key below to guess a FAMILY name of an adult frog/toad?

- 1 A. Webbing on hand (Fig. 1A).....Rhacophoridae (Tree Frog)
- B. No webbing between outer fingers (Fig. 1B).....2

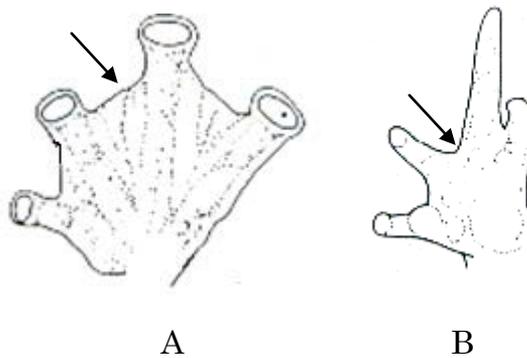


Figure 1

- 2 A. A wart or gland behind eye (Fig. 2).....Bufonidae (Toad)
- B. No large gland behind eye.....3.

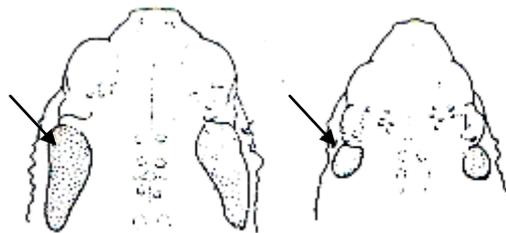


Figure 2

- 3 A. Upper eyelid drawn out into a horned like shape (Fig.3).....Megophryidae (Horned Toads and their Allies)
- B. Upper eyelid not as above4.

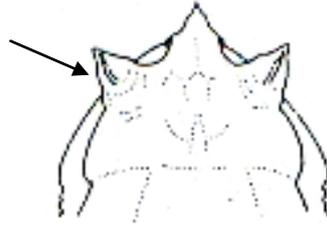
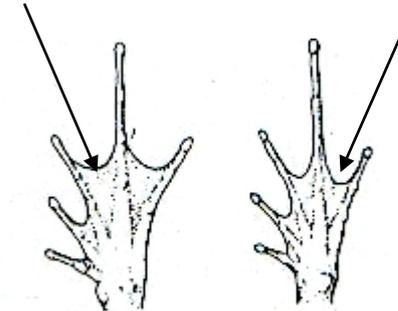


Figure 3

4 A. Toes not webbed or webbed at the base.....Microhylidae (Narrow-mouthed Frogs)

B. Toes at least half-webbed.....Ranidae or Dicroglossidae ('Typical' Frogs)



Question: To which family does the given frog/toad belong?

Answer : Ranidae / Dicroglossidae

Bufonidae

Rhacophoridae

Microhylidae

Megophryidae

Activity 3: Field Observation and Sound Recording

Frogs are nocturnal (active at night), so field observations will be done after dark, via visual encounter survey (VES) and also by listening to the sound of frog calls. Frog eyes reflect a pale orange/yellow light when observed with a headlamp.

Equipments needed

Included in the kit	Not included
Plastic bag (305 x 203 mm)	Watch
Permanent marker	Cloth bag
Pencil and notebook	GPS
	Headlamp or torchlight (with spare batteries)
	Sound Recorder and microphone
	Thermocouple with probe

1. Upon encountering a calling frog, record the sound using a sound recorder.
2. Point the light directly at the frog and catch it firmly but gently using your hands.



3. Place each captured frog into a clear plastic bag. Write field data, such as time and microhabitat on the surface of a plastic bag with a permanent marker.



4. Record detailed information, such as species name, date, time, locality, GPS reading, cloacal temperature, ecological data such as microhabitat association, and collectors' names in a field notebook.



B) Frog Handling and Measurements



1. Grab/ Hold hind legs using second and third fingers to ensure that the frog cannot escape.
2. Measure (in mm) the snout-vent-length (SVL) and tibia length (TL) of captured frog using ruler or calliper.
3. Weigh frog using spring scale with clip (g). Clip tarsus with scale clip and hang scale to take weight.

Activity 4: How to Photograph Amphibians and Reptiles

Introduction

Amphibians and reptiles photography is a great way to understand and appreciate their natural history. The following activities (talks and this handout) will highlight the importance of amphibians and reptiles photography, to introduce essential techniques in amphibians and reptiles photography, to instruct how to take identifiable photographs of these animals and to demonstrate technical tools in macro photography. In addition, some basic photography tips are provided in this manual.

Photography Equipment and Props

Any camera (DSLR, compact or mobile phone), diffuser, frog toys, a headlamp or a flashlight.

Indoor Group Photography Assignment

1. Form a group of five. Name your group.
2. Photograph each toy provided with any of your preferable cameras.
3. Each team needs to choose and submit your best five images for evaluation.
4. All group will requested to deliver a short presentation on the selected images, highlight the reasons for choosing these images. Please mention any special technique that may have been applied.
5. The winner will be announced at the end of activities.

Basic Photography Terms

- 1. Aperture.** The size of the opening of the lens. Larger aperture will let more light into the sensor, producing a brighter image. Aperture is measured in f-stops- a small f-stop, such as f/1.8 produces a wide opening, while f/22 refers to a narrow opening. Aperture set thus will control the exposure and depth of field.
- 2. Depth of field.** Indicates how much the subject in focus.
- 3. Exposure.** Indicate how bright or dark an image is. Exposure is controlled through ISO, shutter speed and aperture setting.
- 4. ISO.** Determines how sensitive the camera is to light.

5. Noise. Simply, little flecks in an image.

6. RAW. Type of file that give photographer more control over image editing. These are large files, and requires special software to open and edit.

7. Shutter speed. How long the shutter will stay open to allow light in when a picture is taken. The speed is indicated in seconds or fractions of second (1/200 s. or 1"). The longer the shutter stays open, the more light is let in.

Tips in Macro Photography

1. **Correct Setting.** Remember to check your camera setting before shooting, such as image file size, format (JPEG or RAW), white balance, ISO, date and time.
2. **Correct framing/composition.** Try to apply different methods when framing the subject, for instant, close-up shot, rule of thirds, background and cropping.
3. **Focus on the eyes.** In images captured through macro photography, the eyes of the subject need to be sharp!
4. **Eye-level.** Try to get down to their eye level: the image will then be more engaging!
5. **Use soft light.** Do your natural light photography during the first hour of light in the morning or late hour of light before sunset. In artificial light photography, try to use diffusers to produce softer highlights and shadows.
6. **Hold camera with steady hand.** Shaky hand will cause a huge difference in framing and blurring of images in macro photography. Try to use a tripod or monopod to overcome this, or rest your hand on a stable object (such as a tree trunk, rock, table, etc).
7. **Take lots of photos.** Try experimenting with different composition and camera settings.
8. **Always strive to improve your photos.** You need to check your images after each shooting sequence; check your images sharpness by zooming in to the eyes of the subject.
9. **Know your lens.** Try to become familiar with your lenses focal length and f-stop settings; use suitable lens in shooting.

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Signature and official stamps

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