

Mating Calls Description of Five Species of Frogs from the Genus *Hylarana* Tschudi 1838 (Amphibia, Anura, Ranidae) from Sarawak, Malaysia

(Pencirian Panggilan Pengawanan Lima Spesies Katak Genus *Hylarana* Tschudi 1838 (Amphibia, Anura, Ranidae) dari Sarawak, Malaysia)

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ABSTRACT

Recordings of frog calls from the genus Hylarana were conducted at seven study sites in Sarawak, Malaysia. The results showed that each species differs in terms of call characteristics, in which a high number of pulsed note belongs to H. baramica, while high repetition note belongs to the sibling species, H. glandulosa. Higher pitched and number of amplitude spectrum, however, belong to H. signata. Pulsed note and note repetition differed significantly among species, except for spectrum amplitude. Advertisement calls for each species were described in detail. This study provide a baseline data on advertisement call characteristics of frogs from the genus Hylarana for future studies of these frogs particularly and the Oriental frogs generally.

Keywords: Acoustic characteristic; amplitude spectrum; Hylarana, note; pitch; pulse

ABSTRAK

Rakaman panggilan katak daripada genus Hylarana telah dijalankan di tujuh kawasan kajian di Sarawak, Malaysia. Hasil kajian menunjukkan bahawa setiap spesies berbeza daripada segi ciri panggilan, iaitu nota yang bernada banyak ditunjukkan oleh Hylarana baramica, manakala nota berulang yang tinggi ditunjukkan oleh H. glandulosa. Nota yang berfrekuensi tinggi dan bilangan spektrum amplitud yang lebih tinggi dimiliki oleh H. signata. Nota bernada dan nada berulang berbeza dengan ketara di kalangan spesies, kecuali spektrum amplitud. Panggilan mengawan untuk setiap spesies diterangkan dengan terperinci. Kajian ini menyumbang kepada pangkalan data asas untuk ciri panggilan mengawan katak daripada genus Hylarana untuk kajian mengenai katak ini khususnya dan katak Oriental amnya.

Kata kunci: Ciri akustik; denyut; hylarana; nota; pic; spektrum amplitud

INTRODUCTION

Studies on advertisement call characteristics of frogs are very limited in Malaysia. A study on advertisement call characteristics of Malaysian *Leptolalax* was successfully conducted by Matsui (1997). The study revealed that advertisement call characteristics of *Leptolalax heteropus* differs from the others suggesting phylogenetic divergence. Call characteristics were also used as one of the characters to revalidate *Hylarana laterimaculata* from the synonym of *Hylarana baramica* (Leong et al. 2003). In addition, Lardner and Lakim (2004) investigated call preferences in female tree-hole frogs and since then no other intensive study on frog advertisement calls of Bornean *Hylarana* has been carried out. This paper aims to document and describe call characteristics of selected frogs from genus *Hylarana* Tschudi 1838 from Sarawak, Malaysia.

MATERIALS AND METHODS

Since the genus *Hylarana* is widely distributed and occupies various habitats it is highly recommended that sampling localities represent most of their habitats. For this, seven study sites in Sarawak were chosen for data collection as shown in Figure 1. The study sites consisted of four National parks (Kubah/Matang, Bako, Mulu and Similajau) and three unprotected areas (Borneo Height, Sadong Jaya and Bario).

Different habitats were surveyed at night making digital recordings of the Bornean *Hylarana* encountered using Sony ICD-SX30 recorder and Sony microphone. Data on air temperature were measured using data logger. The call variables measured in this study followed Matsui (1997) and Bee (2003). Size of calling frogs was taken,