



The Sarawak Museum Journal

Vol. XLII No. 63

December 1991



ISSN: 0375-3050

E-ISSN: 3036-0188

Citation: Han Kwai Hin et al. (1991). Population Structure and Reproduction in the Marine Snake, *Lapemis Hardwickii* Gray, from the West Coast of Sabah. The Sarawak Museum Journal, XLII (63): 463-475

POPULATION STRUCTURE AND REPRODUCTION IN THE MARINE SNAKE, *LAPEMIS HARDWICKII* GRAY, FROM THE WEST COAST OF SABAH

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POPULATION STRUCTURE AND REPRODUCTION IN THE MARINE SNAKE, *LAPEMIS HARDWICKII* GRAY, FROM THE WEST COAST OF SABAH†

by

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ABSTRACT

A total of 754 specimens of *Lapemis hardwickii* were collected by trawlers operating off the west coast of Sabah, Malaysia from the Sabah Fish Marketing wharf in Kota Kinabalu between January and December, 1987. Variations in population structure and reproductive condition through time were studied. No sexual dimorphism was observed although the females were on the average heavier and longer (mean weight: 277.0 g and mean total length: 727.3 mm) than males (mean weight: 249.2 g and mean total length 716.0 mm) with an overall sex ratio of 1:1. Nearly 100% of females collected between January and March carried 1 - 6 large yolky eggs indicating the occurrence of synchronized breeding within this region. The baby snakes were estimated to be born between July and September with a mean birth weight of 39.7 g and a total length of 373.4 mm. The parabolic relationship between egg weight and body weight of the females suggests that there is a maximal amount of energy to be invested into reproduction.

INTRODUCTION

Although several studies of the ecology of marine snakes have been conducted in South East Asia (Bergman, 1949) and Peninsular Malaysia (Voris *et al.*, 1978; Voris & Jayne, 1979; Voris & Lemen, 1981), little is known of their population dynamics and reproduction in Borneo. An exception is the amphibious marine snake, *Laticauda colubrina* which has been studied by Stuebing (1985) and Lading (1987) who investigated its diet and population structure, and estimated population size at Pulau Kalampunian Damit on the West Coast of Sabah.

† Although this study was conducted in Sabah, the species concerned is common in Sarawak.

Only ten species of marine snakes are known from Sabah, the majority of them having been collected along the West Coast (Museum of Zoology, UKMS). The Hydrophiid fauna of this area is dominated by the widely distributed *Lapemis hardwickii*. However, most aspects of the life history of this species are poorly known. The purpose of this study is therefore to examine the population structure and variations in reproductive conditions through time (Jan. - Dec., 1987) for a population of *Lapemis hardwickii* sampled from West Coast of Sabah.

MATERIALS AND METHODS

A total of 754 specimens of *Lapemis hardwickii* were collected from fishermen through the Sabah Fish Marketing (SAFMA) wharf in Kota Kinabalu from January to December, 1987. The majority of the snakes were caught at night in the Kimanis Bay area by trawlers seeking prawns at a depth of 25 - 30 m. All snakes were immediately frozen in ice and subsequently brought to the laboratory for analysis. Specimens were rethawed by soaking in water for about one hour prior to examination.

Total length and tail length for each specimen were measured to the nearest mm. The snout-vent length was computed by subtracting tail length from the total length. Specimens with tails partially severed were excluded from calculations of tail length and snout-vent length. Individual mass was recorded to the nearest gram. The sexes of *Lapemis hardwickii* cannot be easily differentiated externally so that sexing was based on the presence or absence of hemipenes. Hemipenes were exposed by squeezing posterior to anus of a male snake. A pair of genital openings could be seen in female snakes.

A medial longitudinal incision was then made along the ventral scutes of each specimen to examine their reproductive structures. The left testes was measured for its length (mm) as the right testes was inseparable from the epididymal tissues. The testis were then stored in 10% formalin for histological analysis via tissue microsectioning and hematoxylin staining. The testicular tissues were processed with Tisumation (Fisher model) for about 18 hours before microsectioning so as to stabilize the cells. Thirty-five specimens were selected for histological analysis, representing various snout-vent length classes and individuals with or without spines (Han, 1987).

All yolky eggs found in the female oviducts were counted and weighed to the nearest gram. Eggs found with embryos were separately regarded, and the masses of each of these developing eggs were determined. The total length, tail length and snout-vent length of the embryos were determined in the same manner as for the adult snakes. Also, wet fat was isolated and weighed.

Student's t-tests were used to examine snout-vent length, tail length and weight differences between the sexes. Finally, regressions were employed to