

THE DISTRIBUTION AND AVERAGE SIZE OF GRANULAR GLAND IN POISONOUS ROCK FROG, *Odorrana hosii*

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ABSTRACT

Frog skin is reported to have potential in medical application especially the granular gland on the skin producing secretion containing peptide. The objective of this paper was to examine the distribution and average size of granular glands in *Odorrana hosii*'s skin. The skin histology was stained with Haematoxylin-Eosin to identify granular gland. Results revealed that the distributions of granular glands were statistically significantly different between six regions of the frog skin ($F(5,234)=3.47$, $p=0.005$) with dorsal central region of skin has the highest mean number of granular gland (2.22 ± 1.69). The average size of the granular glands was statistically significantly different between six skin regions ($F(5,234)=4.04$, $p=0.012$) with dorsal central region contained the biggest granular gland size ($11.95 \times 10^3 \mu\text{m}^2$). This study showed that the granular glands in *O. hosii* were significantly abundant in dorsal head region and the largest size was in the dorsal central region as compared to other regions of the skin. This implicates the dorsal head and central skin region can be used for peptides extraction due to the abundance and size of granular glands.

Key words: Skin histology, dorsal, ventral, granular gland, frog

INTRODUCTION

The skin is the primary defence mechanism of both animal and human. Some amphibians have the ability to secrete venom or toxin as one of the main defence mechanisms against predators (Toledo *et al.*, 2011; Sharma *et al.*, 2012). The amphibians pose a chemical defence mechanism mainly contributed by skin glands type, particularly granular gland, mostly producing chemical agent against microbial or parasite (Fox, 1994; Clarke, 1997; Rollins-Smith *et al.*, 2005; Sharma *et al.*, 2012). The granular glands of amphibian skin secrete a broad active biochemical such as alkaloids, peptides and steroids (Daly *et al.*, 1987). This active biochemical advanced unconventionally in diverse anuran families throughout the world differing on its ecology and natural history (Toledo & Jared, 1995;

Mallet & Joron, 1999; Sharma *et al.*, 2012). Jared *et al.* (2009) reported that the parotid macro glands of the toad produced venom located over the dorsal head of the skin region and will be activated to expelled the venom after being bitten by predator. Whereas Lenzi-Mattos *et al.* (2005) reported another species of toad released the venom from inguinal macroglands located over the dorsal thigh region.

Odorrana hosii is commonly known as poisonous rock frog and can be found throughout Borneo, Peninsular Malaysia and Sumatra from sea level up to 1800 m and is categorised as least concern in the International Union for Conservation of Nature (Van-Dijk *et al.*, 2004; Inger & Stuebing, 1997). The colour of dorsal side of skin is green, where the lateral sides are brown. The texture of the dorsal skin mainly fine pebbled with minimal fold on each side. The dorsal side of the lower limbs is light brown with dark crossbars and the belly is mainly silvery white as shown in Figure 1 (Inger &

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