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Morphology of Mandibularis and Lingualis Glands of Laughing Chicken (Ayam Gaga) with Special Refferences of Distribution and Content of Carbohydrate

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INTRODUCTION

Laughing chicken in Bugis called Manu gaga which means chicken stutter. The chicken comes from Sidrap district, about 183 km to the north of the city of Makassar, the capital of South Sulawesi province. Laughing chicken is a chicken that became popular in the community. Chicken popularity is due to distinctive voice, which at the end sounds like people are laughing. Physically, the appearance is the same as the chicken chicken village in general (Pratama, 2014).

Salivary gland is one of the components in the digestive system. Salivary glands produce saliva form that helps moisten and soften dry food, media to break down and dilute groceries, maintaining the pH in the oral cavity, break down carbohydrates and as an anti- bacterial agent (Dellman, 1993). Salivary gland important role in the process of digestion and the body's defenses, so that scientific knowledge of the salivary glands need to be developed .

There was few reports about morphology and comparative study of salivary glands among avian species. Comparative morphology and carbohydrate content in the salivary glands of laughing chicken were studied using general morphological purpose with hematoxylin-eosin (HE). Alcian blue pH 2.5/periodic acid-Schiff (AB/PAS) reaction was performed to demonstrate both neutral and acidic carbohydrate and their mixtures. This study were determinate the level of activity among large gland with small glands.

The aim of this study was to observe and compare the morphology and carbohydrate content of the salivary glands of laughing chickens. In addition, this research is also expected to contribute data and information on the salivary glands in laughing chickens.

MATERIALS AND METHODS

A total of three adult Laughing chicken were used in this study. The laughing chicken were provided from the breeder of the laughing chicken. All chickens were in the same parents and fillial. The chicken were euthanized by ketamine with 67,9 mg/kg doses via intravena (McGrath, 1984). Mandibular gland was exposed by removing the skin in the ventral region of the mandible and neck. Macroscopic observations made on the location, structure and size of the mandibular gland. Lingual glands could not be observed macroscopically because the glands located in the tongue. Sampels were quickly removed and fixed in 10% formalin solution for about 48 hour and stored in 70% ethanol ready for further histological processing. Tissues were embedded in Tissue Prep (Fischer Scientific, Pittsburg, PA, USA) and sections were cut at 4 μ m using microtome. Sections of tissues were stained for general morphological purpose with hematoxylin-eosin (HE). Alcian blue pH 2.5/periodic acid-Schiff (AB/PAS) reaction was performed to demonstrate both neutral and acidic carbohydrate and their mixtures. All sections will be observed and photograph using a light microscope equipped with camera unit.

RESULTS AND DISCUSSION

Mandibular gland located below the mandible, at the edge of the basic of the mouth. There were two mandibular gland and located in left and right side with oval shaped. In this study, the internal mandibular gland is not found, only the external mandibular gland and medial mandibular

gland. Lingual gland can not be seen directly with macroscopic observations because it lies beneath the epithelial layer of the tongue .

In laughing chicken, mandibular glands form by lobulated glands and connective tissue are separating each lobe. Each lobe consists of lobules and separated by connective tissue with oval shaped. Mandibular gland cells were cylindrical with flat nucleus and stained with purple-blue (basophilic) with consisted of mucous cells. Suprasert *et al* . (2000) stated that the chicken mandibular gland entirely composed of mucous cells. Lingual gland is divided into two parts namely the anterior and posterior, the position of the anterior part of the tongue is located on both the left and right side of the *os entoglossum*. While the posterior part at the bottom of the base of the tongue. Similarly with the mandibular gland, the lingual gland also lobulated with each lobe separated by connective tissue . This is supported by studies that have been conducted by Adnyane *et al.*, (2007) .

The intensity of the reaction of the lingual and mandibular gland of laughing chicken using AB and PAS staining can be observed in Table 1. The external mandibular gland mucous cell cytoplasm shows the weak intensity of the acid carbohydrate contents and strong intensity of neutral carbohydrate. While the anterior part of lingual glands showed the intensity of acid and neutral carbohydrate were strong intensity in mucous cells.

Tabel 1. The intensity of acid and carbohydrate content in the mandibular and lingual glands of laughing chicken with AB pH 2.5 and PAS staining

Glands	Part	Structure	AB pH2,5	PAS
Mandibularis	Externa	Mucous cytoplasm cell	++	++
		Mucous cell secretion	+++	+++
Lingualis	Anterior	Cytoplasm		
		- Mucous cells	+++	+++
		- Seromucous cells	++	++
		Secretion		
		- Mucous cells	++	++
		- Seromucous cells	++	++

As a result of this study it can be concluded that the type of the mandibular gland in laughing chickens was a complex tubular mucosa. While the type of the lingual glands in laughing chickens was a mixture of complex tubular. Carbohydrate contents of mandibular and lingual glands in laughing chickens consist acid and neutral carbohydrate with weak to strong intensity in the cytoplasm and secretion.

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