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## Gross morphology of tongue of the mute swan (*Cygnus olor*)

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### Abstract

The study was conducted on the tongue of the mute swan (*Cygnus olor*). The tongue and oropharynx involved in the food intake and ingestion as prehensile organ, studying of the gross morphological characters may be help full to identify during forensic cases and other pathological conditions in mute swan. The mute swan tongue composed of apex, body width lingual prominence and the root. The tongue attached bottom part of the bill by the frenulum. The tongue of the swan was long and oval shaped characterized by a prominent longitudinal median ridge called as a median sulcus, it is extended up to lingual prominence. On either side of the groove anterior part of the papilla facing caudal laterally and posterior papillae facing lateral.

**Keywords:** gross morphology, tongue, mute swan.

### Introduction

The mute swan (*Cygnus olor*) is a species of a very large white water birds belonging to the family, Anatidae. Mute Swans are popular birds of waterfowl seen in park lakes, as well as water areas in zoos or bird collections. It habits on shallow coastal ponds, estuaries, ponds, bogs, and streams flowing into lakes and diet consists mainly of aquatic vegetation, along with a wide range of prey which including frogs, tadpoles, fish. Knowledge of the anatomy of the tongue was important to identify structural features that may influence nutrition, food intake and ingestion, as well as to provide a foundation for recognition of pathology in this region. The present study aimed to investigate the anatomical structural adaptations of the tongue in the swan helped in its feeding mechanisms.

### Materials and Methods

For the present study the specimen was procured from adult mute swan bought for post mortem examination to the Department of Veterinary Pathology, College of Veterinary and Animal Sciences, Mannuthy, Thrissur, India. Tongue was rinsed in saline and immersed in 10 per cent neutral buffered formalin, various gross morphological parameters were recorded using a digital camera with 12X zoom (Nikon). The gross photography of an individual bill with various views, showing characteristic features was recorded.

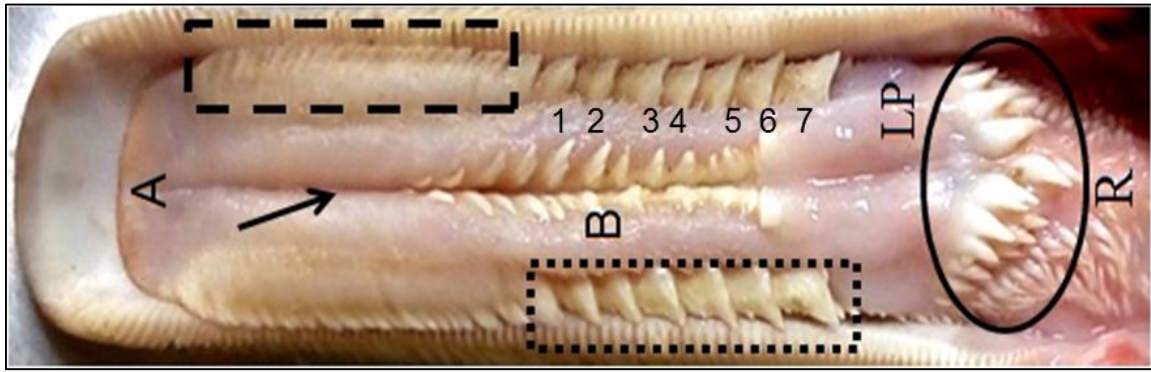
### Results and Discussion

In mute swan, there was lack a definite line of demarcation between the oral and pharyngeal cavity it was combined producing a common oropharyngeal cavity that it is extended from bill to then esophagus. The tongue was strictly limited to the rostral part and laryngeal mound presented in caudal part of the floor of oropharynx. Tongue in swan was long and oval shaped the total length of tongue was 7.3 cm of which the apex was 0.6 cm, body with lingual prominence was 6 cm and the root of tongue was 0.7 cm. The average width of the tongue was 1.9 cm on the apex, 2.2cm on the body width lingual prominence and 0.9 cm in the root. Tongue was presented by two surface dorsal and ventral surfaces. The mute swan tongue composed of apex, body width lingual prominence and the root (Fig. 1). The tongue attached bottom part of the bill by the ligament called frenulum (Fig. 2). An elongated and oval tongue was a characteristic feature in water birds such as duck and goose (Iwasaki *et al.*, 1997) [1]. Apex of the tongue was flat, spatula shape and its dorsal surface was smooth and ventral surface appeared flat, triangular shape containing white plate called lingual nail.

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**Fig. 1:** Tongue dorsal view of the swan

A- Apex of tongue, B- Body, R Root LP -Lingual prominence  
Dashed line- small conical papillae Dotted line- large conical papillae Black arrows- median groove

Black arrowheads- lingual comb Asterisk bilateral swelling  
Round line- papillae on caudal border



**Fig. 2:** Tongue ventral view of the swan

LN- Lingual Nail F-Frenulum

Body of the tongue was divided by a prominent equal half by a longitudinal median groove on which a thick ridge on either side was noticed and extended up to lingual prominence (Fig.1). On either side of the caudal half of the groove caudo laterally directed papillae were noticed. On the lateral surface either side presented by a small and large conical papillae in the body. These observations were in agreement with Iwasaki *et al.*, (1997) [1]. The small conical papillae are present in the rostral part in the body the papillae had brush with jagged ends. The caudal part of the body present large conical papillae was presented next to the small conical papillae. The shapes of the papillae are varied in the size it appeared caudal concave like nib of fountain pen. These papillae are directed to lateral surface of the body. These observations were in agreement with that Szewczyk and Jackowiak (2016) [2]. The total number twenty pairs of small conical papillae and sevens pair of large conical papillae were noticed.

On the caudal part of the body a small elevation was noticed on the dorsal surface of the tongue from the lingual prominence to the median sulcus. On the caudal border of the lingual prominence had a transverse row of caudally directed two row of large horny papillae. Similar observations noticed in duck and goose, there were two rows of upright, horny papillae situated at the edges of the tongue (Getty *et al.*, 1975) [3]. Next to the caudal border mucosa of the surface showed the presence of papillae.

Laryngeal mound located caudal to the tongue with oval laryngeal cleft where glottis opening of the behind the laryngeal mound, two to three rows of caudally directed

pharyngeal papillae which was limited to the floor of the pharyngeal cavity. As in all avian species, a raised structure called laryngeal mound was located immediately caudal to the tongue (Catarina *et al.*, 2011) [4].

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