

Age-related histological and ultrastructural features of the tongue of the Mallard domestic duck, *Anas platyrhynchos* f. *domestica*, Anatidae (Linnaeus, 1758) in different two age stages (post-hatching and adult) captured from Egypt

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Abstract

The domestic duck is classified as a specialist filter-feeder bird living in the water. These birds also use grazing and pecking as terrestrial feeding methods. The tongues of domestic ducks, similar to those of other Anseriformes, exhibit numerous types and shapes of mechanical papillae that serve a number of purposes when collecting food. **Purpose:** The current study attempts to describe the morphological characteristics of the tongue as well as the mechanical papillae's development. In addition, the study aims to determine whether the papillae observed post-hatching exhibit similar morphology to those found in adult avian species, as well as to investigate the readiness of the tongue to fulfill its feeding function following hatching. The comprehensive examination of lingual mucosa is examined about the structural modifications necessary for this variety of feeding activities. **Methods:** In this study, the tongues of nine young and adult females were used. **Results:** The tongue had three distinct parts: the apex, which had a lingual nail on its ventral surface; the body, which exhibits numerous small and large conical papillae on its lateral sides and a lingual prominence in the caudal region; and the root, which is covered with numerous conical papillae of varying sizes. Conical, filiform, and hair-like mechanical papillae, the three types of food filtration apparatus, are present in both stages. The intra-oral transfer involves several structures, including the median groove, lingual combs, and the rostral border of the lingual prominence. The rostral border of the lingual prominence is characterized by distinct rows of conical papillae. The histological analysis demonstrated the presence of both keratinized and non-keratinized epithelium on different tongue regions. The lingual salivary glands in the rostral and caudal lingual salivary glands exhibit a pronounced periodic acid-Schiff (PAS)-positive reaction. Additionally, the yellow adipose tissue and sensory receptors, namely the Grandry and Herbst corpuscles, which collectively form the bill-tongue organ that monitors the movement of food. **Research highlights,** these results conclude the presence of microstructural species-specific alterations in specific tongue areas of domestic ducks' lingual mucosa. These modifications are formed by the filtering mechanism and terrestrial feeding mechanisms such as grazing or pecking. Following hatching, the tongue of the domestic duck undergoes significant development, primarily in preparation for grazing activities. The anatomical and histological structure of the young tongue exhibited similarities to that of the adult domestic duck while also displaying certain variations that could potentially be attributed to the bird's habitat and mode of feeding.

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