Morphological, Anatomical and Histological studies on goose tongue

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Abstract

The tongue of goose was analyzed macroscopically and by light microscope. Macroscopic analysis showed a clear median longitudinal groove along the anterior to posterior half of tongue. The root of tongue have central circular depression. Cylindrical lingual papillae were detected on sides of tongue in addition to conical papillae found in root of goose tongue. Also the macroscopic studies appeared elongated shape with rounded tip about 7 cm in length. The width of anterior part 1.1 cm changing to the posterior region to 1.3 cm.

Histological analysis showed three zones: anterior, middle, and posterior parts. The anterior part covered externally by keratinized non cellular stratified squamous epithelial tissue, deep to it lamina properia with skeletal cells and phagocytes with collagen fibers intermingled with skeletal muscle. Under skeletal muscle the adventitia consist of adipose tissue. While the middle part consist of stratified squamous epithelial tissue more cellular than anterior, the lamina properia consist of skeletal muscle intermingled with few collagen fiber. The posterior parts consist of stratified squamous epithelium but there are crypt formation. Lamina properia of posterior part contain thick skeletal muscle layer and more of salivary glands. Also we find that the posterior part contain cartilage in between adipose tissue under lamina properia.
Introduction

The study of the tongue in avian (goose) is important because it can aid in gathering and swallowing food. Also, the morphology of tongue varies with food habits (Vallard & Cuisin, 2004). The dorsal surface of tongue in goose has an anterior region that extends for five-sixths of its length plus a posterior region. Large conical papillae are located in an arrow between the anterior and posterior region. On both sides of the anterior region, lingual papillae are compactly distributed and a small number of large conical papillae are found (Iswasaki, 2002).

(Hassan, et al. 2010) Observed during studies the tongue of Egyptian goose it composed morphologically from 3 parts (anterior, middle, posterior). The anterior parts represented one half of the tongue, while the two remaining parts comprises the other half. A clear median longitudinal groove was observed macroscopically along the forward half of the anterior region. The caudal part of the body had a central circular depression in front of giant conical papillae arranged in transverse raw on both sides of the tongue, cylindrical lingual papillae were compactelly distributed caudally.

Because the very little literatures in anatomy and histology of goose tongue so we did this work to explain the anatomy and histology of goose tongue.

Material and methods

Five male adult goose were used in the present study. After the birds slaughters, the tongue were washed with distilled water and dissected. The length and width of tongue were measured by vernier instruments, then the tongue examined by dissecting microscope to examine the papillae. The specimen were then kept in 10% formalin for 3 days the histological section were made and stained with hematoxyline and eosin and examined by light microscope to examine histological...
structure of tongue (Galigher.; Kozolff, 1964 and Luna, 1968).

Results

Anatomical results

The tongue of goose presented elongated shape with rounded tip about 7 cm in length. The width of anterior part 1.1 cm changing to the posterior region to 1.3 cm. A clear median longitudinal groove was observed macroscopically along the anterior to posterior half of tongue. The root of tongue have a central, Circular depression in front of conical papillae. Cylindrical lingual papillae were detected macroscopically along the side of goose tongue. Fig 1, Fig 2.

Histological results

On histological examination we divided the tongue on three zone anterior, middle, and posterior parts. The anterior part covered externally by keratinized stratified squamous epithelial tissue, deep to it lamina properia with skeletal cells and phagocytes with collagen fibers intermingled with skeletal muscle cells. under skeletal muscle the adventitia consist of adipose tissue Fig 3. while the middle part consist of stratified squamous tissue more cellular than anterior, the lamina properia consist of skeletal muscle intermingled with few collagen fiber Fig 4. Also the mid parts of tongue contain papillae like nipple between connective tissue Fig 7. The posterior parts consist of stratified squamous epithelium but there were crypt formation Fig 5, Fig 6, Fig 8, Fig 10. Lamina properia of posterior part contain thick skeletal muscle layer Fig 5 and more of salivary glands Fig 11, Fig 12, Fig 13. Also we find that the posterior part contain cartilage in between adipose tissue under lamina properia Fig 12. (By continuous experiments knowledge of morphological glycogen deposit in cells) we find deposit glycogen in cells of posterior parts of tongue as in Fig 9. The nerve which supply goose tongue, is unmylinated was noted in histological section Fig 14.
Fig 1: Goose tongue anatomical pictures showed Cylindrical lingual papillae (A) and median longitudinal groove (B).

Fig 2: Goose tongue anatomical pictures showed central depression (A) and conical papillae (B).
Fig 3 :- Anterior part of the tongue, note, stratified squamous epithelium of many layer over 15(1), covered by outer layer of keratinized non cellular(2) material. Deep of the lamina propria skeletal muscle cells with few phagocytes with collagen fiber intermingled with the skeletal muscle(3). Under the skeletal muscle, the adventitia consist of adipose tissue(4). H&E 125 X

Fig 4 :- Middle part of the tongue consist of stratified squamous epithelium with more cellular layer than the anterior also at the top Keratinized a cellular material(1). The lamina properia at the base consist of skeletal muscle cell intermingled with few collagen fiber (2). H&E 125 X
Fig 5: - The posterior part of the tongue consist of stratified sequamous epithelium but there are crypt formation(1), under layer of the top keratin acellular material. At the layer of lamina properia thick skeletal muscle layer and more of salivary gland structure(2).

H&E 125 X.

Fig 6: - At higher magnification of the posterior part sequamous stratified cells, some glycogen and at the top a cellular Keratin material(1). The folded with stratified sequamous epithelium with crypts forming papillae(2).

H&E 500 X.
Fig 7: - Mid part of tongue forming papillae like nipple in between connective tissue H&E 125 X

Fig 8: Posterior parts with crypts , forming papillae nipple like projection in between connective tissue , H & E 125X .
Fig 9: posterior part of tongue cells with glycogen appear vacuolated
H&E 500X

Fig 10: Posterior part of tongue forming papillae like nipple in between connective tissue H&E 125 X
Fig 11: posterior part of tongue showed large area of salivary (serous) glands appear quite prominent(1) H&E 125X.

Fig 12: Posterior part of tongue note prominent of salivary glands(1) also a section of cartilage in between adipose tissue(2) H&E 125X.
Fig 13: Low magnification of serous salivary glands in base of tongue H&E 125 X

Fig 14: Posterior part of tongue showed unmyelinated nerve fibers (1) and artery with prominent media (2). H&E 125 X.
Discussion :

The anatomical structure of goose tongue are agreed with (Hassan, et al. 2010) who study anatomical features of tongue in Egyptian goose, that composed from cylinder-ical conical papillae on each sides of tongue and contain central circular depression on roots in front of conical papillae. but don’t agree in median longitudinal groove that observed macroscopi-cally along the foreword half of the anterior region in Egyptian goose. Our study differ from (Guimarães, et al. 2009) that study the tongue of ostrich’s who showed the surface of ostrich’s smooth without lingual papillae. (Martinez, et al. 2003) showed that the tongue of budgerigar contain longitudinal and transverse sulcus on tongue dorsum, this differ from our study but we agree that the location of lingual papillae on root of tongue. Rhynchotus rufescens have a triangular shape tongue differ from goose and having hyaline cartilage on whole tongue (Rossi, et al. 2005). The histology of goose tongue agree with (Martinez, et al. 2003) that find the dorsal surface of budgerigar covered by keratinized stratified squamous tissue. Also differ from (Gargiulo, et al. 1991) in chicken that find the secretory cells are typical mucous cells. Chicken have bone in the tongue that is united combined to a cartilage in the tongue apex as described by (Turker, 1966) this description differ from tongue goose.

References:-


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دراسة مظهريّة وتشريحيّة ونسجية للسان البط
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الخلاص

تم دراسة لسان البط عيانياً بواسطة المجهر الضوئي. بينت الدراسة التشريحيّة أن اللسان البط يحتوي على اخدود طويل وسطي واضحاً على النصف الأمامي والخلفي من اللسان. يحتوي جذر اللسان على انخفاض دائري مركزي. كما بينت الدراسة وجود حليمات لسانية اساطرية الشكل على جوانب اللسان بالإضافة إلى الحليمات المخروطية الشكل في جذر اللسان. كذلك بينت الدراسة العيانية للسان الشكل الطولي للسان البط مع استدارة في القمة حوالي 7 سم في الطول. كما بلغ عرض اللسان من المقدمة 1,1 سم يتغير في المنطقة الخلفية إلى 1,3 سم.

بينت الدراسة النسجيّة أن هناك ثلاث مناطق في اللسان، المنطقة الأمامية والوسطية والخلفية. تغطي المنطقة الأمامية خارجياً بواسطة ظهارة مطبقة حرشفية متقرنة وغير خلوية يقع عميقاً منها إلى الداخل الصفية القاعدية مع خلايا عضلية بيكيّة وخلايا مelltها مع الباف غراويا مماثلة مع الخلايا العضلية البيكيّة. إلى الأسفل من الخلايا العضلية تأتي طبقة البرانية والتي تتكون من نسيج شحمي. بينما تغطي المنطقة الوسطية بنسيج مطبق حرشيّي أكثر خلوية من الجزء الأمامي، طبقة الصفية القاعدية تتكون من عضلات بيكيّية تتداخل مع الباف غراويا قليلة مقارنة مع الجزء الأمامي. كذلك تحتوي الصفحة القاعدية للجزء الوسطي على عدد لثابتي.

الجزء الخلفي يغطي بنسيج مطبق حرشيّي ولكن يحتوي على منخفضات أو طويقات. تحتوي الصفحة القاعدية على خلايا عضلية بيكيّة سميكة تحتوي عدد كبير من الغدد اللعابية. يحتوي الجزء الخلفي للسان البط على غضروف مابين النسيج الدهني أسفل الصفحة القاعدية.