

## **Morphological , Anatomical and Histological studies on goose tongue**

Saleh,K.Majeed ; \*Alaa ,H.Saadon ; \*Samira A. Daaje

Department of pathology

\*Department of anatomy and histology

College of veterinary medicin, University of basrah

---

### **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 1.3cm.

Histological analysis Showed three zone 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 & Cuisson , 2004 ). The dorsal surface of tongue in goose has anterior region extends for five – sixths of its length plus a posterior region . Large conical papillae are located in arrow between the anterior and posterior region . On both sides of the anterior region , lingual papillae are compactly distributed and 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 row on both sides of the tongue , cylindrical lingual papillae were compactly 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 propria 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 propria 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 propria 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 propria Fig12. (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 unmyelinated was noted in histological section Fig 14.

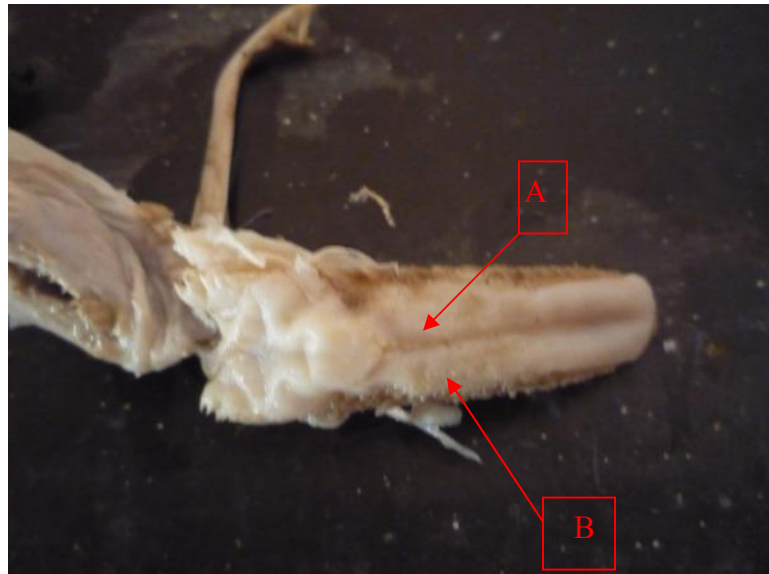


Fig 1 : Goose tongue anatomical pictures showed Cylindrical lingual papillae (A) and median longitudinal groove (B)

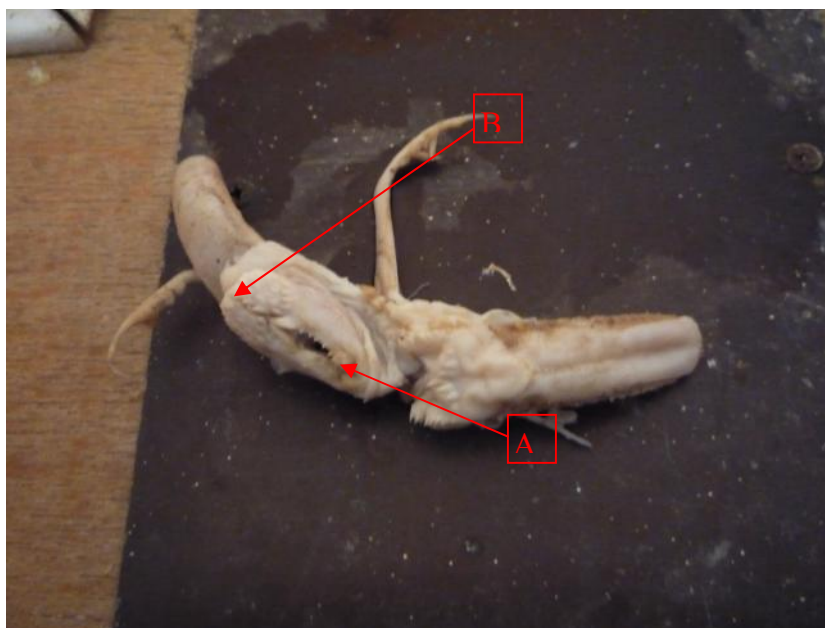


Fig 2 : Goose tongue anatomical pictures showed central depression(A) and conical papillae (B)

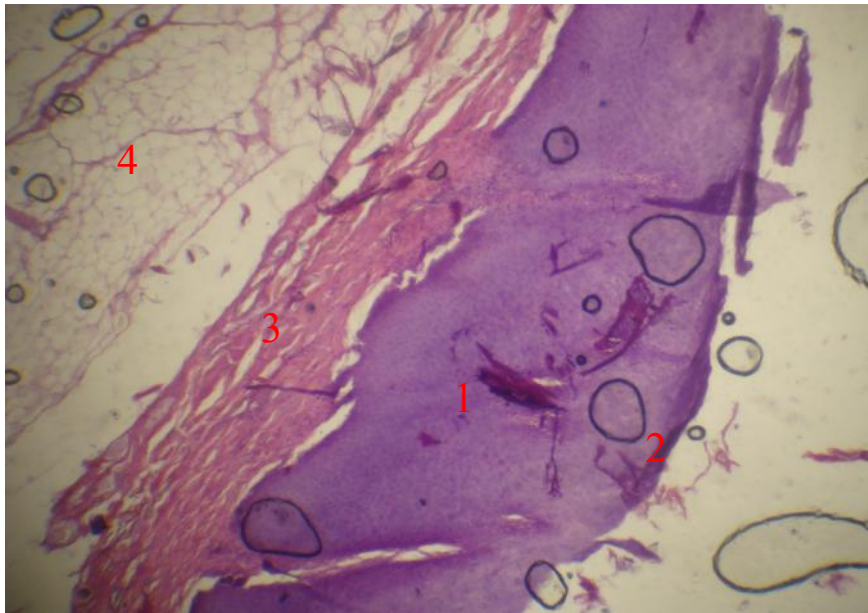


Fig 3 :- Anterior part of the tongue , note , stratified sequamous epithelium of many layer over 15(1) , covered by outer layer of keratinized non cellular(2) material . Deep of the lamina propria skeletal muscle cells with few phagocytes with collagen fiber intermingled with the skeletal muscle(3) . under the skeletal muscle , the adventitia consist of adipose tissue(4) . H&E 125 X

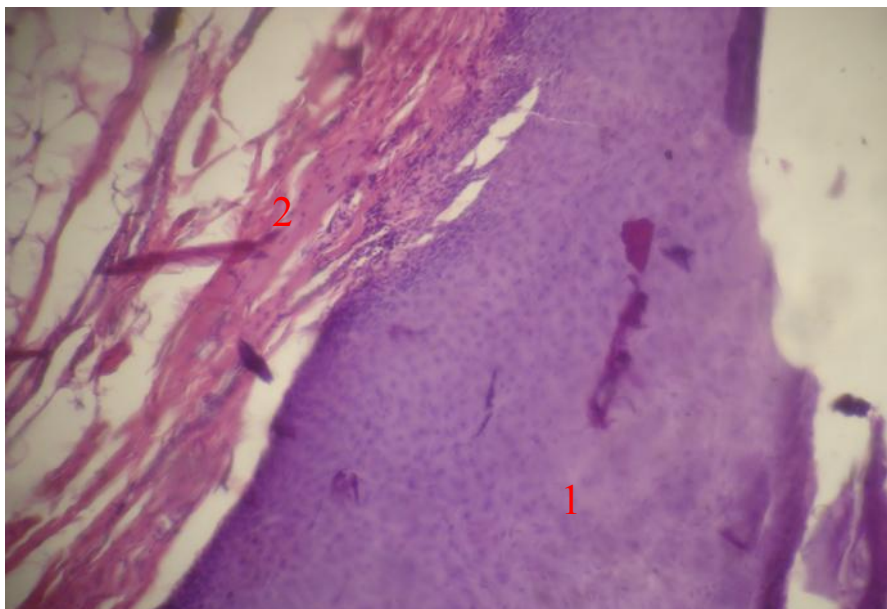


Fig 4 :- Middle part of the tongue consist of stratified sequamous epithelium with more cellular layer than the anterior also at the top Keratinized a cellular material(1) . The lamina propria at the base consist of skeletal muscle cell intermingled with few collagen fiber (2) . H&E 125 X

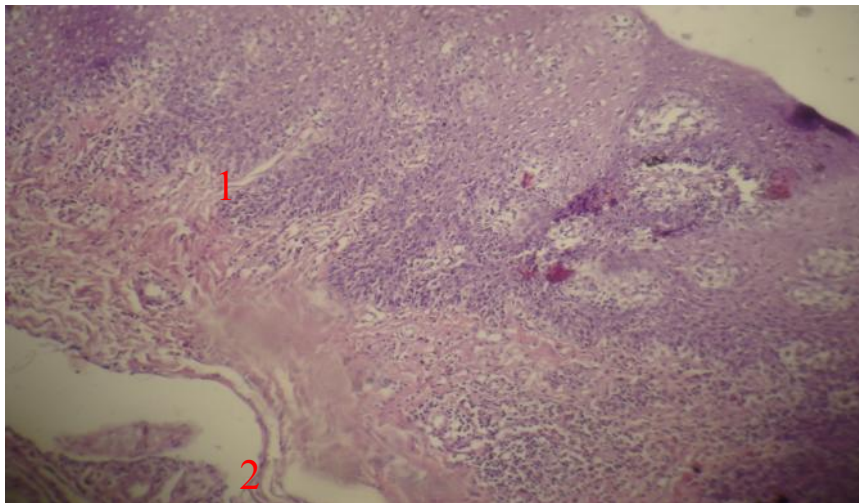


Fig5 :- The posterior part of the tongue consist of stratified squamous epithelium but there are crypt formation(1) , under layer of the top keratin acellular material .At the layer of lamina propria thick skeletal muscle layer and more of salivary gland structure(2)

H&E 125 X .

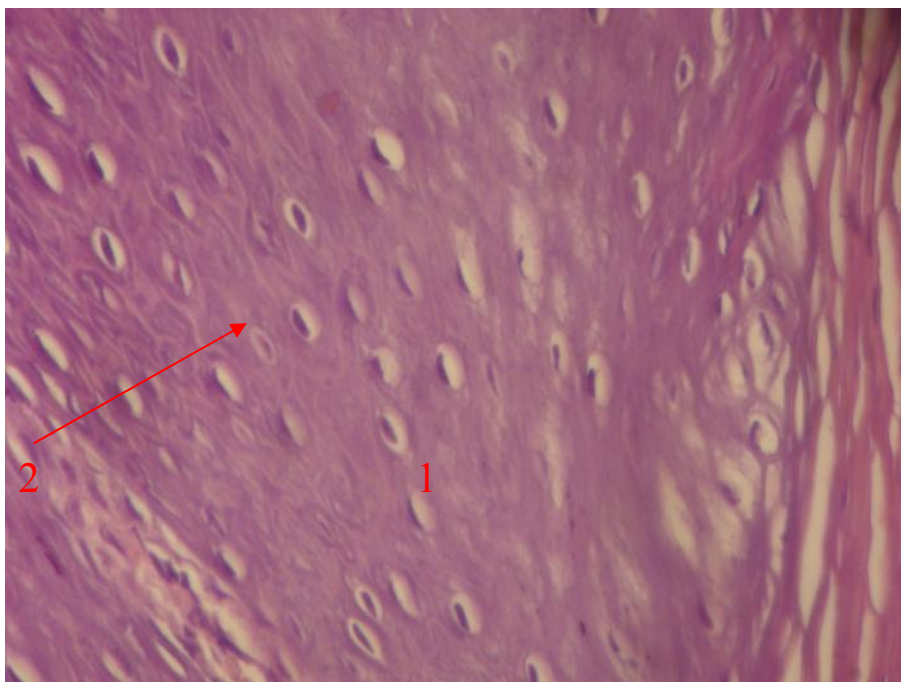


Fig 6:- At higher magnification of the posterior part squamous stratified cells , some glycogen and at the top a cellular Keratin material(1) . The folded with stratified squamous epithelium with crypts forming papillae(2) . H&E 500 X .

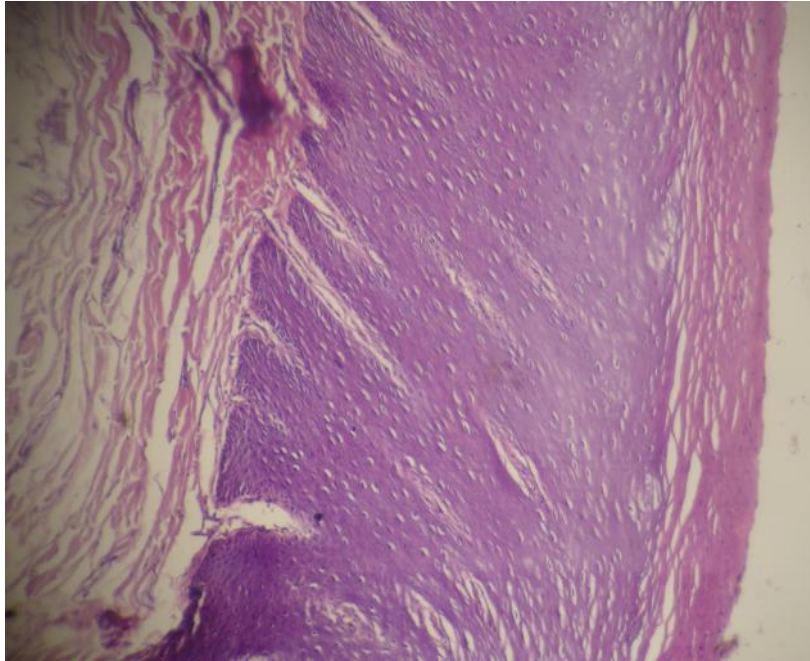


Fig 7 : - Mid part of tongue forming papillae like nipple in between connective tissue H&E 125 X

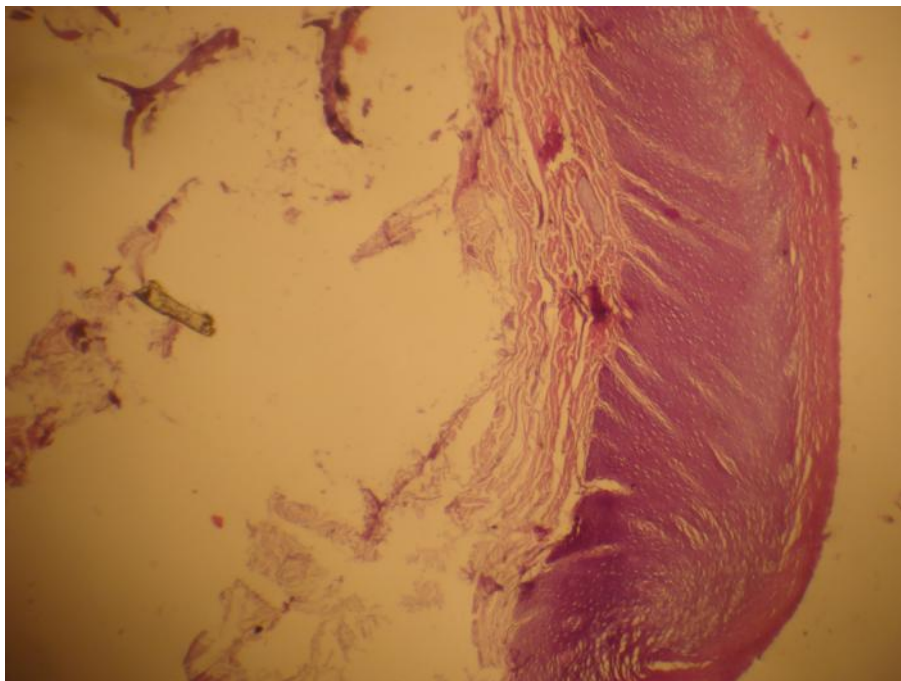


Fig 8: Posterior parts with crypts , forming papillae nipple like projection in between connective tissue , H & E 125X .

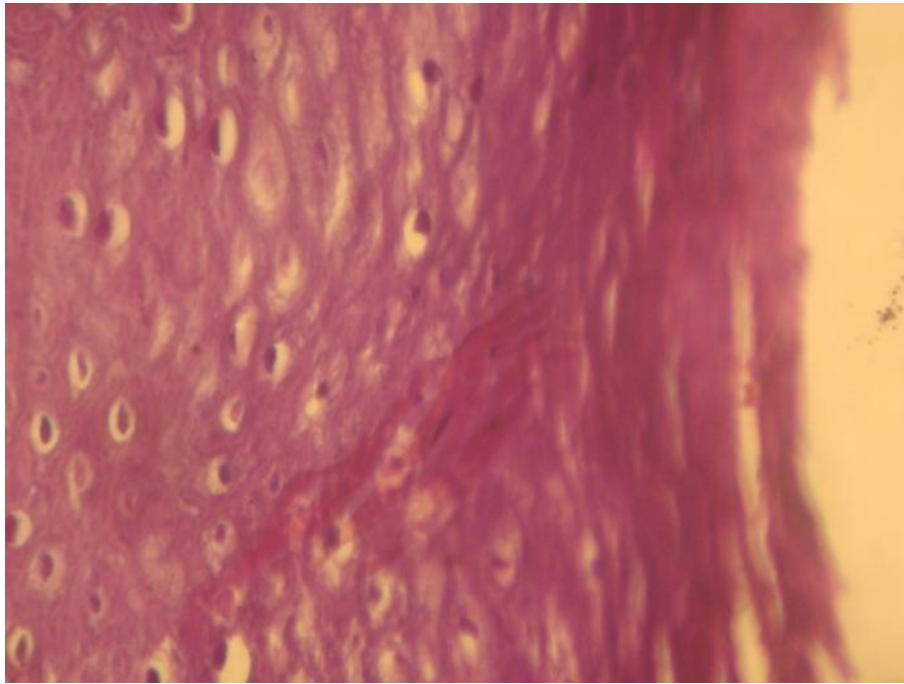


Fig 9: posterior part of tongue cells with glycogen appear vacuolated  
H&E 500X

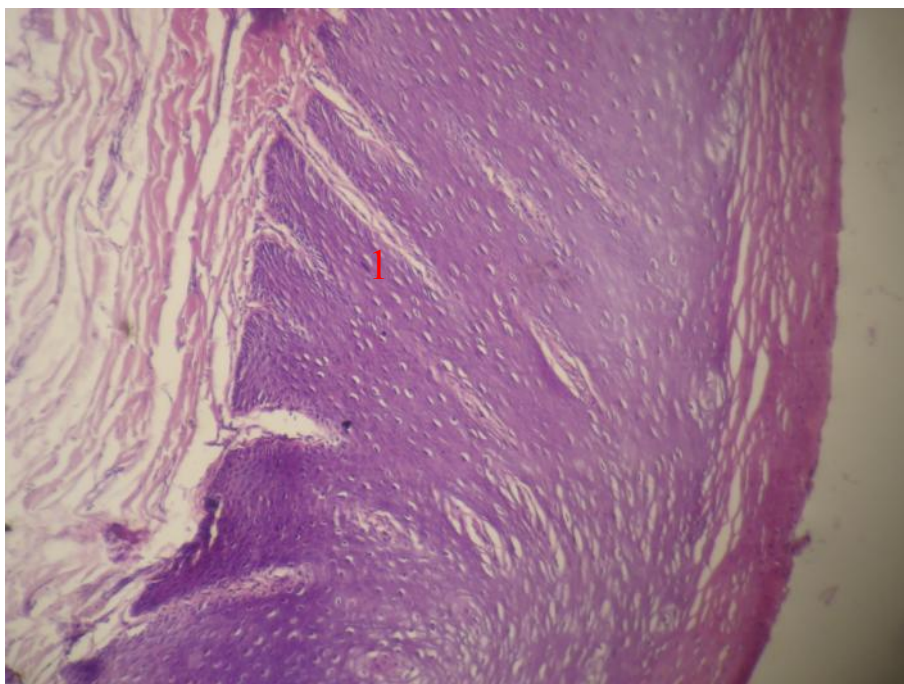


Fig 10 :- Posterior part of tongue forming papillae like nipple in between  
connective tissue H&E 125 X



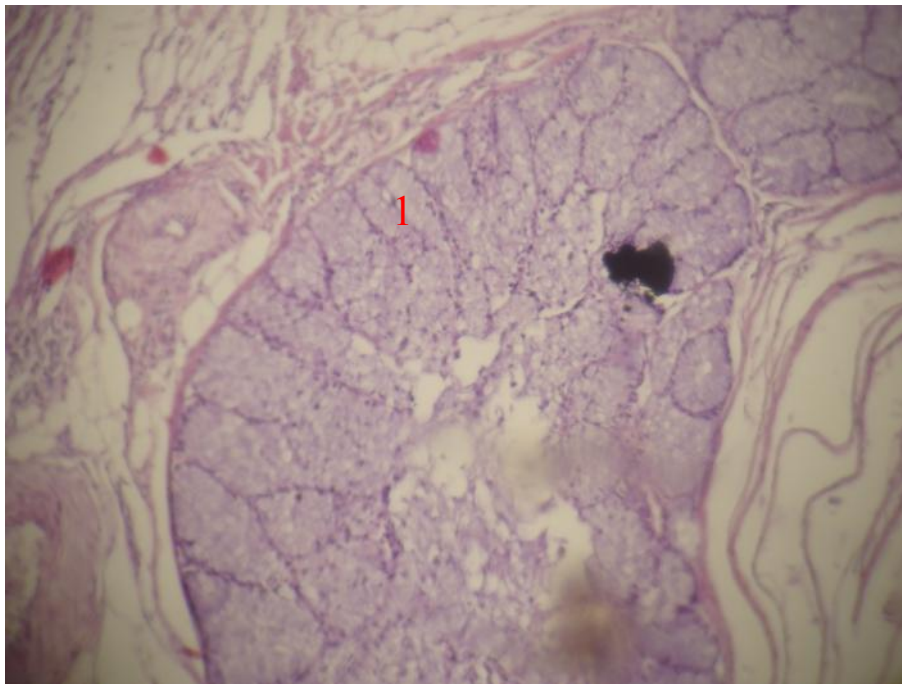


Fig 11 : posterior part of tongue showed large area of salivary (serous) glands appear quite prominent(1) H&E 125X .

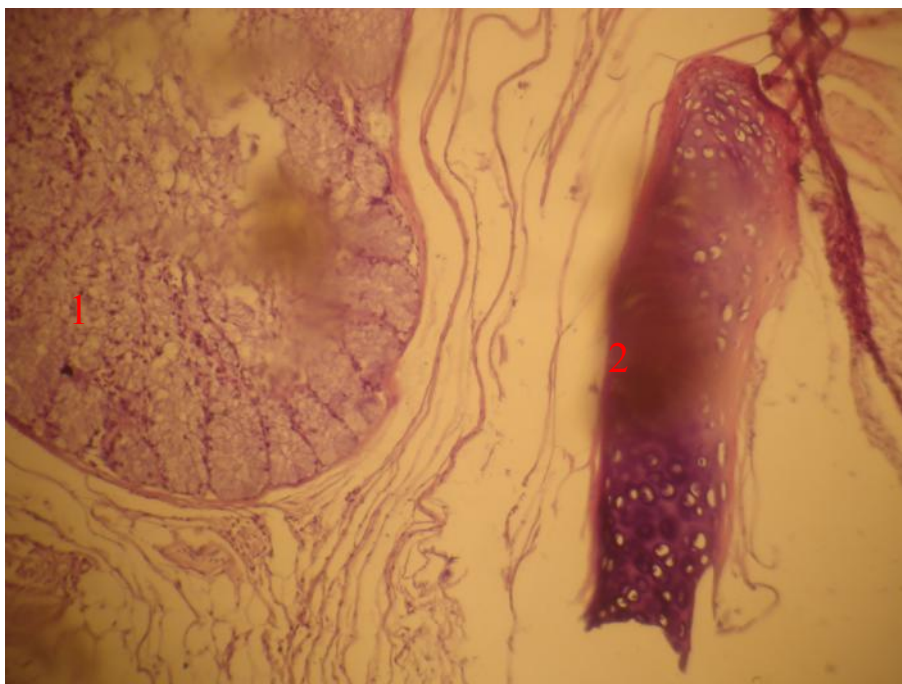


Fig 12 : Posterior part of tongue note prominent of salivary glands(1) also a section of cartilage in between adipose tissue(2) H&E 125X

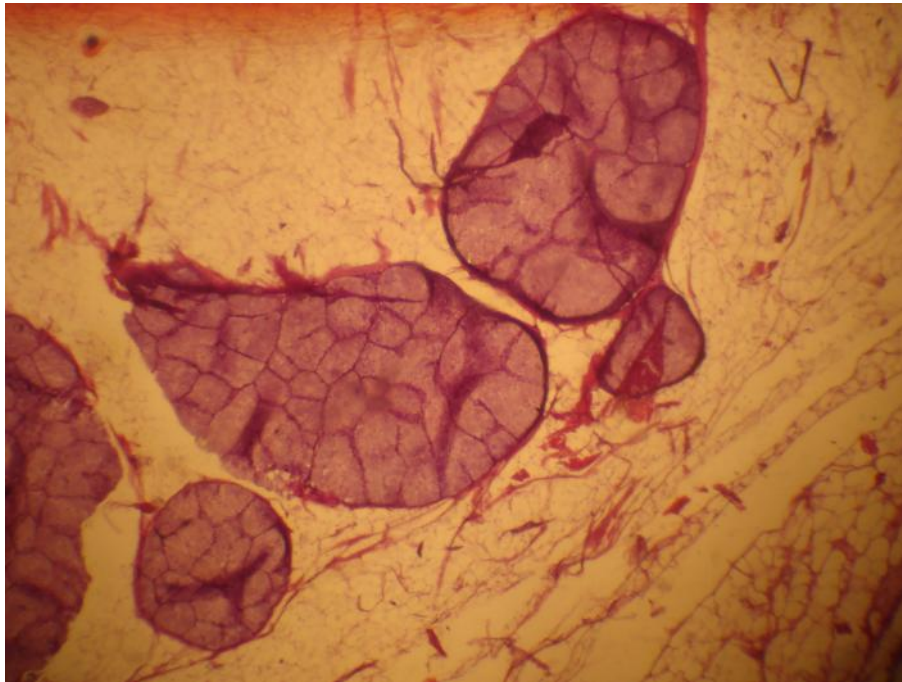


Fig 13 : Low magnification of serous salivary glands in base of tongue H&E  
125 X

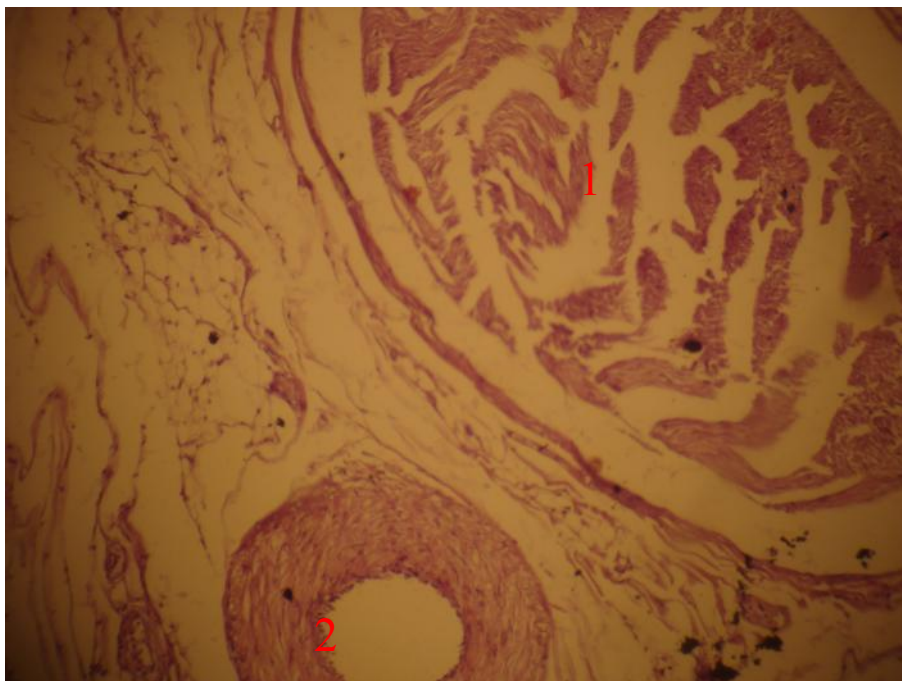


Fig 14 :- posterior part of tongue showed unmyelinated nerve fibers(1) and  
artery with prominent media (2). H&E 125 X .

**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 sequamous 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:-**

- Galigher ,A.E .and Kozolff ,E.N** .1964. Essential particle microtechnique . Lea & Fabrigar , Philadelphia 42 – 44 .
- Gargiulo ,A.M ; Lorvik , S ; Ceccarelli ,P and Pedini , V** . 1991. Histological and histoche-

mical studies on the chicken lingual glands .Br Poult sci 32(4) 693 – 702 .

**Guimarães JP; Maei, RB ; Carvalho , HS and Watanabe , IS.** 2009. Structures of the dorsal surface of the Ostrich's(*Struthio Camelus* ) tongue . J of Zoolog sci 26 (2):153 – 156 .

**Hassan SM, Moussa EA and Cartwright AL** .2010. Variations by Sex in Anatomical and Morphological Features of the Tongue of Egyptian Goose (*Alopochen aegyptiacus*). J of cell tissue organs . 191(2):161-165.

**Iswasaki ,S** .2002. Evaluation of the structure and function of the vertebrate tongue. J of anatomy 201 : 1-14 .

**Luna ,L G** . 1968. Manual of histological staining of the armed forces institute of pathology ,3<sup>rd</sup> edition . Graw – Hill Book co , 1-28 .

**Martinez, M.; Stefanini, M. A.; Martinez. F. E.; Guida, H. L.; Pinheiro, P. F. F.; Almeida, C. C. D. And Segatelli, T. M.**2003.

Morphological study of the tongue of the budgerigar (*Melopsittacus undulatus*) . *Int. J. Morphol.*, 21(2):117-122 .

**Rossi , R.J ; Baraldi – Artoni , M.S ; Oliveria , S.V and Sagula , A** . 2005. Morphology of beak and tongue of Partigde *Rhynchotus rufescens* .Cienc .Rural . Vol 35(5).

**Turker ,R.** 1966. Differentiationus of epithelial and connective tissue component in the tongue of *Gallus Domestic*.Res of vet sci vol 7 p1-16 .

**Villard ,Pand Cuisin** .2004 . How do woodpeckers extract grups with their tongue ?.French west Indies J 121 (2) :509-514 .

دراسة مظهرية وتشريحية ونسجية للسان البط

صالح كاظم مجيد ، علاء حسين سعدون

سميرة عبد الزهرة دعاج

جامعة البصرة-كلية الطب البيطري

### الخلاصة

تم دراسة لسان البط عيانيا بواسطة المجهر الضوئي . بينت الدراسة التشريحية ان اللسان البط يحتوي على اخود طولي وسطي واضحا على النصف الأمامي والخلفي من اللسان . يحتوي جذر اللسان على انخفاض دائري مركزي . كما بينت الدراسة وجود حليمات لسانية اسطوانية الشكل على جوانب اللسان بالإضافة الى الحليمات المخروطية الشكل في جذر اللسان . كذلك بينت الدراسة العيانية لسان 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 الى 1,3 سم .

بينت الدراسة النسجية ان هناك ثلاث مناطق في اللسان ، المنطقة الأمامية والوسطية والخلفية . تغطي المنطقة الأمامية خارجيا بواسطة ظهارة مطبقة حرشفية متقرنة وغير خلوية يقع عميقا منها الى الداخل الصفيحة القاعدية مع خلايا عضلية هيكلية وخلايا ملتزمة مع الياف غراوية متداخلة مع الخلايا العضلية الهيكلية . الى الأسفل من الخلايا العضلية تأتي طبقة البرانية والتي تتكون من نسيج شحمي . بينما تغطي المنطقة الوسطية بنسيج مطبق حرشفي اكثر خلوية من الجزء الأمامي ، طبقة الصفيحة القاعدية تتكون من عضلات هيكلية تتداخل مع الياف غراوية قليلة مقارنة مع الجزء الأمامي . كذلك تحتوي الصفيحة القاعدية للجزء الوسطي على غدد لعابية .

الجزء الخلفي يغطي بنسيج مطبق حرشفي ولكن يحتوي على منخفضات او طويقات . تحتوي الصفيحة القاعدية على خلايا عضلية هيكلية سميكة تحوي عدد كبير من الغدد اللعابية . يحتوي الجزء الخلفي للسان البط على غضروف مابين النسيج الدهني اسفل الصفيحة القاعدية .