

HISTOMORPHOLOGICAL AND HISTOCHEMICAL STUDY OF THE GUSTATORY PAPILLAE AND LINGUAL GLANDS IN LOCAL IRAQI BREED GOAT (*CAPRA HIRCUS*)

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ABSTRACT

The current research conducted on (16) tongue of local breed goat. Histological samples were taken from various regions of the tongue including the gustatory papillae histological technique was done on the sample and slides of 5-7 μ m stain by H, PAS, Ab and a combination of PAS-Ab, pH 2.5. The tongue of goat has fungiform and vallate papillae as gustatory papillae. Serous salivary glands present in the submucosa near the gustatory papillae while the mucous gland spread out among the muscles bundles of the tongue. Our aim in this study is to clarify the structure of papillae and the chemical nature of the lingual gland.

KEYWORDS: Tongue, Papillae, Local breed goat and lingual gland.

INTRODUCTION

Lingua is the more active musculo-membranous organ in herbivores has essential role in reception, tasting and swallowing food. Iwasaki, (2002) it was studied in variable species of animal and bird. Abdulrazzaq, (2018) in the tongue of porcupine and Al-Taai and Khalaf, (2022) in starling bird. Yanping *et al* (2016) in cattle yak.

The Iraqi local cattle and goat had very few attention in the anatomical and histological studies. Little anatomical research was done in mammary gland Badday (2021), Al-Rikabi (2012) in sebaceous glands for these reasons the purpose of our study was to clarify the structure of gustatory papillae and the histochemical nature of the lingual salivary glands associated with them using histological and histochemical methods to provide detailed information to be a basis for other fields (pathology and physiology).

MATERIAL AND METHOD

Histological samples of (1x1 cm) from various parts (Apex body and root) from (6) tongues of local Iraqi breed adult goat were taken immediately after slaughter of animals and head were separated. The sample rapidly fixed in 10% neutral buffered formalin for 48 hours, and then processed for routine histological technique for paraffin

sectioning at 5-7 μ m which stained with hematoxylin and eosin periodic acid Schiff (PAS), Alcian blue and PAS-Alcian blue pH 2.5. Bancroft and Steven, A. (2013).

Slides were examined by light microscope and photographed by digital camera

RESULTS AND DISCUSSION

Morphological result

The dorsal surface of the tongue in local breed goat shows rough thick more cornified stratified—squamous epithelium than the ventral surface which appears smooth except in the anterior margin which has filiform and more fungiform papillae. Fig (1,2,3), this result is in agreement with the finding of Sreeranjini *et al*. (2010), in deer, and Ammar (2014) in goat. The rough dorsum is due to presence of different shapes and sizes of lingual papillae while the thicker thickness of the dorsum epithelium may be to protect the tongue against coarse food. The dorsum in local Iraqi goat has two kinds of gustatory papillae (fungiform and vallate papillae).

The fungiform papillae

In this study it appears round dome-shaped structure among the filiform papillae with high density present on the dorsum of the apex and anterior margin of the ventral surfaces their diameter is 1.9 ± 0.22 mm Table-1, Fig(1,2,3,4). The fungiform papillae decrease in number

toward the torus-linguae and become few scattered on the-laterodorsal aspect of the torus lingua Fig(4).

The circumvallate vallate papillae

It appeared as a large wide flatten circumscribed structure with different-size surrounded completely by a gustatory sulcus, it is present in two rows on the dorsolateral side of the torus lingua, just in front of the lingual root, and slightly prominent over the dorsum Fig (1,5). The vallate number in the left side was 13.2 ± 0.3 and on the right side was 12.8 ± 0.21 . Table -1-, and the number of papillae is more in the outer row than in the inner row in each side. This finding in agreement with the finding of Murad,(2010) in adult Rams and Ammar, (2014) in goat.

1- Histological result Fungiform papillae

Is round dome-like with minute convex dorsal aspect, it covered by very thin cornified layer of stratified squamous epithelium in some papillae the covering was non-cornified layer, and numerous taste buds present on the dorsal epithelium, the core of the papillae is made of dense connective tissue rich with blood vessels and cells Fig (6). Our result is similar to the result of Agungpriyono *et al* (1995) and Murad (2010) in ram, Sari *et al* (2010) in cattle and goats Ammar, (2014) in goat and disagreement with the result of Hussein and Al-sadi (2010) in Iraqi sheep.

The vallate papillae

Each vallate papilla was flattening round shape surrounded by a gustatory groove was covered by thin slightly keratinized layer of stratified squamous

epithelium and had very less or non-keratinized epithelium on its lateral aspect which possesses several small taste buds.

The papilla core consists of dense connective tissue with blood vessels, von-Ebner gland was presented in submucosa surrounded excretory duct opened in the depth of groove. Fig (7). Similar result was found by Agungpriyono *et al* (1995) in mouse deer, Hussein *et al* (2010) in Iraqi sheep and Ammar (2014) in goat.

2- Histological and histochemical of lingual glands
Two kinds of serous and mucous glands are present in the tongue of the local breed goat.

The posterior (weber's gland) was mucous which is widely prevailed among the bundles of intrinsic muscle of tongue and adipose tissue. It appears as a large lobule and its acini are small and large, lined with pyramidal mucus cell and surrounded by the fine amount of connective tissue. The small lumen duct was the intra lobular lined with a single layer of cuboidal cells, and the inter lobar duct which presents in the connective tissue lined by cuboidal cells. Their excretory duct which is open on the lingual surface lined by two layers of cuboidal cell Fig(8).

The mucous acinar cells were positive for APS and AB stain Fig(9), this indicated that mucous call was content of neutral and acid mucopolysaccharides. This result was similar to the finding of Akira and Tadahiko (2010) in monkey and Ammar (2014) in goat and Baydaa *et al* (2015) in Bat.

Table 1: Type equation here Shows The Number And Diameter Of The Gustatory Papilla of Tongue In Local Iraqi Breed Goat.

Number of vallate pip.	Right side	12.8 ± 0.21
	Left side	13.2 ± 0.23
Diameter of vallate (mm)	Large	4.0 ± 0.21
	Small	2.1 ± 0.24
Diameter of fungiform (mm)		1.9 ± 0.22

Data is $M \pm SE$

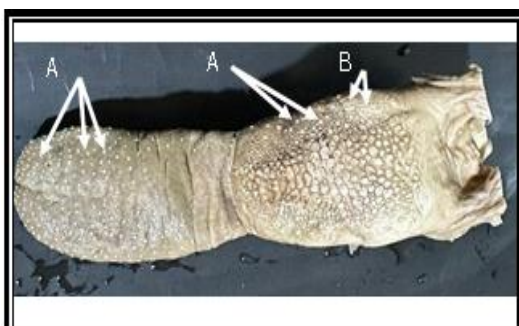


Figure.1: Anatomical specimen of tongue Iraqi goat dorsal surface shows A- fungiform papillae B- circumvallate vallate papillae



Fig.2: Anatomical specimen of tongue Iraqi goat ventral surface shows fungiform papillae at the tip of tongue

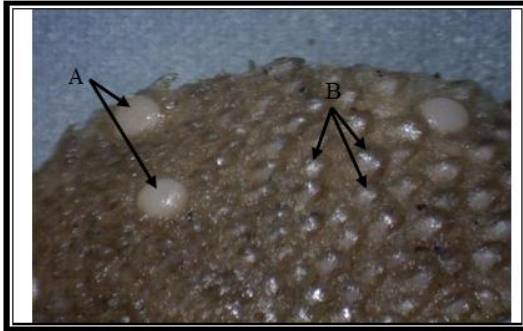


Fig.3: dissecting microscope photograph of the dorsal surface of apex of longue in local breed goat shows A- fungiformpap. B- short filiformpap.

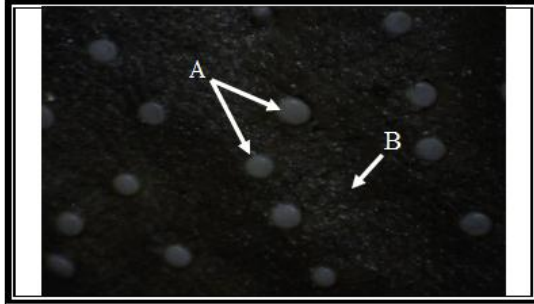


Fig.4: dissecting microscope photograph of the ventral surface of apex of longue in local breed goat shows A- fungiform pap. B- short filiform pap.

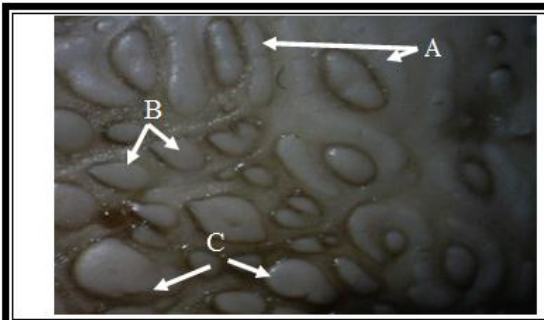


Fig.5: dissecting microscope photograph of torus of longue in local breed goat shows A- circumvallate. B- conical pap. C- lenticular pap.

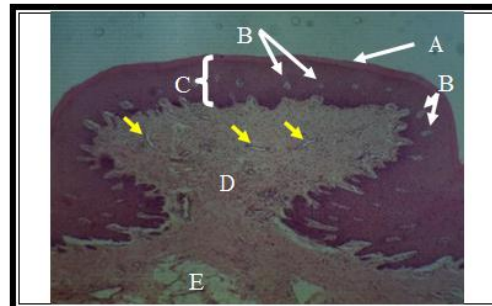


Fig.6: Histological section for fungiform papillae shows A- stratum corneum B- Taste buds C- keratinized stratified squamous epithelium D- dense connective tissue core E- adipose tissue Arterial and blood capillary(Yellow arrow) (H&E-40X)

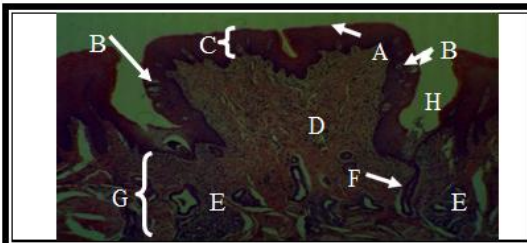


Fig.7: Histological section for circumvallate shows A- thin stratum comeum B- Taste buds C- keratinized stratified squamous epithelium D- dense connective tissue core E- von –Ebner gland F- excretory duct of von –Ebner gland G- lamina propria and submucosa H- gustatory groove (H&E -40X)

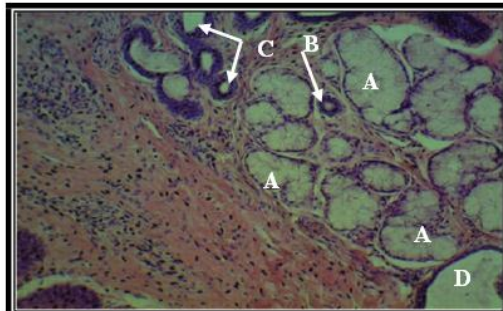


Fig.8: Histological section shows weber's glands A- mucous acini lined pyramidal cells B- intra lobar duct C- inter lobar duct D- excretory duct H&E X100

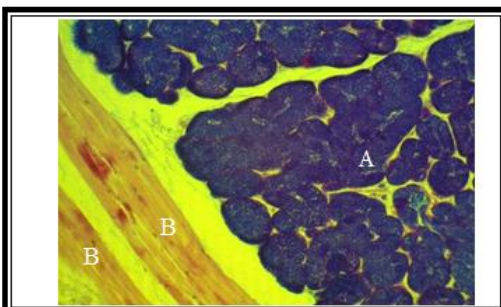


Fig.9: Histological section for The posterior (weber's gland) shows A- positive reaction for PAS, Ab PH2.5 stain B- muscle bundles (100 X)

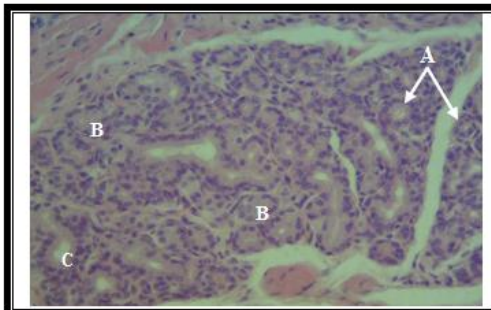
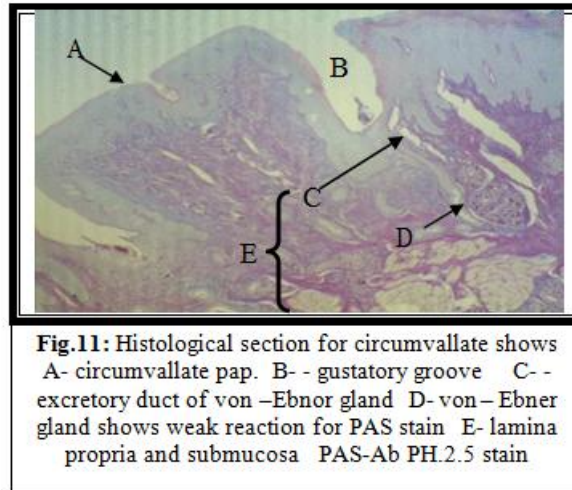


Fig.10: Histological section shows von-Ebner glands A-intra lobar duct B- serous acini lined with cuboidal cells C- inter lobar duct H&E X100



Von-Ebner gland

Is a serous gland located in the submucosa of under the gustatory papillae. The acini is lined by a cuboidal cell with a large round nucleus. Their intralobular duct with small lumen lined by squamous to cuboidal cells while their excretory duct which is opened at the depth of the gustatory sulcus of vallate pap. Fig(10). The serous acinar cells showed weak PAS reaction indicated containing few amount of neutral mucopolysaccharid Fig(11). This result was agree with Akira and Tadahiko (2010) in monkey and Ammar (2014) in sheep. The present of two types of glands (serous and mucous) help in protective and lubricant of lingual surface to help in swallowing and tasting food need to.

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