COMPARATIVE HISTOLOGICAL AND HISTOCHEMICAL STUDY OF THE PAROTID GLAND IN BUFFALOES AND COWS

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ABSTRACT

The present work designed to describe the histological and histochemical features of parotid gland in buffaloes and cows.The glands were collected from ten heads of buffaloes and cows used. The histological and histochemical study revealed that the parotid gland in buffaloes and cows are compound tubuloacinar-type, having dense connective tissue capsule, the parenchyma consists of acini, intercalated, striated and excretory duct, acini surrounded by myoepithelial cells.The parotidis a purely serous gland. histochemical study,demonstrated of mucopolysaccharide by using combined AB-PAS, acini shows weak to moderate reaction in buffaloes but weak reaction in cows.

INTRODUCTION

Salivary glands are extremely complex organs (1).They develop at different location,they have different architectures and produce more than one types of saliva (2). Saliva in the ruminant is primarily supplied by parotid glands, which secrete rapidly and continuously (3). This is highly important for the animals, because they need to relocate nitrogenous and phosphorous compounds,which are essential factors for microbial growth in the forestomach (4).In contrast to humans, the ruminant secrete large volumes of alkaline and well buffered saliva, mostly for lubricating and swallowing food particles (5).Salivary glands are important for research because of their diverse functions (6).

The present study aims to describe histological and histochemical feature of parotid gland in buffaloes and cows.

MATERIALS AND METHODS

Twenty healthy adult heads(10 buffaloes and 10 cows) were bought from the slaughter house at Basra province.The parotid glands were removed directly then serial processes were done according to (7).Later the sections were stained with Harris haematoxylin and eosin, Masson's trichrome stain for appearance of connective tissue,Van Gieson stain differential of collagen and other connective tissue and in the histochemical study AB(PH2.5)-PAS method for mucosubstances. The Statistical analysis was performed on the basis of T-Test by using a Statistical program as described by (SPSS,2012,version21).

RESULT

The microscopic structure of parotid gland in buffaloes and cows revealed that the gland is surrounded by dense connective tissue capsule, septa extend from the capsule and separated the gland into many lobules with different shapes and size,these septa are characterize by the presence of adipose tissue (Fig 1,2).The lobules are composed of pure serous acini which were small in diameter and had small lumen which was difficult to distinguish.The statistical analysis revealed that the mean diameter and lumen of acini were (36.50±0.45, 8.50±0.61)µm,respectively in buffalo and (35± 0.95, 5.5± 0.5)µm respectively in cow (Table1).The acini was characterized by pyramidal shaped lining cells with round centrally located nuclei, very fine and scanty connective tissue were found between acini as intralobular septa,the myoepithelia cells were seen surrounding the acini(Fig.3,4).Intralobular duct system which was initiated by intercalated duct and are lined by simple cuboidal epithelium and elongated nuclei (Fig.3,4).These duct was empties into larger striated duct, the latter duct are lined by simple columnar epithelia and characterized by acidophilic cytoplasm and large centrally located nuclei.These duct are surrounded by fine connective (Fig.5,6).The intralobular striated duct are converged together to form the larger interlobular ducts, which are lined by simple columnar epithelium cells at the beginning and change to stratified epithelia when they are increase in size.These duct located in the interlobular septa (Fig. 7,8).The large interlobular ducts are connected together to form the main excretory ducts of gland which are lined by stratified

columnar epithelia and goblet cells.These ducts were enclosed by connective tissue stroma(Fig.9,10).Histochemically the section from parotid gland stained with(AB(PH2.5)-PAS)revealed weak to moderate reaction in serous acini in buffalo and weak reaction in serous acini in cow and all type of duct show negative reaction only goblet cell were positive toward stain.

Table (1): The Mean for diameter and lumen of secretary end pieces, Intercalated, striated and interlobular duct for parotid salivary gland in buffaloes and cows

Gland Name	Side	Mean ± S.E	Mean ± S.E	Mean ± S.E Intercalated	Mean ± S.E Intercalated	Mean ± S.E Striated Duct	Mean ± S.E StriatedDuct	Mean ± S.E Interlobular Duct	Mean ± S.E Interlobular Duct	T-Test
		Dia. (µm)	Lumen (µm)	Dia. (µm)	lumen (µm)	Dia. (µm)	Lumen (µm)	Dia. (µm)	Lumen (µm)	
Parotid in Buffalo	Serous Acini	36.50 ± 0.45	8.5 ± 0.61	52 ± 1.46	32.5 ± 1.77	70 ± 0.71	52.50 ± 0.94	185 ± 0.79	97.5 ± 0.12	N .S
Parotid in Cow	Serous Acini	35 ± 0.95	5.5 ± 0.50	62.5 ± 0.59	32 ± 0.42	80 ± 0.90	50.50 ± 0.82	150 ± 1.07	98.9 ± 0.58	N .S

SE: Standard Error Mean, N.S: Mean there is no difference between groups at (P>0.05)

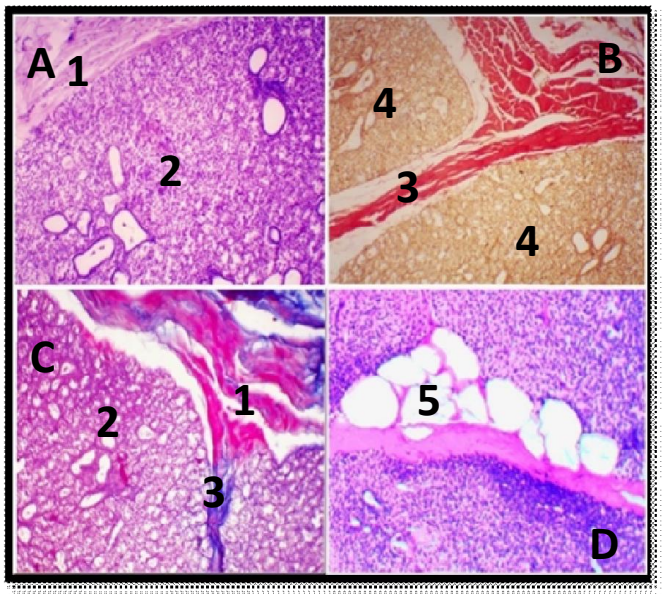

Fig. (1) Section from parotid salivary gland in buffalo showing: A-1. capsule, 2.acini (H&E 100x), B-3.septa, 4.lobules (Van Gieson 100 X), C-(masson's trichrome stain100x), D-5.adipose tissue (H&E 100x).

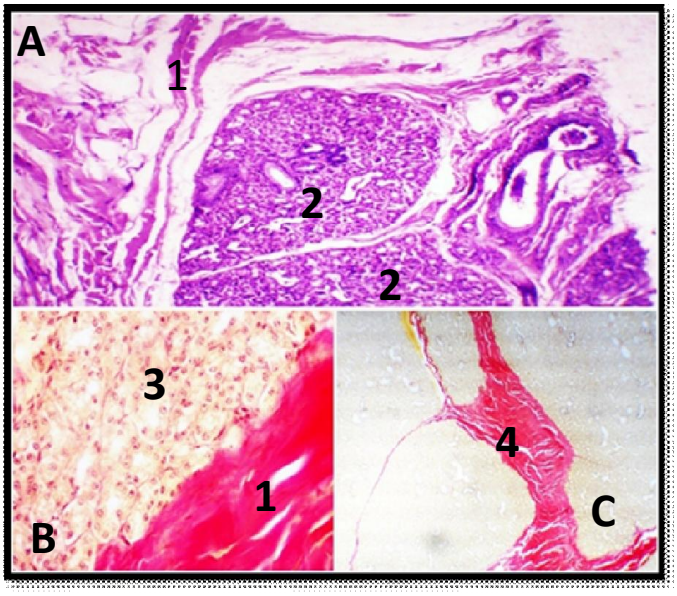

Fig. (2) Section of parotid salivary gland in cow showing: A-1.capsule, 2.lobule (H&E40x), B-3.acini (Van Gieson 400x), C-4.septa (H&E 100x).

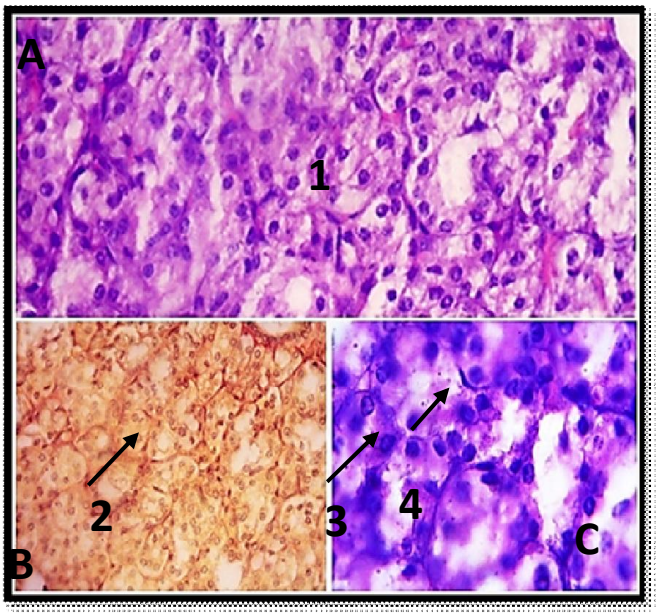

Fig. (3) Section from parotid salivary gland in buffalo showing: A-1.Serous acini (H&E 400x), B-2.lumen of acini (Van Gieson400X), C-3.Pyramidal cell of acini, 4.Myoepithelia cell (H&E oil immersion).

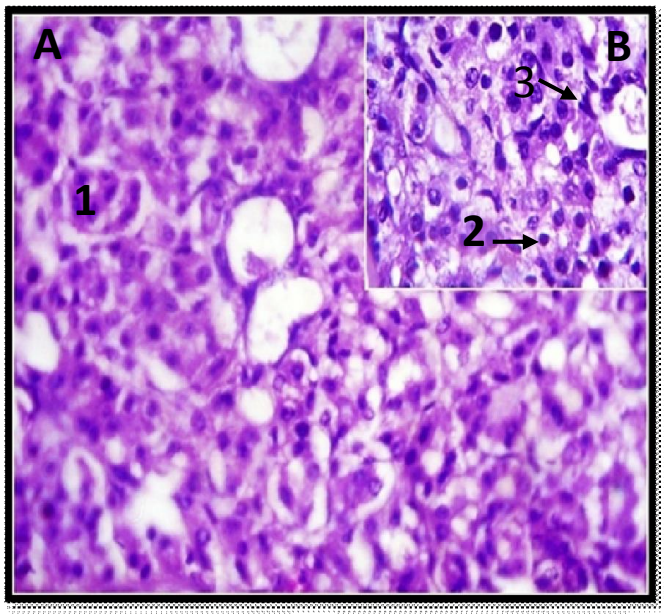

Fig. (4) Section of parotid salivary gland in cow showing: A-1.Serous acini (H&E400x), B-2.Cuboidal cell of acini, 3.Myoepithelia cell (H&E oil immersion).

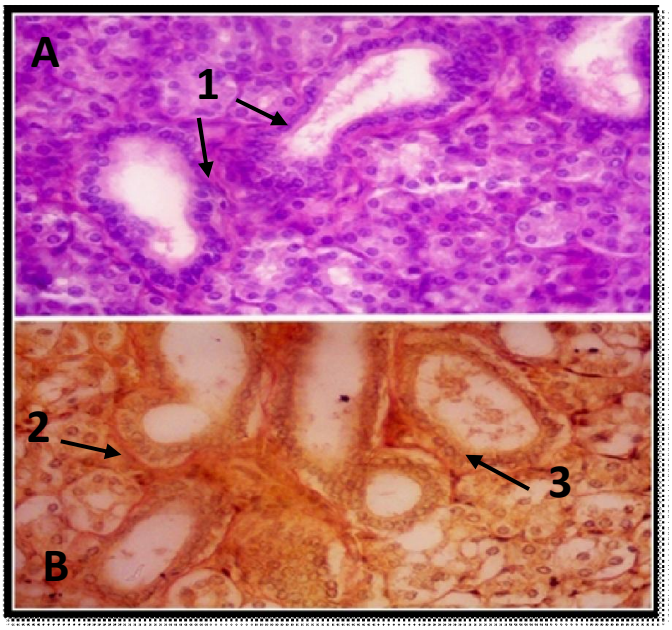

Fig. (5) Section of parotid salivary gland in buffalo showing: A-1.Striated duct (H&E 400X), B-2.Simple columnar epithelia of striated duct, 3.Intercalated duct (Van Gieson stain 400x).

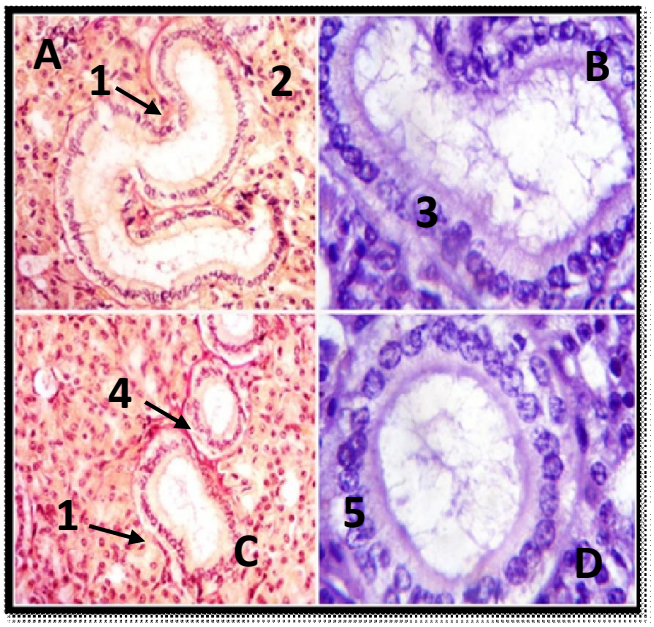

Fig. (6) Section of parotid salivary in cow showing: A-1.Convoluted appearance of striated duct, 2.Acini (Van Gieson stain 400x), B-3. striated duct with simple epithelia (H&E oil immersion), C-4.intercalated duct (Van Gieson stain 400x). D-5. intercalated duct with simple cuboidal (H&E oil immersion).

Fig. (10) Section from parotid salivary gland in buffalo showing: A-

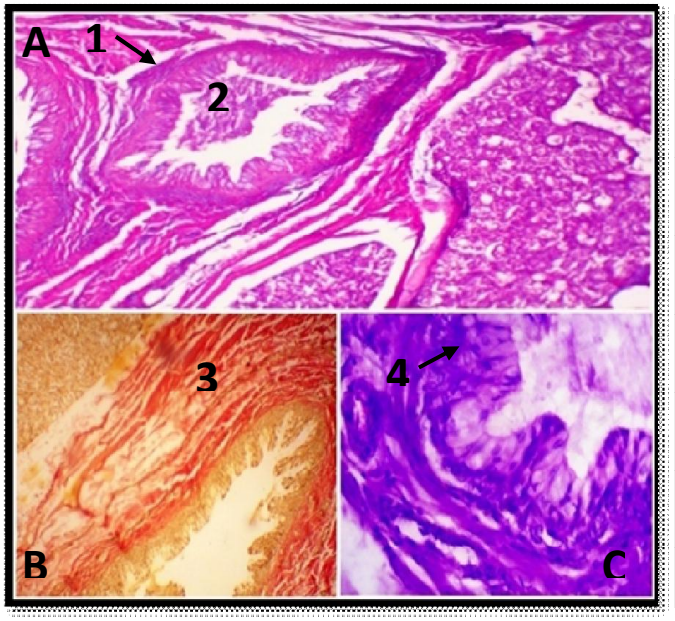

Fig. (7) Section of parotid Salivary gland in buffalo showing: A-1.Interlobular duct, 2.lumen with secretion (masson's trichrom stain 100x), B-3.Interlobular connective tissue around the duct (Van Gieson 100x), C-4.Stratified epithelia of interlobular duct (H&E 400x).

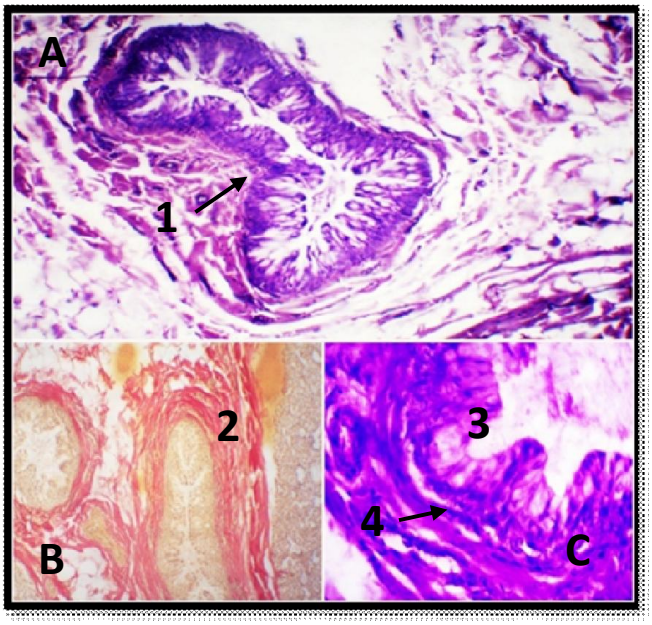

Fig. (8) Section of parotid salivary gland in cow showing: A-1.Interlobular duct (H&E 100x), B-2.Fibrous tissue around the duct (Van Gieson stain 100x), C-3.stratified epithelia, 4.Goblet cell (H&E 400x).

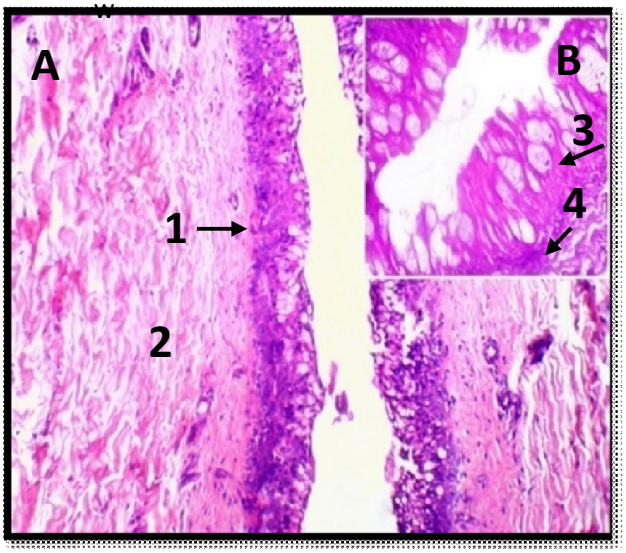

Fig. (9) Section in parotid salivary gland of buffalo showing: A-1.Main excretory duct, 2.fibrous tissue (H&E100X), B-3.Vacuolated epithelia, 4.Goblet cell (H&E 400x).

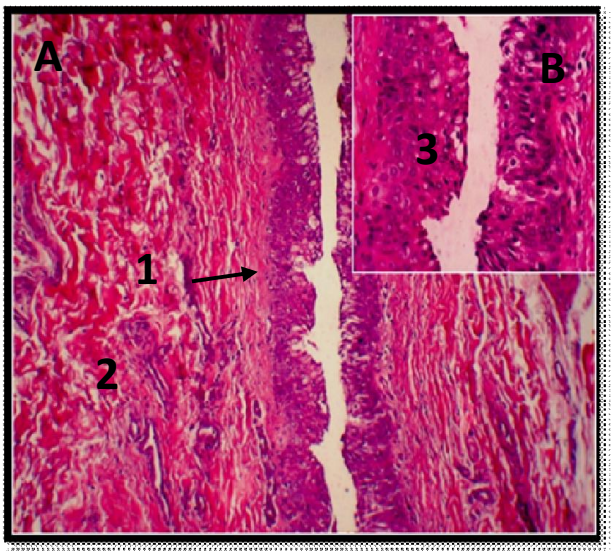

Fig. (10) Section of parotid salivary gland in cow showing: A-1.Main excretory duct, 2.Fibrous connective tissue (H&E 100x), B-3.Stratified epithelia of duct (H&E 400x).

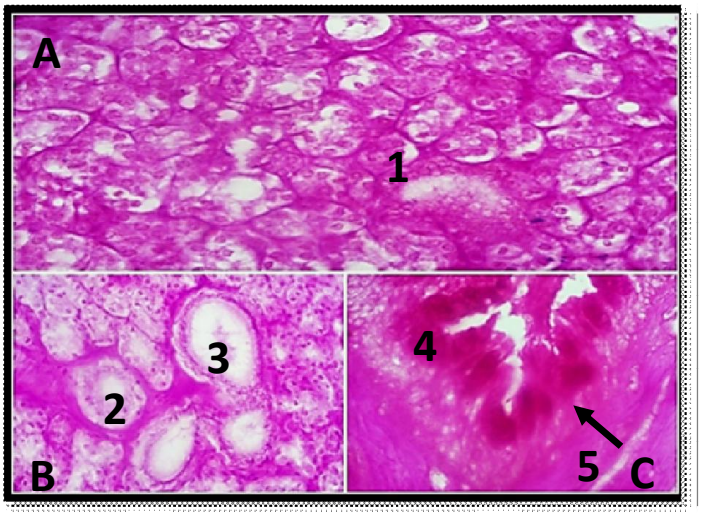

Fig. (11): Section of parotid salivary gland in buffalo showing: A-1.Serous acini (AB-PAS 400x), B-2.Intercalated duct, 3.Striated duct (AB-PAS 400x), C-4.Interlobular duct, 5.Goblet cells (AB-PAS 400x).

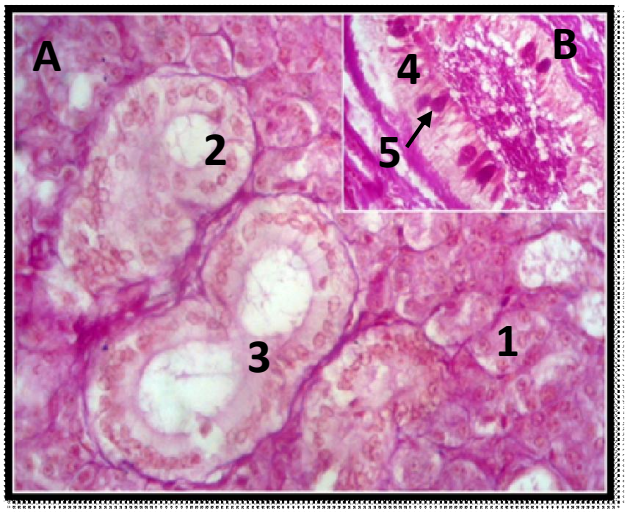

Fig. (12) Section of parotid salivary gland in cow showing: A-1.Serous acini, 2.Intercalated Duct, 3.Striated duct (AB-PAS 400x), B-4.stratified epithelia of Interlobular duct, 5.Goblet cells (AB-PAS 400x).

DISCUSSION

The parotid gland in cattle and buffalo were compound tubulo-alveolar gland this finding was agreement with (8,9,10,11).The gland was covered by capsule of dense regular connective tissue this result was agreement with (12). (13), who reported that covering capsule is used for protecting the serous secretory acini cells, the observation of serous acini had been observed by (14),(8), (15), (16),(17), (18), (19), (20), (21), (22). The finding was disagreed with(23), (24), (25),(26),(27), they found that the parotid gland was mixed gland serous and mucous.(28)mentioned that the serous type was found in the parotid gland of herbivorous animal and mixed in the carnivorous related to the type of feeding of these animal.

The occurrence of well-developed serous cells may be an adaptation for raise digestion of carbohydrates in the oral cavity and also to increase production of antibacterial agent lysozyme to help reduce rate of infection establishment in the wild (29).The present study showed that myoepithelial cells surrounding the serous acini this finding was agreement with (30) while different with (31) the serous acini lack

myoepithelial cells and only cytoplasmic processes of cytoplasmic processes of myoepithelial of intercalated duct were found between acini.

The myoepithelial cells surrounding the acini secretory end piece was provides contractile force to help move secretion from the acinicells and push them during the intercalated duct (32).The intercalated duct of simple cuboidal epithelium play important role in transport secretion from acini to striated duct, this simple cuboidal was reported by (22).The striated duct was lined by simple columnar epithelium it was transport secretion from the intercalated duct to the excretory duct,A tall cuboidal epithelium of striated duct was reported by(33), this result disagree with (34) reported that the intralobular duct in buffalo without striated duct.The interlobular duct was transport product to the oral cavity which was lined by stratified epithelium may reveal the need for protection of underlying basement membrane by occasional action of activated serous fluid enzyme (13).The distribution of goblet cells with epithelium of main duct play important role in modulation of saliva secret from acini by addition of mucous from goblet cells (8). The acini small in diameter and lumen this agreement with (8)In the histochemical study the parotid gland of buffalo show weak to moderate reaction with combined AB-PAS(PH 2.5)and in cow the acini show weak reaction,this result was confirmed by (8),(34) who mentioned that the secretions of the parotid gland contained neutral mucins and some sialo mucins.

Conclusion:

The parotid gland in both buffalo and cow have same structure and no significant difference between them, histochemically parotid gland in buffalo was seromucous gland.

دراسة نسجية وكيمونسجية مقارنة للغدة النكفية في الأبقار والجاموس

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الخلاصة

هدفت الدراسه الحاليه لمعرفه التركيب النسجي والكيمونسجي للغده النكفيه في الابقار والجاموس حيث تم جمع العينات من عشرون راسا" من الجاموس ومثلها من الابقار وجميع العينات بالغة وسالمة مظهريا. أظهرت الدرسه النسجيه ان الغدة النكفية مركبة نبيبية عنيبية تحاط بمحفظة من النسيج الرابط تكون عنيباتها

مصلية الافراز وقد ظهر الجهاز القنوي متكاملا" والذي يتالف من القنوات البينية، والمخططة وبين الفصيصات.اما في الدراسة الكيمونسجية فقد بينت الغدة النكفية تفاعلا" ضعيفا الى متوسط الشدة في العنيبات المصلية في الجاموس وتفاعل ضعيف في العنيبات المصلية في الابقار.

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