Histological and certain histochemical observations on the labial salivary glands of the buffalo, *bubalus bubalis*.

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**Abstract**

Histological, morphometric and histochemical investigations were carried out on the labial salivary glands of the buffalo. Both the upper and lower labial glands of the buffalo are branched tubuloacinar type and composed of serous acini surrounded by myoepithelial cells. Histochemically it showed seromucous character, they secrete neutral mucopolysaccarides, mucopolysaccarides acid and few sulfated mucop olyssaccarides. The labial salivary glands of buffalo possess ductal system of both the intralobular ductules and interlobular ducts.

**Introduction**

Many morphological, histological, histochemical and ultrastructural investigations have been performed on the major salivary glands of buffalo (*Bubalus bubalis*), including the parotid salivary glands (1,2,3,4,5). The mandibular salivary glands (6,5) and the sublingual salivary glands (5). The minor salivary glands have received little attention especially from the histochemical point of view (7,8), and the buffalo minor salivary gland when compared with other animal of rare attention; therefore, the present study is to characterise the histology and histochemistry of the labial salivary gland of the endogenous buffalo and to volumetric proportions of secretory end pieces and its ducts.

**Materials and Methods**

Both upper and lower lips were removed immediately after slaughter of 10 adult buffaloes 8-10 years old male and female in the Al-Fudailiya abattoir, then washing the sample with normal saline. The samples which obtained for histological examination where fixed in bouin's solution for about 12 hours then processed in ethyle alcohol 70% for about 6 hours to remove the colour of picric acid. While the samples which obtained for histochemical examination where fixed in neutral buffer formalin PH 7.0. Then thoroughly washing in running water and processed for sectioning at 5-6 micrometer thickness. The paraffin sections were stained with hematoxyin-eosin, masson trichrom, vanGieson, modified verhoffes stain for histological examination; while The Histochemical examination was done by periodic acid schiffe reagent (PAS) and alcian blue PH 2.5 and PH 1 (9, 10,11). The morphometric measurements; were done on diameter of acini, there lumen, height of acinar cells, and the diameter of each duct: intercalated duct, striated duct and excretory duct of upper and lower labial salivary glands were measured by using ocular and stage micrometer according to the (12).

**Results**

**Histologically:**

The labial glands are surrounded by distinct connective tissue capsule from which septa extended into the glands stroma dividing it into numerous lobes and lobules. The capsule consist of densely packed collagenous bundles fibers with a few irregularly arranged elastic fibers and the smooth muscle fibers were observed in the connective tissue capsule (Fig 1).

The parenchyma consist of clusters of the labial salivary glands that scattered between the lamina propria and striated muscle fibers of the tunica muscularis of the lips (Fig. 2).

**Secretory end pieces:**

The labial salivary glands are of compound tubulo-acinar type in buffalo consist of serous acini there acini were lined by a single layer of pyramidal cells which have a central spherical nuclei. The measurements of secretory end pieces like acini diameters, height of cells, nuclei diameter were present in (table 1).
Spindle-shaped myoepithelial cells occupy the space between the basal lamina and the bases of secretory cells were observed embrace the acini and intercalated ducts (Fig. 3).

**The ducts System:**

begins with short intercalated duct which lined with low simple cuboidal or flat cells with elongated nucleus. Several of these ducts join to form striated duct and its epithelium varies from simple columnar to pseudostratified columnar epithelium in the last part. The striated ducts drain into large ducts located in the connective tissue septae separat the lobules where they become interlobular duct or excretory duct. The excretory duct lined with stratified columnar epithelium table-2 (Fig. 4).

**Histochemistry:**

The labial salivary glands of buffalo show weak to moderate positive PAS reaction (Fig. 5) and these gland exhibit a weak alcianophilia AB at PH 2.5 (Fig. 6) and moderate alcianophilia with AB at PH 1 (Fig. 7), while the epithelial cells lining all kind of ducts system show negative to all tests used to detect mucopolysaccharids (Figs. 5, 6, 7).

**Discussion**

Histological observations revealed the labial salivary glands as a serous glands in buffalo that differ from other mammals studied. The labial glands of on humped camel which composed of mucoserous acini caped by serous demilunes (13), the same glands in human were considered seromucous (14) and in the common marmoset as mainly mucous with serous demilunes (15) while its similar to the labial salivary glands in Giant Rat as aserous acini (16). In the view of the criterion of (17) which are classified secretory units of mammalian salivary glands according to their content of neutral or acidic carbohydrates as a determined by Alcian blue and Periodic acid schieff method and according to their classification, the present histochemical investigations prove the labial salivary glands of buffalo classified as a seromucous acini and according to the classification of mucosubstances proposed by several workers (11, 9, 10, 18). These glands elaborate and secrete neutral mucosubstances, acidic mucopolysaccharides and little sulfated mucopolysaccharides which are similar to the histochemistry of labial and palatine salivary glands of one humped camel (8, 19). The present histochemical investigations is similar to the histochemistry of parotid salivary gland in buffalo which have neutral and acidic mucopolysaccarides except the parotid salivary gland have no sulfated mucopolssaccharides. The present study has demonstrated that the labial salivary glands of buffalo have intercalated ducts, striated ducts as well as interlobular ducts, hence, these ducts differ from those of other mammals studied which believed that the ducts system of minor salivary glands are not characteristic (16) on the other hand its similar to the ductal system of major salivary glands of buffalo which its characteristic feature of this glands (5).
Fig. (1) Labial salivary glands of Buffalo showing:
1- capsule which consist of bundles of collagen fibers;
2- elastic fibers;
3- smooth muscle fibers;
4- lamina propria of lip;
5- striated muscle fibers of lip. Masson trichrom. 240 X.

Fig. (2) Labial salivary glands in the Buffalo showing:
1- connective tissue septa;
2- lobule;
3- interlobular duct. Van Gieson. 240 X.
Fig (3): Labial salivary glands in the Buffalo showing:
1- serous acini . 2- striated duct . myoepithelial cell (arrow).
Hematoxyline and Eosine .340 X..

Fig (4): Labial salivary glands in the Buffalo showing:
1-intercalated duct . 2-striated duct . 3-interlobular duct .
Hematoxyline and Eosine .240 X.
Fig (5): Labial salivary glands in the buffalo showing:
1- positive reaction of the acini  
2- negative reaction of the duct
Periodic acid scheiff .240 X .

Fig (6): Labial salivary glands in the buffalo showing 1-positive reaction of the acini  
2- negative reaction of the duct. Alcian blue PH 1 .240 X .
Fig (7): Labial salivary glands in the buffalo showing 1- positive reaction of the acini  2- negative reaction of the duct. Alcian blue  PH 2.5 .240 X .

References


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بعض الرؤى النسجية والكيميائية المحددة للغدد اللعابية الشفوية في

Bubalus bubalis

الجاموس

عمار اسماعيل جبار
كلية الطب البيطري / جامعة ديالى

اجريت دراسة القياسات النسجية وكذلك الكيميائية على الغدد اللعابية الشفوية في الجاموس المحلي. تكو كلاً

الغدد اللعابية الشفوية العليا و الغدد اللعابية الشفوية السفلية في الجاموس، من النوع المفترض الإثنيي الانبيبي. وتتكون من

عنبيات مصلية، محاطة بخلايا ظهارية عضلية. تظهر في الدراسة الكيميائية المحددة الصفات المحاطية المصلية وتعزز

متعدد السكريات المحاطية المتعادلة وكذلك متعدد السكريات المحاطية الحمضية والقليل من متعدد السكريات المحاطية

الكبريتانات. تمتلك الغدد اللعابية الشفوية في الجاموس منخفضة قوية تشمل قنوات داخليات الصليات و قنوات داخلي

القصص.