Histological and certain histochemical observations on the labial salivary glands of the buffalo \( \textit{bubalus bubalis} \).

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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 mucopolysaccarides. The labial salivary glands of buffalo posses 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 \( \textit{Bubalus bubalis} \), 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. 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 hematoxylin-eosin, masson trichrom, van Gieson, modified verhoffs stain for histological examination. The Histochemical examination was done by periodic acid schiff 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
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 separate 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 mucouserous acini capped 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 scheiff 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 mucopolysaccharides except the parotid salivary gland have no sulfated mucopolysaccharides. 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 are 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).

**Table 1: the measurement of secretory end pieces of labial salivary gland of buffalo**

<table>
<thead>
<tr>
<th>Secretory end pieces</th>
<th>X</th>
<th>SE</th>
<th>T-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acini diameter</td>
<td>31.96</td>
<td>± 1.09</td>
<td>N.S</td>
</tr>
<tr>
<td>Height of cells</td>
<td>12.8</td>
<td>± 0.88</td>
<td>N.S</td>
</tr>
<tr>
<td>Nuclei diameter</td>
<td>3.6</td>
<td>± 1.05</td>
<td>N.S</td>
</tr>
</tbody>
</table>

**Table 2: the measurement of duct system of labial salivary gland of buffalo.**

<table>
<thead>
<tr>
<th>Duct system</th>
<th>X</th>
<th>SE</th>
<th>T-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercalated duct</td>
<td>22.5</td>
<td>± 1.08</td>
<td>N.S</td>
</tr>
<tr>
<td>Striated duct</td>
<td>64.5</td>
<td>± 1.14</td>
<td>N.S</td>
</tr>
<tr>
<td>Excretory duct</td>
<td>124</td>
<td>± 1.08</td>
<td>N.S</td>
</tr>
</tbody>
</table>

\( \bar{X} \): mean SE: Standard error

N.S.: Non significant differ between values in level (p≥0.05)
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.
References


11- Scott, D. E. and Dorling, J. (1965) Diffential staning of acid glycosaminoglycans (mucopo-


بعض الروى النسجية والكيميائسية المحددة للغدد اللثائية الشفوية في Bubalus bubalis

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الخلاصة

اجريت دراسة القياسات النسجية وكذلك الكيميائسية على الغدد اللثائية الشفوية في الحبوب المحلي. تتكون كلاً من النوع الواحد عبارة عن طبقة عضلة مكونة من خلايا مصغرة مبطنة متناوبة عضلية. تظهر هذه الخلايا في دراسة الكيميائسية المحددة الصفات المخاطية المصلية، وترفع محددة السكريرات المخاطية المتناوبة وكذلك متعددة السكريرات المخاطية الحماضية والليل من متعددة السكريرات المخاطية الوراثية. تمثل الغدد اللثائية الشفوية في الحبوب منصوصة قئوية تشمل نسيج داخل الرصع وقناة داخل فصوص.