



جامعة الموصل
كلية الطب البيطري

دراسة تشريحية ونسجية ونسجية كيميائية مقارنة للجهاز
الدمعي في الأغنام العواسي (*Ovis aries*) والماعز الأسود
المحلي (*Capius hircus*)

ميسم منسي داريوس عيسى

رسالة ماجستير
الطب البيطري / التشريح البيطري

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Summary

The anatomical study included morphological and morphometrical measurements of lacrimal glands by using Vernier caliper, to determine the course of the extra glandular duct system and to measure all the parts of this system by using measuring tape. Twelve healthy heads of Awasi sheep rams and the same number of black goat bucks about (9-18) months old was used for this study. The lacrimal apparatus of both animals consisted of a pair of lacrimal glands, a pair of superior lacrimal glands of third eyelid. The deep lacrimal glands of third eyelid (harderian glands) was absent. The extra glandular duct system consisted of dorsal and ventral lacrimal punctae, dorsal and ventral lacrimal canaliculi, lacrimal sac and a nasolacrimal duct. The lacrimal glands of both animals have the same location, shape and color, while the superior lacrimal glands of third eyelid have the same location and color but it differed in shape between the studied animals. The lacrimal glands of Awasi sheep was wider than those of black goat. The punctae drain by paired of canaliculi that was equal in length in the same animal, the canaliculi were separated by small bony process originated from internal surface of lacrimal bone especially in the black goat. The canaliculi of both animals drained into funnel shaped lacrimal sacs especially in Awasi sheep. There was a significant increase in the total length of the extra glandular duct system of Awasi sheep which was longer than that of the black goat. Finally the nasolacrimal ducts of both animals end at nasal opening that was very obvious especially in Awasi sheep. Only the right nasal opening of black goat was significantly wider in diameter than the same opening of that of the Awasi sheep.

8 pairs of lacrimal glands, 8 pairs of superior lacrimal glands of third eyelid and the same number of extra glandular duct system used for histological and histochemical studies. The aim of histological study was to explain general histological features of lacrimal apparatus of both animals. Both lacrimal glands were compound mixed tubuloacinar glands composed of serous, mucous and mixed acini (have both serous and mucous cells). The percentage of acinar shape was greater than tubular shape of both glands of the studied animals, while the mucous acini were comparatively greater in lacrimal glands of Awasi sheep than those of black goat. It was considerable increase in numbers of myoepithelial cells of secretory acini of lacrimal glands in black goat. The intercalated ducts were lined with low cuboidal epithelium, then gradually increase in height to become stratified cuboidal to stratified columnar epithelium in both sheep and goat. It was noticed that the percentage of light cells and goblet cells within the wall of duct system inside the glands of Awasi sheep was greater than that of black goat, while the percentage of goblet cells in the wall of all parts of extra glandular duct system of the black goat was greater than that of Awasi sheep. There was a variable amount of smooth muscle fibers around the connective tissue of interlobular ducts especially in the superior lacrimal gland of third eyelid of black goat.

Different histochemical methods were used to explore types and location of carbohydrate of different parts of lacrimal apparatus. It was observed that the amount of mucous secreted from lacrimal glands of Awasi sheep was comparatively greater than that of black goat this is due to the greater percentage of mucous acini of Awasi sheep than those of the black goat, while the amount of mucous in the extra glandular duct system of black goat was greater than that of Awasi sheep this is due to the increase in the

number of goblet cells in the wall of extra glandular duct system of black goat. Intense reaction of sulfated and neutral glycoproteins was observed especially in the lacrimal gland of Awasi sheep, while sulfated glycoproteins was observed in the lacrimal glands of black goat. Moderate amount of carboxylated glycoproteins present in studied glands of both animals. The concentration of sulfated, neutral and carboxylated glycoproteins was higher in goblet cells present in all parts of extra glandular duct system of black goat, while sulfated glycoproteins was higher in goblet cells present in the wall of lacrimal sac and nasolacrimal duct of Awasi sheep. There was a little amount of glycogen and glycosaminoglycans (GAGs.) especially in the superior lacrimal gland of third eyelid and some parts of the extra glandular duct system of black goat. No reaction was noticed in the serous acini for any type of carbohydrate in lacrimal glands of both animals.

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**Comparative Anatomical, Histological and
Histochemical Study of the Lacrimal Apparatus
in Awasi Sheep (*Ovis aries*) and Black Goat
(*Caprus hircus*)**

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