

MICROSCOPIC STUDY OF THE GLANDULAR PROCTODEALIS (FOAM GLAND) OF THE MALE QUAIL (COURNIX COTURNIX) IN IRAQ.

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ABSTRACT

Proctodeal gland (foam gland) of adult male Asian quail (*Coturnix coturnix*) was studied microscopically. The study declared firstly the foamy appearance of the male quail proctodeal gland and assure its importance for the sexual activity and its absence from the female quail and its species specificity for only the male quail in comparison to the male turkey. The present work also try to compare functionally between male quail proctodeal gland and other accessory sex glands, such as Cowper's gland and seminal vesicle gland.

INTRODUCTION

The presence of a well developed gland in the cloacal region of the sexually active male quail (*Coturnix coturnix*) has been studied by (1 and 2) from the point of gross and microscopic morphology and they referred as a glandular proctodealis (foam gland). European quail proctodeal gland was studied morphologically by (2), while (3) was reported histochemical observations on this gland. (4) analysed the foam of ejaculate of Japanese quail (*Coturnix coturnix*) *Japanica*. (5) reported the histogenesis and the response of the gland to sex steroids. (1) found that this gland lies in the lamina propria, between the muscularis layer and the stratified squamous epithelium of proctodeum. It is of a simple branched alveolar type. The gland was

surrounded by connective tissue capsule that extends introglandular septae, each glandular unit possesses a short terminal papilla at the tip of which is an excretory ductule through which the secretion product released into the proctodeal cavity. The secretory epithelium was typical high columnar. (1) also showed that the female cloaca gland was short and not distended and lack any development of either glandular or musculature in comparison to that of the male. Other studies focused on the analysis of the foamy exudates of the gland and its consistency and the hormonal relation of androgens in castrated quail (7, 8, 9 and 10).

All the above authors except (1) did not study the proctodeal gland in details from the histological site of view. Firstly, this study try to add more important histological details on this gland.

MATERIALS AND METHODS

Eleven common adult quails were prepared from the local market at Baghdad city. These common quails were killed with an overdose of sodium pentobarbital and dissected immediately for topographical and histological examination of the proctodeal gland. The glands were quickly fixed in Bouin's fluid, dehydrated in alcohol, cleared in xylol and embedded in paraffin wax. The wax blocks were serially sectioned at 5-7 micrometer in different orientations. Histological sections were stained with periodic acid shiff reagent stain (6).

RESULTS

The herein study revealed that the proctodeal gland of the male quail was lined by stratified columnar epithelium. The superficial layer of which consist of tall columnar cells that does not extend to the basement membrane and the deeper layer composed of smaller polyhedral cells that do not reach the surface (Fig. 1 and 2). The oval nuclei of the deeper layers forming one raw and resting on the basement membrane. Some of these nuclei lie parallel to the basement membrane, others were lie at acute or right angle to the basement membrane (Fig. 1 and 3). The majority of the cytoplasm was pale globular. The gland showed papillary structures which formed of a complex of glandular units. These structures were intermingled with fibrose collagenous and elastic stroma. Smooth muscle cells were not present (Fig. 4 and 5).

Glandular cavities contain foamy non homogenous globe-like materials of varying sizes (small, intermediate and large).

Besides the intracellular and extracellular secretory contents were also revealed firstly the foamy globular appearance which differ from the lipid and glycogen character (Fig. 2, 4 and 5). The different glandular epithelial cells showing various activities through the different amount and number of the globular secretion and the different state of the nuclei of the basal layer. Excretory canal was apparent, but the secretory ducts were not clear. Moreover, the epithelial glandular of the papillary projection showed stromal septae (Fig. 1, 2 and 5).

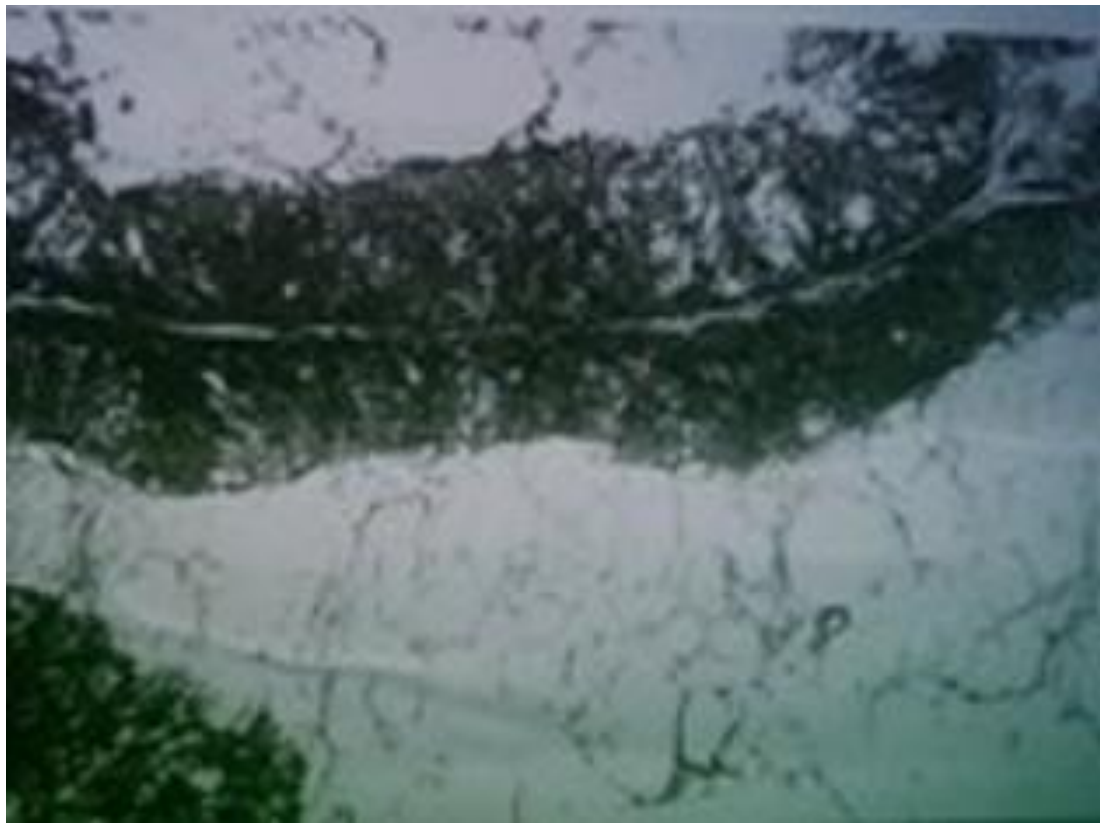


Fig (1): Section of the proctodeal (foam) gland with stratified columnar epithelium. 400X (PAS Stain).

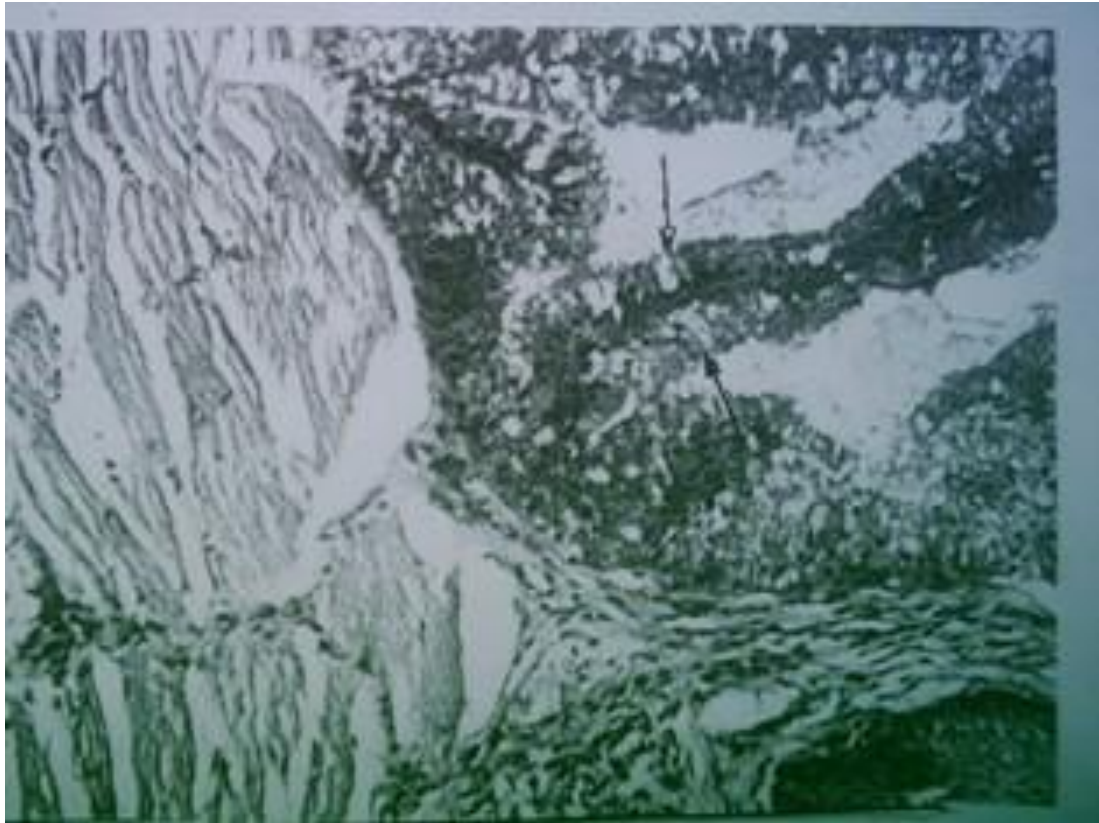


Fig (2): Section of the proctodeal (foam) gland. note the globular cytoplasm (arrows). 400X (PAS Stain).



Fig (3): Section of the proctodeal (foam) gland. note the presence of foamy secretory contents in the lumen of the unit and the interglandular septae (arrows). 400X (PAS Stain).



Fig (4): Section of the proctodeal (foam) gland with fibrous tissue stroma (small arrows) and papillary glandular projections (large arrows). 400X (PAS Stain).



Fig (5): Section of the proctodeal (foam) gland showing glandular cavities containing foamy glandular secretion (arrows), also presence of oval nuclei at the basal part of the cell. 400X (PAS Stain).

DISCUSSION

The current study found that the character and the morphology of the quail gland was identical to that reported by (1). The presence of foamy secretion was firstly reported by the present study and similar to the foamy ejaculate of Japanese quail mentioned by (5). We suggest that the globular secretion of the quail gland was in accordance to that stated by (3) who revealed that this secretion aid in sperm transport like that in the Cowpers gland of mammals and in fowl (8). (2) referred to the presence of diffuse and focal nodules of lymphoid tissue in turkey proctodeal gland. This is in variance with our present work. We regarded the proctodeal gland as a well-developed glandular tissue that secrete androgen modulated as a male hormone. This is in agreement with (9) and (1) and in contrast to the non active proctodeal gland of turkey and female quail which reported by (2) who deseribed the proctodeal gland as a vestigial glandular tissue. The presence of a raws of nuclei in different directions revealed the different status of activity in the basal part of the epithelium. This may play a role in regeneration by replacing the damaged columnar cells in the superficial layers. This is in agreement with (12) who regarded the basal cells as stem cells which showing mitotic activity and cellular proliferation and differentiation to replace the damaged or dead cells in the upper layers, of the epithelial.

The proctodeal gland seems to be unique to the genus *Coturnix coturnix*. Our present results showed a well developed and active proctodeal glands with abundant foamy secretion.

دراسة شكلية مجهرية ضوئية للغدة المسلكية الشرجية في ذكر طائر السلوى

(*Coturnix coturnix*) في العراق.

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الخلاصة

أجريت الدراسة الحالية على احد عشر من ذكور طيور السلوى المحلية البالغة (السلالة الآسيوية) وهي

دراسة مجهرية ضوئية. أظهرت الدراسة لأول مرة خواص الغدة المسلكية الشرجية بأنها ذات صفات رغوية

وأنها ذات أهمية في النشاط الجنسي للذكر وأنها غير موجودة في الأنثى وفي ذكر الدجاج الرومي. حاولت

الدراسة الحالية مقارنة الغدة المسلكية الشرجية في طائر السلوى مع الغدة اللاحقة للجهاز التناسلي الذكري مثل
غدة كوبر والحويصلة المنوية.

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