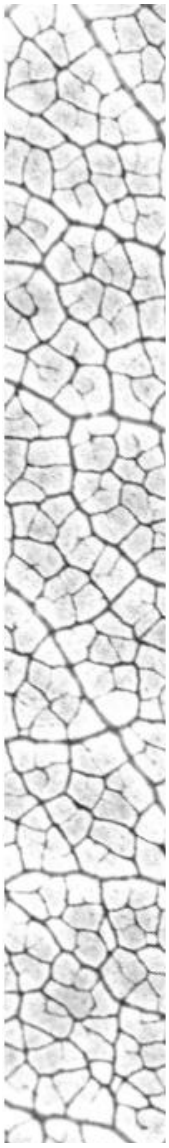

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The Iraqi dominant rabbit (*Oryctolagus cuniculus*) under a stomach-based histological study

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Abstract

Background: The wild rabbit (Oryctolagus cuniculus) is highly present in Iraqi rural regions. **Objectives:** Due to no histological information regarding the histological characterization of this local rabbit, this study was conducted to identify histological characteristic features of its stomach. **Materials and Methods:** According to that, ten stomach tissue samples were collected from ten rabbits. These samples were tissue-section-processed, stained using Harris hematoxylin and eosin dyes, and visualized and photo-taken under a light microscope. **Results:** The gastric wall of the rabbit consisted of a quadric-tunic layer, in to out; mucosa, submucosa, muscularis, and serosa. The inside surface of the stomach was lined by mucosal cells that made an appearance as a tall simple columnar epithelium spread through the pits of the stomach. Moreover, the mucosa displayed three histologically distinct regions based on glandular tissue types (branch-, tubule-, and coil-like appearance) in which these glands were short in the cardiac and pyloric regions. The fundic gland region showed simple long straight branch-like tubular features and revealed mostly mucous secreting cells and less frequent parietal cells in the cardiac and pyloric glands. Furthermore, the fundic gland region consists of different kinds of cells; however, the parietal and chief cells are the highly common cells in this region. **Conclusion:** Characteristic regions are presents in the gastric mucosa of the rabbit with high distribution of parietal and chief cells in the fundic gland region.

Keywords: *Oryctolagus cuniculus*, rabbit stomach, stomach histopathology

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INTRODUCTION

In the wild, European rabbits sometimes reside in broad families, in which a wide-spread buck might share a region around with a different entranced burrow structure called Warren, with many females and male subordinates. The sociability of rabbits and hares is special, and European rabbits are the only leporid animals documented to shape cohesive communities. These species wild communities split into social classes and may involve several subgroups. For example, one community of free-living rabbits composed of (Püschel et al. 2010; Duranthon et al. 2012) breeding groups, 89% of which were males, and 96% of which were females living in a social group with at least one other adult of the same sex. In both genders of these communities, a rigid linear hierarchy evolves. For these groups, a dominant buck regularly patrols the territory. The submissiveness of all other members, both males and females, communicating this very same space. These submissive actions are reflected in dependent animals which are backing away from or fleeing the predominant buck (DiVincenti and Rehrig, 2016).

The O. cuniculus is widely present in different countries of Europe and Asia. The rabbit represents a range of diverse groups that has different evolutional history (Ferrand and Branco, 2007; Parveen, et al, 2014)). The rabbit has unique mental and behavioral structures that make the animal gets affected by different levels of stressors (Hansen and Berthelsen, 2000; DiVincenti and Rehrig 2017). These animals are very important especially when they are recruited to take a major role in laboratory experiments that involve inventing, discovering, and examining different system pathways similar to those in humans and other animal species. The rabbit could also be enrolled in great pre-clinical trials of testing drug and vaccine candidates against a vary groups of diseases in humans and animals (Duranthon et al. 2012 ; Yamada et al. 2016).

Due to the importance of this animal model and the little- or no-information presence regarding the gastric histology of these rabbits present in Iraq, this study was

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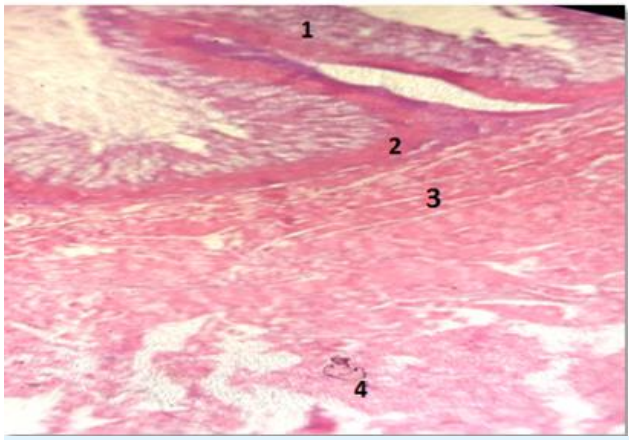

Fig. 1. Section of fundic gland region (stomach) in Iraqi rabbit that displays gastric layers; 1. Mucosa, 2. Submucosa, 3. Muscularis, and 4. Serosa. (H&E) 40X

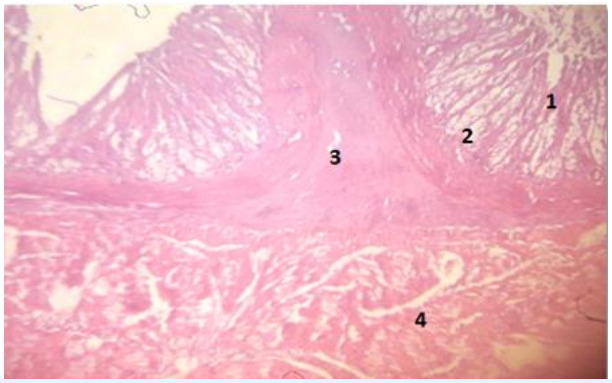

Fig. 2. Section of pyloric gland region (stomach) in Iraqi rabbit that displays gastric layers; 1. Mucosa, 2. Submucosa, 3. Muscularis, and 4. Serosa. (H&E) 400X

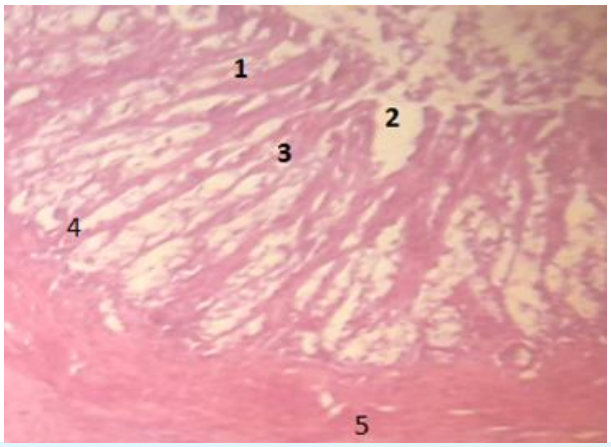

Fig. 3. Section of the cardiac gland region (stomach) that displays the lining cells (surface) of Iraqi rabbit; 1. Simple columnar epithelium, 2. Pits, 3. Lamina propria, 4. Glands, and 5. Muscularis mucosa. (H&E) 400X

conducted to identify histological characteristic features of the animal stomach.

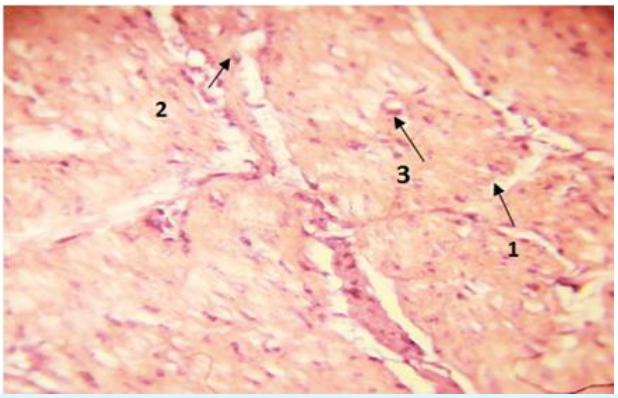

Fig. 4. Section of the pyloric gland region (stomach) that displays the lining cells of Iraqi rabbit; 1- Glands 2- Mucous secreting cells, 3- Parietal cells (H&E) X40

MATERIAL AND METHODS

Ten stomach tissue samples were collected from ten rabbits. These samples were tissue-section-processed by 10%-formalin fixation, washing, dehydration, infiltration, embedding, sectioning into slices, making slides, staining using Harris hematoxylin and eosin dyes, and visualized and photo-taken under a light microscope. The procedure protocols were followed from (Bancroft, 2013).

RESULTS

The gastric wall of the rabbit consisted of a quadric-tunic layer, in to out; mucosa, submucosa, muscularis, and serosa (**Fig.1** and **2**).

The inside surface of the stomach was lined by mucosal cells that made an appearance as a tall simple columnar epithelium spread through the pits of the stomach (**Fig. 3**).

Moreover, the mucosa displayed three histologically distinct regions based on glandular tissue types (branch-, tubule-, and coil-like appearance) in which these glands were short in the cardiac and pyloric regions. The fundic gland region showed simple long straight branch-like tubular features and revealed mostly mucous secreting cells and less frequent parietal cells in the cardiac and pyloric glands. Furthermore, the fundic gland region consists of different kinds of cells; however, the parietal and chief cells are the highly common cells in this region (**Figs. 4**, **5**, & **6**).

DISCUSSION

The stomach of the local rabbit showed histological features.(Khalel and Ghafi, 2012) found, in a study that they performed on the local rabbit, that The Tunica mucosa appears as a ground lining cell which appears as high-column mucus cells, extending into reasonably long stomach pits.A lamina propria, a connective tissue which appears only under the epithelial surface and

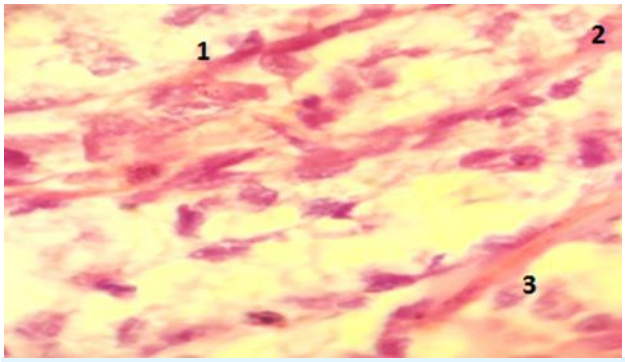

Fig. 5. Section of the cardiac gland region (stomach) that displays the lining cells of Iraqi rabbit; 1- Glands 2- Mucous secreting cells, 3- Parietal cells (H&E) X1000 (oil)

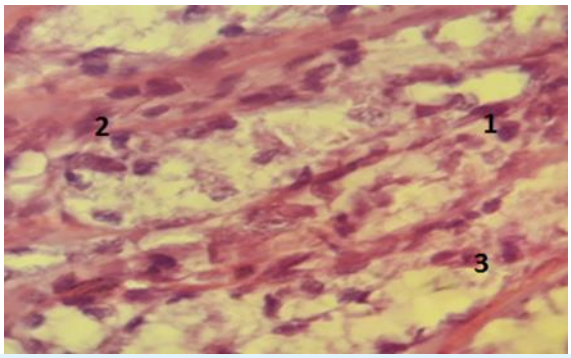

Fig. 6. Section of the fundic gland region (stomach) that displays the lining cells of Iraqi rabbit; 1- Glands 2- Mucous secreting cells, 3- Parietal cells (H&E) X1000 (oil)

occupies the cardiac glands, is the second element of mucoa. The cardiac glands which occupy the lamina propria show up to the lower part of the rather long stand as a short branched tube, coiled gland.

The stomach mucosa in rabbits in the region of the fundic glands is cast in prominent longitudinal folds or rugs into which the core of these folds consists of submucosa, the lumen from the contracted stomach. The epithelial cells on the surface are a simple high column epithelial extending out and lining up the short gastric pits. The lamina Proria is a great connective tissue, and it is so hard to distinguish between the fundic gland numerous simple, ramified tubular glands, which are organized almost in parallel with each other and are perpendicular to the mucous surface lining. In the glands of the cardiac area and fundic areas, lining epithelium appears a s a loose connective tissue with the lamina propria demonstrates more than in fundic region, inhabited with pyloric glands weakly loaded. The glands in the pyloric region are ramified and allow access at the base of long pits as short pyloric glands. The muscularis mucosa occurs as layers from the submucosa of smooth muscle fibers. Tunica submucosas are built up with a loose connective tissue and have many blood supplies in the pyloric glands area which are as same as in the cardiac and fundic glands (Khalel and Ghafi, 2012).

CONCLUSION

Regions are presents in the gastric mucosa of the rabbit with high distribution of parietal and chief cells in the fundic gland region.

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