MORPHOLOGICAL AND HISTOLOGICAL STUDY FOR LIVER IN LOCAL COOT BIRDS *FULICA ATRA*

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ABSTRACT

The results of this study showed that the liver of coot bird *fulica atra* is closely resample to the liver of fowl that it lies in the ventral part of the body cavity and seems red-brown in color and divided into two lobes, right and left . Histologically the liver of coot bird enclosed by thin capsule of connective tissue that continue to subdivided the liver into lobules . The hepatocyte which arranged radially around the central vein as hepatocord in two cells thickness . These cells are polygonal in shape and have rounded nucleus and there is present of sinusoids between hepatocords which lined by flattened endothelial cells .

INTRODUCTION

Liver is the largest gland in the body and it can be regarded as the central organ in the maintenance of energy supply ,moreover, the liver catalyzes biosynthetic and biodegrative processes and excretes final metabolic products(1,2,3) .Liver has secretary capabilities, this organ also is able to excrete, provide, storage, detoxify, metabolize, esterifies , and phagocytize, in short, it play roles as the control center for digestive system it also functions as both endocrine and exocrine gland.(3,4).It is divided into right and left lobes which are joined cranially at the midline, the right lobe is larger in the domestic fowl and turkey the left lobe is subdivided into the dorsal and ventral parts (3,5) The liver parenchyma of birds resemlbe the liver of mammalian but there is some different in histological features such as absent of lobules and interlobular trabeculae,its fact the principal cell of liver is the hepatocyte . (6 ,5, 4 ,3)

The present study was undertaken to investigate the morphological and histological study on coot bird liver in order to show some possible differences with respect to other avian species.

MATERIALS AND METHODS

Ten adult males of coot bird *fulica atra* were obtained from local hunters in Basrah province. The birds were transported to the laboratory of anatomical and histological department and remained in cages for seven days and given feed and water libitum. The birds were killed after anesthesia by intramuscular injection of a mixture of ketamin and diazepam at dose 25,5 mg/kg of body weight (7) .After that a simple exploratory laparatomy procedure was done to remove the liver. Then liver preserved in 10% buffered neutral formalin ,The liver were left in fixative for 24 hours the fixed tissues were washed by water and dehydrated in an ascending series of graduated concentration of alcohol (70%, 80%, 90%, 100%) with a time interval of 2 hours for each stage then cleared with xylene for about 1.5 hours, infiltrated with paraffin wax for three hours and then for overnight and embedded in paraffin blocks, section as 5 microns in thick were then using a microtome mounted on glass slides in the presence of Mayer's albumin , then dried at room temperature. It were stained with hematoxyline and Eosin ,dehydrate and cover slide using per mount as the mounting medium and viewed under a light microscope (8).

RESULTS AND DISCUSSION

The results demonstrated that the liver of coot bird (*fulica atra* lies in the ventral part of body cavity , characteristically it is red-brown in color and it divided into two lobes, right lobes was larger than left one which subdivided into two parts (fig . 1) this agreed with (3,4,5) who reported that the liver of domestic fowl consist of two lobes the left one is small and subdivided into the dorsal and ventral parts while there were no further lobular subdivisions in the liver of Houbara Bustards (9) and in contrast with (10) who described that the left lobe of Passenger Pigeon liver consist of three parts, distal processes a small median one, and one upon either side of double its size . Histologically our results establish indicate the liver of coot bird is large lobed gland enclosed by serosal

lining that contain a thin capsule of connective tissue which continue to subdivided the liver into lobes and to a lesser extend into lobules that provided physical support (fig .2) this finding respected with (11 , 12) this indicates liver of chicken covered by mesothelium called Glisson`s capsule .The Parenchymal cells of liver in coot bird consist of hepatocytes which arranged radially around the central vein as hepatocords in two cells thickness, this hepatocytes it is polygonal in shape, and have rounded nucleus and there is present of sinusoids between hepatocords (fig .3) These results were in agreement with (13 ,14 ,15 ,16) they revealed that radiating plates of hepatocytes are two cells thick in the chicken , fowl , turkey and American coot bird , and unlike with(12,13,15) who observed that hepatocytic plates composed of (1-2) cells in thickness in Pintail duck and Ruffed grouse . In (fig. 4) appeared that the sinusoids lined by endothelial cells which are flattened in shape that contracts with the more prominent phagocytically active kuffer's cells that cell have large nucleus with some depris in cytoplasm this depend on its immuinocytic function ,also sinusoids connected to the hepatic vein and portal vessels which lined by a thin layer of endothelial cells and there are bile ducts lined by cuboidal epithelial cells (fig . 5)these results are similar to those observed by (11 ,13) who repprted that prescence of bile ducts and blood vessels distributed throughout the liver tissue . In a former results I have already described the morphological and histological study of the liver in coot bird was closely to the liver of native fowl .

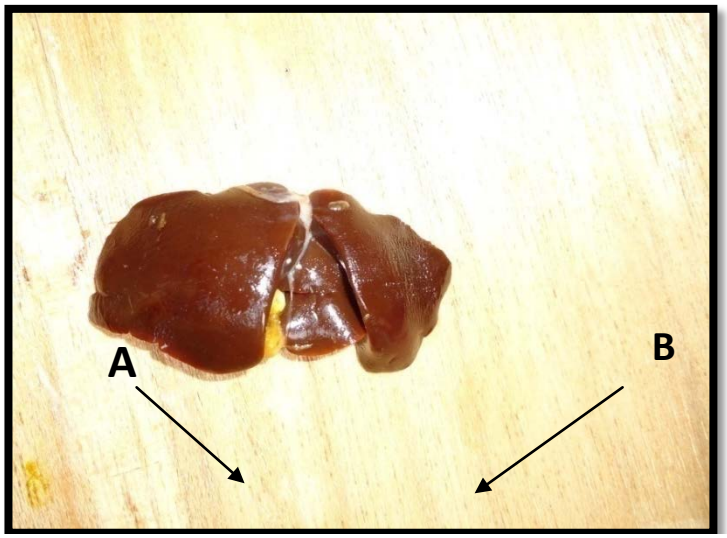

Fig . 1: Liver of local coot bird parietal view show A- Right lobe , B – Left lobe

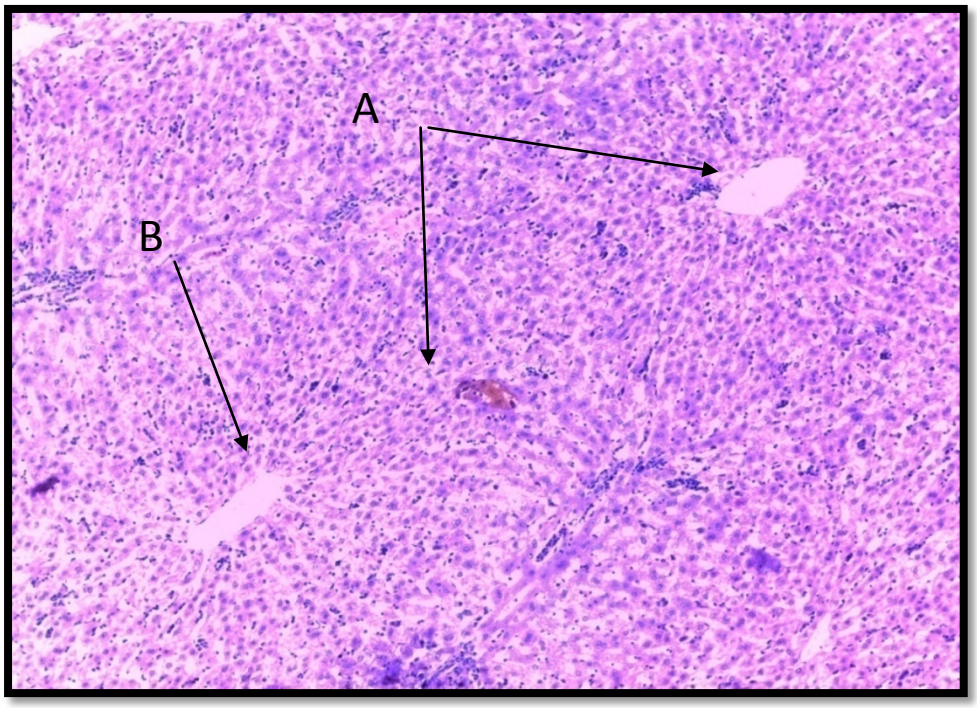

Fig .2 : Histological section of liver show A - liver lobules with B- central vein . H & E (100 X)

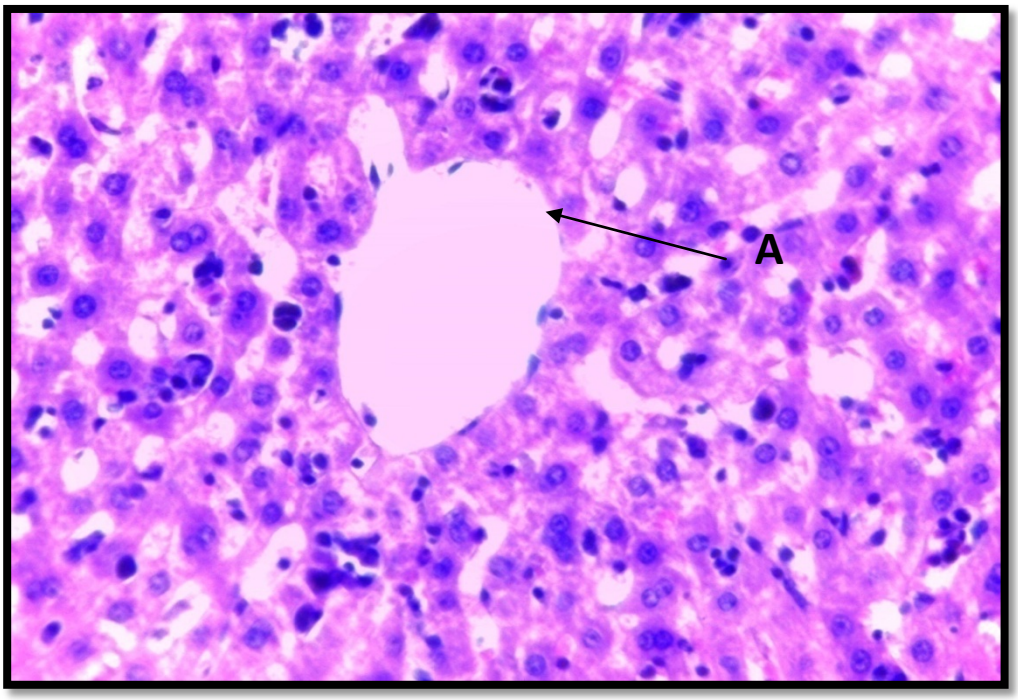

Fig . 3 : Histological section of liver show A – central vein , B – Hepatocytes . H & E (400 X) .

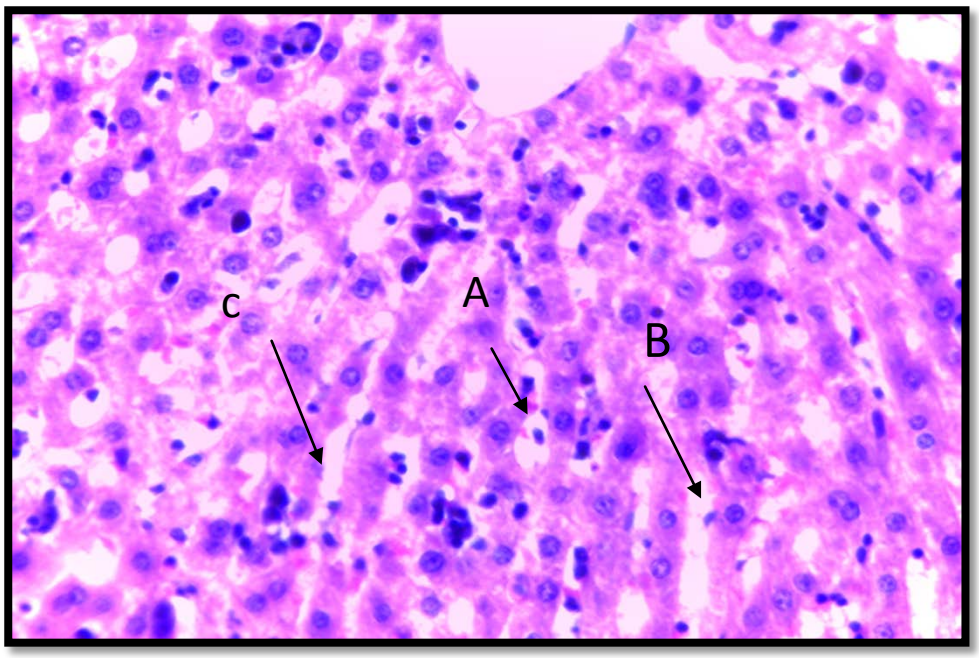

Fig . 4: Histological section of liver show A- Kupffer's cells B – liver sinusoid c -endothelial cell .H&E(400)

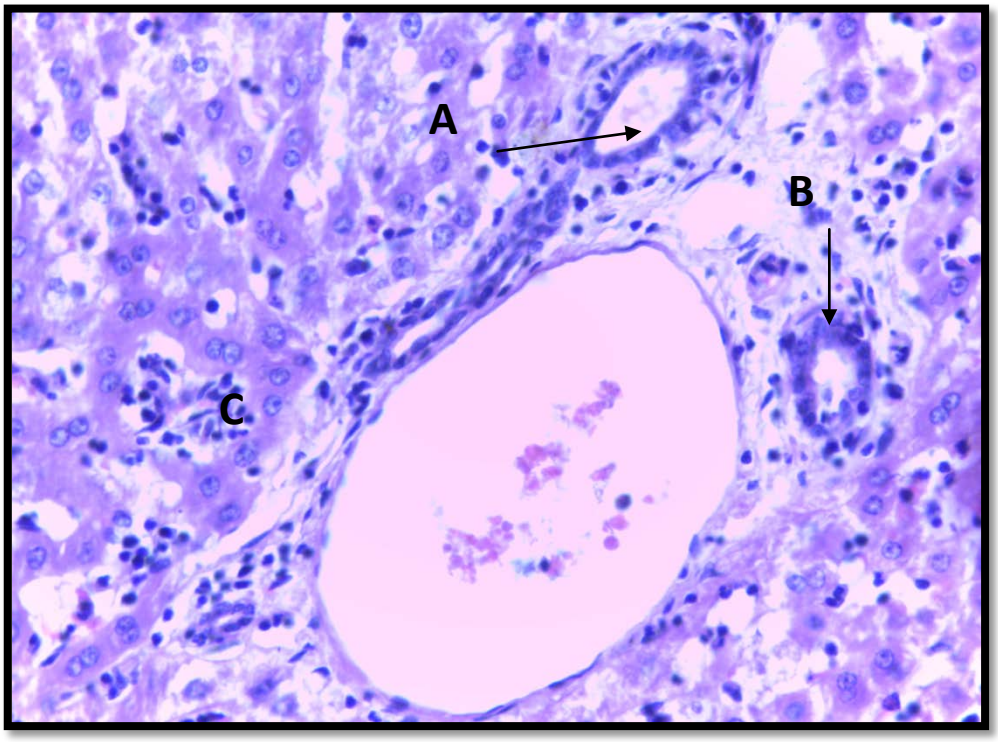

Fig . 5 : section of liver show portal area A –Bile duct , B – Hepatic portal artery , c – Hepatic portal vein . H & E (400 X) .

دراسة شكلية نسيجية للكبد في طائر الغرة البيضاء المحلي

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الخلاصة

بينت الدراسة أن هناك تشابه كبير بين كبد طائر الغرة البيضاء وبقية أنواع الطيور حيث يقع في الجزء ألبطني للتجويف ألبطني وكبد طائر الغرة البيضاء ذات لون بني محمر ويقسم إلى فصين أيمن وأيسر . نسيجيا كبد طائر الغرة البيضاء محاط بمحفظة رقيقة من النسيج الضام وتستمر هذه لتقسم الكبد إلى عدة فصوص ، الخلايا الكبدية مرتبة إشعاعيا حول الوريد الكبدي المركزي على شكل حبال كبدية سمك كل منها خليتين وهذه الخلايا متعددة الوجوه ذات نواة دائرية كذلك وجود الجيوب الكبدية بين الحبال الكبدية والتي كانت مبطنة بخلايا مسطحة الشكل .

REFERENCES

1- Katz .N.R.(1992).Metabolic Heterogeneity of Hepatocytes Across the The Liver Acinus .The Journal of Nutrition (122):843-849 .

2- Dellman ,H.D. and Brown ,E.S. (1979). Text book of Veterinary Histology . Lea and Fibger .Philadelphia . P .985 .

3- Whitlow .G.G.(2000).Gastrointestinal Anatomy and Physiology . Avian Physiology . 5th ed. ,Academic Press ,Honoiula.Hawaii Pp:299-304 .

4- Dyce, K. ; SACK, W.O. and Wensing ,G.J.G.(2002).Text book of Veterinary Anatomy .W.B. Sounders Co. 94 U.S.A. Pp: 806-811 .

5- Caceci ,T . (2006). Avian digestive system . Academic Press , Itheca ,New York. Pp;1-94.

6- King , A.S. and Mclelland , J. (1984) . Birds Their Structure and Function . 2nd ed. Bailliere,Tindall,London. 2 : 9-106 .

7- Schindala, M.K. (1999) . Anesthetic affect of Ketamine with Diazepam in Chicken . Iraqi Vet. J. Sci. 12 : 261-265 .

8- Luna ,L.G. (1968) .Manual of Histological Staining Methods of Armed Forces Institute of Pathology . 3rd ed . New York ,U.S.A . Pp:39-110 .

9- Bailey ,T.A. et al (1997). Comparative Morphology of Dimentary Tract and its glandular derivative of captive bustards. Kingdon J.Anat.Pp:387-398 .United kingdom .

10- Nickel ,R.; Sccummer, A. and Seiferk,E. (1977) . Anatomy of the Domestic Birds. Verlag. Paul parey Berlin .

11- خماس ،وائل عبد الحميد والشيخلي ،عبد القادر جاسم محمد وابراهيم ،عبد حارث محمد (1990) .الشامل في تشريح الدجاج . :وزارة التعليم العالي والبحث العلمي ،جامعة بغداد

12- Hodges, R.D.(1974). The Histology of Fowl . Academic animal . vol. 2 , W.B. Saunders Co. Pp: 1837-1880 .

13- Bacha ,W.J. and Wood ,G.L.M. (1990) Avian Digestive System .Color Atlas of Veterinary Histology .William and Wikins . Waverlly . Company .Hong Kong Pp:113-150 .

14- Beresford ,W.A. and Henninger ,J.M.(1986).Tabular Comparative Histology of the liver .Arch. Histology .Jap., vol. 49, No.3, Pp:267-281 .Morgan Town ,WV,U.S.A.

15- Randall, J.and Reece,Rli.(1996).Color Atlas of Avian Histopathology .Mosby Wolfe , London,Pp:75-77 .

16-Bhatnagar ,M.K. and Singh ,A.A. (1982). Ultrastructure of Turkey Hepatocytes . Anat .Rec. 202: 473-482 . United Kingdom.