

## Histomorphological study of the liver in local Moorhen birds (*Gallinula chloropus*).

Raad Shaalan Ibrahim\* Ahmed Abdulla Hussein\*\*

Waleed J.A.Al-kelaby\*\*\*

Assist. Lecturer. Department of anatomy, histology and embryology, faculty of veterinary medicine, university of Diyala. Iraq.

[raadhisto1982@gmail.com](mailto:raadhisto1982@gmail.com)

Assist. Lecturer. Department of anatomy, histology and embryology, faculty of veterinary medicine, university of Diyala. Iraq.

[www.ahmedess838@yahoo.com](http://www.ahmedess838@yahoo.com)

Lecturer. Department of anatomy, histology and embryology, faculty of veterinary medicine, university of kufa, Al-Najaf, Iraq.

[Waleedj.Abed@uokufa.edu.iq](mailto:Waleedj.Abed@uokufa.edu.iq)

### Abstract

The present study was performed to illustrate some anatomical and histological characteristics of the liver of adult male moorhen bird *Gallinula chloropus*. The present study was conducted on 20 birds divided into two groups (10 for anatomical study and 10 for histological study) mature male healthy moorhen bird were used.

The liver of moorhen bird *Gallinula chloropus* was located in the right, left hepatoperitoneal cavity, seems red-brown in color. Moreover, divided into two lobes, right and left, the left lobe appear larger than right lobe. Histologically the liver of moorhen bird enclosed by thin capsule of connective tissue. The hepatocytes, which arranged radially around the central vein as hepatic cords in two cells thickness. These cells are polygonal in shape and have rounded nucleus and present of sinusoids between hepatic cords which lined by flattened endothelial cells.

**Keywords:** moorhen bird, liver, lobules, central vein.

## دراسة نسيجية شكلية للكبد في دجاجة الماء خضراء الأرجل

رعد شعلان إبراهيم\* احمد عبدالله حسين\*\* وليد جليل عبد الكلابي\*\*\*

### الملخص

أجريت هذه الدراسة لتوضيح بعض الخصائص التشريحية والنسجية لكبد ذكور دجاج الماء خضراء الأرجل البالغة (*Gallinula chloropus*). وقد أجريت هذه الدراسة على 20 طير تنقسم إلى مجموعتين (10 طيور للدراسة التشريحية و10 طيور للدراسة نسيجية) وتم اختيارها على أساس خلوها من الأمراض ظاهريا. كبد دجاج الماء خضراء الأرجل (*Gallinula chloropus*) تقع في اليمين، اليسار تجويف hepatoperitoneal، يبدو أحمر اللون البني. وعلاوة على ذلك، تنقسم إلى فصين هما، اليمين واليسار، والفص الأيسر تبدو أكبر من الفص الأيمن. تشريحا. كبد هذه الطيور يتميز بوجود كبسولة رقيقة من النسيج الضام تحيط خلايا الكبد، والتي ترتب شعاعيا حول الوريد المركزي كما الحبال الكبدية في خليتين سمك. هذه الخلايا هي مضلعة الشكل وقد اعتقلت نواة والحاضر من الجيوب بين الحبال الكبدية التي تصطف بجانب الخلايا البطانية ..

## Introduction

The liver is the largest organ in the body, but its relative size varies between species. Liver many vital tasks that maintain homeostasis. It includes liver function bile acids synthesis of cholesterol in the blood generation and utilization of glycogen. As it is the site for the metabolism of various substances. In preparation for excretion from the body through urine or bile. It is the production site plasma proteins, albumin, fibrinogen, lipoproteins and a variety of alpha and beta globulins.

The avian liver is suspended by peritoneum that is connected with overlying air sac and surrounded by hepatic celomic cavities<sup>(1,2)</sup>. The avian liver has two lobes, as in most birds the right lobe larger than the left one, for example, in the bathroom and Bustard ostrich<sup>(3, 4, 5)</sup>, while the two lobes can be equal in size, for instance, Galliformes<sup>(6)</sup>. However, the left lobe of the domestic fowl divided into the dorsal and ventral parts<sup>(1,7)</sup>.

The liver parenchyma of birds resemble 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<sup>(8,9,10,11)</sup>.

The aim of this study was to carry out some anatomical and histological study description of the liver of moorhen bird in order to show some possible difference with respect to other avian species

## Materials And Methods

Twenty birds were obtained from commercial market of Diyala province. All studied birds were free of any diseases or lesions, therefore; They were considered apparently normal. The birds were anesthetized by

intramuscular injection of a mixture of ketamine and diazepam at dose 25,5 mg/kg of body weight then killed<sup>(12)</sup>. Then specimens were cut from different areas of liver. The processing of Fixation, dehydration, clearing, embedding and cutting were made, H&E were used<sup>(13)</sup>.

## Results And Discussions

The anatomical result showed that the liver of the birds located in the right and left hepatoperitoneal cavity, it has red- brown to dark brown color (**Fig. 1**).

Agreed with this conclusion<sup>(14)</sup>, who said that, the natural color of adult male geese, red, brown to dark brown. In addition, disagree with<sup>(1)</sup>, which has remained the natural color of the liver of the bird depends on nutrition, the case of birds, was a red-brown color, it may be light brown, but if the yellow bird on a high fat diet.

The liver of **Moorhen birds** consisted of right and left lobes, the left lobe is divided into the dorsal portion and my stomach, while the right lobe of the United Nations division (**Figure 2**). This result agreed with<sup>(3,15)</sup>, which indicated that the liver of domestic fowl consists of two lobes left and one is divided into dorsal and ventral parts, while there were no divisions of other lobular in the liver of the Houbara Bustard<sup>(3)</sup> and contrast<sup>(5,16)</sup>, which he described as the ostrich in the left lobe is divided into small caudodorsal part, and a large part caudoventral and part of the left average small.

Histologically, our results establish refers to the liver of bird lobed gland surrounded by lining the chapel containing a thin capsule of connective tissue, which is still divided the liver lobes and to a lesser extent extend to extend into lobules that provided physical support (**Figure 3**). This is a respectable result with<sup>(17, 18)</sup>, this

indicates liver of mesothelium covered called Glisson's capsule. Liver parenchymal cells consist in the water **Moorhen birds** consist of hepatocytes that are arranged radially around a central vein as hepatocords in two thicknesses. The liver cells is polygonal in shape, and have a rounded nucleus and there exist sinusoids between hepatocords (**Figure 3**).

These results are in agreement with <sup>(19, 20)</sup>. The plates radiating from the hepatocytes are cells thick in chicken, fowl, turkey and American coot bird, unlike screwed with <sup>(18, 19)</sup>, which noted that billboards hepatocytic consisting of (1-2) cells in the thickness in Pintail duck and Ruffed grouse.

Portal area contains things fender lobular connective septa consisting branches of Portal vein, hepatic artery and branches of the bile ducts (**Figure 4**). The bile duct lined by simple cuboidal epithelium,, while the hepatic artery endothelial cells lined by simple squamous epithelium protruded into the lumen containing red blood cells and a layer of smooth muscle fibers more than a branch of the portal vein, which is lined by endothelial cells, protruded into the large lumen (**Fig.4**). This result is compatible with some researchers authors as <sup>(2)</sup> duck, <sup>(6)</sup> at pssitacine in chicken.

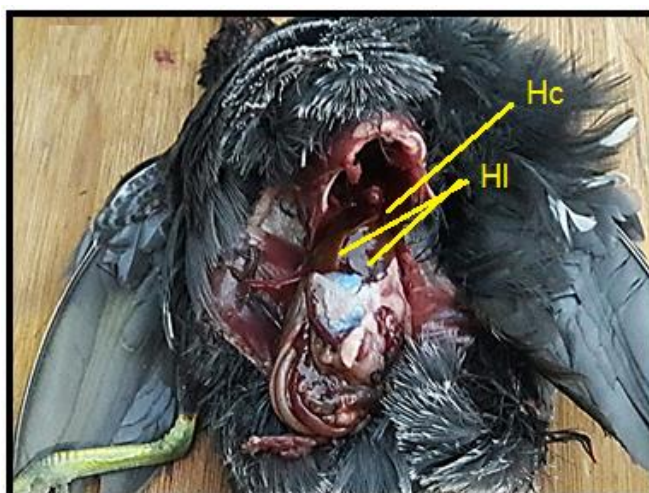


Fig (1): photographic show anatomical position of liver in bird. **Hc**- hepatoperitoneal cavity. **Hl**- left and right hepatic lobes.

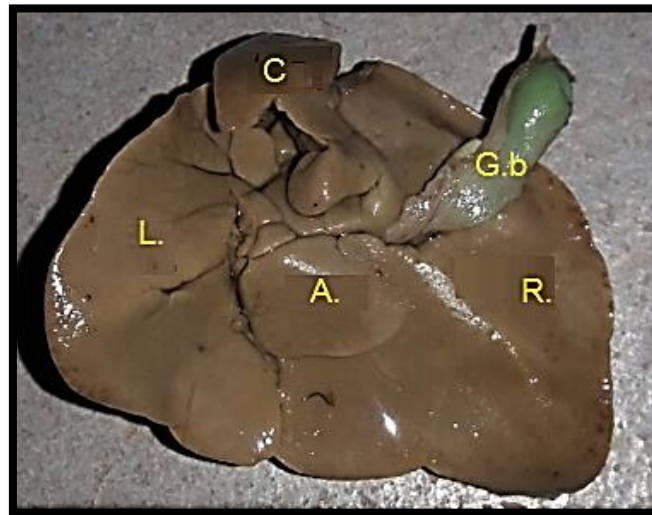
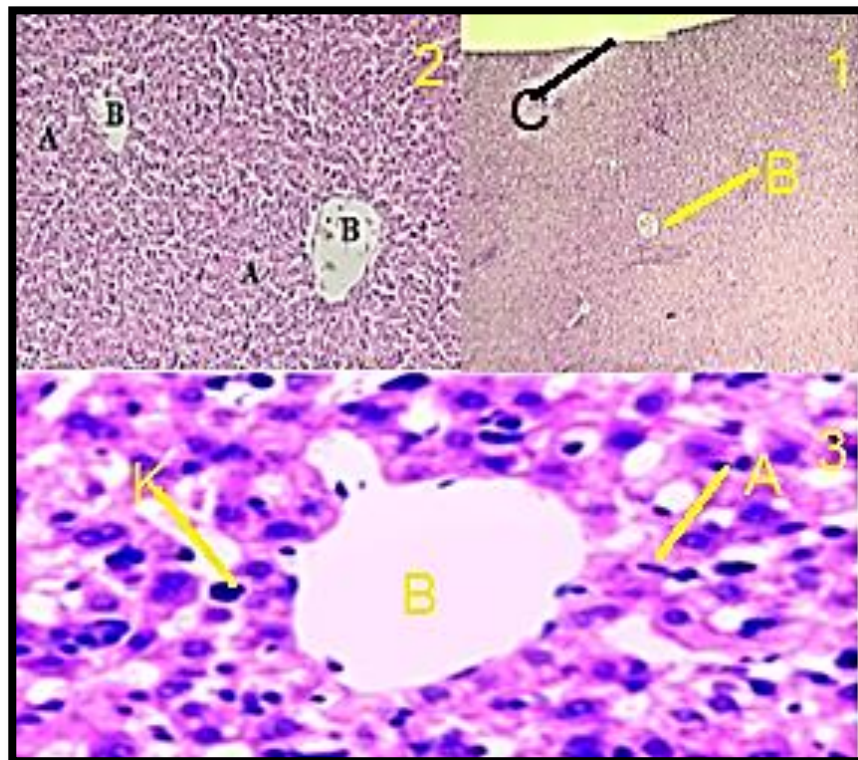


Figure (2): Photograph show ventral surface of liver show: **R**- right lobe. **L**- Left lobe . **C**-caudal lobe .**A**-accessory lobe .**G.b**- gall bladder.



**Figure (3):** histological section of liver (H&E)

1- Histological section of liver (H&E)(X10)

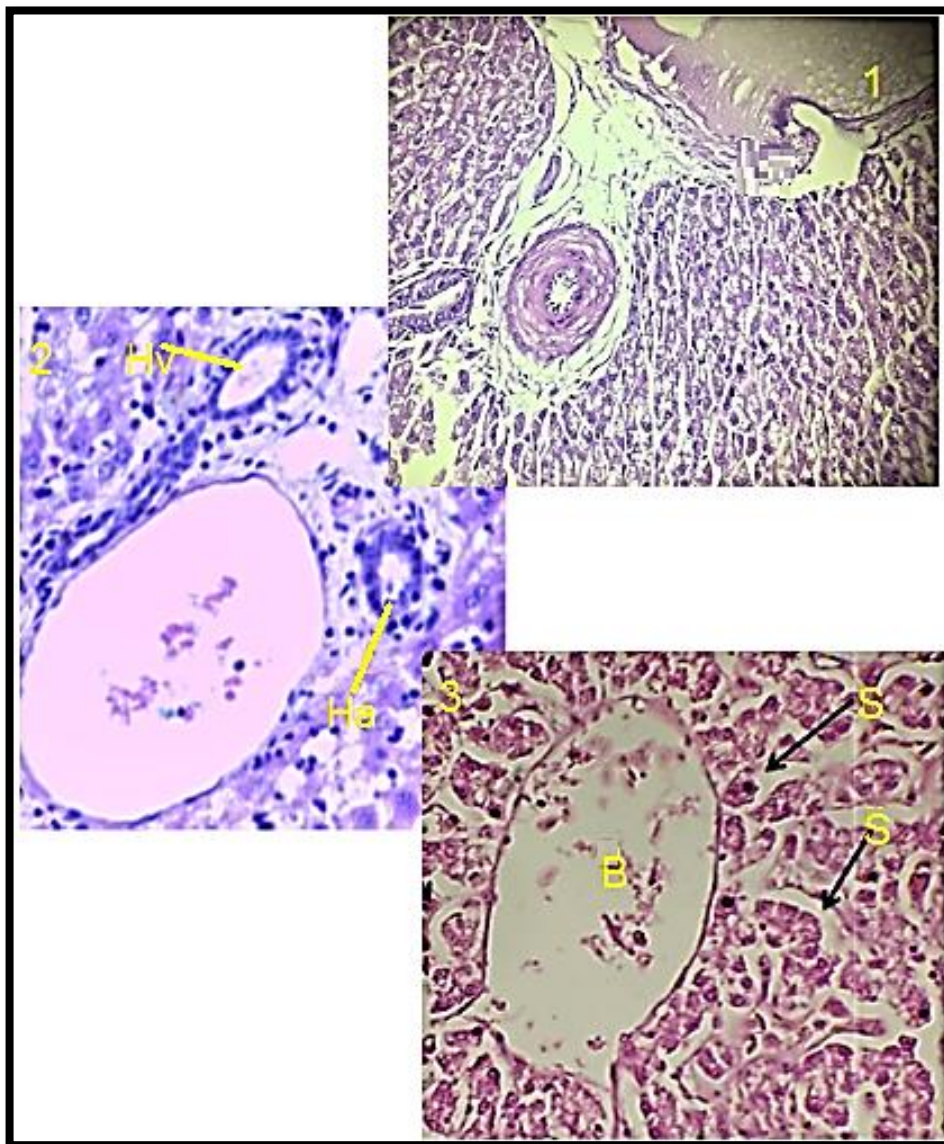
B-central vein, C- thin capsule (dense irregular connective tissue).

2-Histological section of liver (H&E)(X20)

A- Hepatocytes B- central vein

3- Histological section of liver (H&E)(X40)

A- Liver lobules with central vein, B- central vein, K- Kupffer cells.



**Figure (4):** histological section of liver (H&E)

- 1- Histological section of liver (H&E)(X10)  
Portal area show hepatic cords and portal artery.
- 2-Histological section of liver (H&E)(X20)  
Portal area **Hv**- hepatic vein .**Ha**- hepatic artery.
- 3-Histological section of liver (H&E)(X20)  
Portal area **B**- central vein, **S**- hepatic sinusoids

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