

HISTOLOGICAL AND HISTOCHEMICAL STUDY OF THE LIVER OF IRAQI LOCAL DUCKS

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ABSTRACT

The aim of study is provide basic data about the histological features of the liver of local Iraqi ducks and to study the glycogen content in the cytoplasm of the hepatocyte. The anatomical examination showed that liver laid cranial part of the abdominal cavity caudally and ventrally to the heart and associated to the gizzard. The liver of Mallard is divided into two undivided lobes right and left lobes (the right lobe is larger than left lobe). Histological examination revealed that the liver consist of several lobules separated from each other by thin trabeculae of connective tissue extend from delicate capsule that enclosed the liver. The basic unit of the parenchyma of liver is hepatocyte which arranged in plates or cords like that radiated around the central vein and between these cords there is sinusoids lined by alayer of fenestrated endothelial cells and Kupffer's cells. In the boundary of each lobule showed portal area which consist of hepatic artery; hepatic vein and bile duct lining by cuboidal cells. The histochemical study showed formed differ size of glycogen granules in cytoplasm of hepatocytes and in some specimen the glycogen large granules arranged around the central vein because the bird in starvation period .the liver of Mallard generally is closely similar to the liver of another avian birds and vertebrates

INTRODUCTION

The ducks was classified according to the body weight and type of production to nine species (1). The liver is largest gland of body, it is dark brown or red brown in colour and the right side the liver is both endocrine and exocrine gland releasing several substances directly into blood stream and secreting bile into duct system (2 and 3). Embryologically, it derived from endoderm (hepatocyte and biliary epithelium) and mesoderm (stroma cells, satellite cells, kupffer's cells and blood vessels (4 and 5). The liver is bilobed right and left lobe lies ventrally and posteriorly to heart associated with proventriculus and spleen. in adult the liver intervenes between the diaphragm cranially and the stomach and intestinal mass caudally, although extended across median plane the bulk lies to the right in all species (3). In some domestic birds the caudal part of the left lobe subdivided into dorsal and ventral parts (6) and the right lobe is larger than left lobe (2). In the domestic birds, at least, there are one or more intermediate processes which project from the visceral surface immediately ventral to the hilus and gallbladder occurs in most species and lies on the visceral surface to the right lobe. The liver invested by delicate connective tissue capsule (Glisson's capsule) that becomes thicker at the hilum where the portal vein and hepatic artery enter the liver (3;7and 8). Liver divided in several lobules contian polyhydral epithelial cells (hepatocyte) arranged in branching and anastomosing plates around the central vien which separated from each other by blood sinusoids(2

and 3) .between the adjacent hepatocyte are tiny channels which is called bile canaliculi terminate in the bile ducts of the portal area and it lining by one layer of cuboidal cells resting on basal lamina and the lumen of canalicule increase in size toward the external of the liver and the epithelial lining become columnar epithelial (7 ;9and 10). The wall of hepatic bile duct consist of tunica mucosa,muscularis tunica and the tunica serosa(10) . The hepatocyte storage the glycogen (2 and11) and the hepatocyte plates has radial pattern about central vein. The portal area contains a branch of hepaticartery, portal vein, bile duct and lymphatic channel (3 and 12). The function of liver is bile formation, metabolism of carbohydrate, lipid, protein, production and distraction of blood cells, storage of glycogen, fat soluble vitamin, detoxification of substance(2;13;14 and15).

MATERIALS AND METHODS

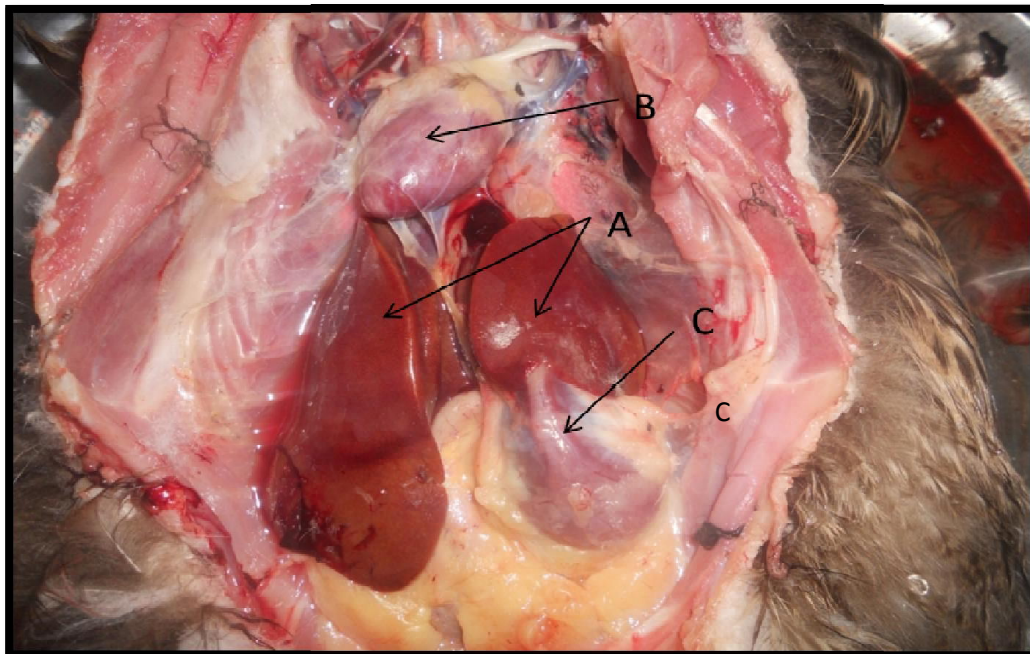
Fifth specimens of liver from healthy adult Iraqi local duck were collected immediately after birds slaughter and washed with (0,9%) normal saline solution and it kept in (10%) formaline approximately (48) hours at room temperature. The specimens were taken from right and left lobes of liver for histological and histochemical study. The tissue was processed by routine processing methods and then the slides were stained with (Hematoxline and eosin) and (periodic acid shiff) PAS stains to study the histochemical features of glycogen content of the liver of Mallard(16and17). .

RESULTS AND DISCUSSION

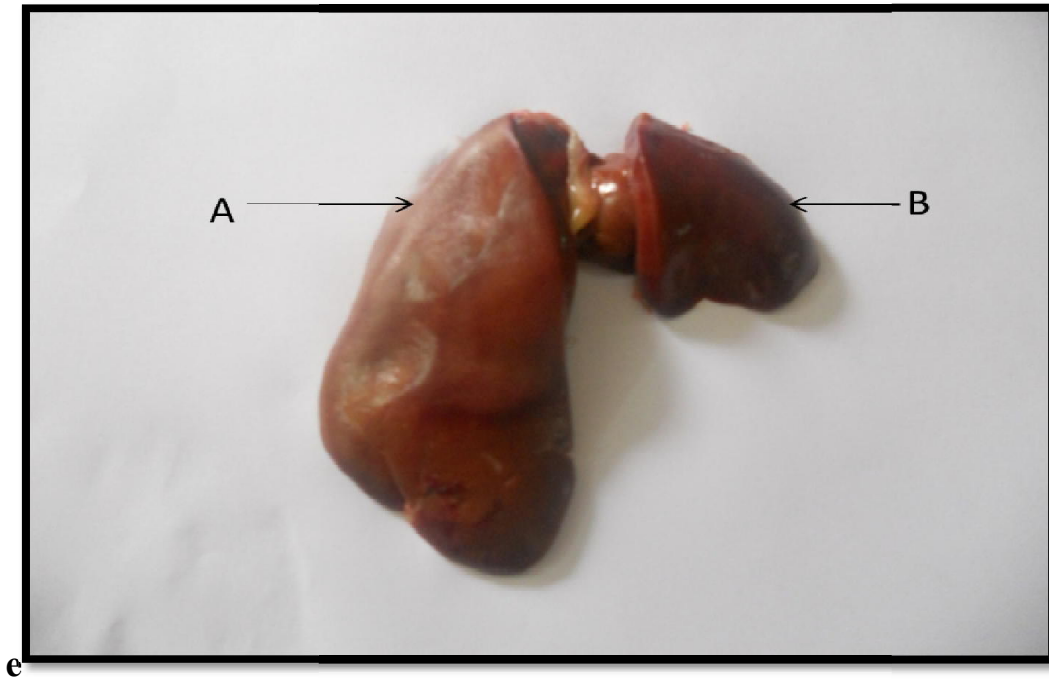
The present study showed that the liver of Mallard is located in cranial part of abdominal cavity behind the diaphragm, it located caudally and ventrally to the heart and was associated with the gizzard figure(1). This finding was agreed with (2 and 7), but the relation between the caudal end of the liver and the end of the sternum differ according to the age of the birds (18). The liver of Mallard is divided into two undivided lobes right and left lobe, the right lobe is larger than the left lobe about twice time figure (2) and this result was agree with (18) In the comparative study of the liver of ducks, chicken and pigeon (only the left lobe of chicken liver is divided), but (19) showed that the left lobe of the ostrich liver is divided into three parts while the right lobe is undivided. The present study revealed that no histological difference between right and left lobes of Mallard and this observed agreed with (20 and 21). The histological study showed that the liver of Mallard was consist of numerous lobules separated from each other by thin layer of connective tissue which is continuous from thin liver tissue capsule figure(3), and this observed was agreed with (20;21 and 22). The parenchyma of the liver lobule is composed of epithelial polyhydral cells called hepatocyte arranged in branching plates (cords,like) and this plates are separated by blood sinusoids and arranged in radiation form around central vein figure(4), the result was agreed with (7 and 9). The hepatocyte cells in each plate of liver of Mallard are (1-2), the hepatocyte is polyhydral in shape with central nucleus and this result was similar to these observed in turkey and pintail duck in number of hepatocyte (23). The sinusoids are large and irregular in shape and it lining

with two type of cells stellate cells called (Kupffer's or hepatic macrophage cells and flattened endothelial cells) figure (5) (19;20 and 21). In the present study showed between the liver lobules the portal area consist of, branch of portal vein and branch of he hepatic artery and bile duct which lining with one layer of cuboidal cells resting on basal lamina figure(6). In the histochemical observation of this study by using (PAS) stain observed numerous granules of glycogen in the cytoplasm differ in their size figure(7) and this observation agreement with the result of (11and 13)in pigeon and chickens. The result of (11) showed the glycogen of the pigeon liver is synthesis from glucose, mannose, fructose and galactose and this synthesis induced during starvation. In the study of (24) on the liver of Muscovy duck liver found that the level of glycogen in liver increase in the level of keton body in blood, but the concentration of the glycogen of chicken liver reduced in higher vibration frequency(13).

In the present study we observed in (some slides) that the granules of glycogen arranged near the to the central vein figure (8) which lead to the birds in starvation period, because the granules of the glycogen when the animal need energy was taken from the border of liver lobules firstly and then it take it from the area near to the central vein (7). Also the level of glycogen related with the age of the Turkey and Poult embryo (25).



Fig(1): The position and relationship of liver of Mallard in abdominal cavity:- liver (A), heart (B) and gizzard (C).



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Fig.(2): The lobes of the liver in the Mallard:-the right lobe of the liver(A) appeared larger than the left lobe(B).

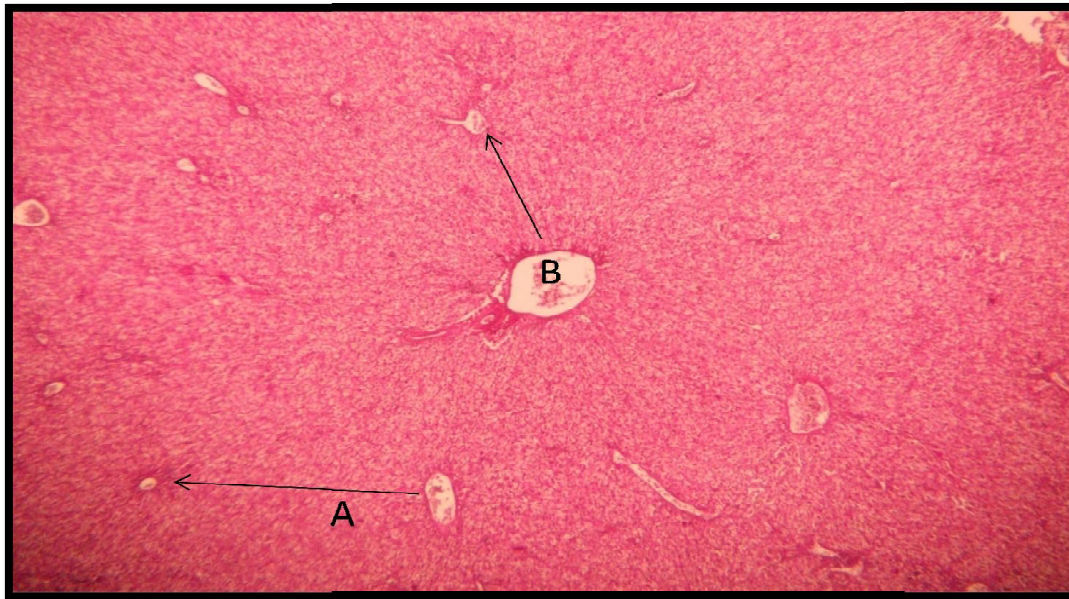
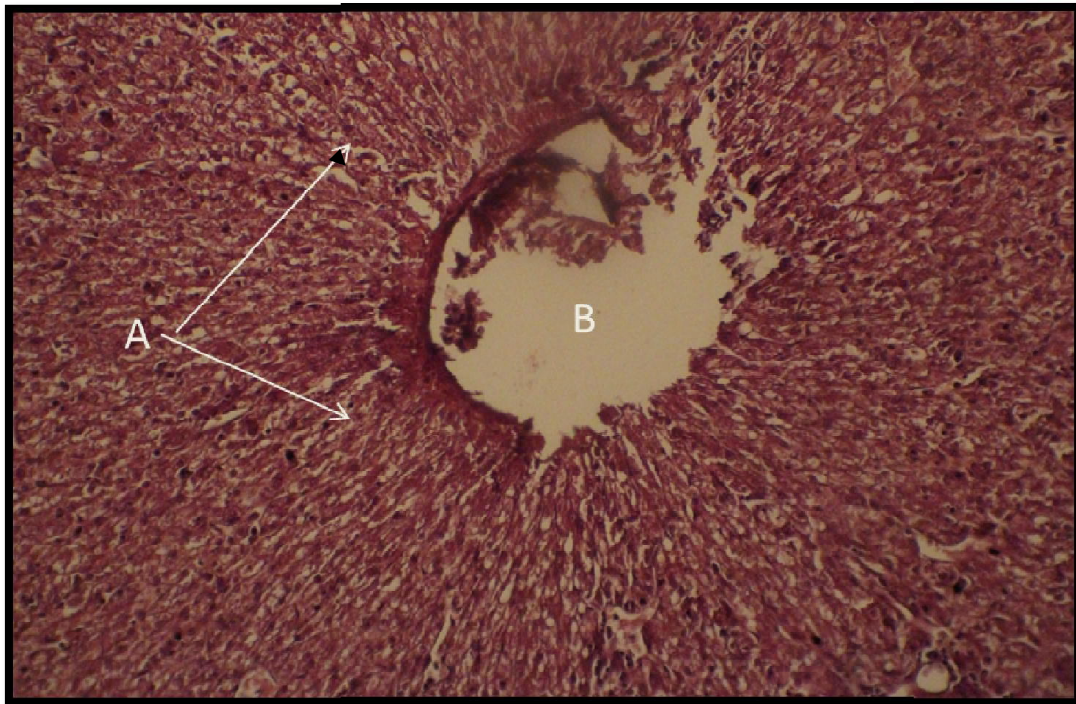


Fig.(3):Section through the liver shows :(A) liver lobule(B) central vein H&E.(100X).



Fig(4):-Section through liver shows:-

(A)Hepatocyte plate (B) the central vien . H&E stian (400X).

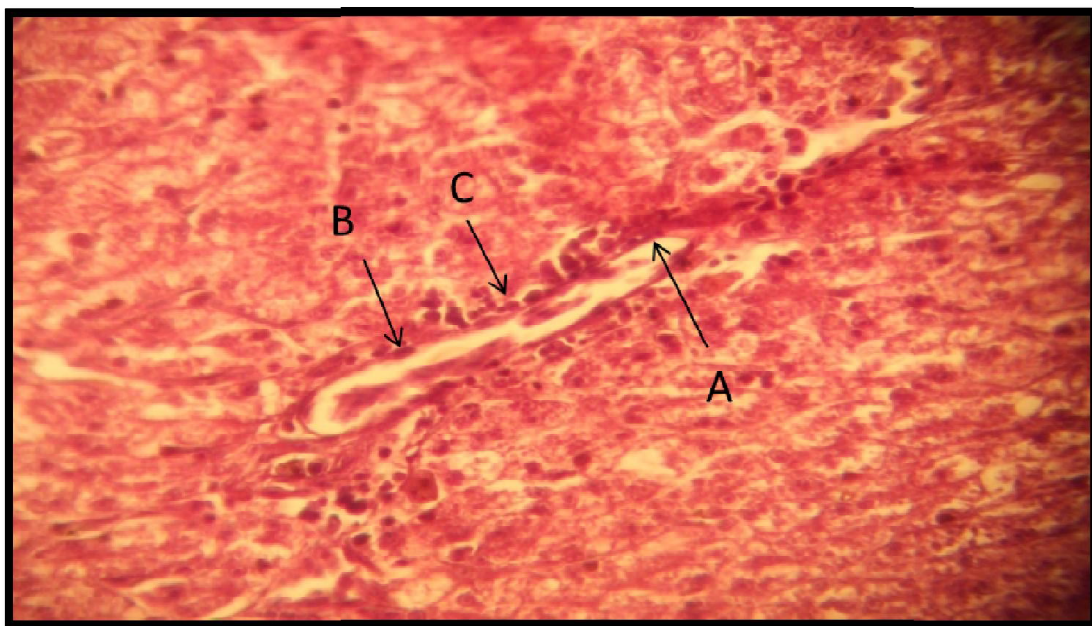


Fig.(5): Section through liver shows:-

(A)sinusoid (B) Kupffer's cel l (C) endothelial cell H&Estain (400X).

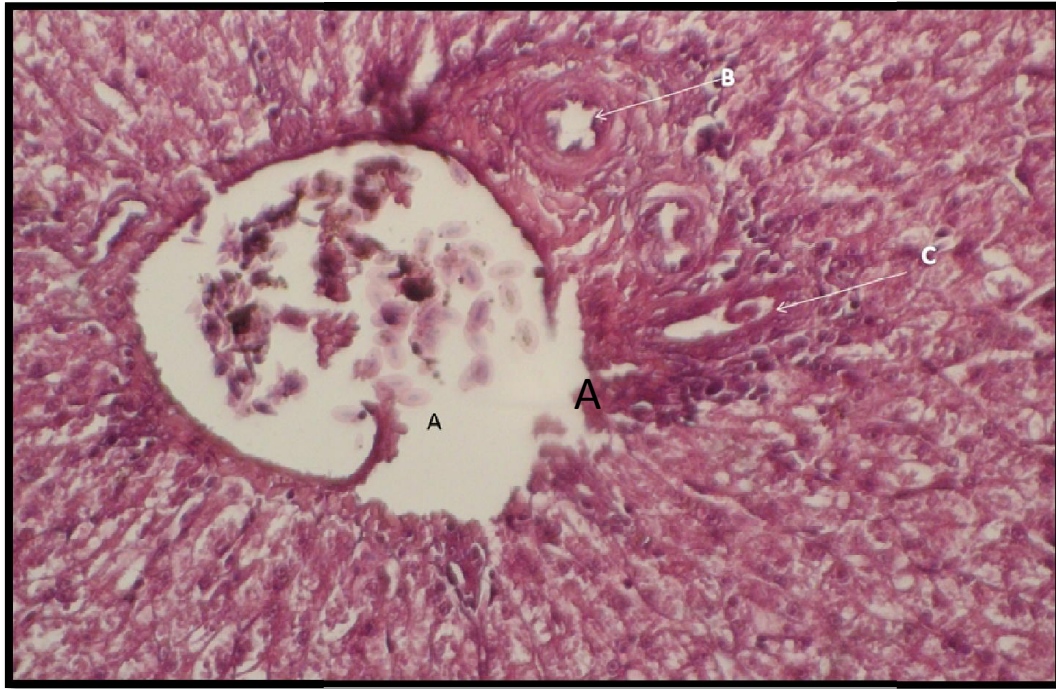


Fig.(6) : -Section through liver shows:

(A)Hepatic portal vein(B) hepatic portal artery(C) bile duct H&E stain (400 X).

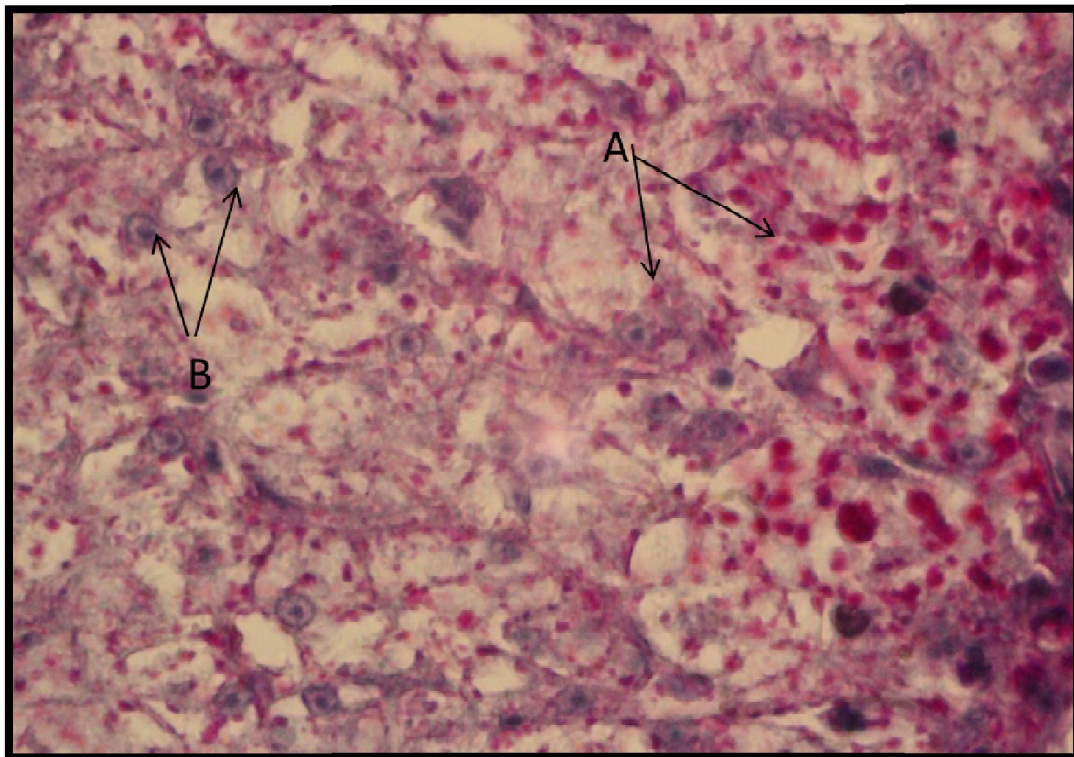


Fig.(7): Section through liver shows:-

(A)glycogen granules (B) hepatocyte nucleus PAS stain(1000 X).

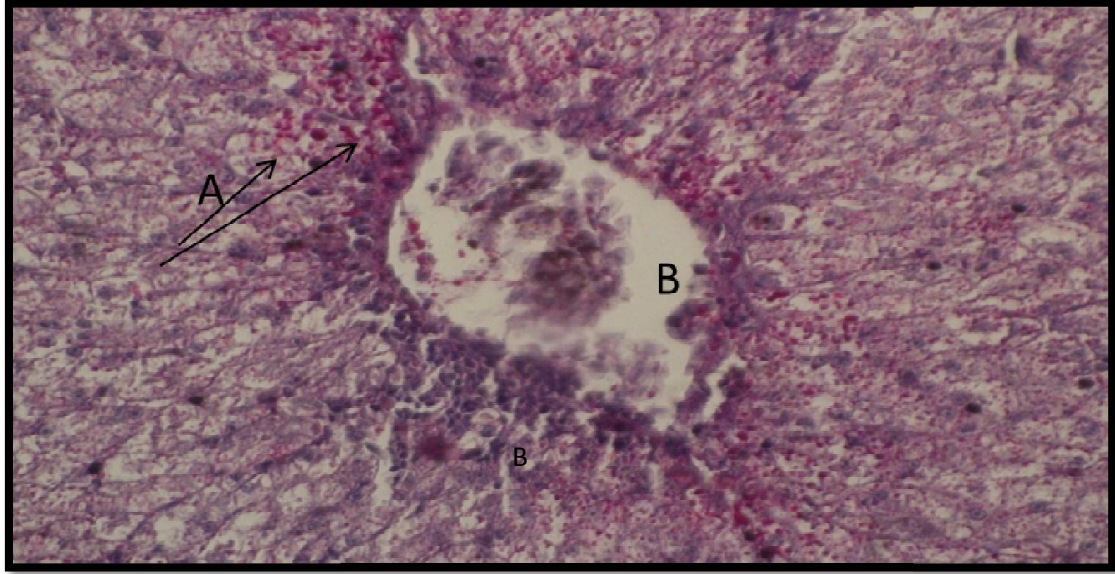


Fig.(8):Section through liver shows

(A)Glycogen granules around (B)the central vein was more than glycogen granules in the hepatocyte far from the central vein . PAS stain, (1000X).

دراسة نسجية وكيمياء نسجية للكبد في البط المحلي العراقي

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الخلاصة

الهدف من هذه الدراسة هو توفير قاعدة معلومات حول التركيب النسجي لكبد البط المحلي (Anas platyrhynchos) ودراسة المحتوى الكلايوجيني في سايتوبلازم الخلية الكبدية اظهرت الدراسة التشريحية الكبد انة يقع في الجزء الامامي للتجويف البطني ،خلفيا وبطنيا للقلب ولة علاقة بالمعدة العضلية.ويتكون من فصين ايمن وفص ايسر (الفص الايمن اكبر من الايسر بمرتين).

نسيجيا يتالف الكبد من عدة فصوص lobes مفصولة عن بعضها البعض بحواجز نحيفة من النسيج الضام تمتد من المحفظة الرقيقة التي تغلف الكبد.الوحدة الاساسية للنسيج الكبدي هي الخلية الكبدية والتي تترتب على شكل حبال حول الوريد المركزي وتوجد ما بين الحبال الكبدية جيبيات دموية تبطن بنوعين من الخلايا الخلايا البطانية المثقبة وخلايا كوفر وفي حدود الفص الكبدي توجد الباحة البوابية والتي تتالف من الشريان الكبدي والوريد الكبدي وقناة الصفراء والتي تبطن بخلايا مكعبة الشكل.

بينت الدراسة الكيمياء نسجية وجود حبيبات الكلايوجين في سايتوبلازم الخلية الكبدية باحجام مختلفة وقد لاحظنا في بعض العينات المدروسة تجمع الكلايوجين حول الوريد المركزي وذلك لان الطائر كان في فترة الجوع. وبشكل عام كبد البط المحلي مشابه لكبد باقي الطيور الداجنة والفقرات في التركيب النسجي.

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