

A review about: Histological of Liver of Sand Partridge (*Ammo Perdix griseiguleris*)

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Abstract— Ten birds (Sand Partridge) strain used to investigate the histological features of the liver in Sand Partridge (*Ammo Perdix griseiguleris*). The histological picture of Sand Partridge liver showed that it surrounded by a thin fibrous capsule and not well subdivided to lobules. The parenchyma consisted from hepatocyte which formed the hepatic cords and organized around central vein in radially manner while the portal triad had portal vein, hepatic artery and bile duct, on the other hand the sinusoids situated between the hepatic cords.

Keywords — Liver, Sand Partridge (*Ammo Perdix griseiguleris*).

INTRODUCTION

The sand partridge (*Ammoperdix heyi*) is a gamebird in the pheasant family Phasianidae of the order Galliformes, gallinaceous birds, this partridge has its main native range from Egypt and to south Arabia. It is closely related and similar to its counterpart in southeast Turkey and east to Pakistan, the see-see partridge, *Ammoperdix griseogularis*. The bird nests in a scantily lined ground scrape laying 5-7 eggs. The sand partridge takes a wide variety of seeds and some insect food (1).

An understanding of avian anatomy is essential for avian practitioners. The liver performs numerous physiological and immunologic functions in pet birds. It comprises a greater percentage of body weight in a bird compared to man. In some birds, such as pigeons, the liver can normally be quite large. When performing abdominal palpation, the liver is normally not detectable. An enlarged liver is palpable, as it usually protrudes beyond the caudal border of the keel bone. In young birds, the liver may be visible through the skin. The liver plays a crucial role in the defense against disease and often a bird that is ill will have an enlarged liver, elevated liver enzymes and icteric serum (2).

The present report was carried out to investigate the histological features of the liver in Sand Partridge (*Ammo Perdix griseiguleris*).

LITERATURES REVIEW

There are about 10000 bird species in the world. From the poles to the equatorial forests, from the deserts to the centers

of the oceans, from the highest mountains to the hearts of our cities, everywhere birds are amongst the most conspicuous forms of animal life. Of all the animals, birds have been the most well-known classes because human beings have used them for feeding, communication, pollinating plants, and decorate the home, etc. Also, birds are important to some animals for biological control (3).

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 biodegradative processes and excretes final metabolic products (4, 5).

The anatomical and histological structure of the liver has been investigated in a wide range of vertebrates species (6, 7, 8, 9). Among the previously investigated birds, there were two different kinds of liver structure, the first kind is showing plates of two-cell thickness as in *Gallus gallus*, *Anas acuta*, *Aix sponsa*, *Bonasa umbellus*, *Struthio camelus* and *Fulica Americana* whereas the second kind has uniformly one-cell-thick plates as in *Sturnella magna*, *Sialia sialis*, *Spizella arborea* and some other birds species (10, 11).

The histology of the liver varies among species, but there were general features that are common in the majority of species (12).

Hepatic parenchyma in birds showed similarity with that observed in most mammals except the variation in some histological characteristic (13), there is some different in histological features such as absent of lobules and interlobular trabeculae, in fact the principal cell of the liver is the hepatocyte (14, 15).

The current report showed that the parenchyma of the liver Sand Partridge covered by a thin fibrous capsule which consisted of irregular dense connective tissue comprised at most collagen fibers and some of elastic fibers (Fig. 1).

In this review, we didn't observe the presence of the liver lobules clearly because the absence or indistinct the hepatic connective tissue septa. This finding was not compatible with observations of (16) in coot bird who observed that the liver subdivided into defined lobules by trabeculae, but agreed with (13) who reports in quail, (17) in chicken, and (18) in turkey who find the liver lobules not well subdivided. The hepatic parenchyma in this bird was consists of hepatocytes that organized as irregular plates or cords of one thick cell, which radiated around the central vein, forming small lobules, and the blood sinusoids were distributed among those plates (Fig. 4) this result was resembled description (19) in the common

moorhen, and with (20) who said that hepatocytes arranged in cords mostly with one cell thick in birds, and disagreed with (17, 21) who found that two thick cells were formed the hepatocyte plates in turkey and chicken.

The hepatocytes appear large and their nuclei were a large, rounded and centrally located with dark distinct nucleoli (Fig. 3). The shape of these cells was polyhedral and oval. The blood sinusoids were distributed between the hepatic cords throughout the hepatic parenchyma, and noted narrower, they were irregular in shape and lined by flattened endothelial cells with existence of a large kupffer cells (Fig. 2). These observations were consistent with (22) in the liver of ostrich.

This report showed that the hepatic tissue in this specie encompassed several regions which enclosed by connective tissue and dispersed throughout the parenchyma without a defined arrangement. These regions were represented the portal triad, and each region contains the terminal branches of portal vein, hepatic artery and bile duct (Fig. 1), as that proved by (23) in many other domestic birds and vertebrates. The bile duct was lined with epithelium of simple cuboidal, while the portal vein had a large lumen with thin wall and lined by endothelial cells, whereas the hallmark of hepatic artery was thick wall, small and winding lumen and lined by endothelial cells. These results agreed with observations of (19) which detected in the liver of moorhen and domestic fowl.

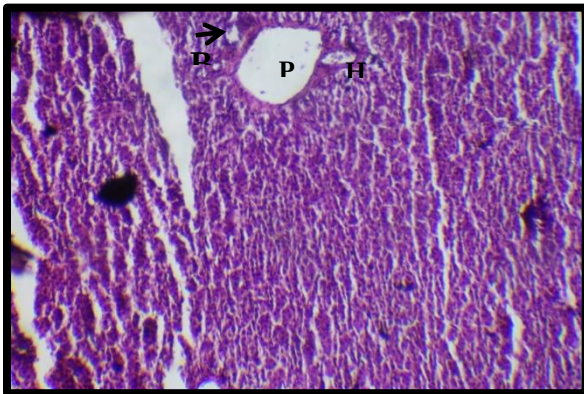


Figure 1. Histological cross section of liver show: portal vein (PV), hepatic artery (HA), bile duct (Bd), 100X (H&E stain).

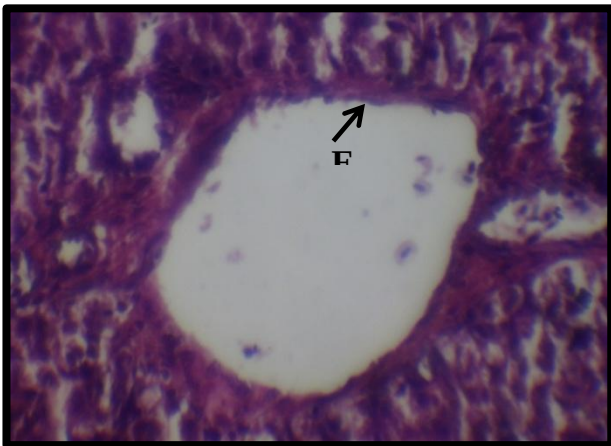


Figure 2. Histological cross section of liver show endothelial cells of portal vein (E) 400X (H&E stain) .

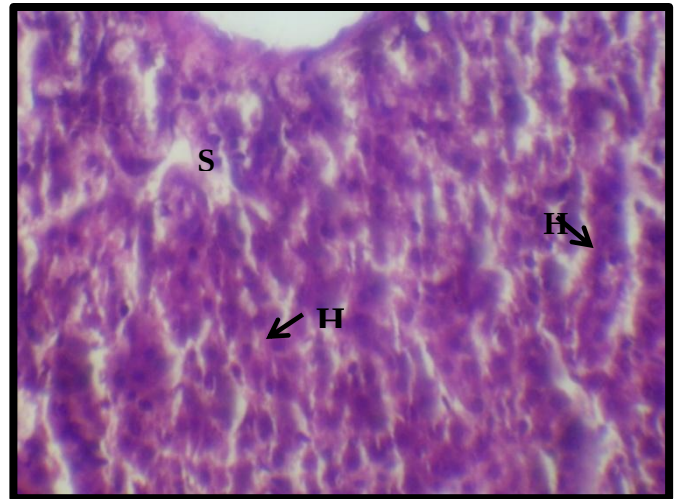


Figure 3. Histological cross section of liver show sinusoids (S), hepatic cord (HC) hepatocyte (H), 400X (H&E stain).

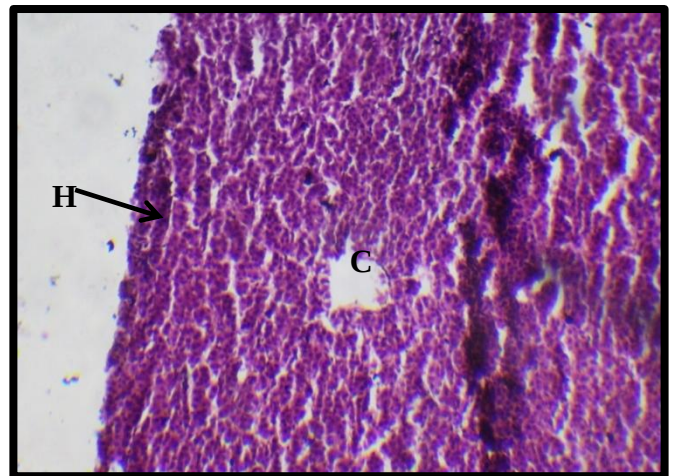


Figure 4. Histological cross section of liver show central vein (CV), hepatocyte cord (HC), 100X (H&E stain).

CONCLUSIONS

The results of the present study concluded that the liver of Sand Partridge (*Ammo Perdix griseiguleris*) histologically surrounded by a thin capsule and the lobules not distinct due to the liver has no clear trabeculae otherwise the parenchyma of the liver consist from hepatocytes with sinusoids and had a portal area which contain portal vein, hepatic artery and bile duct, moreover the parenchyma had central veins arranged around them hepatocytes in radiate manner.

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