Histomorphology of the pancreas in myna

S. Rajathi and S. Muthukrishnan
**Assistant Professor, Department of Veterinary Anatomy,*
Veterinary College and Research Institute,
Tirunelveli – 627 358

ABSTRACT

Histological study was performed in the pancreas of two adult male mynas. Tissue pieces from different lobes of pancreas were fixed and processed in routine manner. Four to Five micron thick sections were stained using Haematoxylin and Eosin staining technique. The present study observed that the histological study of the pancreas in Myna consisted of exocrine acinar portion with ducts and endocrine diffuse portion with no connective tissue separation between them. The pancreas was covered by a thin connective tissue capsule which consisted of collagen, elastic and reticular fibres. The parenchyma was divided into lobes and lobules by connective tissue septa from the capsule. The exocrine acini were round to oval in shape. The acinar cells were columnar to polygonal in shape with apical eosinophilic large granules and basally dark cytoplasm with oval nucleus. The duct system started with intercalated, intralobular, interlobular, intralobar and large ducts which were lined by simple squamous, simple cuboidal, simple columnar, stratified cuboidal and stratified columnar cells, respectively. Centroacinar cells were absent. The endocrine portion consisted of lightly stained cells with different shapes. The nucleus of these cells was also compact in some cells and vacuolated in some cells. Numerous sinusoids were found between the acini.

Key words: Histology, Pancreas, Islets, Myna

Bird's pancreas is composed of two or three lobes with diffused islets. It is located in the right side of the abdominal cavity between the two loops of duodenum. Avian pancreas also consisted of exocrine and endocrine portion like mammals. The exocrine acinar portion is responsible for the production of digestive enzymes and the endocrine portion is responsible for the production of hormones like insulin, glucagon etc. Literature on the digestive organs of myna is scanty. Hence, this research work was undertaken to study the histology of pancreas in myna. This will form the basis for correlating the digestive functions of the birds.

Address for correspondence :
S. Rajathi, Assistant Professor,
Department of Veterinary Anatomy,
Veterinary College and Research Institute,
Tirunelveli – 627 358
Mobile no. 9944692091
Email : srajathi9936@yahoo.in

MATERIALS AND METHODS

The pancreas was collected from two apparently healthy predator killed adult male mynas in Tirunelveli district and was studied for their histological details. The pancreas from all the lobes was cut across into small pieces and was processed

conventionally. Paraffin sections of 4 to 5 µm thickness were taken and stained using Haematoxylin and Eosin (Luna, 1968). Histological images were recorded using image size recording system in digiscope with imaging system.

RESULTS AND DISCUSSION

The pancreas of myna as like other birds was located between the two duodenal loops in the right abdominal cavity. Three lobes were found between the two loops viz, dorsal lobe, ventral lobe and a small lobe near the spleen. This was contrary with the results of Saadatfar and Asadian (2009) who reported that the splenic lobe of the pancreas was absent in myna while in the case of pigeon, the pancreas was composed of four lobes namely dorsal lobe, ventral lobe, small lobe and splenic lobe.

Histologically, the pancreas in the present study was covered with a thin capsule. This was in agreement with the findings of Mobini (2011) in geese, Faris (2012) and Mobini (2013) in pigeon while in turkeys the capsule was thick (Mobini, 2009). The capsule was made up collagen elastic and reticular fibres which is similar to the results of Mobini (2011) in geese, Faris (2012) and Mobini (2013) in pigeon. The septa from the capsule entered into the parenchyma of the pancreas and was divided into lobes and lobules (Fig.3). The connective tissue fibres surrounded each acinus and there was no prominent connective tissue fibres separating the endocrine and exocrine part of the pancreas in the present study (Fig. 3). These interlobular connective tissue fibres contained blood vessels like artery, vein and sinus including nerve fibres as bundles. This was in accordance with the results of Mobini (2011) in geese.

The parenchyma of the pancreas in the present study consisted of exocrine and endocrine portions. The exocrine portion was serous in nature and compound tubuloacinar gland. It also consisted of rounded secretory acini and had duct system which was similar to the findings of Mobini (2011) in geese. The acini were lined by columnar to polygonal shaped acinar cells. The acinar cells were columnar in geese (Mobini, 2011). The acinar cells conatined apically eosinophilic large granules and basally dark cytoplasm with oval nucleus (Fig. 3). Numerous sinusoids were found between the acini (Fig. 2).

The duct system of myna started with intercalated lined by simple squamous, cells, intralobular lined by simple cuboidal cells and interlobular lined by simple columnar, intralobar and large ducts lined by stratified columnar cells (Fig. 1). This was in accordance with the results of Mobini (2011) in geese, Faris (2012) and Mobini (2013) in pigeon. Goblet cells and glands in the duct system were absent in the present study but was found in the pancreatic duct of goose (Mobini, 2011). Centroacinar cells were absent in the present study. Beheiry and Karkit (2018) found centroacinar cells in the pancreas of geese.

Endocrine portion or pancreatic islets consisted of lightly stained cells with different shapes (Fig. 3). The nucleus of these cells was also compact in some cells and vacuolated in some cells. Numerous sinusoids were found between the acini. The islets consisted of large alpha and small

beta islets. This was in concurrence with the reports of Mobini (2011) in geese, Faris (2012) and Mobini (2013) in pigeon but in the case of pancreas in duck, mixed islets were found (Das et al., 2003). Alpha islets consisted of alpha and beta cells and beta islets consisted of beta and delta cells.

CONCLUSION

Histological structure of pancreas in myna was similar to that of geese, turkey, pigeon except capsule thickness, presence of centroacinar cells and goblet cells and gland in the ductular epithelium.

REFERENCES

Beheiry, R. R. and Karkit, M. W. (2018). Morphological, histological and ultrastructural studies on the exocrine pancreas of goose. *Beni-Suef University J. of Basic and Appl. Sci*. **7(3):** 353-358

Das, A., Das, R. K. Parida, S. Mishra, U. S. and Solank, D. (2003). Histomorphological study on pancreas of duck (*Anas boscas*). *Indian J. Anim. Sci.*, **73(6):** 598-599.

Faris, S. A. (2012). Anatomical and Histological study of the Pancreas of Pigeon. J. of College of Education, Thi-Qar University, Iraq, **2(4):** 64-72.

Mobini, B. (2013). Histochemical and histological studies on the pancreas in mature pigeon (*Columbia livia*) *Eur. J. Exp. Biol.,* **3(2):** 148-152.

Mobini, B. (2011). Histological studies on pancreas of goose (*Anse albifrons*). *Vet. Res. Forum.,* **2(1):** 25-29.

Mobini, B., and Aghaabedi, B. (2009). Histological and histochemical studies on the pancreas of native turkey in Iran. *Vet. J. Pajouhesh Sazandegi*, **22:** 2-8.

Luna, L.G. (1968). Manual of histologic staining methods of armed forces institute of pathology. 3rd edition. Mc.Graw hill book company. New York 258

Saadatfar, Z. and Asadian, M. (2009). Anatomy of pancreas in mynah (*Acridotheres tristis*). *J. Appl. Anim. Res*. **36**: 191-193

FIGURES

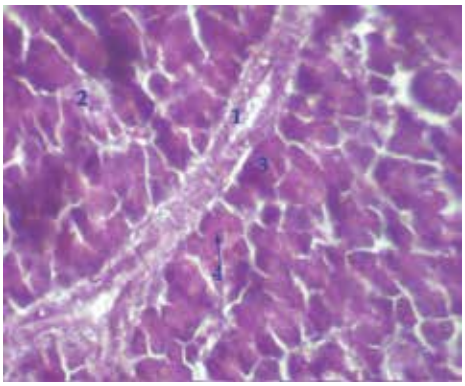

Fig. 1: Cross section of dorsal lobe of pancreas

1 – Intralobular duct 2 - endocrine portion – light islets

3 - exocrine portion 4 – Eosinophilic granules H & E x 400

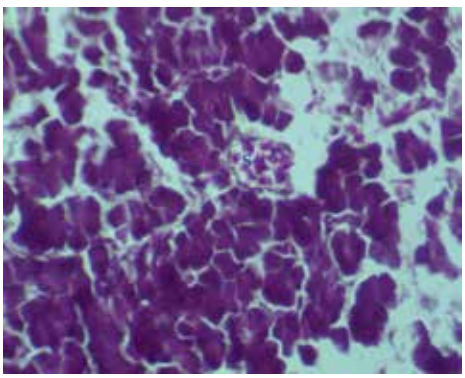

Fig. 2: Cross section of splenic lobe of pancreas showing exocrine acini (1) and blood sinusoids (S) H & E x 400

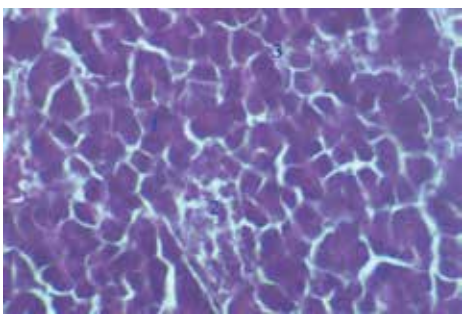

Fig. 3: Cross section of ventral lobe of pancreas showing exocrine (1) and endocrine portion – dark islets (2) and interlobular connective tissue septa (3) H & E x 400