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Gross Anatomy of epididymis and ductus deferens of adult Khaki Campbell duck (*Anas platyrhynchos domesticus*) in Bangladesh

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ABSTRACT

The aim of the work to observe the anatomy (gross and biometrical) of the epididymis and ductus deferens of adult Khaki Campbell duck (Anas platyrhynchos domesticus). The experimental Khaki Campbell ducks (Anas platyrhynchos domesticus) were collected from poultry farm of Bangladesh Agricultural University, Mymensingh from July 2017 to June 2018 . The condition of the health of the birds was apparently good. No external deformities were observed in the birds. The epididymis was closely attached along the entire length of the dorso-medial border of the testis. The cranial part was closely associated with the capsule of the adrenal gland and it was extensive for left epididymis. The ductus deferens was convoluted and wavy in appearance. It started at the caudal end of the epididymis and ran parallel to the midline and extends to the cloaca parallel to the respective ureter. The present study revealed that the gross anatomical structure of the epididymis and ductus deferens of the Khaki Campbell duck was similar to that of the other avian species.

Key Words: *Gross anatomy, Biometry, epididymis, ductus deferens and Khaki Campbell duck.*

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I. Introduction

The anatomy of the reproductive organs in the male domestic birds is of concern to poultry breeders as well as scientific workers (Bull et al., 2007). The study on the reproductive system of wild birds is necessary to improve their production and reproduction efficacy and to preserve their species (Vijayakumar et al., 2014). Though testis is the major reproductive organs of the male birds, epididymis and ductus deferens also play an important role in the reproductive system of the male birds. The epididymis is an elongated, spindle shaped enlargement, closely attached along the full length of the dorso-medial border of the testis (Gray, 1937). In addition to sperm maturation, the epididymis also plays an important role in sperm transportation, concentration, and protection. In birds, the ductus deferens is the major storage organ of sperm (Lake, 1957). A good number of researches have been performed focusing on testis but these two organs are really less focused specially in Khaki Campbell duck. Khaki Campbell (*Anas paltyrhynchos domesticus*) duck is becoming

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more popular as a source of meat and eggs in various part of the world including Bangladesh. The growth and production of Khaki Campbell duck vary due to environment, nutrition and management practices (Nageswara et al., 2005; Islam et al., 2012; Hasan et al., 2017). In future, the duck production in Bangladesh turns to be a big industry for supplying the animal protein to the mass people. But there is no literature available on the epididymis and ductus deferens of Khaki Campbell (*Anas paltyrhynchos domesticus*) duck. Therefore, this investigation is proposed to:

- Explore the anatomy (gross and biometrical) of epididymis and ductus deferens of the adult Khaki Campbell (*Anas paltyrhynchos domesticus*) duck in Bangladesh.
- Compare the epididymis and ductus deferens of the adult Khaki Campbell (*Anas paltyrhynchos domesticus*) duck with other avian species.

II. Materials and Methods

The experiment was conducted on five apparently healthy adult male Khaki Campbell (*Anas paltyrhynchos domesticus*) ducks from July 2017 to June 2018. The birds were procured from poultry farm of Bangladesh Agricultural University, Mymensingh, having apparently good health and devoid of any external deformities. The study was conducted in the Department of Anatomy & Histology, Bangladesh Agricultural University, Mymensingh. After taking the live body weight, birds were killed ethically. The age of the birds were confirmed by record books kept by the farm authority. Gross biometrical parameters were recorded for each organ (epididymis, ductus deferens) separately with the help of Vernier Calliper and scale. Various measurements (length, width and weight) of the right and left epididymis & ductus deferens were recorded properly in our experiment. The data obtained from various parameters were analyzed using Statistical package for the social science (SPSS, version 20) software and reveal the results in tabular form.

III. Results and Discussion

The anatomy of the epididymis: It was observed that the epididymis (Figure 01) of the adult Khaki Campbell duck was elongated and spindle in shape. It was located on the dorsomedial border of the testis (Figure 01). It extended from the cranial extremity to the caudal extremity of the testis and continued caudally as ductus deferens. The anterior part of the epididymis was closely associated with the adrenal gland and it was particularly extensive for left epididymis. It coincided with the observations of Gray (1937), Lake (1957), Ghosh (2006) and Dyc et al. (2009) in domestic fowl, Saleem et al. (2017) in adult Uttarakhand fowl. In epididymis head, body and tail was absent. It supported the observations of Lake (1957) in domestic fowl and Saleem et al. (2017) in adult Uttarakhand fowl. In adult birds, the average values of length, width and weight of left epididymis were recorded as 4.58 ± 0.03 cm, 1.33 ± 0.03 cm, 1.73 ± 0.02 gm respectively and right epididymis were recorded as 4.37 ± 0.06 cm, 1.16 ± 0.02 cm, 1.55 ± 0.06 gm respectively (Table 01). Gray (1937) reported that it is about 1 mm in diameter in eight-month old adult Leghorn cocks. Marvan (1969) reported that it is 3 to 4 mm in diameter in heavy breeds. Razi et al. (2010) reported the mean length of epididymis as 3 cm in White Rooster. The average values of length, width and weight of right epididymis were recorded as 2.63 ± 0.14 cm, 0.45 ± 0.03 cm and 0.59 ± 0.01 gm respectively and for left epididymis as 2.95 ± 0.12 cm, 0.56 ± 0.02 cm and 0.62 ± 0.01 gm respectively by Saleem et al. (2017) in adult Uttarakhand fowl.

The anatomy of the ductus deferens: The ductus deferens (Figure 02) of adult Khaki Campbell duck was convoluted and wavy in appearance. It is a very extensive, convoluted tube which runs posteriorly along the midline, parallel to the ureter. It began at the caudal end of the epididymis and extends to the cloaca parallel to the respective ureter. In the posterior abdomen, the convolutions of the each ductus deferens enlarge greatly; in the pelvis it is straight for a short distance prior to becoming sac like before ending in the cloaca by an erectile papilla which projects into the latero-ventral urodeum. It was similar to the findings of Tingari (1971) in domestic fowl, Aire (1979) in Japanese quail, Das et al. (1965) in domestic duck. In adult birds, the average length of left and right ductus deferens was 16.65 ± 0.10cm and 16.57 ± 0.13 cm respectively and the average width of left and right ductus deferens was 0.45 ± 0.01cm and 0.40± 0.03 cm respectively (Table 01). Parker (1942) reported that the undissected length of ductus deferens is about 10 cm and diameter increases progressively, reaching a maximum

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about 3.5 mm just before it enters the cloaca in white leghorn cockerels. The average length of left and right ductus deferens was recorded by Saleem et al. (2017) in adult Uttarakhand fowl as 14.64 ± 0.19 cm and 14.32 ± 0.16 cm, respectively.

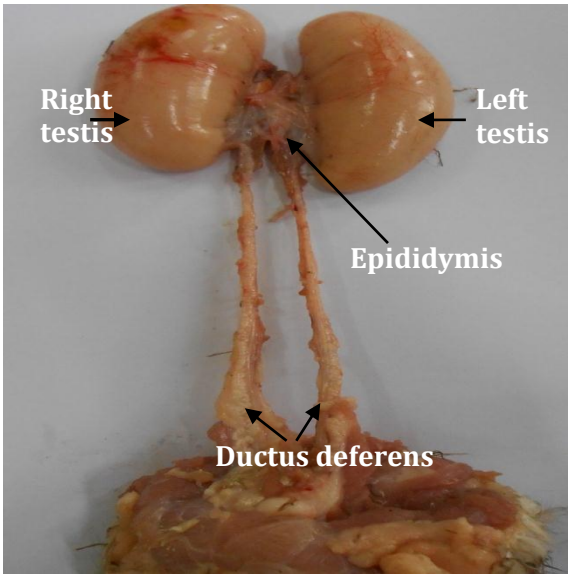

Figure 01. Epididymis of adult Khaki Campbell duck.

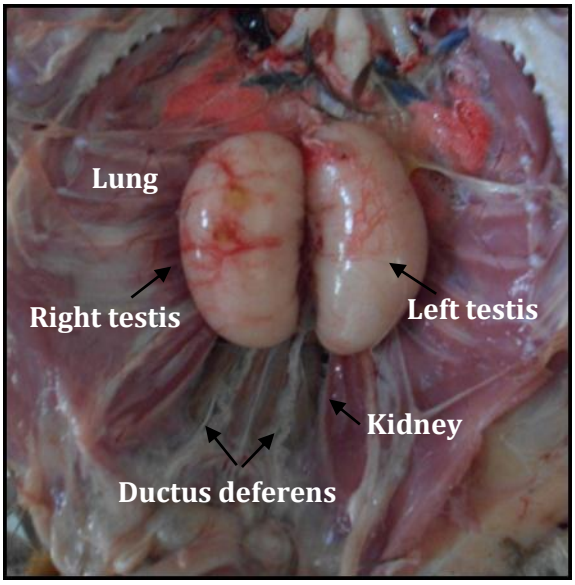

Figure 02. Ductus deferens of adult Khaki Campbell duck.

Table 01. Gross morphometrical observations of Epididymis and Ductus deferens of adult Khaki Campbell duck (Mean ± S.E)

Organs	Parameters	Left	Right
Epididymis	Weight (gm)	1.73 ± 0.02	1.55 ± 0.06
	Length (cm)	4.58 ± 0.03	4.37 ± 0.06
	Width (cm)	1.33 ± 0.03	1.16 ± 0.02
Ductus deferens	Weight	1.9± 0.19	1.81± 0.03
	Length (cm)	16.65 ± 0.10	16.57 ± 0.13
	Width (cm)	0.45 ± 0.01	0.40± 0.03

IV. Conclusion

The epididymis was located on the dorso-medial aspect of the testis in Khaki Campbell duck and was elongated and spindle in shape. The paired ductus deferens was tubular, convoluted and wavy in appearance, extending from caudal end of epididymis to the cloaca of the bird. The anatomy of the epididymis and ductus deferens of Khaki Campbell duck study was more or less similar with those of the other avian species. Although, it is a basic study but it will carry valuable information for the anatomist, poultry or duck researchers, poultry farmers, veterinarians and autonomous learners in this realm.

Conflict of interest

The authors declare that they have no conflict of interest

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