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Gross and Biometrical Studies on Male Reproductive System of Adult Local Fowl of Uttarakhand (Uttara Fowl)

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ABSTRACT

Gross and biometrical study was conducted on male reproductive system of 12 apparently healthy adult male Uttara fowl birds. The testicles were elongated bean shaped and creamy in appearance. The left testis was larger and heavier, while the right one was smaller and lighter. The epididymis was located on the dorsomedial aspect of the testis. The anterior part was closely associated with the adrenal gland and it was particularly extensive for left epididymis. The paired ductus deferens was convoluted and wavy in adult birds. It began at the caudal end of the epididymis and extends to the cloaca parallel to the respective ureter.

Key words: *Biometry, Male reproductive system, Uttara fowl*

INTRODUCTION

The indigenous fowl or poultry forms the backbone of the backyard poultry farming in hills of Uttarakhand. Uttara fowl is an indigenous fowl in the Kumaon region of Uttarakhand, is said to be descended from the Red jungle fowl. These birds thrive very well under adverse environment like poor housing, poor management and poor feeding**.** The hill fowls are unique in their adaptation to the agro- climatic conditions of their habitat[10]. The production and reproduction traits in birds are directly related to the fertility which in turn is related to the structural and functional status of the reproductive system. This entails a need to gain an insight into the reproductive system of domestic fowl. There is no literature available on the male genitalia of Uttara fowl. Therefore, this investigation is proposed to explore the gross and biometrical study of male genitalia in the indigenous breed Uttara fowl.

MATERIALS AND METHODS

The experiment was conducted on 12 apparently healthy adult male Uttara fowl birds. The birds were procured from Instructional Poultry Farm, Nagla, GBPUA&T, Pantnagar.

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After taking live body weight, birds were sacrificed as per the guidelines of SPCEA/ IAEC by severing jugular vein and common carotid artery. Gross biometrical parameters were recorded for each organ (Testis, epididymis and ductus deferens) separately with the help of Vernier Calliper and scale. Various measurements which were recorded viz. Length, width, weight and volume of right and left testis, epididymis and ductus deferens. The data obtained from various parameters was analyzed and subjected to statistical analysis[18].

RESULTS AND DISCUSSION

The testicles were located in the body cavity just caudal to the respective lungs at the cranial end of the kidneys. The findings were similar as found in white rooster by Razi *et al*[17]. They were attached to the dorsal body wall by short mesorchium (Fig. 1). It was similar to the findings of Kumaran and Turner[12] in white Plymouth rock Das *et al*[4]., in domestic duck, Bradley and Grahame[3], Nickel *et al*[15]., Johnson[9], Banerjee[2], Domm[5], Ghosh[7] and Dyce *et al*[6]., in domestic fowl. In adult birds they were elongated bean shaped and creamy in appearance**.** The left testis was larger and heavier, while the right one was smaller and lighter (Table.1). The latter observation supported the findings of Domm[5], Bradley and Grahame[3], King[11], Banerjee[2], Dyce *et al*[6]., and Ghosh[7] in domestic fowl. However, it differed from observations of Gray[8] and Lake[13] in domestic fowl.

In adult birds, the average values of length and width of right testis were recorded as 4.49 ± 0.12 cm and 2.49 ± 0.17 cm. Gray[8] and Lake[13] described the testis in adult Leghorn cocks as measuring 1.5 to 4.5 cm in length and 0.7 to 1.7 cm in width. Domm[5] and Bradley and Grahame[3] described sexually active testis as measuring 3.25 to 5.6 cm long, 1.6 to 2.9 cm wide and about 2.5 cm thick dorsoventrally in domestic fowl. King[11] (1975) reported that during the reproductive period, the testis of the cockerel is 3.5 to 6.0 cm long and 2.5 to 3.0 cm in diameter, while during quiescent period, they are 1.0 to 1.9 cm long and 1.0 to1.5 cm in diameter. Dyce *et al*[6]., reported that testicles are relatively large (5 cm long) during the breeding season while they shrink to about half that size during quiescent period in domestic fowl. Ghosh[7] reported that in matured birds the length and width was about 4 cm and 2.5 cm respectively in domestic fowl.

In adult birds, the average values of weight and volume of right testis were recorded as 14.56 ± 0.19 gm and 25.22 ± 0.36 cc respectively. Parker *et al*[16]., reported the mean weight of the two testicles together to be 19.11 gm in nine White Leghorns between 11 and 17 months old and 31 gm from heavy breed between 15 and 18 months old.

The epididymis was located on the dorsomedial aspect of the testis (Fig. 2). It extended from the cranial pole to the caudal pole 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 (Fig. 1). It coincided with the observations of Gray[8] and Lake[13] in domestic fowl. In epididymis head, body and tail was not present. It supported the observations of Lake[13] in domestic fowl.

In adult birds, the average values of length, width, weight and volume of right epididymis were recorded as 2.63 ± 0.14 cm, 0.45 ± 0.03 cm, 0.59 ± 0.01 gm and 0.72 ± 0.03cc respectively. Gray[8] reported that it is about 1 mm in diameter in eight-month old adult Leghorn cocks. Marvan[14] reported that it is 3 to 4 mm in diameter in heavy breeds.

The paired ductus deferens was convoluted and wavy in adult birds. It began at the caudal end of the epididymis and extends to the cloaca parallel to the respective ureter (Fig. 1). It corroborated the findings of Tingari[19] in domestic fowl, Aire *et al*[1]., in japenese quail.and Das *et al*[4]., in domestic duck.

In adult birds, the average width at cranial, middle and caudal regions of right ductus deferens were 0.35 ± 0.01cm, 0.41 ± 0.01cm and 0.52 ± 0.01 cm respectively. Parker[16] reported that ductus deferns undissected length is about 10 cm and diameter increases progressively, reaching a maximum about 3.5 mm just before it enters the cloaca in WLH cockerels.

Table 1: Gross morphometrical observations of Testis, Epididymis and Ductus deferens of adult Uttara fowl (Mean ± S.E)

PARAMETERS				**RIGHT**	**LEFT**
TESTIS	**Length (cm)**	4.49 ± 0.12	4.95 ± 0.12		
	Width (cm)	2.49 ± 0.17	2.68 ± 0.19		
	Weight (g)	14.56 ± 0.19	15.37 ± 0.16		
	Volume (cm^3)	25.22 ± 0.36	30.32 ± 0.24		
EPIDIDYMIS	**Length (cm)**	2.63 ± 0.14	2.95 ± 0.12		
	Width (cm)	0.45 ± 0.03	0.56 ± 0.02		
	Weight (g)	0.59 ± 0.01	0.62 ± 0.01		
	Volume (cm^3)	0.72 ± 0.03	0.73 ± 0.03		
DUCTUS DEFERENS	**Length (cm)**	14.32 ± 0.16	14.64 ± 0.19		
	Width Cranial (cm)	0.35 ± 0.01	0.38 ± 0.01		
	Width Middle (cm)	0.41 ± 0.01	0.45 ± 0.01		
	Width Caudal (cm)	0.52 ± 0.01	0.54 ± 0.01		
	Weight (g)	1.48 ± 0.11	1.49 ± 0.11		
	Volume (cm^3)	1.50 ± 0.11	1.83 ± 0.25		

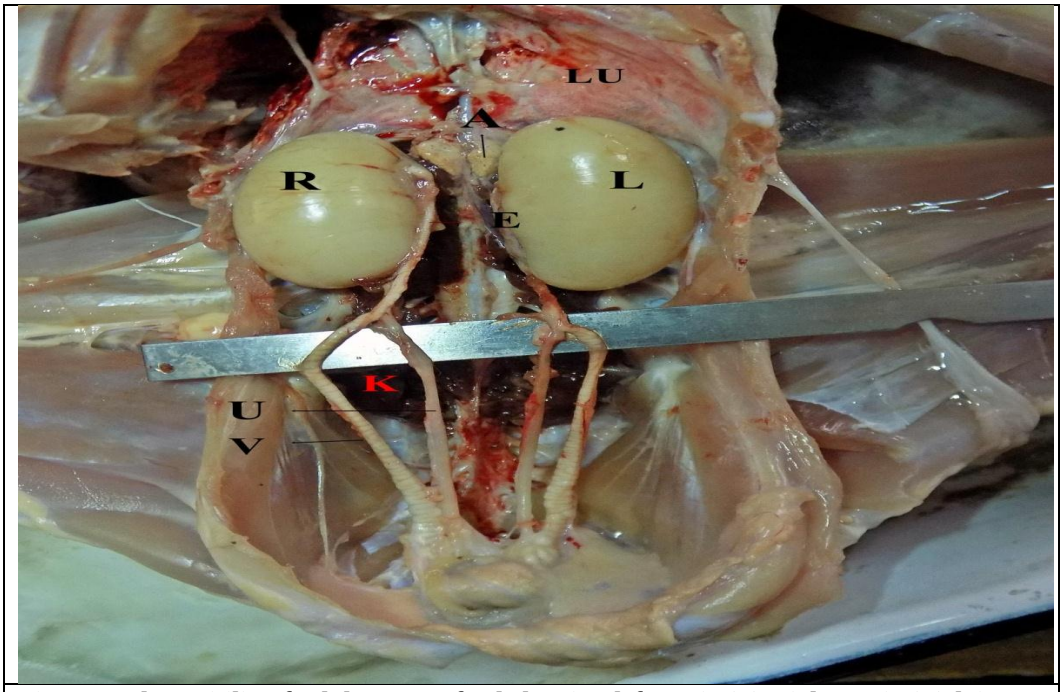

Fig. 1: Male genitilia of adult Uttara fowl showing left testis (L), right testis (R) lying at caudal aspect of lungs (LU) and cranial aspect of kidneys (K), epididymis (E) lies in close association with the adrenal gland (A), paired ductus deferens (V) runs parallel to the respective ureter (U).

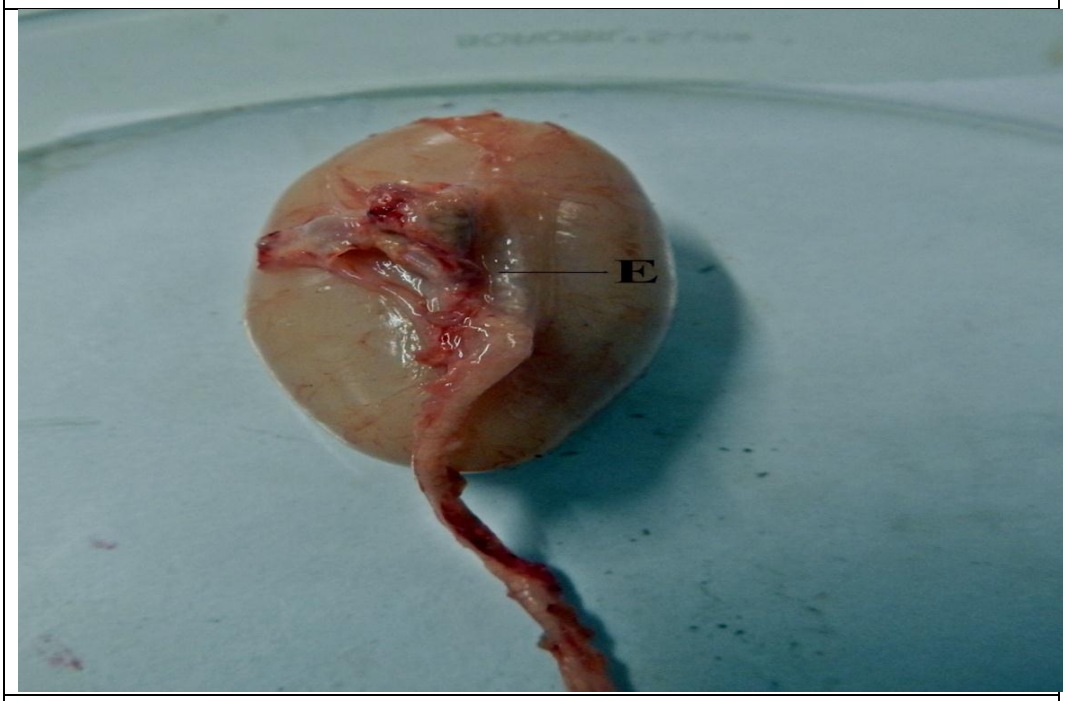

Fig. 2: Epididymis (E) located on the dorsomedial aspect of the testis of adult Uttara fowl

CONCLUSION

The testis of the bird was intra-abdominal, located in the body cavity just caudal to the respective lungs at the cranial end of the kidneys. The left testicle of adult Uttara fowl was found larger and heavier as compared to the right one. The epididymis was located on the dorsomedial aspect of the testis. In epididymis head, body and tail were not demarcated. The paired ductus deferens were tubular, convoluted and wavy in appearance, extending from caudal end of epididymis to

the cloaca. The average width increased from cranial to caudal end in each ductus deferens. The phallus was rudimentary.

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