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Research Article

Gross Morphological Studies on Male Reproductive System of Aseel and Vanaraja Breeds of Poultry

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ABSTRACT

Aseel and Vanaraja are dual purpose breeds of poultry, used by the Department of Animal Husbandry (C.G.) to improve the livelihood of tribal peoples. Reproductive system plays an important role in productivity, so to explore the gross morphology of male reproductive system, present investigation was undertaken. The experiment was conducted on forty apparently healthy birds belonging to two different age groups viz. group 1 (grower) and group 2 (adult). Body weight was significantly higher in growers and adults of Vanaraja. Weight, volume, length, width and percentage contribution to body weight of testis, epididymis and ductus deferens were significantly higher in growers and adults of Vanaraja than Aseel.

Key words: *Gross morphology, Aseel, Vanaraja, Testis, Epididymis, Ductus deferens*

INTRODUCTION

Poultry industry provides supplementary income and employment as well as nutritional security to a large number of poor and small farmers in developing countries of Asia[4]. Aseel breed is domesticated mostly by tribal people for cock fighting which forms an integral heritage of southern part of Bastar district of Chhattisgarh and adjoining parts of Andhra Pradesh which are cores of breeding tract of this breed. Vanaraja crossbreed has been evolved at ICAR Project Directorate on Poultry, Hyderabad. Vanaraja is crossbreed of White Cornish and synthetic broiler breeds of poultry. Vanaraja has attractive feather pattern, better survivability, low cost of rearing and high disease tolerance. It produces 1.6 kg meat in 8 weeks and 55-65 eggs in 200 days. There is no literature available on gross anatomy of male genitalia in Aseel and Vanaraja breeds of poultry. Therefore, the present study was undertaken to elucidate the morphological details in relation to age of birds.

The experiment was conducted on 40 apparently healthy male birds belonging to two different age groups of Aseel and Vanaraja poultry. The birds were procured from Government Poultry Farm, Jagdalpur and Durg (C.G.).

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Based on age, these birds were divided into two groups (grower and adult). Each group was having 20 birds (10 Aseel and 10 Vanaraja). After taking live body weight, birds of specified age groups were sacrificed by cutting jugular vein and common carotid artery. Thereafter following parameters were recorded as: length, width, weight and volume of testis, epididymis and ductus deferens. The data obtained from various parameters was analyzed and subjected to independent mean 't' test[5].

Male reproductive system of the fowl consisted of the testis, epididymis, ductus deferens and the copulatory apparatus. The testis, epididymis and ductus deferens formed the major part of the reproductive system and were studied under the gross morphology.

The testicles were located in the body cavity just caudal to the respective lungs at the cranial end of the kidneys. They were attached to the dorsal body wall by short mesorchium. In grower birds, the testicles were roughly oval in Aseel and bean shaped in Vanaraja, whereas in adult birds they were elongated bean shaped in Aseel and elongated oval shaped in Vanaraja, respectively (fig. 1, 2). It confirmed the findings of Das *et al.*[1]. In two cases of adults of Vanaraja, an accessory testis was observed behind the caudal extremity of the left testis (fig. 1).

The observations showed that the length, maximum and minimum width of right and left testicles of Aseel and Vanaraja, were significantly higher in adults than growers. There were no differences in right and left testicles. Similarly the length, maximum and minimum width of right and left testicles were significantly lower in growers and adults of Aseel than Vanaraja. In growers, the average values of length, maximum width and minimum width of right testis were recorded as 1.43 ± 0.1 cm, 0.8 ± 0.08 cm and 0.09 ± 0.08 cm in Aseel and 2.64 ± 0.21 cm, 1.32 ± 0.07 cm and 1.22 ± 0.07 cm in Vanaraja, respectively. In adult age groups, the average values of length, maximum width and minimum width of right testis were recorded as 3.68 ± 0.14 cm, 1.91 ± 0.09 cm and 1.71 ± 0.09 cm in Aseel and 4.49 ± 0.19 cm, 2.48 ± 0.05 cm and 2.28 ± 0.05 cm in Vanaraja, respectively.

King[3] reported that during the reproductive period, the testis of the cockerel were 3.5 to 6.0 cm long and 2.5 to 3.0 cm in diameter, while during quiescent period, they were 1.0 to 1.9 cm long and 1.0 to1.5 cm in diameter. The testicular morphometry was mostly in accordance to earlier reports of King[3]. The minor differences may be attributed to age, stage of reproductive cycle and reproductive efficiency of the breed of the birds. As the testicles was larger in breeding season than in quiescent stage.

The findings showed that the weight, volume and percentage contribution to body weight of right and left testicles of Aseel and Vanaraja, were significantly higher in adults than growers. They were significantly higher in left testis than right. The weight, volume and percentage contribution to body weight of right and left testicles were significantly lower in growers and adults of Aseel than Vanaraja. In growers, the average values of weight, volume and percentage contribution to body weight of right testis were recorded as 0.93 ± 0.15 gm, 1 ± 0.08 cc and 0.067 ± 0.0034 % in Aseel and 2.96 ± 0.32 gm, 4.3 ± 0.15 cc and 0.148 ± 0.0074 % in Vanaraja and of left testis 1.13 ± 0.20 gm, 1.1 ± 0.11 cc and 0.09 ± 0.0045 % in Aseel and 3.4 ± 0.33 gm, 5.25 ± 0.42 cc and 0.17 ± 0.0085 % in Vanaraja, respectively. In adult age groups, the average values of weight, volume and percentage contribution to body weight of right testis were recorded as 7.18 ± 0.56 gm, 12.7 ± 1.3 cc and 0.33 ± 0.01 % in Aseel and 14.69 ± 1.12 gm, 24.1 ± 1.96 cc and 0.49 ± 0.02 % in Vanaraja and left testis consisted 8.32 ± 0.61 gm, 13.86 ± 2.33 cc and 0.382 ± 0.01 % in Aseel and 15.67 ± 1.11 gm, 30.7 ± 3.36 cc and 0.523 ± 0.02 % in Vanaraja, respectively. Das *et al.*[1], reported the weight of the testicles in chicken constituted about 1 percent of the total body weight. The heavy breeds being appreciably larger testis than White Leghorns. The difference in the weight and percentage contribution to body weight mostly pertains to

age of the birds. In sexually mature birds these parameters would be certainly higher.

The epididymis was located on the dorsomedial aspect of the testis. It was a spindle shaped flattened enlargement in adult birds, whereas it was thread like in grower birds. 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, 2). In epididymis, head, body and tail were not present, which supported the observation of Hess *et al.*[2].

According the observations, the length, width, weight, volume and percentage contribution to body weight of right and left epididymis of Aseel and Vanaraja, were significantly higher in adults than growers. There were no differences in right and left epididymis. The length, width, weight, volume and percentage contribution to body weight of right and left epididymis were significantly lower in growers and adults of Aseel than Vanaraja. Vanaraja approaches to sexual maturity earlier than Aseel. In growers, the average values of length, width, weight, volume and percentage contribution to body weight of right epididymis were recorded as 0.4 ± 0.03 cm, 0.13 ± 0.02 cm, 0.1 ± 0.01 gm, 0.2 ± 0.02 cc, 0.01 ± 0.0006 % in Aseel and 1.52 ± 0.08 cm, 0.2 ± 0.02 cm, 0.17 ± 0.01 gm, 0.31 ± 0.02 cc and 0.015 ± 0.0008 % in Vanaraja, respectively. In adult age groups, the average values of length, width, weight, volume and percentage contribution to body weight of right epididymis were recorded as 1.9 ± 0.08 cm, 0.36 ± 0.02 cm, 0.5 ± 0.02 gm, 0.6 ± 0.08 cc and 0.023 ± 0.001 % in Aseel and 2.87 ± 0.15 cm, 0.44 ± 0.03 cm, 0.6 ± 0.02 gm, 0.71 ± 0.08 cc and 0.024 ± 0.001 % in Vanaraja, repectively. Hess *et al.*[2], reported that it was 3 to 4 mm in diameter in heavy breeds. The epididymalmorphometry of adults of Vanaraja was mostly in accordance to earlier report.

The paired ductus deferens was convoluted, sinuous and wavy in adult birds, whereas it was less convoluted in grower birds. It began at the caudal end of the epididymis and extends to the cloaca parallel to the respective ureter (fig. 1, 2). It corroborated the findings of Das *et al.*[1]. It had a narrow straight portion before forming a barrel shaped enlargement, which corresponds to pars recta. The receptacle continued through the wall of the urodeum as an ejaculatory duct, which terminated into the urodeum by means of a conical papilla. These findings supported the observations of Hess *et al.*[2].

The length, width, weight, volume and percentage contribution to body weight of right and left ductus deferens of Aseel and Vanaraja were significantly higher in adults than growers. There were no differences in right and left ductus deferens. The length, width, weight, volume and percentage contribution to body weight of right and left ductus deferens were significantly lower in growers and adults of Aseel than Vanaraja. Aseel reaches to sexual maturity slower as compared to Vanaraja. In growers, the average values of length, width at cranial, middle and caudal region, weight, volume and percentage contribution to body weight of right ductus deferens were recorded as 10.04 ± 0.37 cm, 0.10 ± 0.01 cm, 0.15 ± 0.01 cm, 0.19 ± 0.01 cm, 0.54 ± 0.02 gm, 0.6 ± 0.01 cc and 0.04 ± 0.002 % in Aseel and 12 ± 0.02 cm, 0.14 ± 0.01 cm, 0.19 ± 0.02 cm, 0.26 ± 0.03 cm, 0.83 ± 0.03 gm, 0.9 ± 0.08 cc and 0.043 ± 0.002 % in Vanaraja, respectively. In adult age groups, the average values of length, width at cranial, middle and caudal region, weight, volume and percentage contribution to body weight of right ductus deferens were recorded as 13.02 ± 0.36 cm, 0.29 ± 0.02 cm, 0.34 ± 0.02 cm, 0.4 ± 0.02 cm, 1.02 ± 0.06 gm, 1.1 ± 0.07 cc and 0.046 ± 0.002 % in Aseel and 14.15 ± 0.22 cm, 0.34 ± 0.01 cm, 0.42 ± 0.01 cm, 0.51 ± 0.02 cm, 1.42 ± 0.04 gm, 1.45 ± 0.12 cc and 0.047 ± 0.002 % in Vanaraja, respectively. Hess *et al.*[2], reported its undissected length as 10 cm and diameter progressively, reaching a maximum about 3.5 mm just before it enters the cloaca. The latter records almost matched with present findings. Overall the male reproductive system of Vanaraja is better than Aseel breed of poultry.

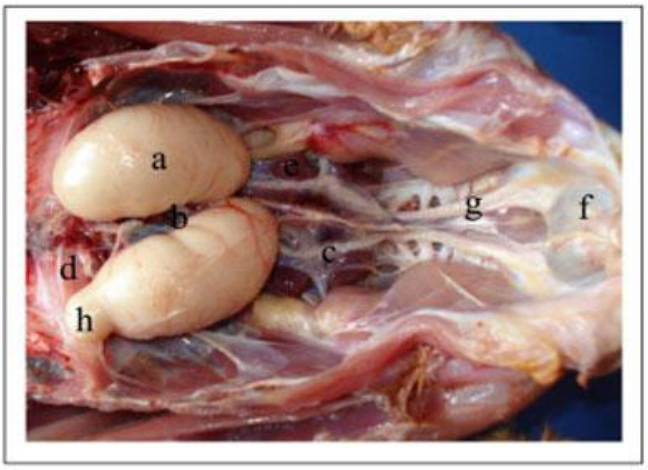

Fig.1: Photograph of Vanaraja of group 2 showing male genital tract (insitu). a. testis, b. epididymis, c. ductus deferens, d. lung, e. kidney, f. cloaca, g. ureter, h. accessory testis

Fig.2: Photograph of Aseel of group 1 showing male genital tract. a. testis, b. epididymis, c. ductus deferens

REFERENCES

1. Das, L.N., Mishra, D.B. and Biswal, G., Comparative anatomy of the domestic duck (Anasboscas).*Indian Veterinary Journal*, **42:** 320-326 (1965).
2. Hess, R.A., Thurston, R.J. and Biellier, H.V., Morphology of the epidiymal region and ductus deferens of the turkey.*Journal of Anatomy*, **122:** 241-252 (1976).
3. King, A.S., "Aves urogenital system".Chapter 65 in Sisson and Grossman's." The Anatomy of the domestic animals". ed. Robert Getty 5thedn. Vol.**II**. The Macmillan Co. of India Ltd., Delhi. (1975).
4. Sathe, B.S., Emerging structure of poultry production livelihood implication for poor farmers in Asia.Mitcon, Pune. pp. 270-299 (2002).
5. Snedecor, G.W. and Cochran, W.G., Statistical methods.6thedn, pp. 557.Oxford and I B H Publishing Co. Bombay. (1967).