HAEMATOLOGICAL AND BIOCHEMICAL CHARACTERISTICS OF YOUNG AND ADULT NATIVE DUCKS OF KERALA

The growing importance of duck industry in India, the large duck population in Kerala and the dearth of information on the local breeds of duck (Chara and Chemballi) prompted the present investigation. Haematobiochemical status is a major component of internal environment determining proper growth, health and productivity of any living being. Information on these aspects could help scientists and management experts to draw out better practices to improve the duck industry. The present study is to investigate the variations in certain normal haematological and biochemical parameters in young and adult drakes of indigenous breeds of Kerala.

Indigenous ducks, *Anas platyrhynchos domesticus* (Chara and Chemballi) reared under caged system of management in the University Poultry Farm, with free access to *ad libitum* water and fed with standard ration as per NRC (1998) recommendation formed the study groups. Ten apparently healthy 20 week old drakes belonging to both Chara and Chemballi, constituted the group designated as young drakes and same number of 32 week old ducks constituted the group designated as adult drakes.

Blood samples were collected from wing vein between 9 a.m. and 10 a.m. in heparinised syringes and adequate samples were immediately subjected to haematological investigations. The rest of the samples were centrifuged at 3000 rpm for 15 min. The separated out plasma was aspirated and stored in labelled vials at -20°C for the analysis of biochemical parameters. The total erythrocyte count (TEC) and leucocyte count (TLC) were determined as per the method described by Sastry (1989). The plasma protein profile (Biuret method, Sastry, 1989), urea (Diacetyl Monoxime method, Gowlenlock, 1988), and cholesterol (Wotton, 1964) were also determined. The ALT and AST were determined by U-V kinetic method (Bergmeyer, 1974). The concentrations of plasma calcium and magnesium were estimated by AAS (Perkin Elmer Model 1330). Paired students t-test (Snedecor and Cochran, 1994) was used to analyse the significant differences between the two groups.

The haematological and biochemical values of the parameters in young and adult drakes are presented in Table. The TEC was significantly ($P<0.05$) higher in adult drakes than in young ones. Factors like age, breed, nutritional status, excitement, environment and muscular activity influence TEC (Sreekumar *et al.*, 2002). The values were similar to that reported by Sreeram *et al.* (1979) in ducks. Newly hatched ducklings had a low TEC, which progressively increased in one and three months of age (Surendranathan *et al.*, 1968). Deshmukh and Suryavanshi (1982) reported that administration of testosterone in male quails resulted in increased TEC due to erythropoietic effect. The higher TEC in adult drakes could be due to the increased levels of androgens than young ones. Stress, diseases and breeds are some of the factors that influence the TEC (Swenson and Reece, 1996). No significant differences in the TEC could be observed between ducklings and adult native ducks by Surendranathan *et al.* (1968). But in the present study a numerically higher TLC was observed in adult drakes compared to young ones and that could be due to the improved immune responses in them.

Though the total proteins, albumin and A: G were significantly ($P<0.05$) higher in young ones, the globulin content was significantly ($P<0.05$) higher in adult drakes. Age related increase in total proteins was observed in White Leghorn chicken (Verma *et al.*, 1975) but such a trend was not observed in the

present study. Surendranathan *et al.* (1967) had reported that albumin and globulin levels in ducks are almost equal. This is contrary to the present results, where albumin content was numerically higher than globulin in both the groups. Olayemi *et al.* (2002) reported that the plasma urea content between young and adult Nigerian ducks did not reveal any significant difference. The native ducks of Kerala also exhibited a similar trend. The level of blood cholesterol was reported to increase with age in chickens and quails (Joshi *et al.*, 1992 and Girish Kumar *et al.*, 2000). In the present investigation, the cholesterol content was numerically higher in adult drakes and was lesser than the values of Surendranathan *et al.* (1967) and this could be attributed to the differences in the age and strains of ducks used for the study. The productivity and vitality of animals and birds are conditioned to a considerable degree by enzymatic factors, which control the metabolic direction and rate at the level of the cell (Jagmohan and Sharma,1987). The results revealed that adult drakes have significantly ($p<0.05$) higher ALT and AST activity than young ones. The concentration of major elements (calcium and magnesium) did not reveal any significant difference between the two age groups and were similar to the levels reported in ducks (Joshi *et al.*, 1992; Surendranathan *et al.*, 1967)

Summary

Haematobiochemical studies on young and adult Chara and Chemballi drakes of Kerala revealed that adults have significantly ($P<0.05$) higher TEC, globulin, ALT and AST levels and that total proteins, albumin and A: G were significantly ($P<0.05$) higher in young ones. Though calcium, magnesium and urea were numerically similar in the groups, the level of cholesterol and TLC were numerically higher in adult drakes than the young ones.

Table. Blood values in young and adult drakes (Mean ± SE, n=10)

Sl. No	Parameters	Young	Adult
1	TEC (millions/µl)	3.15 ±0.05	3.43 ±0.05**
2	TLC (thousands/ µl)	17.80 ± 0.85	25.80 ± 0.77
3	Total proteins (g%)	4.16 ± 0.20	3.60 ± 0.09*
4	Albumin (g%)	2.67 ± 0.09	2.42 ± 0.10*
5	Globulin (g%)	1.06 ± 0.11	1.61 ± 0.18*
6	A:G	2.73 ± 0.36	1.64 ± 0.20**
7	Urea (mg%)	24.89 ± 0.21	24.61 ± 0.18
8	Cholesterol (mg%)	118.72 ± 6.19	142.99 ± 4.4
9	ALT (U/L)	16.20 ± 0.78	21.00 ± 1.03**
10	AST (U/L)	32.50 ± 1.03	36.90 ± 1.59**
11	Magnesium (mg%)	1.14 ± 0.11	1.24 ± 0.12
12	Calcium (mg%)	11.85 ± 0.49	11.65 ± 0.29

*(P<0.05) **(P<0.01)

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