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Some observations on plasma alkaline phosphatase in Guinea fowl

S.K. PAL AND HARPREET SINGH

Central Avian Research Institute, Izatnagar - 243 122 UP

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ABSTRACT

Population distribution of alkaline phosphatase activity in guinea fowl showed three distinct peaks. Highest enzyme activity was identified as hatch. Electrophoresis in agar gel showed discrete heterogeneity and existence of rare variants.

Contains 1 table and 3 fig.

Key words : Alkaline phosphatase, guinea fowl

Inheritance of plasma alkaline phosphatase; variations and its associations with traits of economic importance in indigenous guinea fowl germplasm was recently reported by Pal and Singh (1996). This article presents some further observations on electrophoretic and quantitative variations of this enzyme. Plasma samples from pedigreed 'Guncari' guinea fowl being maintained at this Institute were subjected to agarose-gel and starch-gel electrophoresis as per method of Ogita (1962) and Tamaki and Tanabe (1970), respectively. Quantitation of enzyme activity levels was estimated (Pal and Singh, 1996).

High plasma alkaline phosphatase activity at hatch revealed a declining trend among keets and growers of both sexes but females at the onset of sexual maturity revealed a subsequent increase (Fig. 1). Enzyme activity differences due to sex were significant as reported earlier also by Ukoha *et al.* (1988) and Savova and Kirev (1992). Population distribution pattern of the enzyme activity revealed three peaks (Fig. 2).

Although no heterogeneity was detected during starch-gel electrophoresis as reported by Ukoha *et al.* (1988); but serum alkaline phosphatase electrophoresis in agarose-gel revealed two discrete heterogeneity zones (Fig. 3). Two phenotypes were detected in zone-1. Most predominant slow type (S-type) was characterised by presence of a slow moving major component while the rare fast type (F- type) revealed an extera minor faster moving band. The more annodal zone-II showed two discrete bands in three phenotypic combinations viz., F, FS and S. The allelic their frequences for two systems is presented in Table 1. Inheritance investigations of rare variants involve inherent difficulties in guinea fowl due to its longer generation interval.

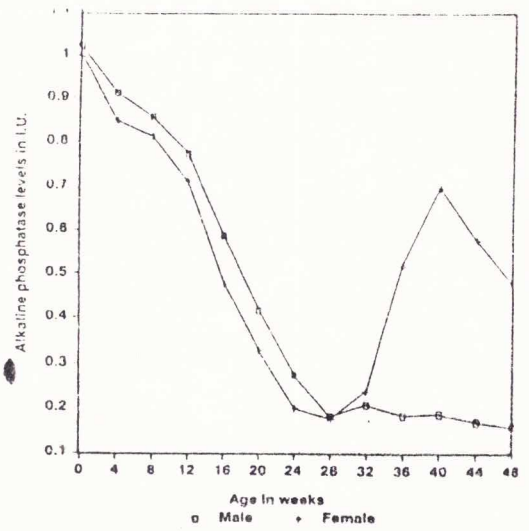

Fig. 1 Plasma alkaline Phosphatase levels in relation to age.

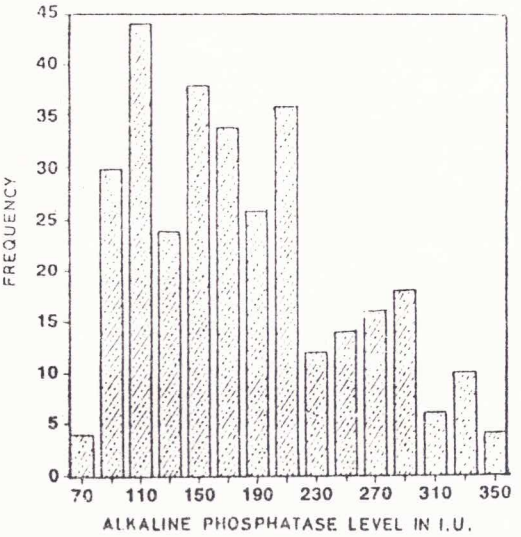

FIG.2. POPULATION DISTRIBUTION OF ALKALINE PHOSPHATASE ACTIVITY LEVELS IN GUINEAFOWL (26 WEEKS)

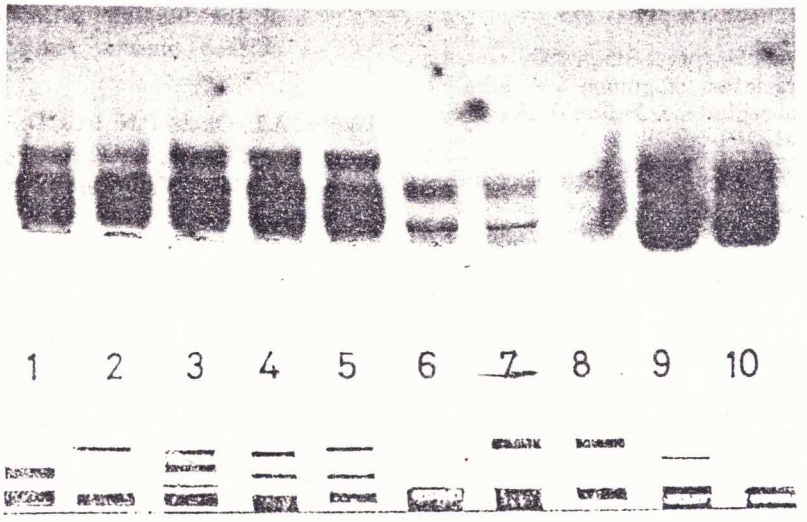

Fig.3 Plasma alkaline phosphatase zymogram and a diagramatic representation of electrophoretic variations : Guinea fowl 1-5, Chicken 5-8, Numigall 9-10

Lane	:	1	2	3	4	5	6	7	8	9	10
Zone I	:	S	F	FS	FS	FS	-	-	-	-	-
Zone II	:	S	S	FS	S	S	S	FS	-	-	-

Table 1. Allelic frequencies for alkaline phosphatase enzyme systems in guinea fowl

Genetic groups	Alkaline phosphatase-I			Alkaline phosphatase-II		
Guncari varieties :	No.	Akp^5	Akp^F	No.	Akp^5	Akp^F
Pearl	42	0.976	0.023	42	0.892	0.108
Lavender	18	1.000	—	18	0.944	0.056
White	32	1.000	—	32	0.906	0.094
Overall	92	0.990	0.010	92	0.972	0.028
Unselected pop.	78	0.975	0.025	78	0.897	0.103

Possibly, in guinea fowl also there exist a single gene control similar to that of domestic fowl and Japanese quails where polymorphism for alkaline phosphatase electrophoretic isozymes has been reported (Tamaki and Tanabe, 1970)

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