ENZYME COMPOSITION OF BUFFALO SEMINAL PLASMA

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The preservation quality of buffalo semen is poor. The possibility that the cause is inherent in the enzyme system of the spermatozoa and seminal plasma has not so far been systematically studied. There are a few reports on acid and alkaline phosphatase (Eapen, Shrivastava & RazaNasir, 1946; Roy, Pandey & Rawat, 1960; Sengupta, Misra & Roy, 1963; Misra, Singh & Tomar, 1969), but no reports appear to be available on the normal activity of glutamic-oxaloacetic transaminase (GOT), glutamic-pyruvic transaminase (GPT), lactic dehydrogenase (LDH) and aldolase in buffalo seminal plasma. Most of the enzymes, the activities of which have been estimated in seminal plasma, are also to be found in spermatozoa and there is a considerable possibility of 'leakage' of some of the intracellular enzymes, e.g. LDH and GOT. We have attempted to study this problem in connection with the distribution of aldolase (Chauhan & Srivastava, 1973). The present communication deals with the normal values of the enzymes quoted above in buffalo seminal plasma.

The semen samples were obtained from six buffalo bulls. The seminal plasma was obtained by centrifugation of semen at 7000 *g* at 4° C for 10 min in a refrigerated centrifuge. The time lapse between collection and assay of samples was not more than 1 hr.

Alkaline and acid phosphatase levels were measured by the method of Bodansky (1932) in order to be able to compare these levels with other comparable data for buffaloes expressed in the same units. The activities of GOT and GPT were estimated by the procedure outlined by Yatzidis (1960). Values for LDH and aldolase were measured by the methods of Berger & Broida (1969) and Sibley & Lehninger (1971), respectively.

The normal activity levels of the enzymes in buffalo seminal plasma are presented in Table 1. The activities of acid and alkaline phosphatase were comparable to those reported by other workers. Lactic dehydrogenase activity was similar to that reported for bull seminal plasma (Stallcup & Hayden, 1960; Roussel & Stallcup, 1965a). Aldolase activity was less than that in bull seminal plasma (Roussel, Beatty, Pinero & Patrick, 1970). The values for transaminase could not be compared because the methods of estimation and units differed from those reported by other workers for bull seminal plasma. The GOT/GPT ratio of 5:1 in buffalo seminal plasma recorded in this study is

much narrower than that (42:1) reported for bull seminal plasma by Flipse (1960) or that (19:1) reported by Roussel & Stallcup (1965b). The values obtained by these authors suggest that GOT/GPT ratios in bull seminal plasma are highly variable.

Table 1. Levels of enzymatic constituents in buffalo seminal plasma

Enzymes	Mean activity $\pm$ S.E.
Alkaline phosphatase (BU/100 ml)	315.31 $\pm$ 22.66 (54)
Acid phosphatase (BU/100 ml)	312.50 $\pm$ 24.04 (54)
Glutamic-oxaloacetic transaminase (units*/ml)	166.72 $\pm$ 14.08 (54)
Glutamic-pyruvic transaminase (units*/ml)	34.56 $\pm$ 4.57 (46)
Lactic dehydrogenase (BBU/ml)	1671.50 $\pm$ 113.11 (20)
Aldolase (SLU/ml)	70.31 $\pm$ 27.79 (7)

The figures in parentheses indicate the numbers of samples from six buffalo bulls. BU = Bodansky units; BBU = Berger-Broida units; SLU = Sibley-Lehninger units.

* One unit is the amount of activity of seminal plasma that results in the formation of 1 μ g of pyruvate.

The phosphatase showed a highly significant difference ($P < 0.01$) between buffalo bulls. There were no significant variations between buffalo bulls in the case of transaminases and lactic dehydrogenase.

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