

LEVELS OF CONGLUTININ AND IMMUNOCONGLUTININ IN THE SERA OF APPARENTLY HEALTHY BUFFALOES*

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Conglutinating factors was described in buffalo serum by Kujungiev (1943). Coombs *et al.* (1961) as well as Le Page and Coombs (1964) have described its presence in a number of African ruminants (Lachmann and Coombs, 1965). The conglutinating activity in the serum of Indian buffaloes was described by Mittal and Jaiswal (1973) Maurya *et al.* (1977). Both conglutinin (K) and immunoconglutinin (IK) was described by the above workers and major portion of activity was ascribed to K. Except the above cited limited studies, there is no information, on the levels of K and IK in the sera of apparently healthy buffaloes in India, as well as regarding the fluctuations in the levels of K and IK due to age, sex and climate. Hence the present paper records the results of the study in this direction.

Materials and Methods

Sera samples:

Blood samples were collected for getting sera samples from apparently healthy buffaloes slaughtered at the local abattoir at Bareilly, by jugular venipuncture into sterile tubes. After allowing the blood samples to clot, serum was separated in the laboratory by centrifugation and stored at -20°C until use. Before use, the sera samples were heat inactivated at 56°C for 30 minutes in a water bath and absorbed with ten percent sheep erythrocytes at 37°C for 30 minutes in a water bath. After absorption, the samples were centrifuged and the clear supernatant was taken as the diluted sample for the titration of K and IK.

Titration of K and IK:

The resuspension technique of Coombs *et al.* (1961) was followed for titration and the procedure of Bienenstock and Bloch (1966) was

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followed for differentiation of activities due to K and IK. The procedures are described in detail elsewhere (Bhatnagar *et al.* 1987).

Results

The results are presented in the table. In general conglutinin (K) was recorded only in 13.8% of the 246 samples tested with a mean titre of 3.62 ± 0.93 . In adult buffaloes the level of K was significantly higher ($P < 0.01$) as compared to buffalo calves. Adult male buffaloes recorded a lower level of K as against adult female buffaloes ($P < 0.05$). The level of K differed significantly in the three seasons studied. Highest titre was recorded in summer, followed by rainy season with least titre in winter.

In respect of immunoconglutinin (IK) an overall mean titre of 58.81 ± 5.56 was recorded in 84.9 per cent of the 246 sera samples tested. Like K, a significantly higher titre of IK was recorded in adult buffaloes as compared to buffalo calves ($P < 0.05$). Difference due to sex was not statistically significant ($P > 0.05$) though female buffaloes registered a higher titre. The level of IK was significantly lower in summer as compared to winter or rainy season which did not differ significantly between them.

Major activity of the conglutination was found to be due to IK.

Discussion

In the present study both K and IK could be detected in the sera samples of buffaloes with a major portion of conglutinating activity being due to IK. But Mittal and Jaiswal (1973) as well as Maurya *et al.* (1977) reported a higher K level than IK level. This difference could be due to a number of factors such as variations in season, sex, age and possibly differences in immunological status of the individual subject examined. IK level in buffaloes was found to be higher than those recorded in cattle (Bhatnagar *et al.* 1987). Presence of conglutinating factor in buffalo sera samples confirms the findings of Kujumgiev (1943). Detection of both K and IK in the sera of buffaloes confirms the findings of Mittal and Jaiswal (1973) and Maurya *et al.* (1977).

Detection of higher K and IK level in adult subjects as compared to buffalo calves confirms the findings of Maurya (1973). Similar findings have been reported by Kakoma and Kinuanjui (1974) in respect of cattle.

The levels of K and IK were found to be higher in adult female buffaloes as compared to adult males. In respect of K this difference was found to be significant ($P < 0.05$). The findings confirmed the results of Maurya (1973).

Table I
Levels of conglutinin and immunoconglutinin in the sera of apparently healthy buffaloes

Subjects	No. of samples tested	K		IK	
		No. Positive +	Mean \pm S.E.	No. Positive +	Mean \pm S.E.
Buffaloes	246	34(13.8)	3.62 \pm 0.92	209(84.9)	58.81 \pm 5.56
Buffalo calves	37	4(10.8)	3.24 \pm 2.22 ¹	34(91.9)	35.94 \pm 6.71 ^a
Adult Buffaloes	74	30(40.5)	7.70 \pm 1.98 ²	54(72.9)	46.41 \pm 12.45 ^b
Adult male	37	15(40.5)	5.27 \pm 1.45 ^a	25(67.6)	37.43 \pm 7.19 ^a
Adult female	37	15(40.5)	10.13 \pm 3.67 ^b	29(78.4)	55.40 \pm 23.92 ^a
Buffaloes in winter	50	1(2)	0.8 \pm 0.8 ^a	49(98.0)	79.30 \pm 15.66 ^a
Buffaloes in summer	50	17(34)	10.4 \pm 4.08 ^b	36(72.0)	49.30 \pm 14.43 ^b
Buffaloes in rainy season	50	6(12)	4.80 \pm 2.32 ^c	49(98.0)	78.2 \pm 7.94 ^a

* Figures with different superscripts indicate significant difference.

+ Figures in parantheses indicate the per cent positive.

There is no literature on the effect of season on the levels of K and IK in buffaloes. In the present study, K was found to be highest in summer followed by rainy season and least in winter. In respect of IK, peak levels were found in winter and rainy seasons as compared to summer. Although a seasonal variation in the level of conglutinating activity in normal cattle was described by Ingram and Barnum (1965), they observed the highest activity in late summer and lowest activity in winter. Rice (1968) had also reported a drop in conglutinin titre in cattle in late winter and early spring. The present group of workers (Bhatnagar *et al.* 1987) recorded highest titre of K in rainy season followed by summer and winter and highest level of IK in winter followed by rainy season and summer in cattle. The present work exemplifying the seasonal differences confirms the hypothesis of Mittal and Jaiswal (1973), in this regard. The climatic difference could be due to the effect of nutrition, hours of daylight and other environmental factors. This area requires further in-depth studies.

Summary

Levels of conglutinin and immunoconglutinin in the sera of apparently healthy buffaloes were recorded. In general, the level of K was much less as compared to the level of IK.

In respect of K, adults possessed significantly higher levels than buffalo calves. Female buffaloes registered a significantly higher level than male buffaloes. The level of K was maximum in summer followed by rainy season and negligible in winter.

In respect of IK, adults possessed significantly higher levels than buffalo calves. Females had only a marginally higher IK than males. IK level was maximum in winter and rainy season followed by summer.

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