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PRECIPITATING ANTIBODY IN SERA OF GOATS NATURALLY AFFECTED WITH PESTE DES PETITS RUMINANTS

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SUMMARY

Precipitating antibody was detected in sera of goats naturally affected with peste des petits ruminants in three locations in Western Nigeria. It was necessary to decomplement sera to obtain a good result.

INTRODUCTION

The diagnosis of peste des petits ruminants (PPR) in Nigeria is usually done by means of clinical and post-mortem examinations of affected sheep and goats. Virus isolation and serological examination are used to confirm a tentative diagnosis (Taylor and Abegunde, 1979) but the laboratory techniques presently in use are not easily applicable in most veterinary clinics and laboratories. There is therefore a need to devise simpler methods of laboratory diagnosis.

This report highlights the usefulness of the agar gel double diffusion test in the detection of PPR antibody in the sera of affected goats.

MATERIALS AND METHODS

PPR outbreaks occurred at Idi-Iroko, Fasola and Oyo between June and September 1979. Clinical signs observed included fever, oculo-nasal discharges, diarrhoea, pneumonia and stomatitis. In the Fasola outbreak 12 of the 19 goats kept in the herd died. Serum samples were obtained from the remaining 5 goats 19 days after the last signs of the outbreak had cleared. Two of the surviving goats had shown clinical signs prior to clearance of the outbreak. At Idi-Iroko the serum samples were obtained during the peak of the outbreak. At the time of sampling many of the goats were febrile and diarrhoea, muco-purulent occulo-nasal discharges and stomatitis were prominent. One sheep and 7 goats were sampled.

At Oyo only few animals showed clinical signs at the time of sampling; 8 goats were sampled.

Preparation of agar

A 1% (w/v) Oxoid purified agar was prepared in borate buffered saline (pH 9·0) containing 0·02% sodium azide and boiled until dissolved. Six millilitres of molten agar was dispensed into each 5 cm diameter Petri dish and allowed to solidify. Five millimetre diameter wells were punched in groups of 7 with a central well surrounded by 6 wells peripherally, the distance between any 2 adjacent wells being 5 mm.

Preparation of PPR antigen

One gram of tissue (lymph nodes, lungs, spleen or intestine) obtained from the carcass of an affected goat or sheep was homogenised in 10 ml of Eagle's minimum essential medium using a mortar and pestle. The homogenate was tested against hyperimmune rinderpest serum in agar and, if a precipitin line developed against it, it was used as virus antigen for subsequent tests.

Test sera

Blood was collected from affected sheep and goats by jugular venipuncture using vacutainers and was allowed to clot and kept at 4°C overnight. Sera were decanted from clotted blood and centrifuged. The supernant sera were then dispensed into Bijou bottles and stored at −20°C until used. Sera were decomplemented by heating at 56°C in a water bath for 30 min.

Agar gel diffusion testing of sera

The centre well was filled with PPR virus antigen. One of the peripheral wells was filled with control positive rabbit hyperimmune rinderpest serum[1] while another peripheral well contained control negative normal goat serum. The remaining peripheral wells were filled with test sera. The experiment was set up in duplicate.

The agar plates were incubated in a humidifying chamber at 25°C and observed daily by means of a viewer and the final readings were taken after 96 h. Test sera which were positive were later tested against rinderpest precitating antigen.[1]

RESULT

Precipitating antibody was detected in sera collected from Idi-Iroko, Fasola and Oyo (Table I).

TABLE I

Precipitating antibody in sera of PPR affected goats

Location	Interval between onset and sample collection (days)	No. tested	No. positive	% positive
Idi-Iroko	7	8	5	62·5
Fasola	26	5	2	40
Oyo	8	8	3	37·5

Decomplementing sera increased the sensitivity of the test (Table II). Test sera which precipitated PPR virus antigen failed to precipitate rinderpest virus antigen.

TABLE II

Effect of decomplementing sera on the detection of precipitating antibody

Serum	Time of appearance of precipitin line (h)		
	Undecomplemented serum	Decomplemented serum	Control line
oy7	+ (72)[1]	+ (18)	(18)
oy8	+ (72)	+ (18)	(18)
oy4	− (−)[2]	+ (48)	(18)
F146	− (−)	+ (48)	(18)
F145	− (−)	+ (48)	(18)

[1] + Positive, h in bracket.
[2] − Negative.
(−) No line by 96 h.

[1] Supplied by the Director, AVRI, Pirbright, UK.

DISCUSSION

Precipitating antibody was detected in sera obtained in the acute phase of the disease and also in sera obtained at convalescence. Scott and Brown (1961) applied the same test to convalescent rinderpest sera but were unable to demonstrate precipitating antibody. Rinderpest and PPR thus seem to differ in this aspect. Also test sera which precipitated PPR virus antigen did not precipitate rinderpest virus antigen. This test is considered useful for field diagnosis of PPR as it can be applied in rural laboratories which do not have facilities for tissue culture and more sophisticated serological techniques.

It was observed that inactivation of complement in sera improved the sensitivity of the test. When sera were decomplemented more positives were detected and precipitin lines developed more rapidly. The role of complement in the inhibition of precipitating antibody in sera is not understood. Precipitating antibodies were only detected in animals that were clinically sick and those in the early stage of convalescence. It is therefore advisable that sera intended for diagnosis be collected at these periods. Although this test provides a rapid serological diagnostic tool for PPR it is advisable that serum neutralisation tests be carried out on test sera as soon as feasible.

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ANTICORPS PRÉCIPITANTS DANS LE SÉRUM DE CHÈVRES NATURELLEMENT ATTEINTES DE LA PESTE DES PETITS RUMINANTS

Résumé—Des anticorps précipitants ont été mis en évidence dans le sérum de chèvres naturellement infectées par la peste des petits ruminants, dans trois localités de l'Ouest de la Nigeria. Il a été nécessaire de décomplémenter les sérums pour obtenir de bons résultats.

ANTICUERPOS PRECIPITANTES EN SUERO DE CABRAS AFECTADAS NATURALMENTE CON PESTE DES PETITS RUMINANTS

Resumen—Se detectaton anticuerpos precipitantes en el suero de cabras afectadas naturalmente con peste des petits ruminants, en tres localidades del Oeste de Nigeria. Fue necesario eliminar el complemento del suero para obtener buenos resultados.