

RESEARCH COMMUNICATION

ANTIBODY TO PORCINE PARVOVIRUS IN WARTHOG (*PHACOCHOERUS AETHIOPICUS*)

G. R. THOMSON and I. PEENZE, Veterinary Research Institute, Onderstepoort 0110

ABSTRACT

THOMSON, G. R. & PEENZE, I., 1980. Antibody to porcine parvovirus in warthog (*Phacochoerus aethiopicus*). *Onderstepoort Journal of Veterinary Research*, 47, 45-46 (1980).

Haemagglutination inhibiting antibody to porcine parvovirus was shown to be widespread in all but one of the warthog populations sampled from South Africa and Zimbabwe Rhodesia. In some instances titres as high as $\geq 1/20\ 000$ were detected.

Résumé

LES ANTICORPS AU PARVOVIRUS PORCIN DU PHACOCÈRE (*PHACOCHOERUS AETHIOPICUS*)

Les anticorps au parvovirus porcin mis en évidence par le test d'inhibition d'haemagglutination se sont révélée être étendue à toutes les populations de phacochères, sauf une, qui fut échantillonnée en Afrique du Sud et en Zimbabwe-Rhodésie. Dans certains cas des titres aussi élevés que $\geq 1/20\ 000$ furent détectés.

INTRODUCTION

Porcine parvovirus (PPV) has a world-wide distribution and is a cause of reproductive failure in domestic pigs which, as far as is known, are the primary hosts of this virus (Joo & Johnson, 1976; Bachmann, Hoggan, Kurstak, Melnick, Pereira, Tattersall & Vago, 1979).

This communication describes the detection of antibody to PPV in the sera of warthog shot during investigations into African swine fever.

MATERIALS AND METHODS

Virus

The 59e/63 isolate provided by the Central Veterinary Laboratory, Weybridge, England, was used throughout. Monolayers of piglet kidney cells were infected when approximately 50% confluent, and the cultures were harvested 4-6 days later. Cells which remained attached were scraped off the glass and these as well as detached cells were separated from the culture medium by low speed centrifugation. The cells were resuspended in phosphate buffered saline (pH 7.4) containing 0.2% bovine serum albumin (PBS/BSA) to $\frac{1}{10}$ of the original volume of medium and then, with the use of a MSE ultrasonicator, disrupted by ultrasonication at maximum amplitude for 30 seconds.

Finally, the debris was deposited by centrifugation at $500 \times g$ and the supernatant, divided into aliquots and stored at $-70^\circ C$, was used as antigen in haemagglutination inhibition tests.

Sera

All the sera were inactivated at $56^\circ C$ for 30 minutes and then adsorbed with 25% kaolin for 20 minutes at room temperature.

Haemagglutination inhibition (HI) tests

A conventional microtitre technique incorporating 4 haemagglutinating units of antigen was employed (Powell, Thomson, Spooner, Plowright, Burrows & Schild, 1974), except that guinea-pig erythrocytes were used in this case and the final incubation was carried out at $4^\circ C$. Titration of a standard serum was performed with each test batch. Titres ≥ 320 were considered to be significant.

RESULTS

All the warthog sampled were either adult or subadult animals but, because no record of age or sex was available in many instances, these details are not shown. However, high HI titres were obtained in sera from both adult and subadult as well as from male and female animals.

The incidence of HI antibody to PPV in warthog from different localities and the distribution of titres are shown in Table 1.

With one exception, all the populations sampled had individuals with titres ≥ 320 , and in all but 2 the proportion of sera in this category was greater than 20%. The incidence in the Hluhluwe Game Reserve was particularly high (89%). None of the 15 sera from Buffalo Range (Zimbabwe Rhodesia) were clearly positive (Table 1).

TABLE 1 Summarized results of haemagglutination inhibition tests for porcine parvovirus carried out on warthog sera from different localities

Locality	Country	No. of sera tested	Distribution of titres		
			< 10	10-160	320- $\geq 20\ 000$
Umfolozi*	RSA	33	11 (33 ¹)	4 (12)	18 (55)
Hluhluwe*	RSA	18	2 (11)	0	16 (89)
Mkuze*	RSA	23	17 (74)	1 (4)	5 (22)
Thabazimbi	RSA	21	13 (62)	0	8 (38)
Sukses	South West Africa/Namibia	7	5 (72)	1 (14)	1 (14)
Buffalo Range	Zimbabwe Rhodesia	15	13 (87)	2 (13)	0
Sebungwe	Zimbabwe Rhodesia	16	6 (38)	2 (12)	8 (50)

* Game Reserves

¹—(%)

Of the 66 sera in which HI activity could be detected, all but 10 (i.e. 85%) had titres ≥ 320 and 47% titres ≥ 2560 .

DISCUSSION

Thus far the haemagglutinating antigen(s) of members of the parvovirus group have been found to be type specific (Bachmann *et al.* 1979) and therefore it must be presumed that the high titres detected in this study are unlikely to have been induced by a cross-reacting parvovirus. It is also unlikely that heterophile antibody would produce such high titres. However, confirmation that PPV is capable of infecting warthog must await its isolation from this species or the results of experimental infection.

Johnson, Donaldson-Wood, Joo & Allender (1976) found that in pigs an HI titre of >256 represented the "minimal active immune titre". For this reason titres between $\frac{1}{16}$ and $\frac{1}{128}$ in warthog sera were not considered specific. However, as can be seen from Table 1, they represented a small proportion of the positive reactions obtained (15%).

Any effect that PPV might have on the high reproductive performance of warthog (Cumming, 1975) is speculative. However, it is interesting to note that Mason (personal communication, 1979) found that between May and November (mean mating and farrowing times respectively), out of the 76

breeding-age females (31.6% primiparous) examined, only 3 had any evidence of reproductive failure. These observations were made in the Northern Natal Game Parks, namely, Hluhluwe, Umfolozi and Mkuze, where antibody to PPV is common in warthog (Table 1).

ACKNOWLEDGEMENTS

We wish to thank Drs A. R. Lewis, H. E. van de Pypekamp, J. M. Olivier and J. Condy for supplying the sera.

REFERENCES

BACHMANN, P. A., HOGGAN, M. D., KURSTAK, E., MELNICK, J. L., PEREIRA, H. G., TATTERSALL, P. & VAGO, C., 1979. Parvoviridae: Second report of the study group on parvoviridae, International Committee on Taxonomy of Viruses. *Intervirology*, 11, 248-254.
 CUMMING, D. H. M., 1975. A field study of the ecology and behaviour of warthog. Museum Memoir No. 7. Published by the Trustees of the National Museums and Monuments of Rhodesia. Salisbury, Rhodesia.
 JOHNSON, R. H., DONALDSON-WOOD, C., JOO, H. S. & ALLENDER, U., 1976. Observations on the epidemiology of porcine parvovirus. *Australian Veterinary Journal*, 52, 80-84.
 JOO, H. S. & JOHNSON, R. H., 1976. Porcine parvovirus: a review. *Veterinary Bulletin*, 46, 653-660.
 POWELL, D. G., THOMSON, G. R., SPOONER, P., PLOWRIGHT, W., BURROWS, R. & SCHILD, G. C., 1974. The outbreak of equine influenza in England, April/May, 1973. *Veterinary Record*, 94, 282-287.