SHORT COMMUNICATION

DETECTION OF BOVINE ROTAVIRUS BY RNA ELECTROPHORESIS

SUMMARY: A bovine rotavirus exhibiting the group A rotavirus RNA electropherotype was detected in a diarrhoeic faecal specimen obtained from Kluang, Johor in February 1987. All other specimens from the same location and from Kuantan, Pahang, obtained in 1987 and 1988, were negative for rotavirus RNA. The RNA-positive specimen reacted positively in an ELISA test for group A rotavirus.

Key words: bovine rotavirus, electropherotype

INTRODUCTION

Rotaviruses have been recognized as the major aetiological agents of acute viral gastroenteritis in humans and all the major species of domestic livestock (Flewett and Woode, 1978; Du-Pont, 1984). Serological analysis has shown that the majority of rotavirus isolates possess a common group antigen on the inner of the two capsid shells, irrespective of their species of origin (Woode *et al.*, 1976; Flewett and Woode, 1978). Electrophoretic analysis of these (group A) rotaviruses reveal a tight migration of segments 7–9 of the 11 genomic double-stranded RNA segments (Pedley *et al.*, 1986).

Although bovine rotaviruses have been observed in Malaysia previously (Sheikh-Omar and Ibrahim, 1984), their detection by RNA electrophoresis has not been documented. In this paper we describe the detection of a group A bovine rotavirus electropherotype in faecal specimen obtained from a diarrhoeic calf in Kluang, Johor.

MATERIALS AND METHODS

Diarrhoeic faecal specimens were obtained from Kluang, Johor and Kuantan, Pahang, from calves aged less than three months, in 1987 and 1988. RNA was extracted directly from the specimens with phenolchloroform, employing the method used in the laboratory of L. Holmes (Australia) and electrophoresed in five percent polyacrylamide slab gels at 7.5 mA for 16–18 hours. The gels were stained with silver nitrate to visualize the RNA bands.

RESULTS AND DISCUSSION

Only one specimen, SI 362, obtained in February 1987 from Kluang was positive for rotavirus RNA. Its RNA profile (Fig. 1) is characteristic of group A rotaviruses, with the tight migration of segments 7–9 triplet. When tested in an ELISA test for group A rotavirus, using the Rotazyme II test (Abbott Laboratories), SI 362 was strongly reactive, confirming that it contained a group A rotavirus (data not shown). All the remaining specimens obtained at the same time (Table 1) were negative for rotavirus RNA. This gives a frequency of detection of 3.7 percent. None of the other specimens obtained in Kluang or Kuantan, in either 1987 or 1988, were positive for rotavirus RNA (Table 1).

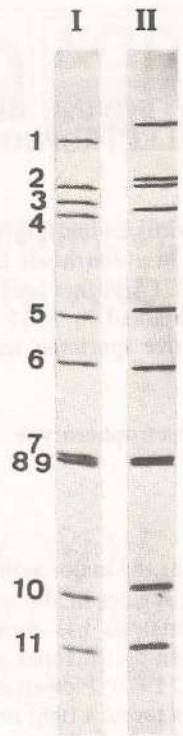

FIG. 1: RNA profile of specimen SI 362 in five percent polyacrylamide gel. Figures on the left indicate the positions of RNA bands. I = SA–11 (Simian rotavirus, group A); II = SI–362.

TABLE 1
Source of faecal specimens and result of rotavirus detection by RNA analysis

Source	Date of collection	No. collected	Result of RNA analysis
Kluang	January, 1987	5	–
	February, 1987	1	+
		26	–
	July, 1988	13	–
Kuantan	December, 1987	15	–
	March, 1988	22	–
	June, 1988	19	–

A previous examination of faecal samples from diarrhoeic calves in the same farm in Kluang by electron microscopy (Sheikh-Omar and Ibrahim, 1984) showed that in the less than three month age group, eight out of 40 of the specimens tested (20%) were positive for rotavirus. In the present report, rotavirus was detected by RNA analysis in only 3.7 percent of 27 specimens tested from the same age-group. Since RNA electrophoresis is recognized to be a sensitive method of detection of rotaviruses, the results suggest a differing frequency of rotavirus-associated diarrhoea in different years of study. The drop in incidence in 1987 and the lack of detection of rotavirus RNA in 1988 may be a result of improved management. The lack of rotavirus RNA in specimens from Kluang obtained in January 1987 and July 1988 or in Kuantan in both 1987 and 1988 may also either reflect a lack of rotavirus-associated diarrhoea in these months or a sample volume below the limit of detection.

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RASOOL, N.
Department of Genetics and Cellular Biology,
University of Malaya,
59100 Kuala Lumpur, Malaysia, and

SHEIKH–OMAR, A.R.
Faculty of Veterinary Medicine and Animal Science,
Universiti Pertanian Malaysia,
43400 Serdang, Selangor, Malaysia.

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RINGKASAN

PENGESANAN ROTAVIRUS BOVIN MENGGUNAKAN RNA ELEKTROFORESIS

Satu rotavirus bovin yang menunjukkan elektroferotip RNA rotavirus kumpulan A telah ditemui dalam satu specimen najis cirit-birit yang diperolehi dari Kluang, Johor pada bulan February 1987. Semua spesimen lain dari lokasi yang sama dan dari Kuantan, Pahang yang didapati pada tahun 1987 dan 1988 adalah negatif bagi RNA rotavirus. Specimen yang RNA-positif itu bertindak balas positif dalam ujian ELISA bagi rotavirus kumpulan A.