

## STRAINS OF FOOT-AND-MOUTH DISEASE VIRUS IN DIFFERENT DISTRICTS OF BANGLADESH

S. M. Z. H. Chowdhury<sup>1</sup>, M. F. Rahman, M. B. Rahman<sup>2</sup> and M. M. Rahman<sup>2</sup>

Animal Health Research Division, Bangladesh Livestock Research Institute, Savar, Dhaka-1341, Bangladesh

### Summary

An investigation was carried out to find out the strains of foot-and-mouth disease (FMD) virus in 24 districts of Bangladesh. A total of 505 FMD virus samples were collected from June, 1989 to June, 1991 and tested by complement fixation test (CFT). Of these, 276 (54.7%) were found positive for different strains of FMD virus and the rest 45.3% were either negative or anticomplementary. Strains identified were O, C, Asia-1 and sub-strains A<sub>5</sub> and A<sub>22</sub>. Strain O was found to be most prevalent (39.8%) followed by Asia-1 (5.7%), C (5.3%), A<sub>5</sub> (3.4%) and A<sub>22</sub> (0.4%). Prevalence of sub-strain A<sub>5</sub> was reported for the first time in Bangladesh. District-wise typing of FMD virus has been done which would be helpful for appropriate vaccination programme in different districts of Bangladesh for control of the malady.

(Key Words : Prevalence, Foot-and-Mouth Disease Virus, FMD Virus Strains)

### Introduction

Foot-and-mouth disease is a serious limiting factor for livestock development in Bangladesh. The disease is caused by a virus of various strains differing from each other antigenically and pathogenically. For laboratory identification of FMD virus in the field samples, complement fixation test (CFT) has usually been used (Buckley et al., 1975). Using this test typing FMD virus of the field samples was carried out earlier in Bangladesh by very few workers (Islam et al., 1985; Rahman et al., 1989). The precise existence of different FMD virus strains in various districts of Bangladesh is not properly known. This paper presents the prevalence and typing of FMD virus in different districts of Bangladesh.

### Materials and Methods

This study was conducted from June, 1989 to June, 1991 in 24 districts of Bangladesh. The epithelial samples

<sup>1</sup>Address reprint requests to Dr. S. M. Z. H. Chowdhury, Animal Health Research Division, Bangladesh Livestock Research Institute, Savar, Dhaka-1341, Bangladesh.

<sup>2</sup>Department of Microbiology and Hygiene, Bangladesh Agricultural University, Mymensingh, Bangladesh.

Received August 12, 1995

Accepted January 6, 1996

from tongue, gum, cheeks, muzzle and interdigital spaces in suspected FMD cases were collected from different districts using sterile forceps. The samples were kept in glycerine phosphate buffer solution and preserved at -20°C until typing was done. Each sample was ground using pestle and mortar and a 10% suspension was prepared in phosphate buffer saline (pH 7.6). The suspension was centrifuged at 3,500 rpm for 10 minutes and the supernatant was collected for the antigen test.

The antisera against strains A<sub>5</sub>, O, C, Asia-1 and A<sub>22</sub> were used and these were procured from Animal Virus Research Institute (AVRI), Pirbright, U.K.

The complement for the test were collected from numbers of male Guinea pigs.

The Micro-complement fixation test (CFT) was employed following the methods described by Forman (1974).

### Results and Discussion

Typing FMD virus of the field samples from 24 districts of Bangladesh is presented in table 1. A total of 505 FMD virus samples were tested by CFT of which 276 (54.7%) were found positive for different strains of FMD virus and the rest 45.3% were either negative or anticomplementary. This figure is much more lower than the findings of Rahman et al. (1989) who reported 73.0% positive cases for FMD virus by CFT. This difference

TABLE 1. TYPING FMD VIRUS OF THE FIELD SAMPLES FROM DIFFERENT DISTRICTS

Districts	No. of samples tested	No. of samples positive with different strains of FMD virus					Total	Negative/Anticomplementary
		A <sub>5</sub>	O	C	Asia-1	A <sub>22</sub>		
Serajgonj	25	—	14	—	—	—	14	11
Pabna	10	—	7	—	—	—	7	3
Bogra	5	—	—	5	—	—	5	—
Joypurhat	25	1	13	—	—	—	14	11
Kurigram	25	—	12	—	—	—	12	13
Gaibandha	51	—	23	—	—	—	23	28
Lalmonirhat	15	—	8	—	—	—	8	7
Rangpur	10	—	6	—	—	—	6	4
Rajshahi	13	—	—	5	—	—	5	8
Natore	7	—	4	—	2	—	6	1
Nowgaon	3	—	3	—	—	—	3	—
Dinajpur	25	—	15	—	—	—	15	10
Dhaka	23	—	15	—	—	—	15	8
Mymensingh	30	5*	12	—	—	—	17	13
Norsingdi	20	—	15	—	—	—	15	5
Manikgonj	90	—	34	11	—	—	45	45
Khulna	19	—	5	2	—	—	7	12
Bagerhat	3	—	—	—	—	2	2	1
Pirojpur	5	—	3	—	—	—	3	2
Barisal	31	—	5	—	10	—	15	16
Jessore	12	—	7	—	—	—	7	5
Feni	30	—	—	—	17	—	17	13
Sylhet	23	8*	—	4	—	—	12	11
Cox's bazar	5	3*	—	—	—	—	3	2
Total	505	17 (3.4%)	201 (39.8%)	27 (5.3%)	29 (5.7%)	2 (0.4%)	276 (54.7%)	229 (45.3%)

\* Also slightly reacted with A<sub>22</sub>.

could be attributed to the number of samples tested in these studies. Strains of FMD virus found in different districts were O (39.8%), Asia-1 (5.7%), C (5.3%) and sub-strains A<sub>5</sub> (3.4%) and A<sub>22</sub> (0.4%). Results showed that the prevalences of strains O and C were higher while that of Asia-1 and A<sub>22</sub> were lower than the findings of Rahman et al. (1989). This could be due to the number of samples tested and/or to the antigenic changes of these strains. Prevalence of sub-strain A<sub>5</sub> was reported for the first time in Bangladesh. Strain O was found to be most prevalent and identified in 18 districts, while C in 5 districts, A<sub>5</sub> in 4 districts, Asia-1 in 3 districts and A<sub>22</sub> in 1 district. Islam et al. (1985) and Rahman et al. (1989) reported, respectively, O and A, and O and Asia-1, as the most prevalent strains.

In 9 districts (Serajgonj, Pabna, Kurigram, Gaibandha, Lalmonirhat, Dhaka, Khulna, Bagerhat and Cox's bazar),

prevalences of virus strains were also reported earlier by Rahman et al. (1989) and in the rest 15 districts virus strains were known for the first time. Of the above 9 districts, similar virus strain was identified by Rahman et al. (1989) in 3 districts (Kurigram, Gaibandha and Lalmonirhat). In the rest 6 districts, new virus strains were found which are not consistent with the findings of Rahman et al. (1989). The probable explanation of these variations was that the animals in these 6 districts developed immunity against the previously reported (Rahman et al., 1989) virus strains. As a result new strains introduced in these areas following increased movement of animals or there might have been antigenic alterations of the previously reported (Rahman et al., 1989) virus strains. The result revealed that the FMD affected areas were increasing with the increasing prevalent areas of mixed strains in comparison with the findings of Rahman

et al. (1989). Such an increase was possibly influenced by increased movement of animals from outside and within the country as well as high humidity and low ambient temperature during the 1st. half of 1990 as compared with recent years. Moreover, antigenic variations might have been taken place among the strains.

The district-wise typing of FMD virus would be helpful for appropriate vaccination programme in different districts of Bangladesh for control of the malady.

#### **Acknowledgement**

The authors are grateful to the Director, Bangladesh Livestock Research Institute, Savar, Dhaka for his financial support and valuable assistance during the study. Cordial thanks are also due to the field staffs for their help during collection of FMD virus samples from different districts of Bangladesh.

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