Molecular characterization of serotype Asia-1 foot-and-mouth disease viruses in Pakistan and Afghanistan; emergence of a new genetic Group and evidence for a novel recombinant virus

Introduction

Foot-and-mouth disease (FMD) is endemic in Pakistan and Afghanistan. The FMD virus serotypes O, A and Asia-1 are responsible for the outbreaks in these countries. Diverse strains of FMDV, even within the same serotype, co-circulate. Characterization of the viruses in circulation can facilitate appropriate vaccine selection and tracing of outbreaks. The present study characterized foot-and-mouth disease serotype Asia-1 viruses circulating in Pakistan and Afghanistan during the period 1998–2009. Phylogenetic analysis of FMDV type Asia-1 revealed that three different genetic Groups of serotype Asia-1 have circulated in Pakistan during this time. These are Group-II, -VI and, recently, a novel Group (designated here as Group-VII). This new Group has not been detected in neighbouring Afghanistan during the study period but viruses from Groups I and -II are in circulation there. Using near complete genome sequences, from FMD viruses of serotypes Asia-1 and A that are currently circulating in Pakistan, we have identified an interserotypic recombinant virus, which has the VP2-VP3-VP1-2A coding sequences derived from a Group-VII Asia-1 virus and the remainder of the genome from a serotype A virus of the A-Iran05AFG-07 sub-lineage. The Asia-1 FMDVs currently circulating in Pakistan and Afghanistan are not efficiently neutralized by antisera raised against the Asia-1/Shamir vaccine strain. Thus, new Asia-1 vaccine strains may be required to block the spread of the current Asia-1 viruses.

General information

Publication status: Published
Organisations: National Veterinary Institute, Sektion for Eksotiske Virussygdomme, Division of Virology, Food and Agriculture Organization of the United Nations, Quaid-I-Azam University
Pages: 2049-2062
Publication date: 2011
Peer-reviewed: Yes

Publication information

Journal: Infection, Genetics and Evolution
Volume: 11
Issue number: 8
ISSN (Print): 1567-1348
Ratings:
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 3.11 SJR 1.189 SNIP 1.185
Web of Science (2011): Impact factor 3.128
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
Original language: English
DOIs: 10.1016/j.meegid.2011.09.015
Source: orbit
Source ID: 313936

Research output: Contribution to journal › Journal article – Annual report year: 2011 › Research › peer-review