Detection of myxoma viruses encoding a defective M135R gene from clinical cases of myxomatosis; possible implications for the role of the M135R protein as a virulence factor

Background: Myxoma virus is a member of the Poxviridae and causes disease in European rabbits. Laboratory confirmation of the clinical disease, which occurs in the autumn of most years in Denmark, has been achieved previously using antigen ELISA and electron microscopy. Results: An unusually large number of clinically suspected cases of myxomatosis were observed in Denmark during 2007. Myxoma virus DNA was detected, using a new real time PCR assay which targets the M029L gene, in over 70% of the clinical samples submitted for laboratory confirmation. Unexpectedly, further analysis revealed that a high proportion of these viral DNA preparations contained a frame-shift mutation within the M135R gene that has previously been identified as a virulence factor. This frame-shift mutation results in expression of a greatly truncated product. The same frame-shift mutation has also been found recently within an avirulent strain of myxoma virus (6918). However, three other frame-shift mutations found in this strain (in the genes M009L, M036L and M148R) were not shared with the Danish viruses but a single nucleotide deletion in the M138R/M139R intergenic region was a common feature. Conclusions: It appears that expression of the full-length myxoma virus M135R protein is not required for virulence in rabbits. Hence, the frame-shift mutation in the M135R gene in the nonpathogenic 6918 virus strain is not sufficient to explain the attenuation of this myxoma virus but one/some of the other frame-shift mutations alone or in conjunction with one/some of the thirty two amino acid substitutions must also contribute. The real time PCR assay for myxoma virus is a useful diagnostic tool for laboratory confirmation of suspected cases of myxomatosis.

General information
State: Published
Organisations: Sektion for Ekotiske Virusygdomme, Division of Virology, National Veterinary Institute, Virology, Division of Veterinary Diagnostics and Research
Pages: 7
Publication date: 2010
Peer-reviewed: Yes

Publication information
Journal: Virology Journal
Volume: 7
Issue number: 1
ISSN (Print): 1743-422X
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
Scopus rating (2017): CiteScore 2.43 SJR 1.053 SNIP 0.848
Web of Science (2017): Impact factor 2.465
Web of Science (2017): Indexed yes
Scopus rating (2016): CiteScore 2.43 SJR 1.154 SNIP 0.903
Web of Science (2016): Impact factor 2.139
Scopus rating (2015): CiteScore 2.47 SJR 1.196 SNIP 0.945
Web of Science (2015): Impact factor 2.362
Scopus rating (2014): CiteScore 2.27 SJR 1.057 SNIP 0.94
Web of Science (2014): Impact factor 2.181
Web of Science (2014): Indexed yes
Scopus rating (2013): CiteScore 2.44 SJR 1.051 SNIP 0.989
Web of Science (2013): Impact factor 2.089
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
Scopus rating (2012): CiteScore 2.37 SJR 0.973 SNIP 0.877
Web of Science (2012): Impact factor 2.092
ISI indexed (2012): ISI indexed yes
Scopus rating (2011): CiteScore 2.65 SJR 1.06 SNIP 0.882