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Quantitative assessment of severity of histopathological lesions in mink infected with Aleutian mink disease virus

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Mink production is one of the most important agricultural industries in Nova Scotia, the province with the greatest number of mink pelts produced in Canada. Aleutian mink disease virus (AMDV) causes Aleutian disease (AD) that seriously threatens this industry. The main characteristics of AD in adult mink are plasmacytosis (abnormally high number of infiltrated plasma cells in tissues), viremia, hypergammaglobulinemia, high anti-AMDV antibody titers and presence of circulating infectious immune complexes. Severity of histopathological lesions of AD is often subjectively assessed under a light microscope; thus, the results are not comparable among laboratories. The objective of this study was to develop a quantitative method of measuring the severity of histopathological lesions in AMDV-infected mink using a digital image analysis system. Slides were prepared from the kidneys of 5 infected mink and stained with hematoxylin and eosin. Three images were taken from different areas of each slide and were transferred to image analysis software, Image Pro Plus v7. Infiltrated plasma cells could not be accurately identified by automatic feature of the software, hence were counted using its manual feature by clicking on each of the intended cells and adding them to a list of counted objects. For calculating the percentage of infiltrated plasma cells, the number of total cells on each image was counted by the automatic feature of the software. The software detects

the nuclei of cells based on the color intensity (gray scale) of their constituted pixels. Therefore, it was necessary to find a range of color intensity by which the software could correctly count the largest number of nuclei. For comparison, total cells were counted visually and by the software on one randomly chosen area on 15 kidney images. Sensitivity and precision of the software in counting total cells in each of the ranges of gray scale (0 and 255) within the three color-channels (red, blue, green) were calculated. The highest sensitivity (0.95) and precision (0.99) were achieved in the red channel. The averages of sensitivity and precision at each of the ranges of gray scale in the red channel were calculated for the 15 images, which were high at the range of 0 to 90. This range of gray scale was used to count the total number of cells in kidney slides of AMDV-infected mink.

Speaker Biography

R Khomayezi has completed his Doctor of Veterinary Medicine (DVM) degree from Azad University of Tabriz and then worked as a Practitioner in his own veterinary clinic for three years. He was admitted in a research-based Master of Animal Science program at Dalhousie University in 2015. His research project is focused on finding relationships between the degree of histopathological lesions and serological changes in AMDV-(Aleutian mink disease virus) infected mink. Passionate about veterinary pathology and virology, his research project has been a great fit. He is planning to defend his thesis by the end of April 2018.

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