Detection of self-biting behavior of mink by loop-mediated isothermal amplification (LAMP) and sequence-characterized amplified regions (SCAR)

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Abstract

Self-biting disease occurs in most farmed fur animals in the world. The mechanism and rapid detection method of this disease has not been reported. We applied bulked sergeant analysis (BSA) in combination with RAPD method to analyze a molecular genetic marker linked with self-biting trait in mink group. The molecular marker was converted into SCAR and loop-mediated isothermal amplification (LAMP) marker for rapid detection of this disease. A single RAPD marker A10 amplified a specific band of 1000bp in self-biting minks. The sequences of the bands exhibited 73% similarity to the Canis Brucella. SCAR and LAMP marker were designed for the specific fragment of RAPD marker A10 and validated in 30 self-biting minks and 30 healthy minks. χ² test showed difference (p<0.05) with SCAR and significant difference (p<0.01) with LAMP in the detection rate between the two groups, but LAMP method was more accurate than SCAR method. This indicated that LAMP can be used as a positive marker to detect self-biting disease in minks.

Key words: mink, self-biting, loop-mediated isothermal amplification, sequence-characterized amplified regions

Introduction

Stereotypical behavior is found in farmed animals but is rare in the wild. The causes are usually multifactorial, involving complex interactions between genetic, environmental, and social factors (De Bellis et al. 1999, De Bellis et al. 1999, Schore 2002, Garner et al. 2004). Stereotyped characteristics have been found to be heritable in bank voles (Clethrionomys glareolus) (Schoe necker and Heller 2000), and African striped mice (Rhabdomys pumilio) (Schwaibold and Pillay 2001), and the importance of genetic transmission in this regard has also been indicated in fur animals, such as mink (Hansen 1993). Lin (2007) showed that the poly-

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