

Molecular and serological investigation of porcine circoviruses epidemiology in China

中国猪圆环病毒的分子和血清学流行

Xiangdong Li, Yangzhou University, Yangzhou, China

Introduction

Porcine circoviruses (PCV), are a group of small, nonenveloped, circular and single-stranded DNA viruses, including PCV1, PCV2, PCV3 and PCV4. PCV1 has been generally accepted to be nonpathogenic in pig herds. PCV2 has been associated with porcine circovirus-associated diseases (PCVADs) which led to huge economic losses to world pig industry. As the newly emerged PCVs, PCV3 and PCV4 have been reported to be associated with acute porcine dermatitis and nephropathy syndrome and abortion. The co-infections of PCVs need to be explored based on the development of molecular and serological assays.

Materials and Methods

A multiplex real-time PCR was developed to detect different types of PCVs simultaneously. ELISA was developed to detect antibodies of PCVs. The developed assays were applied to a nationwide epidemiological survey of PCVs in China.

Results

Both molecular and serological assays showed good sensitivity and specificity with good repeatability. Epidemiological survey results showed that singular PCV2 and PCV3 infections were universal, and the co-infection rates of PCV2 and PCV3 are increasing. The newly emerged PCV4 is also detected in PCV2- and PCV3-positive samples.

Discussion

PCV2, as an economically important PCV, was well studied in the past decades. By contrast, the prevalence and pathogenicity of newly emerged PCVs including PCV3 and PCV4 need further studies. A multiplex real-time PCR could detect all PCVs within one reaction which facilitates clinical high-throughput screenings. Combined with serological survey, specific PCV antibodies could last in a longer period and compensate for the narrow window of viremia. By using both molecular and serological assays, an accurate status of prevalence of PCVs in China can be more accurately illustrated.

Conclusion

Both molecular and serological assays are important for epidemiological surveys of PCVs. The co-infections of PCVs were found common in pig herds in China.

Reference

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