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Viral metagenomics analysis of poultry faeces in live poultry market, Haikou, China

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ABSTRACT Objective: To conduct in-depth study of the distribution and diversity of viruses in poultry is of great importance in monitoring the emergence of interspecies transmission of novel viruses that may cause epidemics with public health significance. Poultry is an economically important source of meat, eggs and feathers which plays an important role as natural reservoirs of many pathogenic viruses. Compared with wild animals, poultry have more frequent interactions and therefore opportunities to transmit their viruses to human. **Methods:** To study the viromes of different types of poultry in Hainan, China, we used metagenomics for deep viral nucleic acid sequencing of the faecal samples collected from chickens, ducks and pigeons from a live poultry market in Haikou. **Result:** The poultry viromes were identified by sequence similarity comparisons of viral reads (BLASTx score, <5) against viral reference database. A total of 15 309 viral reads were obtained, approximately 13 063, 1 370 and 876 viral reads were generated from the chicken, duck, pigeon faecal samples, respectively. The majority of the sequences were homologous to the animal virus of *Adenoviridae*, *Herpeviridae*, *Picobirnaviridae*, *Reoviridae*, *Retroviridae*, *Circoviridae*, *Paramyxoviridae*, *Astroviridae*, *Caliciviridae*, *Coronaviridae*, *Picornaviridae*, and *Orthomyxoviridae*. The VP4 and VP7 segments of a pigeon rotavirus, similar to fox rotavirus in group A, were sequenced and phylogenetically analyzed. The near full genome of a pigeon circovirus was also analyzed. **Conclusion:** The major types of poultry in a Haikou harbor many different families of viruses in their feces which may have the potential for interspecies transmissions. Further studies should be conducted to identify the most prevalent and important viruses among a larger number of poultry in Haikou and other areas in Hainan.

Keywords: Viral metagenomics; Poultry; Rotavirus; Circovirus

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