

## **Phylogenetic and evolutionary analyses of the VP4 gene of P[9]rotaviruses**

### **ABSTRACT**

**Objective:** Rotavirus is one of the major causes of gastroenteritis in children under 5 years of age. It can evolve by reassortment, in which gene segments are exchanged between strains of different origins. In some rotavirus strains the P[9] component is an example of reassortment, in which the P[9] genotype is from feline species. A number of outbreaks associated with P[9] strains have been documented in several countries. However, details regarding the epidemiological relationships between the strains remains largely unknown. Therefore, in the present study, genetic characterization and evolutionary analyses were performed to gain insight into P[9] strains circulating in different parts of the world.

**Materials and Methods:** A total of 94 full-and partial-length VP4 gene sequences of P[9] strains were extracted from GenBank and phylogenetic trees were constructed by maximum likelihood method. Timeline of evolution was performed using the full-length nucleotide sequences of VP4 genes of P[9] strains using the Bayesian Markov Chain Monte Carlo method available in BEAST version 1.6.1. **Results:** The VP4 gene of the P[9] strains could be divided into two lineages, with lineage I is further divided into five sub-lineages. All the P[9] strains characterized in this study shared a common ancestor that circulated in circa 1864 (95% HPD 1755–1941). In each lineage, the strains were not only from different countries, but also from different continents. These findings suggest that none of the lineages has a specific region of distribution, and although humans have had interactions with cats for thousands of years, the common ancestor of the VP4 gene of the current P[9] strains is relatively recent. **Conclusion:** These findings suggest that P[9] rotaviruses can be divided into two lineages. None of the lineages and sub-lineages has a specific region of distribution, and the ancestor of the current P[9] strain is relatively recent.