

Molecular Identification of c, e, and f Serotypes of *Streptococcus mutans* in a Cohort of Children with Early Childhood Caries in Sri Lanka

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Early childhood caries (ECC) is a global public health problem. Despite being a multifactorial disease, *Streptococcus mutans* is the primary bacterium responsible for ECC. Based on its genetic makeup, *S. mutans* is classified into four serotypes, namely c, e, f, and k, among which c, e and f are most prevalent and cariogenic, each exhibiting different virulence profiles. Identifying these serotypes may help establish better preventive strategies and targeted treatments for ECC. However, *S. mutans* serotype diversity in ECC has not yet been reported in Sri Lanka. Therefore, this study aimed to identify c, e, and f serotypes of *S. mutans* in children with ECC using PCR. Dental biofilm samples were collected from 35 children with ECC, selected based on decayed, missing, filled teeth (dmft) scores, attending the Paedodontic clinic at the Dental (Teaching) Hospital, Peradeniya. Streptococci were isolated on mitis salivarius agar, and their DNA was extracted using an optimized chemical method. First, *S. mutans* was identified using PCR with species-specific primers. Subsequently, c, e, and f serotypes were identified using serotype-specific primers in multiplex and singleplex PCR. Sanger sequencing of PCR amplicons further confirmed 100% identity of the *S. mutans* serotypes isolated from Sri Lankan children to reference sequences in the NCBI database. Based on our findings, *S. mutans* was found in 63% of the children with ECC. Out of *S. mutans* positive children, 27% had serotype c. Serotypes e and f each were found in 9% of children. Eighteen percent of children co-harboured serotypes c and e. Thus, it can be concluded that serotype c is the predominant *S. mutans* serotype associated with ECC. Further, children with multiple serotypes had higher dmft scores, suggesting severe decay, reflecting the impact of multiple serotypes on caries severity. Further studies on a larger sample are necessary to consolidate these findings.

Keywords: Dental caries, DNA sequencing, multiplex PCR, *S. mutans*, serotypes.

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