

Molecular Identification of *Porphyromonas gingivalis* in the Saliva of Patients with Periodontitis and Periodontally Healthy Individuals Attending Dental Teaching Hospital, Peradeniya

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Periodontitis, which affects more than 90% of Sri Lankan adults, can eventually lead to loss of teeth and more serious health complications such as cardiovascular diseases. A keystone pathogen involved in the initiation and progression of periodontitis is *Porphyromonas gingivalis*. Since *P. gingivalis* is an anaerobic, slow-growing bacterium, its identification through conventional microbiological techniques is an extremely tedious task. This study aimed to identify salivary *P. gingivalis* using conventional PCR, compare its detection between individuals with periodontitis and those who are periodontally healthy, and assess the possibility of using salivary *P.gingivalis* analysis by PCR as a non-invasive screening test for periodontitis risk assessment in Sri Lankan population. For this purpose, unstimulated whole saliva samples were collected from a total of 86 individuals (64 patients with periodontitis and 22 periodontally healthy individuals) aged 18–80 years, attending the Dental Teaching Hospital in Peradeniya. DNA was extracted from samples using a chemical method. PCR amplification was carried out by targeting the 16S rRNA gene of *P. gingivalis*. The PCR product was visualized using agarose gel electrophoresis. The specificity of the PCR amplicon was verified by Sanger sequencing and comparing it with the reference sequence of *P. gingivalis* in the NCBI database. *P. gingivalis* is more frequently detected in periodontitis patients (50.00%; 32/64) compared to periodontally healthy individuals (22.73%; 5/22). The chi-square test demonstrated a significant association between detection of *P. gingivalis* in saliva and periodontitis, $\chi^2(5, N=86) = 4.9, p = 0.03$. BLAST analysis of the consensus sequence of the PCR product confirmed the specificity of the PCR, showing 100% similarity to the reference *P. gingivalis* 16S rRNA gene. This study demonstrates the feasibility of non-invasive molecular detection of *P. gingivalis* in saliva as a potential biomarker for periodontitis in Sri Lankan patients. Further, it lays the foundation for future quantitative analysis of this bacterium using qPCR, for enhancing its application in population-level screening for risk assessment of periodontitis.

Keywords: *P. gingivalis*, gum disease, salivary diagnostics, molecular detection

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