Preliminary Identification of Phytochemicals in a Polyherbal Formulation for Oral Health Care Using LC–MS

L.K.D.N. Wijewardhana[1]*, K.S.N.D. Gunawardhana[1], P.A. Paranagama[2], G. Dias[3], L. Jayasinghe[4], B.M.H.S.K. Banneheka[1], M.P. Paranagama[1]

[1]*Department of Basic Sciences, Faculty of Dental Sciences, University of Peradeniya, Peradeniya, 20400, Sri Lanka*
[2]*Department of Chemistry, Faculty of Science, University of Kelaniya, Kelaniya, 11600, Sri Lanka*
[3]*Department of Anatomy, University of Otago, Dunedin, New Zealand*
[4]*National Institute of Fundamental Studies, Kandy, 20000, Sri Lanka*
**devindiphd@dental.pdn.ac.lk*

Polyherbal formulations are widely utilized in traditional medicine for their enhanced therapeutic efficacy and reduced toxicity compared to single-compound therapies. However, their complex chemical composition poses challenges for quality control and standardization. This study aimed to conduct preliminary phytochemical profiling of a polyherbal formulation rich in natural antimicrobial and antioxidant compounds developed at the Faculty of Dental Sciences, University of Peradeniya, as an adjunct in the management of dental caries and periodontitis. The formulation consisted of *Piper betle* leaves, *Syzygium aromaticum* flower buds, *Myristica fragrans* seeds and mace, *Elettaria cardamomum* fruits, *Kaempferia galanga* rhizomes, and *Coriandrum sativum* seeds. Plant materials were processed, combined in previously optimized proportions, and extracted using ethanol via ultrasonication. The extract was analyzed using high-performance liquid chromatography coupled with electrospray ionization mass spectrometry (HPLC–ESI–MS) in negative ion mode. Chromatographic peaks were identified based on their retention times and corresponding mass spectra. Tentative identification of the corresponding phytochemicals was performed by comparing their mass-to-charge (m/z) ratios with those reported in the literature. Key compounds tentatively identified included hydroxychavicol, eugenol, myristicin, malabaricone B, α-terpinyl acetate, ethyl *p*-methoxycinnamate, and chlorogenic acid. Further studies employing authentic reference standards are required to confirm compound identities, their quantification, and the evaluation of their effect on common oral pathogens. In conclusion, our results lay the foundation for phytochemical profiling of this polyherbal oral health care formulation, which will facilitate the maintenance of its batch-to-batch consistency and promote compliance of consumers and regulatory bodies.

Keywords: polyherbal formulation, oral healthcare, HPLC, LC-MS, phytochemical profiling

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