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PHYTOCHEMICAL SCREENING AND ANTIMICROBIAL EVALUATION OF POLYHERBAL GARGLE FORMULATED BY INCORPERATING *TRIPHALA* AND *TRILKATU*

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Incorporating Ayurvedic principles into oral health care offers a holistic alternative to conventional treatments, providing comprehensive solutions for maintaining oral hygiene and preventing oral diseases. The current study was aimed to formulate a new polyherbal gargle incorporating well-known ayurvedic remedies *Thriphala* and *Trikatu.* The gargle was formulated by heating the herbal ingredients with 6cups (1440 mL) of water to reduce 1cup (240mL). Food-grade mint flavor and rock salt were added as additional ingredients. The formulated gargle was evaluated against common pathogens associated with oral cavity and pharynx including, *Staphylococcus aureus, Escherichia coli,* and *Klebsiella pneumoniae* using the agar well diffusion method. The Minimum inhibitory Concentration (MIC) was determined by microbroth dilution method. Furthermore, preliminary phytochemical screening of secondary metabolites and Thin Layer Chromatography (TLC) fingerprint was developed for identifying the active compounds responsible for the therapeutic potential of the gargle. Notably, the formulated gargle exhibited remarkable antimicrobial activity against Gram-positive bacteria *Staphylococcus aureus*, with a mean Zone of Inhibition (ZOI) of 19.000± 1mm. The MIC *against Staphylococcus aureus* was found to be 0.125 mg/mL. The preliminary phytochemical screening revealed that the presence of phenolics, flavonoids, saponins, and tannins. Moreover, TLC fingerprinting separated seven different compounds with respective Retardation Factor (Rf) values 0.72, 0.61, 0.34, 0.28, 0.24, 0.94, 0.88 which can be used as a reference standard to ensure the reproducibility and safety. This research presents an innovative approach by integrating the traditional Ayurvedic system with a scientific basis to develop an effective and natural solution for promoting oral hygiene and preventing oral diseases.

Keywords: polyherbal gargle, antimicrobial activity, phytochemical screening, well diffusion assay