GC-MS profiling, assessment of antioxidant, anti-bacterial activity of the essential oil of *Cestrum nocturnum* and Formulation & Evaluation of Herbal Toothpaste

Nishtha, *Department of Botany (Biosciences), UIBT, Chandigarh University, Gharuan, Mohali, Punjab, India. 140413.*

Abstract

Cestrum nocturnum (Family: Solanaceae) is a medicinal aromatic plant which is found in subtropical and tropical regions. The main objective of the research was to extract essential oil (EO) from this plant and analyze its various properties from a medicinal point of view. Gas Chromatography-Mass Spectrometry (GC-MS) profiling of oil revealed the presence of 18 components amongst which Diethylphthalate (31.88%), α-terpineol (31.52%), benzylacetate (11.61%), γ-terpineol (9.78%), and linalool (2.63%), made up the bulk of the composition. The 1,1-diphenyl-2-picrylhydrazyl (DPPH) technique (Ascorbic acid as positive control) was used to assess the samples' potential as antioxidants by inhibiting free radicals. The IC_{50} value of *C. nocturnum's* oil was assessed to be 15.78±0.510 µl/ml. The EO at various concentrations (6.25µl/ml-100µl/ml) was further evaluated for its anti-bacterial activity against the bacterial strains of *Clostridium botulinum, Klebsiella pneumoniae, Proteus mirabilis*, and *Shigella flexneri*. The oil exhibited maximum growth inhibition against *C. botulinum* (zone of inhibition (ZOI) =38.1±0.15mm) followed by *K. pneumoniae* (33.9±0.25mm), *S. flexneri* (30.8±0.2mm), and *P. mirabilis* (24.3±0.5mm). As the oil have significant antibacterial property therefore, it was used to prepare a formulation of herbal toothpaste for maintaining oral hygiene and preventing tooth decay. Different aspects of the formulated herbal toothpaste such as homogeneity, spreadability, foaming power, stability, pH, moisture, volatile matter, and others, were evaluated and found as par the commercial toothpaste available in market. Herbal toothpaste was checked for its antibacterial activity against the tooth decaying bacteria *i.e. Porphyromonas gingivalis.* The formulation showed considerable inhibitory effect with a ZOI=40.05±0.12mm at a MIC of 25 µg/mL which was higher than the commercial dabur toothpaste (ZOI 34±0.17mm at a MIC of 25µg/mL) as well as amoxicillin (positive control; 38±0.20mm). Therefore, our study suggested

that the herbal formulation from the *C. nocturnum* oil can be commercialized as toothpaste to prevent the gingivitis.

Keywords: *Cestrum nocturnum*, essential oil, antioxidant, anti-bacterial and formulation of herbal toothpaste