Anti-bacterial and Anti-Quorum Sensing Properties of Dionysia Revolute Boiss against Secondary Bacterial Infections of COVID-19 Patients; An in-vitro Study

Hadi, Nahal . Moradi, Farhad . Rohi Jahromi, Reyhaneh. Akbari, Maryam

Background and Aim: Today, the use of traditional plant compounds to kill or interfere with their quorum sensing (QS) mechanisms is considered as an alternative approach to control secondary bacterial infections during or after a viral infection. In this study, anti-bacterial and anti-quorum sensing effect of Dionysia revolute Boiss against five secondary bacterial infections of COVID-19 patients were evaluated.Materials and Methods: Extraction of the plant compounds was carried out using n-hexane, methanol, and 96% ethanol mixed solvent. Bacterial samples were collected from respiratory tract fluids among COVID-19 patients and recognized with API kits. Antibacterial activity of the herbal extract was assessed by disc diffusion method as proposed by the Clinical Laboratory Standards Institute (CLSL, 2015). Hence, anti-QS activities of this herbal extract at the sub-minimum inhibitory concentration (MIC) were assessed by violacein quantification assay in Chromobacterium violaceum CV026 biosensor strains in vitro.Results: As it has been indicated in the Results section, a plant extract from 50 to 0.39 mg/ml exposed their antibacterial impacts via hindering the bacterial growth in comparison with controls and exhibited anti-QS activities via decreasing the violacein formation in C. violaceum CV026 biosensor strain at sub-MIC concentrations (3.1 to 0.39 mg/ml) in vitro.Conclusion: Our study showed that the antimicrobial activities of Dionysia revolute Boiss could be due to their anti-QS properties. Therefore, this medicinal plant either as a stand-alone treatment or in combination with antibiotics could be used as an efficient choice for curing secondary bacterial infections.

Keywords: Dionysia revolute, Anti-bacterial, Anti-quorum sensing, Secondary bacterial infections, SARS COVID-19