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Investigating of antibacterial effect of Savory under NaCl and SA treatments

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Savory *(Satureja khuzistanica)* is a medicinal plant from the Labiatae family. It has antifungal and antibacterial properties due to phenolic compounds in its essential oils and tannins in the leaves. The purpose of this study is to investigate the antibacterial properties of leaf and stem extracts of *Satureja* using conventional microbiological methods (measuring diameter of inhibition zone). Also, the effect of salinity and salicylic acid on phenolic components (Rosmarinic acid and Cafeic acid) and relative *RAS* gene expression were investigated. The experiment was carried out with two replications and treatment levels of NaCl (100 and 200 mM) with SA concentration (0.05 Mm). Apical part was tissue cultured on Murashige and Skoog medium and then different salinity levels and SA treatment were treated for 14 days. The methanolic extract impregnated discs was affected on Muller-Hinton agar medium containing the bacteria. The applied bacteria in this study includes *Pseudomonas aeruginosa* (ATCC, 27583), *Escherichia coli* (ATCC, 25922), *Enterococcus faecalis* (ATCC, 25923) and *Staphylococcus aureus* (ATCC, 25923). In conclusion, the medicinal components increased under NaCl and SA treatments. Moreover, relative *RAS* gene expression showed the same results as well. The experiment showed that methanolic extract has antimicrobial effects on *Escherichia coli, Enterococcus faecalis* and *Staphylococcus aureus* that would increase under NaCl and SA treatments. *Staphylococcus aureus* and Escherichia coli was formed in inhibition zone with further diameter. The results of experiments showed that Savory can be used as a medicine plant in the treatment of infections due to *Staphylococcus aureus* and *Escherichia coli.*

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