

Reducing effect of soil salinity through using some strains of Nitrogen fixers bacteria and compost on sweet basil plant



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Abstract: This study was carried out during the two successive growing seasons of 2012./ 2013 and 2013/2014 at the farm of Soils, Water and Environ. Res. Inst., Agric., Res. Center in Sahal El-Tina (North of Egypt), to investigate effects of two plant growth promoting rhizobacteris (PGPR) after encapsulating on growth, essential oil %, essential oil yield and its components and chemical compotition of basil *Ocimum basilicum*, cv. "Grand Vert" at three levels of compost (0,20,40 m³/fed) under soil salinity.

Gradual and significant increases in plant height, number of branches, fresh & dry weights per plant, essential oil percentage, and essential oil yield per plant were recorded with increasing the with compost at 20 m³/fed. Also, 40 m³/fed. Compost produced the highest percentages of main components of the essential oil (Linalool, Camphor and Anethol) which resulted under the effect of 20 m³/fed. While the highest percentages of Cineol resulted under the effect of 40 m³/fed compost. Also, compost treatments increased total chlorophyll (a+b), total carbohydrates % and nutrient contents of P and K while reduced the Na., proline and antioxidant activity content compared to the control.

As for two plant growth promoting rhizobacteris (PGPR) *Paenibacillus polymyxa* and *Azospirillum lipoferum* enhanced the above mentioned traits of growth and essential oil. The highest percentages of Linalool, Camphor and Anethol were recorded in essential oil extracted from plants treated with T6 (Combination of microorganisms encapsulated with sodium alginate), while the highest percentages of Cineol resulted under the effect of T7(Combination of microorganisms carried on free suspension) comparing to control. On the other hand, the lowest percentages of these components resulted under the treatment with T4(*Azosprillum lipoferum* carried on free suspensio). In addition that, T6(Combination of microorganisms encapsulated with sodium alginate) increased total chlorophyll (a+b), total carbohydrates % and nutrient contents of P and K but decreased Na content, proline and antioxidant activity content compared to the control.

Interaction treatments of T6 (Combination of microorganisms encapsulated with sodium alginate) with 20 m³/fed compost resulted in significant increases in the above mentioned traits (plant growth, essential oil determinations). The combined between 20 m³/fed compost and PGPR inoculation T6(Combination of microorganisms encapsulated with sodium alginate) gave the highest values of the Linalool and Camphor. While the combined between 40 m³/fed compost and PGPR inoculation T6(Combination of microorganisms encapsulated with sodium alginate) showed the highest values of the Anethol content. Also, the highest values of the Cineol was obtained in the plants which treated by Treatment T7(Combination of microorganisms carried on free suspension) amended with 20 m³/fed compost. In addition, the highest total chlorophyll (a+b), total carbohydrates and Nutrient contents (P and K) were recorded in herbs of treated plants with 20 m³/fed compost and PGPR inoculation T6(Combination of microorganisms encapsulated with sodium alginate). On the opposite, the all tested treatments gave the lowest proline, and antioxidant activity and Na content compared to the control.

Key words : *Ocimum basilicum*, "Grand Vert", capsule, *Azosprillum lipoferum*, *Paenibacillus polymyxa*. compost, chemical composition and essential oil components.

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