EFFECT OF SOIL TYPE AND SALINITY ON GROWTH, YIELD AND CHEMICAL COMPOSITION OF *Artemisia annua* PLANT

By

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B.Sc. Agric. Sci., (Ornamental Horticulture), Fac. Agric., Cairo Univ., 2010

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SUPERVISION SHEET

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ABSTRACT

Effect of soil type and salinity on growth, yield and chemical composition of *Artemisia annua* plant.

Artemisia annua L. (*A. annua*) plant belongs to family Asteraceae. It has several biological properties and important bioactive constituents were isolated from *A. annua* such as artemisinin and essential oil. Salt stress and soil types are the most environmental factors, which has a very high impact on growth, yield and metabolism of medicinal and aromatic plants. More than nineteen percent of different agricultural soils in Egypt have salts as well as irrigation water. In such conditions cultivation of resistant medicinal and aromatic plants is one way to utilize these soils. Therefore the selection of suitable plants, which could cope with these conditions, is a necessity.

In this investigation the possible effects of saline irrigation water and / or soil types on the growth, yield and chemical composition of *A. annua* were evaluated at the Experimental Farm, Faculty of Agriculture, Cairo University and National Research Centre (NRC), Egypt, during 2014 and 2015 seasons.

Artemisia annua plants were exposed to different levels (0.0, 1.6, 3.2, 4.7, 5.3 and 7.9 dS m^{-1}) of saline irrigation water (SIW) under two soil types (clay and sandy loam). Growth characters (Plant height, branch number, fresh and dry mass) as well as chemical composition (essential oil content, artemisinin, photosynthetic pigments, total carbohydrates, total soluble sugars, proline, total flavonoids, total phenolic compounds, free radical scavenging and mineral contents) were recorded.

The interaction between SIW and soil type resulted in various decreases of different growth characters, photosynthetic pigments and nutrients uptake (NPK). Essential oil and its major constituents, total carbohydrates, total soluble sugars, proline, total flavonoids, total phenolic compounds and free radical scavenging were increased with SIW levels under different soil types.

Keywords: *Artemisia annua* L., saline irrigation water, soil types, essential oil, artemisinin and chemical composition.

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