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EFFECT OF DROUGHT STRESS ON SOME MORPHOLOGICAL AND PHYSIOLOGICAL CHARACTERISTICS OF ECHINACEA SPP

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Drought stress is one of the most important environmental stress of plants in arid and semi arid regions that limiting productivity. In order to evaluate the effects of drought stress on two-years old seedlings in four leave stage of *Echinacea purpurea* and *Echinacea angustifolia* plants, an experiment was conducted with four levels of irrigations, 25%, 50%, 75% and 100% of FC (Field Capacity) in completely randomized factorial design with three replications. Several morphological and biochemical traits such as protein content, proline and antioxidant capacity of leaves were measured after three month of drought treatments. Evaluation of flowering indices carried out until the end of growing season. Growth indices such as leaves number, plant height, shoot weight, root weight, shoot dry weight, root dry weight reduced at lower FC in both species, but *E. angustifolia* showed more sensitivity than *E. purpurea*. Effect of drought on flower stem length, flower longevity and flower diameter of angustifolia species was significant. In addition, flowering was not observed *in E. angustifolia* under 50% and 25% Fc treatment and the lowest flowering longevity observed at 75% treatment (16 days) and best flowering quality and longevity observed in *E. purpurea* under 75% Fc treatment (37 days). Protein content decreased in both species when plants exposure to lower irrigation levels. The lowest rate of protein was seen in *E. angustifolia* under 25% FC treatment. Reducing radical scavenging activity by DPPH assay was observed in both of species during higher drought stress, while the highest antioxidant capacity was found in *E. purpurea* under 75%FC. The amount of proline was the highest rate in *E. angustifolia* under 25% FC treatment. According to flower quality, longevity and Antioxidant capacity that were measured in this experiment it seems that *E. purpurea* is more tolerant than *E. angustifolia* to drought stress.

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