**Effect of water stress on the agronomic characteristics and on water use efficiency of four landraces of basil (*Ocimum basilicum)***

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**ABSTRACT**

Water availability is one of the major issues in modern agriculture and especially in Mediterranean countries. In addition, climate change and the scenarios that are proposed show that water availability will be a serious problem for many countries especially in the Mediterranean area. Basil (*Ocimum basilicum* L.) is an aromatic and medicinal crop that is grown widely for its essential oil, dry leaves, and flowers. The objective of the present study was to determine the tolerance of four landraces of basil and a commercial cultivar to water stress under field conditions using agronomic and physiological characteristics. The experiment was conducted at the University farm of Aristotle University of Thessaloniki, Greece during the summer of 2018. The landraces and the commercial cultivar were evaluated using a number of physiological (gas exchange parameters, chlorophyll meter readings, chlorophyll fluorescence, water potential, relative water content) and agronomic traits (dry weight in three different samplings and essential oil content). Two irrigation levels of 40% and 100% of the required evapotranspiration were used for maximum yield (ETm). The availability of water affected the dry weight and chlorophyll content and did not affect chlorophyll fluorescence and the content of essential oils. Chlorophyll content and dry weight showed significant correlation with the yield of essential oils. There was an interaction of leaf area index with genotype and growth stage. The results of the experiment show that the most efficient use of irrigation water can be done by using appropriate genotypes and by applying deficit irrigation. Consequently, it can be concluded that under these conditions the quality and yield of the basil landraces can be maintained at high levels, which confirms that they have a good adaptability to the dry-land conditions of the Mediterranean area.

**Keywords: dry weight, chlorophyll content, chlorophyll fluorescence, essential oil content.**

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