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CHARACTERIZATION OF THE RESPONSE OF WALNUT (*JUGLANS* SPP.) TO SALINITY FOR AGROBIODIVERSITY PRESERVATION AND UTILIZATION IN SALT AFFECTED LANDS

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The percentage of agricultural land afflicted by salinity is increasing in many parts of the world, due to both natural phenomena and agricultural practices, such as the use of brackish irrigation waters. Abiotic stresses reduce plant growth and cause significant crop yield losses. Plants have developed physiological and molecular mechanisms to respond and adapt to abiotic stress conditions (Munns and Tester 2008). Plant sensitivity or tolerance toward salt injury results from coordinated action of these mechanisms that allows the adaptive response to salt. The identification of salt tolerant species is considered as a valuable tool to enhance productivity and develop sustainable agriculture in salt affected lands.

To the genus *Juglans* belong approximately 20 species of walnut with a natural distribution range across the Northern Hemisphere and extending to South America. Some species are commercially important as source of edible walnuts, highly prized timber and also as ornamental trees. Several studies provide evidence of beneficial effects on human health deriving from consume of walnut into dietary patterns due to their nutrients content, such as antioxidant polyphenols (i.e. gallic acid and ellagic acid), monounsaturated and polyunsaturated fatty acids (i.e. linoleic and linolenic acid), fiber, protein, vitamin E, magnesium and low saturated fats and sugars (USDA-ARS 2015).

Walnuts (*Juglans* spp.) are very sensitive species to abiotic stresses, therefore the search of salt-tolerant genetic resources, that can be used successfully in extensive arid and semi-arid regions, is very important for developing and implementing agrobiodiversity conservation strategies of this crop. Thus, in this study we will use *in vitro* cultures as model system to investigate the effect of salinity stress on different micropropagated walnut species and genotypes with the main objective to understand the physiological mechanisms of response adopted by these species to counteract soil salinity that can be used for further selection approaches. Moreover, we will investigate salt or abiotic stress mediators as elicitors of production of compounds that can be associated with health benefits and/or protection against chronic diseases.

Munns R, Tester M (2008). Mechanisms of salinity tolerance. Annual Review of Plan Biology 59: 651–681.

USDA-ARS (2015) US Department of Agriculture, Agriculture Research Service, USDA nutrient data lab, USDA national nutrient database for standard reference, release 28. https://ndb.nal.usda.gov/ndb/foods/show/3689?manu=&fgcd=&ds=.

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