

()

(Olea europaea L.)

**EVALUATION OF STOMATA RESISTANCE, LEAF WATER
POTENTIAL LEVEL AND PROLINE ACCUMULATION IN SIX
IRANIAN NATIVE OLIVE (*OLEA EUROPAEA* L.) CULTIVARS UNDER
DROUGHT STRESS**

(' ' ' ' ' ' ' ' ' ')

/ / : / / :

(hshirzad1354@yahoo.com)

Oleaceae

(*Olea europaea* L.)

()

CO₂

()

()

()

()

()

()

()

...

.()

.()

.()

.()

.()

.....

/

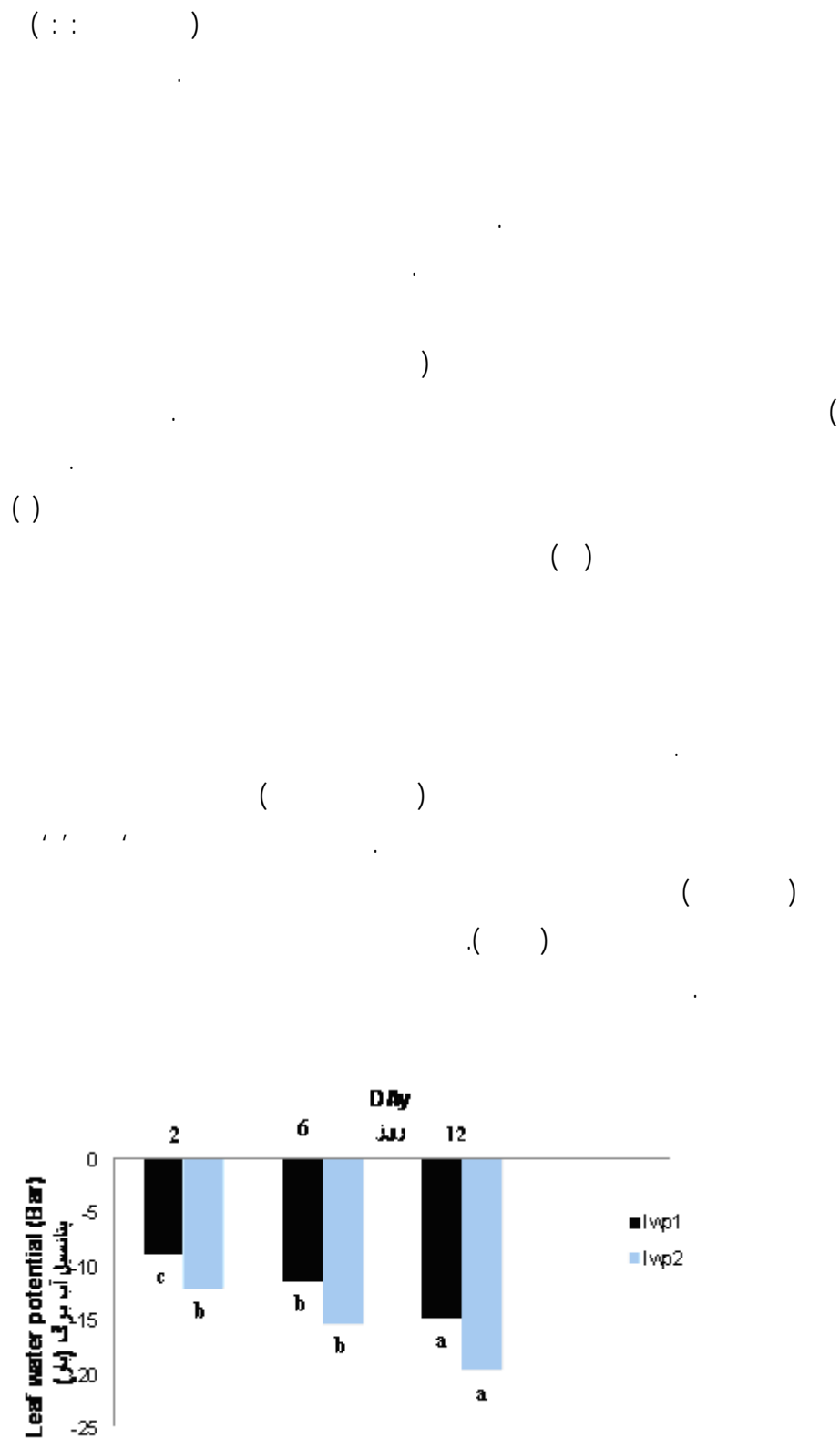


Fig. 1. Mean comparison of leaf water potential in various irrigation levels in two measurements.

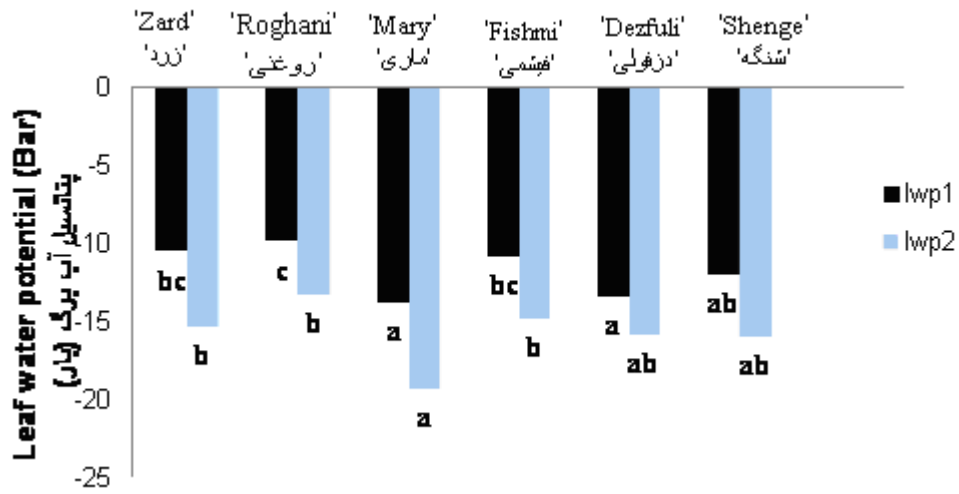


Fig. 2. Mean comparison of leaf water potential in various olive cultivars in two measurements.

()

()

()

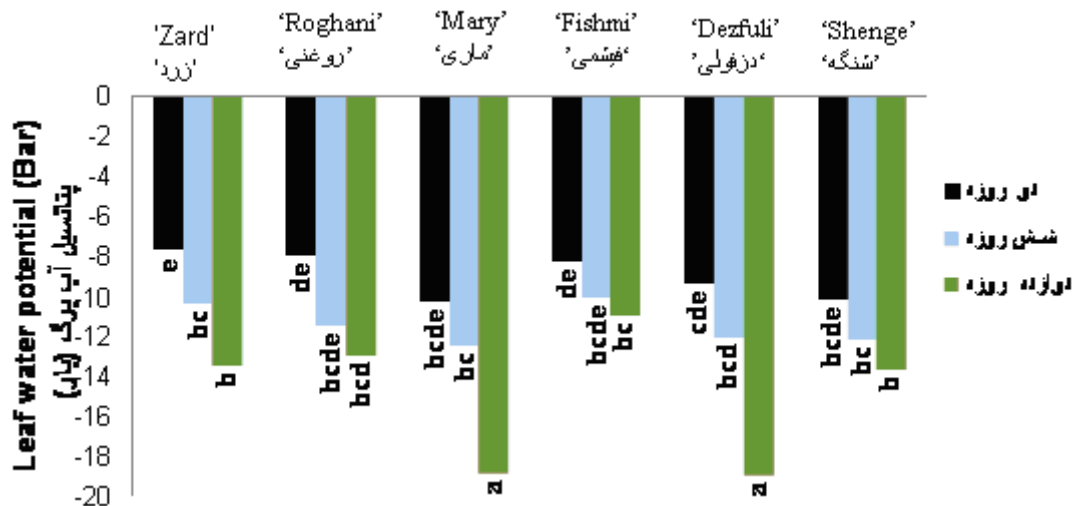


Fig. 3. Mean comparison of leaf water potential in various olive cultivars in irrigation various levels in first measurement.

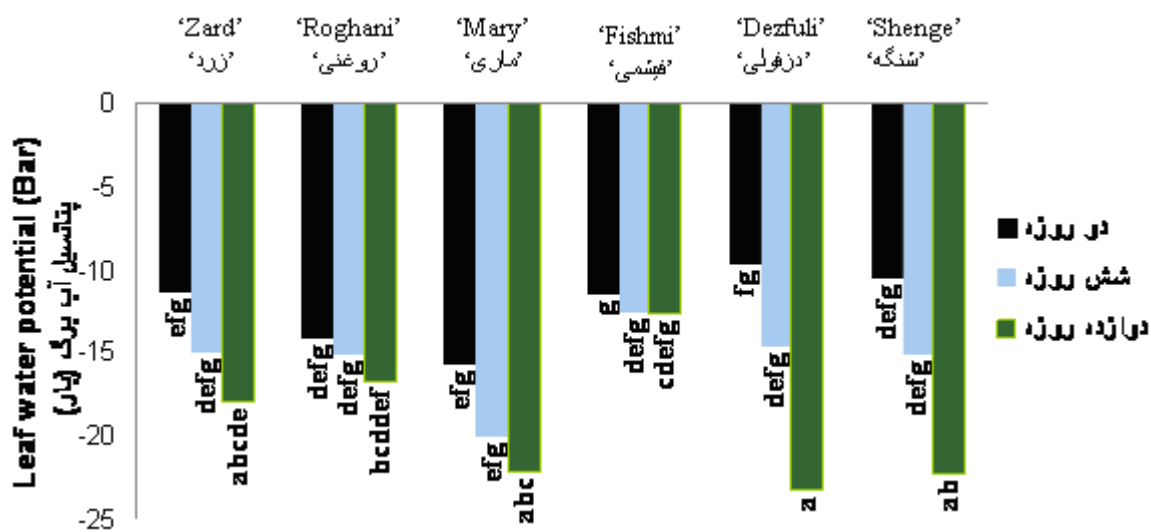


Fig. 4. Mean comparison of leaf water potential in various olive cultivars under various irrigation levels in second measurement.

()

()

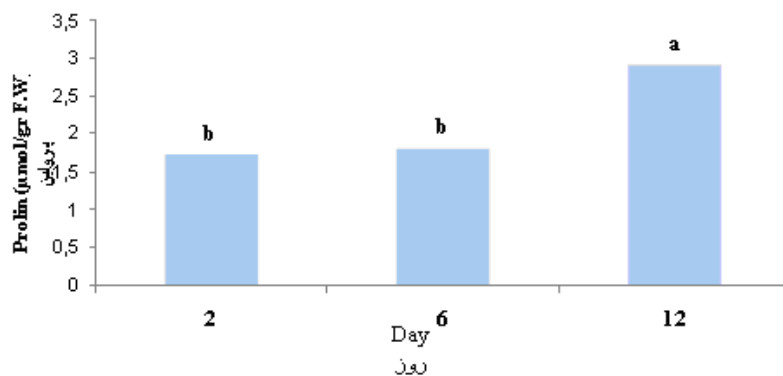


Fig. 5. Mean comparison of proline changes in various irrigation levels.

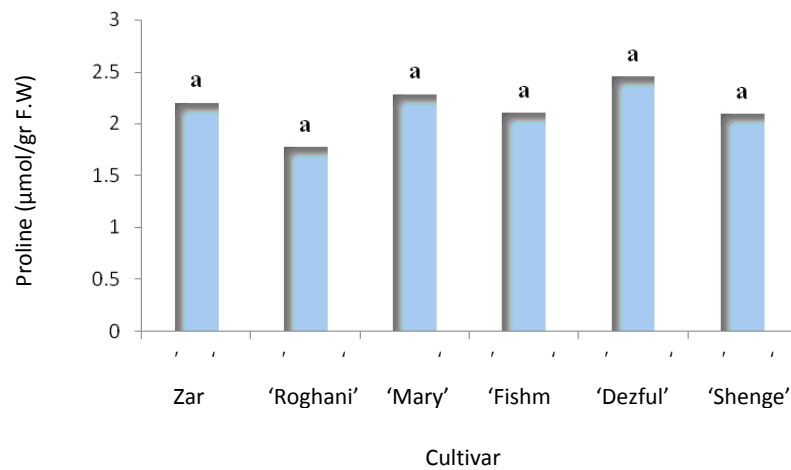


Fig. 6. Mean comparison of proline changes in various olive cultivars.

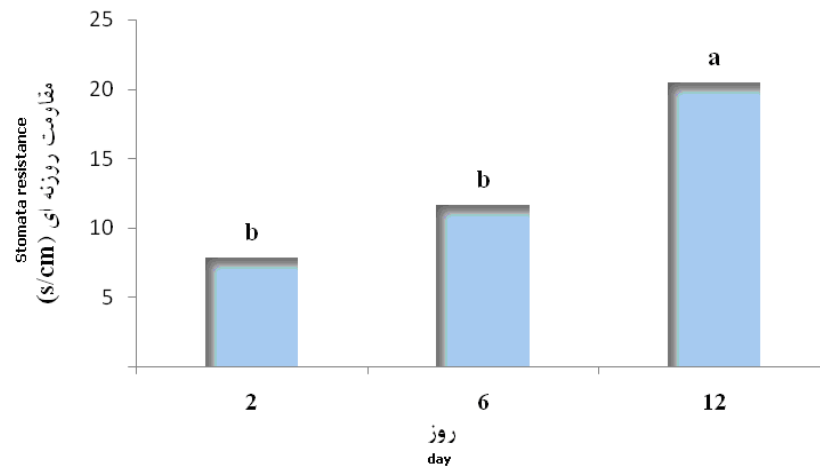


Fig. 7. Mean comparison of stomata resistance changes in various irrigation levels.

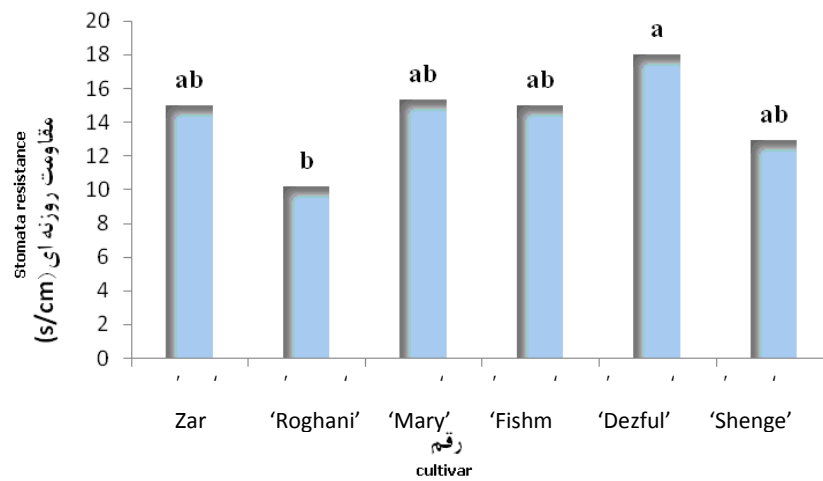


Fig. 8. Mean comparison of stomata resistance changes in various olive cultivars.

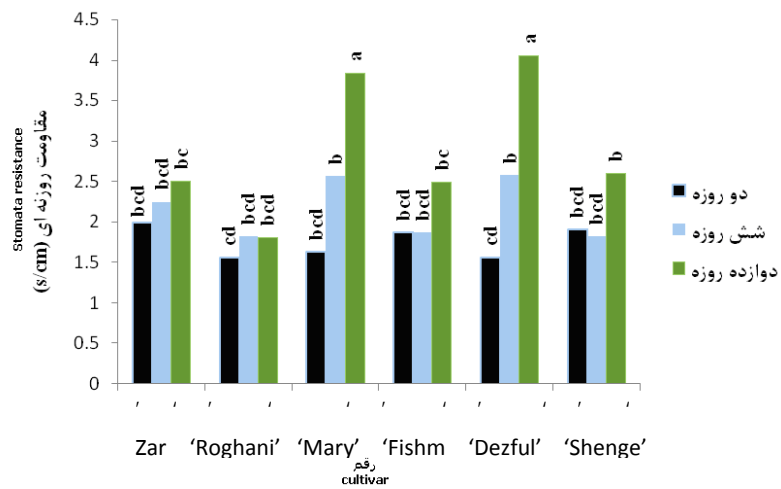
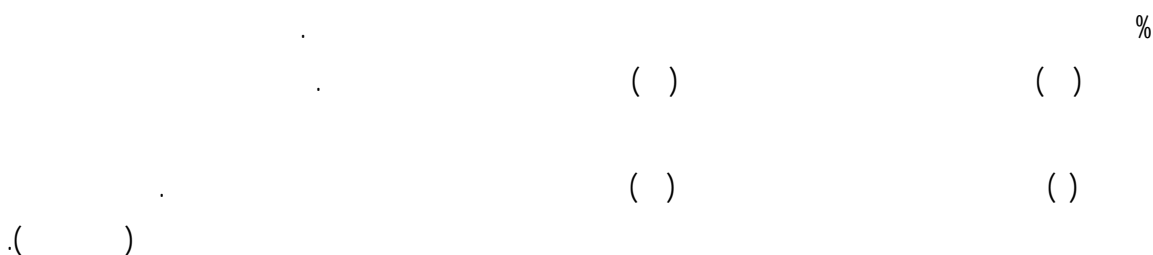


Fig. 9. Mean comparison of stomata resistance changes in olive various cultivars in various irrigation levels.



REFERENCES

3. Al- Karaki, R.N., R.B. Clark and C.Y. Sullivan. 1996. Phosphorus nutrition and water stress effects on proline accumulation in sorghum and bean. *Plant Physiol.*148:745-751.
4. Bates, L.S., R.P. Waldren and I.D. Teare. 1973. Rapid determination of free proline for water stress studies. *Plant and Soil.* 39:205-207.
5. Blum, A. 1996. Crop responses to drought and the interpretation of adaptation. *Plant Growth Regul.* 20:135-148.
6. Bradford, K.J and T.C. Hsiao. 1982. Physiological responses to moderate water stress. In : *Encyclopedia of Plant Physiology.* Lange, O.L., P.S.Nobel, C.B.Osmond and H. Ziegler (eds.) New series. Vol 12b. Springer Verlag. New York. U.S.A. 263-324.
7. Giron, J., J. Marsal, A. Arbones and C. Miravete. 1993. Evaluation of almond seasonal sensitivity to water stress. *Acta Hort.* 449:489-496.

8. Girousse, C., R. Bournvill and J.H. Bonnenmain. 1996. Water deficit induced changes in concentrations in proline and some other amino acids in the phloem sap of alfalfa. *Plant Physiol.* 111:109-133.
9. Handa, S., A.K. Handa, P.M. Hasegawa and R.A. Bressan. 1986. Proline accumulation and the adaptation of cultured plant cells to water stress. *Plant Physiol.* 80:938-945.
10. Hanson, A.D., C.E. Nelson and E.H. Everson. 1977. Influence of free proline accumulation as an index of drought resistance using two contrasting barley cultivars. *Crop. Sci.* 17:720-726.
11. Heuer, B. 1993. Osmoregulatory role of proline in water and salt stressed plants. In: *Handbook of Plant and Crop Stress*. Pessarakli, M. (ed.) Marcel Dekker Inc. New York, U.A.S. 363-381.
12. Levitt, J. 1980. *Responses of Plants to Environmental Stresses*. Vol II, 2nd ed. Academic Press. London, U.K. 497 p.
13. Levy, Y. 1980. Field determination of tree proline accumulation and water stress in lemon tree. *Hort. Sci.* 15:302-303.
14. Marsal, J., J. Girona and M. Mata. 1997. Leaf water relation parameters in almonds compared to hazelnut trees during a deficit irrigation period. *J. Amer. Soc. Hort. Sci.* 122: 582-587.
15. McMichael, B.L. and C.D. Elmore. 1977. Proline accumulation in water stressed cotton leaves. *Crop Sci.* 17:905-908.
16. Paleg, L.G. and D. Aspinall. 1981. *The Physiology and Biochemistry of Drought Resistance in Plant*. Academic Press. London, U.K.
17. Parsons, L.R. 1980. Plant response to water stress. In: Levitt, J. (ed.) *Response of Plant to Environmental Stresses*. 2:175-193.
18. Sanchez-Blanco, M.Y., M.C. Ruiz-Sanchez, J. Planen and A. Torrecillas. 1991. Water relation of two almond cultivars under anomalous rainfall in non-irrigation culture. *J. Hort. Sci.* 64:667-671.
19. Schwabe, W.W. and S.M. Lionakis. 1996. Leaf attitude in olive in relation to drought resistance. *J. Hort. Sci.* 71:157-166.
20. Sivaramakrishnan, S., V.Z. Patell, D.J. Flower and J.M. Peacock. 1988. Proline accumulation and nitrate reductase activity in contracting sorghom lines during mid- season drought stress. *Plant Physiol.* 74:418-420.
21. Stewart, C.R. and A.D. Hanson. 1980. Proline accumulation as a metabolic response to water stress. In: Turner, N.C. Kramer, P.J. (eds). *Adaptation of Plant to Water and Temperature Stress*. John Willey & Sons. New York, U.S.A. 173-189.
22. Syvertsen, J.P. and M.H. Smith. 1983. Environmental stress and seasonal changes in proline accumulation of citrus tree tissue and juice. *J. Amer. Soc. Hort. Sci.* 108:861-866.
23. Tardieu, F. and W.J. Davies. 1993. Root-Shoot communication and whole-plant regulation of water flux. In: Smith J.A.C. and H. Griffiths (eds) *Water Deficit, Plant Response from Cell to Community*. BIOS. Sci. Pub. Ltd. London, U.K. 147-162.
24. Tombesi, A., P. Proletti and G. Nottiani. 1986. Effect of water stress on photosynthesis, transpiration, stomatal resistance and carbohydrate level in olive trees. *Olea* 17:35-40.
25. Turner, N.C. 1988. Measurement of plant water status by the pressure chamber technique. *Irrig. Sci.* 9:289-308.
26. Zue, G.L. and J.S. Boyer. 1992. Enlargement in chara studied with a turgor-clamp. Growth rate is not determined by turgor. *Plant Physiol.* 100:2071-2080.