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Water stress and degradation rates in different populations seeds of oriental beech (*Fagus orientalis* Lipsky.)

Ebru Bal[1,*], Nezahat Turfan[2], Sezgin Ayan[3], Ebru Çalışkan[1]

[1] Kastamonu University, Institute of Sciences,ForestEngineeringDepartment, Kastamonu, Turkey
[2] Kastamonu University, Faculty of Art & Science, Department of Biology, Kastamonu, TURKEY
[3] Kastamonu University, Faculty of Forestry, Silviculture Department, Kastamonu, TURKEY
[*] Corresponding author: ebru-571@hotmail.com

Abstract: Many factors that affecting the seed quality and vitality are influential on seed characteristics in ecological conditions, where the population is exposed.Seed characteristics can also provide practical and theoretical information about the population that it represents. In this study, it was aimed to examine the water stress (proline level) and deterioration rates (MDA and H_2O_2) of *Fagus orientalis* L. seeds collected from six different localities (Sinop, Sinop-Türkeli, Sinop-Ayancık, Kastamonu-Bozkurt, Kastamonu-İneboluandKastamonu-Cide). Proline, lipid peroxidation (malondialdehyde-MDA) level and hydrogen peroxide (H_2O_2) concentration were measured in the seeds. To do this, the coat of the seeds are removed, milled and powdered. Then in samples; the experiments carried out for proline, MDA and H_2O_2 assays were carried out in three replicate. At the end of the study, the highest proline amount was found in the populations od seed collected from Sinop-Ayancık (239.6 µmol), Kastamonu-Bozkurt (202,71 µmol) and Kastamonu-Inebolu (129,63 µmol),while the lowest proline was detected in seeds collected from Sinop (81,27 µmol), Kastamonu-Cide (93,62 µmol) and Sinop-Turkeli (127,69 µmol); the highest MDA levels were found in seed samples collected from Kastamonu-Bozkurt (2,14 µg), Kastamonu-Inebolu (2,12 µg) and Sinop-Ayancık (1,98 µg), the lowest MDA levels were found in seed samples representing Sinop (1,69 µmol), Kastamonu-Türkeli (1,81 µmol) and Kastamonu-Cide (1,83 µmol) populations. While the highest H_2O_2 concentrations values were measured in samples taken from, Kastamonu-Cide (2.78 µmol), Kastamonu-Inebolu (2.46 µmol) and Sinop (2.36 µmol), the lowest values were determinedin samples taken from Sinop-Türkeli (2,19µmol), Kastamonu-Bozkurt (2,19 µmol) and Sinop-Ayancık (2,35 µmol). From the obtained data, seed samples collected from Sinop, Kastamonu-Cide and Sinop-Turkeli according to proline values and seed samples collected from Kastamonu-Bozkurt, Kastamonu-İnebolu and Sinop-Ayancık according to the amount of MDA and depending on the concentration of H_2O_2, it was concluded that structural deterioration occurred in seed collected from Kastamonu-Cide, Kastamonu-Inebolu and Sinop. In the light of on the data all values, it is suggested that the chemical components of the seed vary according to their growth conditions and seed characteristics are affected by many factors. In addition, the high level of proline found in the seed content against the stress factors of the growing environment suggests that the osmotic regulatory role of Sinop-Ayancık and Kastamonu-Bozkurt populations is therefore more capable of adaptation.
Keywords: Bean seeds, Prolin, MDA, H_2O_2