S131 (P010) Morphophysiological changes of Lippia citriodora L. plants to foliar application of polymeric biostimulants under cold stress

Hanieh Rafiee (1)*, Ali Mehrafarin (2), Hassanali Naghdi Badi (2), Heshmat Omidi (3), Farahnaz Khalighi Sigaroudi (2), Mohammad Taghi Khosravi (4), Esmaiel Jabbari (5), Mahsa Roodbaraki (1)

(1)Department of Horticulture, Science and Research Branch, Islamic Azad University, Tehran, IRAN (Hanieh_r20032003@yahoo.com)
(2) Medicinal Plants Research Center, Institute of Medicinal Plants, ACECR, Karaj, IRAN
(3)Faculty of Agriculture, Shahed University, Tehran, IRAN
(4)Department of Horticulture, Faculty of Agriculture, Karaj branch, Islamic Azad University, Karaj, IRAN
(5) Biomimetic Materials and Tissue Engineering Laboratories, Department of Chemical Engineering, University of South Carolina, Columbia, South Carolina 29208, United States

To investigate the effect of polymeric biostimulants on morphophysiological traits of lemon verbena (Lippia citriodora L.) plants under cold stress, three experiments were conducted on the basis of randomized complete blocks design (RCBD) in three replications. The treatments were ethylene glycol (EG) and glycerol (GLY) in 3 levels (0, 3%w/v and6%w/v) for the 1st experiment, glycerol (GLY) in 3 levels (0, 3%w/v and 6%w/v) for the 2nd experiment and GLY and PVA in three levels (0, 3%w/v and 6%w/v) for the 3rd one. The effects of treatments were significant on all of traits. The results of the 1st experiment showed the maximum relative water content (RWC) (69.92%) and leaf area (54.66 cm2) at3%w/v EG and the chlorophyll a (1.13mg), chlorophyll b (0.92 mg), and total chlorophyll (1.84 mg) content at 6%w/v GLY. In the 2nd experiment the greatest total chlorophyll (1.84 mg), total carotenoids (1.22 mg), lycopene 503(0.06 mg), lycopene 470 (0.40 mg), lycopene 450 (0.64 mg), β-carotene (0.42 mg) and anthocyanine (1.66 mg) was observed in plants treated by 6%w/v GLY, while in the 3rd study the highest amount of leaves fresh and dry weight (13.81 g.plant-1and 2.07 g.plant-1), shoot fresh and dry weight (24.28 g.plant-1 and 8.08 g.plant-1), and total fresh and dry weight (26.68 g.plant-1and 8.62 g.plant-1) was attained at 3%w/vPVA. The greatest stems fresh and dry weight (12.72g.plant-1and 6.58 g.plant-1) was observed at 6%w/vGLY. These results showed the biostimulative effect of polymeric substances on medicinal plants.

Key words: Cold stress, Lippia citriodora L., Polymeric biostimulants