PA-58

The Potential of Melatonin, Chitosan, and N-acetylglucosamine in Alleviating Heavy Metal Stress in Soybean(*Glycine max* L.)

Jin Ryeol Jeon[1], Ji-In Woo[1], Ho-Jun Gam[1], Eun-Hae Kwon[1], Sang-Mo Kang[1], In-Jung Lee[1]*

[1]Dep. of Applied Biosciences, Kyungpook National University, Daegu 41566, Korea

[Introduction]

This study investigates the potential of Melatonin(MT), Chitosan(Chi), and N-acetylglucosamine(NAG) in alleviating heavy metal stress in soybean(*Glycine max* L.). Heavy metal contamination in farmland is a serious problem, and excessive amounts can have harmful effects on crop yields. The functions of MT, Chi, and NAG include promoting plant growth and enhancing antioxidant enzyme activity. Our research team aims to reduce heavy metal stress in soybean by treating MT, Chi, and NAG with these substances.

[Materials and Methods]

After soaking soybean seeds in DW, 50uM of MT, 0.1% (w/v) of Chi, 0.1% (w/v) of NAG, MT(50uM)+Chi(0.1%(w/v)), and MT(50uM)+NAG(0.1%(w/v)) solutions for 24 hours, they were treated with Cd stress solution (0uM, 100uM, 200uM) by adding 10mL of the solution. The germination rate, germination speed, and mean germination time(MGT) were observed for 5 days, and the fresh weight, shoot length, and root length were measured.

[Results and Discussion]

In all treatment groups, a reduction in Cd stress was observed, with particularly significant effects in the MT+Chi and MT+NAG treatment groups. The MT+Chi treatment group showed an 85% increase in germination rate and a 47% increase in fresh weight compared to the Cd stress treatment group. The MT+NAG treatment group exhibited a 114% increase in germination rate and a 69% increase in fresh weight compared to the Cd stress treatment group. Therefore, the treatment of plant organisms with MT, Chi, and NAG is believed to alleviate heavy metal stress and increase crop yields.

*Corresponding author: E-mail. ijlee@knu.ac.kr Tel. +82-053-950-5708