عنوان مقاله:

Epichloë Endophyte Modifies Antioxidative Defense and Aquaporin Genes Expression in Response to Ni Contamination in Lolium perenne

محل انتشار:

مجله فرآیند و کارکرد گیاهی, دوره 10, شماره 43 (سال: 1400)

تعداد صفحات اصل مقاله: 9

نویسندگان:

Maryam Salehi - *Department of Plant Sciences, Faculty of Sciences, Shahrekord University, Iran*

Leila shabani - *۱Department of Plant Sciences, Faculty of Sciences, Shahrekord University, Iran ۲Research Institute of Biotechnology, Shahrekord University, Shahrekord, Iran*

mohammad reza Sabzalian - *Department of Agronomy and Plant Breeding, College of Agriculture, Isfahan University of Technology, Isfahan ۸۴۱۵۶-۸۳۱۱۱*

خلاصه مقاله:

The aim of this study was to determine the impacts of endophyte (E) inoculation on Nickel tolerance of the Lolium prenne by measuring the physiological and biochemical traits in two populations of ryegrass consisting both (E-) and (E+) plants cultivated under Ni stress. The plants were grown in a Ni polluted soil at ۰, ۳۰, ۹۰ and ۱۸۰ mg Ni kg -۱. The present research showed that the activity of antioxidant enzymes increased in Ni treated plants in contrast to control plants; whereas the activity of glutathione reductase enzyme decreased. Also, endophyte infection increased the activity of some antioxidant enzymes but decreased the activity of SOD enzyme. Upregulation of aquaporin gene (LpTIP۱;۱) was shown in population ۱ E+ plants at all treatments and ۳۰ ppm Ni in E- plants, whereas, the expression of LpTIP۱;۲ in population ۱ E- plants increased and no significant difference was shown for E+ plants. After ۳ months from treating plants, considerable reduction in shoot biomass of E+ and E- plants was observed in ۱۸۰ ppm Ni and endophyte inoculation decreased the biomass of plants. The shoot water content of E- plants was greater than E+ counterparts. A significant increase of Ni concentration of roots and shoots was also observed under Ni stress and the Ni concentration of E+ plants was ۸۸.۷% and ۱۲.۷% greater in shoots and roots, respectively, than in E- plants. Overall, results suggest that variation in response to Ni stress in E+ and E- ryegrass populations may aid survival of the grass under stress conditions.

کلمات کلیدی:

Keywords: Aquaporin, Endophyte, Epichloe festuca, Nickel, Reygrass