



The effect of different concentrations of Mn on yield and growth rate of Arabidopsis plants

Samane Eskandari¹, H. Hofte²

¹ Soil Science department, Agriculture College, Isfahan University of Technology, Isfahan, Iran

² PI cell wall group, Jean-Pierre Bourgin Institute, INRA-Agro Paris Tech, Univ. Paris-Saclay, Versailles, France

Abstract:

Manganese (Mn) is an essential element for growth and development of plants. This micronutrient plays a key role in activation of more than 35 enzymes in plants (Millaleo et al. 2010). The action of these enzymes induces the important biological and physiological functions in plants. Some of these functions have been recognized in Arabidopsis as model plant (Delhaize et al. 2007; Lanquar et al. 2010). The current experiment was conducted to investigate the effect of Mn at different concentrations on growth and yield of Arabidopsis plants. For this purpose, Arabidopsis seeds (cv. Colo) were germinated on medium culture containing 0, 70, 200 and 600 μM Mn as MnSO_4 in light and dark rooms. After one week, the fresh weights and root length (for light-grown seedlings) as well as hypocotyl length (for dark-grown seedlings) were recorded. The yield index of plants was calculated by dividing the fresh weight of seedlings by percentage of seed germination. Results showed that the yield index of Arabidopsis plants grown in light room remained unchanged up to 200 μM Mn, while, by application of 600 μM Mn a decrease was observed in plant yield. For the seedlings cultured in dark room, the same trend was also observed.

Although application of 70 and 200 μM Mn had no significant effect on root and hypocotyl lengths of Arabidopsis seedlings, the use of 600 μM Mn decreased the amount of these parameters. These results revealed that this concentration of Mn (600 μM) may be toxic for Arabidopsis seedlings (Peiter et al. 2007). However, more studies is needed for characterizing the toxic threshold level of Mn in Arabidopsis plants.

Biography:

Samane Eskandari is a researcher by profession and works with one of the scientific institute in Iran. He holds a PhD in Soil Science and Plant Nutrition from Isfahan University of Technology and has additionally worked as visiting scholar in Institute Jean-Pierre Bourgin/INRA/Agro Paris Tech/University of Paris Saclay for 6 months.



Samane has 13 published articles in national and international journals and two manuscripts under review in ISI journals. She has also reviewed some papers submitted to ISI journals. She has presented 14 short papers and abstracts in national and international conferences. Samane grew up in Tehran, capital of Iran and is passionate about discovering the novel strategies to achieve sustainable agriculture.

Publication of speakers:

1. Delhaize E, Gruber BD, Pittman JK, White RG, Leung H, Miao Y, Jiang L, Ryan PR, Richardson AE. 2007. A role for the AtMTP11 gene of Arabidopsis in manganese transport and tolerance. *The Plant Journal*; 51: 198-210.
2. Lanquar V, Ramos MS, Lelievre F, Barbier-Brygoo H, Krieger-Liszka A, Kraemer U, Thomine S. 2010. Export of vacuolar manganese by AtNRAMP3 and AtNRAMP4 is required for optimal photosynthesis and growth under manganese deficiency. *Plant Physiology*; 152: 1986-1999.
3. Millaleo R, Reyes DM, Ivanov AG, Mora ML, Alberdi MA. 2010. Manganese as essential and toxic element for plants transport, accumulation and resistance mechanisms. *Journal of Soil Science and Plant Nutrition*; 10 (4):470-481.
4. Peiter E, Montanini B, Gobert A, Pendas P, Husted S, Maathuis FJM, Blaudez D, Chalot M, Sanders D. 2007. A secretory pathway-localized cation diffusion facilitator confers plant manganese tolerance.

Emerging Trends in Plant Science and Natural Products Research, March 19-20, 2020; London, UK

Citation: Samane Eskandari; The effect of different concentrations of Mn on yield and growth rate of Arabidopsis plants; Natural Products 2020; March 19-20, 2020; London, UK