BEHAVIOR OF CERTAIN NUTRITIONAL ELEMENTS IN RELATIONSHIP TO SOME POLLUTANT ELEMENTS AND REFLECTION ON THE NUTRITIONAL STATUS OF PLANT

By

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B.Sc. Agric. Sci. (Soil Science), Ain Shams University, 2003

M. Sc. Agric. Sci. (Soil Science), Ain Shams University, 2009

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ABSTRACT

Suzan Ali El-Sayed Ahmed. Behavior of Certain Nutritional Elements in Relationship to Some Pollutant Elements and Reflection on the Nutritional Status of Plant. Unpublished Doctor of Science. Thesis, Soils Dept. , Fac. Agric. , Ain Shams Univ. , 2017.

Multi-series excised root experiments followed by short term adsorption experiments and pot experiments were conducted to study the adsorption and absorption of some heavy metals (cadmium and zinc) and interactions with macronutrients (potassium and phosphorus). The study involved evaluation for the uptake and adsorption of such heavy metals; effects of either potassium or phosphorus interactions on mechanics and kinetics of the indicated heavy metals were undertaken.

The study included evaluation for maximum uptake velocity constant (V_{max}) and Michaelis constant (K_m) as well as their responses to some environmental factors including concentration of the studied ions in the absorption media and absorption period.

Responses of adsorption rate of both Cd and Zn to certain environmental conditions were studied, such conditions being the applied ion concentration in the concerned solution, equilibrium concentration and interaction with other elements represented by potassium and phosphorus. Investigations were performed through evaluating the responses of ion adsorption to ion concentration in the concerned solution, this studies being carried out through evaluation for both a_{max} (the maximum adsorption) and b (binding energy constant of Langmuir isotherm model).

The responses of plant growth, element status at heading growth stage of wheat plant to application of both indicated elements (cadmium and zinc) and interactions with both potassium and phosphorus, respectively, were also evaluated.

Key words: Cadmium, Zinc**,** Potassium, Phosphorus, Excised roots, Uptake mechanics, Uptake kinetics, Barley, Adsorption, Langmuir equations Adsorption, Wheat, Plant growth, Nutrient Status.

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