

STATISTICAL ANALYSIS OF SOME HEAVY METALS TOXICITY ON PLANTS USED IN PHYTOREMEDIATION

¹Cristina GHINEA*, ¹Mihaela ROȘCA, ¹Petronela COZMA,
¹Elena-Diana COMĂNIȚĂ UNGUREANU, ¹Mariana MINUȚ,
¹Camelia SMARANDA, ¹Mariana DIACONU, ^{1,2}Maria GAVRILESCU

Abstract. *Statistical analysis of data resulted from laboratory tests of three heavy metals (Cd, Pb, Ni) toxicity for a plant form Brassicaceae family, namely Brassica rapa (rape) was performed, using Minitab 18 software, as well. This analysis is justified since plants can be used in soil, water bioremediation by phytoremediation, when it is necessary to know the ability of plants to bioabsorb heavy metals and to face their toxicity. The collected data were processed by regression analysis to determine how the response variable changes when the predictor varies. In this case, the input variables are the concentration of heavy metals (Cd(II), Pb(II) and Ni(II), expressed in mg/L) and dry biomass of plant (g), and the response variable can be the length of roots or stems of rape. The analysis showed that the variables are moderately correlated and the influence of plant biomass on roots and stems growth can be neglected.*

Keywords: phytotoxicity, statistical analysis, root, stem, biomass

1. Introduction

1.1. Heavy metals in the environment

Heavy metals are among stable pollutants that are not subject to degradation processes, resulting in their concentration exceeding normal levels in soil, water and sediment, due mainly to massive industrialization and other related human activities [1].

Heavy metal pollution of living environments is due to both anthropogenic and natural activities. These pollutants are considered a "hazard to environmental health" and are included in the priority list of dangerous substances in the top 10 positions by the Agency for Toxic Substances and Diseases (ATSDR). According to information provided by IARC, most heavy metals are included in the list of substances classified according to their potential to cause cancer. Cadmium and

*Corresponding authors: cbghinea@yahoo.com, mgav@tuiasi.ro

¹„Gheorghe Asachi” Technical University of Iasi, “CristoforSimionescu” Faculty of Chemical Engineering and Environmental Protection, Department of Environmental Engineering and Management, 73 Prof. D. Mangeron Blvd., 700050, Iasi, Romania

²Academy of Romanian Scientists, 54 Splaiul Independentei, 050094 Bucharest, Romania
