

Determination of heavy metal pollution in water, soil and plants of vegetable gardens in Ardabil

Authors:

Hassan Attarnia¹ and
Ebrahim Fatai²

Institution:

1. Department of
Environment, Department of
Agriculture, Islamic Azad
University, Ardabil, Iran.

2. Department of
Environmental sciences,
Ardabil Branch, Islamic
Azad University, Ardabil,
Iran.

Corresponding author:

Ebrahim Fatai

ABSTRACT:

Food security in a growing population with limited natural resources is one of the most important issues of the world. Accumulation of heavy metals in food and their concentrations increase and reaching to a risk limit can threaten human health. The purpose of this study, is to study the heavy metals lead and cadmium in vegetables, cultured on spinach and watercress at 10 Gardens of Ardabil. This study is cross-sectional and 81 samples in water, soil, and spinach and watercress were prepared during the months of June, July and August in 2015 and after preparation according to the standard methods and using atomic absorption spectrophotometer (Perkin Elmer) for the determination of heavy metals. SPSS software was used for data analysis. The results showed that the mean level of lead and cadmium in all samples were less than the EPA standard. Between studied orchards in terms of the amount of cadmium and lead no statistically significant different was seen. The independent t-test showed that in terms of cadmium between two species of spinach and watercress there found a significant difference at the 5% level so that the amount of cadmium in spinach was more than the watercress. Since the concentration of heavy metals in all samples at second and third stages in July and August were zero, but in the first step in June, the amount of heavy metals have been found in some samples showed that all three samples of first cut had more contamination than second and third cut. And in this case, the concentration of heavy metal pollution in hibernation at vegetable gardens Ardabil is possible. The results of spinach cadmium amount in the first cut in the three garden of viz., 3, 6 and 10 showed that in the garden (3), the amount of cadmium in water is higher than the standard and is concentrated in spinach and the gardens of 6 and 10 Cadmium in the soil of the gardens, is slightly higher that is condensed in spinach thus it can be considered that spinach in terms of cadmium has bioaccumulation.

Keywords:

Bioaccumulation, Cadmium, Lead, Spinach, Cress, Ardabil.