

THE EFFECT OF SOIL CONTAMINATION LEVEL AND PLANT ORIGIN ON
CONTENTS OF ARSENIC, CADMIUM, ZINC, AND ARSENIC COMPOUNDS IN
MENTHA AQUATICA L.

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Abstract: Water mint (*Mentha aquatica* L.) belongs to the arsenic tolerant plant species suitable for cultivation in Central European climate conditions. Therefore, its possible application for remediation of contaminated soil was investigated in pot and field experiments. Two *M. aquatica* plants of different origin, i) commercially market-available mint plants, and ii) plants habituated at the arsenic contaminated former mining area in southern Tuscany (Italy) were tested for their arsenic uptake, transformation, and speciation. The total arsenic concentrations in the experimental soils varied from 21 to 1573 mg As kg⁻¹, the mobile fractions did not exceed 2% of total soil arsenic. The mint plants originating from the contaminated area were able to remove ~400 µg of arsenic per pot, whereas the commercial plant removed a significantly lower amount (~300 µg of arsenic per pot). Only arsenite and arsenate, but no organoarsenic compounds were identified in both stems and leaves. Arsenate was the predominant arsenic compound and reached up to 80% regardless of the origin of the mint plants. Although *M. aquatica* seems to be able to grow in contaminated soils without symptoms of phytotoxicity, its efficiency to remove arsenic from the soil is limited as can be demonstrated by total elimination of As from individual pots not exceeding 0.1%. Moreover, the application of plants originating from the contaminated site did not result in sufficient increase of potential phytoextraction efficiency of *M. aquatica*. Although not suitable for phytoextraction the *M. aquatica* plants can be used as vegetation cover of the contaminated soil at the former mining areas.