

Information bank of phytoremedial plants in arid and semi-arid rangeland ecosystems

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Introduction

Accumulation of heavy elements by human activities in ecosystems and food chains created hazards for human, plants and ecosystems. Among different methods of managing heavy elements in the environment, using phytoremedial plants has emerged as an efficient way to reduce the concentration of heavy metals in soils (Shtangeeva, 2008). This research examines the efficiency of this heavy metal reduction strategy in dry rangeland ecosystems.

Methods

We collected data from rangeland species growing in arid and semi-arid ecosystems to identify those with the capability to accumulate heavy elements. We have prepared a database for these rangeland plants through compiling a variety information derived from source around the world.

Results

The data showed that shrubs had the most ability to absorption of Mo, Cd and Cu to herbs, scrub and trees forms (Table 1). Overall, the *Poaceae* (*gramineae*) family had the most absorptive species compared to other families. This family use extraction mechanism for element absorption (Table 2). Among plant organs, leaves had the most ability to absorption Cu whereas roots have the highest absorption of Cd and Mo in the species reviewed (Fig. 1).

Conclusion

Determination of plants that absorb heavy elements is important because these plants can help in environment management for cleaning up polluted sites (Suresh and Ravishankar 2004). Some rangelands ecosystems are located along the mine. This caused to rangeland pollution and destructs these ecosystems. Thus, use of heavy elements absorbing species is a good way for improvement of these habitats (Suresh and Ravishankar, 2004).

References

- Shtangeeva I (2008) Uptake of uranium and thorium by native and cultivated plants. *Environment Activity* 32-39.
- Suresh B, Ravishankar G (2004) Phytoremediation a novel and promising approach for environmental clean-up. *Critical Reviews in Biotechnology* 24, 97-124.

Table 1. Percentage of vegetative forms to absorption of Cu, Cd and Mo.

Vegetative forms (%)	Cd	Cu	Mo
Herb	23.2	26.0	55.6
Shrub	69.6	68.1	44.5
Scrub	20.2	3.0	-
Trees	41.0	3.0	-

Table 2. The plant families observing Cu, Cd and Mo.

Family	Cd	Cu	Mo
<i>Poaceae</i>	13	14.37	-
<i>Asteraceae</i>	8	10.17	-
<i>Labiatae</i>	5	7.17	-
<i>Fabaceae</i>	4	4.78	33.34
<i>Lemnaceae</i>	3	3.59	-
<i>Brassicaceae</i>	11	2.98	-
<i>Cyperaceae</i>	3	2.98	-
<i>Plantaginaceae</i>	-	2.39	-
<i>Euphorbiaceae</i>	-	2.39	-
<i>Polygonaceae</i>	-	2.39	-
<i>Salvinaceae</i>	-	2.39	-
<i>Patamogetanaceae</i>	5	-	-
<i>Nymphaeaceae</i>	3	-	-

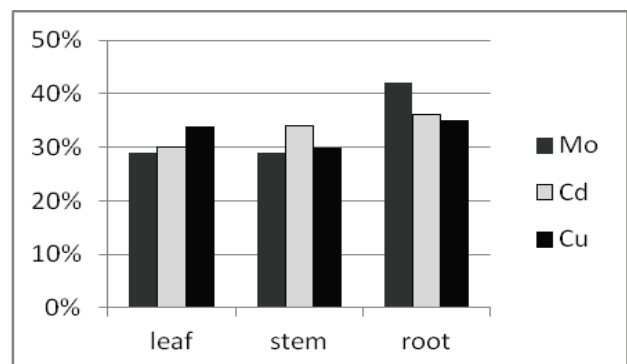


Figure 1. Frequency percentage of heavy element observation in different parts of studied species