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Phytoremediation of reclaimed coal dumps in Western Donbass

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Introduction

Objective: Phytoremediation by phytostabilization of heavy metals and other toxic elements;

Idea: To increase a stabilization capacity of heavy metals by roots of native plants growing on reclaimed coal dumps in Western Donbas; ;

Task:

- to study the physical-and-chemical parameters of soil substrates used for coal dump reclamation in Western Donbas, in particular black soil and red-brown clay;
- to investigate the Bioconcentration Factors, Translocation Factors and Tolerance Index of indicator plants;
- to compare the different additions to soil substrate in order to increase the phytostabilization by testing in model laboratory experiments examples of different biosorbents and bioremediants.

Methods

- 1) Growth Test;
- 2) Compare different methods (biochar, biocompost) for increasing of phytostabilization^[1,2]
- 3) Physico-chemical analysis (pH, heavy metals concentrations, Bioconcentration Factors, Translocation Factors and Tolerance Index).

Expected results

- 1) Decrease concentration active heavy metals and toxic elements in soil;
- 2) Increase concentration heavy metals and toxic elements in plants biomass;

Discussion

- What may be specific limitations for a successful bioreclamation of coal waste dumps in Western Donbass, Ukraine? How can these limitations be overcome?
- Which approach of bioremediation is more appropriate for studied conditions: phytoaccumulation/phytoextraction or phytostabilization?
- What is the potential of rhizosphere in heavy metals stabilization?

Conclusion

The obtained results will be the basis for the development of a technology for phytostabilization of heavy metals at the coal dumps of Western Donbas

Reference

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