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Title: Phytomining as a technology of dump revitalization in dredging gold mining

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Keywords:
Phytomining, dump, revitalization, dredging, gold mining

Research Objective:

Today we can find in literature that the gold mining volume in decreasing for the last few years, so the necessity of improving technology for gold mining is increasing. Gold mining enterprises need in effective technology for gold microparticles mining from dump. The authors believe that the technology of bio mining of minerals and the innovative phytomining technology can solve this problem. Phytomining is the using of plant for commercial metal mining from soils and tailings wastewater.

For phytomining we can use shoot system of plants. Later we dry them and burn and after that we can get metals from the ash.

The goal of the work is description the technology of phytomining for northern territories in Bodaybo region, where gold mining has existed for 150 years.

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Results

At the first stage of research, we analyzed the foreign scientific literature on the compilation of a list of plants-hyperaccumulators of gold. As a result, several species have been identified that are capable of accumulating gold in large quantities. It has been found that it is possible to accumulate gold with the help of algae such as Chlorella vulgaris; Fucus vesiculosus, Ecklonia cava, Cystoseira baccata and others.

The ability to accumulate gold was revealed in the following terrestrial plants: large-rhizome alocasia (Alocasia macrorrhizos), up to 89% of gold accumulates in the stem, up to 65% in the leaves; Tal (Arabidopsis thaliana) accumulates 15% of gold in the roots, the rest is concentrated in the shoots, 3 species of Iranian alfalfa (Nikshahri, Hamedani, and Yazdi).

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Conclusions

With regard to the conditions of the Far North of the Bodaibo region, we proposed to use industrial hemp as a hyperaccumulator of gold, directly planting it on dumps, as well as aquatic plants - chara algae and Canadian elodea.

it was found that 1 hectare of canadensis canadensis can extract 6 -202 lead, copper-89, zinc -10, gold-296, silver -210 from wastewater per day (g).

By planting industrial hemp on dumps, you can additionally extract gold in the form of bio-ore. The technology under consideration is promising and pilot testing is required.

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Thank you for your attention!

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