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Phytomining as a Technique to Mine Rare Metals with the Help of Plants

The idea of availability of metals in plants has been known since 16th century as indicated by works of Swedish chemist U. Hiarne. Currently, it is common knowledge that plants can accumulate many chemical elements. For example, ash of *Lycopodium clavatum* contains 52 % of aluminum oxide giving grounds for its use as mordant.

Scientists from Philippine University Los Baños discovered species of plant with very specific way of life. To live they absorb nickel. It is of interest that the plants don't intoxicate.

The new species is called *Rinoreanic colifera*; the name reflects its ability to absorb no end of nickel. Hyperabsorption of nickel is very rare phenomenon as no more than 0.5-1% of plant species growing on soil being rich in nickel can demonstrate such a quality.

According to information by Dr Marilyn Quimado, one of the foremost scientists taking part in the research, the plant has been found within western part of Luzon Island (Philippines) where soil is rich in heavy metals.

Plants with hyperabsorption are very potential for the development of such techniques as phytorestitution and cultivation and mining from plants that is phytomining.

Phytorestitution is the technique to solve environmental problems with the help of plants minimizing unfavorable effect without the necessity to remove contaminating material and its reuse elsewhere.

Phytorestitution is the impoverishment of harmful substances in contaminated soil, water or air owing to plants which can absorb, transform or remove heavy metals, pesticides, solvents, explosives, crude oil and its derivatives as well as other contaminants.

Certain plants absorb copper compounds through their roots. As a result, they concentrate the compounds. The plants can be burnt out to produce ash containing copper.

Both scientists and researchers believe that in literal sense plants can “extract” toxins from soil. Similar process has already been applied in Maryland where trees extract slowly toxic agents from soil. The toxic agents are a result of the disposal of chemical weapons and commercial chemicals after the year of 1970 when the region was used as weapons range.