DOMANHYC

Domesticating the first MANganese Hyperaccumulator Crop

ABSTRACT

The Anthropocene has seen a dramatic change in metal cycliing and restoring soils left bare by mining activities or polluted by toxic elements has become a major challenge to maintain ecosystem services and sustainable food production. Some plants naturally exposed for millions of years to high concentrations of metals, have developed particular adaptations including metal accumulation.

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Project type : AAP YOUNG SCIENTISTS
Research units in the network : AGAP
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Flagship project : no

Project leader : Yohan Pillon
Project leader's institution : IRD
Project leader's RU : LSTM AMAP

Budget allocated : 19980 €
Total budget allocated (including co-financing) : 19980 €
Funding : Labex

GOAL

The shrubs of the genus Hakea are plants that naturally occur on the nickel mining site of New Caledonia and are manganese accumulator. Their metail rich biomass can be used to catalyse chemical ractions in the chemical industry. The project is aiming at characterisiting the genetic, ecological and chemical diversity of the genus Hakea in New Caledonia. This will allow to identify the most appropriates genotypes to use in ecological restoration and identify the best candiate for for farming as a metal accumulator crop to to provide the chemical industry with metal rich biomass.

RESULTS

The genetic study will allow to clarifiy the taxonomy of the genus Hakea in New Caledonia which has not been udpated for 50 years and is disputed. It will provide infomation on the genetic strucuture of these plants since the landscape of New Caledonia is strongly fragmented. This information will guide the choice of ecotypes to transplant on each mining sites depending on its geography and ecological setting (elevation, precipitations, etc.). Measures of manganese concetration in Hakea leaf will allow the identifcation of the strongest metal accumulator in New Caledonia. Such plnts would be prime canddiates for large scale planting to produce large amount of metal rich biomass.

PERSPECTIVES

The project should pave the way for the domestication of the first manganese accumulating crop, and the first New Caledonia endemic plants. This is promising avenue to diversify the economic acitvity of this oversea territory with a novel cash crop.