

## **Bio-production of natural phytostimulants and their application under abiotic stress conditions**

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Developing circularity processes in every production chain is an important objective of the new economy and in plants propagation the use of waste and by-products is particularly interesting.

Temporary Immersion Bioreactors (TIBs) technology is used for mass propagation in different plant species being a controlled *in vitro* system that allows to obtain genetically similar and pathogens-free material with a higher yield, a high quality production and a reduced impact on the environment. During the propagation in TIBs, the liquid culture medium can be enriched with metabolites produced by the plant and that makes it a useful waste product for other purposes, such as use in agriculture as a plant biostimulant.

The aim of this research was to evaluate the phytostimulant effect of water and culture media from the propagation in temporary immersion bioreactors of aquatic mosses whose biomass, once increased, has other biotechnological uses. Initially, *in vitro* assays were carried out on tobacco model plants under normal conditions and under abiotic stress observing how, especially in salt stress, the response of plant, in terms of growth, was better, even compared to the non-stressed control. Successively, a phenomic study was carried out at High-throughput plant phenotyping platform placed at the ALSIA Centro Ricerche Metapontum Agrobios s.r.l. where, these by-products of moss micropropagation, were tested on tomato to study plant growth, performance, and composition based on multi-spectrum, high-throughput image analysis to detect morphometric and physiological parameters in addition to traditional measurement methods.