

USE OF FUNGAL-DERIVED SHORT-CHAIN CHITO-OLIGOSACCHARIDES TO STUMULATE PLANT MYCORRHIZATION

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It was recently demonstrated that the exogenous application of chito-oligosaccharides (COs) stimulates the establishment of arbuscular mycorrhizal symbiosis (AM), paving the way for the use of such molecules to promote plant nutrition in a sustainable agriculture perspective. Currently, purification costs, seasonal availability and environmental pollution limit the use of commercial COs. The aim of this study was to isolate and characterize COs from selected strains of *Pleurotus ostreatus*, *Cunninghamella bertolletthiae* and *Trichoderma viride* as a low-cost alternative to commercially available molecules (obtained from shrimp exoskeletons). Fungal COs resulted to have a higher degree of acetylation compared to shrimp COs. Furthermore, they also displayed a higher bioactivity as symbiotic signals and a dose-dependent response when tested for their ability to 1) elicit a symbiotic signalling pathway (activation of nuclear calcium signals) and 2) enhance arbuscular mycorrhiza development in the model legume *Medicago truncatula*. These results open the way to a new circular economy approach in CO production for a possible large-scale agricultural application. The optimization of the extraction steps is expected to reduce costs and reagent use, making the use COs in agricultural contexts an achievable goal in the near future.