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WOOL-BASED PLANT BIOSTIMULANT COMPOSITION AND PROCESS FOR OBTAINING IT

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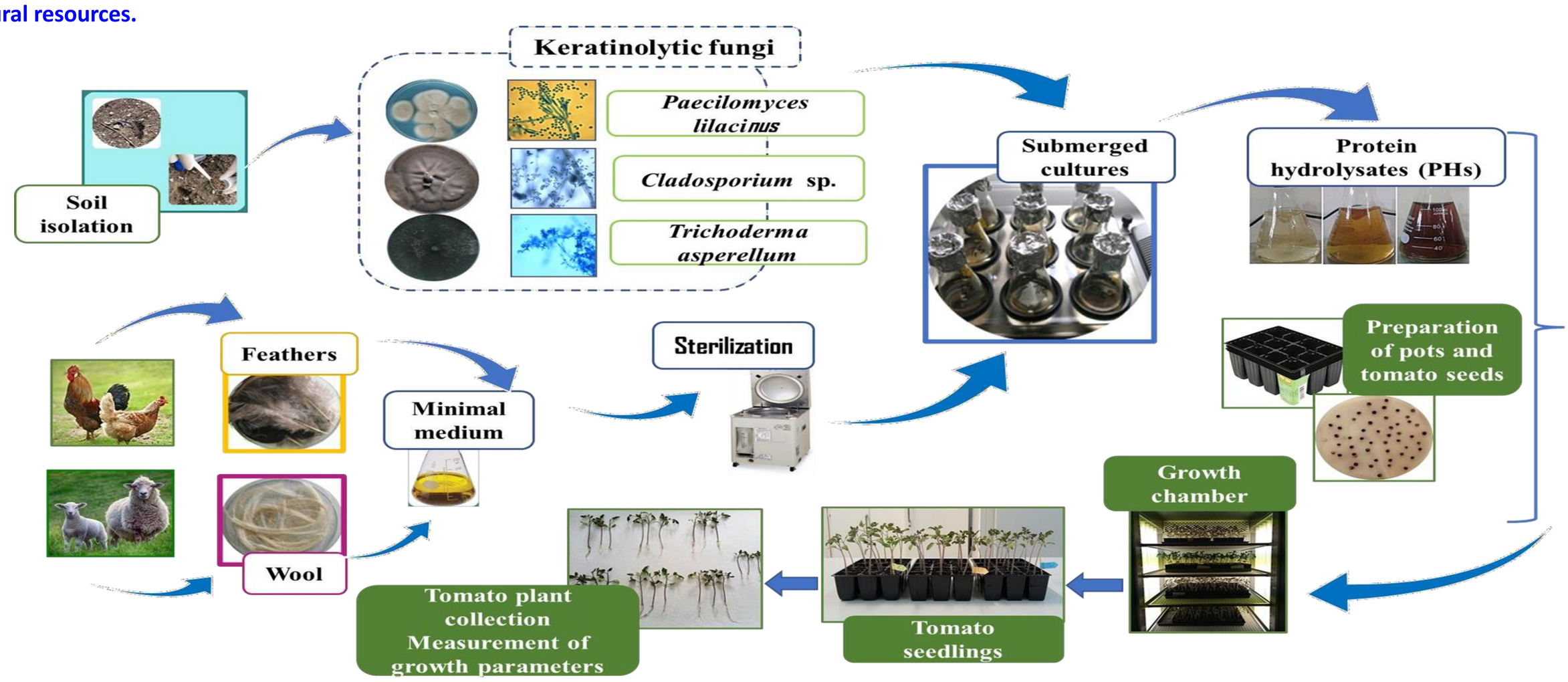
Background

The invention RO Patent 133240 B1/2021 is related to the development and use of plant biostimulant based on keratin waste, an abundant and valuable resource, which creates serious problems for the environment due to its recalcitrant nature. Keratin can be hydrolyzed in mild conditions by keratinolytic microorganisms. Fungal isolates from Microbial Collection of ICECHIM produce protein hydrolysates (PHs), a class of biostimulants, by cultivation on medium with keratin wastes as carbon and energy sources. The biodegradation process is efficient, with low costs and ensures the valorization of keratin waste in higher added-value applications, plant biostimulants for agriculture. The fungal isolates showed significant characteristics as plants biostimulants, namely antagonism *versus* pathogens, secretion of hydrolytic enzymes, and capacity to promote plants growth. Encouraging results were obtained treating tomato seedlings with PHs from fungal strains cultured on medium supplemented with 1% (w/w) keratin waste (chicken feathers or wool). The growth parameters (biomass, plant heigh and diameter, number of branches and leaves per plant) were significantly higher compared to those treated with water. The application of fungal PHs can serve as a promising approach for sustainable agriculture with beneficial effects on culture crops. The valorization of keratin waste is an example for applying the principles of circular economy, agro-industry wastes are valorized and returned in agriculture contributing to renewable natural resources.



OBTAINMENT OF PROTEIN HYDROLYSATES FROM KERATINOLYTIC FUNGI CULTURED ON KERATIN WASTE

The fungal isolates showed significant characteristics as plants biostimulants, namely antagonism *versus* aggressive phytopathogens (*Rhizoctonia solani, Fusarium graminearum, Sclerotinia sclerotiorum* and *Botrytis allii)*, secretion of hydrolytic enzymes (cellulases, chitinases and keratinases) by acting against the fungal cell walls of pathogens, production of phytohormones as 3-indole acetic acid, solubilization of essential micronutrients (zinc and phosphorus), and capacity to promote plant seedlings growth.

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https://icechim.ro/en/rd-groups/g6-biotechnology-bioanalysis/

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