

Degrading Microorganisms Preserved in the Multifunctional Microorganism Cultures Collection of Embrapa Temperate Climate: Biotechnological Interest

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Abstract:

The Multifunctional Microorganism Cultures Collection of Embrapa Temperate Climate (CCMMECT) preserve 316 strains, being 69 degrading of them registered pesticides (herbicides, fungicides and insecticides) and recommended for culture of irrigated rice by flooding in Southern Brazil. These microorganisms were isolated from poorly drained soils, formed in areas of plane and gently undulating topography known as Low Lands. Of these, CMM1, CMM104, CMM105, CMM106, CMM38, CMM39, CMM40, CMM16, CMM17, CMM18, CMM19, CMM20, CMM21, CMM22, CMM41, CMM42, CMM43, CMM44 and CMM45 are bacteria capable of degrading clomazone, glifosate and pyrazolsufuron-ethyl herbicides and the carbofuran insecticide, being identified as: *Pseudomonas fluorescens*, one species of the Enterobacteriaceae Family and two lines of *Bacillus megaterium*; two species of *Pseudomonas* and one species of *Sinorhizobium*; six species of *Pseudomonas* and one of *Raoultella planticola*; and five species of *Pseudomonas*, respectively. Besides the capability of mineralizing organochlorated compounds, these strains provide germplasms that can be utilized in biotechnological processes for bioremediation and biorecovery of soils contaminated by these pesticides, for vegetative growth and for prospective new functions such as production of biopolymers and biosurfactants. CMM22, CMM41, CMM42, CMM43, CMM44 and CMM45 besides producing PHB (polyhydroxybutyrate), also present biotechnological interest for application in processes for biodiesel production. CMM22 grows at low temperatures (+10°C), presenting potential for insertion via biotechnological processes in plants seeking resistance to cold. CCMMECT preserves these bacteria by successive planting out in solid media with the pesticide (refrigeration at + 4°C), to avoid loss of plasmids that confer the capability for degradation, lyophilization and in mineral oil.

Key words: Pesticides, Biodegradation, Bioremediation, Rice, Soil