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# Biodegradation of mulching films

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More than 6.5 million tonnes of plastic are used nowadays in agriculture (mulchingfilms, greenhouse effect coverings and irrigation tubes). About 10% of the total worldconsumption concerns mulching films. In fact, mulching improves the yield and optimizesgrowth conditions by controlling soil humidity and temperature, disabling the growth ofweeds. Thus, it offers advantages to agriculture such as the reduction of irrigation frequencyand the use of herbicides. In contrast, the majority of these films are made up of PE (aresistant synthetic polymer) which causes a serious environmental drawback consisting of ahuge quantity of waste. Moreover, it is forbidden to bury or to burn these films in field inapplication of a recent law concerning non-ultimate waste which was introduced in 2002.Interest towards applying biodegradable plastics as a substitution for the conventionalplastic is promising and the introduction of biodegradable materials which can be disposeddirectly into the soil can be a possible solution to the waste accumulation problem. But beforeintensive use of these materials it is necessary required to examine their safety for theenvironment. Once these materials are buried, they could represent a threat for soilcontamination and food produced.A biodegradation test of two biodegradable mulching films (mainly composed ofstarch and PBAT) on soil medium under aerobic conditions was developed using an inertmedium called pozzolan. This medium was activated by consortia (addition ofmicroorganisms extracted from two different soil modalities in order to study the impact ofbiodiversity on the biodegradation rate) and a mineral solution. A follow up of the evolutionof physical and chemical material parameters (DSC, TGA, SEM, RMN1H and IR) as well asthe evolution of the microbial biomass (microbial C determined by using the chloroformfumigation extraction method, DNA extraction, CFU evolution) was investigated during thetest period. The mineralization rate was evaluated based on the $CO_2$ trapped (NaOH solution)during the respiration of microorganisms.Terrestrial eco-toxicity test was performed on plants and earthworms to show apotential toxic effect and to establish a dose-effect relation.

## Biography

My name is Sedki BEN ALI, I'am currently a student doing a thesis in bioplastics, in my third and final year at the University of Rouen in France. Previously, I obtained a Master's degree in Material's Science at the institute of Material Science in Rouen.The theme I am working on is "characterization of bioplastics during their biodegradation".

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