**Biodegradation of mancozeb by two Aspergillus species isolated from surface water of agricultural areas contaminated by pesticides**

Ouahiba BORDJIBA [1], AIMEUR Najet [1], TAHAR Wafa [1]

*[1] Plant Biology and Environment Laboratory, department of Biology, BADJI Mokhtar University, P.o. Box 12, 23000 Annaba Algeria*

Email: [ouahiba\_bordjiba@yahoo.fr](mailto:ouahiba_bordjiba@yahoo.fr)

Pesticides are a means of control, the most effective against major diseases of crop plants, and which are necessary in maintaining or increasing agricultural yields. However, most of these molecules are highly toxic persistent and slowly biodegradable.  
Algeria is ranked among the countries that use larger amounts of pesticides. So, about 400 pesticides are registered in Algeria (Moussaoui et al., 2001 (Bouziani, 2007). This situation is particularly worrying especially since use of pesticides should be repeated periodically. The repeated application of pesticides on land parcels may lead to the adaptation of the soil microflora that acquires the ability to degrade these molecules. From the environmental point of view, it is generally interesting because it reduces the persistence of the plant protection product in soil, thus limiting its transfer, including to surface and ground water.

So, in this context, we conducted our study which consists to verify the catabolic metabolic capabilities of two fungal strains (*Aspergillus niger* and *Aspergillus flavus*). To do this, the influence of mancozeb on strains growth was determined. The biodegradation ability of two microbial species toward the molecule of fungicide was also evaluated.

The cultures were carried out in batch mode in Erlenmeyer flasks containing 100 ml of GS medium supplemented with glucose stirred on an orbital plate 180 rpm for 48 hours. The fungicide solution prepared in DMSO / ethanol (50/50, V / V), sterilized by filtration through a Millipore membrane 0,22 µm is added to cultures of aseptically to a final concentration of 100 mg /l. The abiotic degradation (culture medium + substrate without inoculum) are included in the trials. Each series of experiments was made in triplicate. Every 24 hours, there was sampling to verify strains growth by measuring the optical density at a wavelength of 660 nm. Growth of fungal strains was confirmed by counting the colonies after 5 days of incubation. The molecules biodegradation rates are calculated from samples (1 ml) fulfilled at T0J and T5J time after adding the pesticide. These samples were filtered through Millipore membrane 0,45μm and injected directly without extraction. The evaluation of residual pesticides is made by gas chromatography GC.

The biodegradation tests show that mancozeb disappearance rates are variable depending on the nature of the fungal strain. The *Aspergillus flavus* catabolic power seems better with removal rate exceeding 50%. This strain appears to possess interesting capacities of biodegradation and, therefore, it could be envisaged in the bioremediation process.  
  
**Keywords:** Pesticides, mancozeb, *Aspergillus Niger*, *Aspergillus flavus*, biodegradation, surface water