



# STUDY OF THE ROLE OF INDIGENOUS ACTINOBACTERIA FROM ACTIVATED SLUDGE IN THE DEGRADATION OF THE FUNGICIDE FENHEXAMID

7<sup>ème</sup>MGIBR

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## INTRODUCTION

Fenhexamid is a fungicide from hydroxylanil family with excellent activity against phyto-pathogenic fungi. The rate of disappearance of this fungicide in natural water seems to be slow and can be accumulated in the body of aquatic organisms. Therefore, it can be an endocrine disruptor for people who consume these contaminated organisms. Because of its toxicity to non-target species, finding microorganisms with ability to degrade this fungicide is of great interest in the bioremediation of polluted sites.

## MATERIAL AND METHODS

### 1. Isolation of *Actinobacteria*

Activated sludge collected from WWTP

Isolation media: AF, Czapeck dox, ISP4, Olson

Incubation at 30°C for 21 days

### 2. selection of fenhexamid tolerant *Actinobacteria*

*Actinobacteria* isolates

Agar Minimum Medium (MMA)+ fenhexamid (50 ppm, 200ppm, 500ppm).

Incubation at 30°C for 21 days.

### 3. Identification of the performing isolate

#### Biochemical

Catalase, amylase, caseinase, tyrosinase, gelatinase, esterase

#### Physiological

Growth at different: temperature,pH, NaCl%

#### Molecular

Analysis of the rRNA16S gene

## RESULTS

### 1. Selection of tolerant *Actinobacteria*

<i>Actinobacteria</i> strains	MMA+ 50 ppm fenhexamid	MMA+ 200 ppm fenhexamid	MMA+ 500 ppm fenhexamid	MMA	MMA+glucose
4 isolates	-	-	-	-	+
ML	+	+	-	-	+
MM	+	-	-	-	+
YO	+	+	+	-	+

### 2. Identification of the performing isolates

Table 2: Biochemical and physiological characterization of performing isolates

Isolate	Catalase	Amylase	Caseinase	Tyrosinase	Gelatinase	Esterase	T=37°C	T=45°C	pH=5	pH=9	NaCl%=2%	NaCl%=9%
ML	+	+	+	+	+	+	+	+	+	+	+	+
MM	+	+	+	+	-	-	+	+	-	+	+	+
YO	+	+	+	+	+	-	+	+	+	+	+	+

Table 3: Molecular identification of the isolates.

Isolate	The closest organisme	Similarity %
ML	<i>Streptomyces collinus</i> strain NBRC 12759	99%
MM	<i>Micrococcus luteus</i> strain NCTC 2665	99%
YO	<i>Streptomyces cavourensis</i> strain NRRL 2740	100%

## CONCLUSION

The use of these strains in the bioremediation of contaminated environments with fenhexamid seems a very promising ecological alternative and can contribute to minimize the pollution caused by fenhexamid.