



## Isolation and preliminary identification of actinomycetes isolated from a wastewater treatment plant and capable of growing on methyl ethyl ketone as a sole source of carbon and energy

S. Silini<sup>a</sup>, H. Ali-Khodja<sup>b,\*</sup>, A. Boudemagh<sup>a</sup>, A. Terrouche<sup>b</sup>, M. Bouziane<sup>b</sup>

<sup>a</sup>Laboratoire de Biologie Appliquée et Santé, Faculté des Sciences de la Nature et de la Vie, Département des Sciences de la Nature et de la Vie, Université Constantine 1, Constantine, Algeria, Tel. +213 0 551183203; email: [soumi.21@hotmail.fr](mailto:soumi.21@hotmail.fr) (S. Silini), Tel. +213 0 771206765; email: [boudemaghallaoueddine@yahoo.fr](mailto:boudemaghallaoueddine@yahoo.fr) (A. Boudemagh)

<sup>b</sup>Laboratoire de Pollution et de Traitement des Eaux, Faculté des Sciences Exactes, Département de Chimie, Université Constantine 1, Constantine, Algeria, Tel. +213 0 552682141; email: [hocine\\_ak@yahoo](mailto:hocine_ak@yahoo) (H. Ali-Khodja), Tel. +213 0 794554548; email: [terroucheahmed@gmail.com](mailto:terroucheahmed@gmail.com) (A. Terrouche), Tel. +213 0 777980260; email: [Kbouz@ymail.com](mailto:Kbouz@ymail.com) (M. Bouziane)

Received 3 June 2014; Accepted 26 April 2015

---

### ABSTRACT

Volatile organic compounds are considered as major sources of air pollution. They cause toxicity problems, bad odors, global warming, etc. Methyl ethyl ketone (MEK) is used in the formulation of lacquer type paints, varnishes, cleaners, thinners, etc. and in many other industries such as the manufacture of synthetic leather and in the decaffeination of coffee. Released into the environment, it causes respiratory, eye, and skin health problems. At high concentrations, it poses a potential threat to public health. In recent years, effective, very environmentally sound, and economical organic biological waste gas treatment processes have emerged. The sources of degrading micro-organisms are diverse and activated sludge suspensions are widely used. Actinomycetes are known for their ability to degrade various polymers. In this study, we are interested in isolating *actinobacteria* from activated sludge from the wastewater treatment plant of El Athmania, Mila. Thus, five actinomycetes were isolated on ISP4 medium supplemented with nystatin at 100 µg/ml and nalidixic acid at 10 µg/ml. These isolates proved to degrade efficiently MEK in batch reactors. Growth kinetics were determined for each isolate. The time course of MEK consumption was also measured by gas chromatography. A strain named A5.7 stood out as the best degrading bacterium. Indeed, complete degradation of the substrate was achieved after only 72 h of incubation. The A5.7 isolate was assigned by morphological and cultural methods to the genus *Streptomyces*.

*Keywords:* Methy ethyl ketone; Biodegradation; Activated sludge; Actinomycetes; *Streptomyces*

---

\*Corresponding author.