Microbial dynamics on decaying leaves in a temporary Moroccan river. II – Bacteria

A. Maamri¹, E. Pattee², X. Gayte³ and H. Chergui⁴

With 4 figures and 2 tables in the text

Abstract: Seasonal variations of bacterial abundance on dead leaves decaying both in air and water, as well as microbial Electron Transport System (ETS) activity, were investigated in a Northeastern Moroccan temporary river, Oued Cherraa. Bacteria were counted using epifluorescence microscopy after sonication, and DAPI and acridine orange staining. ETS activity was measured with a spectrophotometer by the reduction of INT to INT-formazan. The results point out the overwhelming influence of water on bacterial distribution: bacteria were most abundant and larger during the flowing phase of the river and in a permanent pool. ETS activity on leaves was higher in water than in air, and during submersion it was higher in the permanent than in the temporary sites. Some temporal correlations were found with temperature and dissolved organic matter. Bacterial density peaked in May, and ETS activity in June. These trends explain a great part of the breakdown rates described from the same leaf packs in a former paper.

Introduction

Bacteria and fungi are some of the few organisms capable of producing enzymes that break down large molecules such as cellulose, lignin, or chitin into smaller and more readily digestible compounds (Sinsabaugh & Linkins 1990). According to Saunders et al. (1980), these microorganisms are the main agents of organic matter breakdown, some 75% of which is often per-

Authors’ addresses: Hydrobiologie et Ecologie Générale, Faculté des Sciences, Université Mohamed Ier, Oujda, Morocco. E-mail: maamri@sciences.univ-oujda.ac.ma.
² ESA CNRS 5023 Ecologie des Eaux Douces, Université Claude Bernard Lyon-I, F-69622 Villeurbanne Cedex, France. E-mail: pattee@biomserver.univ-lyon1.fr
³ GRETI, Université de Savoie, F-73376 Le-Bourget-du-Lac Cedex, France. E-mail: gayte@univ-savoie.fr
⁴ Hydrobiologie et Ecologie Générale, Faculté des Sciences Dhar el Mehraz, B.P. 1796, Fes-Atlas, Morocco.

DOI:10.1127/archiv-hydrobiol/144/1999/157
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