

ABSTRACTS

**SIXTH
INTERNATIONAL
SYMPOSIUM
ON
MICROBIAL ECOLOGY
(ISME-6)**

BARCELONA, 6-11 SEPTEMBER

1992



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CONTRIBUTED PAPERS

ORAL
COMMUNICATIONS

P1-07

MICROORGANISMS IN CHANGING ENVIRONMENTS

P1-07-01

NITRIFICATION IN ACID FOREST SOIL FERTILIZED WITH RAPIDLY AND SLOWLY RELEASING NITROGEN COMPOUNDS
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In acidic coniferous forest soils nitrification activity is generally low. Addition of nitrogen may enhance nitrification which can lead to losses of N via leaching and denitrification. We studied nitrification and N mineralization in an acid coniferous forest soil receiving nitrogen as fast releasing urea or as compounds containing urea and slow releasing ureaformaldehyde (UF) in different proportions (0-100 %). Three months after the application the numbers (MPN) of chemolithotrophic ammonium oxidizers were much higher in the soil treated with urea than in the soil treated with UF. The numbers of nitrifiers increased with the increasing proportion of urea in the fertilizer. The nitrifier counts showed more clearly the effect of fertilizers on nitrification than did the determination of net nitrification activity, which was very low in this soil. The amount of exchangeable ammonium was also congruent with the proportion of urea. The results indicated that stimulation of nitrification in acid forest soil after addition of organic N compounds depends on releasing rate of ammonium from the compounds.

P1-07-02

ENVIRONMENTAL FACTORS AFFECTING PHYTOTOXIC ACTIVITY OF SOILBORNE ACTINOMYCETES
Barazani, O., Chayen, S. and Friedman, J.
Department of Botany, The George S. Wise Faculty of Life Sciences, Tel Aviv University, Tel Aviv 69978, Israel.

Soilborne phytotoxic actinomycetes are considered to be involved in decimation of annuals near *Artemisia herba-alba* in the Negev desert of Israel (average rainfall of 100mm). During winter, short rain showers are followed by dry periods. In various regimes of soil drying/rewetting, phytotoxic activity of the original microflora increased by ca. 16%. Inhibition of rootlet elongation was reproduced when sterile loess was inoculated with known phytotoxic isolates of actinomycetes. No such effect was observed on non-sterile loess. On artificial Malt Yeast Agar medium, decreasing the amount of Malt ext. increased markedly the average phytotoxic effect from 27.5% to 80.2%. Testing diffusates of these media revealed higher phytotoxic secretion in Malt-free medium. Phytotoxic activity of microorganisms in the soil may be controlled by drying/rewetting fluctuations, competition of the original microflora and by the availability of carbon sources.

P1-07-03

INFLUENCE OF ENVIRONMENTAL CONDITIONS ON THE EFFICIENCY OUTPUT OF DIFFERENT FECAL COLIFORM MEDIA
Bordalo, A.A. and Pereira M.R. Institute of Biomedical Sciences, Oporto University, P-4000 Porto, Portugal

The enumeration of fecal coliform microorganisms is traditionally applied to evaluate the microbiological quality of water. Several techniques and media are available thus making difficult the comparison of results. In this study two standard fecal coliform media (mFC Agar and Lactose Agar with TTC & Tergitol) were used to characterize quantitative and qualitatively the population of planktonic thermotolerant coliforms along an estuarine salinity gradient submitted to different degrees of urban run-off. An overall of 34 samples that represent seven distinct situations of salinity and pollution commonly found in the Douro Estuary (Portugal), were analyzed either by plate count or membrane filtration. The quantitative data obtained with both media were studied by nested ANOVA using a mixed model. Although in particular situations the recovery of fecal coliforms in both media was unequal, the differences were not statistically significant ($p < 0.05$). Based on the analysis of 1,144 typical colonies, *Escherichia coli* was found to represent 75.7% of all strains. In polluted samples the efficiency decreased with increasing salinity (0-33%) whereas in less contaminated ones the number of *E. coli* isolates diminished considerably only in brackish-water. Nevertheless freshwater estuarine samples always showed higher recovery counts (81.8-88.5%). The results were similar for both media. More than 90% of other identified lactose positive strains belonged to the *Enterobacteriaceae* family.



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**INTERNATIONAL COMMITTEE ON MICROBIAL ECOLOGY (ICOME)
SPANISH SOCIETY OF MICROBIOLOGY (SEM)
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