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The influence of aromatic plants on microbial biomass and respiration in a natural ecosystem

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Abstract

The influence of three aromatic plant species, laurel (*Laurus nobilis* L.), myrtle (*Myrtus communis* L.), and French lavender (*Lavandula stoechas* L.), on top soil microbial biomass, respiration rates, and bacterial colonies was investigated. Fresh, mature plant material was introduced into a typical Mediterranean habitat in Northern Greece. The essential oil chemical compositions from the aromatics used in the study were evaluated by GC-MS analysis. The major compounds constituting *L. nobilis* essential oil were 1,8-cineole (48.1%), eugenol (12.3%), and α -pinene (6.0%); *M. communis* oil consisted of α -pinene (31.2%), myrtenyl acetate (19.3%), and 1,8-cineole (16.1%); and *L. stoechas* consisted of fenchone (46.7%), camphor (9.9%), and 1,8-cineole (9.0%). *L. nobilis* presented the highest inhibition against bacterial colonies (44.9%) and lowered soil respiration and microbial biomass when compared to control soils. In contrast, *M. communis* and *L. stoechas* were found to augment bacterial activity by 85.9% and 63.8%, respectively, and to increase soil respiration (1.5-fold) and microbial biomass (2.5-fold) compared to control soil samples. These two plants are proposed for further investigations in biodegradation programs.

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