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STRUCTURAL AND FUNCTIONAL CHARACTERISTICS OF THE SOIL NEMATODE COMMUNITY IN A MEDITERRANEAN GRASSLAND

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In this paper, we describe the community of soil nematodes in a Mediterranean grassland, where soil temperature and humidity were experimentally manipulated, in order to simulate modifications proposed by climate change scenaria. For temperature adjustment, a combination of vertical windshields and horizontal transparent greenhouse roofs was used, while humidity was controlled by weekly irrigation. Two levels of soil temperature and two of humidity were created. The two temperature levels differed by 1.4°C, while the two humidity levels differed by 2.3 % water content. The experiment involved monthly sampling of nematodes for a six month period (July to December). The community parameters considered were: density, biomass, richness, Shannon diversity, respiration as an index of nematode activity, and Motomura environmental constant, as an index of community structure. Moreover, we considered Maturity Index (MI) and Plant Parasite Index (PPI) in order to assess the strategic response of the community.

According to our results, all parameters changed significantly with time except the Motomura constant. This latter together with the nematode biomass were the only parameters that were significantly affected by the experimental manipulation of both temperature and humidity. Moreover, richness and diversity were affected by temperature and PPI by humidity. Due to the independence of Motomura's constant from time, i.e. from seasonal fluctuations of climatic parameters, it might be an efficient index for assessing community changes induced by small-scale climatic modifications, analogous to those predicted by climate change scenaria.

Correlations between nematode community parameters and microbial parameters (respiration, biomass in terms of Cmic, Nmic and ergosterol, bacterial substrate utilization) were examined by Pearson correlation coefficient. Although, nematode density and richness were correlated with some microbial parameters, the latter did not seem to affect either the structure of the community or its strategic response.

As regards the composition of the nematode community, bacterivorous and fungivorous nematodes contributed more than the other functional groups to the total density and richness, followed by plant parasites and root-hair feeders. Predacious nematodes had the lowest contribution to the community. Although the contribution of omnivorous nematodes to the total density and richness was low, regarding the total biomass and respiration it was the highest among all functional groups. Moreover, this group contributed significantly to the Maturity Index of the community, due to the high scores in the colonizer-persister continuum.