

MODEL ECOSYSTEM APPROACH TO ESTIMATE COMMUNITY LEVEL EFFECTS OF RADIATION

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Abstracts

Mathematical computer model is developed to simulate the population dynamics and dynamic mass budgets of the microbial community realized as a self sustainable aquatic ecological system in the tube. Autotroph algae, heterotroph protozoa and saprotroph bacteria live symbiotically with interspecies' interactions as predator-prey relationship, competition for the common resource, autolysis of detritus and detritus-grazing food chain, etc. The simulation model is the individual-based parallel model, built in the demographic stochasticity, environmental stochasticity by dividing the aquatic environment into patches.

Validity of the model is checked by the multifaceted data of the microcosm experiments. In the analysis, intrinsic parameters of umbrella endpoints (lethality, morbidity, reproductive growth, mutation) are manipulated at the individual level, and tried to find the population level, community level and ecosystem level disorders of ecologically crucial parameters (e.g. intrinsic growth rate, carrying capacity, variation, etc.) that related to the probability of population's extinction.