

研究报告

不同食细菌线虫取食密度下线虫对细菌数量、活性及土壤氮素矿化的影响

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摘要

采用悉生培养微缩体系,探讨了不同食细菌线虫取食密度下线虫(*Caenorhabditis elegans*)对细菌(*Bacillus subtilis*)数量和活性及土壤氮素矿化的影响.结果表明,线虫对细菌的取食,促进了细菌的增殖,并在不同线虫取食密度下对细菌的增殖促进作用总体表现为:接种 $20\text{条}\cdot\text{g}^{-1} > 10\text{条}\cdot\text{g}^{-1} > 40\text{条}\cdot\text{g}^{-1}$ 处理.线虫在促进细菌增殖的同时,明显提高了土壤呼吸强度和土壤蔗糖酶、脲酶和磷酸酶的活性,但不同取食密度处理间差异不明显.线虫与细菌之间的相互作用显著提高了土壤铵态氮和矿质态氮含量,促进了土壤氮的矿化.不同取食密度处理间,线虫对土壤氮素矿化的促进作用与对细菌的增殖促进作用趋势一致.

关键词 [线虫密度](#),[食细菌线虫](#),[相互作用](#),[土壤氮素矿化](#)

分类号

Effects of bacteria-feeding nematode at its different density on bacterial number, bacterial activity and soil nitrogen mineralization

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Abstract

A gnotobiotic microcosm experiment was conducted to study the interactions between bacteria-feeding nematode *Caenorhabditis elegans* and bacterium *Bacillus subtilis*, and their effects on soil nitrogen mineralization at different *Caenorhabditis elegans* density. The results showed that the inoculation of the nematode stimulated the growth of the bacterium, and the increment was in order of $20 > 10 > 40$ nematodes $\cdot\text{g}^{-1}$ dried soil. The interaction between *Caenorhabditis elegans* and *Bacillus subtilis* significantly enhanced soil respiration rate and soil invertase, urease and phosphatase activities, with no significant differences among three test nematode densities. The inoculation of bacteria-feeding nematode markedly increased soil NH_4^+-N and mineral N, suggesting that soil N mineralization was enhanced under the effect of the nematode. The increment of soil nitrogen mineralization at different nematode density was also in the same order mentioned above.

Key words

[Nematode density](#) [Bacteria-feeding nematode](#) [Interaction](#) [Soil nitrogen mineralization](#)

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