

研究报告

岷江冷杉根际土壤微生物对大气CO₂浓度和温度升高的响应

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收稿日期 2005-8-11 修回日期 2006-3-21 网络版发布日期 接受日期

摘要 应用自控、封闭、独立的生长室系统,研究了川西亚高山岷江冷杉根际土壤微生物数量对大气CO₂浓度升高(环境CO₂浓度+350(±25)μmol·mol⁻¹, EC)和温度升高(环境温度+2.2(±0.5)℃, ET)及其CO₂浓度和温度同时升高(ECT)的响应.结果表明,1)同对照(CK)相比,在6月、8月和10月,EC处理的根际细菌数量分别增加了35%、164%和312%,ET处理增加了30%、115%和209%,而EC和ET处理对根际放线菌和根际真菌数量影响不显著;ECT处理的根际放线菌数量分别增加了49%、50%和96%,根际真菌数量增加了151%、57%和48%,而ECT对根际细菌数量影响不显著.2)3种处理对非根际土壤微生物数量影响均不显著.3)在EC、ET和ECT处理下,微生物总数的根际效应明显,其R/S值分别为1.93、1.37和1.46(CK的R/S值为0.81).

关键词 [CO₂浓度升高](#) [温度升高](#) [土壤微生物](#) [根际效应](#) [岷江冷杉](#)

分类号

Responses of microbes in rhizospheric soil of *Abies faxoniana* to elevated atmospheric CO₂ concentration and temperature

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Abstract

With independent and top-enclosed chamber system,this paper studied the responses of culturable bacteria, fungi, and actinomycetes in rhizospheric soil of *Abies faxoniana* sapling to elevated atmospheric CO₂ concentration (ambient+350(±25)μmol·mol⁻¹, EC), temperature (ambient+2.2(±0.5)℃; ET), and their combination (ECT) under high frigid conditions of West Sichuan Province. The results showed that in comparing with the control, treatments EC and ET increased the number of rhizospheric bacteria by 35%, 164% and 312%, and 30%, 115% and 209% in June, August and October, respectively, but had little effects on the numbers of rhizospheric actinomycetes and fungi. In treatment ECT, the numbers of rhizospheric actinomycetes and fungi increased by 49%, 50% and 96%, and 151%, 57% and 48% in June, August and October, respectively, while that of rhizospheric bacteria had little variation. EC, ET and ECT had significant effects on the total number of rhizospheric microbes, with the R/S being 1.93, 1.27 and 1.46, respectively, but had little effects on non-rhizospheric microbes.

Key words [Carbon dioxide enrichment](#) [Elevated temperature](#) [Soil microbes](#) [Rhizospheric effect](#) [Abies faxoniana](#)

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