

CO₂浓度升高和氮沉降对南亚热带主要乡土树种及群落生物量的影响赵亮^{1,2}, 周国逸¹, 张德强¹, 段洪浪¹, 刘菊秀^{1*}

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Effects of elevated CO₂ concentration and nitrogen deposition on the biomass accumulation and allocation in south subtropical main native tree species and their mixed communities.ZHAO Liang^{1,2}, ZHOU Guo-yi¹, ZHANG De-qiang¹, DUAN Hong-lang¹, LIU Ju-xiu¹

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摘要 选取荷木、海南红豆、肖蒲桃、红鳞蒲桃和红锥5种南亚热带乡土树种构建混交群落, 通过5年人为提高CO₂浓度和氮输入试验, 研究碳-氮交互作用对南亚热带主要乡土树种及群落的生物量积累与分配的影响。结果表明: CO₂浓度升高及氮沉降对植物生物量的积累和分配的影响因树种不同而有显著差异。CO₂浓度升高和氮沉降对豆科植物生物量积累相对提高了49.3%和71.0%, 且促进了阳生植物生物量的积累; 氮沉降能显著提高偏阴生植物生物量积累, 但在CO₂浓度升高条件下, 其生物量积累低于对照。CO₂浓度升高抑制了阳生植物地下生物量的分配, 但促进偏阴生植物地下生物量的分配。CO₂浓度升高、氮沉降以及碳-氮交互作用对南亚热带植物群落生物量积累均具有促进作用; CO₂浓度升高促进群落地下生物量积累, 氮沉降显著提高其地上部分生物量分配。在全球变化背景下, 南亚热带林业固碳树种适宜选用海南红豆和红锥。

关键词: CO₂ 氮沉降 生物量 南亚热带 乡土树种

Abstract: A 5-year experiment was conducted to study the effects of simulated elevated CO₂ concentration, nitrogen deposition, and their combination on the biomass accumulation and allocation in five south subtropical native tree species *Schima superba*, *Ormosia pinnata*, *Acmena acuminatissima*, *Syzygium hancei*, and *Castanopsis hystrix* and their mixed communities. The test tree species had different responses in their biomass accumulation and allocation to the elevated CO₂ concentration and nitrogen deposition. Elevated CO₂ concentration and nitrogen deposition increased the biomass of legume species by 49.3% and 71.0%, respectively, and promoted the biomass accumulation in sun species. Nitrogen deposition increased the biomass of shade-preference species significantly, but elevated CO₂ concentration was in adverse. Elevated CO₂ concentration inhibited the biomass allocation in the belowground part of sun species but promoted the biomass allocation in the belowground part of shade-preference species. Elevated CO₂ concentration, nitrogen deposition, and their interaction all promoted the biomass accumulation in mixed communities. Elevated CO₂ concentration increased the biomass accumulation in the belowground part of the communities, while nitrogen deposition increased the biomass accumulation in the aboveground part. Under the background of global climate change, *Ormosia pinnata* and *Castanopsis hystrix* tended to be the appropriate species for carbon fixation in south subtropical area.

Key words: CO₂ N deposition biomass south subtropical area native tree species**引用本文:**. CO₂浓度升高和氮沉降对南亚热带主要乡土树种及群落生物量的影响[J]. 应用生态学报, 2011, 22(08): 1949-1954.. Effects of elevated CO₂ concentration and nitrogen deposition on the biomass accumulation and allocation in south subtropical main native tree species and their mixed communities. [J]. Chinese Journal of Applied Ecology, 2011, 22(08): 1949-1954.**链接本文:**<http://www.cjae.net/CN/> 或 <http://www.cjae.net/CN/Y2011/V22/I08/1949>

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