

树木年龄和断面积对加拿大北方林树木死亡率的影响

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Effects of tree age and basal area on boreal forest tree mortality in Canada.

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摘要 以加拿大北部的杨树(*Populus* spp.)、斑克松(*Pinus banksiana*)、黑云杉(*Picea mariana*)为对象,采用长期定位试验,对134块固定样地的活立木及枯死木进行调查,并运用线性回归的方法研究树木年龄、断面积和林分类型对3种树木死亡率的影响.结果表明:随着树龄和断面积的增加,林木的死亡率呈上升趋势.杨树在斑克松林中的死亡率较高,而在黑云杉林中死亡率较低.在黑云杉林中,树龄是影响斑克松死亡率的主要因子;而在杨树林中,断面积是影响斑克松死亡率的重要因子;不同林分类型中树龄对黑云杉死亡率的影响显著.树种组成对树种的死亡率有显著影响;树木年龄、断面积和林分类型之间的交互效应对各树种的死亡率均有显著影响;不同林分类型中同一树种的死亡状况有明显差异.

关键词: 林分类型 年龄 断面积 死亡率

Abstract: Taking the poplar (*Populus* spp.), jack pine (*Pinus banksiana*), and black spruce (*Picea mariana*) in northern Canada as test objects, a repeated investigation was conducted on the living and dead trees at 134 fixed sampling plots, and linear regression models were applied to study the effects of tree age, basal area, and stand type on the mortality of the three tree species. Generally, the tree mortality increased with increasing tree age and basal area. Poplar had a higher mortality in jack pine stand but a lower mortality in black spruce stand. In black spruce stand, tree age was the major factor affecting the mortality of jack pine, while in poplar stand, tree basal area was the important factor. In the three stands, tree age had significant effects on the mortality of black spruce. Species composition had significant effects on the mortality of the tree species, and the interactions between tree age, basal area, and stand type all had significant effects on the mortality of each tree species. The mortality of the same tree species in different stands differed significantly.

Key words: stand type age basal area mortality

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