

研究报告

松材线虫入侵后不同伐倒干扰强度对马尾松林植物多样性的影响

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摘要 以松材线虫入侵马尾松林后经过不同伐倒干扰强度经营形成的不同群落类型作为研究对象,对9个群落类型的物种多样性进行了研究.结果表明,乔木层物种多样性指数大小排列顺序为:马尾松纯林受害皆伐后形成的阔叶林(富阳)>轻度受害的马尾松-木荷混交林(富阳)>对照>轻度受害的马尾松-纯林(富阳)>马尾松-栓皮栎混交林受害择伐后形成的栓皮栎林(舟山)>马尾松纯林受害皆伐后形成的马尾松幼龄林(富阳)>马尾松纯林受害择伐后形成的枫香林(舟山)>受害的黑松-马尾松混交林(舟山)>受害的马尾松纯林(舟山).灌木层舟山马尾松纯林的3种多样性指数均最低,其余各地相差不大.草本层马尾松幼树纯林、栓皮栎林和枫香林的3个指数较高.不同地理位置和不同受害程度的马尾松林植物多样性差异显著;不同干扰程度、不同恢复方式下马尾松林内的植物多样性差异也显著.建立了伐倒干扰强度指数,发现物种多样性指数随伐倒干扰强度指数的变化规律符合“中间高度膨胀”理论.协方差分析结果表明,所建的指数能有效地反映松材线虫入侵及病木伐除后马尾松林植物多样性的变化.

关键词 [松材线虫](#) [伐倒干扰强度](#) [植物多样性](#) [干扰](#)

分类号

Effects of different removal disturbance intensity on plant diversity of *Bursaphelenchus xylophilus* invaded Masson pine community

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Abstract

The study on the plant diversity of *Bursaphelenchus xylophilus* invaded Masson pine community under effects of different removal disturbance intensity showed that the species diversity indices (richness, Shannon Wiener index and evenness) of arbor layer decreased in the sequence of broad leaved stand after the removal of all infected pine trees in the pure pine stand in Fuyang> lightly infected Masson pine-*Schima superba* mixed stand in Fuyang> uninfected stand mixture of Masson pine and *Castanopsis fargessi* as the control>lightly infected pure Masson pine stand in Fuyang>*Quercus variables* stand formed after selective removal of infected pine trees from a mixed Masson pine and *Q. variables* stand in Zhoushan Islands> pure young Masson pine stand formed after the removal of all infected pine trees from a pure Masson pine stand> pure *Liquidambar formosana* stand after the removal of infected pine trees from a pure pine stand in Zhoushan Islands > mixed stand consisted of *Pinus thunbergii* and the Masson pine in Zhoushan Islands>moderately infected Masson pine stand in Zhoushan Islands. All the three indices of shrub layer did not show any significant differences among different communities, except for the pure pine stand in Zhoushan Island, which were the lowest. The three indices of herb layer were higher in pure young Masson pine, *Q. variables* stand, and *L. formosana* stand than in other stands. The Masson pine forest at different geographical situation and with different harm extent had distinct disparity,

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as well as that in different disturbance degree and restoring manner. The “Index of Disturbing Intensity of Stump and Fallen Woods” or IDISF was created to represent the disturbance degree of tree removal on plant diversity. It was found that for both less and more removal disturbing degree, the relationship between species diversity indices and IDISF followed the “Mid-altitude bulge” theory. Specifically, both excessive and insufficient removal of infected trees would cause the decline of plant species diversity in certain degree. Covariance analysis of IDISF indicated that different IDISF had no significant effects on the species diversity of arbor layer, but had different effects on that of shrub and herb layers, which could be used to assess the changes in species diversity of different Masson pine communities after the invasion of pine wood nematode.

Key words [Bursaphelenchus xylophilus](#) [Disturbing intensity of stump and fallen woods](#) [Plant diversity](#) [Disturbance](#)

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