

遥感应用

模拟酸雨不同水平下杜英和山核桃的高光谱特点

摘要:

通过模拟酸雨大棚试验,测定了3个酸雨梯度下4个时期杜英和山核桃高光谱反射率以及对应的叶绿素相对含量(SPAD相对值),并利用反高斯模型拟合红边光谱曲线,构建红边位置 λ_p 及红边宽度等光谱特征参量。结果表明:在pH较低的酸雨处理下杜英的叶绿素含量有一定的升高,而山核桃则是呈现下降的趋势;在可见光区,杜英在pH5.6处理下的平均光谱反射率要高于pH2.5的处理;而山核桃在pH5.6处理下的平均光谱反射率普遍要低于pH2.5的处理;杜英红光区域叶绿素吸收最小反射率值 R_0 在pH5.6的处理要低于pH2.5的处理,山核桃相反;杜英的 λ_p 值表明其反射率光谱曲线发生了“红移”现象,而山核桃则产生了“蓝移”。这表明或可建立叶片的光谱反射率同酸雨危害程度之间的定量或定性关系。

关键词: 酸雨 高光谱 杜英 山核桃 SPAD 红边

Characteristics of *Elaeocarpus Glabripetalus* Merr and *Carya Cathayensis* at Different Levels of Simulated Acid Rain

Abstract:

The hyperspectral reflectance and the relative chlorophyll concentration(relative value of SPAD)of *Elaeocarpus glabripetalus* Merr and *Carya cathayensis* of 4 periods in 3 acid rain gradients were measured in the shed experiment of simulating acid rain.By use of the Inverted Gaussian(IG)model,the curves of red edge spectral got fitted,and its position was built,including some spectral characteristic parameters,and its width.The results showed that:in the acid rain treatment of the lower pH,chlorophyll concentration of *elaecarpus glabripetalus* Merr had certain increasing,while the chlorophyll concentration of *carya cathayensis* showed a downtrend;in the visible light region,the average spectral reflectance of *Elaeocarpus glabripetalus* Merr in the pH5.6 treatment was higher than that of the pH2.5 treatment;while *carya cathayensis* had the different result which had a lower average spectral reflectance in pH5.6 treatment than pH2.5.In red light area of *elaecarpus glabripetalus* Merr had a lower minimum reflectance value R_0 of chlorophyll absorption in the pH5.6 treatment than that of pH2.5,while it is opposite to *carya cathayensis*.The λ_p value of *elaecarpus glabripetalus* Merr showed the red shift phenomenon of its reflectance spectral curve,while the blue shift phenomenon happened with *Carya cathayensis*.All above shows a possibility of setting up a qualitative or quantitative relationship between the leaves spectral reflectance and the damage extent of acid rain.

Keywords: acid rain hyperspectral *elaecarpaceae* *carya cathayensis* SPAD red edge

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