

## 不同强度人工疏伐对侧柏光合特性的影响

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### 摘要:

Li-6400  
CCM-200  
“ ”  
 $P_n$   
 $A_{max}$   $LSP$   $R_d$   $LCP$  CK  $LSP$   $A_{max}$   $P_n$   
 $R_d$   $LCP$  CK

### 关键词:

中图分类号: Q945.79

文献标识码: A

文章编号: 1000-2324(2015)05-0671-05

## Effects of the Different Strength of Artificial Thinning Treatment on Photosynthetic Characteristics of *Platycladus orientalis*

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**Abstract:** To analyze the effects of different strength artificial thinning treatment on photosynthetic characteristics of *Platycladus orientalis* so as to provide references for selecting the suitable approaches of forest fuel. This paper selected the representative *P. orientalis* in Taishan Mountain area as a object to ensure gradients of treatment strength ( control group, low strength, medium strength, high strength ). The photosynthetic physiological indexes were tested by Li-6400 photosynthesis system and the relative content of chlorophyll was tested by CCM-200 portable chlorophyll meter. Diurnal variations of the net photosynthesis rate ( $P_n$ ) in leaves of *P. orientalis* under different strength artificial thinning treatment exhibited a bimodal curve with obvious “midday depression”. After thinning treatment, the mean value of net photosynthesis rate ( $P_n$ ), maximum net photosynthetic rate ( $A_{max}$ ), light saturation point ( $LSP$ ), dark respiration ( $R_d$ ), light compensation ( $LCP$ ) of the experimental group were greater than the control group, and under the medium level of thinning treatment, the daily means of the first three indices were maximum, but the change of  $LSP$  and  $R_d$  were minimum. Relative content of chlorophyll of the experimental group under different strength artificial thinning treatment were less affected than the control group, but the thinning treatment was the most obvious one under the medium level.

**Keywords:** *Platycladus orientalis*; photosynthetic characteristics; thinning treatment

[1]

[2,3]

[4-6]

收稿日期: 2014-07-03

修回日期: 2014-07-20

基金项目:

(LGYB201515)

(201512213068XY)

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: 2015-09-18 http://www.cnki.net

[7-9]

[10]

[11]

[12]

# 1 材料与amp;方法

## 1.1 研究地区概况

36°12'~36°22'N 116°58'~117°10'E

1132 mm 7.2 725.6 mm 12.8 195 d

63.8% 40 cm 11931.8 hm<sup>2</sup> 9490 hm<sup>2</sup>

81.5% (*Pinus tabulaeforms*) (*Quercus acutissima*) (*Quercus variabilis*) (*Platycladus orientalis*) (*Robinia pseudoacacia*) (*Pistacia chinensis*)

## 1.2 样地设置

4 20 m×20 m)

CK 20%) 30%) 40%)

3

## 1.3 光合日变化测定

LI-COR, Inc., USA 7~9 Li-6400

2 h 3 6:00~18:00 2 h 1

$P_n$ ,  $\mu\text{mol}/\text{m}^2\cdot\text{s}^{-1}$   $G_s$ ,  $\text{mmol}/\text{m}^2\cdot\text{s}^{-1}$   $\text{CO}_2$   $C_i$ ,  $\mu\text{mol}/\text{mol}$

$PAR$ ,  $\mu\text{mol}/\text{m}^2\cdot\text{s}^{-1}$   $T_r$ ,  $\text{mmol}/\text{m}^2\cdot\text{s}^{-1}$

## 1.4 光响应和 CO<sub>2</sub> 响应及参数估算

30 70%~75% CO<sub>2</sub> 9:00~11:00 Li-6400

$\mu\text{mol}/\text{m}^2\cdot\text{s}^{-1}$  45 min 400  $\mu\text{mol}/\text{mol}$  2000

1200 1000 800 600 400 200 150 100 80 50 20 0  $\mu\text{mol}/\text{mol}$  1800 1500

CO<sub>2</sub> Li-6400

CO<sub>2</sub> 1500 1200 1000 800 600 400 200 150

120 100 80 50  $\mu\text{mol}/\text{mol}$  30 1200  $\mu\text{mol}/\text{m}^2\cdot\text{s}^{-1}$

## 1.5 相对叶绿素含量的测定

3 CCM-200 5 (OPTI-SCIENCES USA)





[15] “ ”

10:00~12:00  $P_n$  “ ”

$P_n$  —CO<sub>2</sub>  $P_n$

$P_n$

$LSP$   $LCP$   $R_d$

$A_{max}$   $R_d$

$LSP$   $A_{max}$

$R_d$   $LCP$

[16,17]

[11]

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