

研究报告

检疫性杂草毒莴苣的光合特征及其入侵地群落生态学调查

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摘要 毒莴苣是我国东南沿海地区的新入侵杂草,也是国家进境植物的检疫对象.调查发现,毒莴苣植株高大,易在入侵地形成群落优势种;常见的伴生杂草有小飞蓬、野塘蒿、鬼针草、裂叶月见草、裂叶牵牛、狗尾草、野胡萝卜、苍耳、一年蓬、山莴苣、葎草、龙葵和钻形紫菀等.应用LC-4光合蒸腾测定系统对毒莴苣进行净光合速率测定,结果表明:该种实测净光合速率高达 $21.22 \pm 0.45 \mu\text{mol CO}_2 \cdot \text{m}^{-2} \cdot \text{s}^{-1}$,比入侵性杂草一年蓬、野塘蒿稍低,比藜、北美车前、山莴苣等高,是一种高光效植物;根据毒莴苣的光合-响应曲线,该外来入侵种的理论光补偿点为 $37.58 \mu\text{mol} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$,光饱和点为 $1480 \mu\text{mol} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$,理论最大净光合速率 $20.81 \mu\text{mol CO}_2 \cdot \text{m}^{-2} \cdot \text{s}^{-1}$;毒莴苣的光合作用具有午休现象,是由于高光照和高温导致气孔阻力增加、气孔关闭,影响了植株对外的气体交换;影响净光合速率的主要因素是气孔导度、叶面光合有效辐射和叶片的蒸腾.

关键词 [毒莴苣](#) [光合作用](#) [群落](#)

分类号

Photosynthetic characteristics and coenological survey of *Lactuca serriola* in its invaded area

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Abstract

Lactuca serriola, a national class quarantine object, is a new invasive species in the coastal area of Southeast China. The coenological survey showed that because of its big individual, *L. serriola* could easily form dominant population in its invaded area, and its main accompany species were *Conyza canadensis*, *C. bonarinensis*, *Bidentis bipinnata*, *Oenothera laciniata*, *Ipomoea hederacea*, *Setaria viridis*, *Daucus carota*, *Xanthium sibiricum*, *Erigeron annuus*, *L. indica*, *Humulus scandens*, *Solanum nigrum* and *Aster subulatus*. The measurements with LC-A4 portable photosynthesis and transpiration system (ADC, England) revealed that the net photosynthetic rate of *L. serriola* was as high as $21.22 \pm 0.45 \mu\text{mol CO}_2 \cdot \text{m}^{-2} \cdot \text{s}^{-1}$, being slightly lower than that of *E. annuus* and *C. bonarinensis*, similar to that of *C. canadensis*, and higher than that of *Chenopodium album*, *Plantago virginica* and *L. indica*. Based on the photosynthesis-light response equation, the theoretic light compensation point of *L. serriola* was $37.58 \mu\text{mol m}^{-2} \cdot \text{s}^{-1}$, its theoretic light saturation point was $1480 \mu\text{mol} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$, and theoretic maximal net photosynthetic rate was $20.81 \mu\text{mol CO}_2 \cdot \text{m}^{-2} \cdot \text{s}^{-1}$. A distinct "noon break" phenomenon was observed in *L. serriola* photosynthesis, which might result from the high stomatal resistance against high light intensity and temperature. The main factors affecting the net photosynthetic rate of *L. serriola* were leaf photosynthetic active radiation, stomatal conductance, and leaf transpiration rate.

Key words [Lactuca serriola](#) [Photosynthesis](#) [Coenology](#)

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