

研究论文

# 超级杂交稻两优培九及其亲本生育后期的光抑制和早衰特性

王荣富, 张云华, 焦德茂, 钱立生, 于江龙

安徽农业大学生命科学学院, 安徽合肥230036

收稿日期 2002-12-6 修回日期 2003-6-30 网络版发布日期 接受日期

**摘要** 以超级杂交稻两优培九(培矮64S/9311)和母本培矮64S(PA64S)以及父本中粳9311为材料,研究亲本和后代在自然条件下叶绿素荧光和活性氧代谢的差异。结果表明:强光高温下,在叶片衰老过程中,两优培九的叶绿素、蛋白质含量、PS II原初光化学效率(Fv/Fm)和光化学猝灭系数(qP)减少较少,非光化学猝灭系数(qN)增加不明显,说明在自然条件下,超级杂交稻两优培九吸收的光能较多地转化为化学能,热耗散较少,耐光抑制。同时两优培九的内源活性氧清除酶系如超氧化物歧化酶(SOD)和过氧化物酶(POD)诱导的活性较高,表现耐光氧化和抗早衰。研究证明超级杂交稻两优培九在耐光抑制和抗早衰特性上具有一定的光合生理优势。

**关键词** [超级杂交稻](#) [光抑制](#) [早衰](#) [叶绿素荧光特性](#) [膜脂过氧化](#)

**分类号** [S511](#)

## Characteristics of Photoinhibition and Early Aging in Super-hybrid Rice (Oryza sativa L.) “Liangyoupeijiu” and It’s Parents at Late Development Stage

WANG Rong-Fu, Zhang Yun-Hua, Jiao De-Mao, Qian Li-Sheng, Yu Jiang-Long

College of Life Sciences, Anhui Agriculture University, Hefei 230036, Anhui

**Abstract** With the materials of super-hybrid rice “Liangyoupeijiu” and its female parent Peiai64S and male parent indica rice 9311, relationships between Liangyoupeijiu and it’s parents were studied through chlorophyll fluorescence parameters and key indexes of active oxygen metabolism under natural condition. The decrease of contents of chlorophyll and protein, PS II primary photochemical efficiency (Fv/Fm) and photochemical quenching coefficient (qP) were less; increment of non-photochemical quenching coefficient (qN) were less in super-hybrid rice Liangyoupeijiu at noon (high light intensity and temperature) and during leaf senescence. The above results suggested that more light energy absorbed by Liangyoupeijiu was converted into chemical energy and less light energy was dissipated through thermal energy, showing the tolerance to photoinhibition. Meantime, the inductive activity of scavenging active oxygen enzymes such as superoxide dismutase (SOD) and peroxidase (POD) were higher. Thus endogenous active oxygen could be scavenged efficiently. As a result, the membrane-lipid peroxidation was lighter. These showed the tolerance to photooxidation and resistant to early aging. The above results demonstrated that super-hybrid rice “Liangyoupeijiu” had photosynthetic physiology advantage in the tolerance to photoinhibition and resistant to early aging.

**Key words** [Super-hybrid rice](#) [Characteristics of chlorophyll fluorescence](#) [Photoinhibition](#) [Early aging](#)

DOI:

通讯作者 王荣富 [rongfuwang@hotmail.com](mailto:rongfuwang@hotmail.com)

### 扩展功能

#### 本文信息

▶ [Supporting info](#)

▶ [PDF\(238KB\)](#)

▶ [\[HTML全文\]\(0KB\)](#)

▶ [参考文献](#)

#### 服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

#### 相关信息

▶ [本刊中包含“超级杂交稻”的相关文章](#)

▶ 本文作者相关文章

- [王荣富](#)
- [张云华](#)
- [焦德茂](#)
- [钱立生](#)
- [于江龙](#)