全国中文核心期刊
中国科技核心期刊
中国农业核心期刊
RCCSE中国核心学术期刊
中国科学引文数据库（CSCD）期刊
CAB International 收录期刊
美国《生物学文摘》收录期刊
美国《化学文摘》（CA）收录期刊

«上一篇 (DArticle.aspx?type=view&id=200905039)
下一篇 (DArticle.aspx?type=view&id=200905041)

PDF下载 (pdfdow.aspx?Sid=200905040)
+分享 (http://www.jiathis.com/share?uid=1541069)

微信公众号：大豆科学

[1]周倩倩,杨维,梁婵娟,等.镧与酸雨对大豆幼苗叶绿素含量和光合速率的复合影响[J].大豆科学,2009,28(05):941-944.[doi:10.11861/j.issn.1000-9841.2009.05.0941]
ZHOU Qian-qian,YANG Wei,LIANG Chan-juan,et al.Effects of La and Acid Rain on Chlorophyll Content and Photosynthetic Rate of Soybean Seedling[J].Soybean Science,2009,28(05):941-944.[doi:10.11861/j.issn.1000-9841.2009.05.0941]
点击复制

镧与酸雨对大豆幼苗叶绿素含量和光合速率的复合影响

《大豆科学》 [ISSN:1000-9841 /CN:23-1227/S] 卷： 第28卷 期数： 2009年05期 页码： 941-944 栏目：
出版日期： 2009-10-25

Title: Effects of La and Acid Rain on Chlorophyll Content and Photosynthetic Rate of Soybean Seedling

文章编号： 1000-9841(2009)05-0941-04

作者： 周倩倩[1] (KeySearch.aspx?type=Name&Sel=周倩倩)；[2] (KeySearch.aspx?type=Name&Sel=2</sup>) (KeySearch.aspx?type=Name&Sel=2</sup>)； 杨维[2] (KeySearch.aspx?type=Name&Sel=杨维)； 梁婵娟[2] (KeySearch.aspx?type=Name&Sel=梁婵娟)； 周青[1] (KeySearch.aspx?type=Name&Sel=周青)；[2] (KeySearch.aspx?type=Name&Sel=2 </sup>) (KeySearch.aspx?type=Name&Sel=2 </sup>)
1.江南大学 工业生物技术教育部重点实验室，江苏 无锡 214122；
2.江南大学 环境与土木工程学院，江苏 无锡 214122

Author(s): ZHOU Qian-qian[1] (KeySearch.aspx?type=Name&Sel=ZHOU Qian-qian)；[2] (KeySearch.aspx?type=Name&Sel=2</sup>)； YANG Wei[2] (KeySearch.aspx?type=Name&Sel=YANG Wei)； LIANG Chan-juan[2] (KeySearch.aspx?type=Name&Sel=LIANG Chan-juan)； ZHOU Qing[1] (KeySearch.aspx?type=Name&Sel=ZHOU Qing)；[2] (KeySearch.aspx?type=Name&Sel=2 </sup>) (KeySearch.aspx?type=Name&Sel=2 </sup>)
1.The Key Laboratory of Industrial Biotechnology, Ministry of Education, Jiangnan University, Wuxi 214122;
2.College of Environment and Civil Engineering, Jiangnan University, Wuxi 214122, Jiangsu, China

关键词： La(III) (KeySearch.aspx?type=KeyWord&Sel=La(III))； 酸雨 (KeySearch.aspx?type=KeyWord&Sel=酸雨)； 光合作用 (KeySearch.aspx?type=KeyWord&Sel=光合作用)； 大豆幼苗 (KeySearch.aspx?type=KeyWord&Sel=大豆幼苗)

Keywords: Lanthanum (La) (KeySearch.aspx?type=KeyWord&Sel=Lanthanum (La))； Acid rain (KeySearch.aspx?type=KeyWord&Sel=Acid rain)； Photosynthesis (KeySearch.aspx?type=KeyWord&Sel=Photosynthesis)； Soybean seedling (KeySearch.aspx?type=KeyWord&Sel=Soybean seedling)

分类号： X517;Q945

DOI: 10.11861/j.issn.1000-9841.2009.05.0941 (http://dx.doi.org/10.11861/j.issn.1000-9841.2009.05.0941)

文献标志码： A

摘要： 为探索稀土元素镧和酸雨对大豆幼苗光合作用的复合影响，采用水培实验方法研究了La(III)与酸雨(AR)复合处理对大豆幼苗叶片叶绿素含量(Chl)及光合速率(Pn)的影响。结果表明：在酸雨(AR_1/pH3.0、AR_2/pH3.5、AR_3/pH4.0、AR_4/pH4.5和AR_5/pH5.0)单独作用下，Chl含量与Pn均低于对照组稀土La(RE_1/20 mg.L^{-1}、RE_2 /60 mg.L^{-1}、RE_3/100 mg.L^{-1}、RE_4/300 mg.L^{-1}和$RE_5$500 mg.L^{-1})单独作用时，2个指标均呈现“低促高抑”规律。RE +AR复合作用影响下，Chl含量与Pn低于CK值，且AR的pH越低，RE的浓度越高，抑制作用越明显。RE_1和AR复合对大豆幼苗的抑制程度低于AR单独作用，呈拮抗效应，RE_2~RE_5与AR对大豆幼苗的复合影响表现为协同作用。

Abstract: To explore the combined effects of acid rain and rare earth on photosynthesis, with soybeans cultivated under laboratory conditions as test materials, the effects of simulated acid rain and lanthanum on chlorophyll content (Chl) and photosynthetic rate (Pn) in soybean seedlings were studied. The results showed that under acid rain (AR_1/pH3.0, AR_2/pH3.5, AR_3/pH4.0, AR_4/pH4.5 and AR_5/pH5.0) stress alone, Chl content and Pn were both inhibited. Under single La(RE_1/20 mg.L^{-1}, RE_2/60 mg.L^{-1}, RE_3/100 mg.L^{-1}, RE_4/300 mg.$L^{-1}$and $RE_5$500 mg.L^{-1}) treatment, the two indexes were both promoted under low concentration and inhibited under high concentration. With RE and AR combined treatments, Chl content and Pn had declined compared with the CK group. The inhibition degree was larger under lower pH value of AR and higher concentration of RE solution. Moreover, inhibition degree of the two indexes under $RE_1$and AR combined treatment was lighter than that under AR or RE_1 treatment alone, so they showed antagonistic action, while RE_2-$RE_5$and AR combined treatment showed synergetic effect.

参考文献/References:
[1]范金凤，曾淑萍，梁婵娟，等.La(III)与酸雨对大豆幼苗生长的复合影响[J].大豆科学，2009,28(4):744-746，750.(Fan J F, Zeng S P, Liang C J, et al.Effects of La(III) and acid rain on growth of soybean seedling[J].Soybean Science, 2009,28(4):744-746, 750.
[2]李万超，江洪，曾波，等.模拟酸雨对青冈和木荷幼苗光合响应特性的影响[J].西南大学学报(自然科学版)，2008,30(7):98-103.(Li W C, Jiang H, Zeng B, et al.Effects of simulated acid rain on photosynthesis in schima superb and quercus glauca [J].Journal of Southwest University(Natural Science Edition), 2008,30(7):98-103.)

[3]陶忠玲，周青.酸雨胁迫对水稻和高粱种子萌发的影响[J].安全与环境学报，2008,8(4):58-61.(Tao Z L，Zhou Q.Effects of acid rain on seedlings of germination of broomcorn and rice plants[J].Journal of Safety and Environment，2008,8(4):58-61.)
[4]付晓萍，田大伦.酸雨对植物的影响研究进展[J].西北林学院学报，2006,(4):23-27.(Fu X P，Tian D L.Research progress of the effect of acid rain on plant[J].Journal of Northwest Forestry University，2006,(4):23-27.)
[5]张秋英，李发东，刘孟雨.冬小麦叶片叶绿素含量及光合速率变化规律的研究[J].中国生态农业学报，2005,13(3):95-98.(Zhang Q Y，Li F D，Liu M D.Changing laws of chlorophyll content and photosynthetic rate in winter wheat leave[J].Chinese Journal of Eco-Agriculture，2005,(3):95-98.)
[6]陈振德，傅以彬，邹琦，等. 二甲亚砜和丙酮混合法测定叶绿素含量[J].山东农业大学学报(自然科学版)，1989,20(2):31-35.(Chen Z D，Fu Y B，Zou Q，et al.Determination of chlorophyll content by the mixed method of dimethyl sulphoxide with acetone[J].Journal of Shandong Agricultural University（Natural Science）1989,20(2):31-35.)
[7]周青，黄晓华，王冬燕，等. 稀土元素La对酸雨损伤蜡梅的影响[J].生态学杂志，1997,16(6):59-61.(Zhou Q；Huang X H；Wang D Y，et al.Effect of rare earth la on the wintersweet harmed by simulated acid rain[J].Chinese Journal of Ecology,1997,16(6):59-61.)
[8]梁婵娟，陶文沂，李操，等. UV-B与AR胁迫下油菜光合及CAT活性的恢复过程(Ⅱ)[J].农业环境科学学报，2004，23(5):890-894.(Liang C J，Tao W Y，Li C，et al.Restoration of defense enzyme and photosynthesis in rape seedling under combined stress of elevated ultraviolet-B radiation and acid rain (Ⅱ) [J].Journal of Agro-environmental Science，2004,23(5):890-894.)
[9]黄晓华，陆天虹，周青，等.酸雨伤害植物机理与稀土调控研究[J].中国生态农业学报，2004,12(3):116-118.(Huang X H，Lu T H，Zhou Q，et al.Injury mechanism of acid rain on plant and its rare earths control[J].Chinese Journal of Eco-Agriculture，2004，12(3):116-118.)

相似文献/References:

[1]陶彦,彭祺,周青.酸雨对大豆萌发种子能量代谢的影响[J]. (darticle.aspx?type=view&id=200902014)大豆科学,2009,28(02):243.[doi:10.11861/j.issn.1000-9841.2009.02.0243]
TAO Yan,PENG Qi,ZHOU Qing.Reponses of Energy Metabolism in Soybean Seed Germination to Acid Rain Stress [J].Soybean Science,2009,28(05):243.[doi:10.11861/j.issn.1000-9841.2009.02.0243]
[2]徐凌翔,丁爽,周青.大豆种子萌发过程中呼吸作用对酸雨胁迫的响应[J]. (darticle.aspx?type=view&id=200802017)大豆科学,2008,27(02):255.[doi:10.11861/j.issn.1000-9841.2008.02.0255]
XU Ling-xiang,DING Shuang,ZHOU Qing.Reponses of Respiration in Seed Germination of Soybean to Acid Rain Stress [J].Soybean Science,2008,27(05):255.[doi:10.11861/j.issn.1000-9841.2008.02.0255]
[3]张国正,吴洪颜,何小红,等.酸雨对江苏淮北地区大豆产量影响的研究[J]. (darticle.aspx?type=view&id=201602011)大豆科学,2016,35(02):251.[doi:10.11861/j.issn.1000-9841.2016.02.0251]
ZHANG Guo-zheng,WU Hong-yan,HE Xiao-hong,et al.Effect of Acid Rain on Soybean Yield in Huaibei District of Jiangsu[J].Soybean Science,2016,35(05):251.[doi:10.11861/j.issn.1000-9841.2016.02.0251]
[4]范金凤,曾淑平,梁婵娟,等.La(Ⅲ)与酸雨对大豆幼苗生长的复合影响[J]. (darticle.aspx?type=view&id=200504040)大豆科学,2009,28(04):744.[doi:10.11861/j.issn.1000-9841.2009.04.0744]
FAN Jin-feng,ZENG Shu-ping,LIANG Chan-juan,et al.Effects of La(Ⅲ) and Acid Rain on Growth of Soybean Seedling [J].Soybean Science,2009,28(05):744.[doi:10.11861/j.issn.1000-9841.2009.04.0744]

备注/Memo 基金项目：江苏省大学生实践创新训练资助项目，院长基金资助项目(HT2008-6-1)。
作者简介：周倩倩(1989-),女,学士，研究方向为环境生态学。
通讯作者：周青，教授。E-mail:zhouqeco@yahoo.com.cn。

更新日期/Last Update: 2014-09-19