

# 李成涛

## 报告人简介:

李成涛，男，安徽阜阳人，博士，陕西科技大学环境科学与工程学院副院长，硕士生导师。近年来先后主持国家及省部级项目 2 项，厅局级项目 6 项，发表科研论文 20 余篇，其中 SCI 收录 9 篇，EI 收录 1 篇，申请国家发明专利 3 项，已授权 2 项，获陕西省



科学技术二等奖 1 项（排名第 2），陕西高等学校科学技术二等奖 1 项（排名第 2），陕西省环境保护科学技术一等奖 1 项（排名第 2）。研究方向为：（1）环境友好型生物降解材料；（2）工业污染物的降解与资源化。

## Chengtao Li

### Profile of the Author:

Name: Li Chengtao

Sex: Male

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Educational Background: PhD

Profession: Associate Dean and a master supervisor of College of Environmental Science and Engineering, Shaanxi University of Science & Technology

### Academic Research:

In recent years, he has presided over 2 national, provincial and ministerial-level projects, 6 bureau-level projects, and published more than 20 research papers, including 9 SCIs, 1 EI, 3 national invention patents, and 2 authorized projects. Received 1 second prize of science and technology in Shaanxi Province (ranked 2nd), 1st prize of science and technology in Shaanxi Higher Education School (ranked 2nd), 1st prize of Shaanxi Provincial Environmental Protection Science and Technology (ranked 2nd).

### Research Direction:

- (1) Environmentally friendly biodegradable material
- (2) Degradation and Recycling of Industrial Pollutants

# 可生物降解的脂肪族聚酯对植物生长代谢的影响

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**摘要:** 本研究通过短期种子发芽实验、中、长期植物生长实验, 考察了聚乳酸 (PLA)、聚丁二酸丁二醇酯 (PBS) 及其共聚物等可生物降解材料对植物生长代谢的影响, 综合评价了可生物降解材料对生态环境的影响。结果表明: (1) 低质量分数的 PBS 及对青菜和生菜的发芽、生长以及叶绿素的合成具有一定的促进作用, 而高质量分数的 PBS 则会产生轻微的抑制作用; PBS 的加入有利于青菜种子的发芽, 较大幅度地提高了其发芽率、根长、苗长等, 并随着 PBS 质量分数的增加这种促进作用越发明显; (2) 冬小麦、玉米种子发芽实验发现, PBS 对种子的发芽势、种子活力指数均具有一定的促进作用, 对根系生长也具有促进作用, 且较低含量的聚合物更利于种子发芽; 通过对 PBS 和 PBS-co-HS 对冬小麦的前期生长起促进作用, PBS-co-BA 对冬小麦的生长代谢没有影响。

**关键词:** 可生物降解、脂肪族聚酯、植物生长代谢、环境影响评价、质量分数

## Effect of Biodegradable Aliphatic Polyester on Plant

### Growth and Metabolism

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**Abstract:** In this study, the effects of biodegradable materials such as polylactic acid (PLA), polybutylene succinate (PBS) and their copolymers on plant growth and metabolism were investigated by short-term seed germination experiments and medium- and long-term plant growth experiments. The impact of biodegradable

materials on the ecological environment was comprehensively evaluated. The results showed that: (1) low-quality PBS and germination, growth and chlorophyll synthesis of green vegetables and lettuce have a certain promoting effect, while high-quality fraction of PBS will produce a slight inhibition; PBS is beneficial to green vegetables. The germination of the seeds greatly increased the germination rate, root length, seedling length, etc., and the promotion effect became more obvious with the increase of the PBS mass fraction; (2) The germination experiment of winter wheat and corn seeds showed that PBS had a certain promoting effect on seed germination potential and seed vigor index, and also promoted root growth, and lower content of polymer was more conducive to seed germination; PBS and PBS-*co*-HS promoted the growth of winter wheat, and PBS-*co*-BA had no effect on the growth and metabolism of winter wheat.

**Key words:** Biodegradable; Aliphatic polyester; Plant growth metabolism ; Environmental impact assessment; Mass fraction