

种子小蜂和空壳果实对生物能源树种黄连木果实和油产量的影响(英文)

刘琼霞, 文礼章, 周华建, 吴倩, Marvin K. HARRIS, 肖治术

Effects of seed wasps and seedless fruits on fruit and oil yields of *Pistacia chinensis* as a biofuel tree

LIU Qiong-Xia, WEN Li-Zhang, ZHOU Hua-Jian, WU Qian, Marvin K. HARRIS, XIAO Zhi-Shu

- 摘要
- 参考文献
- 相关文章

全文: PDF (2525 KB) HTML (1 KB) 输出: BibTeX | EndNote (RIS) 背景资料

摘要 黄连木 *Pistacia chinensis* Bunge 因果实含油量高, 被作为生物能源树种在我国进行大面积栽培推广和能源开发利用。然而, 专性寄生害虫(主要为黄连木广肩小蜂 *Eurytoma plotnikovi* Nikolskaya) 的危害及由单性结实和败育所造成的空壳果实可能影响黄连木的果实产量和质量。为了评价种子害虫和空壳果实对黄连木果实产量和质量的影响, 我们测定了河南省济源市3个黄连木种群40株结果雌树的果实产量和油产量, 同时测定了完好果实、空壳果实和虫蛀果实等3类果实的干重和含油量。结果表明: (1) 虫害率和空壳率分别达22.6%和53.0%, 且不同个体和种群间均存在显著差异 ($P < 0.05$)。 (2) 空壳果实 (30.7 mg/果) 和虫蛀果实 (33.1 mg/果) 的干重均不到完好果实 (67.4 mg/果) 的一半; 空壳果实 (3.9%) 和虫蛀果实 (3.8%) 的含油量均显著低于完好果实 (39.9%)。 (3) 实测的果实产量 (2.9 kg/树) 和油产量 (0.6 kg/树) 分别仅为期望产量的50% (4.7 kg/树) 和33% (1.9 kg/树), 但在3个种群之间无显著差异。本研究显示小蜂危害和空壳果实对黄连木果实产量和质量能造成严重影响, 在将其作为生物能源树种利用时对此应加以克服。

关键词: 黄连木 生物能源 生物能源树种 种子小蜂 黄连木广肩小蜂 空壳果实 果实产量 油产量

Abstract: *Pistacia chinensis* Bunge (Anacardiaceae) produces high-oil fruits and is being evaluated as an important biofuel source through establishing large plantations in China. However, harvest of fruit and oil crops from this tree may be limited by the damage from the seed wasp (*Eurytoma plotnikovi* Nikolskaya as the specialist seed predator) and seedless fruits (*i.e.*, those parthenocarpic and aborted). In order to assess the impact of predator damage and seedless fruits on fruit and oil yields of this prospective biofuel tree, we quantified crop reduction caused by seedless fruits and seed wasps by estimating fruit and oil production among individual plants of three *P. chinensis* populations in Mt. Taihang Shan in Jiyuan City, Henan province and also measured fruit oil content for each fate category (*i.e.*, sound, seedless and insect-infested). The results indicated that fruit conditions varied considerably both among individual plants and among populations with the average 53.0% exhibiting seedless fruits and 22.6% showing insectinfested fruits. The dry mass of either seedless (30.7 mg/fruit) or insect-infested (33.1 mg/fruit) fruits was less than half of sound fruits (67.4 mg/fruit), and the oil content was similar between deceptive (3.9%) and insect-infested (3.8%) fruits, but up to ten times lower than that (39.9%) of sound fruits. Based on dry mass and oil content for each fate category, the observed fruit yield (2.9 kg/tree) was reduced up to 50% of the expected (4.7 kg/tree), and the observed oil yield (0.6 kg/tree) was less than one third of the expected (1.9 kg/tree), and fruit and oil yields were similar among populations. Our study indicates that *P. chinensis* faces serious challenges posed by seedless and insect-infested fruits that need to be overcome before adopting this tree as a major biofuel source.

Key words: *Pistacia chinensis* biofuel biofuel tree seed wasp *Eurytoma plotnikovi* seedless fruits fruit yield oil yield

收稿日期: 4503-03-28; 出版日期: 2011-10-20

基金资助:

国家自然科学基金项目 (30770372); 中国科学院知识创新项目 (KSCX2-YW-N-088)

通讯作者: 肖治术

服务

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ E-mail Alert
- ▶ RSS

作者相关文章

- ▶ 刘琼霞
- ▶ 文礼章
- ▶ 周华建
- ▶ 吴倩
- ▶ Marvin K. HARRIS
- ▶ 肖治术

引用本文:

刘琼霞,文礼章,周华建等.

种子小蜂和空壳果实对生物能源树种黄连木果实和油产量的影响(英文)[J]. 昆虫学报, 2011, 54(10): 1133-1139.

LIU Qiong-Xia,WEN Li-Zhang,ZHOU Hua-Jian et al. Effects of seed wasps and seedless fruits on fruit and oil yields of *Pistacia chinensis* as a biofuel tree[J]. ACTA ENTOMOLOGICA SINICA, 2011, 54(10): 1133-1139.

链接本文:

<http://www.insect.org.cn/CN/> 或 <http://www.insect.org.cn/CN/Y2011/V54/I10/1133>

没有本文参考文献

没有找到本文相关文献

版权所有 © 2010 《昆虫学报》编辑部

地址: 北京市朝阳区北辰西路1号院5号中国科学院动物研究所 邮编: 100101

电话: 010-64807173 传真: 010-64807099 E-mail: kcxb@ioz.ac.cn 网址: <http://www.insect.org.cn>

本系统由北京玛格泰克科技发展有限公司设计开发 技术支持: support@magtech.com.cn

京ICP备05064604号