

根瘤蚜侵染对不同抗性葡萄品种根系超微结构的影响

杜远鹏, 蒋恩顺, 翟衡

山东农业大学园艺科学与工程学院, 作物生物学国家重点实验室, 山东泰安271018

Effects of phylloxera infestation on the root ultrastructure of grape cultivars with different resistance

DU Yuan-Peng, JIANG En-Shun, ZHAI Heng

State Key Laboratory of Crop Biology, College of Horticulture Science and Engineering, Shandong Agricultural University, Tai'an, Shandong 271018, C

- 摘要
- 参考文献
- 相关文章

全文: [PDF \(10712 KB\)](#) [HTML \(1 KB\)](#) 输出: [BibTeX](#) | [EndNote \(RIS\)](#) [背景资料](#)

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

- ▶ [杜远鹏](#)
- ▶ [蒋恩顺](#)
- ▶ [翟衡](#)

摘要 【目的】探讨不同抗性葡萄品种对葡萄根瘤蚜 *Daktulosphaira vitifolia* Fitch 侵染后的组织结构响应。【方法】以砧木140Ru (*Vitis rupestris* × *V. berlandieri*) 和栽培品种赤霞珠 *Vitis vinifera* cv. Cabernet Sauvignon 离体三级根及140Ru盆栽苗为试材接种根瘤蚜卵, 接种两周后取刺吸位点组织作超薄切片并观察超微结构变化, 取盆栽140Ru不同时期根结测定多酚含量。【结果】超微结构显示, 砧木140Ru根系周皮层最外层细胞壁的厚度 (1 031.25 nm) 及周皮层细胞层数 (6~7层) 显著高于赤霞珠品种的周皮层细胞厚度 (543.75 nm) 及层数 (3~4层), 140Ru根系韧皮部酚类物质含量比赤霞珠高出35%; 侵染后, 砧木140Ru周皮层细胞第3层以内的细胞壁加厚并积聚大量的多酚类物质, 140Ru葡萄新根被根瘤蚜侵染后多酚含量呈升高趋势, 在接种20 d时是对照的2.4倍; 赤霞珠粗根被根瘤蚜侵染后薄壁细胞中细胞质变浓, 出现大量淀粉粒, 线粒体及内质网数量增多。【结论】砧木140Ru的周皮层组织结构较赤霞珠不利于根瘤蚜口针穿刺, 被根瘤蚜侵染后发生了不利于根瘤蚜侵染取食的变化。

关键词: 葡萄 根瘤蚜 砧木140Ru 赤霞珠 根系超微结构 酚类物质含量 淀粉粒

Abstract: 【Aim】 To investigate the effects of phylloxera infestation on the root ultrastructure of grape cultivars with different resistance. 【Methods】 Excised tertiary roots of rootstock 140Ru (*Vitis rupestris* × *V. berlandieri*) and *Vitis vinifera* cv. Cabernet Sauvignon and potted 140Ru were inoculated with phylloxera eggs. After two weeks, tissues at the probing sites were collected to make ultrathin section and the transmission electronic microscope was used to observe the changes of ultrastructure, and potted 140Ru nodosities in different stages were collected to examine the phenol content. 【Results】 The outermost periderm cell wall in 140Ru (1 031.25 nm) was thicker than that in Cabernet Sauvignon (543.75 nm), and the number of periderm cell layers in 140Ru (6-7 layers) was more than that in Cabernet Sauvignon (3-4 layers). The total phenol content of 140Ru tertiary roots was 35% higher than that of Cabernet Sauvignon. After phylloxera infestation, the cell wall of 140Ru periderm cells from the third layer became thicker, and much more polyphenol materials were accumulated in the periderm cells. Total phenol content of 140Ru nodosities kept increasing after phylloxera infestation, which was 2.4 times as high as the control at 20 d after inoculation. After phylloxera infestation, the cytoplasm concentration of Cabernet Sauvignon became higher, and the numbers of starch granule, mitochondria and endoplasmic reticulum also increased. 【Conclusion】 Periderm structure of 140Ru impedes the penetration of phylloxera stylet compared to that of Cabernet Sauvignon, and the phylloxera infestation causes the changes unfavorable to phylloxera feeding.

Key words: Grape phylloxera Rootstock 140Ru; *Vitis vinifera* cv. Cabernet Sauvignon root ultrastructure phenol content starch granules

收稿日期: 2011-08-09; 接受日期: 2012-02-23

基金资助:

国家自然科学基金项目 (30871680)

通讯作者: 翟衡 E-mail: hengz@sdau.edu.cn

作者简介: 杜远鹏, 女, 1982年生, 山东蓬莱人, 博士研究生, 主要从事葡萄抗逆机制研究, E-mail:

duyuanpeng001@163.com

引用本文:

杜远鹏,蒋恩顺,翟衡. 根瘤蚜侵染对不同抗性葡萄品种根系超微结构的影响[J]. 昆虫学报, 2012, 55(3): 324-329.

DU Yuan-Peng,JIANG 恩Shun,DI Heng. Effects of phyloxera infestation on the root ultrastructure of grape cultivars with different resistance[J]. ACTA ENTOMOLOGICA SINICA, 2012, 55(3): 324-329.

链接本文:

<http://www.insect.org.cn/CN/> 或 <http://www.insect.org.cn/CN/Y2012/V55/I3/324>

没有本文参考文献

- [1] 孙庆华, 陈迎春, 王海波, D.A. DOWNIE, 翟衡. 我国根瘤蚜mtDNA CO I 遗传多样性与系统发育[J]. 昆虫学报, 2009, 52(8): 885-891.
- [2] 杜远鹏, 郑秋玲, 翟衡, 蒋恩顺, 王忠跃. 根瘤蚜对不同抗性葡萄的选择性及葡萄根系挥发性物质的鉴定[J]. 昆虫学报, 2009, 52(5): 537-543.
- [3] 赵亚华, 张 微, 李日清, 钟杨生, 郑慧平, 林健荣. 蜂毒溶血肽对鸡红细胞及膜的生化作用[J]. 昆虫学报, 2008, 51(6): 586-594.
- [4] 曹广力, 贡成良, 薛仁宇, 朱越雄, 魏育红. 家蚕核型多角体病毒egt基因的分子进化分析[J]. 昆虫学报, 2008, 51(12): 1244-1254.
- [5] Firdose Ahmad MALIK, Y. Srinivasa REDDY. 高温对家蚕三品系血淋巴中糖水平的影响[J]. 昆虫学报, 2008, 51(11): 1113-1120.
- [6] 杜远鹏, 王兆顺, 杨阳, 赵青, 翟衡, 王忠跃. 根瘤蚜侵染不同抗性葡萄对根结形成及植株营养消耗的影响[J]. 昆虫学报, 2008, 51(10): 1050-1054.
- [7] 杜远鹏, 王兆顺, 孙庆华, 翟衡, 王忠跃. 部分葡萄品种和砧木抗葡萄根瘤蚜性能鉴定[J]. 昆虫学报, 2008, 51(1): 33-39.
- [8] 栾丰刚, 郑伟华, 李芳, 热孜万古丽·加马力, 米日古丽·热合木都, 马德英. 吐鲁番地区葡萄斑叶蝉发生规律及种群空间分布型研究[J]. 昆虫学报, 2006, 49: 416-420.
- [9] 黄小红, 陈清西, 尤民生, 王君, 关雄. 棉铃虫N-乙酰- β -D-氨基葡萄糖苷酶的分离纯化及酶学性质[J]. 昆虫学报, 2005, 48(4): 498-502.