

同位素示踪 · 资源环境 · 动植物生理

成熟期淹水对烤烟石油醚提取物、主要化学成分及致香物质含量的影响

李祖良¹, 刘国顺¹, 张庆明², 伍顺波³, 何川¹, 拓阳阳¹, 黄勇琴⁴, 赵龙杰¹

1. 河南农业大学烟草学院/国家烟草栽培生理生化研究基地, 河南 郑州 450002;
2. 贵州中烟工业有限公司, 贵州 贵阳 550000;
3. 毕节烟草公司金沙县分公司, 贵州 毕节 551700;
4. 河南农业大学林学院, 河南 郑州 450002

摘要:

以烤烟云烟97为材料,采用田间试验研究了成熟期不同淹水时间处理对烤烟石油醚提取物、主要化学成分及致香物质含量的影响。结果表明,在不同淹水处理后,烤烟中部叶石油醚提取物、总糖、还原糖、烟碱、钾、氯含量以及钾/氯低于对照,而总氮和氮/碱高于对照;其中总糖、烟碱含量降幅达到44.06%和48.52%,总氮含量升幅达到47.64%。大多数致香物质含量和致香物质总量及不同种类致香物质含量都有不同程度的降低,致香物质中以新植二烯降幅最大达到52.15%,4种致香物质种类中以苯丙氨酸类和类西柏烷类致香物质下降最为明显,分别达到34.75%和31.90%。在各淹水处理中,以淹水5d对烤烟烟叶品质影响最大,说明成熟期淹水时间越长,对烟叶品质形成越不利。

关键词: 烤烟 成熟期 淹水 石油醚提取物 化学成分 致香物质

EFFECT OF WATERLOGGING AT MATURE STAGE ON THE CONTENT OF THE PETROLEUM ETHER EXTRACTS,THE MAIN CHEMICAL CONSTITUENTS AND AROMA MATTER OF FLUE-CURED TOBACCO

LI Zu-liang¹, LIU Guo-shun¹, ZHANG Qing-ming², WU Shun-bo³, HE Chuan¹, TUO Yang-yang¹, HUANG Yong-qin⁴, ZHAO Long-jie¹

1. College of Tobacco Science/National Tobacco Cultivation and Physiological and Biochemical Center, Henan Agricultural University, Zhengzhou, Henan 450002;
2. China Tobacco Guizhou Industrial Co., Ltd., Guiyang, Guizhou 550000;
3. Jinsha Corporation of Bijie Region Tobacco Monopoly Administration, Bijie, Guizho 551700;
4. College of Forestry, Henan Agriculture University, Zhengzhou, Henan 450002

Abstract:

A field experiment of the flue-cured tobacco cv. Yunyan 97 at the maturity was conducted to research the influence of different flooded periods on the content of petroleum ether extract,the main chemical constituents and aroma matter. Results indicated that, for the middle leaves of flooded flue-cured tobacco, after different waterlogging phases, the contents of petroleum ether extracts,total sugar, reducing sugar, nicotine, potassium, chlorine and the ratio of potassium to chlorine were lower than the control. Moreover,the content of total nitrogen and nitrogen alkali ratio were higher than the control;the amplitude reduction of total sugar and nicotine was 44.06% and 48.52%, respectively, and the increase amplitude of total nitrogen was 47.64%. For most of aroma components, their content,total content and each kind content were declined at different degrees, the neophytadiene with the biggest decline of 52.15%, the phenylalanine group and cembratriendiol group with the most significant decline of 34.75% and 31.90% among four kinds of flavor matter, respectively.During all the flooded treatments, the first 5 days was the most influential period for the quality of flue-cured tobacco leaves,which showed the worse their quality was the longer the flooding time was.

Keywords: flue-cured tobacco maturity waterlogging petroleum ether extract chemical constituents aroma matter

收稿日期 2011-10-08 修回日期 2012-02-09 网络版发布日期

DOI:

基金项目:

贵州省烟草公司毕节地区公司项目(2009A-1)

扩展功能

本文信息

- ▶ Supporting info
- ▶ PDF(1138KB)
- ▶ [HTML全文]
- ▶ 参考文献[PDF]
- ▶ 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
- ▶ 引用本文
- ▶ Email Alert
- ▶ 文章反馈
- ▶ 浏览反馈信息

本文关键词相关文章

- ▶ 烤烟
- ▶ 成熟期
- ▶ 淹水
- ▶ 石油醚提取物
- ▶ 化学成分
- ▶ 致香物质

本文作者相关文章

- ▶ 李祖良
- ▶ 刘国顺
- ▶ 张庆明
- ▶ 伍顺波
- ▶ 何川
- ▶ 拓阳阳
- ▶ 黄勇琴
- ▶ 赵龙杰

PubMed

- ▶ Article by LI Zu-liang
- ▶ Article by LIU Guo-shun
- ▶ Article by ZHANG Qing-ming
- ▶ Article by WU Shun-bo
- ▶ Article by HE Chuan
- ▶ Article by TUO Yang-yang
- ▶ Article by HUANG Yong-qin
- ▶ Article by ZHAO Long-jie

通讯作者: 刘国顺(1954-),男,河南叶县人,教授,博士生导师,主要从事烟草栽培生理生化研究。E-mail: liugsh1851@163.com

作者简介:

作者Email: liugsh1851@163.com

参考文献:

- [1] 刘国顺.烟草栽培学[M].北京:中国农业出版社,2003:212-236
- [2] 周冀衡.烟草生理与生物化学[M].合肥:中国科学技术大学出版社,1996,172-182
- [3] Migge A,Kahmann U,Fock H P,Becker T W.Prolonged exposure of tobacco to a low oxygen atmosphere to suppress photorespiration decreases net photosynthesis and results in changes in plant morphology and chloroplast structure[J].Photosynthetica,1999,36(1-2): 107-116
- [4] 宫长荣,汪耀富.淹水胁迫对烤烟生理生化特性的影响[J].中国农业科学,1995(增刊): 126-129
- [5] Gevondyan A A,Pogosyan K S,Agaronyan S A,Malkhasyan L M.Response of hydroponically-grown tobacco and nightshade plants to the flooding of their root systems [J].Russian Journal of Plant Physiology,1999,46(2): 258-261
- [6] 蔺万煌,李艳红,萧浪涛,彭克勤,孙福增.淹水对烟草生理特性的影响[J].湖南农业大学学报(自然科学版),2001,27(5): 339-342
- [7] 中国农业科学院烟草研究所主编.中国烟草栽培学[M].上海:上海科学技术出版社,1987
- [8] 毕庆文,汪 健,杨志晓,邱妙文,翟争光,张小全,杨铁钊.成熟期大田渍水胁迫对烤烟叶片生理特性的影响[J].中国烟草学报,2009, 15(2): 46-49
- [9] 曾淑华,刘飞虎,覃 鹏,刘小莉,周 玮.淹水对烟草生理指标的影响[J].烟草科技,2004,(1): 36-38
- [10] 黎时光,杨友才,曾 强,龚 理,黄晓辉.淹水胁迫对烤烟不同生育时期生理生化特性的影响[J].华北农学报,2008,23(3): 116-119
- [11] 鲍士旦.土壤农化分析[M].北京:中国农业出版社,2000
- [12] 国家烟草质量监督检验中心.烟草及烟草制品,石油醚提取物的测定YC/T176-2003[S].北京:中国标准出版社,2003
- [13] 王瑞新.烟草化学[M].北京:中国农业出版社,2003
- [14] 赵世杰,刘华山,董新纯.植物生理学实验指导[M].北京:中国农业科技出版社,1998
- [15] 史宏志,刘国顺.烟草香味学[M].北京:中国农业出版社,1998
- [16] 温永琴,徐丽芬,陈宗瑜,陆 富,林良斌,程辉斗,程迎辉.云南烤烟石油醚提取物和多酚类与气候要素的关系[J].湖南农业大学学报,2002,28(2): 103-105
- [17] 闫克玉,李兴波,侯雅珍,李荣兴.河南烤烟(40级)石油醚提取物含量的研究[J].郑州轻工业学院学报,1995,10(1): 71-75
- [18] 颜合洪.水分条件对烤烟主要化学成分的影响研究[J].中国生态农业学报,2005,13(1): 101-103
- [19] 李艳红,蔺万煌,彭克勤,肖浪涛,王惠群,孙福增.水涝胁迫对烤烟化学品质的影响[J].中国烟草科学,2000,21(4): 35-37
- [20] Hsiao T C. Plant Responses to Water Stress[J]. Ann Rev Plant Physiol,1973,24: 519-570
- [21] 许振柱,周广胜.植物氮代谢及其环境调节研究进展[J].应用生态学报,2004,15(3): 511-516
- [22] 潘瑞炽.植物生理学[M].北京:高等教育出版社,2004: 298-299
- [23] 蔡永萍,陶汉之,张玉琼.土壤渍水对小麦开花后叶片几种生理特性的影响[J].植物生理学通讯,2000,36(2): 110-113
- [24] 王文泉,梅鸿猷,郑永战,张福锁.芝麻对涝害的反应及适应性变异[J].中国油料作物学报,1999,21(4): 29-32

本刊中的类似文章

1. 强继业.不同臭氧浓度对水培烤烟吸收 $(32)P$ 的影响[J].核农学报,2004,18(01): 47-50
2. 张会慧,包卓,许楠,王鹏,尹鹏达,孙广玉.钙对低温高光锻炼下烤烟幼苗光合的促进效应[J].核农学报,2011,25(3): 582-587
3. 张晓海,雷永和,殷端,徐树德,万兆良,别之龙,申鸿,刘大永.不同施肥量烤烟钾素营养效应[J].核农学报,1999,13(02): 0-0
4. 王寿祥,刘义宁.淹水土壤中久效磷的降解及消失动态[J].核农学报,1990,4(01): 52-56
5. 朱英华,屠乃美,肖汉乾,张国.硫对烤烟中镁吸收与积累的影响[J].核农学报,2011,25(4): 818-823
6. 王鹏,曾玲玲,王发鹏,张维理,李志宏.黄壤烤烟追肥氮的积累、分配及利用[J].核农学报,2010,24(3): 618-622
7. 刘德育,于方玲,孙冰玉,贺国强,元 野,赵光伟,李恒全,孙广玉.旺长期烤烟叶片的叶绿素荧光特性与激发能分配[J].核农学报,2010,24(3): 623-627
8. 谢志坚,涂书新,李进平,许汝冰,陈振国,王学龙.基肥(^{15}N)施用时间对烤烟产量、产值及氮素利用率的影响[J].核农学报,2010,24(4): 829-834
9. 谢志坚,涂书新,李进平,许汝冰,陈振国,曹仕明,王学龙,李建平,陈良存,曹翔练,郭利.移栽期和氮肥对烤烟产量、产值及氮素吸收利用的影响[J].核农学报,2009,23(3): 513-520
10. 尹鹏达,赵丽娜,朱文旭,焦玉生,赵光伟,孙广玉.氮磷钾配施对烤烟农艺性状和主要化学成分的影响[J].核农学报,2012,(2): 375-379