



作物所在甜玉米籽粒叶酸营养研究方面取得新进展

近日，作物所玉米研究团队在国际学术期刊Frontiers in plant science（中科院大类二区，IF=6.627）以A genome-wide association study of folates in sweet corn kernels为题发表甜玉米籽粒叶酸营养研究最新成果。作物研究所肖颖妮博士、于永涛研究员、谢利华助理研究员为论文的第一作者，胡建广研究员、李高科研究员为共同通讯作者。

叶酸是人体必需的一种营养成分，摄入不足容易引发孕妇流产、胎儿神经发育异常等多种疾病，甜玉米作为一种富含营养物质的特用玉米深受人们喜爱，但是控制其籽粒叶酸代谢途径的遗传基础并不清晰。广东省农业科学院作物研究所甜玉米团队一直以来致力于甜玉米营养品质研究。在本研究中，利用HPLC-MS/MS方法对295份甜玉米籽粒进行叶酸的测定，在甜玉米籽粒中检测到6种叶酸及其衍生物，结合重测序获得的高密度分子标记，通过全基因组关联分析手段共检测到95个与籽粒叶酸含量显著关联的位点，在这些位点中，发掘到一个编码5-甲酰四氢叶酸环化连接酶的关键基因与5-甲酰四氢叶酸含量显著关联，该位点能解释30.12%的表型变异，进一步通过候选基因重测序和单倍型分析发现该基因的功能位点是位于第二个外显子上的AA碱基突变成GG碱基，从而引起氨基酸由丙氨酸替换为甘氨酸。本研究结果为提高甜玉米叶酸含量和优质甜玉米品种改良提供了重要的理论依据。

本研究得到广东重点领域研发计划、省级乡村振兴战略专项、广东省农业科学院食品营养与健康研究协同中心、广东省农业科学院优势学科团队项目、科技创新战略-高水平农科院建设等项目的资助。

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A genome-wide association study of folates in sweet corn kernels

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Folate is commonly synthesized in natural plants and is an essential water-soluble vitamin of great importance in human health. Although the key genes involved in folate biosynthesis and transformation pathways have been identified in plants, the genetic architecture of folate in sweet corn kernels remain largely unclear. In this study, an association panel of 295 inbred lines of sweet corn was constructed. Six folate derivatives were quantified in sweet corn kernels at 20 days after pollination and a total of 95 loci were identified for



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