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# 抗虫棉外源Cry1A融合杀虫蛋白在土壤中的降解动态

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# Studies on Degradation Dynamics of Cry1Ac Protein from Different Types of Transgenic Bt Cotton in Soil

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摘要 以转Bt基因棉GK12和转Bt+CpTI基因棉中棉所41为试验材料，以其亲本材料（泗棉3号、中棉所23）为对照，采用ELISA测定方法，研究了抗虫棉外源Bt杀虫蛋白在土壤中的降解动态。结果表明：在土壤掩埋条件下，转Bt 基因棉和转双价基因棉叶片中Bt杀虫蛋白的降解动态基本一致，降解周期达6个月；叶片掩埋后1～3个月，杀虫蛋白降解最迅速，4～6个月降解缓慢，第7个月已检测不到。不同生育期两者根系中Bt杀虫蛋白含量变化趋势基本一致，5月最高，6－9月迅速下降，10月至次年3月逐渐下降，至次年4月已检测不到。土壤中Bt杀虫蛋白的降解动态基本一致，两类抗虫棉播种前土壤中均检测不到Bt杀虫蛋白，苗期开始Bt杀虫蛋白的含量逐渐增加，至花期均达到最高峰，铃期以后逐渐下降。棉花收获后6个月内，两类抗虫棉田土壤中Bt杀虫蛋白含量迅速降低，到次年4月已检测不到。

关键词： 转基因抗虫棉 外源杀虫蛋白Cry1A ELISA测定 蛋白含量 降解动态

Abstract： The degradation dynamics of toxin protein released by transgenic Bt cotton in soil were studied by the ELISA method, using Bt transgenic cotton cultivar GK 12 and transgenic *Bt* plus *CpTI* gene cultivar CCRI 41 as materials, and their parents (Simian 3, CCRI 23, respectively) as controls. The results showed that the degradation dynamics of Bt insecticidal protein in GK 12 was the same as that in CCRI 41 in leaves buried in soil. The degradation period was six months, and the Bt insecticidal protein degraded rapidly after being buried into soil for one to three months, and slowly from the fourth to the sixth month, and it could not be detected after seven months. The dynamics of Bt insecticidal protein of GK 12 and CCRI 41 in the roots in different growing stages were almost the same: the contents of insecticidal protein reached the peak in May(715.55 ng · $g^{-1}$ and 531.23 ng · $g^{-1}$, respectively), but decreased rapidly from June, fell to 45.63 ng · $g^{-1}$ and 42.33 ng · $g^{-1}$ in September, and decreased continually from October to next March, could not be detected after next April. The degradation dynamics of Bt insecticidal protein in GK 12 and CCRI 41 in soil were almost the same: the Bt insecticidal protein could not be detected before sowing, began to increase after the seedling stage, and reached the peak(324.06 ng · $g^{-1}$ and 355.50 ng · $g^{-1}$, respectively) in the flowering stage, then gradually decreased from the boll stage, dropped to 50.25 ng · $g^{-1}$ and 65.76 ng · $g^{-1}$, respectively, in the harvest period. Within six months after cotton harvest, the insecticidal protein decreased rapidly, but Bt insecticidal proteins could be detected until the following year in April.

Keywords： transgenic Bt cotton insecticidal Cry1A protein ELISA protein contents degradation dynamics

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