How pink bollworm may evolve resistance to GMO Bt crops

Insect resistant Bt crops are widely grown in many countries all over the world to prevent pest attacks in highly economical crops. However, the ability of pests to rapidly evolve resistance reduces the efficacy of Bt crops. In an article published by *Scientific Reports*, scientists from Hubei Academy of Agricultural Sciences and Chinese Academy of Agricultural Sciences reported that transposon insertion causes cadherin mis-splicing and confers resistance to Bt cotton in pink bollworm, a devastating pest of cotton globally.

The researchers found the allele (*r15*) harboring the insertion in a field population from China. They described the insertion as a miniature inverted repeat transposable element (MITE) with two additional transposons and produces two mis-spliced transcript variants. A strain homozygous for *r15* had 290-fold resistance to Cry1Ac, little or no cross-resistance to Cry2Ab, and completed its life cycle on Bt cotton producing Cry1Ac. The researchers also reported that for transformed insect cells, susceptibility to Cry1Ac was higher for cells producing the wild-type cadherin than for cells producing the *r15* mutant proteins.

The similar resistance of pink bollworm to Cry1Ac in laboratory- and field-selected insects from China, India and the U.S. provides a basis for developing international resistance management practices.

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