



Retracted: Comparative Functional Studies on Two Diploid Cotton Genomes Reveals Functional Differences of Basic Helix-loop-helix Proteins in Arabidopsis Trichome Initiation

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Authors' contributions

This work was carried out in collaboration among all authors. Author APNB designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors VKB, TANH and TLL managed the analyses of the study. Author HDT supervised and edited the final manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Background: The cultivated tetraploid cotton species (AD genomes) was originated from two ancestral diploid species (A and D genomes). While the ancestral A-genome species produce spinnable fibers, the D- genome species do not. Cotton fibers are unicellular trichomes originating from seed coat epidermal cells, and currently there is an immense interest in understanding the

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process of fiber initiation and development. Current knowledge demonstrates that there is a great deal of resemblance in initiation mechanism between Arabidopsis trichome and cotton fiber.

Methodology: In this study, we performed comparative functional studies between A genome and D-genome species in cotton by using Arabidopsis trichome initiation as a model. Four cotton genes TTG3, MYB2, DEL61 and DEL65 were amplified from A-genome and D-genome species, and transformed into their homolog trichomeless mutants Arabidopsis *ttg1*, *g1*, and *g13egl3*, respectively.

Results: Our data indicated that the transgenic plants expressing TTG3 and MYB2 genes from A-genome and D-genome species complement the *ttg1* and *g1* mutants, respectively. We also discovered complete absences of two functional basic helix loop helix (bHLH) proteins (DEL65/DEL61) in D- diploid species and one (DEL65) that is functional in A-genome species, but not from D-genome species. This observation is consistent with the natural phenomenon of spinnable fiber production in A- genome species and absence in D-genome species.

Keywords: Arabidopsis; trichome; MYB2; TTG3; DEL65; DEL61; A genome; D genomes.

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