



## Elucidation of thermotolerance diversity in cotton (*Gossypium hirsutum* L.) using physio-molecular approaches

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**ABSTRACT.** Cotton (*Gossypium hirsutum*) is an important cash crop, but high temperature during its growing season is one of the major factors that limit its productivity. This problem compels plant breeders to breed for heat tolerance, which can help to overcome this challenge. It is very important to make a comprehensive screening of heat-tolerant genotypes so that only the best are chosen. Here we report the combined use of several techniques that can help breeders to screen their germplasm. Twelve cultivated cotton genotypes were evaluated for thermotolerance, using assays that included electrolyte leakage, chlorophyll accumulation and protein profiling, as well as RAPDs to assess genetic diversity. Two genotypes (B-557 and NIAB-78) showed tolerant behavior in three thermotolerance assays. RAPD analysis results showed maximum similarity in a range of 86.7-66.7% between the genotypes MNH-554 and CIM-443. We conclude that combined use should be made of relative electrolyte leakage, chlorophyll stability and differential display with SDS-PAGE to aid in screening for stress

tolerance. RAPD-based diversity analysis will further help to improve the efficiency of breeding programs.

**Key words:** Relative electrolyte leakage; Chlorophyll accumulation; SDS-PAGE; RAPD