

Short Communication

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IDENTIFICATION OF COTTON HYBRIDS AND THEIR PARENTS THROUGH SCANNING ELECTRON MICROSCOPY OF SEED COAT

S. MURALI KRISHNA AND O.P. SAXENA

Botany Department, University School of Sciences, Gujarat University, Ahmedabad - 380 009, India.

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Seed coat patterns of cotton hybrids and their parents were compared through scanning electron microscopy to explore the potentialities of technique in making a quick, clear and reliable identification. Variations in seed coat sculptures are helpful in differentiation of hybrids and parents.

Key Words : SEM, cotton hybrids, parents.

Cotton is one of the important national economy builder crop of India. Advent of hybrids in it has brought tremendous revolution in cotton industry. The manual emasculation of plants is an error prone process as it causes enormous selfed seed settings during hybridization which on harvest come along with hybrid seeds and subsequently reduce their productivity.

In present studies the technique of scanning electron microscopy was explored to find possible clue(s) capable of identifying hybrids and parents at seed stage.

Intact seed coats were removed from dry seeds of cotton hybrids and their parents. 2 mm of seed coat was mounted on a specimen holder. The samples were

coated in 'sputter coater' with approximately 200 Å thick layer of gold and palladium. For uniform coating the samples were made to rotate at an angle of 45°C from the vapour sources, while they were also rotating at their own axis. The samples were scanned by Scanning Electron Microscope (JEOL, JSMT-300, Techniques Co. Ltd., Tokyo, Japan). Photographs were taken at 100 X magnification.

The results were tabulated (Fig. 1). Various arrangements of fissured, reticulated and related types of seed coat sculptures differed in cotton hybrid and its two parents. Farooqui and Bahadur (1984) in the similar way identified *Nicotiana* varieties through seed coat sculpture. Furrows and ridges formed the basis of *Pavonia* species and *Malvastrum* species identifica-

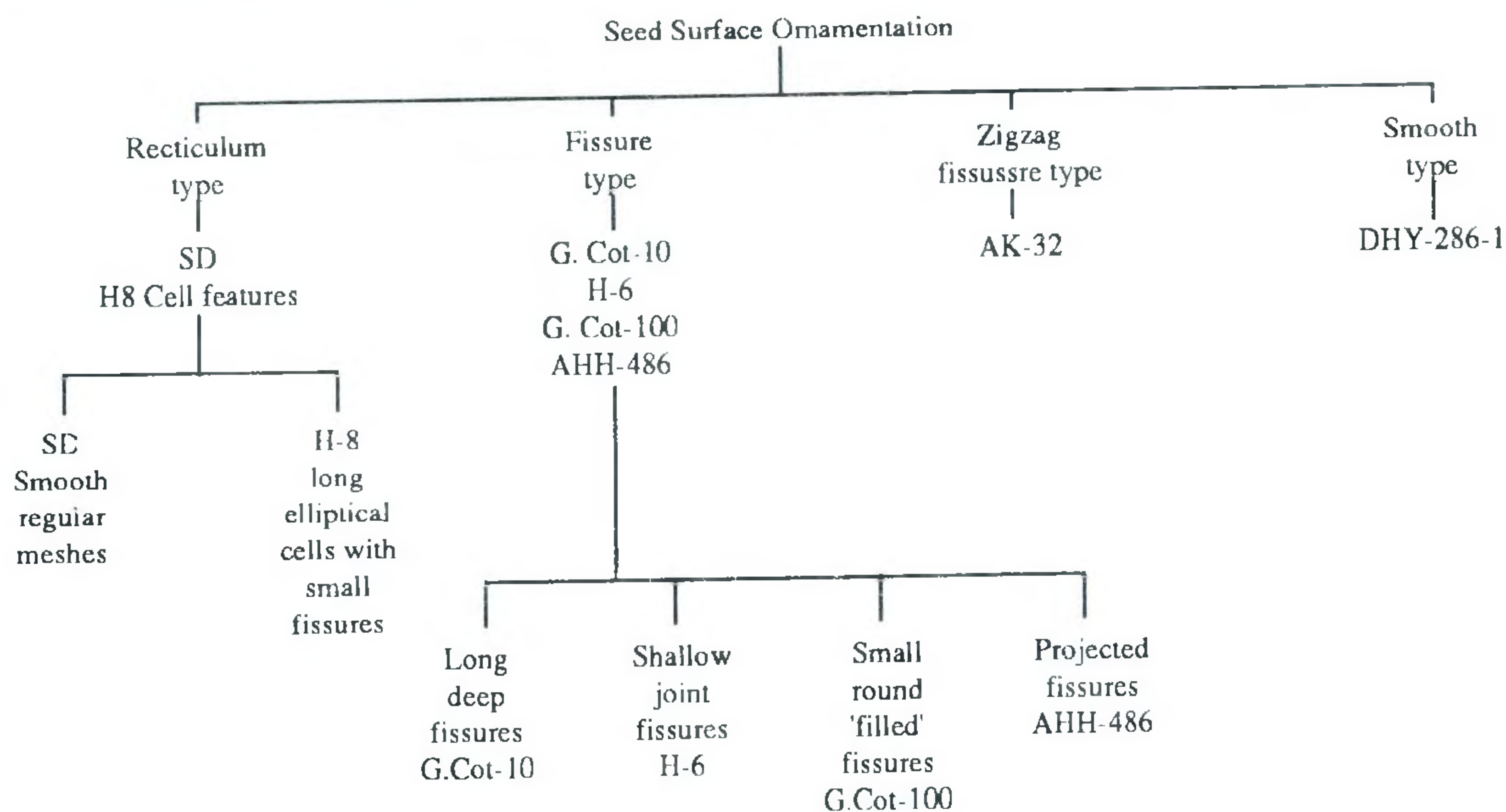


Fig. 1: Identification of cotton hybrids and parents on the basis of their seed coat features (SEM)

tion (Kumar *et al.*, 1987; Kumar and Singh, 1989).

Hybridization in cotton affected length, texture, orientation as well as depth of fissure and reticulum. Hybrid seed got a sort of intermediate (of male and female) type of ornamentation on its seed coat while the seed coat patterns were completely different in male and female parents. Seed coat pattern is a genetically inherited character (Lavania, 1990) therefore it forms fully reliable character for genotypic identification. However there are evidences that seed coat sculptures are also liable to get affected by ovule to ovule relationship inside ovary, environment of ovary and seed maturity (Brisson and Peterson, 1976) but examination of large number of samples eradicates the 'intra' varietal/genotypic differences. SEM provides quicker, simpler and reliable technique to differentiate cotton hybrids and parents but high cost of technique does not make it fit for commercialization i.e. for certification purposes, however, it would be of immense use in identifying seeds which generally can not be made available in large quantities such as breeders seeds, not only this the SEM also allows the usage of

same seeds in fields or for other experimentations and therefore seeds do not go waste but remain reusable which could be highlight of the technique in varietal identification.

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