

## Research Paper

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# Self incompatibility assessment in vascular streak dieback (VSD) disease resistant hybrids of cocoa (*Theobroma cocoa* L.)

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**ABSTRACT :** Self incompatibility is widely exploited in cocoa for hybrid seed production. Though a lot of studies were conducted on this aspect self incompatibility varies with genotypes and unpredictable. This necessitates assessment of incompatibility status in every seedling derived cocoa, before it is exploited for any breeding programme. Fifty field established potential vascular streak dieback (VSD) disease resistant hybrids were used for the study. Crosses involving parents GVI 55 (IMC 10), GVI 18.5 (CCRP 5) and GVI 126 (Scavina 6) the proven source of resistance showed maximum recovery of good hybrids with VSD resistance. Among fifty hybrids studied, twenty-one turned out to be self-incompatible (SIC) and nine self-compatible (SC). Twenty did not produce enough flowers to arrive at a conclusion. All crosses tested involving GVI 126 (Scavina 6) were self incompatible. Result revealed that hybrid progenies belonging to the same cross need not be identical in their compatibility reaction.

**KEY WORDS :** Cocoa, Self incompatibility, *Theobroma cacao* L., Vascular streak die back disease

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Cocoa (*Theobroma cacao* L.), the only source of exciting, restorative and relishing chocolates, is a plantation crop of highly complex genetic make up. The plant is highly cross pollinated on an account of peculiarity of flower structure and existence of self incompatibility. The mechanisms of genetic control and methods to circumvent in compatibility have been studied by many scientists (Pound, 1933; Marshall, 1933; Knight and Rogers, 1955; Cope, 1962; Bartley and Cope, 1973), but the system continues to be genotype dependent and unpredictable. This necessitates assessment of incompatibility status in every seedling derived cocoa, before it is being utilized as parents in hybridization programme or as parents in clonal gardens or for release as a clone. In Kerala Agricultural University, breeding for resistance to vascular streak dieback (VSD) disease (Fig. B) was initiated in 1995, soon after that the disease began to spread to the major cocoa growing belts of India. During the period 1995-96 to 1997 -98 explorative crosses using 298 resistant parents were made

and this resulted in field establishment of 953 hybrid seedlings showing various level of resistance (CCRP report, 1998). An evaluation of these VSD resistant hybrids (Fig. A) in the field for a period of 12 years resulted in identification of 50 superior



Fig. A : Cocoa hybrids