ABSTRACT

An improved method of artificial cross-pollination and the appropriate statistical analysis was used to investigate the nature of the incomaptibility alleles in the Scavina clones.

Crossing the Scavina clones with a series of "test" clones of various genotypes of incompatibility demonstrated that the SCA clones do not have as dominant "S" allele the Saa/genotype of ICS 45 (Designated by Cope, 1962). The SCAs also do not have as dominant "S" allele the alleles "R" and "Q" designated by Glendinning (1967). It was also shown that the alleles S2/, S3/, S4/, and S5/ of Knight and Rogers' (1955) series are not present in the SCA clones.

A diallele crossing of the Scavina clones established that these clones are self-incompatible. The compatibility allele "C" of Glendinning's scheme (Sff by Cope's designation) is absent. A series of at least eight different dominant "S" alleles is present in the SCA clones with three pairs of clones having the same dominant incompatibility allele.

Histological investigations of the mechanism of incompatibility in the Scavina clones confirm some of the hypotheses of Cope (1962) in that the incompatibility reaction in these clones is manifested by the failure of a certain percentage (25% and 50%) of male and female gametes to fuse when they have the same dominant "S" allele.

An evolutionary model of incompatibility is postulated to explain the multi-allelic nature of incompatibility in the Scavina clones of *T. cacao*.