

Mariana Mota  
DCEB - Horticultura/CEER  
Instituto Superior de Agronomia

**Abstract**

Gametophytic incompatibility system (GSI) promotes cross-pollination in several families, namely in *Rosaceae*, where pome and stone fruits are included. In rosaceous species, GSI is controlled by a single multi-allelic locus (S-locus) which contains a haplotype-specific S-RNase gene expressed extracellularly in the pistil and a haplotype-specific F-box protein expressed in the pollen. Incompatibility is determined **[part I]** by the haploid composition of the pollen and the diploid composition of the pistil in cases of self-incompatibility and intra-specific cross-incompatibility. The interaction is established during the growth of the pollen tube in the style: if the S-haplotype of the pollen grain is coincident with one of the S-alleles present in the style, the pollen tube growth is inhibited. The expression of both alleles is co-dominant, both influence the pollen tube growth. The model proposed to explain specific pollen tube rejection by the S-RNases suggests that S-FBox recognizes specifically the S-RNase that is distinct from its haplotype and mediates its degradation by the ubiquitin-26S-proteasome system (in pome fruits) or interacts with its own S-RNase, keeping its activity in incompatible crosses (in stone fruits). The knowledge about GSI and the development of PCR-based genotyping methods allowed the identification of several S-haplotypes in apple, pear, almond, cherry and japonese plum **[part II]** and to define (in)compatible interactions between cultivars.