

Mate choice in plants

June 28 2008

In flowering plants, the female reproductive organ, the pistil, comprises the stigma, style, and ovary. The stigma catches pollen shed by the male anthers. If the pollen is compatible, it will germinate and send tubes through the extracellular matrix (ECM) of the style toward the ovary. It is in the style ECM where recognition and acceptance or rejection of the pollen takes place. Compatible pollen tubes grow unhindered toward the ovary. Incompatible pollen tubes become distorted and stop growing. The recognition mechanism is analogous to the immune systems in animals. Factors present in both the ECM and the pollen are needed for recognition and rejection or acceptance.

The most widespread SI system is genetically controlled at the chromosomal region called the S locus, which contains numerous alleles that control recognition specificity. These genes code for S-locus ribonucleases (S-RNases), enzymes that degrade RNA. S-RNases are expressed in the stigma, style and ovary and concentrate in the style ECM where they interact with pollen tubes. The recognition factors on the pollen side are the SLF (S-locus, F-box) alleles. If the S alleles of the pollen match those in the stylar ECM, the pollen is rejected. If they are different, the pollen tubes are allowed to grow toward the ovary.

Because of their immobility, plants face numerous challenges to ensure reproductive success and genetic diversity. Remarkably, they have evolved more than one system of mate choice, and components of the best studied are still being discovered. Knowledge of these systems may help us engineer plant breeding systems more precisely to achieve greater yields and to provide built-in safeguards for preventing

inadvertent pollination by and in pest or insecticide resistant crops or those bred to produce drugs or industrial materials.

Dr. Felipe Cruz García and his colleagues Karina Jimenez Duran, Grethel Busot, Claudia Ibarra Sanchez, and Bruce McClure have been investigating the components of the self-incompatibility system in tobacco. Dr. Cruz-Garcia, of the Departamento de Bioquímica, Facultad de Química, Universidad Nacional Autónoma de México, will be presenting this work at a symposium on the Biology of Solanaceous Species at the annual meeting of the American Society of Plant Biologists in Mérida, Mexico.

Source: American Society of Plant Biologists

Citation: Mate choice in plants (2008, June 28) retrieved 19 April 2024 from <https://phys.org/news/2008-06-choice.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.