

The Chromosomal Mechanism of Plant Sex Determination

Hsiang-Yi Huang¹

Abstract

Sexual propagation depends on gamete combination which is produced by different-gendered physics or organs. Most animals developed unisexual individuals, whereas the sexual expression in plant produces various sexual types among different species. Most of angiosperms are hermaphroditic or monoecious, only 5% of angiosperms are dioecious. The genetic mechanism of plant sex determination is controlled by single locus, unlike multiple loci or sex chromosome. Generally, the dioecious species sex is decided by sex chromosome which genotype of male is heterogametic (XY) and genotype of female is homogametic (XX) and few female is heterogametic. Sex-determination systems discovered in sex chromosome were Active Y-system and X-to-autosome ratio system. The development of unisexual flower is varies among different species. The male and female floral organs are developed simultaneously in some species and some developed the single-sex flower directly. The studies on dioecious dicotyledon plants indicated that sex development is controlled by MADS-box gene on the homeotic gene. MADS-box gene contained 3 sets of functional genes which controlled different floral organs developed. So far, the genetic mechanism of plant sex-determination is known, however its interactions with metabolism and environment are not clear.

Key words : hermaphroditic, dioecious, monoecous, sex chromosome

¹ Assistant Researcher, Kaohsiung District Agricultural Research and Extension Station, COA, EY.