

The Role of Apomixis in Plant Reproduction

Huang, Hsiang-Yi ¹

Abstract

Apomixis is a mode of sexual seed formation without meiotic reduction and fertilization which accompany to the events of sexual reproduction. Apomixis is usually separated into aposporous and diplosporous forms. Aposporous apomixis is developed from a somatic cell within the ovule. Diplosporous apomixis is developed from an unreduced megaspore. Both types of apomixis bypass the meiosis. Another apomixis is occurred by endosperm development depends on the fertilization of the polar cells, which called pseudogamous apomixis. The switch from a normal sexual pathway to an apomictic pathway should content at least three conditions: circumvention of meiosis, development of the embryo independently of fertilization and formation of a functional endosperm. Apomixis is found almost in polyploidy and highly heterozygous species that probably attribute to the mechanism of polyploid formation. The genetic mechanism of apomixis is not clear and differ among species until now. For example, apomixis is inherited by a single allele in *Panicum maximum* and *Ranunculus auricomus*. Some species are controlled by more than two loci, such as citrus have at least six apomixis relative QTL(quantitative trait locus). So far, apomictic genes have not found in major food crops. If the apomictic gene was introduced into the strong vigor, pest and stress resistant varieties of major crops. It will certainly be a challenge to the traditional F₁ variety breeding strategy.

Keywords : apomixis, polyploidy, plant reproduction

¹ Assistant Researcher, Kaohsiung District Agricultural Research and Extension Station, Council of Agriculture, and Ph. D. candidate of Institute of Plant Science, National Pingtung University of Science and Technology, Pingtung, Taiwan, ROC.