

4th International Conference on

PLANT SCIENCE & PHYSIOLOGY

March 25-26, 2019 Sydney, Australia

Compatibility between cytoplasm and a single chromosome derived from *Diplotaxis tenuifolia* results in selectable female sterility in *Brassica rapa*Yoshiaki Fujita^{1,2}¹Utsunomiya University, Japan²Tokyo University of Agriculture and Technology, Japan

In plants, particular combinations between nuclear genomes and alien organelle genomes often results in Cytoplasmic Male Sterility (CMS). *Diplotaxis tenuifolia* (Dt) used as a cytoplasmic resource belongs to Brassicaceae and is a wild plant closely related to Brassica crops. We have tried to produce a *B. rapa* CMS line ($2n=20$) carrying *D. tenuifolia* cytoplasm (cyt-Dt) by means of an intergeneric crossing between *D. tenuifolia* and *B. rapa* and successive backcrossing with *B. rapa*. However, the alloplasmic *B. rapa* line has not been obtained through the breeding work of several years and only a type of Monosomic Addition Line (MAL) has been produced. Here, we investigated female fertility and embryogenesis in the (cyt-Dt) *B. rapa* MAL. The pollen tube attraction rate at the micropyle of the ovule of the (cyt-Dt) *B. rapa* MAL was approximately 50% compared with the autoplasmic *B. rapa* line. Most of fertilized embryos of the (cyt-Dt) *B. rapa* MAL reached the mature stage in an enlarged ovule at thirty days after pollination. It was suggested that the ovules without alien additional single chromosome may fail to develop female gametophytes and that the pollen tubes could not be attracted. It is possible that only the ovules with alien additional single chromosome could produce monosomic addition progenies. These results suggest that the female gametes of $n=10$ and 11 were developed in the (cyt-Dt) *B. rapa* MAL. When it was crossed with *B. rapa* lines only the female gametes with $n=11$ were fertilized and developed mature seed. It might be the reason why all progenies were obtained as MAL.

Biography

Yoshiaki Fujita is currently a PhD student of Tokyo University of Agriculture and Technology in Japan.

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