

Cytology and Flow Cytometry of Three Japanese Drosera Species

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Abstract : Three Japanese Drosera species are the good model to study genome organization with highly specialized morphological group for insect trapping, and has revealed anti-inflammatory, and antibacterial effects, so there must be a reason for botanists are so appealing in these plants. Cytology and Flow cytometry were used to investigate the genetic stability and ploidy estimation in three related species. The cytological and Flow cytometry analysis were done in Drosera rotundifolia L., Drosera spatulata Labill and Drosera tokaiensis. The cytological studies by fluorescence staining (DAPI) showed that D. tokaiensis was an allopolyploid ($2n=6x=60$, hexaploid) which is a natural hybrid polyploids of D. rotundifolia and D. spatulata. D. rotundifolia was a diploid with the middle size of metaphase chromosomes ($2n=2x=20$) as a paternal origin and D. spatulata was a tetraploid with small size of metaphase chromosome ($2n=4x=40$) as a maternal origin. We confirmed by Flow cytometry analysis to determine the ploidy level and DNA content of the plants. The 2C-DNA values of D. rotundifolia were 2.8 pg, D. spatulata was 1.6 pg and D. tokaiensis was 3.9 pg. However, 2C-DNA values of D. tokaiensis should be related from their parents but in the present study the 2C-DNA values of D. tokaiensis was no relation from the theoretical of hybrids representing additive parental. Possibility of D. tokaiensis is a natural hybrid, which is also hybridization in natural evolution can cause the genome reduction in plant.

Keywords : drosera, hybrid, cytology, flow cytometry

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