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Comparative Study of a *Brassica rapa* Linkage Map with the Genome of *Arabidopsis thaliana* and its Application

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Brassica rapa is closely related to the model plant, *A. thaliana*. The *Brassica* and *Arabidopsis* lineages diverged ~20 MYA. One major goal of this comparative genomic information enables to obtain the interesting gene from model species to other. If we know the highly conserved genome region between two-compared genome and we can be quickly identified the candidate genes in nonmodel organism. Early comparative studies conducted at the level of genetic linkage maps revealed extensive duplication within Brassica genomes and tracts of collinearity disrupted by multiple rearrangements between the genome Brassica and *A. thaliana*. Over than 550 genetically linked RFLP loci in *Brassica rapa* were mapped to homologous positions in the Arabidopsis genome on the basis of sequence similarity. Blocks of genetically linked loci in *B. rapa* corresponded to physically linked markers in Arabidopsis. The conserved regions extended over lengths are great as 50~80 cM in *B. rapa* genetic map, compared 8~10 Mb of contiguous region of Arabidopsis genome. Most of comparison blocks of *B. rapa* were compared two segments of Arabidopsis and highly matched by chromosome size of Arabidopsis. Subsequent comparative analyses between *B. rapa* linkage map and the *A. thaliana* genome identified numerous one-to-one segmental relationships and apparent genome duplication, in addition to genome triplications.