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Development and applications of fluorescence in situ hybridization using oligonucleotide-based probes

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Abstract/Resumo

Fluorescence in situ hybridization (FISH) has been the most important technique in plant cytogenetic research. However, application of FISH techniques in most plant species has been hindered by the lack of cloned probes that generate distinct signals on chromosomes. We have recently developed a procedure to develop FISH probes by selecting a large number of oligonucleotides (oligos) derived from single copy DNA sequences. The bioinformatically selected oligos are then massively synthesized de novo in parallel, amplified, and labeled as FISH probes. The "oligo-FISH probes" designed from conserved DNA sequences generate distinct FISH signals on related plant species that have diverged for more than 10 million years. We have conducted oligo-FISH in several distantly related species in the Solanaceae family. This comparative FISH mapping effort has revealed karyotype evolution and discovered species-specific chromosomal translocations in several *Solanum* species.

Keyword/Palavras-chave: FISH; Oligonucleotides; Karyotype; Chromosome evolution

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