ИНСТИТУТ ФИЗИОЛОГИИ РАСТЕНИЙ им. К.А. Тимирязева РАН

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Видообразование растений (эукариот): новый молекулярно-генетический подход

(Speciation of plants (eukaryotes): a novel molecular genetic approach)

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ПРИГЛАШАЮТСЯ ВСЕ ЖЕЛАЮЩИЕ

Abstract

Understanding of how genomes change to result in new species is a fundamental question in evolutionary biology. Eukaryotic cells operate with a partite genome which is of endosymbiotic ancestry and was established initially by a massive restructuration and intermixing of the genomes of the symbiotic partner cells. Today, the cellular subgenomes in nucleus, mitochondria and, in plants, plastids form an integrated genetic machinery that is spatiotemporally and quantitatively regulated in its entirety and co-evolves in a species-specific way. This becomes obvious after interspecific exchanges of plastid and nuclear genomes which – even between closely related species – can cause serious developmental disturbances of the resulting plastid/nuclear hybrids or cybrids. Compartmental co-evolution nowadays appears as an important element of reproductive isolation that defines species, because nucleo/organelle interactions are known to influence a variety of processes during ontogenetic cycles. Plastid genomes (= plastomes) with their defined structure and limited number of genes provide a particularly appealing tool to monitor speciation processes in plants. Utilizing the genus *Oenothera* (evening primroses) with its unique and intriguing nuclear and plastid genetics as a model, hybrid and cybrid technologies can not only be used to demonstrate the contribution of nucleo/organelle interactions in speciation, they also allow the distinction between primary mutations, causative for speciation, and secondary changes that only strengthen an already existing hybridization barrier.