

A comprehensive study on plant molecular systematics in the higher plants based on organellar DNA analyzes

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1993 Fiscal Year Final Research Report Summary

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Research Project

Project/Area Number

03304007

Research Category

Grant-in-Aid for Co-operative Research (A)

Allocation Type

Single-year Grants

Research Field

植物形態・分類学

Research Institution

KANAZAWA UNIVERSITY

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Project Period (FY)

1991 - 1993

Keywords

organellar DNA / DNA systematics / sequence / RFLP / higher plants / cultivated plants / phylogeny / taxonomy

Research Abstract

The project has finished within this fiscal year. During these three years, the participants have made a fruitful co-operative study, holding assemblies and symposia.

(1)Research method. For an easier way to obtain molecular information of the angiosperms, we attempted to detect restriction site variations in several

regions of chloroplast DNA amplified by PCR method. The research example was shown in the Rosales(Terachi, Shimizu et al.).

(2)Chloroplast DNA The molecular phylogeny in the Lardizabalaceae based on RFLP analysis of chloroplast DNA and also on sequence of rboL gene. The difference in the phylogenetic trees obtained between both methods was attributable to numbers of informative characters detected. (Shimizu, Ueda and Yamaguchi). On the Eupatorieae, the diploid genera (n=10) were proved originated from polyploid genera (n=17,25) based on RFLP analysis (Yahara et al.). Likewise, the genus Kalimeris was proved of polyphyletic origin, and Aster ovatus was found to be of hybrid origin between Aster and Kalimeris with Aster as maternal plants (Ito et al.). Variation and origin of various cultivated plants were studied with special references to Fagopyrum (Kishima et al.). Sesamum (Yamada et al.), potatoes (Hosaka et al.) and Triticum (Terachi et al.).

(3)Mitochondrial DNA Five patterns of mitochondrial genome were detected through RFLP analysis of coxII and atp6 genes. In southern Hokkaido and northern Tohoku district, it is more variable than in other areas, suggesting origin of cultivated G.max there (Mikami et al.). Variation and origin of the cultivated Beta, Malus(both Mikami et al.). Oryza(Kadowaki et al.) and Triticum(Mori et al.) were also discussed.

In September 1993, a symposium entitled "Molecular systematics on the higher plants" organized by Terachi was held at the 65th Meeting of The Genetics Society of Japan. All the results obtained through the present project will be published in a book entitled "A comprehensive study on plant molecular systematics in the higher plants based on organellar DNA analyzes".▲ Less

Research Products (17 results)

All Other

All Publications (17 results)

- [Publications] T.Shimizu: "Comments on the present situation of DNA systematics in higher plants" J.Plant Res.107. 65-73 (1994) ▼
- [Publications] M.Ito: "Molecular evidence for polyploid origin of the tribe Eupatorieae(Asteraceae)" J.Plant Res.107(in press). (1994) ▼
- [Publications] T.Kubo: "The sugar beet mitochondrial genome contains an ORF sharing sequence homology with the gene for the..." Mol.Gen.Genet.241. 479-482 (1993) ▼
- [Publications] S.Kato: "Mitochondrial DNA restriction fragment length polymorphism in Malus species" Plant Breeding. 111. 162-165 (1993) ▼
- [Publications] K.Hosaka: "Similar introduction and incorporation of potato chloroplast DNA in Japan and Europe" Jpn.J.Genet.68. 55-61 (1993) ▼
- [Publications] M.Ishikawa: "Excess RNA editing in rice mitochondrial atp9 transcripts" Plant Cell Physiol.34. 959-963 (1993) ▼
- [Publications] K.Ueda: "Endocytobiology V.(participated)" Tubingen Univ.Press,Tubingen, 586 (1993) ▼
- [Publications] Hosaka, K.: "Similar introduction and incorporation of potato chloroplast DNA in Japan and Europe." Jpn.J.Genet.68(1). 55-61 (1993) ▼
- [Publications] Ishikawa, S.S.et al.: "Organelle DNA polymorphism in apple cultivars and rootstocks." Theor.Aool.Genet.83. 963-967 (1992) ▼
- [Publications] Ishikawa, M.et al.: "Excess RNA editing in rice mitochondrial atp9 transcripts." Plant Cell Physiol.34. 959-963 (1993) ▼
- [Publications] Ito, M.et al.: "Molecular evidence for polyploid origin of the tribe Eupatorieae (Asteraceae)" (in press). ▼
- [Publications] Kato, S.et al.: "Mitochondrial DNA restriction fragment length polymorphisms in Malus species." Plant Breeding. III. 162-165 (1993) ▼
- [Publications] Kofuji, R., K.Ueda, K.Yamaguchi and T.Shimizu: "Molecular phylogeny in the Lardizabalaceae." J.Plant Res.(submitted). ▼
- [Publications] Kubo, T., T.Mikami and T.Kinoshita: "The sugar beet mitochondrial genome contains mitochondrial complex 1." Mol.Gen.Genet.241. 479-482 (1993) ▼
- [Publications] Shimizu, T.: "Comments on the present situation of DNA systematics in higher plants." J.Plant Res.106(1081). 65-73 (1993) ▼
- [Publications] Terachi, T.: "The progress of DNA analyzing techniques and its impact on plant molecular systematics." J.Plant Res.106(1081). 75-80 (1993) ▼
- [Publications] Yamada, K.et al.: "Chloroplast DNA variation in the genus Sesamum." J.Plant Res.106(1081). 81-87 (1993) ▼

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