

機関番号：32658

研究種目：基盤研究（A）

研究期間：2007～2010

課題番号：19255004

研究課題名（和文） アジア大陸産日本フロラ関連絶滅危惧種の保全と分子細胞遺伝学的・系統学的特性研究

研究課題名（英文） Conservation and characterization by molecular cytogenetics and phylogenetics in certain endangered species in Asian continents directly related to members of Japanese flora

研究代表者

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研究成果の概要（和文）：

近藤勝彦が代表のグループは、今まで 27 年間にわたって中華人民共和国中国科学院植物研究所系統与進化植物学国家重点実験室（北京市、香山）を中心とした洪徳元教授（中国科学アカデミー会員）グループをカウンターパートとして、日本と中国に共通して分布する植物種を分析して日本フロラの起源、種間関係ならびに絶滅危惧種の保全、異なった場所での塩基配列の変化、多様性、構成関連種の系統関係、動態、デモグラフィ、染色体核形態の変化などをさぐってきた。さらに 2000 年から、ロシア連邦を研究対象に加え、ユーラシア大陸ウラル山脈以東の構成植物に研究範囲を拡大し、ロシア科学アカデミー会員（A. A. Korobkov, P. V. Kulikov, M. S. Knyasev, A. Gontcharove, V. P. Verkholat, A. Shmakov）、モスクワ国立大学（P. Zhmylev, M. V. Remizova, D. D. Sokoloff）、モスクワ国立教育大学（N. I. Shorina, E. Kurchenko, I. V. Tatarenko, A. P. Zhmyleva, E. D. Tatarenko）、アルタイ国立大学（A. Shmakov, S. Smirnov, M. Kucev）、プリヤート国立大学（D. G. Chimitov, S. A. Kholboeva, B. B. Namzalov）、オーレル国立大学（N. M. Derzhavina）、さらにはモンゴルをも加え、ホフト国立大学（D. Oyunchimeg）の方々と、日本の植物関連植物が分布する東アジアユーラシア大陸の東アジアフロラを研究してきた。東端に位置する日本列島島嶼域は全北植物界、北植物亜界の東アジア植物区系に属し、地史的に大陸と接合したり分離したりしてきた島環境が個体群遺伝子給源を保持しながら、時には遺伝子浮動を起こして繁栄してきたか、また、アルタイ山脈はロシア連邦シベリア地方の中央部を南北に縦断し、ヨーロッパ・フロラとアジア・フロラがぶつかり合って南北に境界線を作り上げ、混ざり合って自生しているが、これら 2 フロラがどのようにして共存しているのか、雑種性は頻繁に起きてきた可能性が大いにある。これら両端域に共通して自生する被子植物種で今迄に分類、系統、分布学的に問題を提起している分類群に注目して、発生生物学的データ集積と絶滅危惧性の扱いに注目しながら、近藤等（東京農業大学）の日本側グループとロシア側グループは、相互関連植物の分布、構造、パターンの成因を分子系統進化、分子細胞遺伝学的ならびに核形態学的研究による種分化に関する研究、および特異的種の絶滅危惧性を含めて今までに増して共同研究を進めた。しかし、まだ分析していない植物も多く、研究の継続を期待する。

研究成果の概要（英文）：

This project was operated as the sixth of our research series conducted by Katsuhiko Kondo, Laboratory of Plant Chromosome and Gene Stock, Graduate School of Science, Hiroshima University and then, shifted to Laboratory of Plant Genetics and Breeding Science, Department of Agriculture, Faculty of Agriculture, Tokyo University of Agriculture collaborated with Laboratory of Systematic and Evolutionary Botany, Institute of Botany, Chinese Academy of Sciences after the agreement on academic and educational exchange between Hiroshima University and Chinese Academy of Sciences. Additionally, our sixth international research collaboration has included more members of Russian teams not only from Russian Academy of Sciences, Moscow State University, Moscow State Pedagogical University, and Orenburg State Pedagogical University but also from Altai State University and Bryat State University after the agreement on academic and educational exchange between

Hiroshima University and Moscow State Pedagogical University. We also made a research collaboration with Mongolian teams such as Hovd State University. Thus, we had made more wider research progress in floristic elements in East Asia from the Japanese archipelago to the west-most extreme of Mts. Altai.

This research series has been continued for 26 years as one of the oldest and the longest-team project supported by the Japanese Ministry of Education, Culture, Sports, Science and Technology and later Japan Society for the Promotion of Science. Our research main interests have been to clarify and justify chromosome morphology as well as function by using the orthodox methodologies to molecular cytogenetics and also molecular systematics to molecular phylogenetics among the wild plant species commonly found in Japan and East Eurasia to the westmost Altai Mountains to study floristic organization, composition, and finally the origin of Japanese flora.

The Eighth Official Meeting of Japanese Ministry of Education, Culture, Sports, Science and Technology and Russian Ministry of Science Technology held in December 2005 selected and accepted our continuous research collaboration between Kondo's Japanese team and Shmakov's Russian team. We also have been proposing the Japan-Russian Cooperative Research Program between Tokyo University of Agriculture and Altai State University. Thus, our joint research program during the years of 2007-2011 was continuously progress, success and concluded at the end of March, 2011.

交付決定額

(金額単位：円)

	直接経費	間接経費	合計
2007年度	5,400,000	1,620,000	7,020,000
2008年度	4,600,000	1,380,000	5,980,000
2009年度	4,200,000	1,260,000	5,460,000
2010年度	4,400,000	1,320,000	5,720,000
総計	18,600,000	5,580,000	24,180,000

研究分野：農学

科研費の分科・細目：資源保全学・資源保全学

キーワード：(1)アジア大陸 (2)日本フロラ関連植物 (3)アルタイ要素 (4)絶滅危惧植物種 (5)特性研究 (6)保全 (7)分子細胞遺伝学 (8)分子系統分類学

1. 研究開始当初の背景 1984年に日本学術振興会と中国科学院による2国間交流事業により近藤が中華人民共和国に長期派遣研究員として滞在した時、中国科学院植物研究所(北京市)の分類及進化植物学解放研究所を中心としたグループをカウンターパートとして、日本と中国に共通に分布する植物種を共同研究してきた。さらに1999年から日本フロラの生い立ち、多様性、構成関連植物の系統関係、分化、動態、デモグラフィ、分布論、植物地理の解析の為に対象をユーラシア大陸東部フロラ構成植物に範囲を広げた。このため、カウンターパートとして新たにロシア科学アカデミー、モスクワ国立大学、モスクワ国立教育大学のメンバーを含めた。そして、2001年第7回日露科学技術協力委員会『日露科学技術協力計画』(日本国文部科学省とロシア連邦科学技術省間)協議で、我々の共同研究『極東ロシアの日本フロラ関連絶滅危惧植物種保全のための分子細胞遺伝学的特性研究』が共同プロジェクトとして承認された。そして、2004年10月30、31日、文部科学省科学研究費補助金研究成果公開促進費研究成果公开发表(C)の交付を受けて

国際会議を広島大学で行った。日本側250名、中国側13名、ロシア側11名、アメリカ合衆国側2名、大韓民国2名、エジプト2名、インドネシア1名、バングラデシュ1名、マダガスカル1名、イタリア1名が参加し、共同研究の継続と発展を誓った。

2. 研究の目的 東アジア(ユーラシア大陸東部)の東端にある日本列島島嶼域のフロラの成立と西端でヨーロッパフロラと接して種間雑種ができていくアルタイ山脈で、共通種がどれ程あり、外部形態の相同性から同種として扱われている種の中で、DNA塩基配列の違いの程度がどれほどであるのか、染色体の数的違いはどれ程かにより、遺伝的相同性、非相同性を比較して分化の違いを分析する。

3. 研究の方法 オーソドックスな形態比較による分類、染色体核型分析、各種蛍光染色分析、分子細胞遺伝学的分析、各種分子系統学、分子分類学的手法により、日本の植物相構成種と極類縁のロシア植物各種を比較し、類縁度を比較分析した。

4 . 研究成果 植物相は北極に近づくにつれ種数が減ってゆくが、アルタイ地方では日本の植物相の 1/4 ~ 1/5 の数となる。従ってより単純になってゆくが、雑種出現頻度は、日本より少ないようである。4 年間になるべく多くの各植物専門研究者を投入したが、まだまだ全体を把握できるまでのデータの構築までに及んでいない(報告書参照)。今後もデータ集積に努力する所存である。

5 . 主な発表論文等

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6. 研究組織

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無

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無

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