

Comparison of population structures of widely distributed sea-dispersal plants with mangrove species

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Abstract

"Pantropical Plants with Sea-drifted Seeds" (PPSS) are characterized by their extremely wide distribution ranges over littoral areas of the tropics over the globe. A small number of species from some families are known in this plant group, and their wide distribution ranges have been thought to be formed by long distance seed dispersal by ocean currents. To clarify how this intriguing distribution patterns have been maintained, we studied some representative species of PPSS, namely, *Hibiscus tiliaceus* (Malvaceae), *Canavalia rosea* (Fabaceae), *Ipomoea pes-caprae* (Convolvulaceae) with *Rhizophora* (Rhizophoraceae) that is a widely distributed mangrove genus. Using samples obtained from wide range of distribution range, we investigated genetic structures of these species using some molecular markers. Comparing results obtained from the species, common phylogeographic patterns were observed. Firstly, analyses of chloroplast DNA sequences showed that a few common haplotypes distributed over very wide range, sometimes over different oceanic regions. This result suggests that long distance seed dispersal by ocean currents was responsible to maintain the extremely wide distribution range of PPSS and *Rhizophora* species. Secondly, genetic structures were observed between populations over the East Pacific and over the American continents in some analyses. Both the wide ocean space and continental land mass can be barriers to prevent gene flow by sea-drifted seeds. Thirdly, some PPSS species as well as *Rhizophora* species shared common haplotypes with their closely related species. Secondary contact between species and their sister species can be a force to increase the genetic diversity of the sister species. Although population structures were similar between PPSS and *Rhizophora* species, phylogenetic history was deeper in *Rhizophora* than in other PPSS species.

Keywords

comparative phylogeography, pantropical plants with sea-drifted seeds