

Molecular Phylogenetic Analyses of Geographical and Ecological Speciation of *Anaphalis margaritacea*

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Anaphalis margaritacea (Asteraceae) is a perennial species distributed widely from Asia to North America. In Japan, *A. margaritacea* consists of three varieties; var. *margaritacea* distributed mainly in the mountain areas in eastern Japan, var. *angustifolia* distributed in mountain areas in western Japan, var. *yedoensis* distributed in riverbanks covered with pebbles throughout Japan. These varieties are considered to have been derived via different speciation patterns such as geographical and ecological speciations. They seem to need taxonomic reexamination based on the molecular analysis because morphological intermediates between these varieties have been sometimes reported. In this study, we collected these three varieties from all over Japan and examined the genetic differentiation among the three varieties using the genome-wide SNPs by MIG-seq.

Analyses based on the SNPs showed that the populations of *A. margaritacea* var. *angustifolia* and var. *yedoensis* were monophyletic, respectively and these lineages were contained with *A. margaritacea* var. *margaritacea*, suggesting that they are of a single origin from *A. margaritacea* var. *margaritacea*. Population genetics analyses showed that the *A. margaritacea* complex comprised three clades as a whole: “*A. margaritacea* var. *margaritacea* in Hokkaido” clade, “*A. margaritacea* var. *margaritacea* in Honshu” clade, and “*A. margaritacea* var. *yedoensis* in Hokkaido” clade. *Anaphalis margaritacea* var. *angustifolia* was included in “var. *margaritacea* in Honshu” clade. On the other hand, it is revealed that *A. margaritacea* var. *yedoensis* in Honshu have a admixture of the two clades of *A. margaritacea* var. *margaritacea* in Honshu and *A. margaritacea* var. *yedoensis* in Hokkaido. Based on these results, we will discuss differentiation processes among the three varieties of *A. margaritacea*.