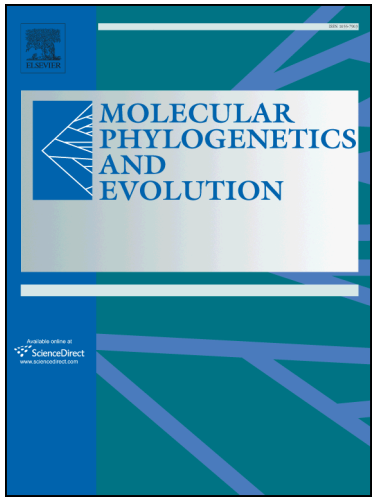

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Unique parallel radiations of high-mountainous species of the genus *Sedum* (Crassulaceae) on the continental island of Taiwan

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ABSTRACT

We explored the temporal and spatial diversification of the plant genus *Sedum* L. (Crassulaceae) in Taiwan based on molecular analysis of nrITS and cpDNA sequences from East Asian *Sedum* members. Our phylogenetic and ancestral area reconstruction analysis showed that Taiwanese *Sedum* comprised two lineages that independently migrated from Japan and Eastern China. Furthermore, the genetic distances among species in these two clades were smaller than those of other East Asian *Sedum* clades, and the Taiwanese members of each clade occupy extremely varied habitats with similar niches in high-mountain regions. These data indicate that species diversification occurred in parallel in the two Taiwanese *Sedum* lineages, and that these parallel radiations could have occurred within the small continental island of Taiwan. Moreover, the estimated time of divergence for Taiwanese *Sedum* indicates that the two radiations might have been correlated to the formation of mountains in Taiwan during the early Pleistocene. We suggest that these parallel radiations may be attributable to the geographical dynamics of Taiwan and specific biological features of *Sedum* that allow them to adapt to new ecological niches.

Keywords: Crassulaceae; phylogeny; radiation; *Sedum*; Taiwan