

Willyard, A; Wallace, L.; Wagner, W.L.; Weller, S.G.; Sakai, A.; Nepokroeff, M. 2011. *Estimating the species tree for Hawaiian Schiedea (Caryophyllaceae) from multiple loci in the presence of reticulate evolution*. Mol. Phylogenetics and Evol. 60:29-48.

Abstract

Schiedea (Caryophyllaceae) is a monophyletic genus of 34 species, all endemic to the Hawaiian Islands, that arose from a single colonization, providing one of the best examples of adaptive radiation in Hawai'i. Species utilize a range of habitats and exhibit a variety of growth forms and transitions in breeding systems from hermaphroditism toward dimorphism or autogamy. Our study included the most thorough sampling to date: 2–5 individuals per species and 4 independent genetic partitions: eight plastid and three low-copy nuclear loci (9217 bps), allowing a three-locus BEST species tree. Despite incomplete resolution at the tips, our results support monophyly for each extant species. Gene trees revealed several clear cases of cytonuclear incongruence, likely created by interspecific introgression. Conflict occurs at the divergence of section *Alphaschiedea* as well as at the tips. Ages inferred from a BEAST analysis allow an original colonization onto either Nihoa or Kauai and inform some aspects of inter-island migrations. We suggest that several hard polytomies on the species tree are biologically realistic, signifying either nearly simultaneous speciation or historical introgressive hybridization. Based on inferred node ages that exceed expected coalescent times, we propose that undetected nuclear introgression may play a larger role than incomplete lineage sorting in sections *Schiedea* and *Mononeura*.