REPRODUCTIVE BIOLOGY SYSTEM AND ITS IMPACT ON GENETIC ARCHITECTURE

Since the days of Darwin, scientists have observed that life history traits are associated with patterns of population adaptation and diversity. Significant relationships between genotypic and adaptive diversity and genetic architecture have been demonstrated for numerous life history traits, the most consistent being: mating system, taxonomy, life form, successional status, range extent and contiguity, and dispersal mechanism of seed and pollen. In nature, many of these traits are correlated and few studies have evaluated the individual factors. Generally, longer-lived, late-successional, outcrossing, animal-dispersed perennials that are not endemic have higher expected and observed heterozygosity than annual, endemic or narrowly distributed, gravity- or wind-dispersed, pioneer species. The former group generally have less differentiated populations than the latter. However, there is wide variation among species. In addition to life history traits, many studies have quantified equally strong − sometimes even stronger − external influences on plant genetic architecture. Dominant influences include: refugia and post-glacial range expansion, spatial and temporal disturbance patterns, soil and geology, hybridization, management interventions, sample breadth and size for genetic studies, and type of genetic marker used. Adding to the complexity, these factors can also have significant interactions with life history traits. While general patterns of total heterozygosity, population differentiation, and heterozygote deficiency are associated with life history characteristics, species-specific data based on a carefully designed study with clear objectives are needed to answer questions about any particular species.

Jodie Krakowski
Ministry of Lands, Forests and Natural Resource Operations
Squamish, BC
Email: Jodie.Krakowski@gov.bc.ca