

Clark, Nancy Charest, and Curtis Clark. 1984. Comparison of trichomes of the capitulum to leaf trichomes of the *Encelia californica* clade (Asteraceae: Heliantheae). Amer. J. Bot. 71(5), Part 2, p. 152.

to genomic evolution is not simple. Normal developmental factors (e.g., developmental homeostasis, pleiotropy), structural constraints, epigenesis and environmentally induced phenotypic variation (phenotypic plasticity) decouple the integration of genome and phenome and lessen their correlation. Early stages of speciation can be studied by quantifying morphological variation within and among populations and partitioning the plastic component of phenotypic variation from the genetic component. Morphological traits that are highly variable within some populations yet exhibit low variability in other conspecific populations are consistent with a hypothesis of intraspecific adaptation. Speciation is concordant with conspecific populations that consistently exhibit high inter-populational differentiation of the same suite of morphological traits. Genetic assimilation is consistent with results of transplant experiments that revealed genetic divergence as great or greater in plastic as in nonplastic characters. Morphological analyses provide essential information for understanding speciation processes, as well as for describing results of evolution.

431

JACKSON, R.C. Department of Biological Sciences, Texas Tech University, Lubbock, TX 79409. - Genome differentiation and its effects on gene flow. Nuclear genome differentiation is defined as any changes in the nucleotide. Changes may be of four major types: (1) Additions of DNA such as gene duplication, increases in moderately to highly repeated "non-functional" sequences, holaneuploid or meroaneuploid increases, and polyploidy; (2) Deletions of DNA through loss of non-functional or functional sequences, holaneuploid or meroaneuploid loss, monopleidy, and polyhaploidy; (3) Chromosomal mutations such as para- and pericentric inversions, transpositions, translocations between homologous or non-homologous chromosomes, centric fission, and centric fusion (Robertsonian translocations); and (4) Point mutations. Of these changes, those that usually have the greatest effect on gene flow are chromosomal mutations and polyploidy. However, point mutations can affect the frequencies of these two processes as well as producing changes that may function as initial isolating mechanisms. Both chromosome mutations and polyploidy can severely affect gene flow. A major shortcoming in evolutionary and systematic studies has been the inadequate use of methods to quantify the effects of such changes on gene movement between differentiated populations under experimental conditions so that extrapolations can be made for natural populations. This discussion centers on those modes of nucleotypic change that have the greatest impact on gene flow among populations and on more quantitative methods of measuring such effects.

POSTERS

432

CLARK, NANCY CHAREST* and CURTIS CLARK. Biological Sciences, California State Polytechnic University, Pomona CA 91768. - Comparison of trichomes of the capitulum to leaf trichomes of the *Encelia californica* clade (Asteraceae: Heliantheae).

Encelia, a genus of woody shrubs of arid southwestern North America, consists of two major clades, one including *E. frutescens* and the other *E. californica*. Although the trichome complement of the former clade does not differ among the leaves, peduncles, phyllaries, and pales, that of the latter does. We have investigated these differences with light and scanning electron microscopy, both to resolve taxonomic problems in the clade and to better understand the adaptive nature of the trichomes. The presence of glandular trichomes on the pales of all species suggests that their absence on the leaves of some may be adaptive rather than historical. The information from this study helps to refine our hypotheses of phylogeny within the clade.

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proposed by Rollins

MCCREA, KENNETH D
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CONTRIBUTED PAP

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University
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