Donald Williamson’s larval transfer hypothesis suggests that marine invertebrate larvae originated by hybridization between different organisms. Williamson’s work focuses primarily on larval transfer among marine invertebrates, but he suggests that larval transfer can also explain the origin of larvae in insects, especially taxa that have eruciform (caterpillar) larvae. Eruciform larvae are present in some species of the orders Mecoptera and Hymenoptera as well as in all species of the order Lepidoptera. Phylogenetic trees of these orders were evaluated in terms of adult morphological characters and larval morphological characters. The trees exhibited major incongruities. Such incongruities are often interpreted as convergence. Reassessment of this morphological information suggests that the patterns of distribution of eruciform larvae are better explained by larval transfer than by convergent evolution. The larval transfer hypothesis is assessed through molecular comparison of 18s rNA from butterfly specimens. These preliminary molecular analyses indicate that further molecular studies can be used to provide critical tests in evaluating the larval transfer hypothesis. The larval transfer hypothesis thus appears to provide a more reasonable explanation for the distribution of eruciform larvae in insects. This conclusion has implications for remodeling genetic trees as well as modifying the progression of gene transfer and evolution.