

# **BIOGEOGRAPHY EXPLAINS COPHYLOGENETIC PATTERNS IN TOUCAN LICE.**

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Historically, biologists assumed that cospeciation, rather than ecological interactions and adaptation, was the most important factor structuring host-parasite assemblages. Comparisons of host and parasite phylogenies have also concentrated on cospeciation. However, many of these comparisons have also demonstrated that the phylogenies of hosts and parasites are seldom completely congruent, suggesting that phenomena other than cospeciation play an important role in the evolution of host-parasite assemblages. Other coevolutionary phenomena, such as host switching, parasite duplication (speciation on the host), sorting (extinction), and failure to speciate can also structure host-parasite assemblages. Using mtDNA sequences, I reconstructed phylogenies of *Ramphastos* toucans and their ectoparasitic chewing lice in the genus *Austrophilopterus*. I then compared these phylogenies to reconstruct the history of coevolutionary events in this host-parasite assemblage. Two salient findings emerge. First, the phylogeny of *Ramphastos* toucans is not concordant with the phylogeny of *Austrophilopterus* lice. Second, geographic distribution of the hosts seems to play a role in the speciation of these lice. For example, lice from distantly related sympatric toucan species form a monophyletic group. I analyze and discuss the possible causes and implications of the lack of concordance between these host and parasite phylogenies.