LINKING COEVOLUTIONARY HISTORY TO ECOLOGICAL PROCESS: DOVES AND LICE

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Abstract. — Many host-specific parasites are restricted to a limited range of host species by ecological barriers that impede dispersal and successful establishment. In some cases, microevolutionary differentiation is apparent on top of host specificity, as evidenced by significant parasite population genetic structure among host populations. Ecological barriers responsible for specificity and genetic structure can, in principle, reinforce macroevolutionary processes that generate congruent host-parasite phylogenies. However, few studies have explored both the micro- and macroevolutionary ramifications of close association in a single host-parasite system. Here we compare the macroevolutionary histories of two genera of feather lice (Phthiraptera: Ischnocera) that both parasitize New World pigeons and doves (Aves: Columbiformes). Earlier work has shown that dove body lice (genus Physconelloides) are more host specific and have greater population genetic structure than dove wing lice (Columbicola). We reconstructed phylogenies for representatives of the two genera of lice and their hosts, using nuclear and mitochondrial DNA sequences. The phylogenies were well resolved and generally well supported. We compared the phylogenies of body lice and wing lice to the host phylogeny using reconciliation analyses. We found that dove body lice show strong evidence of cospeciation whereas dove wing lice do not. Although the ecology of body lice and wing lice is very similar, differences in their dispersal ability may underlie these joint differences in host specificity, population genetic structure, and coevolutionary history.

Key words. — Columbidae, cospeciation, host, macroevolution, parasite, Phthiraptera, specificity.