

Sweeny, R. J., Lovette, I. J., and Harvey, E. L. In press. Evolutionary variation in the feather waxes of passerine birds. *Auk* .

ABSTRACT .--Feather waxes are ubiquitous in passerine birds, but their composition, phylogenetic distribution, and function in passerines are poorly characterized. We used gas chromatography-mass spectrometry to survey the diversity of saturated fatty acids in the feather waxes of 91 taxa representing most major passerine groups, and used an independent phylogenetic hypothesis to explore evolutionary variation in the expression of these compounds. Saturated fatty acids are highly stable, and we obtained congruent results in comparisons of extracts from fresh material and from museum skins as much as a century old. All taxa expressed unbranched fatty acids, but in a broad range of proportions relative to their total saturated fatty acid profile. The expression of three other classes of fatty acids was more variable, although each showed a high degree of conservation at the phylogenetic level corresponding approximately to avian families. 2-methyl fatty acids were expressed in a number of families, often in high proportions, but were absent or low in all fringillid taxa surveyed except the Dickcissel (*Spiza americana*). 3-methyl fatty acids were common only in fringillids and allies and in one genus of turdids (*Zoothera*). 4-methyl compounds were comparatively rare and were abundant only in the Paridae, Polioptilinae, and Troglodytidae. Feather wax composition is unlikely to serve as a highly informative source of information for reconstructing phylogenetic relationships, but the study of secretion diversity in a comparative phylogenetic context holds promise for characterizing the functions of these compounds.