Patterns of vocal divergence in a group of non-oscine birds (auklets; Alcidae, Charadriiformes)

Sampath S. Seneviratne¹,2, Ian L. Jones¹ and Steven M. Carr¹

¹Department of Biology, Memorial University of Newfoundland, St. John’s, Newfoundland, Canada and ²Biodiversity Research Centre, University of British Columbia, Vancouver, British Columbia, Canada

ABSTRACT

Question: Are phylogenetic relationships the major determinant of vocal relationships in non-oscine birds (birds that do not have a learning component in the vocalization)?

Background: Both environmental variables and phylogenetic affinities can affect vocalizations. Unlearned vocalizations are characteristics of most non-oscine bird families, which have a relatively less-complex syrinx and vocalizations.

Organism: A monophyletic group of underground-nesting seabirds (auklets; Aethiini, Alcidae, Charadriiformes) from the Aleutian Islands, Alaska, USA.

Methods: We mapped vocal characters (28 acoustic and 10 syringeal) from total repertoires of all members of the tribe Aethiini onto a molecular phylogeny to compare the relative influence of phylogeny and breeding habitat on vocal divergence.

Conclusion: Phylogeny, visual display, and ecological factors have contributed to vocal divergence in this clade. Temporal attributes and syringeal attributes of the acoustics of vocalization showed high congruence with phylogeny. Frequency attributes, which are affected by environmental variables, showed low congruence, and therefore high homoplasy.

Keywords: Alcidae, auklets, character reconstruction, display evolution, non-oscine birds, phylogeny, vocalization.

INTRODUCTION

Vocalizations are sensitive indicators of speciation and population divergence (Lanyon, 1969; Payne, 1986; Martens, 1996; Price and Lanyon, 2002; Isler et al., 2007; Miller and Baker, 2009), and are used routinely in modern species-level systematics (Cuervo et al., 2005; Athreya, 2006; Alström et al., 2007). Vocal behavior has also been studied to elucidate the phylogenetic history of species groups (e.g. Irwin, 1996; Price and Lanyon, 2002). In birds, vocalizations that are not learned are likely to be especially informative phylogenetically (Miller and Baker, 2009). Such vocalizations are widespread in non-oscine birds (whose vocalizations do not have a learned component), and are characteristic of most bird groups [27 of 30 orders, excluding Passeriformes,
Evolutionary Ecology Research is delighted that you wish to consult one of its articles.

You may if your library or laboratory subscribes.

Did you know that EER invented the idea of posting final drafts of mss as soon as they are accepted?

Ask your librarian or library committee why your place does not already subscribe to the low-cost journal that is publishing splendid science in a socially responsible manner. EER's low prices have helped librarians to rein in the indefensible cost increases that have reduced our access to science all over the world! Just ask our partners at SPARC — the Scholarly Publishing & Academic Resources Coalition of the Association of Research Libraries.

Or maybe you should just remind the folks who order your journals to contact us and subscribe! You need — and they should support — the journal that:

- Was the first journal in the world to allow e-only subscriptions while maintaining a traditional print edition, too.
- Vests the copyrights of all articles in their authors while preserving the rights of educational and research groups to use its material in classes, seminars, etc. at no additional cost.
- Maintains a unified data-base of articles so you can use your web browser to find any article, author, title word or keyword in any article that EER has ever published. (Forget about issue numbers, author order, and other such impediments to easy access.)
- Provides Webglimpse so that you can search any word, place, species, variable, phrase, keyword or author in any article EER has ever published.
- Provides its own new search filter that allows you instantly to compile a hot-linked list of articles according to year, issue, author, title word or keyword (as you prefer).

EER is the place to go for great science, responsible publication policies and easy access!

Click here for the Table of Contents of the most recent issue of Evolutionary Ecology Research

Click here for full access to a sample issue of Evolutionary Ecology Research

Click here for SUBSCRIPTION INFORMATION