## JOURNAL CLUB

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**An evolutionary biologist ponders the pace of evolution.**

Studies of evolution 'in action' in creatures such as sticklebacks, lizards and mice have taught us that evolution can proceed rapidly. Given this lightening-quick tempo, why are there so few species on Earth, and why are so many so similar to each other?

One possible answer comes from long-term studies of Galapagos finches. During drought years, when small seeds — the birds' preferred food — were scarce, the birds evolved larger beaks to help crack open bigger seeds **(ok?)**. However, these changes were reversed during wet years, when smaller seeds again became prevalent. This sort of reversal can occur repeatedly **(ok?)**, impling that much of the evolutionary change we observe over short timescales is only temporary.

A study of patterns of natural selection over time suggests that such evolutionary reversals might explain the slower pace of evolution over longer timescales. Adam Siepielski of Dartmouth College in Hanover, New Hampshire, and his colleagues used published reports to gather more than 5,500 estimates of the strength and direction of natural selection in the wild (A. M. Siepielski *et al. Ecol. Lett.* **12,** 1261–1276; 2009). By focusing on studies in which selection was measured more than once, the authors were able to see for the first time that aspects of selection change rapidly — its direction, strength and form — from generation to generation.

This new perspective, if correct, has profound implications. First, we should not be surprised to find rapid evolution in vertebrates **(ok?)**, even over human lifetimes. At the same time, we should not expect evolutionary change that can be measured in real time to be permanent. More synthetic studies — combining observations of evolution in action with historical data — are needed to better understand the relationship between evolution in 'real time' with evolution in 'deep time'.

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