

Field Museum Study Challenges Bird Species Connections

Early Bird Project links parrots to songbirds, falcons

By Erin O'Brien

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Hyacinth macaw.
Peregrine falcon.

Biology textbooks and bird-watching field guides, as well as numerous scientific bird names, will have to be changed, according to the Early Bird Project, an international research project centered at the Field Museum in Chicago that has focused on the phylogenetic study of birds for more than five years.

For the research project, funded by the Tree-of-Life Research Program, scientists from a number of institutions built and analyzed sets of data of more than 32 kilobases of nuclear DNA sequences from different locations on the DNA of each of the 169 bird species. The results of the project, published in *Science* magazine on June 27, 2008, suggested a number of new and even controversial connections between bird species.

For one, the project suggested that falcons are actually closer relatives to parrots than hawks and eagles, as was the original thought. The results also yielded a very close relationship between parrots and songbirds.

"One of the big questions of our study was, 'What are the closest relatives to songbirds?'" said Sushma Reddy, one of three leading authors of the study and Bucksbaum Postdoctoral Fellow at the Field Museum. "Using [the DNA sequence data], we were able to conclude that parrots are the closest relatives to songbirds. As far as we know, our study is the first to propose this link."

Reddy adds that follow-up studies on the relationships among bird species, including parrots and songbirds, are in the works.

Despite the initial skepticism surrounding the project, Reddy and her fellow authors "are confident in our results because we analyzed them in different ways and using different gene-sets, and [we] still got similar results," Reddy said.

"Unlike other studies," said Rebecca Kimball, another leading author of the study and associate professor of zoology at the University of Florida at Gainesville, "we consistently found several well-supported, deep divisions within Neoaves (a basal division of birds that includes 95 percent of all living birds), and this signal was persistent across analyses."

"Our study yielded robust results," said Shannon Hackett, the third leading author of the study and associate curator of birds at the Field Museum, "and [it] illustrates the power of collecting genome-scale data to reconstruct difficult evolutionary trees."

In addition to Reddy, Kimball and Hackett, the study was also co-written by scientists at the Smithsonian Institute, the University of California at Berkeley, Louisiana State University, Stellenbosch University in South Africa, the University of New Mexico, Wayne State University and the University of Maryland. The study is part of "Assembling the Tree of Life," a federally funded effort that focuses on tracing the evolutionary lines of all living creatures.

Bird enthusiasts across the world will notice the impact of the Early Bird Project, which Reddy believes will be significant. The convention-challenging results will especially rock the boat in the science world.

"Because our study presents a very different view of avian evolutionary history (than traditionally held), we think the impact will be deep," Reddy said. "And as so often happens, our study brings up as many questions as it answers, so we expect many follow-up studies that will build on our results."