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# DNA tests find a world of variety

Lewis Smith, Environment Reporter

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Fifteen extra species of birds and six bats have been identified in a project aimed at creating a "genetic portrait" of every animal on Earth.

Each of the birds had been observed many times by residents and visiting ornithologists but only genetic finger-printing revealed them as previously unknown species.

Until scientists analysed the DNA of the birds they had been assumed to be exactly the same as visually similar but genetically different species.

"People have watched birds for so long we might think every different tweet has been heard, every different colour form observed," said Paul Hebert, who led the research. "But we found there are a number of cases of deep genetic divergences within what are currently called single species. Given the intensity with which people have looked at the birds we were surprised at the number that had been overlooked."

The bats were less well known to the public but had been studied in great detail by scientists, so the DNA researchers were astonished to find so many extra types.

Scientists from Canada and the United States took samples from 643 species of North American birds and 87 bats from Guyana. They calculated that if birds as well known and observed as the North American species could yield 15 unknown types, up to 1,000 more may be found when the project is extended to record the DNA of the 10,000 species worldwide. Similarly, if the same proportion of bats studied worldwide prove to be as new as those found in Guyana, another 50 species are waiting to be identified. About 1,100 are already known.

The findings of the genetic barcoding team are published today in the journal *Molecular Ecology Notes*. The scientists believe that the studies open the way to barcoding all the world's animals. Recording the genetic make-up of every animal would help conservationists to decide where to concentrate their efforts in saving species from extinction.

Professor Hebert, of the Biodiversity Institute of Ontario, at Guelph University, said that the new birds were virtually indistinguishable from the species they were previously presumed to be.

Among birds found to have been mistakenly identified was the solitary sandpiper. Analysis revealed that some of the birds were a different, related, type and that their DNA split into two distinct groups 2.5 million years ago. The new bird may be called the cinnamon sandpiper.

But some birds regarded by ornithologists as separate species should be treated as the same as other known types. There were also fourteen pairs of birds that turned out to be genetic twins, and two groups of three birds that should be reclassified as triplets.

The 87 known bat species from Guyana had been described in great taxonomic detail but scientists had still overlooked six types. One, a look-alike of *Trachops cirrhosus*, specialises in eating frogs.

Professor Hebert said it showed how much new information could be uncovered by genetic barcoding. "Wouldn't you think we'd have all of the world's 5,500 mammals identified by now? The scientific community has been at it for 250 years. This work is raising questions about how evolution works and what species are."

The Barcode of Life project now has more than 25,000 species of all animal catalogued and scientists hope to increase this to 500,000 species by 2014.

## Barcode birds

**15 species that turn out to be 30 species:**

**Northern fulmar**  
(*Fulmaris glacialis*)

**Solitary sandpiper***(Tringa solitaria)***Western screech owl***(Megascops kennicottii)***Warbling vireo***(Vireo gilvus)***Mexican jay***(Aphelocoma ultramarina)***Western scrub jay***(Aphelocoma californica)***Common raven***(Corvus corax)***Mountain chickadee***(Poecile gambeli)***Bushtit***(Psaltriparus minimus)***Winter wren***(Troglodytes troglodytes)***Marsh wren***(Cistothorus palustris)***Bewick's wren***(Thyromanes bewickii)***Hermit thrush***(Catharus guttatus)***Curve-billed thrasher***(Toxostoma curvirostre)***Eastern meadowlark***(Sturnella magna)***Eight gulls become one:****California gull***(Larus californicus)***Herring gull***(Larus argentatus)***Thayer's Gull***(Larus thayeri)***Iceland gull***(Larus glaucooides)***Lesser black-backed gull***(Larus fuscus)***Western gull***(Larus occidentalis)***Glaucous-winged gull***(Larus glaucescens)***Glaucous gull***(Larus hyperboreus)*

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