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Pocket DNA Barcoder

Imagine a hand-held device that naturalists and amateurs could carry out into the field to automatically register the lifeforms they encounter. Such a "Life Barcoder," as its proponents call it, would instantly make experts out of enthusiasts and more rapidly approach Linnaeus's goal: cataloguing every species on Earth.



The back end of this gadget system already works: scientists are methodically working through the DNA barcoding of species, having already covered at least 25,000. Most recently, Paul Hebert--the founder of the barcode of life movement--and his colleagues catalogued most species of North American birds, discovering 15 new ones based only on genetic differences as my recent article notes.

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	Common Name	Scientific Name
1	Northern Fulmar	Fulmaris glacialis
2	Solitary Sandpiper	Tringa solitaria
3	Western Screech Owl	Megascops kennicottii
4	Warbling Vireo	Vireo gilvus
5	Mexican Jay	Aphelocoma ultramarina
6	Western Scrub-Jay	Aphelocoma californica
7	Common Raven	Corvus corax
8	Mountain Chickadee	Poecile gambeli
9	Bushtit	Psaltriparus minimus
10	Winter Wren	Troglodytes troglodytes
11	Marsh Wren	Cistothorus palustris
12	Bewick's Wren	Thyromanes bewickii
13	Hermit Thrush	Catharus guttatus
14	Curve-billed Thrasher	Toxostoma curvirostre
15	Eastern Meadowlark	Sturnella magna

Courtesy of Rockefeller University (for all you birders out there)

They also tackled the proliferating bats of Guyana, the subject of intensive taxonomic work--the typical method by which experts survey the size and shape of the various bats, along with other characteristics, to determine new species. By analyzing the genetic differences in one gene of the mitochondria that all life shares, the researchers correctly identified all known Guyanese bat species as well as adding six, hitherto overlooked ones.

The technique can work with any fragment from a living thing--feather, fur, tissue, what have you--and can work in specimens collected long ago (the genetic barcode of the [Ivory-billed woodpecker](#) is in the system thanks to a Smithsonian Institution specimen, meaning even one fresh feather could prove the continued existence of that rare bird.) And it seems to avoid some potential pitfalls, such as wide, within-species variation that might obscure species boundaries. On the contrary, most individuals with a species seem to share almost exactly the same COI sequence, letter for letter, nucleotide for nucleotide (which contradicts expectations, a subject for another post.)

As a result of its broad applicability, an investment of just \$100 million could fund the recording of 500,000 additional animal species, and more money could help complete the book of life--a prospect [many scientists](#) anticipate with glee.

Unfortunately, however, the gadget end of this remains a further-off goal. Although the basic technology is available--and the DNA testing has been shown to work--it requires a clean, sterile lab to ensure accuracy. "The large tunas that swim in the sea, they differ by just a single nucleotide position," Hebert says. "Those are ones where your sequencing better be pretty clean."

But maybe someday a kid will be able to catalogue all the species in the backyard or at the seashore with a simple hand-held device--and perhaps add to the book of life in all its [fondness for beetles](#) and nematodes. A nice technological fix for [nature deficit disorder](#), don't you think?

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