

DNA barcodes may tell species apart

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TORONTO - One gene may give scientists an easy-to-identify label to distinguish an animal from a closely related species.

Scientists spot new species by carefully comparing characteristics such as wing colour, beak shape, or bird songs. Using DNA tests is currently labour intensive.

Researchers say a new molecular technique called DNA barcoding can tell closely related species of birds and butterflies apart and help to find new ones.

The barcode is a short stretch of DNA, similar to supermarket barcodes used to tag retail products. The DNA barcode varies slightly between species.

The term DNA barcoding was coined by zoology Prof. Paul Hebert of the University of Guelph, the first author of the study in the Sept. 28 issue of Public Library of Science (PLoS) Biology.



Skipper butterfly (Courtesy: Daniel Janzen)

Hebert and his colleagues studied 260 birds that breed in North America, using samples taken from specimens at the Royal Ontario Museum in Toronto.

Using the new technique, they found distinct barcodes in four species, which means the birds may have been improperly lumped in with other species.

The four birds are:

- Solitary sandpiper.
- Eastern meadowlark.
- Marsh wren.
- Warbling vireo.

The technique focused on part of a gene from the energy-generating mitochondria inside animals cells.

It is easier for scientists to spot differences between closely related species by analyzing mitochondrial DNA, which accumulates mutations more quickly than nuclear DNA.

Hidden species

["Birds are] big, they're coloured differently, and they sing different songs," said team leader Mark Stoeckle, a molecular ecologist at Rockefeller University in New York City. "Yet even in that easy to identify group, there are hidden species," he added in a release.

Differences in the sequence of one gene are about 18 times greater between species than within a species, the researchers found.

Scientists have to determine if the results can be generalized to animals in other ecosystems.

They hope to eventually establish a public reference library holding DNA bar code for known and newly identified species of plants and animals.

The research was sponsored by the Natural Sciences and Engineering Research Council of Canada, the Canada Research Chairs program, and the Canadian Wildlife Service.

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Butterfly barcodes

In a related study, Daniel Janzen, an evolutionary biologist at the University of Pennsylvania in Philadelphia, and his colleagues used the DNA barcoding technique on butterflies.

His team identified 10 new species of butterflies within the tropical skipper group.

Janzen's paper appears in the Sept. 29 issue of the Proceedings of the National Academy of Sciences.