

DNA barcoding for identification and conservation of fauna

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(IANS)

Even the most avid of bird watchers can't always spot every tiny little difference. That's why a new classifying technique described in two papers published Sunday in the British journal *Molecular Ecology Notes* was needed to distinguish 21 new birds and bats from identical-looking species in the Americas.

So-called DNA 'barcoding' serves as an identity card for animal species, and also has potential conservation and bio-security benefits. The technique consists of a short DNA sequence taken from a specific, uniform point on any animal's genome.

Scientists have begun creating a library of barcodes over the past three years, and one of the most comprehensive studies to date, inducting 643 North American bird and 87 Guyanese bat species into the 'barcode of life' collection, was published in the two papers.

Climate change, deforestation and hunting have brought many species to the brink of extinction, and the study brings some welcome news.

Scientists identified 15 new birds and six new bats from virtually identical-looking and identical-sounding species through variances in the DNA sequence, an amazing feat given the centuries-long history of bird studies in North America.

'There are as many bird watchers out there as there are species,' co-author Paul Hebert of the Biodiversity Institute of Ontario at Guelph University in Canada, said in a telephone interview. 'Sequencing technology is very young indeed.'

The findings raise the question of what exactly is a species, and could bring an older, somewhat foundering theory back into play: breeding. Species very rarely inter-breed, but that theory has been notoriously difficult to prove in some animal types - especially those of similar shapes and sizes.

'The difficulty has been the lack of ability to apply this (theory) in nature. We are not in a position to watch bats mate,' said Mark Stoeckle, at Rockefeller University, New York, who co-authored the bird study. 'DNA data is becoming a standard part of species description.'

The difficulties are no more true than with birds, of which there are about 10,000 different species around the world today. Stoeckle predicts that at least 1,000 new species could still be discovered through DNA barcoding.

But bird watchers won't be entirely left out of the fun. DNA can only identify the species - it will now be up to the 'community of interested biologists' to identify behavioural patterns and other practices that could further distinguish the birds, according to Stoeckle.

Once the barcode library is complete, that community could be armed with handheld identification devices to take with them into the wild. DNA can be taken from samples of any part of an animal, at any age and, scientists say, could provide a definitive distinction between animal species within minutes. That technology is about 10 years away.

Other benefits: conservation efforts will be improved by allowing environmentalists to better track species, helping tropical countries with dense, unexplored forests decide which areas to protect. 'We have some ideas of what species we may be finding but not where these species might be found,' Hebert said.

Barcoding could also stop the illegal trade in foodstuffs and endangered animals like shark fins, as the handheld devices would allow port officers to quickly inspect cargo.

'Once you cut up a fin and dry it you can't tell what it is,' but barcoding can, Stoeckle said. Scientists expect to have completed their bird DNA-inventory by

2011.