

## Every species of animal and plant to be given a 'barcode'

**By Steve Connor, Science Editor**

**10 February 2005**

An ambitious project to take a genetic "barcode" of every animal and plant begins today in an attempt to identify and label the 10 million species on Earth.

Biologists said yesterday that the plan to give every species its own barcode - made from a stretch of DNA unique to each life form - will help them to understand the bewildering diversity of life.

The DNA barcode will represent a segment of a gene that differs from one species to the next but is almost identical to all members of the same species.

DNA barcodes look superficially like supermarket barcodes and will work in much the same way in helping field biologists to carry out an audit of life by distinguishing between closely related species.

Less than a fifth of the estimated 10 million species of plants and animals have been formally named and classified and many experts fear thousands are at risk of becoming extinct before they are identified.

Scientists hope to name the rest of the unknown species by 2010 as part of the international Barcoding of Life project, said Richard Lane, director of science at the Natural History Museum in London. "We don't actually know what [species are] here so we can't possibly know what we are losing," Dr Lane said yesterday.

The barcode for animals is based on a stretch of DNA within a key gene found in the tiny "power stations" of the cell called the mitochondria, which contain the only genetic material outside the cell's nucleus. Analysing the sequence of genetic "letters" that makes up this mitochondrial gene gives a sequence of barcode stripes which is unique to most species.

Across humans the sequence is identical in all but two of the 648 letters of the gene, and there are 60 other letters that separate us from our closest living relative, the chimpanzee.

The aim eventually is to develop hand-held instruments that field biologists will use to analyse tissue samples taken in the wild in order to compare the resulting barcodes against a huge GenBank database of 19 million DNA records.

Robert Hanner of the Coriell Institute of Medical Research in Camden, New Jersey, said that barcoding life will help speed up the process of identifying species formally using standard methods of taxonomy.

"It will help species identification but also open up information held by many of the world's finest natural history museums, herbaria and institutes," Dr Hanner said.

Biologists hope to barcode the 15,000 known species of marine fish and 8,000 species of freshwater fish within the next five years. One practical benefit will be to help tackle commercial fraud when low-value fish are surreptitiously substituted for more valuable species.

But DNA barcodes will also help in marine conservation, said Paul Hebert of the University of Guelph in Ontario. "DNA barcoding could enable us to monitor quotas and bycatch and provide a more detailed understanding of fish and their ecological relationships," he said.

DNA barcodes of the 10,000 known species of birds will also be collected. Many can be made from feathers or tissue samples taken from museum specimens, said Mark Stoeckle of Rockefeller University in New York.

Dr Lane said Barcoding of Life was separate from the Frozen Ark project, launched last year, which set up a tissue bank of stored genetic material from thousands of endangered animals. Their genetic codes will be stored in a frozen database which may allow future clones to be made, raising the possibility of resurrecting extinct species.