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DNA barcode | 11/07/2011 12:07

Scientists explore the barcode of animals and plants

Using DNA barcoding technique, scientists to catalog 10% of biological species in Brazil in four years

Fabio Castro , the Agência FAPESP

São Paulo - In 250 years of practical taxonomic scientists described about 1.7 million species of living beings. But it is estimated that about 87% of existing species are still completely unknown, according to Professor Claudio Oliveira, Institute of Biosciences, Universidade Estadual Paulista (UNESP) in Botucatu.

He said Brazil is helping to reduce this huge knowledge gap using the technique of DNA barcoding - barcode or DNA - that has established itself as a global standard for identifying biological species. During the 7th Symposium of the BIOTA-FAPESP, held last week in São Carlos (SP), Oliveira said, using the technique of DNA barcoding, the Research Network molecular identification of Brazilian Biodiversity (BR-BoL) should cataloged 120 thousand copies of 24 000 species in four years.

Database of life

The network, coordinated by Oliveira, has funding from the National Council for Scientific and Technological Development (CNPq) and member of the International Barcode of Life project ("Barcode of Life, or iBOL, its acronym in English), launched in 2004. The data collected are entered into the database Barcode of Life Data Systems (BOLD, its acronym in English).

"The goal is that in four years, 120,000 copies are cataloged based on the Bold. Our estimate is that this corresponds to about 10% of Brazil's biodiversity, "said Oliveira. According to him, are now known - that is, have the scientific name - about 50 000 species of vertebrates, 800 000 species of insects, 200 000 species of flowering plants. But the numbers of unknown species are much more impressive.

"It is estimated that the number of species is ignored in the order of 10 times the number of species identified taxonomically. Vertebrates are even well known. It is estimated that the rate of ignorance is only 7%. But that rate is 15% for plants, 65% for molluscs, 80% for protozoa, insects and 90% to 99% for bacteria, for example. It is therefore essential to have a simple and effective method of identification, such as DNA barcoding, "he said.

The base Bold has cataloged more than 106 000 described species in over 1.2 million records barcode. The process is fast since it began just five years ago. But the main feature is reliability. With this technique, scientists have more than 90% chance of accurately identifying the species.

"The Bold cherishes the basis for data quality. For each individual there are two pages of information and is not about static information. If we identify a sequence that is identical to the base, but found that the body is another, we can repair the data. Thus the growth of the database gradually refines its quality, "said Oliveira

Error history

During the event, which was held in conjunction with the 7th Meeting of Evaluation of the Biota-FAPESP and Evaluation Meeting of the BIOprospecTA Oliveira presented a conference on the application of DNA Barcoding in the comparative study of faunas. He described a study by his group that, thanks to the technique of DNA barcoding, was able to reveal and correct a taxonomic history. In an article published in the journal Zootaxa, scientists revealed that there were two names for one species of mullet.

The project "Phylogeography of the species of mullet Mugil liza and Mugil platanus, has the support of FAPESP through the Research Grants - Regular. "The species Mugil liza was identified in 1836 in Maracaibo, Venezuela. In 1880 we identified the supposed species Mugil platanus in Buenos Aires, Argentina. But the DNA barcoding, the different species of mullet have a genetic distance of almost 20%. Between liza platanus and had a genetic distance of only 0.2%, "he explained.

Before the study, it was believed that the mullet found between Venezuela and Cabo Frio (RJ) was Mugil liza and from there to Argentina, Mugil platanus. Both were, in fact, some morphological differences.

"The genetic analysis showed that the differences were caused by a polymorphism variation of water temperature. This difference has no valid taxonomic point of view. It is a single species distributed in the Atlantic Ocean across South America in 2010, described the species with its true name: Mugil liza, "said Oliveira.