

Sardines and horse mackerel identified using forensic techniques

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A team of researchers from Galicia in Spain have used forensic mitochondrial DNA species identification techniques to distinguish between sardines and horse mackerel. This method makes it possible to genetically differentiate between the fish, even if they are canned or processed, which makes it easier to monitor the degree to which fisheries resources are being exploited.

DNA from the [mitochondria](#) – cell organelles – is ideal for distinguishing between [species](#). One of its components in particular, cytochrome b, is a genetic marker that scientists use to establish relationships between genera and families, and is also used by some forensic laboratories to identify animals that appear at crime scenes (cats or insects, for example).

Now, for the first time, researchers from the National Association of Manufacturers of Canned [Fish](#) and Shellfish (ANFACO-CECOPESCA, [Spain](#)) have used this technique in order to genetically identify small pelagic (non-coastal) species, such as sardines and horse mackerel. This study was supported by the European Fisheries Fund (EFF) and Spain's Ministry of the Environment and Rural and Marine Affairs (MARM).

"These molecular tools represent a great step forward for the sector, since they enable fisheries imports to be monitored and tracked, and also ensure they are correctly labelled", Montserrat Espiñeira, a biologist for ANFACO-CECOPESCA and lead researcher of the study, tells SINC.

By using this method, the team was able to identify more than 20 species from the sardine group (genera such as *Sardina*, *Sardinella*, *Clupea*, *Ophistonoma* and *Ilisha*) and a similar number of horse mackerel species (*Trachurus*, *Caranx*, *Mullus*, *Rastrelliger* and others), originating from seas all over the world.

The methodology involved gathering a sample of [mitochondrial DNA](#) from the fish (even if it was canned or processed), amplifying a fragment of cytochrome b (using a polymerase chain reaction – PCR) and, lastly, carrying out a phylogenetic analysis by obtaining a "forensically informative nucleotide sequencing" (FINS).

The research on the [sardines](#) was published this month in the journal *European Food Research and Technology*, while the one on the horse mackerel was issued in March in the *Journal of Agricultural and Food Chemistry*.

The researchers are now focusing on analysing the distinct organoleptic, microbiological, physical-chemical and nutritional properties of the species analysed, and are also looking into whether some currently unexploited species could be of interest from a consumer perspective. "The end goal is to improve the management of fisheries resources and ensure they are sustainably exploited", explains Espiñeira.

The team is also developing rapid molecular identification methodologies (based on the Real Time-PCR technique), which will make it possible to distinguish between the most commercially-valuable small pelagic fish species – the European anchovy (*Engraulis encrasicolus*), the European sardine (*Sardina pilchardus*) and the main species of horse mackerel (*Trachurus trachurus*) – simply and in less than three hours.

More information:

Fátima C. Lago, Beatriz Herrero, Juan M. Vieites, Montserrat Espiñeira. "FINS methodology to identification of sardines and related species in canned products and detection of mixture by means of SNP analysis systems". European Food Research and Technology, May 2011 (on line). [DOI: 10.1007/s00217-011-1481-1](https://doi.org/10.1007/s00217-011-1481-1)

Ftima C. Lago, Beatriz Herrero, Juan M. Vieites, Montserrat Espiñeira. "Genetic Identification of Horse Mackerel and Related Species in Seafood Products by Means of Forensically Informative Nucleotide Sequencing Methodology". Journal of Agricultural and Food Chemistry 59 (6): 2223, March 2011. [DOI: 10.1021/jf104505q](https://doi.org/10.1021/jf104505q)

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