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Identifying commercial fish species and detection mislabeling using DNA barcoding

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In order to protect the consumer, the EU has strict regulations for seafood labeling, which must include the species name (EU Council Regulation No 104/2000, EU Commission Regulation No 2065/2001). However, commercial fish species available on the market cannot always be easily identified, especially when morphological characters have been removed in processed products (e.g. fish fillets). DNA barcoding, i.e. the sequencing of the mitochondrial reference marker gene cytochrome oxidase subunit 1 (CO1), can be used to identify species (Hebert et al. 2003).

Introduction

Problem: seafood labeling to protect consumer on processed commercial fish product

Solution: food control on DNA sequences of samples

Example: mislabelling in 25% of fish products in Dublin[1]

Aim: proportion of mislabeling in and around Brussels

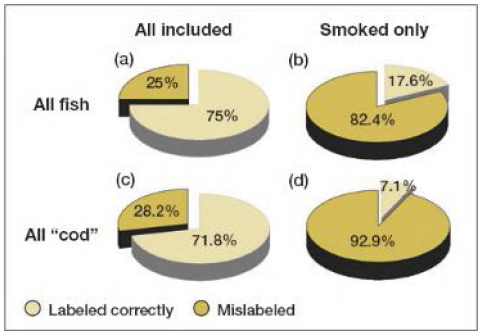

Fig.1 Proportion of mislabeled fish products in Dublin by Miller&Mariani (2010)

Fig.1 Sample sold as a tuna steak of species *Thunnus albacares*

Methods

Sampling: taking samples of high-prized fish species cod *Gadus morhua* and tuna *Thunnus sp.*

Sequencing: Cytochrome oxidase subunit 1 as marker gene DNA extraction and PCR with specific primers

Analysis: analyzing sequentions with software Mega5 sequentions compared with voucher specimens

Hebert P.D.N., Cywinska A., Ball S.L., de Waard J.R. Biological identifications through DNA barcodes. Proc.R.Soc.Lond. (2003) 270:313-321

Miller D.D., Mariani S. Smoke, mirrors and mislabeled cod: poor transparency in the European seafood industry. Front.Ecol.Environ. (2010)