

DNA BARCODING IN IDENTIFICATION OF RAW AND SMOKED SALMONID PRODUCTS

EMRE KESKIN, HASAN HUSEYIN ATAR

Ankara University, Faculty of Agriculture, Department of Fisheries and Aquaculture Engineering, Ankara, Turkey

DNK KODIRANJE U IDENTIFIKACIJI ŽIVIH I DIMLJENIH SALMONIDNIH PROIZVODA

Abstract

Identification of processed fish foods usually requires the application of a molecular tool because most of the morphometric keys used in species identification are lost during this process. Identification through DNA barcodes is being developed for all animal species and when used together with high throughput sequencing technologies, potentially provides a simple, common tool for the identification of raw and processed sea food. In this study, raw and smoked products of 8 species from genus *Oncorhynchus* were identified using DNA barcoding.

Raw and smoked products of all species (*Oncorhynchus clarkia*, *O. gorbuscha*, *O. keta*, *O. kisutch*, *O. masou*, *O. mykiss*, *O. nerka* and *O. tshawytscha*) were collected and samples of muscle tissue were taken for each species. Total genomic DNA was extracted and two regions of COI gene were amplified: DNA barcode region, which is approximately 650 base pairs long and a shorter part (307 base pairs) of DNA barcode region, which we used in amplification of heavily degraded DNA samples. PCR products were purified and DNA sequencing reactions were conducted on an automatic sequencing system. Alignment of sequences and phylogenetic analyses of the aligned sequences were conducted using MEGA 5. Sequences from the smoked eel products were aligned against GenBank COI entries for the species involved. Sequence divergences were calculated using Tamura-Nei distance model and a maximum likelihood (ML) tree using Tamura-Nei parameter was constructed with bootstrap tests of 1000 replicates for the reliability of the constructed tree.

Sequences of 307-652 base pairs in length were obtained from all raw and smoked fish products. Procedures used in smoked fish production do not appear to denature the DNA to an extent that eliminates recovery of short to moderate length sequences from processed fish food. Both universal primers (Fish F1-R1) and internal DNA Barcode

region primers designed in this study successfully amplified the COI region from raw and smoked products of 8 different *Onchorhynchus* species. Raw and smoked products could be identified to the species level with 100% identity matches against sequences in GenBank. As high throughput sequencing tools become more accessible, DNA barcoding is becoming a standard tool for the identification of species and products.

Key words: *COI, DNA barcoding, Onchorhynchus, Smoked fish products, species identification.*