Simultaneous detection and quantification of two European anglerfishes by novel genomic primer

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Abstract

Globalisation has led to increased trade and consumption of fish worldwide. As international trade and consumption of fish increases, so does the likelihood of fish being adulterated. It is often an illegal exchange of species where a cheaper species is substituted for a more expensive and rarer one. In Europe, the anglerfish (Lophius piscatorius) is often traded as the rarer, more popular black-bellied anglerfish (Lophius budegassa). To improve our ability to monitor and detect adulterants in these fish species, we developed a real-time PCR assay that allows for the simultaneous detection and quantification of L. piscatorius and L. budegassa. The newly designed primers target the second intron of the genomic gene parvalbumin. The proposed methodology shows good robustness, efficiency and high specificity. Of the 47 species tested, only Lophius species were amplified. Their differentiation is possible by analysing melting curves with an average Tm of 70.1 °C for L. piscatorius and 75.3 °C for L. budegassa, respectively. The detection limit for both species was 0.050 ng/µl. The assay also provides a tool to quantify parvalbumin in European anglerfish. The findings point to the use of the method proposed as a potential tool in forensic investigations to prevent illegal species substitutions, mislabeling, and food fraud.

Keywords: fish fraud;fish species identification

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