

DNA Fingerprinting of *Thunnus obesus* and *Thunnus albacores* Fish Species for Proper Identification in Large Scale Fish Processing Industry

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Detection of species substitution has become an important topic within the food industry and there is a growing need for rapid, reliable, and reproducible tests to verify species in commercial fish and seafood products. The effects of species substitution are far-reaching and include economic fraud, health hazards, and illegal trade of protected species. In Sri Lanka tuna fish industry is a rapid developing field. However, the species identification prior to the processing is achieved through morphological characteristics, which is not a reliable method. Therefore, the aim of this study was to develop a diagnostic method by combining Polymerase Chain Reaction with Restriction digestion to differentiate *Thunnus obesus* (bigeye tuna) and *Thunnus albacores* (yellowfin tuna) species in order to facilitate the fish processing industries and fish exporters by developing the test for species confirmation. Deoxy ribonucleic acid (DNA) extracted from muscle tissues of *T. obesus* and *T. albacores* were analyzed. DNA was amplified using primers flanking a region of cytochrome b gene of 558 bp and digested using two restriction endonucleases, *EcoNI* and *Scal*. A product having band sizes of 187 bp and 371 bp was observed from *T. albacores* after digesting with *EcoNI*. The digestive product by *Scal* resulted 215 bp and 343 bp band sizes for both *T. albacores* and *T. obesus*. The polymorphism of DNA profiles obtained by restriction digestion was used to differentiate the *T. albacores* and *T. obesus* species. Therefore, the current study carries a reliable approach to identify and distinguish *T. obesus* and *T. albacores* from the other tuna species.

Keywords: Tuna species, DNA extraction, Polymerase chain reaction, Restriction Enzyme digestion