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Polymerase Chain Reaction in the assessment of fish meat taxonomic identity

Fish meat consumption increases worldwide, even in landlocked countries, due to its health benefits. In this context, it is becoming critical to control the fish market of developed countries, also regarding the proper labelling according to the zoological origin of the traded fish. This is important economically, as mislabelling can result from the fraudulent substitution of species of high value with some less expensive fish. Proper labelling is also important in terms of the impact on health as fish parvalbumin can trigger allergic reactions in sensitive consumers. The severity of the reaction varies, according to some reports, for each individual patient based on the species of fish. Methods based on polymerase chain reaction (PCR) can be employed in fish species determination from small piece of meat devoid of morphological traits. Approaches based on mitochondrial markers play dominant role so far. However, intron regions of nuclear genes can serve as a platform for such approaches as well. Second intron in protein coding region of fish parvalbumin gene was used as such marker in a model species Black seabream. In interlaboratory study all participating laboratories detected Black seabream with no false positivities in panel of other fish species. Also, Real Time PCR modification can be designed. This approach brings ability to quantify the amount of target fish species as an extra readout of the assessment. Such information can be very useful in inspection of fish market as adulteration usually takes place in complex foods and extent of admixed species is important criterion. Cloning of fragment of nuclear gene intron into plasmid vector can lead to recombinant calibrators for such detection methods based on Real Time PCR and bring these assays on more defined, precise and generally more sophisticated in methods.

Speaker Biography

Petr Hanak graduated in biology in 1990 at Charles University, Prague, Czech Republic. He obtained his PhD in biochemistry at Safarik´s University in Kosice, Slovakia in 2006. Currently, he is the head of laboratory of molecular biology in Food Research Institute in Prague. His research interest includes employment of PCR in fraud detection of food, in particular fish species determination by various PCR modifications.

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