Differentiation between two Black Sea sturgeon species by PCR–RFLP

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Marine migratory sturgeon populations from our country have severely declined because of various influencing factors such as over harvesting and habitat alteration and now their survival in the wild is seriously endangered. All this facts made necessary the development of conservation programs for these species, including the practice of restocking natural basins with artificially reproduced individuals, raised in conditions of aquaculture. For all these reasons, it is important to develop a reliable method for the correct identification of sturgeon species, especially since this group of fish is characterized by the undemanding production of hybrids, even with non native species. At the same time sturgeon caviar is one of the most exclusive and expensive fishery products and the determination of originating species of caviar sturgeons is very important.

A method for the identification of sturgeon species has been developed based on the amplification of a region of the mitochondrial genome (tRNAGlu/cytochrome b) using the polymerase chain reaction. To distinguish between the two types of sturgeon the 462bp long PCR-products obtained were cut with different restriction endonucleases resulting in species-specific restriction fragment length polymorphisms (RFLP). A careful selection of restriction enzymes prevents ambiguous results cause by intraspecies polymorphisms.

In our study we employed the PCR-RFLP to discriminate between two Black Sea sturgeon species, Acipenser stellatus (stellate sturgeon) and Huso huso (beluga sturgeon). We amplified a region from mitochondrial genome (cyt b) by PCR and the 462bp long product obtained was cut with different restriction enzymes (SspI, Tru9I and RsaI). We selected four restriction enzymes in order to obtain species specific restriction patterns.

The advantages of PCR-RFLP compared to the other methods are manifold: one universal PCR-primer system in combination with a few restriction enzymes can be sufficient for species identification. No references are necessary once the restriction patterns of the species of interest are determined. In this study we have demonstrated that two sturgeon species within the genus Acipenser and Huso can be successfully identified using PCR-RFLP. This method has been applied in the discrimination of different sturgeon species in caviar.