

# DIFFERENCES of MUSCLE STRUCTURE in FRESHWATER FISH USING SCANNING ELECTRON MICROSCOPE INVESTIGATION

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## INTRODUCTION - Freshwater fish

➔ Fish consumption on land is significant, mainly from ocean saltwater & aquacultur. The fish meat and highly unsaturated fatty acids (HUFA) play an important role in protection of cardiovascular, cancer diseases. Hungary is rich with freshwater fish in rivers but the consumption of fish meat lower than the European average. In 2007:3.8 kg/capita/year, in 2016 increased to 6.0 kg/capita/year. The important aspect of preserving the structure of fish meat in living rivers and develop the processing of technology with traditional cooking - i.e. Fish soup, Fried fish etc.

How altered the structure using different processing of freezing technique?

In this study we considered a different structure differences of skeletal tissues, which has not been investigated yet.

## AIM

To investigate the structure of skeletal tissues of freshwater fish by scanning electron microscope, confocal microscope and technofunctional parameters to compare the differences between African catfish & Siberian sturgeon

## METHOD

➔  Siberian sturgeon (*Acipenser baerii*)  
 &  
 ➔  African catfish (*Clarias gariepinus* Burchell)

Both are antients but Different genetic background & lifestyle

➔  African catfish (1, 2, 3 fish meat)  
 Native to Inland waters of Africa, Bu, Ro, Hu, N etc.  
 Siberian sturgeon (4, 5, 6 fish meat)

Native to subtropical, temperate and sub-Arctic rivers, lakes and coastlines of Eurasia and North America. Lake Baikal, Lake Balaton etc.

➔ Scanning electron microscope (SEM)  
 ➔ The processing of freezing was precooled (PRE) or fast freezing (FF) or slow freezing (SF)

➔ Organoleptic analysis

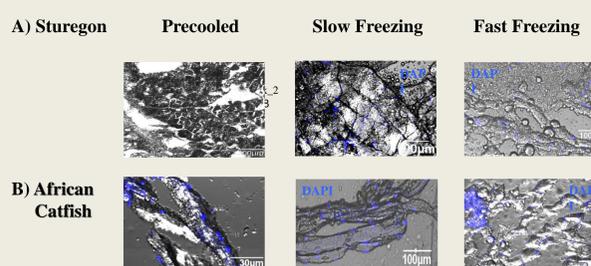
## Analysis by scanning electron microscope



➔ The precooled and slow-freezing muscle structure was very similar. Fibers, structural elements of muscle are different between these species.

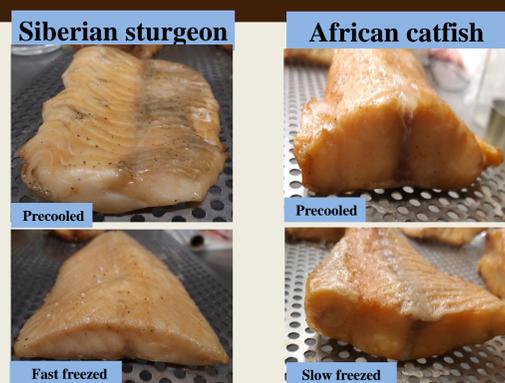
## Analysis by confocal microscope

### Structure of skeletal muscle in freshwater fish



## Confocal microscope studies

## Organoleptic analysis



## Organoleptic values

➔ Organoleptic values were excellent both in species but altered freezing parameters and smoked

➔ After fried with oil, the African catfish and Siberian sturgeon are best in substance, taste and essence

## RESULTS

The structural changes in Sturgeon due to rapid freezing and higher lipid content have proved sufficient to increase the enjoyment value of the product. The knowledge of the molecular structure and composition of meat is important for the precise setting of functional parameters.

Consumption a fish, as a good meat, perhaps will be raised most likely, due to the complete values of fish meat addition to daily diets in particular diseases.

Hungary is able to produce top quality freshwater fish and to supply the own country and also the EU markets

## DISCUSSION

The structures of skeletal muscle differ between Siberian sturgeon (*Acipenser sp.*) and African catfish (*Clarias sp.*)

The scanning electron microscopy method is an advantageous choice for measuring quality differences in muscle structures

In the future, we are able to use to developed new methods to compare freshwater fish by scanning electron microscopy technique



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