



MASTER THESIS PROJECT

MEASUREMENT OF TELOMERE LENGTH AND TELOMERASE ACTIVITY IN SOLES

MARIIA KUZNETSOVA

French National Institute for Sea Exploration (Ifremer)

Nantes, France

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SUMMARY (English version)

Anthropogenic activities lead to the production of a high variety of chemicals, which pollute land, air and water. The aquatic environment is known to act as a sink for chemical pollutants, which puts aquatic life in danger. To assess the exposure to the chemicals or the effects of the pollutants on the organisms, biomarkers are widely used. Different biomarkers can require different time, cost and provide different information. Therefore, scientists always try to improve the ways to assess aquatic life's health.

In this study, we worked on a new promising biomarker of fish health – Telomere Lengths. The widely distributed flatfish *Solea senegalensis* was caught in several estuaries during 2 health assessment campaigns: SELIMANCHE, which included Seine and Somme bays, and MAGMA, during which Gironde estuary was investigated. We assessed Absolute and Relative telomere lengths and observed the age and site effect, but no sex effect. Fish from Gironde turned out to be less healthy, having shorter telomeres. Future investigation into the correlation of telomere length with biotic and abiotic factors is required.

Furthermore, we validated a new method of telomere lengths measurement. Telomere Restriction Fragment analysis is known to be a gold technique for this purpose, but recently the possibility of Quantitative Polymerase Chain Reaction (qPCR) is discussed. We checked the reliability and variation of the obtained by qPCR data. Coefficient variation of the raw data is low, while during the steps of calculations it increases. It is expected to find a new way of calculation to overcome this problem. Further studies are necessary to overcome impossibility of inter-laboratory comparison of the results.

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Telomere lengths and qPCR as a method of their measurement are both found to be promising in future ecotoxicology studies.

We also tried to link telomere lengths with telomerase activity, an enzyme which can restore telomeres. This is a very new field of studies, so the protocols are not well-settled yet. Unfortunately, we indeed faced the problems in performing the protocol, which are discussed in the current report. This information should be useful in future works regarding this question.

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