



ÁSA JACOBSEN

CONTACT

 Fiskaaling
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SCIENTIFIC EDUCATION and POSITIONS

2020

Doctoral degree in Biotechnology

Thesis title: Exploring potential causes of gaping in salmon (*Salmo salar* L.) fillets

Supervised by: Prof. Svein-Ole Mikalsen and Dr. Jonhard Eysturskarð

Funded by: The Faroese Research Council, Fisheries Research Fund of the Faroe Islands, Fiskaaling

2004

MSC in Biology – University of Copenhagen

Dissertation title: A genetic analysis of the white-sided dolphin (*Lagenorhynchus acutus*)

Supervised by: Dr. Liselotte Wesley Andersen

Funded by: Fisheries Research Fund of the Faroe Islands,

2007-present

Researcher

The Aquaculture Research Station of the Faroe Islands / Fiskaaling

PROFILE and RESEARCH INTERESTS

I have a broad education in biology covering ecology, zoology and molecular evolution and analyses. Project experiences include project management, development of concept, experimental setup, sampling, laboratory work, data analyses and dissemination. I am experienced working with method development and research in molecular laboratories, particularly in genetics, in relation to aquaculture and environment interactions. I have previous experience in collaborating with the aquaculture Industry and presentation of scientific material on popular platforms. I continuously publish peer-reviewed scientific papers and write technical reports. I value both national and international collaboration and am interested in cross disciplinary work.

My main interest is the interactions between the environment and the farming operations in the aquaculture industry. My research has mainly investigated how the environment affects the farmed animals and how the farming procedures affect the environment. My current work focuses mainly on establishing, standardizing and implementing environmental DNA methods in biomonitoring of the water, sediment and kelp forest in the Faroese coastal region, facilitating biomonitoring and impact assessments. In addition, research into the fish microbiome is an area of interest.

RECENT PROJECTS

2023-present **BlueCea**

The aims of BlueCea are to assess the macroalgae blue carbon potential across the ridge and trace the fate of macroalgal production to potential blue carbon sinks. Two systems will be surveyed, a temperate fjord in the Faroe Islands and a sub-Arctic fjord in East Greenland to estimate blue carbon standing stocks in macroalgal forests and to trace the likelihood of this carbon reaching carbon sinks.

In a multidisciplinary approach eDNA will be used to identify potential macroalgae in sediment cores.

Funded by Marine Research in the North Atlantic Ocean

2022-present **Lumpfish & AquaNest**

Monitoring the effect of seaweed shelters on lumpfish welfare and their abilities as cleaner fish in pens with farmed salmon. Measured parameters include welfare indicators and microbiome in the lumpfish skin mucus and seaweed and plastic biofilm.

Funded by FHF in Norway.

2022-present **Kelp Forests as nursing area for wild fish**

Establishing best methods for monitoring kelp forests and their role as nursing area for wild fish. The project will test various methods for measuring biodiversity of seaweed, wild fish and food availability in the kelp forests in order to get an insight into this ecosystem and determine how to best monitor the status and potential effects of human activity and climate change. Methods tested are observations of fish by camera and capture by nets and traps, seaweed transect investigations and eDNA analysis of seaweed, fish and invertebrate biodiversity.

Funded by the Fisheries Research Fund in the Faroes.

2022-2022 **UNIFleD**

(Project manager)

Gathering data on eDNA methods and application in marine projects in various Nordic countries. A compiled status report will give an overview of how eDNA methods currently are implemented in marine research and monitoring in these countries. Fundamental issues such as sampling, storage and archiving are in focus. In addition, details about project types, management roles, funding, national interest, cooperation etc. will give insight into regional strengths and challenges.

Funded by The Nordic Council of Ministers.

2020-2021 **Bioinformatics pipeline**

(Project manager)

Establishing a dynamic bioinformatics pipeline for analysis of NGS data. From reads to publishable data, statistics and graphics for scientific manuscripts and reports by application of QIIME2, JupyterLab and Rstudio.

Funded by Fiskaaling.

2019-2021 **Phytoplankton and harmful algal blooms**

(Project manager)

Establishing fundamental knowledge of phytoplankton communities in the Faroese coastal region and setting up monitoring of potentially harmful algae by LM and molecular methods.

Funded by the Faroese aquaculture industry and Fiskaaling.

2011-2020 **Exploring potential causes of gaping in salmon (*salmo salar* L.) fillets (PhD project)**

The project implemented various methods to explore potential causes of gaping in salmon fillets. The project included setting up NGS protocols and establishing and performing bioinformatic analysis. Other methods used

included glycosaminoglycan extraction, mass spectrometry analysis and enzyme activity measurements.
Funded by the Faroese Research Council, the Fisheries Research Fund in the Faroes and Fiskaaling.

- 2019-2020** **Phytoplankton dynamics**
(Project manager)
Comparison of phytoplankton community composition and dynamics on the Faroese shelf and in selected fjords by NGS analysis.
Included comparison of various primers and extraction methods.
Collaboration with Hiddenfjord salmon farming company and Faroe Marine Research Institute.
- 2018-2019** **Quantification of salmon lice in plankton samples**
Comparison of methods for quantification of salmon lice in plankton bulk samples using molecular methods.
Collaboration with the Institute of Marine Research in Bergen, Norway.
- 2018-2019** **Lumpfish microbiome - effect of stress**
Experimental setup examining the potential effect of stressful conditions on lumpfish (*Cyclopterus lumpus* L.) microbiome.
- 2017-2018** **Salmon smoltification and stress**
Investigating the effect of salmon smoltification and stress in relation to transfer of large smolts from RAS systems to sea cages. Methods Included qPCR analysis and measurements of cortisol levels in skin mucus.
Collaboration with MOWI salmon farming company.
- 2016-2017** **Cortisol in salmon skin mucus**
(Project manager)
Establishing and validating standard methods for monitoring stress in salmon by non-invasive sampling and measuring cortisol levels in skin mucus.
- 2016-2017** **Microbiome of wild and farmed lumpfish**
(Project manager)
Comparison of the microbiome of wild and farmed lumpfish (*Cyclopterus lumpus* L.).
Collaboration with Hiddenfjord farming company.

SELECTED PUBLICATIONS AND REPORTS

Jacobsen Á, Vang A, Salter I, Juul-Pedersen T, Sveinsson S, Pampoullie C, Wangensteen O, Præbel K, Mikalsen S-O, Djurhuus A, Pálsson S, Gíslason D (2023)
Perspectives on implementation of eDNA methods in Northeast Atlantic marine monitoring – A basis for researchers and stakeholders to discuss challenges and ambitions. *TemaNord* 2023:517. Doi:10.6027/temanord2023-517.

Jacobsen Á, Johannesen Á (2023)
Bioinformatic Pipeline. A user guide documenting the pipeline used to process amplicon-based next-generation sequencing data at Fiskaaling. *Fiskaaling Rit* 2023-01.

Jacobsen Á, Jacobsen E (2021)
Comparison of phytoplankton community composition and dynamics on the Faroese shelf and selected fjords by NGS analysis. *Fiskaaling Rit* 2021-02.

Bui S, Dalvin S, Vågseth T, Oppedal F, Fossøy F, Brandsegg H, **Jacobsen Á**, á Norði G, Fordyce M, Michelsen H, Finstad B, Skern-Mauritzen R (2021)

Finding the needle in the haystack: comparison of methods for salmon lice enumeration in plankton samples. *Aquaculture Research* Doi:10.1111/are.15202.

Jacobsen Á, Jacobsen E, Dam M (2020)

Chlorophyll *a* and potentially harmful algae in various Faroese fjords in 2020. *Fiskaaling Rit* 2020-20.

Jacobsen Á (2020)

Exploring potential causes of gaping in salmon (*Salmo salar* L.). PhD thesis. *NVD Rit* 2020:07.

Jacobsen Á, Shi X, Shao C, Eysturskarð J, Mikalsen S-O, Zaia J (2019)

Characterization of glycosaminoglycans in gaping and intact connective tissue of farmed Atlantic salmon (*Salmo salar* L.) filets by mass spectrometry. *ACS Omega* 4: 15337-15247. Doi:10.1021/acsomega.9b01136.

Jacobsen Á, Mikalsen S-O, Joensen H, Eysturskarð J (2019)

Composition and dynamics of the bacterial communities in the post-slaughter environment of farmed Atlantic salmon (*Salmo salar* L.) and correlation to gelatin degrading activity. *PeerJ* 7: e7040. Doi:10.7717/peerj.7040.

Jacobsen Á, Mortensen H, Mortensen AM, Jacobsen E, Djurhuus DD, Eliassen K (2019)

Chlorophyll *a* and potentially harmful algae at selected aquaculture farming locations in 2019. *Fiskaaling Rit* 2019-(10-12).

Jacobsen Á, Joensen H, Eysturskarð J (2017)

Gaping and loss of fillet firmness in farmed salmon (*Salmo salar* L.) closely correlated with post-slaughter cleaning of the abdominal cavity. *Aquaculture Research* 48: 321-331. Doi:10.1111/are.12884.

Eysturskarð J, í Kongsstovu SK, Færø D, **Jacobsen Á**, Joensen H (2017)

Fucus vesiculosus extract Inhibits the proteolytic activity and gene expression of matrix metalloproteinases In Atlantic salmon (*Salmo salar* L.). *Aquaculture International* 25(2). Doi:10.1007/s10499-017-0157-7.

Jacobsen Á, Jacobsen E (2017)

Microbiome of wild and farmed lumpfish. *Fiskaaling Rit* 2017-(22-27).

Eysturskarð J, Dam M, í Kongsstovu SK, **Jacobsen Á**, Joensen H (2017)

Rapid sex identification of Atlantic salmon (*Salmo salar* L.) by real-time PCR. *Aquaculture Research* 48, 2618-2620. Doi:10.1111/are.13003.

In prep:

Jacobsen Á, Johannesen Á, Jacobsen E, Salter I, Joensen H, Patursson EJ

Resolution of phytoplankton community structure and dynamics on the Faroese Shelf and coastal region by two 18S rRNA primer pairs.

RECENT PRESENTATIONS

2022 UNIFleD online workshop

“The UNIFleD project and survey introduction”

Implementing genetic methods in phytoplankton monitoring -
online network,
"The UNIFleD project"

Nordic Marine Phytoplankton Group (NOMP), annual meeting,
Faroe Islands
"Integrated approaches for examining phytoplankton dynamics
in a Faroese fjord"

Nordic Marine Phytoplankton Group (NOMP), annual meeting,
Faroe Islands
"Phytoplankton and HAB monitoring in the Faroe Islands"

Norwegian Seafood Research Fund (FHF), theme meeting,
Norway
"Lumpfish and Akva-nest: Effect of seaweed shelters on welfare
and efficiency of cleanerfish"

Research fund for Marine Research, work meeting, Faroe Islands
"Focus on Marine environmental DNA"

2021 **Implementing genetic methods in phytoplankton monitoring**, -
online network,
"Phytoplankton monitoring in the Faroe Islands using molecular
methods"

Sustainable Aquaculture, online conf., Faroe Islands
"Harmful algae"

2020 **Aquaculture Conference**, Faroe Islands
"Microalgae"

2019 **1st International Symposium of Mucosal Health in
Aquaculture**, Norway
"Microbiome of lumpfish (*Cyclopterus lumpus*)"

Nordic Marine Phytoplankton Group Workshop, Norway
"Application of molecular methods in HAB monitoring in the
Faroe Islands"

49th WEFTA conference, Faroe Islands
"Gaping in salmon fillets – a different approach"