GÖTEBORGS UNIVERSITET

INSTITUTIONEN FÖR MARINA VETENSKAPER
TJÄRNÖ MARINA LABORATORIUM

Fiskeridirektoratet

Toktrapport 23.11.2021, 01.01.2022-31.12.2022, Jnr. 21/18191

Cruise summary report RV Nereus 2022

Ship: RV Nereus, Call sign: SKTD
Type of ship: Research vessel

Cruise: 23.11.2021, 01.01.2022-31.12.2022, Jnr. 21/18191

Operating authority:
Tjärnö Marine Laboratory, Tjärnö, University of Gothenburg, Sweden

Owner: University of Gothenburg, Sweden

Name of master: Peter Nilsson

Scientist in charge: Ann Larsson

Principal investigators:
Ann Larsson (AL)
Susanna Strömberg (SS)
Iga-Maria Nestorowicz (IMN)

Cruise dates and activities at the Tisler reef:

Date	PI	Latitude	Longitude	Depth (m)	Fieldwork
2022-01-25	SS	58°59.777	10°58.104	104-125	Coral sampling*. Collected four samples. Deployed ADCP and sediment trap.
2022-04-22	IMN	58°59.777	10°58.104	104-114	Retrieved ADCP and sediment trap.
2022-07-01	SS	58°59.783	10°57.818	123-128	Deployed ADCP and sediment trap.

2022-09-30	AL	58°59.738	10°58.144	116-123	Retrieved settling panels from 2021-04-12, sediment trap and deployed another ADCP. Film crew onboard.
2022-10-12	IMN	58°59.783	10°57.818	126-128	Retrieved ADCP and deployed sediment trap.
2022-11-14	SS	58°59.736	10°58.171	110-120	Coral sampling*. Collected four samples – RESTORESEAS.
2022-11-25	IMN	58°59.840	10°57.581	114-122	Coral sampling*. Six samples – LIFE Lophelia.
2022-11-29	IMN	58°59.732	10°58.168	110-114	Coral sampling*. Four samples – LIFE Lophelia.
2022-12-16	IMN	58°59.790	10°58.168	116-120	Coral sampling* aimed at males, as only females were collected in Nov. Two samples – LIFE Lophelia.

* All necessary permits were in place: the Ytre Hvaler National Park Board 19.11.2021, sak 2021-26, Jnr. 2019/48047; Miljødirektoratet, CITES export permits 22NO-0031-EX, and 22NO-0032-EX; and the Swedish Board of Agriculture, CITES import permits Dnr: 4.10.18-15955/2022, 4.10.18-15956/2022

Aim of the cruise

Corals and data from the cruise activities are used in the following projects:

LIFE Lophelia, Method development for cold-water coral reef habitat restoration with implementation in Kosterfjord-Väderöfjord, Sweden. 2019–2025, PI Ann Larsson.

Biophysical modelling of *Lophelia pertusa* larval dispersal in the Skagerrak. PhD-project 2018–2022, Vilhelm Fagerström, PI Göran Broström.

iAtlantic, Integrated Assessment of Atlantic Marine Ecosystems in Space and Time. H2020 project 2019–2024, PI Ann Larsson.

EcoPulse. Internal waves, development and enhancement of biological production at coral reefs. 2020–2023, PI Johannes Röhrs, Meteorological Institute in Oslo.

RESTORESEAS -nature-based tools to protect and restore biodiversity, Biodiversa Water JPI, 2022–2025. PI Ann Larsson

Reproductive biology of cold-water corals: Insights from fertilisation kinetics, ultrastructural morphology, and histological analysis. PhD-project 2021–2025. Diego Moreno Moran, PI Rhian Waller.

Cumulative impacts of climate change and human activities on cold-water coral communities in the Azores. 2022–2026. Anaïs Sires de Vilar, PIs Marina Carreiro Silva, Ann Larsson

The collected corals were used for studies of reproduction, embryo and larval development, larval behaviour and larval settlement during different experimental conditions in the laboratory. These studies were made within the LIFE Lophelia, iAtlantic and RESTORESEAS projects as well as the PhD-projects by Diego Moreno Moran and Anaïs Sires de Vilar. For example, the effects of pH, temperature, microplastics, mining particles and benthic sediments on embryo and larvae were tested as well as the effect of sperm concentration on fertilization success. For mature larvae we examined the effect of material composition and surface structure on settlement behaviour. Data from the current measurements and sediment traps are together with measurements from 2020-2022 currently being analyzed and prepared for publication within the LIFE Lophelia, EcoPulse and Biophysical modelling projects. Settling panels deployed in 2021 for the LIFE Lophelia project were retrieved in September 2022, and the effects surface structure on the recruitment of marine invertebrates were analyzed by a MSc student from GU. We aim to publish all data and results from our studies in peer-reviewed scientific articles.

Tjärnö 2023-10-12
Ann Larsson