

Trophic ecology of larval Atlantic herring in lagoons of Îles-de-la-Madeleine

The lagoons of Îles-de-la-Madeleine act as marine refuges by hosting the spawning and providing important habitats promoting growth of early life stages of numerous marine species. These species include Atlantic herring (*Clupea harengus*), a pelagic fish currently facing conservation issues in the southern Gulf of St. Lawrence. However, the contribution of Îles-de-la-Madeleine lagoons to herring recruitment remains poorly understood. Egg hatching is expected to occur in early May following a 2-3 week incubation period, but larval development and the potential role of the lagoons as a nursery habitat for the juveniles remain unknown. The general objective of this project is to determine if the support capacity of the lagoons is effective to support the early development of spring herring at the level of the population. Preferred prey for herring larvae have often been identified as copepod nauplii and copepodites, but smaller prey such as ciliates and even microalgae larger than 10 µm could be important, particularly during the first-feeding stage. Because these oligotrophic lagoons are supporting a high biomass of heterotrophic microplankton, such as ciliates, this marine refuge could therefore be appropriate for the larval development of herring. As part of this study, we will sample herring larvae along with environmental and trophic conditions from spring to early summer, i.e., throughout the entire larval cycle. Subsequently, mesocosm experiments will be developed from eggs collected in the field to determine food sources, their nutritional importance on development and possible trophic competition with filter-feeding organisms. The trophic linkages between larval herring and their prey, as well as larval herring nutritional status, will be determined by the combined use of high-resolution stomach content analysis trophic markers, such as fatty acid composition and stable isotopes. The identification of larval prey and organisms composing the plankton assemblage could also be identified by eDNA metabarcoding.

Supervisory team

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