

Discovery and distribution of *Mediopyxis helysia* Kühn, Hargraves & Halliger in Breiðafjörður, West Iceland



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Introduction

A survey on phytoplankton abundance, community composition and physical and chemical drivers was initiated in Breiðafjörður, West Iceland, in 2007 (Figure 1). In the same year a new species of diatoms to Icelandic waters, *Mediopyxis helysia* (Figure 2), was observed in the phytoplankton community. The occurrence of *M. helysia* is recent in the North Atlantic Ocean.¹ The monitoring program in Breiðafjörður is ongoing and here we present the frequency of occurrence of *M. helysia* from May 2007 to September 2011.

Methods

Phytoplankton samples were collected at 10 locations in the fjord on a ten day interval during spring and summer but less frequently during autumn and winter. Samples were collected at 1m and 10m depth for species identification and enumeration and net tows (15µm) were collected from 5m to surface. Up on detection of *Mediopyxis helysia* every single net tow was screened for the presence of the species.

Results

Mediopyxis helysia has been found in Breiðafjörður annually from 2007 to 2011 (Figure 3). *M. helysia* was frequently detected in autumn and winter with erratic occurrence in spring and summer (Figure 4). The species has been observed at all 10 sample locations within the fjord, but the highest relative frequency of occurrence was at the shallowest northernmost station, BFS1 (Figure 1). Comparison of *M. helysia* abundance with measured environmental parameters revealed no significant correlation (data not shown), but cell density ranged from 20 to 800 cells in liter (Figure 5).

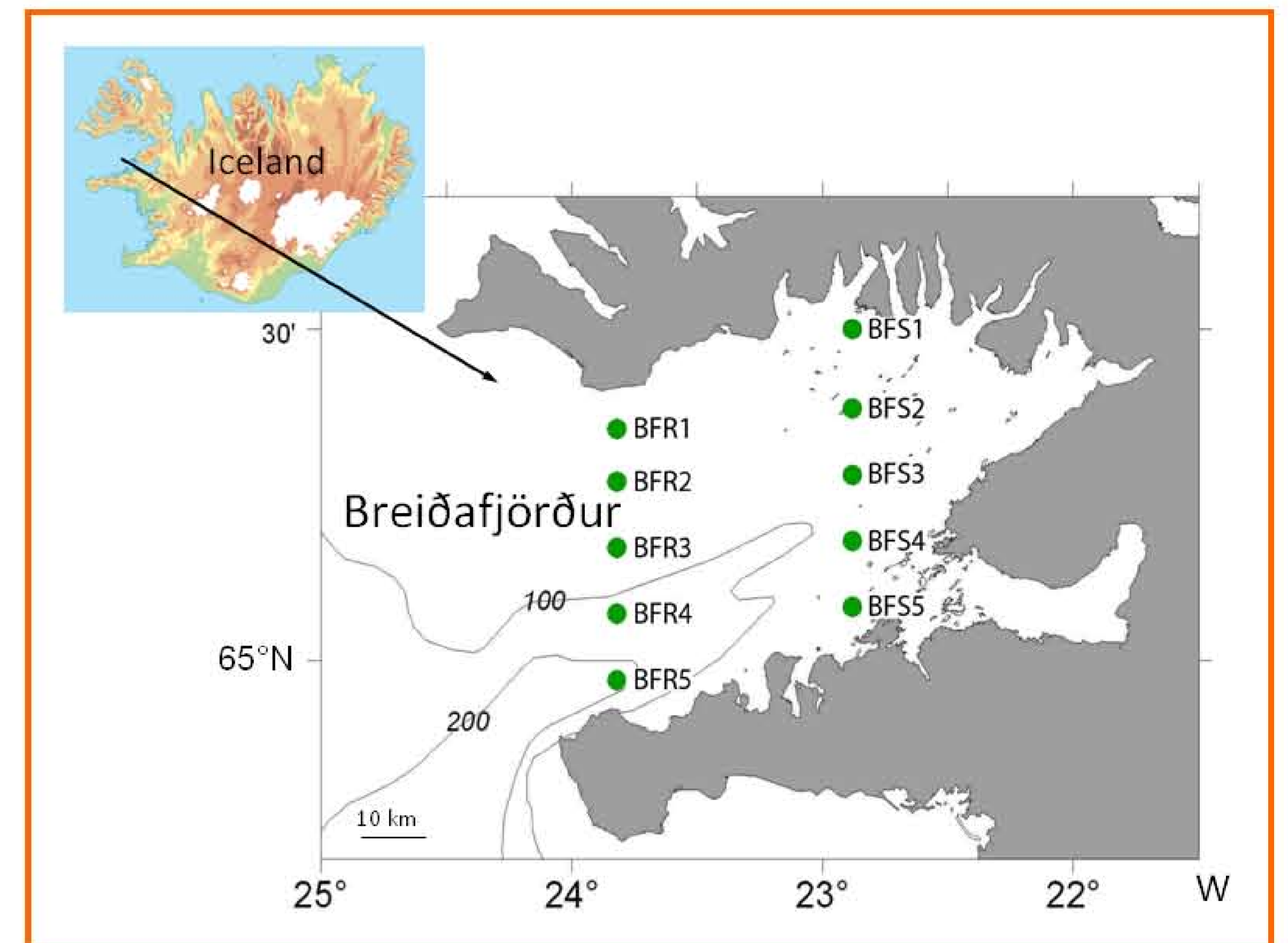


Figure 1. Sample locations in Breiðafjörður. Distance between stations 10 to 11 km.



Figure 2. *Mediopyxis helysia* Kühn, Hargraves & Halliger, from Breiðafjörður.

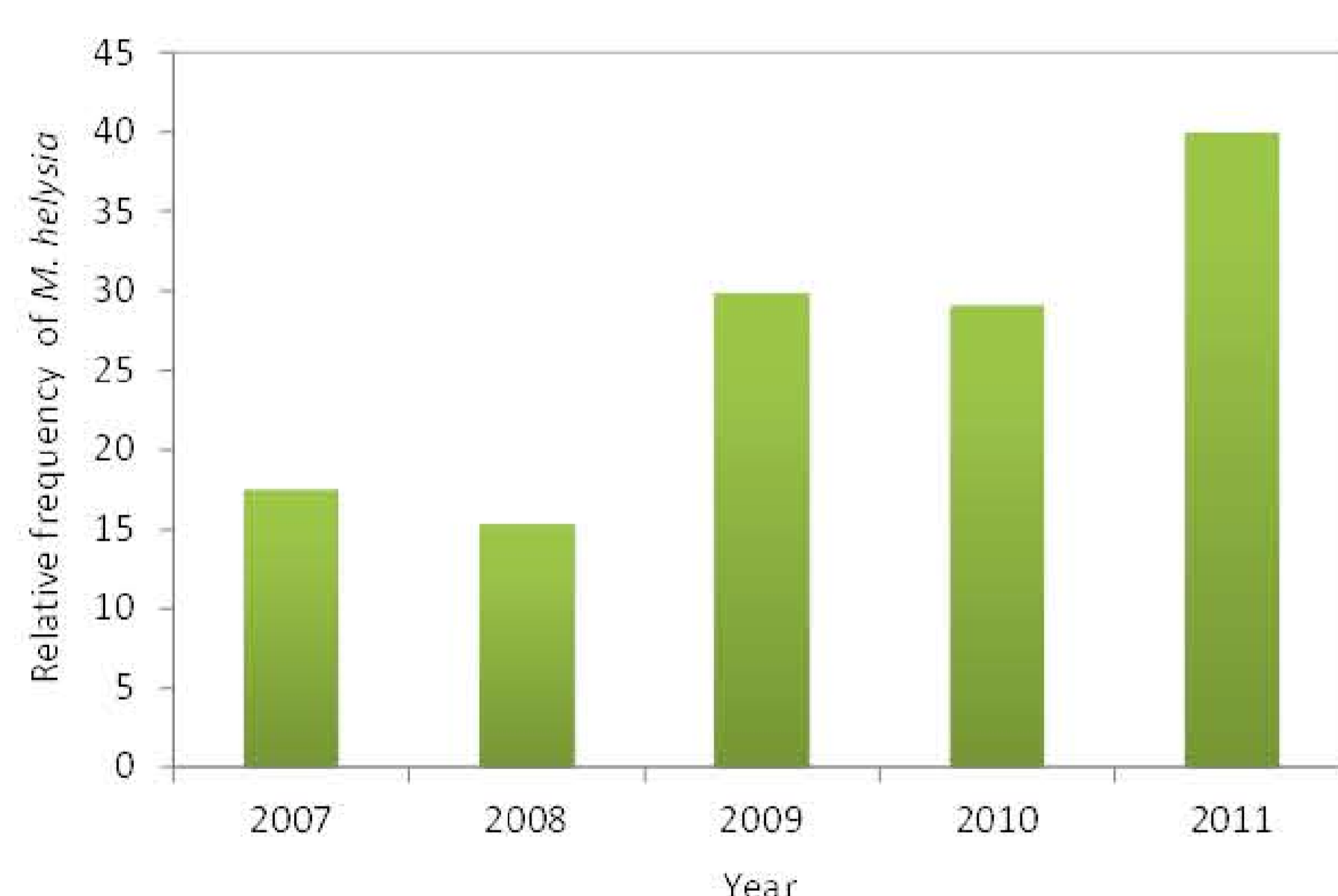


Figure 3. Relative frequency of *Mediopyxis helysia* in phytoplankton samples collected from 2007 to 2011.

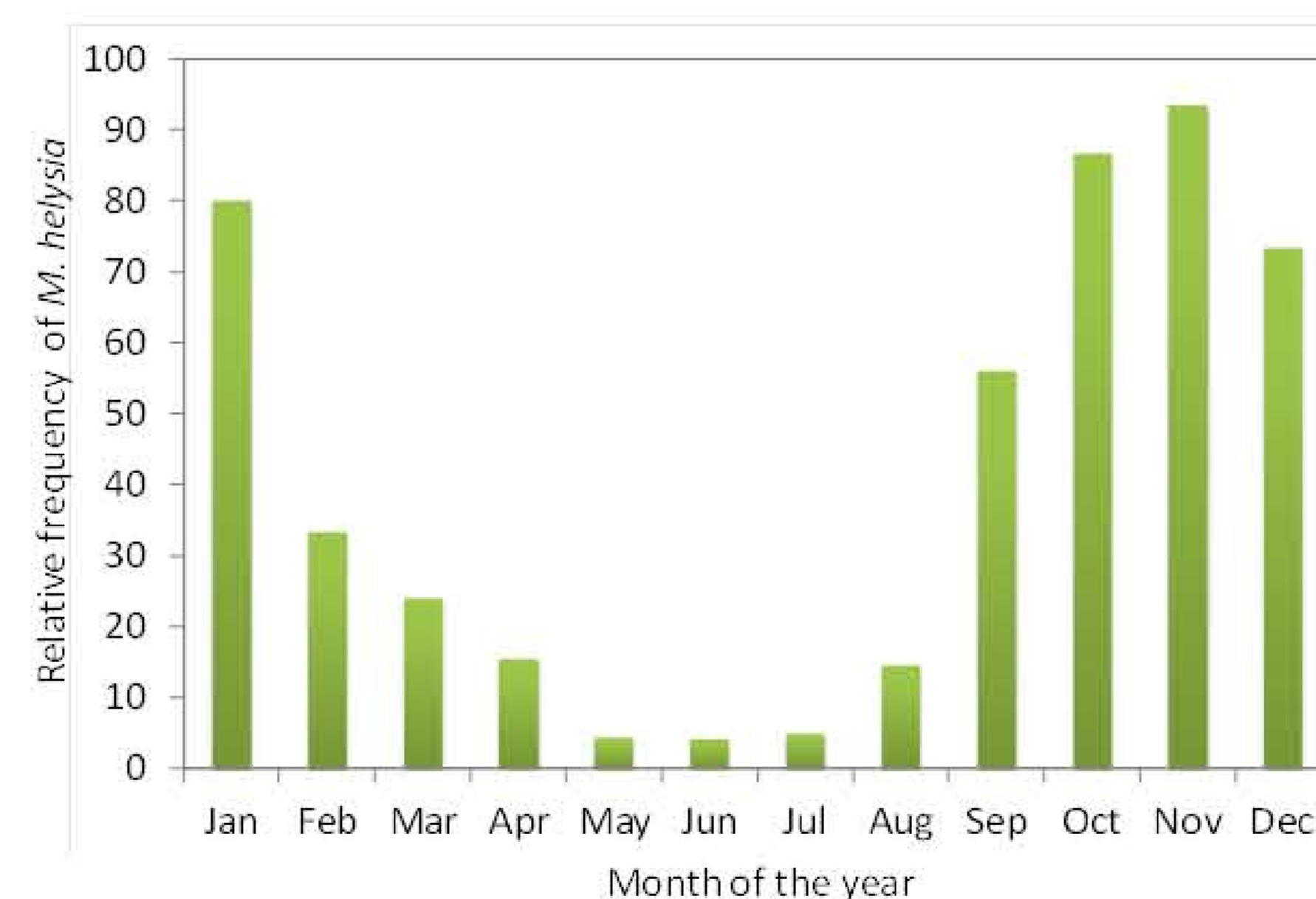


Figure 4. Relative frequency of *Mediopyxis helysia* in phytoplankton samples, on monthly basis combined for May 2007 to September 2011.

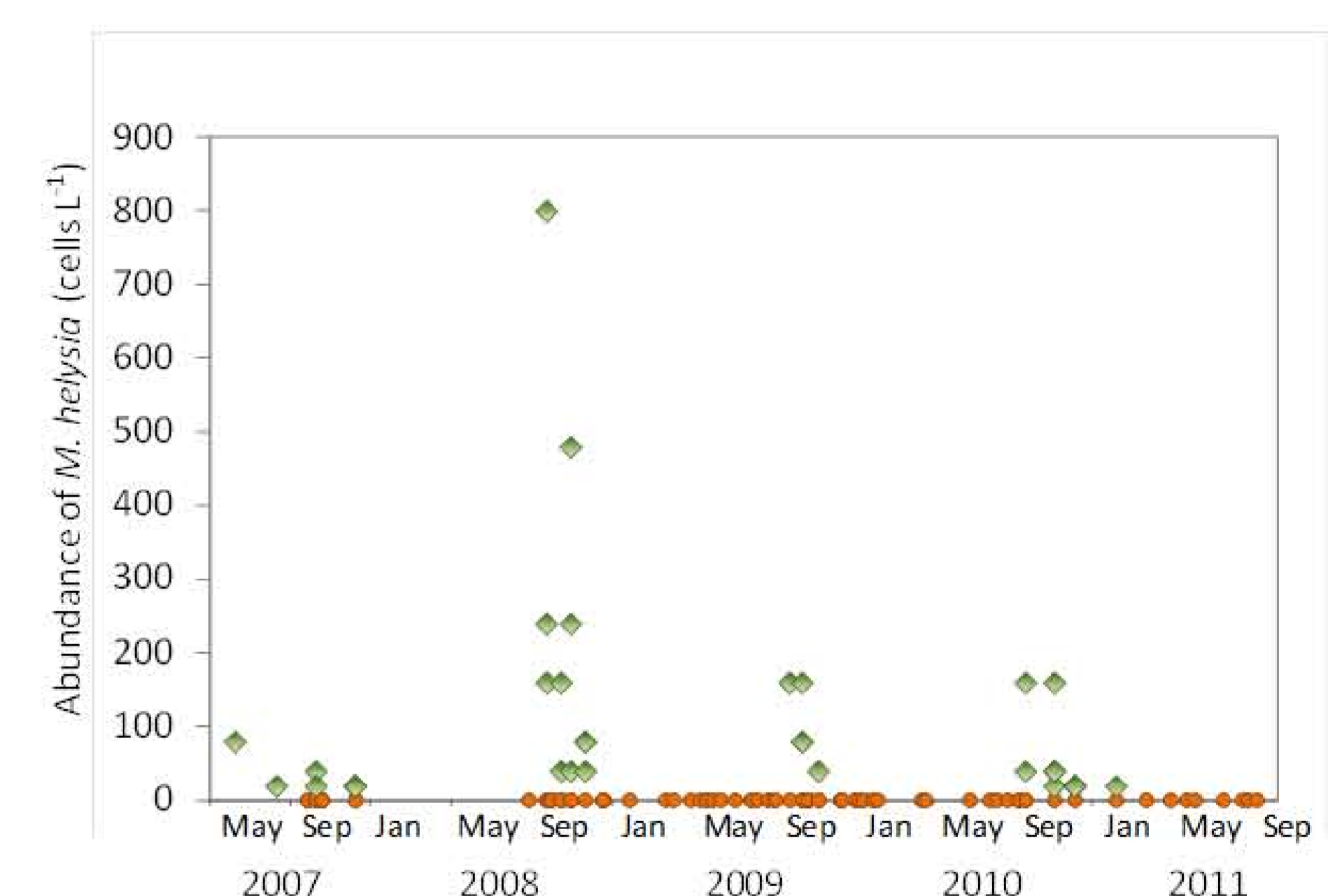


Figure 5. Abundance of *Mediopyxis helysia* in Breiðafjörður. Limit of detection for cell enumeration was 20 cells per liter. Orange dots indicate presence of *M. helysia* in plankton samples.

Discussion

In Iceland, *Mediopyxis helysia* has only been detected from Breiðafjörður and its origin and dispersal mechanism is unknown. Currently, the locations of possible origin are in the North Sea (Scotland, German Bight) or from the east coast of North-America (Gulf of Maine, Bay of Fundy), the only locations in the world where the species has been reported hitherto. *M. helysia* is a large and conspicuous species which is hard to overlook and thus it might be indicative of more extensive transport of inconspicuous phytoplankton or other marine microscopic organisms.

Acknowledgements

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Conclusion

The discovery of *Mediopyxis helysia* during the current monitoring scheme of Breiðafjörður and the species winter time maxima highlights the value of frequent observations of phytoplankton communities. Regular observations of algae community composition throughout the year was essential in order to fathom the species diversity of the ecosystem.

References

1. Kühn, S.F., Klein, G., Halliger, H., Hargraves, P.E. and Medlin, L. K. 2006. A new diatom *Mediopyxis helysia* gen. nov. and sp. nov. (Mediophyceae) from the North Sea and Gulf of Main as determined from morphological and phylogenetic characteristics. *Nova Hedwigia*. 130: 307-323.