

Genetic structure of common whelk (*Buccinum undatum* L.) populations in Iceland and the Faroe Islands

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Introduction

A subtidal gastropod, the common or waved whelk *Buccinum undatum* is widely distributed in the North Atlantic as well as the Greenland and Norwegian seas [1]. The morphology of the common whelk, both in appearance and shell ratios, is variable between countries and areas. Distinct morphological differences in whelks have been observed between areas in Breiðafjörður in the current study. The varying morphology indicates that migration of whelks between areas might be limited enough to form genetically distinct subpopulations. The aim of this study is to test the hypothesis that there are different populations of the common whelk in Iceland and the Faroe Islands as well as between areas within Iceland.



Figure 1. The sample sites. A) Iceland B) The Faroe Islands. Stations are marked with a red diamond.

Methods

Whelks were collected from four locations; in Breiðafjörður in the west of Iceland (Hempill and Oddbjarnarsker), Húnaflói in the northwest of Iceland and the Faroe Islands (Fig 1). DNA was extracted from the mantle of the whelks and isolated using CTAB and chloroform:isoamyl alcohol. Fragments of the mitochondrial gene 16SrRNA was amplified by PCR. The PCR product was then sequenced using ABI PRISM 3100 Genetic Analyser. Data was analysed with R 2.6.2.

Results

Three sites were found to be polymorphic within the partial sequences of mitochondrial genes for 16SrRNA. The sequenced individuals comprised 6 different haplotypes (Table 1). Haplotype composition differed between stations (Fig 2).

Table 1. Haplotype composition of the common whelk at four sampling stations

Haplo types	Faroe Islands	Hempill	Húnaflói	Oddbjarnarsker	Total	
Haplotype 1	T-C	23	4	0	7	34
Haplotype 2	CAT	1	0	0	0	1
Haplotype 3	C-C	5	16	13	14	48
Haplotype 4	TAT	2	1	3	0	6
Haplotype 5	T-T	0	3	8	2	13
Haplotype 6	C-T	0	0	0	1	1
Total		31	24	24	24	103

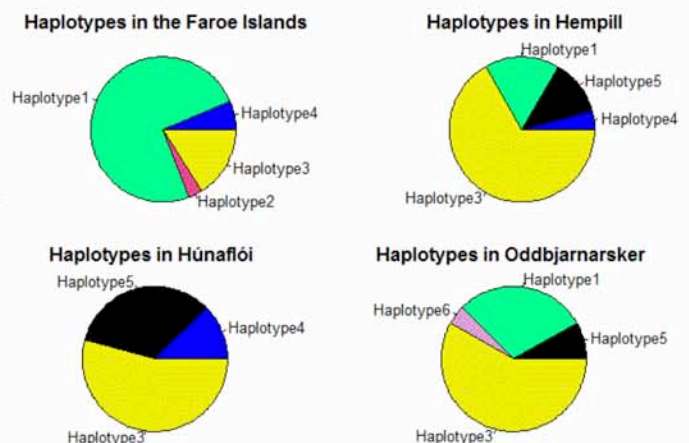


Figure 2. Haplotype frequency at the four sites sampled in the study.

Discussion

The present study shows that some haplotypes are more frequent in Iceland than in the Faroe Islands and two haplotypes that exist in the Icelandic samples are not found in the Faroese sample. This indicates that whelks in Iceland and the Faroe Islands are distinct populations. The next step is to analyse the data further and sequence 16SrRNA in more individuals and also the COI gene in order to further reveal the genetic variability.

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References

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Map of the Faroe Islands: <https://www.cia.gov/library/publications/the-world-factbook/geos/fo.html>
Map of Iceland: www.lmi.is