

## Non-parallel divergence across Danish freshwater and marine three-spined stickleback *Gasterosteus aculeatus* populations - DTU Orbit (09/11/2017)

### Non-parallel divergence across Danish freshwater and marine three-spined stickleback *Gasterosteus aculeatus* populations

This work investigated whether multiple freshwater populations of three-spined stickleback *Gasterosteus aculeatus* in different freshwater catchments in the Jutland Peninsula, Denmark, derived from the same marine populations show repeated adaptive responses. A total of 327 *G. aculeatus* collected at 13 sampling locations were screened for genetic variation using a combination of 70 genes putatively under selection and 26 neutral genes along with a marker linked to the ectodysplasin gene (*eda*), which is strongly correlated with plate armour morphs in the species. A highly significant genetic differentiation was found that was higher among different freshwater samples than between marine–freshwater samples. Tests for selection between marine and freshwater populations showed a very low degree of parallelism and no single nucleotide polymorphism was detected as outlier in all freshwater–marine pairwise comparisons, including the *eda*. This suggests that *G. aculeatus* is not necessarily the prime example of parallel local adaptation suggested in much of the literature and that important exceptions exist (*i.e.* the Jutland Peninsula). While marine populations in the results described here showed a high phenotype–genotype correlation at *eda*, a low association was found for most of the freshwater populations. The most extreme case was found in the freshwater Lake Hald where all low-plated phenotypes were either homozygotes for the allele supposed to be associated with completely plated morphs or heterozygotes, but none were homozygotes for the putative low-plated allele. Re-examination of data from seven *G. aculeatus* studies agrees in showing a high but partial association between phenotype–genotype at *eda* in *G. aculeatus* freshwater populations and that mismatches occur everywhere in the European regions studied (higher in some areas, *i.e.* Denmark). This is independent of the *eda* marker used.

#### General information

State: Published

Organisations: National Institute of Aquatic Resources, Section for Marine Living Resources, Aarhus University, Université Laval

Authors: Pujolar, J. M. (Ekstern), Ferchaud, A. (Ekstern), Bekkevold, D. (Intern), Hansen, M. M. (Ekstern)

Pages: 175-194

Publication date: 2017

Main Research Area: Technical/natural sciences

#### Publication information

Journal: Journal of Fish Biology

Volume: 91

Issue number: 1

ISSN (Print): 0022-1112

Ratings:

BFI (2017): BFI-level 1

Web of Science (2017): Indexed yes

BFI (2016): BFI-level 1

Scopus rating (2016): CiteScore 1.57 SJR 0.741 SNIP 0.882

Web of Science (2016): Indexed yes

BFI (2015): BFI-level 1

Scopus rating (2015): SJR 0.951 SNIP 0.935 CiteScore 1.64

Web of Science (2015): Indexed yes

BFI (2014): BFI-level 1

Scopus rating (2014): SJR 0.944 SNIP 0.934 CiteScore 1.76

Web of Science (2014): Indexed yes

BFI (2013): BFI-level 1

Scopus rating (2013): SJR 1.049 SNIP 1.118 CiteScore 1.98

ISI indexed (2013): ISI indexed yes

Web of Science (2013): Indexed yes

BFI (2012): BFI-level 1

Scopus rating (2012): SJR 0.93 SNIP 1.035 CiteScore 1.88

ISI indexed (2012): ISI indexed yes

Web of Science (2012): Indexed yes

BFI (2011): BFI-level 1

Scopus rating (2011): SJR 0.895 SNIP 0.946 CiteScore 1.66

ISI indexed (2011): ISI indexed yes

Web of Science (2011): Indexed yes

BFI (2010): BFI-level 1  
Scopus rating (2010): SJR 0.774 SNIP 0.834  
Web of Science (2010): Indexed yes  
BFI (2009): BFI-level 1  
Scopus rating (2009): SJR 0.773 SNIP 0.891  
Web of Science (2009): Indexed yes  
BFI (2008): BFI-level 2  
Scopus rating (2008): SJR 0.883 SNIP 0.968  
Web of Science (2008): Indexed yes  
Scopus rating (2007): SJR 0.996 SNIP 1.06  
Web of Science (2007): Indexed yes  
Scopus rating (2006): SJR 0.897 SNIP 1.051  
Web of Science (2006): Indexed yes  
Scopus rating (2005): SJR 0.827 SNIP 0.898  
Web of Science (2005): Indexed yes  
Scopus rating (2004): SJR 0.945 SNIP 1.148  
Web of Science (2004): Indexed yes  
Scopus rating (2003): SJR 0.937 SNIP 1.096  
Web of Science (2003): Indexed yes  
Scopus rating (2002): SJR 0.949 SNIP 1.056  
Web of Science (2002): Indexed yes  
Scopus rating (2001): SJR 0.874 SNIP 1.1  
Web of Science (2001): Indexed yes  
Scopus rating (2000): SJR 0.751 SNIP 0.993  
Web of Science (2000): Indexed yes  
Scopus rating (1999): SJR 1.025 SNIP 1.176  
Original language: English  
Armour plate, Ectodysplasin, Outlier detection, Parallel adaption, Single nuvleotide polymorphisms  
DOIs:  
10.1111/jfb.13336  
Source: FindIt  
Source-ID: 2356901342  
Publication: Research - peer-review › Journal article – Annual report year: 2017