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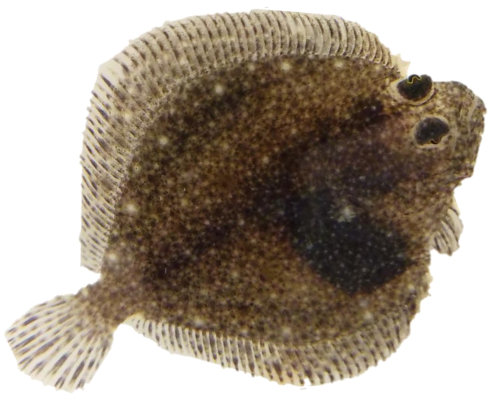
Amphipod meal in formulated diets for juvenile turbot *Psetta maxima*



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Background

Increasing fish meal prices and the depletion of natural fish stock due to fish meal production is driving demand for novel feed ingredients in aquaculture. Marine amphipods are a natural food source for many flatfish species and are rich in essential fatty acids hence strong candidates as fish meal replacement in aquafeeds.

Recent studies showed promising fatty acid profiles and fatty acid synthesis in marine amphipods (Alberts-Hubatsch et al. 2019, Jiménez-Prada et al. 2018, Baeza-Rojano et al. 2014), which could lower the need for fish oil supplementation in finfish feeds.

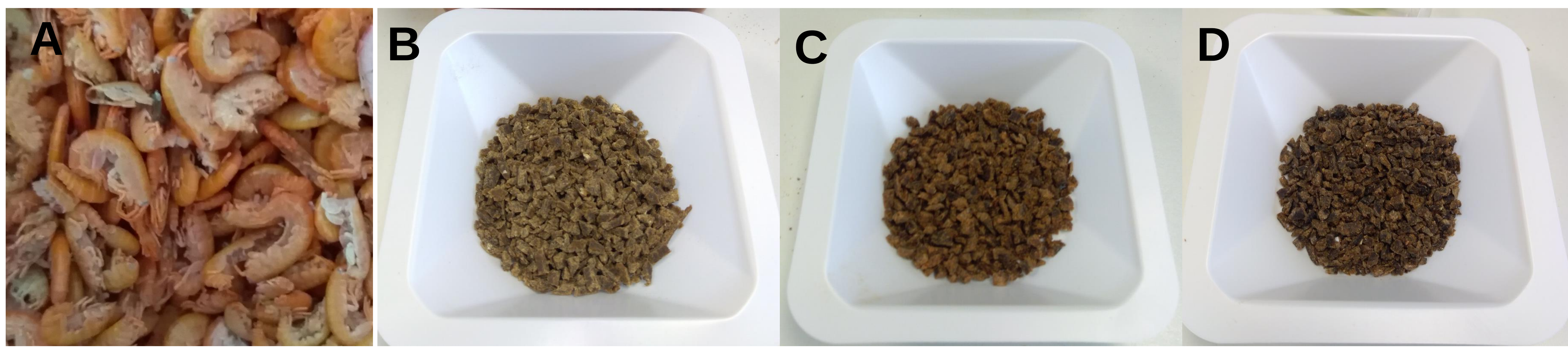
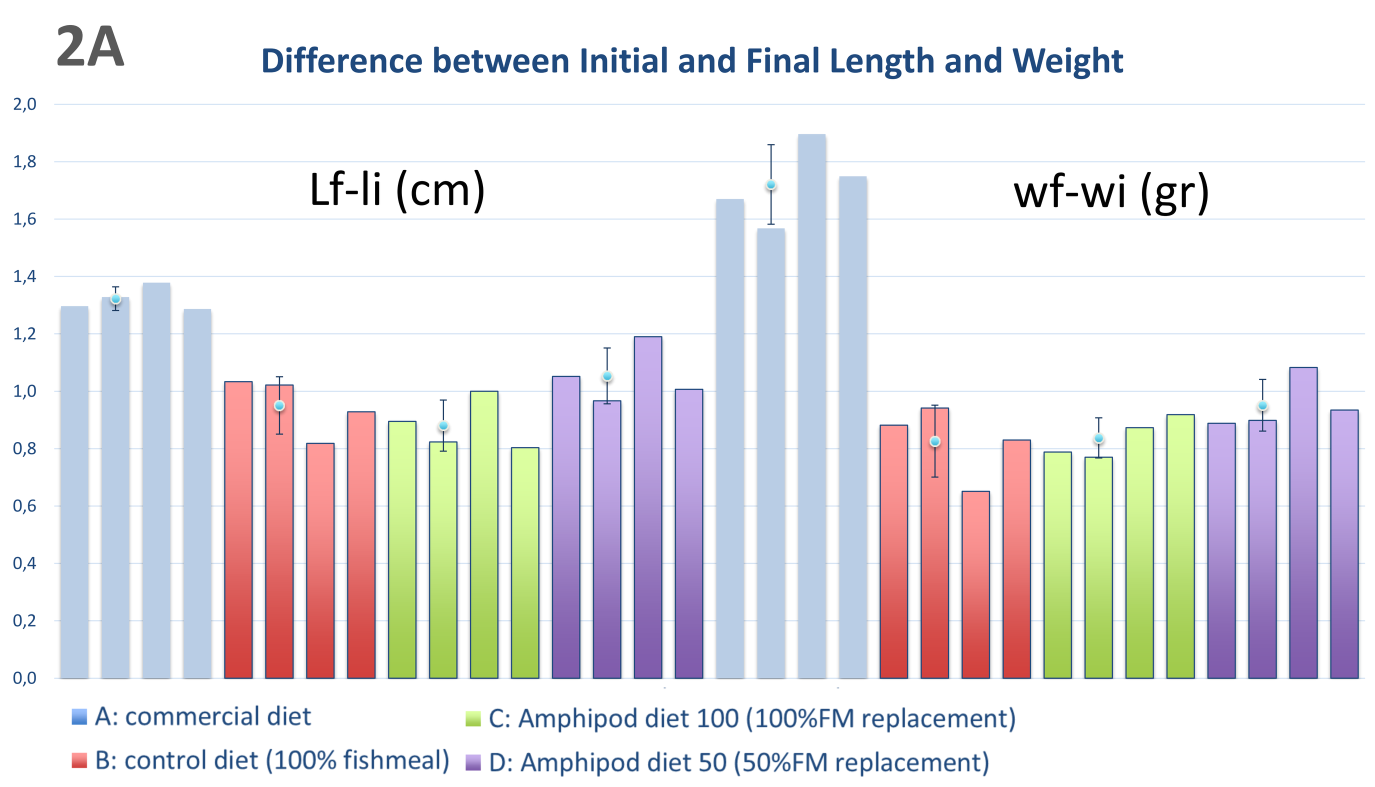


Figure 1: Dried amphipods *Echinogammarus marinus* (A) and formulated diets used for the feeding trial. B=fishmeal diet (100%FM), C=amphipod meal diet (100% AM), D=Fishmeal and amphipod meal 50/50%

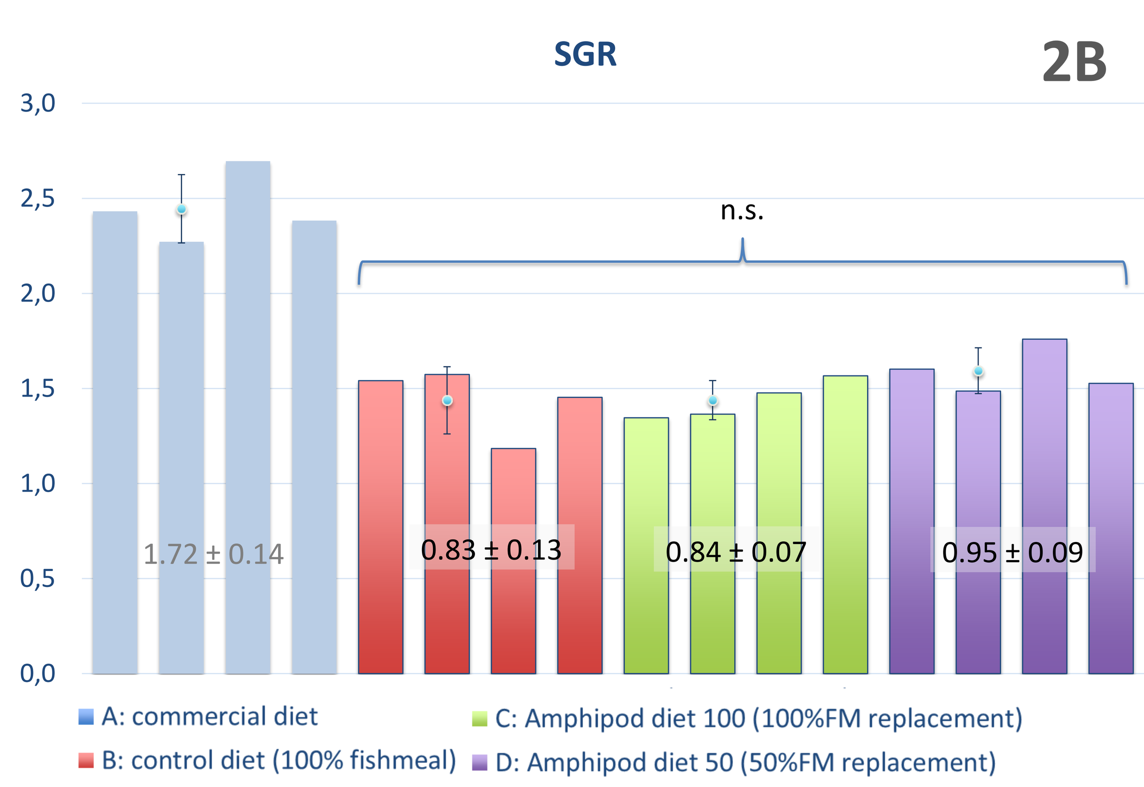
Material and Methods

A 32-day feeding trial was conducted with juvenile turbot (1.43 ± 0.2 g), fed four different diets containing different levels of fish-meal replacement: (A) commercial turbot diet (BioMar Inicio) as reference diet, (B) control diet containing 100% fish meal, (C) diet with 100% Amphipod meal, (D) diet with 50/50% Amphipod/fish meal (Figure 1). Each treatment was performed in four replicates of 20 juvenile turbot. At the end of the experiment, final growth parameters (weight, length) were recorded. Whole body as well as tissue samples of liver and muscle were taken, immediately frozen in liquid nitrogen and stored in -80°C until later analyses (proximate chemical composition, lipid classes and fatty acid profiles, results pending).



Results

Figure 2: Weight and (wf-wi), length (lf-li) gain (2A) and SGR (2B) of juvenile turbot fed four different diets: parameters did not differ between replacement and control diets, but the commercial diet as reference exhibited higher growth rates. However, survival rates did not differ between the treatments with 100% survival.



Conclusions

Replacing fishmeal with 100 or 50% of amphipod meal does not impact growth or survival when tested against an isoenergetic fish-meal based control diet.

Natural feeds can exhibit more natural lipid classes that provide well balanced lipid classes, which often have a better palatability then processed lipid mixtures. Being part of the natural diet of flat fishes (Braber & De Groot 1973), we expect a better bioavailability of lipid classes and respective fatty acids then fish meal diets.

Generally, amphipods constitute a good source of high valued long-chain polyunsaturated fatty acids as well as other nutritional factors such as pigments. Growing interest in these species as feed ingredient in terms nutritional value and suitability as fish and crustacean feed calls for novel culturing and processing methods for amphipods, i.e. gammarids.

References
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