

Assessing bone anabolic properties of marine extracts in fish

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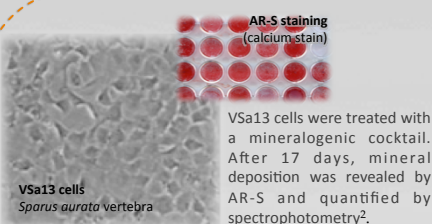
Introduction

Novel bone anabolic compounds are needed to develop a new generation of therapeutics for the successful treatment of diseases characterized by low bone mass, such as osteopenia and osteoporosis but also to improve bone quality in other vertebrates like aquaculture fish species. Marine organisms have long been recognized as valuable sources for bioactive compounds but still remain under-exploited regarding osteoactive molecules¹. In this work, mineralogenic and osteogenic properties of semi-purified fractions prepared from crude extracts of the halophyte *Spartina alterniflora* and 8 strains of cyanobacteria by liquid/liquid extraction were assessed using *in vitro* and *in vivo* fish systems.

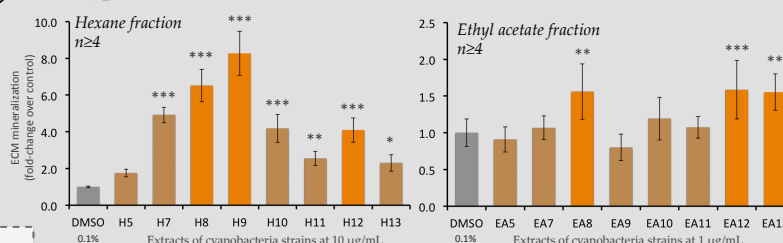
AIM

Evaluate the mineralogenic and osteogenic properties of marine extracts

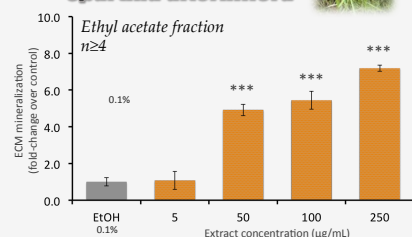
In vitro mineralization



Cyanobacteria



Spartina alterniflora



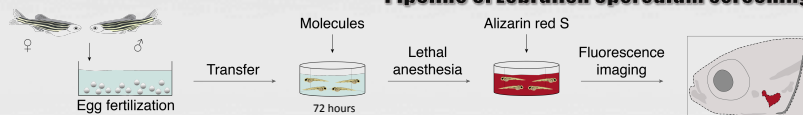
Hexane fraction of cyanobacteria extracts and *S. alterniflora* ethyl acetate fraction have high pro-mineralogenic activities *in vitro*.

STATISTICAL ANALYSIS

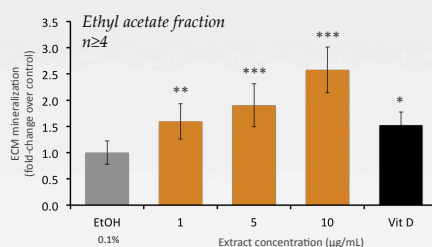
Statistical analysis was performed with Prism 6 (GraphPad). One-way ANOVA followed by Dunnett's multiple comparison test was used (* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$) to compare each extract to the respective control. Vitamin D (0.01 µg/mL) was used as an *in vivo* positive control.

In vivo effect on bone formation

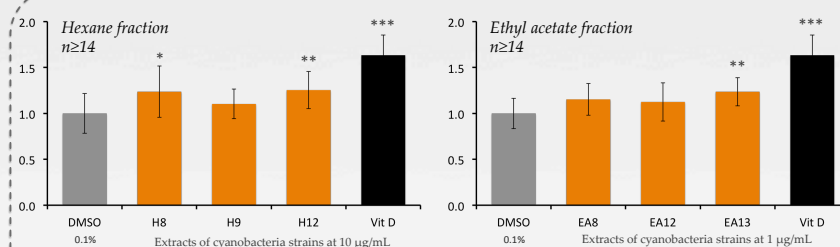
Pipeline of zebrafish operculum screening³



Spartina alterniflora



Cyanobacteria



S. Alterniflora Ethyl acetate fraction significantly increased bone growth up to 2.5 times. Although to a lesser extent, 3 cyanobacteria strain extracts (H8, H12 and EA13) also stimulated the growth of zebrafish opercular bone.

CONCLUSIONS

Marine resources can be a sustainable source of bone anabolic molecules for nutraceutical and/or pharmaceutical applications. Fish systems proved to be suitable to discover these molecules.

Acknowledgments:

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- Tarasco et al. (2017) Comparative Biochemistry and Physiology, Part C 197:45-52.

