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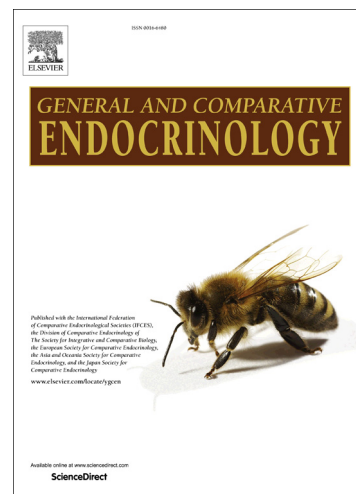
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# **Hormonally active phytochemicals from macroalgae: a largely untapped source of ligands to deorphanize nuclear receptors in emerging marine animal models**

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## **Abstract**

Hormonally active phytochemicals (HAPs) are signaling molecules produced by plants that alter hormonal signaling in animals, due to consumption or environmental exposure. To date, HAPs have been investigated mainly in terrestrial ecosystems. To gain a full understanding of the origin and evolution of plant-animal interactions, it is necessary also to study these interactions in the marine environment, where the major photosynthetic lineages are very distant from the terrestrial plants. Here we focus on chemicals from red and brown macroalgae and point out their potential role as modulators of the endocrine system of aquatic animals through nuclear hormone receptors. We show that, regarding steroids and oxylipins, there are already some candidates available for further functional investigations of ligand-receptor interactions. Furthermore, several carotenoids, produced by cyanobacteria provide candidates that could be investigated with respect to their presence in macroalgae. Finally, regarding halogenated compounds, it is not clear yet which molecules could bridge the gap to explain the transition from lipid sensing to thyroid hormone high affinity binding among nuclear receptors.

**Keywords:** hormonally active phytochemicals; macroalgae; ligands; nuclear receptors

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