

Initial screening of bioactive secondary metabolites *D. menziesii*

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Abstract

Phytochemical screening a drug discovery resource for the detection of molecules with biological activity.

Introduction

Antarctic macroalgae have a different metabolism compared to other, with a capacity to adapt in extreme cold environments. As a result, the Antarctic macroalgae have become the focus of studies for new molecules.¹

The brown algae belong to the phylum Ochrophytae, reaching over 25 m and forming kelps.² Are found in the seas of the cold and temperate regions polar, synthesizing low molecular weight substances such as mannitol, glycerol and sucrose, which are structures with cryoprotectant and osmotic stabilizing functions. Consist of violaxanthin, chlorophyll a, c1, c2, β -carotene and fucoxanthin, which is the responsible for brown pigmentation feature of this phylum.³

An important process for the detection of molecules with biological activity is the initial phytochemical screening, which can trigger drug discovery.⁴ This study aims to detect the main secondary metabolites of brown macroalgae Antarctic *Desmarestia menziesii*.

Results and Discussion

The macroalgae was collected in King George Island (Punta Hennequin - 11/10/14).

The phytochemical screening was performed by qualitative tests (Table 1) using ethanoic extracts and aqueous from the extraction.

The tests are specific to each class of metabolites in order to detect secondary compounds including alkaloids, flavonoids, steroids, saponins, tannins, cardiac glycosides and phenols using standard method with modification according to Matos, 1997 and Ndan et. al., 2014.

Bioactive metabolites such as saponins have anti-inflammatory, antifungal in complex with ergosterol and hypocholesterolemic form complexes with cholesterol.⁵

Cardiac glycosides are known to lower blood pressure being digitalis,⁶ important drugs in the control of congestive heart failure, tannins have antimicrobial and antiviral effects.

In plant steroids are known for their anti-inflammatory properties, and the alkaloids to exert

analgesic, antispasmodic and antibacterial action activities.⁷

Table 1. Qualitative analysis of bioactive compounds *D. menziesii*.

Kind	Extract EtOH	Extract H ₂ O
Saponins	-	+
Steroids	+++	+
Flavonoids	-	-
Tannins	-	-
Alkaloids	+	-
Cardiac Glycosides	++	-
Phenols	+++	-

Tabela 1: + =Low concentration, ++ = Moderate concentration, +++ = High concentration, - = Absent.

Alkaloids, flavonoids, and other molecules have been reported as allelopathy agents.⁸ The phenols can be found in different forms, in the free form or glycosides, widely distributed, and have high potential for antioxidant to neutralize and scavenge free radicals.⁹

Conclusions

The results proved promising in the search for new drugs, allelopathy studies, food industry and cosmetics. More studies are needed to evaluate, isolate, characterize and elucidate the structures of bioactive compounds.

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¹ Graeve, M.; Kattner, G.; Wiencke, C.; Karsten, U. *Mar Ecol-Prog Ser.* **2002**, 231, 67-74.

² Leal, M.; Calado, R.; Munro, M.; Blunt, J.; Puga, J.; Jesus, B.; Rosa, R.; Madeira, C. *Nat Prod Rep.* **2013**, v. 30, n. 11, 1380-1390.

³ Lourenço, S. O. *RiMa Rio de Janeiro*, **2006**.

⁴ Lopes, G.; Sousa, C.; Bernardo, J.; Andrade, P.; Valentão, P.; Ferreres, F.; Mougá, T. *J. Phycol.* **2011**, V.47, N.5, 1210-1218.

⁵ Vinha, A.F.; Soares, M.O. *J. Med. Plants.* **2012**, 2(4) 335-347.

⁶ Sayyah, M.; Hadidi, N. *J. Ethnopharmacol.* **2004**, 9(2-3): 325-329.

⁷ Savithramma, N.; Linga R.M. *J. Scientific Res.* **2011**, 8(3): 579-584.

⁸ Mungole, A.; Day, S.; Kamble, R.; Kanfode, H.; Chaturvedi, A.; Zanwar, P. *Indian J. Sci. Technol.* **2010**, 6: 679-683.

⁹ <http://www.revistas.unincor.br/index.php/revistaunincor/article/view/1151> [acesso em 29/01/2016 às 17:33].