

New Insights Into Seaweed Polyphenols on Glucose Homeostasis

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ABSTRACT

Context: Polyphenol-rich marine macroalgae are gaining dietary importance due to their influence over diabetes mellitus and the role as a vital source of high-value nutraceuticals. Their assorted beneficial effects on human health include competitive inhibition of digestive enzymes, varying the activity of hepatic glucose-metabolizing enzymes, lowering the plasma glucose levels, and lipid peroxidation, delaying the aging process.

Objective: In this paper, we review the health beneficial effects of polyphenols and phlorotannins from brown seaweeds with special emphasis on their inhibitory effects on carbohydrate-metabolizing enzymes.

Methods: A survey of literature from databases such as Sciencedirect, Scopus, Pubmed, Springerlink, and Google Scholar from the year 1973 to 2013 was done to bring together the information relating to drug discovery from brown seaweeds as a source for diabetes treatment.

Results: Over the past two decades, 20 different bioactive polyphenols/phlorotannins have been isolated and studied from 10 different brown algae. Discussion of the positive effect on the inhibition of enzymes metabolizing carbohydrates in both *in vitro* and *in vivo* experiments are included.

Conclusion: Despite the recent advancements in isolating bioactive compounds from seaweeds with potential health benefit or pharmaceutical behavior, studies on the polyphenol effectiveness on glucose homeostasis in human beings are very few in response to their functional characterization. Added research in this area is required to confirm the close connection of polyphenol rich seaweed-based diet consumption with glucose homeostasis and the exciting possibility of prescribing polyphenols to treat the diabetes pandemic.

KEYWORDS: α -Amylase, α -glucosidase, carbohydrate metabolizing enzymes, diabetes mellitus, macroalgae, phlorotannins, postprandial hyperglycemia

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