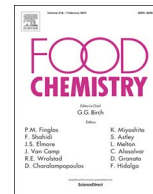




ELSEVIER

Contents lists available at ScienceDirect

# Food Chemistry

journal homepage: [www.elsevier.com/locate/foodchem](http://www.elsevier.com/locate/foodchem)

## Inhibitory effects of edible seaweeds, polyphenolics and alginates on the activities of porcine pancreatic $\alpha$ -amylase



Nazikussabah Zaharudin<sup>a,b,\*</sup>, Armando Asunción Salmeán<sup>c</sup>, Lars Ove Dragsted<sup>a</sup>

<sup>a</sup> Department of Nutrition, Exercise and Sports, Faculty of Science, University of Copenhagen, Copenhagen DK-1958, Denmark

<sup>b</sup> Faculty of Industrial Sciences & Technology, Universiti Malaysia Pahang, 26300 Gambang, Pahang, Malaysia

<sup>c</sup> Department of Plant Glycobiology, Faculty of Science, University of Copenhagen, Copenhagen DK-1871, Denmark

### ARTICLE INFO

#### Keywords:

Seaweed  
Glucose liberation  
 $\alpha$ -Amylase  
Phenolic compound  
Alginate  
Inhibitor  
Hyperglycaemia

### ABSTRACT

Edible seaweeds are valuable because of their organoleptic properties and complex polysaccharide content. A study was conducted to investigate the potential of dried edible seaweed extracts, its potential phenolic compounds and alginates for  $\alpha$ -amylase inhibitory effects. The kinetics of inhibition was assessed in comparison with acarbose. The methanol extract of *Laminaria digitata* and the acetone extract of *Undaria pinnatifida* showed inhibitory activity against  $\alpha$ -amylase,  $IC_{50}$   $0.74 \pm 0.02$  mg/ml and  $0.81 \pm 0.03$  mg/ml, respectively; both showed mixed-type inhibition. Phenolic compound, 2,5-dihydroxybenzoic acid was found to be a potent inhibitor of  $\alpha$ -amylase with an  $IC_{50}$  value of  $0.046 \pm 0.004$  mg/ml. Alginates found in brown seaweeds appeared to be potent inhibitors of  $\alpha$ -amylase activity with an  $IC_{50}$  of  $(0.075 \pm 0.010$ – $0.103 \pm 0.017)$  mg/ml, also a mixed-type inhibition. Overall, the findings provide information that crude extracts of brown edible seaweeds, phenolic compounds and alginates are potent  $\alpha$ -amylase inhibitors, thereby potentially retarding glucose liberation from starches and alleviation of postprandial hyperglycaemia.