

## Biological role of phlorotannis extracted from brown algae and its activity in the diabetic treatment

Mai Abd-Elnaby

Chemistry Department, Faculty of Science, Tanta University, Egypt

■■■

**Background:** Diabetes mellitus is characterized by hyperglycemia, which is associated with failure of various organs. **Aim:** This study aimed to investigate biological activity including the antioxidant, antibacterial and antidiabetic activities of polyphenolic compound "phlorotannis" derived from Egyptian brown seaweed *Cystoseira compressa* and *Sargassum linifolium*. **Materials and Methods:** Phlorotannis were extracted and confirmed by different chemical and physical tests. The seaweed extracts exhibited higher antioxidant properties. Phlorotannis extracts showed antibacterial activity evaluated against species [*Staphylococcus aureus*, *Escherichia coli*, and *Bacillus cereus*]. In in vivo study, fifty white male albino rats were divided into six equal groups. The first three groups of rats are control normal, control *C. compressa* extract and control *S. linifolium* extract groups, the last three groups which are diabetic by intraperitoneal injection of streptozotocin had one diabetic control and diabetic that got 60 mg/kg of *C. compressa* phlorotannis extract and diabetic that got 60 mg/kg of *S. linifolium* after four weeks of diabetes induction. **Results:** Phlorotannis extracts decrease serum glucose,  $\alpha$ -amylase, glucosidase activity and liver malondialdehyde. However, serum insulin, hepatic glutathione and total antioxidant capacity "TAC" were significantly increased compared with diabetic non-treated groups. Also, phlorotannis make activation of AMPK $\alpha$ 2 expression in skeletal muscle in treated group as compared to diabetic group. The histopathological results supported that phlorotannis extracts markedly reduce damage in  $\beta$  cells of pancreas. **Conclusion:** This study confirmed that phlorotannis extract from *C. compressa* and *S. linifolium* algae have the capacity to act as antioxidant and antidiabetic agents. These results point phlorotannins extracts as potential pharmaceutical resources for human health.

**Keywords:** Antidiabetic; Antioxidant; Brown seaweed; Phlorotannis

---

Editor-in-Chief: Prof. M.L. Salem, PhD - Article DOI: 10.21608/JCBR.2021.59486.1131

---