α-Glucosidase- and α-amylase-inhibitory activities of phlorotannins from Eisenia bicyclis.

Eom SH, Lee SH, Yoon NY, Jung WK, Jeon YJ, Kim SK, Lee MS, Kim YM.

Abstract

BACKGROUND:

In an effort to develop alternative therapeutic agents, strong inhibitory activity against α-glucosidase and α-amylase was detected in Eisenia bicyclis methanolic extract.

RESULTS:

In this study, two phlorotannins were isolated from E. bicyclis and characterised by chromatography and nuclear magnetic resonance. The active substances were identified as fucofuroeckol A (FF) and dioxinodehydroeckol (DD). To the authors’ knowledge, this is the first report of the identification of these substances in E. bicyclis. However, to date, no antidiabetic activity of FF and DD has been reported. Both phlorotannins demonstrated significant inhibitory activity against α-glucosidase and α-amylase. FF showed potent antidiabetic activity, with IC(50) values of 131.34 nmol L(-1) against α-glucosidase and 42.91 µmol L(-1) against α-amylase. The corresponding IC(50) values of DD were 93.33 nmol L(-1) and 472.7 µmol L(-1) . Furthermore, kinetic analysis revealed that FF and DD exhibited non-competitive inhibitory activity against α-glucosidase.

CONCLUSION:

These results suggest that FF and DD may be candidates for the development of an antidiabetic pharmaceutical agent or food additive.