



α -Glucosidase and α -amylase inhibitory potential of main compounds and drug candidates from *Elaeagnus rhamnoides* (L.) A. Nelson

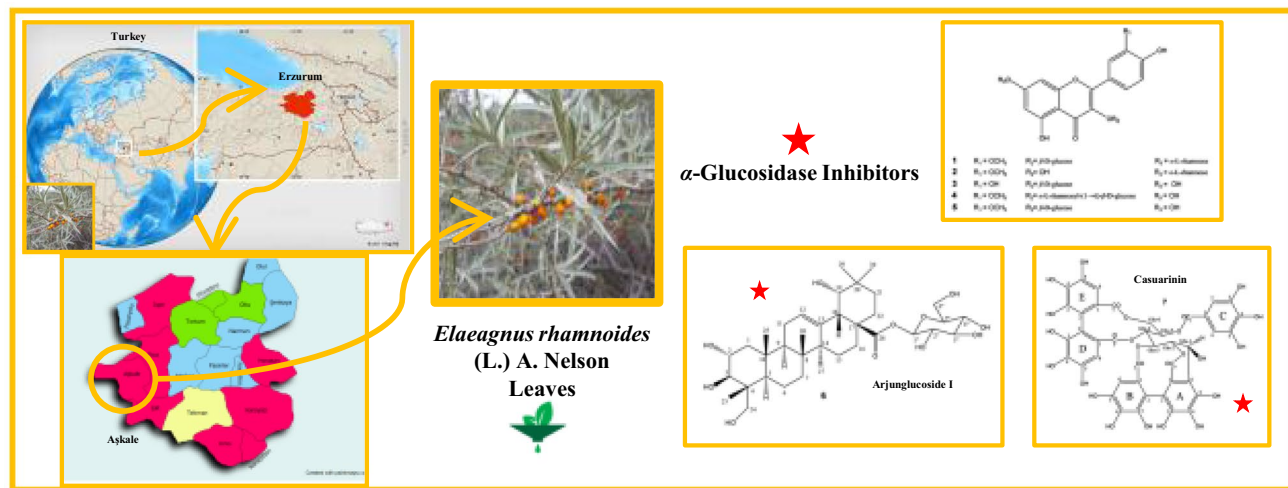
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Abstract

Elaeagnus rhamnoides (L.) A. Nelson (synonym: *Hippophae rhamnoides*) (Elaeagnaceae) is an important plant with multiple usages. The current study was laid on discovering the phytochemical profiling of *E. rhamnoides* leaves through antihyperglycemic and antioxidant effects. The ethyl acetate ($IC_{50} = 46.89 \pm 2.18 \mu\text{g/mL}$) and *n*-butanol extracts ($IC_{50} = 51.33 \pm 2.53 \mu\text{g/mL}$) possessed potent inhibitory activity against α -glucosidase enzyme as compared with standard compound, acarbose ($IC_{50} = 4212.62 \pm 130.00 \mu\text{g/mL}$). Seven compounds were isolated, and their structure was determined by 1D- and 2D-NMR. Isorhamnetin-3-*O*- β -D-glucopyranosyl-7-*O*- α -L-rhamnopyranoside (**1**), isorhamnetin-7-*O*- α -L-rhamnopyranoside (**2**), isorhamnetin (**3**), narcissin (**4**), isorhamnetin-3-*O*- β -D-glucopyranoside (**5**), arjunglucoside I (**6**), and casuarinin (**7**) were isolated from *n*-butanol extract. All isolated compounds, especially arjunglucoside I ($IC_{50} = 1074 \pm 32 \mu\text{M}$) and casuarinin ($IC_{50} = 21 \pm 2 \mu\text{M}$), showed higher α -glucosidase inhibitory activity than acarbose ($IC_{50} = 6561 \pm 207 \mu\text{M}$). Casuarinin displayed powerful scavenging activity against to both ABTS radical with $2 \pm 1 \mu\text{M}$ IC_{50} value and DPPH radical with $14 \pm 1 \mu\text{M}$ IC_{50} value while IC_{50} values of trolox and α -tocopherol were 31 ± 1 and $50 \pm 1 \mu\text{M}$ against ABTS radical, and 67 ± 2 and $95 \pm 3 \mu\text{M}$ against DPPH radical, respectively. Arjunglucoside I was isolated for first time from this species and Elaeagnaceae family. Preparations prepared from *E. rhamnoides* leaf extracts standardized via casuarinin and arjunglucoside I could be potential phytotherapeutics for diabetes mellitus.

Graphic abstract



Keywords *Elaeagnus rhamnoides* · Elaeagnaceae · α -Glucosidase inhibition · Antioxidant activity · Arjunglucoside I · Casuarinin

Extended author information available on the last page of the article