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# Dual amylase/glucosidase inhibition, antilipolytic and antiproliferative potential of the aerial parts of *Pistacia atlantica*, *Pistacia lentiscus* and *Pistacia terebinthus* on a obesity related-colorectal cancer cell line panel

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## Abstract

*Pistacia* species (*P. spp*) have been used as a treatment for various diseases, including diabetes and inflammation. This study aimed to identify the main components of flavonoids in *Pistacia* species and evaluate the effect of aqueous extracts of *P. spp* on pancreatic enzymes and on cancer cells

associated with obesity in colon and rectum. HPLC was used to identify the major components of flavonoids. The potent inhibitory effect of Pistacia species against pancreatic  $\alpha$ -amylase,  $\alpha$ -glucosidase and lipase was examined. The antiproliferative efficacy of the plant extract against several colorectal cancer cell lines were then measured. The main flavonoids component found in Pistacia species are quercetin-3- $\beta$ -D-glucoside, rutin, kaempferol and vitexin. The starch blockade  $IC_{50}$  ( $\mu$ g/mL) of Pistacia species in a descending order were: *P. lentiscus* leaves:  $1.09 \pm 0.01$ ; *P. atlantica* leaves:  $0.96 \pm 0.09$  and *P. atlantica* fruits:  $0.48 \pm 0.02$ . Pistacia species exerted promising inhibition effect for pancreatic lipase (PL). Besides the aglycones of *P. atlantica* leaves, all the tested aqueous extracts exerted appreciably novel antiproliferative activity against the tested colorectal cancer cell lines. This study provides useful indication for the Pistacia species as a potential novel therapeutic agent against diabetes and cancer. © 2023 Author(s).

## Author keywords

acarbose; orlistat; Pancreatic lipase;  $\alpha$ -amylase;  $\alpha$ -glucosidase

## Indexed keywords

### EMTREE drug terms

aglycone; alpha amylase pancreas isoenzyme; alpha glucosidase; amylase; flavonoid; glucosidase; kaempferol; Pistacia atlantica extract; Pistacia lentiscus extract; Pistacia terebinthus extract; plant extract; quercetin 3 beta dextro glucoside; rutoside; starch; triacylglycerol lipase; unclassified drug; vitexin

### EMTREE medical terms

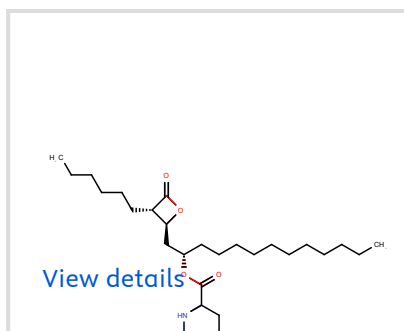
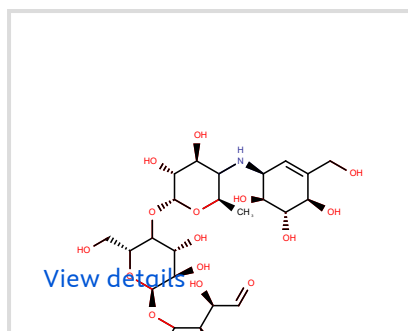
aerial plant part; antilipolytic activity; antiproliferative activity; Article; colorectal cancer; colorectal cancer cell line; controlled study; cytotoxicity; digestion; drug activity; elution; enzyme inhibition; fruit; high performance liquid chromatography;  $IC_{50}$ ; in vitro study; nonhuman; obesity; Pistacia; Pistacia atlantica; Pistacia lentiscus; Pistacia terebinthus; plant leaf; retention time

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|                           |                                 |
|---------------------------|---------------------------------|
| alpha glucosidase         | 9001-42-7                       |
| amylase                   | 9000-90-2, 9000-92-4, 9001-19-8 |
| glucosidase               | 9033-06-1                       |
| kaempferol                | 520-18-3                        |
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