

**Phytochemistry:
Ibuprofen-like activity in extra-virgin olive oil**

**Enzymes in an inflammation pathway are inhibited by
oleocanthal, a component of olive oil**

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FROM ABSTRACT

Newly pressed extra-virgin olive oil contains oleocanthal — a compound whose pungency induces a strong stinging sensation in the throat, not unlike that caused by solutions of the non-steroidal anti-inflammatory drug ibuprofen.

We show here that this similar perception seems to be an indicator of a shared pharmacological activity, with oleocanthal acting as a natural anti-inflammatory compound that has a potency and profile strikingly similar to that of ibuprofen.

Although structurally dissimilar, both these molecules inhibit the same cyclooxygenase enzymes in the prostaglandin-biosynthesis pathway.

THESE AUTHORS ALSO NOTE:

The agent in extra-virgin olive oil responsible for throat irritation is thought to be oleocanthal, with oleo- for olive, -canth- for sting, and -al for aldehydes.

These authors isolated oleocanthal from different premium olive oils and measured its intensity as a throat irritant. They found that irritation intensity was positively correlated with oleocanthal concentration.

These authors tested whether oleocanthal might mimic the pharmacological effects of ibuprofen, a potent modulator of inflammation and analgesia.

Ibuprofen is a inhibitor of the cyclooxygenase enzymes COX-1 and COX-2, "which catalyse steps in the biochemical inflammation pathways derived from arachidonic acid."

We found that, like ibuprofen, oleocanthal caused dose-dependent inhibition of COX-1 and COX-2 activities.

"Our findings raise the possibility that long-term consumption of oleocanthal may help to protect against some diseases by virtue of its ibuprofen-like COX-inhibiting activity."

"If 50 g of extra-virgin olive oil containing up to 200 g per ml oleocanthal is ingested per day, of which 60-90% is absorbed, then this corresponds to an intake of up to 9 mg [of oleocanthal] per day."

"This dose is relatively low, corresponding to about 10% of the ibuprofen dosage recommended for adult pain relief, but it is known that regular low doses of aspirin, another COX inhibitor, confer cardiovascular health benefits."

A Mediterranean diet, which is rich in olive oil, confers various health benefits, including a reduction in the risk of developing some cancer, of platelet aggregation in the blood, and reduced incidence of Alzheimer's disease. "Our discovery of COX-inhibitory activity in a component of olive oil offers a possible mechanistic explanation for this link."

KEY POINTS FROM DAN MURPHY:

- 1) Newly pressed extra-virgin olive oil contains a chemical called oleocanthal.
- 2) Ibuprofen is an inhibitor of the cyclooxygenase enzymes COX-1 and COX-2, which catalyse steps in the biochemical inflammation pathways derived from arachidonic acid to pro-inflammatory prostaglandins [PGE₂].
- 3) Oleocanthal, like ibuprofen, caused dose-dependent inhibition of COX-1 and COX-2 activities with reduced pro-inflammatory prostaglandin-biosynthesis [PGE₂].
- 4) Long-term consumption of extra-virgin olive oil that contains oleocanthal may protect against some diseases by virtue of its COX-inhibiting activity, including a reduction in the risk of developing some cancer, increased cardiovascular health, reduction of platelet aggregation in the blood, and reduced incidence of Alzheimer's disease.
- 5) Oleocanthal in extra-virgin olive oil may be responsible for the various health benefits Mediterranean diet.