



Monell Chemical Senses Center

Press Release

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Olive oil contains natural anti-inflammatory agent ***Throaty sting provides new clues to health benefits of Mediterranean diet***

PHILADELPHIA (August 31, 2005) – A naturally occurring chemical found in extra-virgin olive oils is a non-steroidal anti-inflammatory agent, report scientists from the Monell Chemical Senses Center and collaborators at the University of Pennsylvania, The University of the Sciences in Philadelphia, and Firmenich, Inc.

Named *oleocanthal* by the researchers, the compound inhibits activity of cyclooxygenase (COX) enzymes, a pharmacological action shared by ibuprofen.

The finding is significant because inflammation increasingly is believed to play a key role in a variety of chronic diseases. “Some of the health–related effects of the Mediterranean diet may be due to the natural anti-COX activity of oleocanthal from premium olive oils,” observes Monell biologist Gary Beauchamp, PhD.

The findings are described in the September 1 issue of the journal Nature.

The scientists were led to the discovery by the serendipitous observation that fresh extra-virgin olive oil irritates the back of the throat in a unique and unusual manner. “I had considerable experience swallowing and being stung in the throat by ibuprofen from previous studies on its sensory properties,” explains Beauchamp. “So when I tasted newly-pressed olive oil while attending a meeting on molecular gastronomy in Sicily, I was startled to notice that the throat sensations were virtually identical.”

Taking their lead from the cues provided by olive oil’s throaty bite, the scientists systematically evaluated the sensory properties of an unnamed chemical compound thought to be responsible for the throat irritating property of premium olive oils. When results confirmed that the irritating intensity of a given extra-virgin olive oil was directly related to how much of the chemical it contained, the researchers named the compound *oleocanthal* (oleo=olive; canth=sting; al=aldehyde).

To rule out the possibility that any other compound was involved, chemists at Monell and Penn created a synthetic form of oleocanthal identical in all respects to that found naturally in olive oil, and showed that it produced exactly the same throat irritation. Co-author Amos Smith, PhD, explains, “Only by *de novo* synthesis could we be absolutely certain that the active ingredient was oleocanthal.”

The sensory similarities between oleocanthal and ibuprofen led scientists at Monell and the University of the Sciences to investigate potential common pharmacological properties. Studies revealed that, like ibuprofen, oleocanthal inhibits activity of COX-1 and COX-2 enzymes.

Because inhibition of COX activity underlies the anti-inflammatory actions of ibuprofen and other non-steroidal anti-inflammatory drugs (NSAIDs), the new findings suggest oleocanthal is a natural anti-inflammatory agent.

Monell sensory scientist Paul Breslin, PhD, who directed the research together with Beauchamp remarks, "The Mediterranean diet, of which olive oil is a central component, has long been associated with numerous health benefits, including decreased risk of stroke, heart disease, breast cancer, lung cancer, and some dementias. Similar benefits are associated with certain NSAIDs, such as aspirin and ibuprofen. Now that we know of oleocanthal's anti-inflammatory properties, it seems plausible that oleocanthal plays a causal role in the health benefits associated with diets where olive oil is the principal source of fat."

Beauchamp said future research will aim to identify how oleocanthal inhibits COX enzymes and how this is related to throat sting.

According to Breslin, "This study is the first to make the case for pharmacological activity based on irritation and furthers the idea originally proposed decades ago by Fischer that a compound's orosensory qualities might reflect its pharmacological potency."

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The Monell Chemical Senses Center is a nonprofit basic research institute based in Philadelphia, Pennsylvania. For 35 years, Monell has been the nation's leading research center focused on understanding the senses of smell, taste and chemical irritation: how they function and affect lives from before birth through old age. Using a multidisciplinary approach, scientists collaborate in the areas of: sensation and perception, neuroscience and molecular biology, environmental and occupational health, nutrition and appetite, health and well being, and chemical ecology and communication. For more information about Monell, please visit www.monell.org.

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