AUTHOR COMMENTARIES - 2009

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Lorenzo Cerretani

Featured Scientist Interview

According to a recent analysis of Essential Science Indicators℠ *from Thomson Reuters data, the work of Dr. Lorenzo Cerretani has entered the top 1% in the field of Agricultural Sciences. His citation record in this field includes 33 papers cited a total of 239 times between January 1, 1999 and June 30, 2009. Some of his papers appear in the field of Chemistry as well.*

Dr. Cerretani is a researcher in the Department of Food Science at the University of Bologna at Campus of Food Science in Cesena, Italy. Below, he talks with ScienceWatch.com *about his highly cited research.*

SW: The bulk of your research concerns olive oil—what drew your interest to this field?

Correct. Some 85% of my published papers are on olive oil. My interest in this field is related to several events. I was born in Loreto Aprutino, a beautiful village situated in the center of Italy encircled by olive orchards, where just about everyone produces virgin olive oil. My family still produces and bottles olive oil.

During my studies in Food Science and Technology at the University of Bologna, I had the chance to meet the research group coordinated by Professor Giovanni Lercker, where Dr. Tullia Gallina Toschi and Dr. Alessandra Bendini also work, with whom I worked closely during my Ph.D. thesis and postdoctoral studies. During my initial studies, I also spent several months at Spanish universities looking at olive oil chemistry and composition, collaborating with different research groups at the University of Castilla La Mancha with Professors Giuseppe Fregapane and Amparo Salvador, at the University of Granada with Professors Alberto Fernández-Gutiérrez and Antonio Segura-Carretero and at the University of Valencia with Professor Ernesto F. Simó-Alfonso.

At present, most of my research is on olive oil, and it is even a hobby for me. In fact, I'm a professional olive oil taster and panel leader; I am often a judge for national and international olive oil contests.

SW: From the sound of it, olive oil is a complex as wine—would you agree?

Yes, it is true. Olive oil, and more correctly virgin olive oil, is a very complex matrix constituted mainly of triglycerides (>98%), although minor components are the most interesting. This fraction contains some molecules (i.e. phenolic compounds, tocopherols, and squalene) that are interesting in terms of their potential protective role against some

diseases. Different from wine, virgin olive oils can be consumed even after cooking, which leads to changes in the chemical composition of oils and in the sensory and chemical characteristics of foods. For this reason, we have recently studied, in collaboration with Dr. Maria Theresa Rodriguez-Estrada (of my department), Dr. Emma Chiavaro, and Prof. Elena Vittadini (of the University of Parma), the effects of thermal treatment on olive oil composition, the results of which were recently published:

Cerretani L, Bendini A, Rodriguez-Estrada MT, Vittadini E, Chiavaro E, "Microwave heating of different commercial categories of olive oil: Part I. Effect on chemical oxidative stability indices and phenolic compounds," *Food Chemistry* 115 (4): 1381-8, 2009.

Chiavaro E, Barnaba C, Vittadini E, Rodriguez-Estrada MT, Cerretani L, Bendini A, "Microwave heating of different commercial categories of olive oil: Part II. Effect on thermal properties," *Food Chemistry* 115 (4): 1393-1400, 2009.

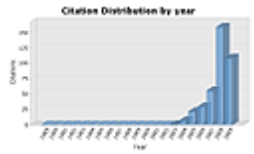
Figure 1 [+] details

Some members of our research team...

Figure 2 [+] details

Lorenzo Cerretani...

Figure 3 [+] details



This graph shows...

SW: What is your specific focus within olive oil research?

Currently, the main focus of my research is phenolic compounds in virgin olive oils. In particular, thanks to interdisciplinary collaborations, we have studied the effects of agronomical differences (in collaboration with Dr. Olfa Baccouri of the Centre de Biotechnologie de Borj-Cédria at Hammam-Lif, Tunisia) and technological processing on phenol content in virgin olive oil.

Moreover, we set up methods for analysis of these compounds in collaboration with the University of Granada for separative techniques, and with the University of Teramo (Prof. Angelo Cichelli and Dr. Michele del Carlo) for rapid electrochemical evaluation. Most recently, we are also interested in establishing methods for detection of olive oils fraudulently sold as extra virgin olive oils. We have used both traditional and rapid spectroscopic methods, and have collaborated with Dr. Ruben Maggio of the University of Rosario in Argentina.

SW: What are the most challenging aspects of your work? The most rewarding?

The main spur is represented by the practical application of our research, which shows that research can indeed contribute to the growth of knowledge for the benefit of society. Quite honestly, the most rewarding aspects are obtaining research results, publishing them and receiving international acknowledgement. In fact, I am only 33 years old, and do not yet have a permanent position in the university—the future for young researchers in Italy is very hard. Unfortunately, the results recognized by this interview are of little relevance for a staff position in Italian universities.

SW: Where do you plan to take this research in the future?

The next step of our research will be the study of the interaction of antioxidant compounds to oxidative stability in virgin olive oils during storage, and to set up a treatment process for extending shelf-life. We have recently obtained an Italian patent for this kind of treatment before oil bottling. In addition, I think that the knowledge acquired over the years on antioxidant compounds in virgin olive oils will be useful for other sectors of agricultural and food sciences, such as emulsified systems.

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Lorenzo Cerretani's current most-cited paper in *Essential Science Indicators*, with 45 cites:

Carrasco-Pancorbo A, *et al.*, "Evaluation of the antioxidant capacity of individual phenolic compounds in virgin olive oil," *J. Agr. Food Chem.* 53(23): 8918-25, 16 November 2005. Source: *Essential Science Indicators* from Thomson Reuters.

Additional Information:

Read an interview with coauthor Alessandra Bendini regarding this paper.

KEYWORDS: VIRGIN OLIVE OIL, PHENOLIC COMPOUNDS, TOCOPHEROLS, SQUALENE, TRIGLYCERIDES, CHEMICAL COMPOSITION, THERMAL TREATMENT, AGRONOMICAL DIFFERENCES, TECHNOLOGICAL PROCESSING, SEPARATIVE TECHNIQUES, SPECTROSCOPIC METHODS, ANTIOXIDANT COMPOUNDS, OXIDATIVE STABILITY, BOTTLING, SHELF-LIFE.

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