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TRACKING TRENDS & PERFORMANCE IN BASIC RESEARCH

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2010 : April 2010 - Emerging Research Fronts : Jeng-Leun Mau and Colleagues on Antioxidant Properties in Three Tasty Mycelia

EMERGING RESEARCH FRONTS - 2010

April 2010

Jeng-Leun Mau, Chieh-No Chang, Shih-Jeng Huang, & Chin-Chu Chen talk with *ScienceWatch.com* and answer a few questions about this month's Emerging Research Front Paper in the field of Agricultural Sciences.



Lead author Jeng-Leun Mau

Article: Antioxidant properties of methanolic extracts from *Grifola frondosa*, *Morchella esculenta* and *Termitomyces albuminosus* mycelia

Authors: **Mau, JL;Chang, CN;Huang, SJ;Chen, CC**

Journal: **FOOD CHEM, 87 (1): 111-118 AUG 2004**

Addresses: **Natl Chung Hsing Univ, Dept Food Sci, 250 Kuokuang Rd, Taichung 40227, Taiwan.**

Natl Chung Hsing Univ, Dept Food Sci, Taichung 40227, Taiwan.

Grape King Inc, Ctr Biotechnol, Chungli 320, Taiwan.

SW: Why do you think your paper is highly cited?

It may be due to the following reasons:

1. Maitake, morel, and termite mushrooms are three palatable mushrooms well-known in the world. However, these fruiting bodies are rare and difficult to cultivate in mass-production.
2. As an alternative or substitute, three mycelia are isolated from their fruiting bodies and mass-produced from submerged fermentation, mainly for the formulation of nutraceuticals and functional foods.
3. Our studies demonstrated that these mushroom mycelia have good antioxidant properties in addition to their delicious taste.
4. The effective concentration of each antioxidant attribute assayed is available for comparison.

SW: Does it describe a new discovery, methodology, or synthesis of knowledge?

Our paper describes the valuable antioxidant properties of three tasty mycelia and examines the implication that hundreds of other mushrooms—including fruiting bodies and mycelia—may possess better antioxidant properties than these three mycelia, especially some which are regarded as medicinal mushrooms.

SW: Would you summarize the significance of your paper in layman's terms?

Mushrooms possess all four functionalities of foods, which include nutritional values, tasty properties, physiological effects, and cultural characteristics.

Nowadays, due to an increased awareness of health issues, the physiological functionality of mushrooms has been studied extensively, including their antioxidant properties. Our paper provides information about these three mycelia as possible protective agents in human diets which can help to reduce oxidative damage.

SW: How did you become involved in this research and were any particular problems encountered along the way?

Jeng-Leun Mau: I have worked on mushrooms since my doctoral studies at Penn State University in University Park, Pennsylvania—considered to be the homeland of *Agaricus* mushrooms.

For more than 20 years, our research team had expanded studies from *Agaricus* mushrooms to all kinds of commercial and medicinal mushrooms, examining the cultivation of fruiting bodies to the submerged and solid-state fermentation of mycelia.

We evaluated flavor, taste components, polysaccharides, physiological components, and various functional properties, which included antioxidant properties.

Mushrooms consist of all kinds of different higher fungi. However, some people always think that mushrooms belong to only one species—the common mushroom. This point of view really makes research funding and publication difficult to obtain. For example, the research we described in this paper was not financially supported.

SW: Where do you see your research leading in the future?

Many functional components such as vitamin D, gamma-aminobutyric acid, monacolin K, ergothioneine, and other active components are present in mushrooms. Their content in mushrooms and their physiological effects are areas of investigation.

Besides, incorporating fruiting bodies or mycelia into various food products such as breads and noodles is also a practical way to extend and broaden their consumption and provide their beneficial health effects. We will focus our short-term efforts in these areas.

SW: Do you foresee any social or political implications for your research?

Our research and the research of others in the field will help people to realize that it is beneficial to



Coauthor Chieh-No Chang



Coauthor Shih-Jeng Huang



Coauthor Chin-Chu Chen

consume both culinary and medicinal mushrooms.

Jeng-Leun Mau, Ph.D.

Distinguished Professor

Department of Food Science and Biotechnology

National Chung Hsing University

Taichung, Taiwan, Republic of China

Chieh-No Chang

General Manager

Max Best International Trade Co.

Taichung, Taiwan, Republic of China

Shih-Jeng Huang, Ph.D.

Assistant Professor

Department of Nutrition and Health Science

Chung Chou Institute of Technology

Yuanlin, Taiwan, Republic of China

Chin-Chu Chen, Ph.D.

Vice President

Biotechnology Center, Grape King Inc.

Chungli, Taiwan, Republic of China

KEYWORDS: Grifola fondosa; Morchella esculenta; Termitomyces albuminosus; antioxidant activity; reducing power; scavenging effect; chelating effect; antioxidant components; MUSHROOMS; AUTOXIDATION.

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