

## PROFESSOR SHU-TING CHANG ON HIS 80<sup>TH</sup> BIRTHDAY

On September 30<sup>th</sup>, 2010, Professor Shu-Ting Chang, S.T. to many of his friends and acquaintances, celebrated his 80<sup>th</sup> birthday. Dr. Chang was born in Yuanping, Shanxi, China, but he is Australian by nationality since 1973. He is married to Judy Li-Ju Chang (nee Lee). Their children are: David Ming-Tsan, Barbara Ming-Wai, Judy Ming-Sze, Ernest Ming-Cheng, and Jennifer Ming-Jing. They have 11 grandchildren.

Professor Chang's name occupies a prominent place in the world of mycology because of his outstanding input into the field of mushroom biology, mushroom cultivation, and medicinal mushrooms. Chang's wide circle of interests, his clarity of scientific vision, his enormous energy, his enthusiasm and honesty are just a few of his many great personal attributes.

Professor Chang graduated from the National Taiwan University and received a B.S. degree in 1953. He received his MS. from the University of Wisconsin, USA, in 1958. He stayed on at the University of Wisconsin to pursue his Ph.D., which he received in 1960. After receiving his Ph.D., Professor Chang started his professional career at the Chinese University of Hong Kong (CUHK). He began as an assistant lecturer in biology and worked his way up to an Emeritus Professor. All throughout his scientific career, over a span of 45 years, he has been connected to CUHK in one way or another. He also influenced administrative changes in the Department of Biology at CUHK. For 11 years (from 1983-1994) he served as Chairman of the Department of Biology. From 1974-1977 he was the Dean of the Faculty of Science. From 1979 to 1981 he served as the Director of the Office of Student Affairs. From 1975 to 1985 he was the Director of Research Laboratory for Food Protein Production. In 1983 until 1994 he was Director of the Marine Science Laboratory. In 1985 he became the Director of the Institute of Science and Technology until 1992. In 1980 he was the Head of the Division of Biology in the Graduate School. From 1983 through 1994 he was Chairman of the Board of Studies in Biology. Dr. Chang became Chairman of the Science Center Management Committee, which he served on for three years. In 1991 he worked as Director of the Chinese Medicinal Material Research Center for one year. In 1993 until 1995 he became Chairman of the Science Engineering Complex Management Committee.

Since 1960 Professor Chang's main field of research has been mushroom biology, mushroom technology for cultivation, and mushroom biotechnology for tonic and medicinal products. The main philosophy and drive behind this line of research for the past 45 years can be summarized as follows.

Modern technology for human civilization is expanding every day. However, human beings still face, and will continue to face three basic problems capable of causing crises: shortage of food, pollution of the environment, and diminishing quality of human health resulting from a continuously increasing world population. Mushrooms (macrofungi) not only can convert the huge lignocellulosic biomass waste into rich protein food, but can also produce notable nutraceutical/pharmaceutical products that have many health benefits. The most significant aspect of mushroom cultivation is to create pollution free or zero emission environments. In addition, mushroom-based farming and industry could provide employment to the youth and women, particularly in rural areas in less developed countries.

Mushrooms are relatively fast-growing organisms. Some tropical mushrooms can be harvested and consumed within 10 days after spawning. By using different varieties, mushrooms can be cultivated all year round. Professor Chang's main research areas are: (1) the life-cycle of mushrooms using genetic and cytological techniques, (2) improvement of mushroom strains by genetic manipulation including molecular markers and protoplast fusion techniques, (3) nutritive values and medicinal effects of mushrooms, (4) development and improvement of cultivation technology, (5) development of new concepts of mushroom biology, mushroom science (concerned with mushroom production) and mushroom biotechnology (concerned with mushroom products), and (6) introduction and development of the terms and concepts: "what is a mushroom?", "mushroom biology", "mushroom nutraceuticals" and the "non-green revolution" concept. This research has improved the supply of nutritious food for human consumption, the quality of life for humanity, and the condition of polluted environments.

As the result of Professor Chang's 45 years of research on the basic and applied aspects of mushrooms with over 200 scientific papers and 21 books published, the following major contributions have already had and will continue to have an impact at national, regional and global levels. (1) In 1969, cotton wastes from cotton textile industry were used for the first time to grow straw mushrooms (*Volvariella volvacea*) in Hong Kong. (2) Using protoplast techniques to breed high-temperature strains of *Lentinus edodes*. (3) The new disciplines of mushroom biology and mushroom biotechnology was established leading to the First International Conference on Mushroom Biology and Mushroom Products, held at the Chinese University of Hong Kong, 23-26 August 1993, and also leading to the formation of the World Society of Mushroom Biology and Mushroom Products (WSMBMP). (4) Introduction of the term and concept "Mushroom Nutraceuticals" with Professor J.A. Buswell in 1996. (5) Mushroom cultivation and mushroom products were named as the "Non-green Revolution" for the first time, in 1998, due to positive effects of cultivation and development of edible and medicinal mushrooms on equitable economic growth and human welfare. Benefits include use of mushrooms as food, health tonic, medicine, animal feed, fertilizer, for protecting and regenerating the environment, for promoting sustainable development and contributing positively to economic and social conditions.

Professor Chang is an author or co-author of 21 books. Special attention must be drawn to his latest book with Professor P.G. Miles, published in 2004, entitled "Mushrooms: Cultivation, nutritional value, medicinal effect, and environmental impact". This book is an encyclopedia review and emphasizes worldwide trends and developments in mushroom biology from an international perspective and is highly recommended for medicinal mycologists, mushroom growers, botanists, plant pathologists, and professionals and scientists in related fields. Chang's book illustrates that mushroom cultivation has and will continue to have a positive global impact on long-term food nutrition, healthcare, environmental conservation, regeneration, and economic and social change. The value of this book can't be overestimated. The potentially extensive use of this book can be recognized in universities, classroom, laboratories, etc. This book is useful for beginning students through PhD studies and beyond. This book is a real encyclopedia of mushroom biology including cultivation, nutritional value, medicinal value, and environmental impact. To our knowledge, no past or current book comes close to covering all the subjects considered in this book.

Professor Chang is now the Vice-President of the World Society for Mushroom Biology and Mushroom Products. He has served as a member of the Executive Committee of International Society for Mushroom Science (ISMS) from 1996-2004. Professor Chang was also the President of the International Mushroom Society for the Tropics (1981-95), National-Point-of-Contact Representative of Hong Kong for the UNESCO Regional Network of Microbiology in Southeast Asia (1981-93), and Executive Secretary of the Headquarters of the UNESCO Regional Network of Microbiology in Southeast Asia (1984-87). He was elected to be a member of the Executive Board of International Union of Microbiological Societies (IUMS) (1990-94) and a member of the Standing Committee on Membership, Structure and Status of International Council of Scientific Unions (ICSU) (1993-96).

Professor Chang was one of the initiators of our special International Journal of Medicinal Mushrooms. He is and has been an editor of the Journal since its inception in 1999. He has been a critical and proficient reviewer of several articles. He has also been an author himself. During this time he published very important keynote papers in our Journal. They are:

- Global impact of edible and medicinal mushrooms on human welfare in the 21<sup>st</sup> century: non-green revolution (IJMM, 1999, 1, 1-8)
- World production of cultivated edible and medicinal mushrooms in 1997 with emphasis on *Lentinus edodes* (Berk.)Sing. in China (IJMM, 1999, 1, 291-300)
- *Ganoderma lucidum* (Curt.:Fr.)P.Karst. (Aphylllophoromycetidae) – a mushrooming medicinal mushroom (IJMM, 2000, 2, 139-146)
- A 40-year journey through bioconversion of lignocellulosic wastes to mushrooms and dietary supplements (IJMM, 2001, 3, 299-310).
- The world mushroom industry: trends and technological development (IJMM, 2006, 8,

- 297-314).
- The need for scientific validation of culinary-medicinal mushroom products (IJMM, 8, 187-195).
- Development of the culinary-medicinal mushrooms industry in China: past, present, and future (IJMM, 2006, 8:1-17).
- Development of the world mushroom industry: Applied mushroom biology and international mushroom organizations (IJMM, 2008, 10, 195-208).

Since 1977, as an eloquent and prominent speaker, Professor Chang has been associated with agents of the UN, e.g., UNESCO, UNDP/UNOPS, UNU, UNIDO, and FAO as a consultant on mushroom cultivation and mushroom products. Since 2000, Professor Chang has been invited twice by the Commonwealth Secretariat in London to serve as a consultant on mushroom farming in Namibia. He has also been invited to conduct many training workshops/courses on mushroom biology and mushroom biotechnology all over the five continents, most recently in African and Latin American countries, sponsored by UNDP/UNOS. He has also been invited to serve as scientific advisor and Honorary Professor for over 30 research institutes and universities in China.

He has also been honored in receiving the following awards:

- Elected as a Fellow of the World Academy of Arts and Science, Sweden (1989)
- Fellow of the International Institute of Biotechnology, England (1990)
- Fellow of the World Academy of Productivity Science, Sweden (1992)
- International Cooperation Award for Light Industry, China (1990)
- Honorary Life Member of the British Mycological Society (1990)
- Honorary Life Member of the International Society for Mushroom Science, England (1993)
- An Officer of the Most Excellent Order of the British Empire (OBE) in the Queen's Birthday Honours List (1994)
- Recipient of the Magnolia Silver Award from the Shanghai Municipal People's Government (2004)
- Outstanding Researcher Award from World Society for Mushroom Biology and Mushroom Products (2005)
- Fellow of the World Technology Network (WTN), USA, (2005)
- West Lake Friendship Award from Zhejiang Provincial People's Government, China (2008)
- Friendship Award from the Chinese Government, the country's highest award for foreign experts for their contributions to its economic and social development (2009)

The diversity of Chang's research programs, scientific, organizational, and pedagogical activities and his significant achievements in various fields of mycology represent him as a scientist of a wide scope of interests, a brilliant science organizer, a world scientific leader of the school of mushroom biology, whose achievements and accomplishments became incorporated into the world of science.

Professor Chang was the honor President and main organizer of the 5<sup>th</sup> International Medicinal Mushrooms Conference (September, 2009, Nantong, China).

Professor Chang, with his ability to learn languages and his ease in adapting to various cultures, is currently living in Canberra, Australia, with his family. He is an extraordinary, vibrant man in the broadest sense of the word. People are attracted to him like a magnet because of his charm, wit, and erudition. His avocations are traveling, reading, golf, cycling, and walking. From the first encounter with him you sense the warmth of his personality, and his outgoing, unconventional nature. Chang is not only a creative and gifted scientist, but also an intellectual with a broad education. He celebrated his 80<sup>th</sup> birthday at the peak of his creative activity. We, friends, colleagues, collaborators, and students wish him good health, happiness in all his activities, new creative achievements, good fortune, and wisdom.