

PREFACE

Mushroom Biology is a newly described subdiscipline of mycology that deals with the scientific study of mushrooms. Our definition of mushroom is more broad than those definitions in most books of mycology. We define a mushroom as a macrofungus with a distinctive fruiting body which can be either above ground (**epigeous**) or below ground (**hypogeous**). In addition, macrofungi have fruiting bodies large enough to be seen with the naked eye and to be picked up by hand; thus, mushrooms may be ascomycetes or basidiomycetes, edible or non-edible, poisonous or medicinal species, fleshy or non fleshy textured macrofungi. Mushroom Biology differs from Mushroom Science, which is defined as the discipline that is concerned with the principles and practices of mushroom cultivation, in that it includes Mushroom Biotechnology. Mushroom Biotechnology is mainly concerned with mushroom products derived either from fermentation or as extracts from the fruiting body. These products have been reported to have bioactive properties, *e.g.*, enhancement of immunoregulatory systems and antitumor activity. Since intentional cultivation of mushrooms began in China almost 1400 years ago, Mushroom Science, which we view as a subdiscipline of Mushroom Biology, is an ancient discipline.

Today there are scientific research journals devoted to what we just referred to as Mushroom Science: *e.g.*, *The Mushroom Journal* (UK), *Edible Fungi* (Shanghai, China), *Mushroom Research*, (India), *Micologia Neotropical Aplicada* (Mexico), *Edible Fungi of China* (with English abstracts, Kunming, Yunnan Province, China), *de Champignon Cultuur* (Netherlands), *Mushroom Information* (Italy), and *Mushroom News* (USA), as well as articles in mycological and microbiological journals that publish the results of scientific investigations in this field. There have been several advanced treatises published on what we are calling Mushroom Biology: (*e.g.*, *The Biology and Cultivation of Edible Mushrooms*, edited by Chang and Hayes (1978); *Tropical Mushrooms: Biological Nature and Cultivation Methods*, edited by Chang and Quimio (1982); *The Biology and Technology of the Cultivated Mushroom*, edited by Flegg, Spencer and Wood (1985); *Edible Mushrooms and Their Cultivation*, written by Chang and Miles (1989); and *Genetics and Breeding of Edible Mushrooms*, edited by Chang, Buswell, and Miles (1993).

There have been several texts of varying degrees of detail published on general mycology and some of its subdisciplines, such as physiology, biochemistry, and genetics, in which species which produce mushrooms are commonly considered; and there are several books or manuals on mushroom cultivation, but there is no other publication that the authors know about that is devoted solely to the general biological principles of mushrooms, devoid of details intelligible only to the scientific specialist, and that also considers developments in the field.

It is our intent to present Mushroom Biology in a concise manner so that those interested in mushrooms will acquire a basic understanding of the biological processes involved in mushroom growth and development and an insight into the potential development of the discipline and the commercial enterprises, both mushroom production and mushroom products, to which Mushroom Biology contributes. We have attempted to organize the subject in such a way that it can also serve as a textbook to guide students in their study in courses involving mushrooms as well as apprising those interested in any aspect of Mushroom Biology as to the present developments in the field.

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