

Science and Cultivation of Edible and Medicinal Fungi: Mushroom Science XVII
Proceedings of the 17th Congress of the International Society for Mushroom Science, Cape
Town, South Africa, 20-24 May 2008

The ISMS congress has been held since 1951, but it was not until 1976 that the information presented in the congress was compiled in a printed format. Mushroom Science XVII is available on CD-ROM and contains eighty-three full papers, abstracts and posters. The contents is organized into twelve sections: 1) keynote lectures, 2) molecular biology and genetics, 3) breeding and germplasm diversity, 4) compost and composting, 5) casing, 6) cultivation and spawn, 7) pest and diseases, 8) medicinal, pharmaceutical and nutritional aspects, 9) industries, marketing and consumption, 10) by-products and extended uses, 11) grower presentations, and 12) poster presentations.

Keynote lectures highlight the latest findings and biotechnological approaches in mushroom science. Some of the topics addressed in this section refer to the molecular mechanisms involved in mushroom morphogenesis, nutritional values of several species, the innovative production of biopharmaceuticals in mushrooms, food safety, and a review of the past, present and future of the Chinese mushroom industry.

The “molecular biology and genetics” section displays information on molecular markers for isolate identification (*Lentinula edodes*), assessment of genetic diversity of wild and commercial isolates (*Agaricus* spp and *Pleurotus eryngii*), sequencing and expression of genes involved in metabolism, quality and fungal-fungal interactions in mushrooms. Examples of the outcomes contained in “Breeding and germplasm diversity include development of a cold resistant strain of *Volvariella volvacea* and reproductive behavior of *P. pulmonarius*.

“Compost and composting” addresses factors influencing mycelial growth and the use of spectroscopy to measure spawnrun and variability of raw materials. Innovative research on the use of composted municipal food wastes to produce *A. bisporus* and *A. brasiliensis* is also presented. Six manuscripts are included in the “Casing” section: Three are related to the search and evaluation of alternative materials that may be used in combination or as a substitute of the peat-

based casing. New insights of the roles of bacterial populations and the effects of the volatile organic compounds found in the casing are also addressed.

A variety of topics are covered under “Cultivation and spawn”. A review on alternative materials and techniques to produce spawn in small-scale farms and energy-management strategies, crucial in maintaining and increasing profitability of the mushroom industry are presented. An alternative method of grain sterilization (ionizing irradiation) and several aspects of the biology and cultivation of *Lentinus squarrosulus*, *Boletus edulis* and *P. florida* are also mentioned.

The most extensive section of the proceedings is devoted to “pest and diseases” which include fourteen manuscripts. *Trichoderma* spp., *Verticillium fungicola*, *Cladobotrium* spp., and *Mycogone pernicioso* are the subject of research focused on fungicide resistance, disease management and species identification. Control strategies and diagnosis of the newly identified *T. pleurotum* and *T. pleuroticola* affecting *Pleurotus* spp. crops are reviewed. One manuscript presents important correlations between secretion of extracellular enzymes (proteases and chitinases) and pathogenicity of *Pseudomonas* spp. in oyster mushrooms. Two papers relate to studies on movement and detection of mushroom virus X and variations in gene expression between virus-infected mushrooms. One manuscript explores an efficient strategy for biological control of sciarid flies (*Lycoriella mali*) by *Bacillus thuringiensis* and the use of plant extract to reduce incidence of dry bubble disease and phorid flies.

The section on “Medicinal, pharmaceutical and nutritional aspects” include papers on research on antitumor, anticarcinogenic, pro-oxidative and immunostimulatory properties of polysaccharide extracts of several mushroom species.

“Industries, marketing and consumption” contains a broad range of topics such as prediction of optimal storage conditions of white button mushrooms through the use of mathematical models and marketing of a sporeless *P. ostreatus* strain.

The section on “By-products and extended uses” gathers information on utilization of spent substrates for fattening lambs, degradation of crude oil by *Pleurotus* spp. and *L. squarrosulus* and

xylanase production by *Flammulina velutipes*. One paper assesses health risks associated to hydrogen sulfide gas emissions from heaps of stored spent compost.

Presentations for the grower audience report on the application of science to the practical business of mushroom production. It includes papers on the latest climate control systems in order to save energy and improve quality and shelf life of the mushrooms, as well as on the preparation and management of the casing layer. Papers on composting include discussions about pathways in nitrogen metabolism, changes in raw materials such as chicken litter and information on aspects to bear in mind when upgrading a mushroom farm and changing from conventional to bulk composting.

Finally, the CD includes A4 electronic copies of twelve of the posters presented at the Congress of which the topics fit in the previously described categories.

Mushroom Science XVII CD-ROM is a valuable reference material that any scientist, grower or individual interested in the mushroom biology, cultivation and industry must include in their collection.

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