

English summary of papers which appeared in Nippon Kingakukai Kaiho Vol. 39 (1998)

Original paper: Influence of light illumination on water buoyancy of sclerotia of *Sclerotium rolfsii* isolated from water chestnut and other plants, and comparison of inner structures of these sclerotia

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The effect of light illumination on sclerotial buoyancy of 15 strains of *Sclerotium rolfsii* isolated from water chestnut and 27 strains isolated from other host plants and examined. In most strains, sclerotia formed on V-8 agar medium under light exposure tended to float in water, and sclerotia formed in darkness tended to sink. Buoyancy rates of sclerotia varied with exposure time to light during incubation, and in most strains were about 50% or more for 1 h/d illumination, and about 100% for 12 h/d. Microscopic study revealed that the buoyant sclerotia had broader intercellular spaces in sclerotial tissues, and this structural difference was suggested to be an important factor in sclerotial buoyancy.

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Original paper: Culture conditions for commercial production of *Lyophyllum shimeji*

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An ectomycorrhizal fungus, *Lyophyllum shimeji*, was cultivated using commercially available culture instruments, and culture conditions for mass production of this mushroom were determined. The results obtained were: (1) Suitable ratio of barley to saw dust as a basal substrate of the medium was 2 : 3 by volume. (2) Addition of inorganic nutrients, especially P and Fe, increased yield of the fruit-body. (3) High yields per volume of the medium were obtained with wide cap bottles filled less than half full with medium. (4) Peat and porous stone (Kanumatsuchi) were good materials for casing at 30–35 d after inoculation. (5) Excellent strains must be selected to cultivate this mushroom commercially, since wild strains showed wide variations in yield and form of the fruit-body. Under the above conditions, 4 strains selected from 60 wild strains produced the average of 123 g/bottle of fresh fruit-body on 650 ml of medium during the average culture period of 81 d.

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Original paper: Conidiomata of *Truncatella* sp. on different media

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Truncatella sp. has two development processes of conidium formation on different media. On PDA, *Truncatella* sp. formed many conidiogenous cells directly from hyphae. On culture with hortensia leaves, on the other hand, *Truncatella* sp. formed many conidiogenous cells on acervuli. These results indicate that the characteristic features of Hyphomycetes and Coelomycetes are affected significantly by environment.

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Original paper: Occurrence of apple bitter rot by grayish colony form of *Colletotrichum acutatum* in Japan and pathogenicity to apple fruits of *C. acutatum* and *Glomerella cingulata* isolated from other plants

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Grayish and reddish fungal isolates were obtained from bitter rot apple fruits in Ehime Pref. and in Chiba and Niigata Pref., respectively. The former isolates were morphologically intermediate between *Glomerella cingulata* and *Colletotrichum acutatum*. As a result of comparison with *C. acutatum* and *G. cingulata* isolates from bitter rot apples, both types of isolates were identified as *C. acutatum* on the basis of conidial and appressorial morphology, mycelial growth speed and sensitivity to benomyl. This is the first report on apple bitter rot caused by a grayish colony form of *C. acutatum* in Japan. Vigorous acervular formation was observed on lesions produced by inoculation with *C. acutatum*. But few acervuli were produced on apples inoculated with *G. cingulata*, though the latter species developed lesions faster than the former. It was demonstrated by inoculation with various isolates of both species to apples that 13 host plant species of *C. acutatum* and 9 of *G. cingulata* were potential hosts of infection sources of the apple bitter rot.

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Original paper: Mycofloral study of house dust in indoor environments of apartment dwellings

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A total of 19,716 strains of microfungi were isolated and identified from 533 samples of house dust collected in nine homes. The dust samples were collected monthly for 1 yr using the home-owner's vacuum cleaner fitted with a new collection bag. The average colony counts of microfungi from the total surveyed sites were 9.2×10^4 CFU/g of dust. Molds belonging to the Deuteromycota were the most frequent group detected in dust (59.4% of the total fungi). *Penicillium* (1.2×10^4 CFU/g), *Phoma* (7.7×10^3 CFU/g) and *Cladosporium* (7.0×10^3 CFU/g) were frequently isolated and revealed important concentrations in the dust samples. Fungal colony counts in the house dust were higher in spring and midsummer, the peak periods being March-April and August.

The sterilizing effect of microwave irradiation on fungal contamination in the flooring was evaluated by the dilution plate method using dust samples from the treated materials. Within 1 or 2 mo after the irradiation, the colony counts of surviving microfungi increased and recovered to the contamination level before the treatment.

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Original paper: Variations in characteristics of F₁ hybrids between Japanese and Thai oyster mushroom

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Variations in cultivation characteristics of Thai and Japanese stocks of oyster mushroom and their F₁ hybrids were studied. Crossing experiments revealed that mating factors of the two stocks were compatible (A ≠, B ≠). In cultivation at 22°C, Thai stock flushed twice or more, and Japanese stock once or not at all. However, at 15°C, Japanese stock normally flushed twice. While some F₁ hybrids flushed once or not at all (F₁-L), and others flushed twice or more (F₁-H). The hybrids graded as F₁-H were capable of fruiting well in a wider range of temperature than those graded as F₁-L. In principal component analysis of data including days required for fruiting, fruiting productivity (yield), pileus color and shape, each stock was compared on a Z-score diagram of their first and second principal components. The stocks of F₁-H hybrids formed each cluster on the diagram, and the Thai and Japanese parental stocks were located near or within the clusters of F₁-H and that of F₁-L, respectively. In fruiting characteristics, most members of both the clusters lay in the same area at 22°C, but at 15°C, they segregated in distinct areas. Some characteristics appeared to be linked and inherited. Introduction of Thai germplasm into Japanese stocks will be effective to improve their cultivation traits.

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Original paper: Hyphal interactions between *Pythium ultimum* and a mycoparasite, *P. oligandrum* – Light microscopic observations of their interface in and around cucumber roots in soil

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The modes of hyphal interactions were examined in a around lateral roots of *Cucumis sativus* 'Suyo' seedlings (cucumber) pre-treated with the mycoparasitic *Pythium oligandrum* (parasite), and then inoculated with the phytopathogenic *P. ultimum* var. *ultimum* (host) in soil. Cucumber seedlings completely damped-off and died within 2 d when inoculated with the host alone. When inoculated only with the parasite no seedlings were killed, and the seedling growth was delayed and restored. Furthermore, the growth of the seedlings was delayed in early stages when pre-treated with the parasite before inoculating the host, and about 50% of the seedlings remained standing. Host hyphae vigorously penetrated into the roots. Parasite hyphae were, however, found on the root surface. Parasite mycelium repeatedly approached, trapped, and penetrated the host mycelium. Protoplasm of the host mycelium granulated as it made contact with the parasite. Host mycelium was septated and disappeared as it was trapped and penetrated. In the presence of the parasite, protoplasm of the host mycelium degenerated and produced abundant oospores in the early stages. Abundant parasite hyphae but fewer oospores were observed in the presence of the host.

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Note: A species of *Leccinum* newly recorded from Japan

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Leccinum variicolor, hitherto unknown from Japan, is first recorded from Nagano Prefecture, central Japan, where it grows under birch in wet places in September. A description and illustrations of the species are given based on the Japanese material.

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Note: Cultural characteristics of mycelial growth of *Pleurotus eryngii*

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Cultural characteristics of mycelial growth of *Pleurotus eryngii* were examined and compared with those of *Lentinus edodes* and *Grifola frondosa*. The results were as follows. (1) The optimum temperature for mycelial growth of *P. eryngii* on YMG medium was 30°C. (2)

Pleurotus eryngii grew in the initial pH range of 5.0–8.0 with the optimum at pH 6.0, while *L. edodes* and *G. frondosa* grew well at the initial pH of 4.0 and 5.0, respectively, but very poorly at pH higher than 6.0. (3) The pH of cultured medium changed with mycelial growth of *P. eryngii*. It shifted to higher value when the initial pH was lower than 6.0, and to lower value when the initial pH was higher than 6.5. (4) *Pleurotus eryngii* grew fairly well under illumination by fluorescent lighting at below 700 lx, while the mycelial growth of *L. edodes* and *G. frondosa* was completely arrested by illumination.

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Review: Taxonomic studies on plant parasitic fungi on fruit trees and forest trees in Japan

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Since 1962, the author has been engaged with various plant diseases in Tohoku district of Japan, with special emphasis on life cycle study and identification of the causal fungus. As a result, thirty two new species (ascomyces 13, rusts 11, anamorphic fungi 7, smut 1), together with five new genera, have been proposed so far by the author and his colleagues. In this review, several topics, which were of particular interest and were most rewarding with much information, would be presented as follows: 1, on Japanese species of *Monilinia* (Sclerotiniaceae), the brown rot fungi of fruit trees; 2, on *Lambertella corni-maritima*, a mycoparasite occurring on stroma of *Monilinia fructigena* on apple fruits; 3, comparative life cycle studies on apple and pear rusts (*Gymnosporangium yamadai* and *G. asiaticum*) in Japan; 4, classification and identification of *Cristulariella* occurring on woody plants in Japan; 5, on “facultative heteroecism” of the *Thujopsis* rust (anamorph *Caeoma asnaro*, teleomorph *Blastospora betulae*) and 6, on large concentric ring spot, a unique leaf disease of *Aesculus turbinata* caused by *Mycodidymella aesculi* (synanamorphs *Mycopappus aesculi* and *Blastostroma aesculi*).

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Review: The role of the amateur in mycology – what would we do without them!

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The amateur’s role in the history of mycology will be traced from its early roots deeply based in the collection of fungi for food to the amateur’s present day activities. Attention will be drawn to the most important key amateur figures studying fungi solely or as a wider part of natural history in the eighteenth and nineteenth centuries, and the early part of the present century. How their work influenced the development of mycology will be demonstrated. It is often forgotten that the authorities attached to fungal names, including those we use in mycology on a daily basis, often belong to amateurs. The true professions of these amateurs, the net-work of correspondents they developed, etc. will be revealed and discussed in the context of an overall understanding of fungi as organisms. In addition the formation of mycological societies, and how they have become a focus of amateur activity and a source of accurate and disciplined information valuable to professional scientists will be plotted. The kind of work undertaken by amateurs I refer to will be demonstrated by documenting the activities of the British Mycological Society which celebrated its centenary in 1996.

The continuing work of this band of workers and their counterparts throughout the world in the closing years of the millennium will be described. It is argued that they are nationally important and necessary resources, despite many governments or their advisers, especially the most influential ones, being under the delusion that systematics is not cutting edge science. It is also emphasized that amateurs will have an even more important role to play in the future as custodians of knowledge – until hopefully opinions change.

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