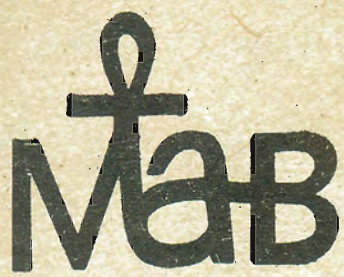


UNESCO: Man and the Biosphere National Committee for Sri Lanka.

Publication No17

A HAND BOOK

to the

MACROFUNGI OF SRI LANKA

by

Umarany Coomaraswamy

and

Saratha Kumarasingham

Published by the Natural Resources, Energy & Science Authority of Sri Lanka,
47/5, Maitland Place,
Colombo 7.
1988

UNESCO: Man and the Biosphere National Committee
for Sri Lanka

Publication No. 17

A HANDBOOK

to the

MACROFUNGI OF SRI LANKA

by

Umarany Coomaraswamy
Department of Botany,
Eastern University, Sri Lanka
Chenkaladi EP.

and

Saratha Kumarasingham
School of Biological Sciences,
Queen Mary College,
Mile End Road,
London, UK.

Illustrations by Suneetha Medis

Published by the Natural Resources, Energy & Science Authority
of Sri Lanka.
47/5, Maitland Place,
Colombo 7.
1988.

PUBLICATIONS OF UNESCO - MAB NATIONAL COMMITTEE FOR SRI LANKA

The absence of Handbooks and Guides to most groups of plants and animals of Sri Lanka has limited the development of interest in our flora and fauna, and this has also been a very serious handicap to ecological studies in this island.

The UNESCO - MAB National Committee set up jointly by the Ministries of Science and Education and functioning under the aegis of the Natural Resources, Energy and Science Authority of Sri Lanka has been sponsoring the publication of checklists of species and Handbooks to the identification of Genera of various groups of plants and animals. The Committee welcomes any additions, corrections and suggestions for improvement of these publications.

Dr. R.P. Jayewardene
Director-General
NARESA

Publications in this series:-

MAB NO 1 - A CHECKLIST OF THE LIVERWORTS OF SRI LANKA (1978)
B.A. Abeywickrema and M.A.B. Jansen

MAB NO 2 - A CHECKLIST OF THE MOSSES OF SRI LANKA (1978)
B.A. Abeywickrema and M.A.B. Jansen

MAB No 3 - A CHECKLIST OF THE PTERIDOPHYTES OF SRI LANKA (1979)
B.A. Abeywickrema

MAB NO 4 - A HANDBOOK TO THE FUNGI PARASITIC ON THE PLANTS OF SRI LANKA (1979)
Umarany Coomaraswamy

MAB NO 5 - A HANDBOOK TO THE AGARICS OF SRI LANKA (1979)
Umarany Coomaraswamy

MAB NO 6 - A HANDBOOK TO THE FRESH WATER ALGAE OF SRI LANKA (PART I) (1979)
B.A. ABeywickrema

MAB NO 7 - A HANDBOOK TO THE SOIL FUNGI OF SRI LANKA (1981)
Umarany Coomaraswamy and R.N. de Fonseka

MAB NO 8 - A CHECKLIST OF MOSQUITOES OF SRI LANKA (1981)
N. Jayasekera and Robert V. Chelliah

MAB NO 9 - A CHECKLIST OF THE MAMMALS OF SRI LANKA (1982)
K.D. Arudpragasam, S.W. Kotagama and I. Kotelawala

MAB NO 10- A CHECKLIST OF AMPHIBIA OF SRI LANKA (1982)
K.D. Arudpragasam, S.W. Kotagama and I. Kotelawala

MAB NO 12- A HANDBOOK TO THE FAMILIES OF THE FLOWERING PLANTS OF SRI LANKA (PART I) (1983)
B.A. Abeywickrema

MAB NO 13 - A CHECKLIST OF LAND SNAILS OF SRI LANKA(1983)
K.D. Arudpragasam

MAB NO 14 - A HANDBOOK TO THE FUNGI ASSOCIATED WITH INSECTS OF SRI LANKA (1983)
Umarany Coomaraswamy

MAB NO 15 - THE GENERA OF FRESHWATER ALGAE OF SRI LANKA - PARI II - Cyanophyceae (1986)
B.A. Abeywickrema

MAB NO 16 - THE THREATENED PLANTS OF SRI LANKA (1987)
B.A. Abeywickrema

MAB NO 17 - A HANDBOOK TO THE MACROFUNGAI OF SRI LANKA (1988)
U. Coomaraswamy & Saratha Kumarasingham

PREFACE

The UNESCO - MAB (Man and the Biosphere) National Committee for Sri Lanka has in its programme the compilation of Checklists and Handbooks, as essential guides to the identification of the flora and fauna of Sri Lanka . Several have been published in this series and this Handbook is concerned with the 'Macrofungi' or the fungi which are large enough to be easily examined with the unaided eye or at the most they require a low power (X 10) hand lens.

Sri Lankan records on the macrofungi are contained only in the work of Petch and Bisby (1950) . Since then no collections have been recorded.

The classification and arrangement of the genera is based on the schemes set forth by Ainsworth (1963) and Ainsworth et al (1973). In devising simple dichotomous keys, already existing keys have been selected, with appropriate modifications to fit the material covered. The genera are arranged in the order in which they appear in the keys. The numbers after the generic names in the keys refer to the serial number of the genera. For the taxonomic data of the genera, a brief description of the characters are given. After each generic description, the local species are listed and the source of information cited. The letter P, with figures after each specific name, refer to the page in Petch and Bisby (1950). In order to provide a better understanding of the structure of the fungi listed, many of them have been illustrated. Many of the drawings are from preserved specimens. For the convenience of the user, a Glossary of terms is given at the end of the text.

Grateful acknowledgement is made to Miss N Nadarajah and Miss S Arumugarajah for the assistance during checking the typescript. Our thanks are also due to Mr V Sothinathan and Miss M Stanislaus for the secretarial assistance. Finally it is a pleasure to acknowledge NARESA for publication of this Handbook.

NA-88-1

INTRODUCTION

This Handbook deals with the world of 'Macrofungi' which includes species belonging to several different taxonomic groups and which are quite different in appearance, but having one common feature - all large enough to be easily examined with the unaided eye or at the most with a hand lens of a magnification, X 10. This group of fungi, with a magic speed of growth and unique way of life, have attracted man, from time immemorial. For an amateur the collections and study of these can be one of the most fascinating and rewarding hobbies. For an artist they tempt with their beauty of shape and colour. Within the last century, man has come to realize the enormous influence that these fungi have on his life and the environment around him.

In all these, the basic unit of construction is hypae, constituting the mycelium. Individual hyphae or parts of mycelium become highly modified to form the fruiting bodies.The sole function of the fruiting body is the production of spores. The strange shapes and coloured structures we see in the forests, grass lands, wood lands etc., are only the fruiting bodies of those species. The mycelium which is the actively growing and feeding part of the fungus, remains underground or beneath the substratum.The mycelium may persist for years while the fruiting bodies may only survive a matter of hours in some,or years in others.

The fungal kingdom is very large and of the estimated 100,000 different species 25 - 30% can be considered under this group, and are included in the two sub-divisions, Ascomycotina and Basidiomycotina. Before we go on to look at the diversity, it is important to realise the part they play in our environment.

ECOLOGY

Larger fungi are much more familiarly known as destroyers of human property, attacking and destroying lumbar, railroad sleepers etc. Polyporaceae family including species of Poria , Stereum, Coniophora, Serpula is responsible for most of the wood rot of lumbar, against which great sums of money are spent annually for preservatives to protect lumbar from the attack of these fungi.

A large majority of the macrofungi occur on dead trees, rotting wood or any rich organic matter such as straw,and dead leaves and produce large discernible fruit bodies. These are saprophytic and play an important role in nature, as decomposers of wood and of the remains of herbaceous plants. You need only to think of the average forests and of the amount of the leaves and twigs or even whole trees which fall to the ground, to realise that unless something were removing this litter, it would quickly reach enormous proportions.

Agarics as a group exhibit a curious feature of luminosity. A tropical forest at night will be a picture of strange glowing light on the tree trunks, on rotten logs, or on the forest floor. There is the famous quote of a soldier on duty in the jungles of New Guinea in the second world war writing home " I am writing to you to night by the light of 5 mushrooms....".

The light varies from garnish green, blue , yellow or white. Luminiscence is specially common in species of Pleurotus and Mycena.

Some are parasites of various plants attacking their tissues and often eventually killing them. Some are serious parasites of forest trees and shade trees causing root rots and heart rots eg. Armillaria mellea, Phellinus, Fomes, Rossellinia, Corticium etc.

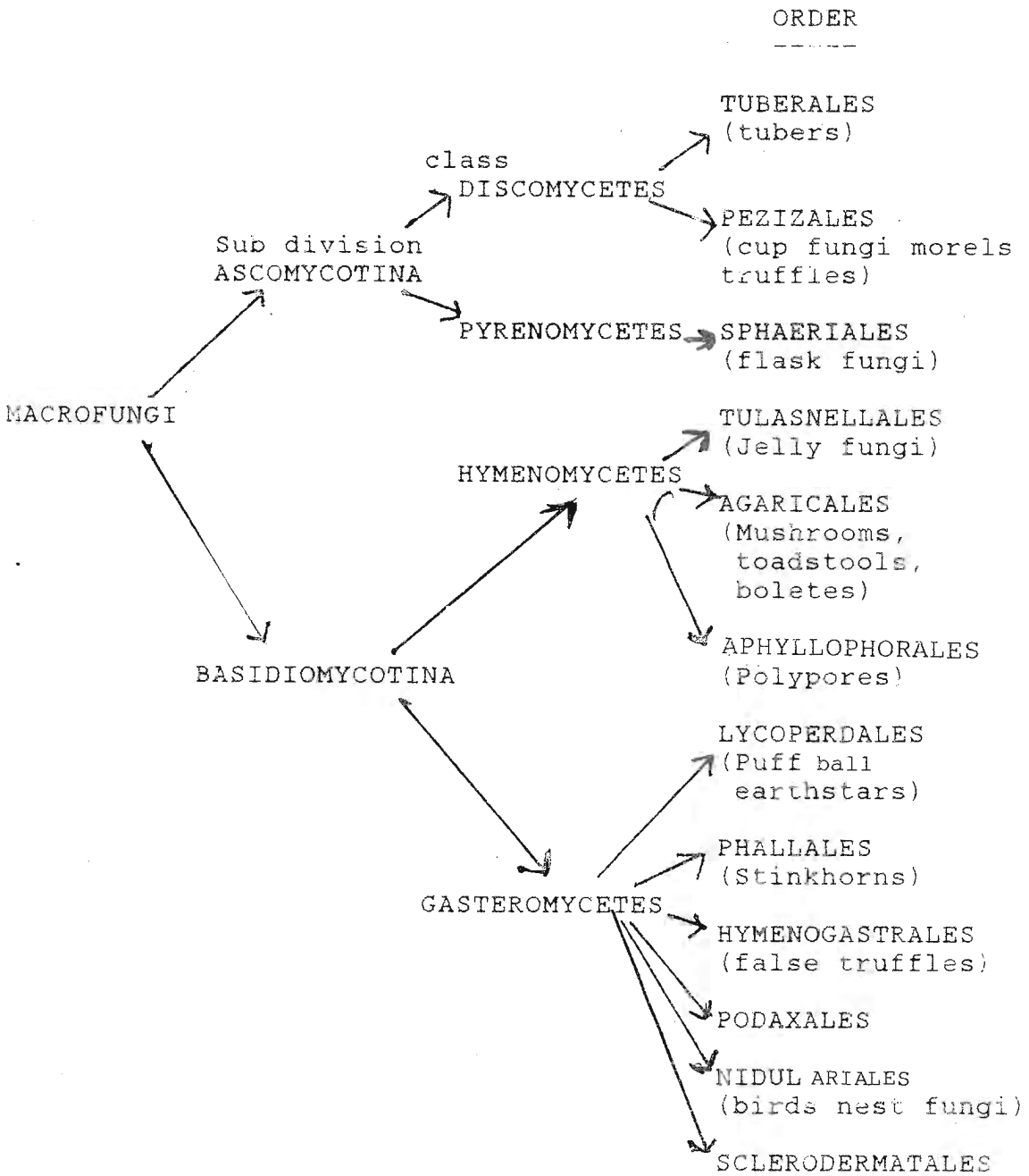
Many live in close harmony with the roots of living plants without either partner suffering from the association and both normally benefitting. These symbiotic associations are known as mycorrhiza and is typical of many members belonging to the Sub-division Basidiomycotina. It is now known that most families of flowering plants form these associations with fungi and without these fungi vigour of host plant suffers. Most of the mycorrhizal fungi are agarics.(Coomaraswamy 1979.)

A number of larger fungi are edible. In many of the common mushrooms there is a wide range of flavours which runs from almost tasteless to sweet, minty, spicy , bitter , and finally hot and acrid. They are eaten as a vegetable and nutritionally they provide significant amounts of proteins, and many species also contain useful vitamins A , B and D as well as trace elements and minerals. Although some species of mushrooms (Agaricus bisporus, Volvariella volvaceae ,Leptinus) are cultivated extensively for food, many of the wild species are equally good or better in flavour and are highly prized. Although some mushrooms are poisonous, there are great many tried and tested fungi which are eaten regularly the world over and which are quite easily recognised without risk of error. The rule of thumb procedures to distinguish poisonous from edible fungi is not good enough. Such well known and commonly used rules such as peeling the cap, poisonous species turning silver black or only edible fungi that grow in the fields, have no foundation. The death cap Amanita halloides the deadliest of all, will pass most tests and still kill you. The golden rule is " if you are not sure of a mushrooms identity, do not eat it".

DIVERSITY

Table 1 gives the schematic classification of the macrofungi. Majority of the larger fungi belong to the sub-division Basidiomycotina. Among those, it is the fungi with a distinct cap and stem rather like an umbrella, which springs to most peoples minds. These are the mushrooms, the toadstools, the boletes, and hedgehog fungi. For a detailed taxonomic account of this group reader is referred to the Hand Book on the Agarics of Sri Lanka (Coomaraswamy 1979). The diversity of shape,colour and size can be bewildering to the beginners. Some speceis are so small and fragile, that a careless breath can almost blow them away and which lasts only for a night and disappears with the first rays of the morning sun. Other species are large and robust with caps, which easily fill the average frying pans. Giants such as Boletus partentosus can reach a diameter of 2 ft and a total weight of 3 kilograms. Some are exquisitely beautiful, with colours and shapes to match the brightest

TABLE 1 - SCHEMATIC CLASSIFICATION OF MACROFUNGI



flowers. They outdo every other group of fungi in their smell. Almost every type of odour is found in them.

Almost everyone knows the flat semicircular plates or brackets which grow on treetrunks or from the stumps of fallen logs. These fungi are the polypores, their name referring to thousands of tubes which form the layer of pores on the underside of the cap (Page 39). They have a tough, woody flesh and fruit bodies lasting for many years growing new pore layers each year. Majority do not have and grow directly from the surface of a log or tree to form the distinctive shelf or bracket shape. Polypores hold the record for size among fungi; Polyporus giganteus can reach a width of over one metre.

Most magnificent fruit bodies are produced by the coral or cauliflower shaped species, Rammaria botrytis and Sparassius crispa which can reach 7 inches high and 1 foot across. They look like clumps of deep sea corals or smell clubs (Page 41).

Puff balls come in a number of different forms and can reach truly gigantic proportions. Eg. Langermannia (= Calvatia) giganteus can grow up to 1 metre in diameter. They are usually toughly skinned and warty. At maturity, outer skin of the fungus splits or breaks up in various ways and in some it is much like a 5 - 6 pointed star, the earth stars (Page 81). Most remarkable and curious ones are the stinkhorns. They reach their greatest diversity and beauty in the tropics. Commonest and best known is Phallus. Dictyophora indusiata is magnificent with a veil hanging almost to the ground like the skirt of a ballet dancer. Birds nest fungi are small fruit bodies of Cyathus, Nidularia etc, looking very much like a miniature nest with eggs. Inside the eggs are spore masses covered by a skin. Another group is the subterranean false truffles, which rely on small mammals to dig them up and so disperse the spores (Page 90).

The second major group of macrofungi is the Ascomycotina. Among the Ascomycotina, vast majority are small (Page 13). , and not included here. Cup fungi can be recognised by the cup or disc-shaped fruit bodies, produced on the ground on buried sticks, rotten logs, leaves, fruits and animal dung. Fruit bodies of some species, are brilliantly coloured , red, yellow or orange. Those of others are known blending with the dead leaves among which they grow on the forest floor. A few are black. Besides the typical cups are sponges, bells, saddles, tongues and branch-like fruit bodies. Fruit body reaches its most complexity in Morchella or true morels, with a flat hollow stem and large spherical or conical cap, pitted and ridged with hollows to produce a sponge or honey-comb like effect.

Contained within the Ascomycotina, is a large group of mixed fungi collectively known as flask fungi (Page 13). These are very hard and woody in texture and either spherical or club shaped in form. Typical of this group are Daldinia concentrica popularly known as King Alfred Cakes or cramp balls - the latter name, in reference to their supposed ability to cure cramped muscles.

COLLECTION AND EXAMINATION

A thorough knowledge of the form and structure of the fruit bodies, spore bearing organ, and spores is a prerequsite to proper identification of the species. Morphology and anatomy of the agarics have been described in the Hand Book to the Agarics of Sri Lanka (Coomaraswamy 1979). All other macrofungi have been described in this book.

Equipment required for collecting is of the simplest; a few tins of assorted sizes for the larger and fragile specimens and envelopes for the minute fungi on stems or leaves. Polythene bags should never be used as fungi will turn into a liquid mass. A sharp knife should be used to cut and remove the substratum on which the fruit bodies may be growing on. Specimens should be collected, preferably during the morning. While collecting, it is desirable to select several specimens showing different stages of development so that one of them may be used to cut sections for observations and another for spore print etc. The entire fruit body must be dug up intact, from the ground, special care being taken not to break them. Where the fruit body is wood inhabiting, they have to be cut and removed with the portion of the wood on which they are growing. To avoid collecting effects material of larger Sphaerials, edge of the stroma should be sliced across and if locules are producing spores (they will be seen with the aid of handlens) with mucilage or have a slimy smooth interior. If this is not seen, collections will probably prove to be worthless.

The habitat should be noted for each collection including associated trees and type of soil. Many characters of the fruit bodies are easily seen when they are viewed in situ. Habit sketch, measurements, colour of different parts, colour on bruising and on cutting the flesh, consistency spore prints chemical tests etc. should be made at this stage. Technique of obtaining spore prints has been described in the Hand Book on the Agarics of Sri Lanka. (Coomaraswamy 1979). A watercolour sketch of the fresh specimen is also desirable. If it is not possible to identify the specimen on the same day, atleast the characters likely to be affected by drying must be noted.

Specimens should be dried as quickly as possible after collection, as this helps to retain form and colour. Polypores are generally easier to dry than other large fungi. The larger specimens need to be cut into smaller portions. They can be dried, by slicing them vertically and drying between blotting papers (Bohus 1963). Ideally, successful and rapid drying requires a flow of warm air passing over the specimen. This can be achieved by using a electric fan heater. A perforated tin with a 60 watt lamp beneath a number of wire-shelves is also useful. In the field a similar perforated tin, may be suspended over an oil lamp. The most satisfactory method of preserving fleshy fungi is by freeze drying, as specimens processed in this way, show little change in either colour or shape (Onion 1971). In localities with high atmospheric humidity the thoroughly dried specimens must be stored either in a desicator over calcium chloride or sealed in polythene bags with a few granules of silica gel. If this is not done they will be ruined by moulds. Specimens could also be preserved in

in spirit or a mixture of 25% ethanol and 4% formaldehyde.

It is often necessary to re-examine tissue from specimens which have been dried and kept in a herbarium. It is desirable to soak the material or gently heat the material, in 10% NAOH or 8% KOH solution to soften it and re-swell the tissue. It should then be rinsed with water before staining.

When asci, paraphyses and hairs are to be examined microscopically, water is the best mounting medium since this will give one of the truest colours of spore walls 10 - 15% KOH can also be used as a mounting medium. Hyaline epispores and appendages are most readily seen in black indian ink. For critical studies it is usually desirable to employ some staining and clearing agent; Melzers reagent (KI 1.5g; I 0.5g; Distilled water 20 ml; Chloral hydrate 20 ml) is a common stain used in the study of ascomycetes. Lactophenol cotton blue is used for studying ascospore ornamentation and septation.

LIST OF THE GENERA

1. Rosellinia De Not
2. Anthostomella Sacc.
3. Poronia Willd. ex Fr.
4. Xylaria Hill ex Grev.
5. Penzigia Sacc.
6. Kretzschmaria Fr.
7. Daldinia Ces. de. Not.
8. Nummularia Tul.
9. Hypoxylon Bull. ex Fr.
10. Ustulina Tul.
11. Petchiomyces Fisher & Mattir.
12. Tuber Mich. ex Fr.
13. Peziza Dill ex Fr.
14. Otidia Fuckel
15. Lamprospora de Not
16. Pithya Fuckel
17. Humaria (Fr.) Sacc.
18. Geopyxis (Pers.) Sacc.
19. Discina (fr.) Fr.
20. Ascophanus Boud.
21. Saccobolus Boud.
22. Ascobolus Pers. ex Fr.
23. Dacrymyces Nees ex Fr.
24. Geupinia Fr.
25. Calocera (fr.) Fr.
26. Auricularia Bull. ex Merat

27. Septobasidium Pat.
28. Uredinella Couch.
29. Heterochaete Pat.
30. Sebacina Tul.
31. Exidia Fr.
32. Tremella Dill. ex Fr.
33. Ganoderma Karst.
34. Fistulina Bull. ex Fr.
35. Schizophyllum Fr.
36. Stromatoscypha Donk
37. Henningsomyces O. Kuntze
38. Coniophora D. C ex Merat
39. Hymenochaete Lev.
40. Mucronoporus Ellis & Everh.
41. Phellinus Ques
42. Tomentella Pat.
43. Thelephora Ehrhart ex Fr.
44. Irpex Fr.
45. Sarcodon P. Kars.
46. Hydnum L. ex Fr.
47. Gloidon P. Kars.
48. Grandinia Fr.
49. Steccherinum S.F. Gray
50. Odontia Fr.
51. Cantharellus Adams ex. Fr.
52. Pterulicium Corner
53. Pterula Fr.

54. Lachnocladium Lev.

55. Clavicorona Doty.

56. Scytinopogon Singer

57. Ramaria Gray

58. Physalacria PK.

59. Chaetotyphula Corner

60. Clavariadelphus Donk

61. Clavulinopsis Van Ov.

62. Clavaria Fr.

63. Elmerina Bres.

64. Favolus (Beauv. ex Fr.) Fr.

65. Polyporus (Mich) Fr. ex Fr.

66. Poria Pers. ex S.F. Gray

67. Trametes Fr.

68. Rigidoporus Murril

69. Daedalea Pers. ex Fr.

70. Fomes (Fr.) Fr.

71. Lenzites Fr.

72. Aleurodiscus Rabenh. ex Schroet.

73. Cytidia Quel

74. Gloeoporus Mont.

75. Merulius Fr.

76. Peniophora Cooke

77. Corticium Pers. ex Gray

78. Cymatoderma Jungh.

79. Stereum Pers. ex. Gray

80. Lopharia Kalchlor and Mac Owan

81. Podaxis Desv.

82. Geastrum Pers.

83. Lycogalopsis Fisch

84. Bovista Pers.

85. Lycoperdon Pers.

86. Langermannia Rostak.

87. Calvatia Fr.

88. Protubera MOller

89. Clathrus Mich. ex Pers.

90. Colus Caval.

91. Simblum Klotzch

92. Aseroe La Bill. ex. Fr.

93. Lysurus Fr.

94. Mutinus Fr.

95. Dictyophora Desv.

96. Phallus Pers.

97. Rhizopogon Fr & NOrdholm

98. Hymenogaster Vittad.

99. Hydnangium Wallr.

100. Sphaerobolus Tode ex Pers.

101. Cyathus Haller ex Pers.

102. Nidula White

103. Nidularia Fr.

104. Scleroderma Pers.

105. Tulostoma Pers.

106. Calostoma Desv.

NA-88-3

KEY TO THE SUBDIVISIONS OF THE MACROFUNGI OF SRI LANKA

SUBDIVISION - ASCOMYCOTINA

The very large number of species included in the sub-division, are characterised by having their spores produced in asci. In the great majority of them the asci are numerous and packed side by side to form a hymenium, seated on or in, and protected by a fruit body called the ascocarp. The asci or mother cells are the specialised tips of ascogenous hyphae and, when fully formed, vary in form (Plate I Fig. A1 - A5) from cylindrical, clavate or clubshaped to obovate or spherical. The apex of the ascus may be round, more or less narrowed or truncate. In some cases the basal portion of the ascus, below the spore bearing portion, is narrowed and elongated to form a stalk. The apex of the ascus is a very important morphological feature (Plate 1 Fig.B1 - B8) on which classification into orders and families are based; some, have a simple apical pore which connects the cavity of the ascus with the exterior, in some the wall of the ascus is thick at the apex and forms a more or less distinct plate; apical pore may be surrounded by a ring like structure which is more refractive and may be coloured, blue with cotton blue; ascus may be funnel shaped, the base of funnel being connected to the cavity of the ascus by a pore surrounded by a cushion like structure; apex may be slightly thickened and provided with a pore and plugged by a large chitinous body; complex plug composed of a number generally amyloid rings or plates; may be provided with a lid (an operculum) apically or subapically which is thrown back at spore discharge; and yet others discharge their spores through vertical slits. In a few cases ascus wall is evanescent releasing the spores into the cavity of the ascocarp. Ascus wall is bitunicate when two walls are clearly visible, or unitunicate when the walls appear single. (Plate I Fig. C1 - C2)

The most usual number of spores, present in an ascus, is eight; in a few cases four and in others more than eight. The arrangement of spores (Plate 1 Fig. D1 - D5) is generally constant in a given species; uniseriate when the spores are arranged in a single row, biseriate when the spores are in two rows; inordinate when the spores are grouped without order; and fasciculate when very long spores are arranged in bundls. All the spores are colourless at first, many remain so even after maturity and are then described as hyaline. In others the epispore becomes coloured at maturity. The epispore is smooth at first but in many species become variously ornamented as it matures (Plate I Fig. E1 - E15); verruculose when covered with minute projecting points; warted or verrucose when warts are longer and fewer in number; reticulated when there are numerous regular polygonal pits or depressions thus leaving a net work of

raised ridges. Spores vary in form and are perfectly globose or spherical to filiform or needle shaped. Spores are always one-celled (or continuous) at first, and many remain so at maturity; others become divided into two or more cells by the formation of septa at right angles to the long axis of the spore, and then described as septate. (Plate 1 Fig. F1 - F6). Spores are said to be muriform when septa are formed at right angles to each other. In many spores, one or more globules or guttulae are present; their presence is indicated by the term guttulate.

In a large number of species the asci are accompanied by sterile slender hyphae called paraphyses. These occur between the asci and apparently afford some protection to the developing asci, at least in the species with an exposed hymenium. Paraphyses are of value in the identification of species. The following points should be noted; presence or absence of septa in the paraphyses; form of the paraphyses whether cylindrical, clavate or lanceolate; simple or branched; presence or absence of colour at the tip; whether the tip is straight, curved, knob-headed, curled or contorted; whether they cohere at the tips held together by coloured or colourless mucilage, to form a compact layer above the asci, often of a distinctive colour and then called an epithecium.

The asci along with other sterile structures form a fructification - an ascocarp, the form of which is very varied (Plate 1 Fig. G1 - G4). In the orders dealt with in this book, the ascocarps are either flask-shaped or globose with the hymenium covered and termed perithecia, or they bear an exposed hymenium and called apothecia. These will be discussed in greater detail under the respective classes (Page 13).

To test the iodine reaction of the apices of asci Melzers reagent (0.5 g.m I ; 1.5 g Kl; 20 gm. Chloral hydrate and 20 ml. of water) is used. A positive reaction is blue or purple. Cotton blue dye solution are lactic acid and or lactophenol is used for staining certain cyanophilic ascospore markings. Spore markings which fail to give deep blue when heated with cotton blue solution is termed cyanophobic.

Plate I Figure A - G

Figure A Shape of Asci

A1 - clavate
A2 - obovate
A3 - globose/spherical
A4 - filiform
A5 - stalked

Figure B Apical structures of asci

B1 - typical operculum
B2 - bilabiate opening
B3 - softening and bursting
B4 - subapical operculum
B5 - opening by vertical slit
B6 - thickened apex traversed by delicate pore, a plug of wall material plugging the apex until it dehisces.
B7 - broad pore with a distinct ring
B8 - funnel shaped tip

Figure C Walls of asci

C1 - unitunicate
C2 - bitunicate

Figure D Arrangement of asci

D1 - uniseriate
D2 - Oblique
D3 - biseriate
D4 - inordinate
D5 - fasciculate

Figure E Ascospore ornamentation & Shapes

E1 - broadly elliptic
E2 - elliptical
E3 - elliptic fusiform
E4 - warted minutely
E5 - small spherical
E6 - coarsely warted
E7 - reticulate
E8 - cylindric clavate
E9 - slender with tapering end
E10 - sausage shape
E11 - filiform

Figure F Ascospore variation in shape, size and septation

F1 - transversely septate
F2 - muriform
F3 - spore with long appendage
F4 - spore with rounded appendage
F5 - spore with germ pore
F6 - spore with germ slit

Figure G Ascocarp

G1 - typical perithecium
G2 - perithecia in subiculum
G3 - perithecia in stroma
G4 - typical apothecium

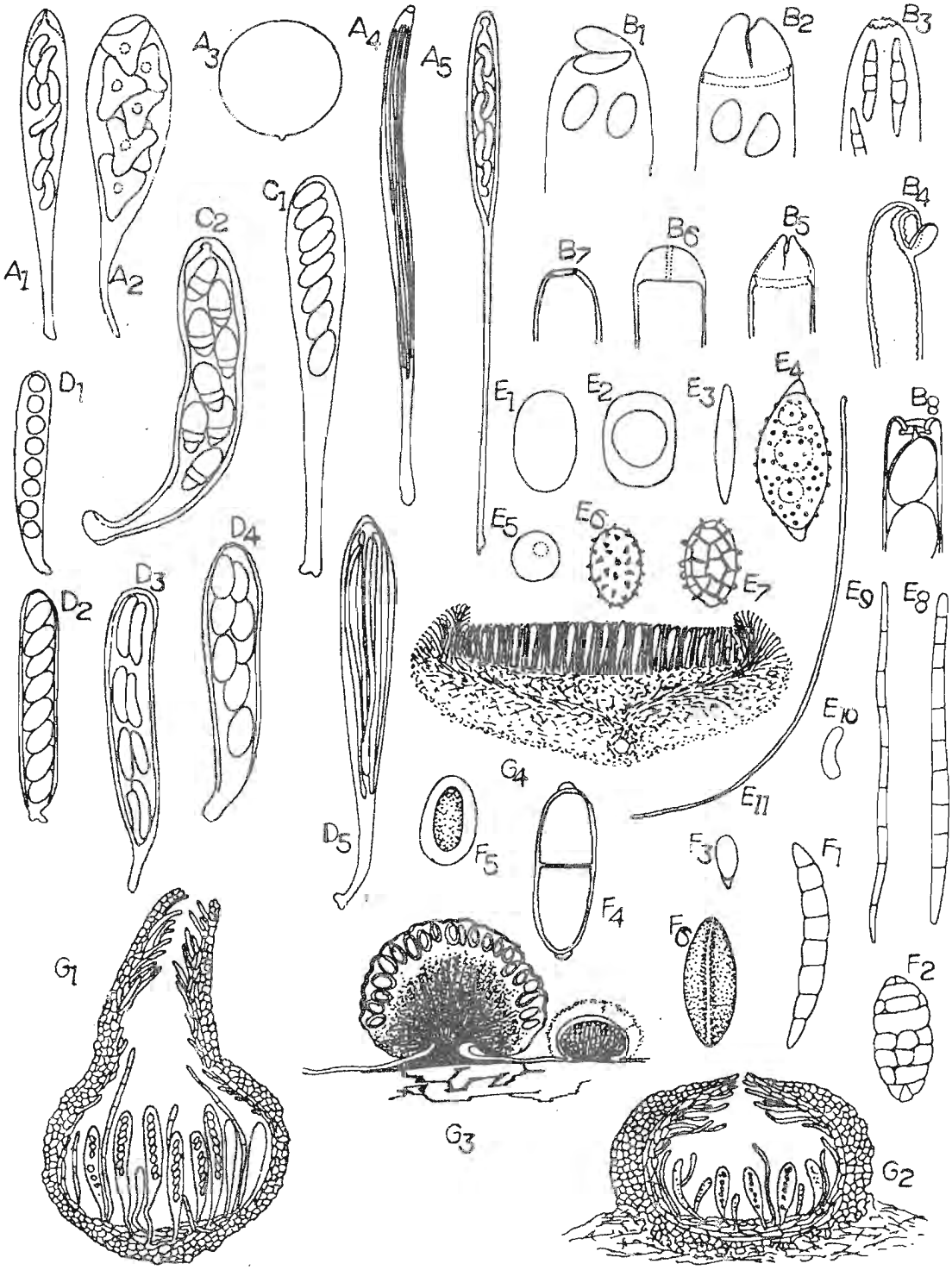


Plate I Figs. A-G

KEY TO THE CLASSES OF THE SUBDIVISION ASCOMYCOTINA

Ascocarp typically a perithecium which is usually ostiolate; if not ostiolate, asci not evanescent - PYRENOMYCETES Page 13

Ascocarp typically an apothecium or a modified apothecium - DISCOMYCETES Page 21

CLASS PYRENOMYCETES

Members of this class produce a perithecium. A typical perithecium consists of a more or less hollow structure within which there is formed a hymenium of unitunicate asci, lining the perithecial wall or forming a cluster at the base. The perithecia are provided with an opening - the ostiole, which is typically apical and rarely lateral. Usually the paraphyses arising from the vegetative mycelium are intermingled with the asci. Near the apex of the perithecial cavity, the sterile hairs are referred to as periphyses. In many cases the vegetative mycelium growing over the perithecial wall forms a more or less distinct stromatic layer. The perithecia may be seated on a mass of tissue termed the stroma or may be embedded in it, with only the ostioles visible at the surface. Stromata vary in size and shape. A very large proportion of the species have asexual reproduction by means of conidia.

A single order treated.

ORDER SPHAERIALES

This order is treated here in a very broad sense to include Sphaeriales s. str., Diaporthales, Xylariales, Claviceptales and Hypocreales (Muller and Von Arx 1973). The most significant characteristic of this order is the nearly constant form of the perithecium. It is spherical, hemispherical or flask shaped, mostly with an apical ostiole and fleshy, membranous or carbonous wall. Perithecia are borne singly, free or partly embedded in the substratum or on a weft of hyphae, or seated on or imbedded in an independent elaborate stroma. Perithecia in the stromatic forms are arranged just below and at right angles to the surface of the stroma. Their development may be preceded by the formation of conidia which often cover young stromata with a white or brown powder. Asci are spherical, clavate, fusiform or cylindrical. Ascospores one-celled, hyaline or coloured.

KEY TO THE GENERA OF THE ORDER SPHAERIALES

1. Ascocarp free or surrounded by a hyphal subiculum or immersed in the host tissue and covered by a clypeus. - 2

   Ascocarp embeddded in a stroma or seated on a stroma consisting entirely of fungal tissue. - 3

2. Ascocarp superficial. - Rosellinia (1)

   Ascocarp immersd in the host tissue. - Anthostomella

3. Stromata light coloured occasionally covered by a dark crust. - 4

   Stromata dark throughout. - 7

4. Stromata more or less erect. - 5

   Stromata not erect. - 6

5. Stromata occuring on dung. - Poronia (3)

   Stromata not occuring on dung. - Xylaria (4)

6. Stromata sessile. - Penzigia (5)

   Stormata stalked. - Kretzlhmaria (6)

7. Stromata showing concentric zones in cross section. - Daldinia (7)

   Stromata not as above. - 8

8. Ascocarp sunken on the base of the stromata and provided with long necks. - Nummularia (8) (=Nummula)

   Ascocarp not as above. - 9

9. Perithecia and ascospores small. - Hypoxylon (9)

   Perithecia and ascospores large. - Ustulina (10)

1. Rosellinia de Not (Plate II Fig.1)

Perithecia in dense clusters upon blackish subiculum (a hyphal mat), superficial, not embedded in a stroma; sub-globose ostiolate with a papilla; asci with a well developed apical ring; ascospores, coloured, 1-celled, often with minute colourless appendages.

14 species recorded.

1) R. albocincta Petch
   On wood P: 25

2) R. arcuata Petch
   On diseased roots of plants P: 25

3) R. beccariana Ces.
On dead Erythrina Wariapola P: 25

4) R. bothrina (B. & Br.) Sacc.
On wood P: 25

5) R. bunodes (B. & Br.) Sacc.
On roots of plants P: 26

6) R. catevaria (B. & Br.) Sacc.
On wood and old Fomes. P: 26

7) R. caudata Petch
On dead branches P: 26

8) R. decidua Petch.
On dead branches Hakgala P: 26

9) R. emergens (B. & Br.) Sacc.
On sticks P: 26

10) R. immersa Petch
On branches Peradeniya P: 26

11) R. microspora (Ces.) Sacc.
On wood Peradeniya P: 26

12) R. obtusa Petch
On dead twigs Hakgala P: 26

13) R. rhypara (B. & Br.) Sacc.
On bark P: 26

14) R. tenuistromicola Petch
On dead stems Peradeniya P: 26

2. Anthostomella Sacc. (Plate II Fig.2)

Perithecia usually immersed in leaves or herbaceous stems often beneath á patch of dark mycelium on the surface of the substrate; asci with an apical ring like thickening; ascospores uniseriate, light to dark brown with a germ slit, 1-celled, with a minute hyaline appendage attached at one end or each end or with a gelatinous coat.

3 Species recorded.

1) A. confluens Petch
On petioles of a palm P: 22

2) A. dilatata (B. &Br.) Petch
On petioles of a palm P: 22

3) A. palmarum Petch
On decaying spathe of
Cocos nucifera P: 22

Plate II Figure 1 - 4

Figure 1 Rosellina spp.

a) R. arquata - entire x 2
b) R. cafervaria - entire x 1
c) Rosellina sp. - stroma with numerous condiophores
d) Rosellina sp - mature perithecium
e) Rosellina sp - asci young and old with paraphyses.

Figure 2 Anthostomella spp.

a) A. calomi	entire
b) A. grandispora	entire
c) Anthostomella sp.	entire
d) Anthostomella sp.	section showing pertithecia
e) Anthostomella sp.	ascus with spores

Figure 3 Poronia sp.

a) - entire x 1
b) Section x 1
c) ascus x 400

Figure 4 Xylaria sp.

a) Xylaria allentoides	entire
b) X. epiculata	entire
c) X. nigripos	perithecial stroma
d) X. nigripos	conidial stroma
e) Xylaria sp.	conidia & conidiophores

Plate II Figs. 1 - 4

3. Poronia Willd. ex Fr. (PlateII Fig.3)

Perithecia in a single layer in a stroma; stroma light coloured stalked, and expanded above into a cup or disc which in the early stage of development is covered by a greyish white film of conidia. Later the ostioles appear as black dots scattered over the surface of the disc.

2 species recorded.

1) P. macrorhiza Speg.
On the ground Hakgala P: 25

2) P. minuta petch
On hare's dung Peradeniya P: 25

4. Xylaria Hill ex Grev. (Plate II Fig.4)
= Xylosphaera Dumortier

Perithecia in a stroma; stroma vertical,stalked, more or less clubshaped, simple or branched; may become branched to form antler like structures resembling those of the family Clavariaceae of the Basidiomycotina, and often mistaken for them by the beginners; stroma externally black with white flesh , covered with light coloured conidia when immature and black after producing perithecia; perithecia embedded in the periphery beneath the outer crust in a single layer; spores uniseriate, 1-celled , obliquely elliptical, brown sometimes with hyaline appendages.

18 species recorded.

1) X. allantoidea (Berk.) Berk
On wood. Central Province.Also Henaratgoda and Haputale P: 27

2) X. apiculata Cooke
On branches P: 27

3) X. exalbata B. & Br.
On wood. Central Province P: 27

4) X. furcata Fr.
From termite nests P: 27

5) X. haemorrhoidalls B. & Br.
On wood P: 27

6) X hypoxylon (Fr.) Grev P: 27

7) X. lanthino-velutina Mont. Lloyd
On capsules of Cullenia excelsa P: 27

8) X. muscandae Lloyd
Peradeniya P: 27

9) X. myosurus Mont.
On wood Peradeniya P: 27

10) X. nigripes (Kl.) Sacc.
From termite nests P: 27

11) X. oocephala Penz. & Sacc.
On dead leaves P: 27

12. X. petchii Lloyd
On dead leaves, Peradeniya P: 27

13. X. plebeia Ces.
Common on wood P: 27

14. X. pyramidata B. & Br.
On wood in Kandy P: 27

15. X. tabacina (Kickz) Berk. P: 27

16. X thwaitesii Berk & Cooke apud Cook
On roots of Hevea brasiliensis P: 27

17. X. vagans Petch
Common on dead leaves Pakistan P: 27

18. X. zeylanica (Berk.) B. & Br.
On wood P: 27

5. Penzigia Sacc. Plate III Fig. 5)

Perithecia in a stroma; stroma small subglobose or hemispherical.

4 species recorded.

1) P. eterio (B.& Br.) Petch
Hakgala P: 25

2) P. frustulosa (Berk. & Curt.)
J.H.Miller
On wood Anuradhapura P: 25

3) P. placenta Petch
On dead Hevea Henaratgoda P: 25

4) P. poroniiformis Petch
On Wood Hakgala P: 25

6. Kretzschmaria Fr. (Plate III Fig. 6)

Perithecia in a stroma; stroma small or forming a broad crust on wood, indistinctly stalked, flattened, hemispherical, composed of a light coloured prosenchyma occasionally covered by a dark crust; perithecia several; asci with apical amyloid structures, cylindrical.

Plate III Figures 5 - 7

Figure 5 Penzigia spp

a) Penzigia eterio entire x 1
b) P. eterio section
c) P. poroniaeformis entire
d) P. poroniaeformis section
e) P. placenta entire
f) P. placenta section

Figure 6 Kretzmaria spp.

a) K. micropus entire x 1 (side view)
b) K. micropus surface view x 2
c) K. sphaerocephala entire x 6
d) K. turbinata entire
e) K. turbinata entire (side view)

Figure 7 Daldinia sp.

a) D. concentrica entire
b) D. concentrica V.S.
c) spores & ascus x 500
d) conidiophore x 400

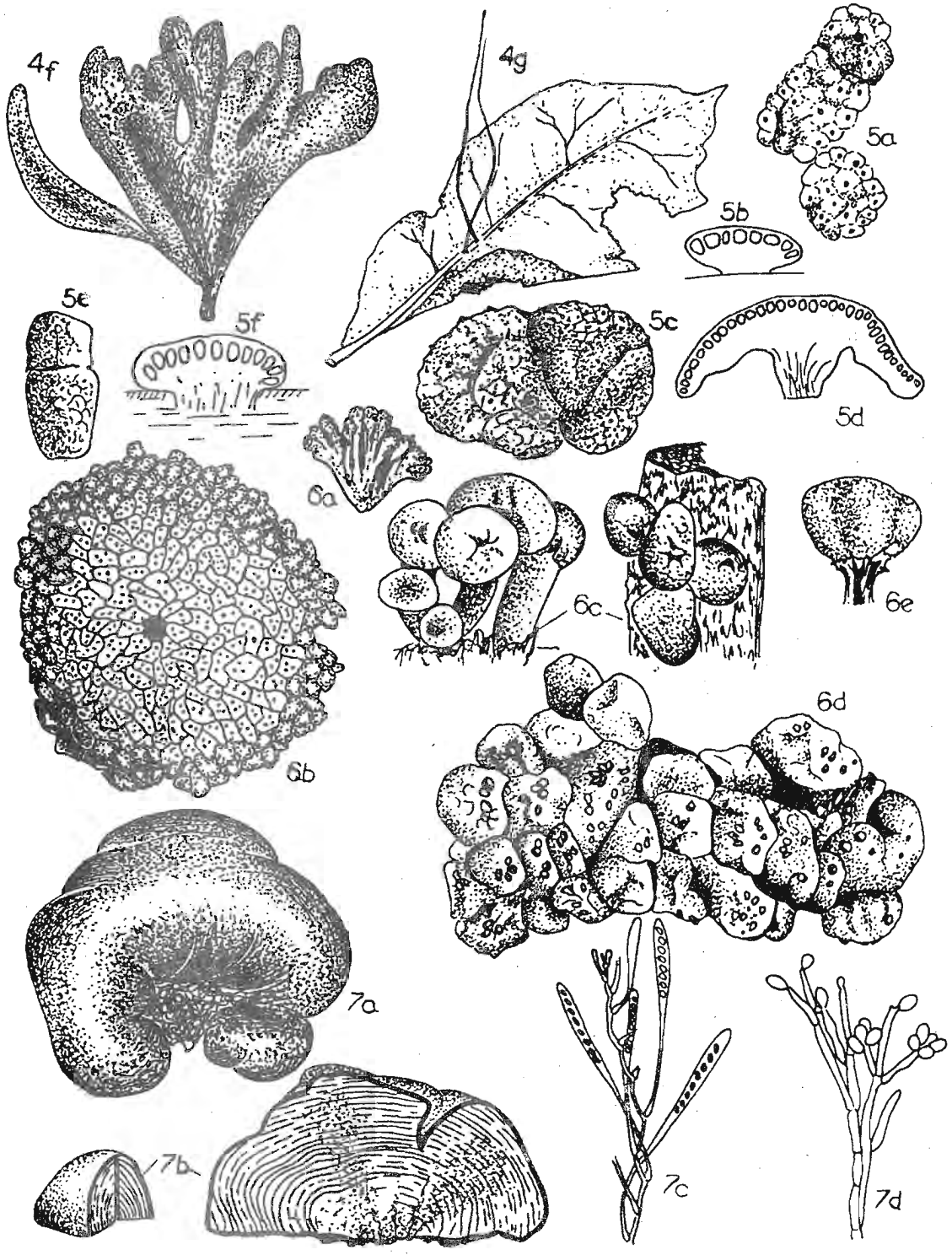


Plate III Figs. 4-7

3 species recorded.

1) K. micropus (Fr.) Sacc.
On wood and a wound parasite of Hevea brasiliensis P: 24

2) K. sphaerocephala Petch
On dead branches of Bombax malabaricum P: 24

3) K. turbinata Petch
On wood P: 24

7. Daldinia Ces. de Not. (Plate III Fig. 7)

Perithecia in a stroma; stromata solitary or in clusters; bursts through the surface of the substratum, hemispherical, rarely stalked, of various shades of purple, surface black, context blackish fibrous showing distinct concentric zones; perithecia in a single layer just below the outer crust; asci cylindrical, 8-spored; spores elliptical, brown.
On decaying trunks and logs of wood. If a mature specimen is placed on white paper a dense mass of spores resembling a layer of soot will be deposited on the paper round the specimen.

1 species recorded.

1) D. concentrica (Fr.) Ces. de Not
Abundant on dead logs P: 22

8. Nummularia Tul (Plate IV Fig.8)

Perithecia in a stroma; stroma becoming an independent black crust, a circular disc or a flattened cushion, with an undulating black surface, when young are weakly developed and covered with conidiophores; perithecia flask shaped with long necks; asci cylindrical; ascospores elliptic to fusiform, dark one-celled with a distinct colourless furrow down one side.

3 species recorded.

1) N. insculpta Hohnel apud wesse
On bark Peradeniya P: 25

2) N. pithodes (B. & Br.) Petch
Common on dead tree trunks,standing or felled P: 25

3) N. porosa Petch
On old trunks of Artocarpus integer, Peradeniya P: 25

Plate IV Figure 8 - 11

Figure 8 — Numularia spp

a) N. pithoges entire x 1
b) N. pithoges entire x 10

Figure 9 — Hypoxylon spp

a) H. pelliculosum entire
b) H. perforatum entire x 10
c) H. trucodes entire x 1 & x 5
d) Young stroma producing conidia a mature stroma having perithecia.

Figure 10 — Ustulina spp

a) U. zonata entire x 1
b) section x 12
c) U. sp. section x 2. Surface producing conidia and perithecia forming within the tissue.

Figure 11 — Petchiomyces thwartsei

a) entire
b) }
c) } development of the fructification
d) }

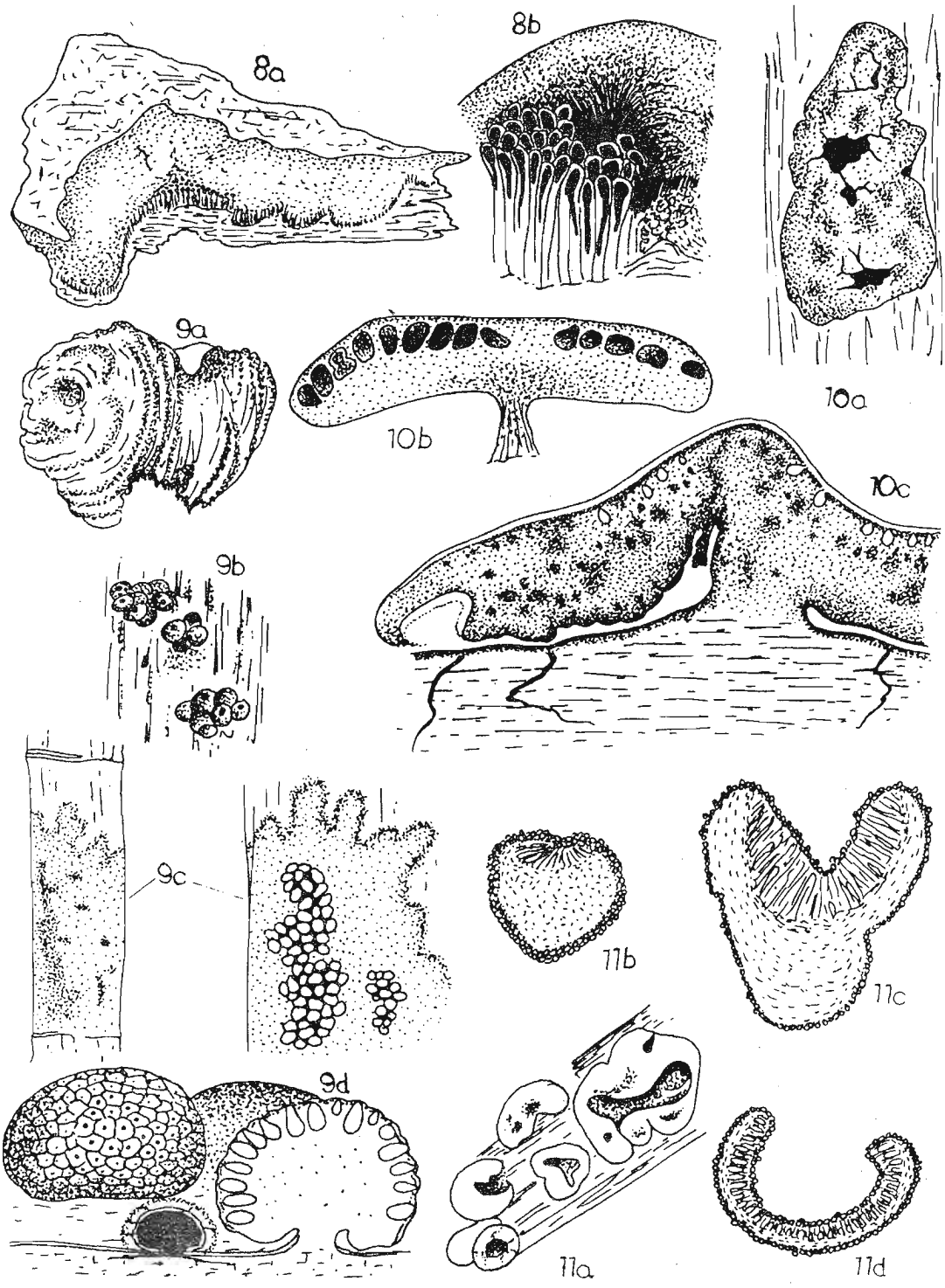


Plate IV Figs. 8 - 11

9. **Hypoxylon** Bull. ex. Fr. (Plate IV Fig. 9)

Perithecia in a stroma; stroma coloured black, brown or reddish variously shaped from hemispherical cushions to a thin spreading crust, sometimes partly sunken in the substratum, when young covered by a tuft of conidiophores from which small oval conidia are abstricted; when mature surface minutely warted owing to the slight projection of the mouths of perithecia; perithecia globose to slightly flask shaped, borne in a layer just beneath the crust; spores elliptic - fusiform to bean shaped, dark brown, 1-celled with a distinct colourless furrow on one side.

Differs from Daldinia in the flesh and showing concentric zones or lines.

22 species recorded.

1) H. angustum Petch
On a dead tree trunk Peradeniya P: 23

2) H. carneum Petch
On dead Cinnamomum camphora, Hakgala P: 23

3) H. chalybeum B. & Br.
On wood P: 23

4) H. chrysoconium B. & Br.
Fairly common P: 23

5) H. coccineum Bull
Fairly common at Hakgala P: 23

6) H. denudatum Petch
Ganagaruwa P: 23

7) H. discolor B. & Br.
On sticks. Central Province P: 23

8) H. distillatum B. & Br.
On wood P: 23

9) H. epixanthum (B. & Br.) Petch
On wood P: 23

10) H fragaria Ces.
Pidurutalagala P: 23

11) H. glomeratum Cooke
On branches, Peradeniya P: 23

12) H. haematostroma Mont.
On wood P: 23

13) H. hypoleucum (B. & Br.) Cooke
On bark P: 23

14) H. hypomiltum Mont.
On wood P: 23

15) H. olivaceum Petch
Common at Peradeniya on Mangifera indica P: 23

16) H. papyraceum (Rehm.) J.H.Miller
On a branch. Hakgala P: 23

17) H. pelliculosum Petch
On branches, Peradeniya P: 23

18) H. quisquillarum Mont.
On wood & bark P: 23

19) H. rubiginosum (Fr.) Fr
Common P: 24

20) H. stygium (Lev'.) Sacc.
Peradeniya & Hakgala P: 24

21) H. truncatum (Schw. ex Fr.) J.H.Miller
On wood P: 24

22) H. vestitum Petch
On a stem of Camellia sinensis P: 24

10. Ustulina Tul (Plate IV Fig. 10)

Perithecia in a stroma; stroma becomes an independent black crust of a considerable size and possess an undulating black surface; when young weakly developed and covered with conidiophores; perithecia large globose to slightly flask shaped; asci cylindric to clavate; spores large elliptic fusiform - bean shaped, dark brown 1-celled with a distinct colourless furrrow on one side.

Resembles Hypoxylon except for its large perithecа and large ascospores.

1 species recorded.

1) U. deusta (Fr.) Petrak
On roots of woody plants P: 27

CLASS DISCOMYCETES

Ascocarps of this class bear an open hymenium of paraphyses and asci, fully exposed to the air at maturity and is called an apothecium. A typical apothecium is disc or saucer shaped or cup-like, hence the name `cup fungi' . Apothecia range in size from a few millimeters to a few centimeters in diameter and in colour from pale brown to black and sometimes red orange or yellow. The texture is usually fleshy, fragile to tough, and sometimes leathery. They may be sessile or stalked, may be free or seated on a subiculum on a stroma or spring from a sclerotium. The uppermost portion of a mature apothecium is the hymenium which consists of asci intermingled with paraphyses. In some species the apices of the paraphyses may branch, and the

branches together form a tissue called epithecium, in a few others theapices may be merely immersed in an amorphous substance and then referred to as a pseudoepithecium. Immediately below the hymenium is a layer of light coloured hyphae running parallel to the surface of the hymenium. This layer may be thin or fairly thick and is referred to as the hypothecium. The hypothecium grades into a fairly large basal portion called the excipulum which may be differentiated into an inner medullary excipulum and an outer ectal excipulum. The outer surface of the excipulum resembles an epidermis. The different layers of a typical apothecium is illustrated in Fig. G.4 (PLATE I).

In the excipulum, stalk, sclerotium and stroma from which an apothecium may arise,the hyphae become organized into several tissue types: globose cells with intercellular spaces; isodiametric cells without intercellular spaces, brick shaped short hyphal cells, interwoven hyphae with parallel thin walled or thick walled hyphae.

The outside of the apothecium is often ornamented with characteristic hairs especially around the margin. The shape and colour of these hairs are of diagnostic value. The dehiscence of the ascus is also a major feature in distinguishing the orders. Asci are cylindrical to clavate, two— many spored, spores of various shapes.

Some of the members of this order have an apothecium modified in various ways, complexity varying from group to group.

KEY TO THE ORDERS OF THE CLASS DISCOMYCETES

Ascocarp almost always subterranean; ascospores not violently discharged into the air — TUBERALES P:23

Ascocarps almost always produced above ground; ascospores violently discharged into the air — PEZIZALES P:24

ORDER TUBERALES

In this order the ascocarp is a modified apothecium,more or less globose, sometimes completely closed and sometimes with a small opening, characteristically subterranean either close to the surface of the soil or at a considerable depth, sometimes growing among decaying leaves,varying in size from a few millimeters to three or more centimeters. In this group various stages can be traced between a single large cavity lined by the hymenium to one in which the hymenium is thrown into closely spaced ridges and folds with a very large hymenial surface; the convolutions of the hymenium giving the appearance in sections of separate chambers within the fruit body. Asci are indehiscent. When mature they give a powerful smell which attract soil animals, which eat the fruit bodies. Ascospores are dispersed after passing through the alimentary canal of the animals. Asci are 1 - 8 spored;ascospores with ornamented epispores at maturity and with cyanophilic markings.

KEY TO THE GENERA OF THE ORDER TUBERALES

Paraphyses fused apically to form a layer over the asci - Petchiomyces (11)

Paraphyses not as above - Tuber (12)

11. Petchiomyces Fisher and Mattir. (Plate IV FIG. 11)

Periphery of apothecia curved upward causing the fructification to appear as a hollow knob. The outer surface of this structure consists of the rind tissue and the hymenium covers the inner surface.

1 species recorded.

1) P. thwaitesii (B. & Br.) E.Fish & Mattir.
On decaying wood,dead leaves. P: 20

12. Tuber Mich ex Fr.(Plate V Fig. 12)

Mature ascocarp is enclosed by a special sheath, is irregular, globose, fleshy in some species,woody in others; internally the walls of the `chambers' are extensively branched and the free space between them is diminished so that opposite layers of the hymenium are brought close together and constitute the so-called fertile veins. The hymenial chambers become obliterated by the asci and paraphyses; asci ovoid or spherical and project into the epithecial tissues at various levels; spores ornamented usually, four but may be reduced to two or one.

Ascocarps of many species are edible and are known as truffles. Some species form mycorrhizal associations with trees.

1 speceis recorded.

1) T. zeylanicum B. & Br. P: 21

ORDER PEZIZALES

This order is characterised by their fleshy or sometimes brittle to leathery rarely gelatinous apothecium bounded by a more or less definite peridium, or more or less globose at first and is later pushed open by the growth of a conical mass of paraphyses giving the mature fruit body its cup or saucer or almost completely plane shape. Asci are arranged in a distinct hymenium,typically cylindrical to clavate and characteristically open by an apical or subapical lid or operculum and rarely by a vertical apical slit, usually 8 - spored but some contain 2 -16 or more spores. Ascospores hyaline or brown, typically 1-celled.

Plate V Figure 12 - 22

Figure 12 Tuber sp

a) entire - surface view
b) portion of hymenium
c) ascus & spores

Figure 13 Peziza sp

a) P. epispetula entire

Figure 14 Otidea spp

a) entire
b) Ascus & paraphyses

Figure 15 Lamprospora spp

L. miniata a) entire x 1
b) ascus & paraphyses x 200
c) ascospore x 500
L. asteoidee d) entire
e) ascospore x 500

Figure 16 Pitya spp

P. vulgaris a) entire x 1
b) ascus & paraphyses x 200
c) ascospore x 500

Figure 17 Humaria spp

a) entire
b) ascus & paraphyses
c) ascospore x 500

Figure 18 Geopyxis spp

a) G. hindsii entire
b) G.tricholoma entire

Figure 19 Discinia spp

a) entire

Figure 20 Ascophanus spp.

a) A. microsporus entire
b) A. microsporus spore
c) A. corneus entire
d) ascus & paraphyses

Figure 21 Ascobolus spp

a) entire
b) section

Figure 22 Saccobolus

(a) & (b) spores x 500

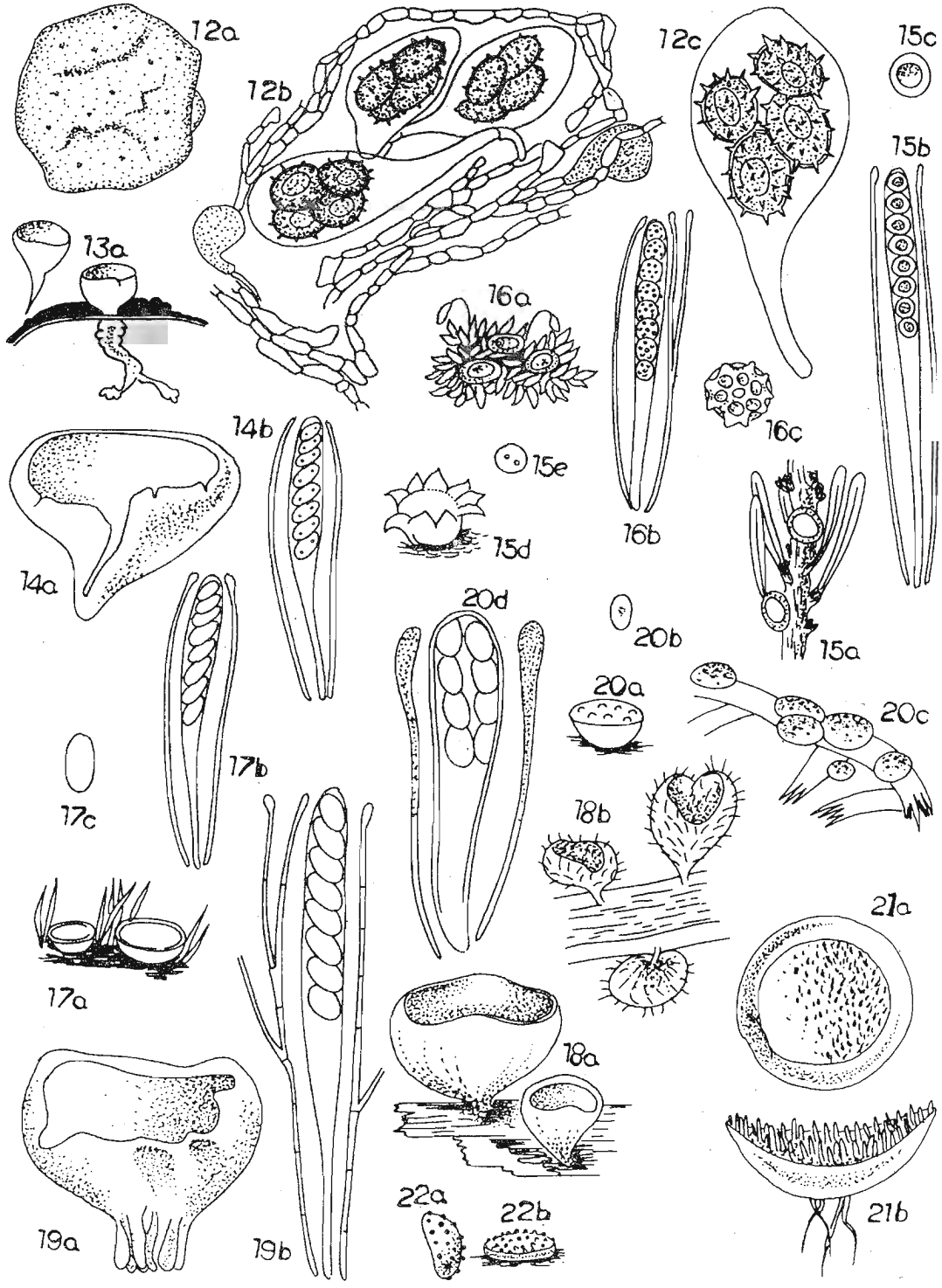


Plate V Figs. 12 - 22

KEY TO THE GENERA OF THE ORDER PEZIZALES

1 Asci mostly cylindric; not protruding - 2
Asci broad; protruding from disc at maturity - 8

2 Asci turning blue with iodine - Peziza (13)
Asci not as above - 3

3 Apothecium ear-like, cleft on one side - Otidea (14)
Apothecium not as above. - 4

4 Ascospores globose - 5
Ascospores elliptic to fusoid - 6

5 Apothecium sessile - Lamprospora (15)
Apothecium stalked - Pitya (16)

6 Apothecium stalked - 7
Apothecium sessile - Humaria (17)

7 Apothecium persistently cup shaped - Geophyxis (18)
Apothecium finally open and flat - Discina (19)

8 Ascospores coloured - 9
Ascospores hyaline - Ascophanus (20)

9 Ascospores in a gelatinous mass in the ascus - Saccobolus (21)
Ascospores free in the ascus - Ascobolus (22)

13. Peziza Dill ex Fr. (Plate V Fig.13)

Apothecium sessile but sometimes narrowed to a short stem-like base, fleshy and brittle, closed at first then expanding until cup-shaped, or quite plane or even convex; disc even nodulose or veined; externally warted, scurfy or glabrous; asci cylindrical, 8-spored, tip amyloid; ascospores elliptical, obliquely 1-seriate, 1-celled, hyaline or rarely tinged brown; spore smooth, without oil drops or ornamented by warts and ridges and usually containing 2 large oil drops.

4 species recorded.

1) P. epispartia B. & Br.
On termite nests P: 20

2) P. reticulata (B.& Br.) Petch
On wood P: 21

3) P. sarmentorum B. & Br.
On petiols P: 21

4) P. glaberrima Penz. & Sacc
Hakgala P: 21

14. Otidea Fuckel (Plate V Fig.14)

Apothecium shortly stalked or sessile, large, fleshy or somewhat leathery, externally scurfy, villose or almost

glabrous; markedly eccentric, elongated and cut down one side nearly or quite to the base so as to resemble a rabbit's ear, or irregularly contorted and often caespitose, colour some shade of yellow brown or ochroe; asci cylindrical, apex rounded or slightly truncate, 8-spored , not amyloid; ascospores elliptical to elliptic-fusiform with 2 conspicuous oil drops, obliquely uniseriate hyaline 1-celled, smooth or rough; paraphyses strongly curved at the tip, slender, septate, often forked.

1 species recorded.

1) O. lechria (B. & Br.) Sacc
On rotten wood. Peradeniya P: 20

15. Lamprospora de Not. (Plate V Fig. 15)
= Barlaeina Sacc. & Syd.(Ainsworth 1963)

Apothecia produced in usually close association with Bryophytes; usually less than 1 centimeter in diameter disc orange or red, cup shaped, sessile, nominally hairless but has a dentate fimbriate margin outer surface of which bears delicate white fibrils; asci not amyloid; ascospores globose; paraphyses with strongly curved apices.

1 species recorded under the genus Barlaeina.

1) B. verruculosa (B. & Br.) Petch P: 19

16. Pithya Fuckel(Plate V Fig. 16)

Growing on conifers. Apothecium narrowed into a short stout, stem-like base, pyriform and closed at first, then becoming almost or quite plane; margin entire glabrous, lower portion of apothecium and stem minutely villose, rather fleshy; cortex parenchymatous, cells irregularly polygonal; asci cylindrical, apex obtuse, narrowed below into a very long pedicel, 8-spored, spores globose, 1-celled,hyaline, 1-seriate.

1 species recorded.

1) P. fascicularis (B. & Br.) Sacc

17. Humaria (Fr.) Sacc. (Plate V Fig. 17)

Apothecium sessile, fleshy, closed at first finally becoming saucer-shaped or plane,clothed with brown septate pointed hairs; asci cylindrical 8-spored; ascospores elliptical, usually with 2 oil drops and rough, 1-celled, hyaline, obliquely 1-seriate. The species are generally small, rarely reaching 1 centimeter in diameter. Closely related to Peziza, which differs more especially in the apothecium being larger and granular or scurfy externally.

3 species recorded.

1) H. crenulate (B. & Br.) Sacc
On sticks Peradeniya P: 20

2) H. lacticolor (B. & Br.) Sacc
On sticks P: 20

3) H. ustorum (B. & Br.) Sacc.
On burnt earth, Hakgala P: 20

18. Geopyxis (Pers.) Sacc. (Plate V Fig.18)

Apothecium stalked, rather fleshy, closed at first then cup shaped or nearly plane, externally pilose, downy, scurfy, or glabrous; stem usually slender, often tapering at the base and rooting, not longitudinally grooved or lacunose; asci cylindrical, 8-spored; spores obliquely 1-seriate, hyaline, 1-celled, elongated. Growing on the ground or among dead leaves, rarely on wood.

1 species recorded.

1) G. harmorge (B. & Br.) Sacc.
On very rotten twigs. Peradeniya P: 19

19. Discina (Fr.) Fr. (Plate V Fig. 19)

Apothecium cup shaped, becoming expanded, hymenium yellow or brown, stalked,stalk short stout and sometimes furrowed; asci cylindrical not amyloid, with a prominent hyaline apiculus at each end.

1 species recorded.

1) D. emarginata (B. & Br.) Sacc.
On the ground or on very
rotten wood P: 19

20. Ascophanus Boud. (Plate V Fig. 20)

Apothecium small, or lenticular, somewhat fleshy, sessile externally glabrous or pilose; asci broadly clavate, cylindric-clavate or ovate, dehiscing by a convex operculum; ascospores hyaline, elongated,smooth without oil drops.

1 Species recorded.

1) A. granulatus (Bull. ex. Fr.) Speg.
On dung P: 19

21. Saccobulus Boud. (Plate V Fig.21)

Apothecium sessile, somewhat fleshy minute, at first subglobose; disc expanding and becoming plane or slightly convex, at length, studded with tips of the projecting asci; externally glabrous or pilose; asci broadly clavate-oblong apex rather truncate, base narrowed into a pedicel, 8-spored; ascospores elliptical at first hyaline, finally violet or violet brown, epispore often minutely cracked, when mature aggregated in a cluster surrounded by a special membrane and situated near the top of the ascus.

Related to Ascobolus in the coloured spores, but readily separated by having the spores enclosed in a special membrane within the ascus and aggregated in a group at the apex of the ascus when mature.

1 species recorded.

1) S. punctiformis (Ces.) Petch
On cowdung P: 21

22. Ascobolus Pers. ex Fr. (Plate V Fig. 22)

Apothecium sessile or narrowed below into a very short stem-like base, usually gregarious rather fleshy, soft and translucent when fresh, closed at first, then expanding the disc becoming plane or slightly convex ,at length studded with the tips of the projecting asci; asci clavate, 8-spored; spores irregularly 2-seriate, elliptical, 1-celled,at first hyaline then purple finally brown, epispore usually rugulose at maturity. Most of the species grow on cowdung, a few on the ground, charcoal etc.

4 species recorded.

1) A. cervinus B. & Br.
On dung P: 19

2) A. follicola B. & Br.
On dead leaves P: 19

3) A. leiocarpus B. & Br.
On dung P: 19

4) A. thwaitesii B. & Br.
On rotten wood P: 19

SUBDIVISION BASIDIOMYCOTINA

The members of this sub-division include over 15,000 species possessing a well developed perennial mycelium and a single mycelium building up numerous fruitbodies which in the majority are elaborate, conspicuous and brightly coloured, such as may be observed in mushrooms, toadstools, bracket-fungi, coral fungi, puff balls, earth stars, bird's nest fungi and stinkhorns. These thousands of different species of fungi which are frequently dissimilar in many features share one cardinal point; the principal sexual spores called the basidiospores are borne externally on a mother cell, the basidium. A typical basidium is a aseptate, (Plate VI Fig. E1.) club shaped (holobasidium) terminal cell of an ordinary hypha that becomes densely filled with protoplasm. From the rounded apex of the basidium four very slender spine-like processes, the sterigmata are produced. The tip of each sterigma becomes swollen, a portion differentiating into a spore. As a rule the basidiospores are asymmetrical in outline and the point at which they are attached to the basidia, the apiculus or hilum, remain visible. The type of basidia have a special method of disseminating their spores (Plate VI Fig. E6). The sterigmata on the developing basidium. rises above the surface of the hymenium and cuts off a spore at its tip. A drop of liquid appears at the hilum, attains a final size and separates from the sterigmata carrying the spores with it. Basidiospores which are shot violently into the air in this manner are termed ballistospores. Some members have septate basidia (phargmobasidia) (Plate VI Fig. E3, E4), usually of four celled, each cell giving rise to a single basidiospore. However within this subdivision there is a large group (Gasteromycetes) whose basidiospores are symmetrical in outline, and are not liberated by the 'liquid drop mechanism' These basidiospores are referred to as statismospores. (Plate VI Fig. E2).

Usually the basidia are borne singly, but in one group (rusts) the basidia develop in chains. In most Basidiomycetes, basidia are thin walled throughout their development and give rise to spores while they are still attached to the mycelium. However there are members (rusts and smuts) where the contents of the basidium are enclosed in a thick wall forming a teleutospore which becomes detached from the mycelium and germinate later. The form of the basidiospores is also an important criterion used in the classification of the major taxa (Plate VII Fig. G1-G5).

In great many forms some of the potential basidia develop into sterile structures called paraphyses which act as spacing elements. Besides the paraphyses some of the hyphae underlying the basidial layer may insert themselves between the basidia in the form of much modified terminal cells and

Plate VI Figure A - E

Figure A — Hyphal organisation

A1 - globose cell with intercellular spaces.
A2 - tightly packed isodiametric cells without intercellular spaces.
A3 - short celledhyphae with individual cells more or less barrel shaped.
A4 - interwoven hyphae
A5 - separable thin walled hyphae
A6 - agglutinated thick walled hyphae
A7 - hyphae which are agglutinised and interwoven mostly in 1 plate to form irregular shaped cells.

Figure B — Hyphal system

B1 - monomitic with generative hyphae
B2 - dimitic with skeletal hyphae
B3 - dimitic with binding hyphae
B4 - trimitic hyphal system

Figure C — Types of hyphae

C1 - generative hyphae
C2 - binding
C3 - skeletal

Figure D

D1 - cystidiole
D2 - incrusted cystidia

Figure E — Types of basidia

E1 - holobasidia with asymmetry
E2 - holobasidia with symmetry
E3 - longitudinally divided basidia
E4 - tuning fork type
E5 - transversely septate
E6 - metabasidia with thick wall
E7 - basidia showing water drop mechanism.

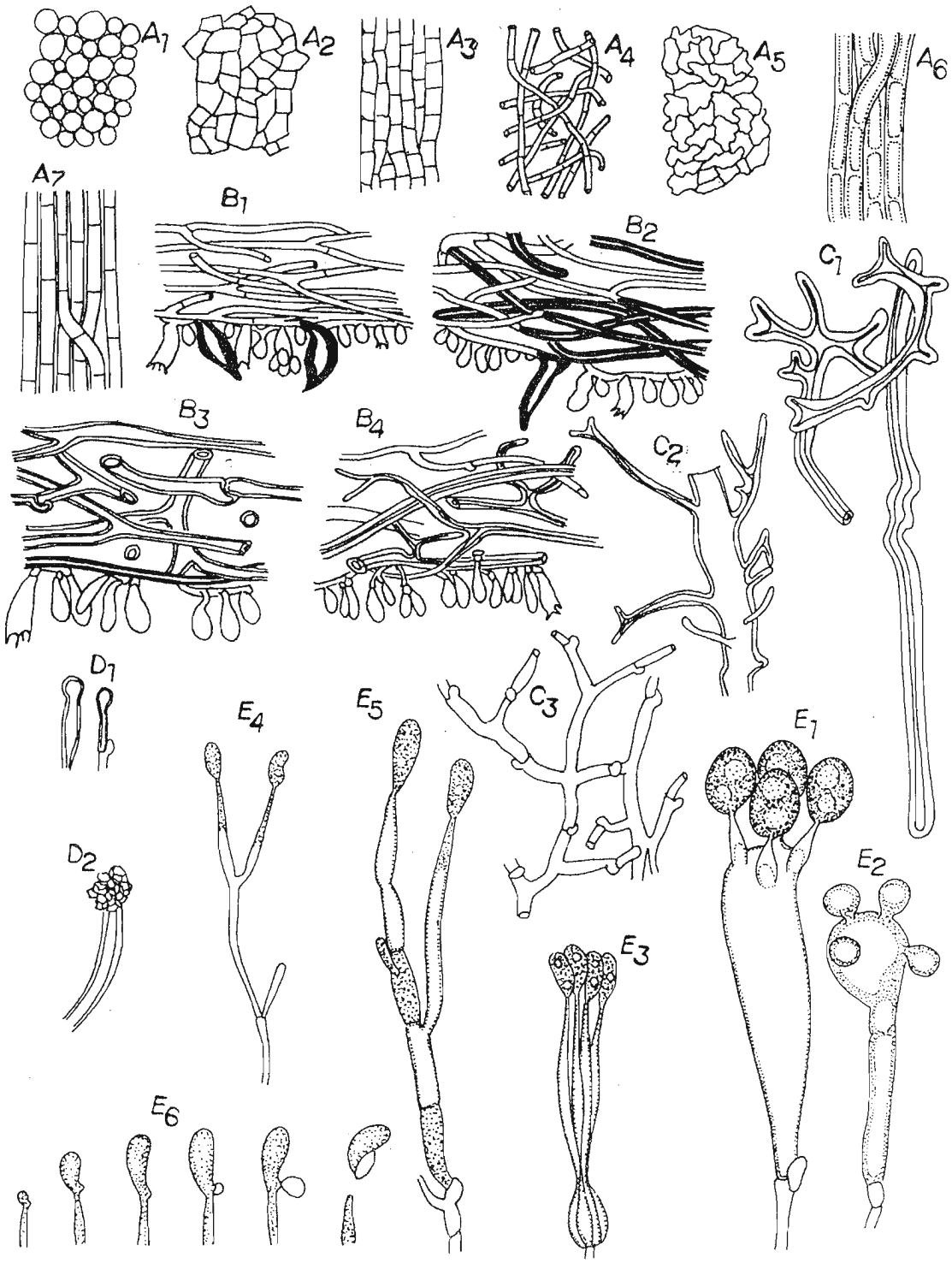


Plate VI Figs. A - E

are called cystidia. (Plate VI Fig. D2). Cystidia are varied and are named according to the location, shape, contents and function cystidia containing mucilagenous or oleagenous contents and usually at the ends of conducting hyphae underneath the hymenium, are called gloescystidia; stellately branched thick walled cystidia at the edges, pores or lamellae are called chielocystidia; those occuring on the hymenium that lines the pores or surface of lamellae are called pleurocystidia or hymenial cystidia; when present in the trama, tramal cystidia etc. Cystidioles (Plate VI Fig.D1) are yet another type of sterile structures of the hymenium, which are thin walled, about the same diameter as the basidia and usually protruding only slightly from the hymenial surface.

In the simpler forms basidia and the sterile structures associated with this develop from ordinary vegetative hyphae. In the higher forms the hyphae are organised in fruit bodies - basidiocarps, and the basidia producing hyphae are arranged in a palisade layer which constitute the hymenium. The layer which produces the hymenium and supports it, is called the hymenophore. The development of the fruit body is an important feature in the classification of the subdivision. Basically there are two types of development: gymnocarpic, with the hymenium appearing and developing to maturity on the surface of the fruit body and never enclosed by tissue as seen in the bracket fungi or angiocarpic, with the hymenium appearing, developing and maturing within a hymenial cavity which, from the first, is completely closed as seen in puff balls. A hymenium in which the collective development of the parallel hyphal ends proceeds at a uniform rate, is referred to as euhymenial, and not uniform rate catahymenial. The form and complexity of basidiocarps vary (Plate VII Fig. F1-F11).

In the simplest type of basidiomycetes the hymenium covers the entire exposed surface of the basidiocarp which shows little differentiation, a crust like expansion closely attached to the substratum throughout its entire length with the hymenium facing outwards. This type of a basidiocarp is described as resupinate. When a portion of the basidiocarp is from the substratum and curved downwards it is called effused-reflexed; when attached by a broad base to the substratum, the fruit body standing out at right angles to the substratum and often in a more or less semicircular form, the upper barren surface being the pileus and the under fertile surface the hymenium, it is called dimidiate: when hoof shaped with hymenium on the undersurface, ungulate; when three edged with 3 salient angles, triquetrous; stalks attached to the pileus on a side, laterally stipitate and stalk attached to the centre of the pileus, centrally- stipitate.

In all the higher forms the hymenium is continuously spread over surface of thin plates of tissue which are variously arranged in different groups and furnish important taxonomic characters. The hymenium may be formed uniformly on all the sides of the sporophore (amphigenous) or may be limited to certain areas (unilateral). The characteristics of the various types of fruit bodies will be discribed later in the discussion of the several classes and orders.

The traditional systems of classifications were based on the macroscopic features of the fruit body, and the ways in which the hymenium was arranged on the basidiocarps. The modern systems give importance to the microscopic features, especially the details of the anatomy of the basidiocarp, staining reactions of hyphae, spores etc. Corner (1937) was the first person to introduce the hyphal analysis into the taxonomy of some of the groups. He recognised three distinct types of hyphae in the various parts of the fruit bodies. (Plate VI Fig. C1 - C3) Generative hyphae are thin walled at least to start with, of unlimited growth, possess abundant cytoplasmic contents, and universally present in all basidiocarps. They are produced directly from the secondary mycelium and hence frequently possess clamp connections. This is the principal type of hyphae which gives rise to the basidia and directly or indirectly to all other structures. The generative hyphae may give rise to two other kinds of hyphae, skeletal, which are thick walled with narrow lumen,no clamp connections, aseptate and unbranched. These arise as lateral branches of the generative hyphae. Binding hyphae are much branched irregularly, narrow thick walled and of limited growth. When only generative hyphae is pesent in a basidiocarp hyphal system is referred to as monomitic; when generative hyphae is present along with either skeletal or binding hyphae dimitic and when all three types are present trimitic (Plate VI Fig. B1 - B4). The different types of hyphal organisations are given in Plate VI Fig. A1 - A7.

Two of the staining reactions which are used for grouping genera and species are Melzer's reagent and pottassium hydroxide. Melzen's reagent gives with spores, hyphae or both various colour reactions; when the resulting colour is reddish brown it is described as dextrinoid; bluish black to grey-black amyloid; and when greyish apparent amyloid. Pottassium hydroxide solution (3-10%) can either intensify the brown colour of the hyphal walls when described as xanthocoric, or give greenish blue, dull or dark bluish black.

The main subdivisions of the Basidiomycotina are based on the development of the basidiocarp structure, of the basidia and discharge of the basidiospores. Species with typical

Plate VII Figure F - G

Figure F Basidiocarps

F1 - resupinate
F2 - effuse reflexed
F3 - ungulate
F4 - triquetrous
F5 - dimitic
F6 - laterally stipitate
F7 - centrally stipitate
F8 - sessile
F9 - sSub stipitate
F10 - imbricate
F11 - corolloid

Figure G Basidiospore types

G1 - cylindrical
G2 - allentoid
G3 - globose
G4 - ellipsoid
G5 - with truncate base

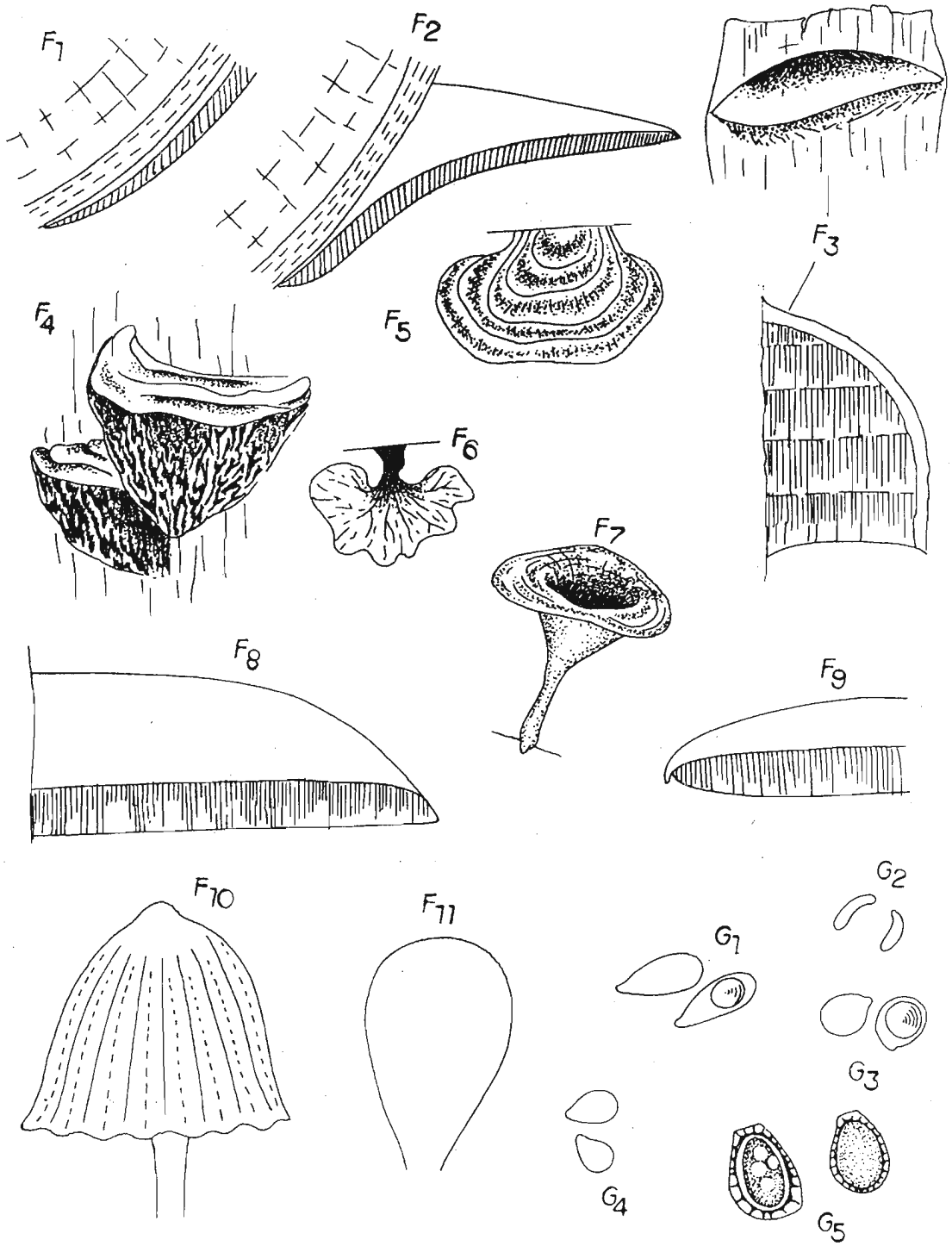


Plate VII Figs. F - G

gymnocarpic or hemiangiocarpic basidiocarps with ballistospores are included in the Hymenomycetes while typically angiocarpic species with statismospores are included in Gasteromycetes. The class Teliomycetes with basidia arising from teleutospores are not treated in this book.

KEY TO THE CLASSES OF THE SUBDIVISION BASIDIOMYCOTINA

(Based on the classification proposed by Ainsworth (1966)

Hymenium always exposed or exposed before all the spores are mature; basidiospores violently discharged (ballistospores) - HYMENOMYCETES Page 31

Hymenium enclosed within a peridium until all the spores are mature; basidiospores not violently discharged (statismospores) - GASTEROMYCETES Page 78

CLASS HYMENOMYCETES

This is the group of basidiomycetes including mushrooms,toadstools, jelly fungi, bracket fungi, coral fungi etc. The principal features of this group are: a) the basidia are arranged in a hymenium,a characteristic which gives the name to the entire group, b) the hymenium is fully exposed from the first or at all events before the spores are mature (gymnocarpic or hemiangiocarpic in development), c) basidiospores are actively discharged when mature (ballistospores). The class is further divided into subclasses based on the structure of the basidium. Members with septate basidia are included in Phragmobasidiomycetidae and those with aspetate basidia in Holobasidiomycetidae. The phragmobasidiate fungi are included in the Order Tulsanellales those having holobasidia are included in two Orders Agaricales and Aphyllophorales. The character of primary importance in distinguishing the orders of Holobasidiomycetidae consists in the arrangement of the hymenium or spore bearing layer which may be spread over gills in Agaricales and line tubes, spines or clubshaped structures etc in the Aphyllophorales. Another distinguishing character of these two orders is that the developing hymenophore is surrounded by one or more veils in the Agaricales which are absent in Aphyllophorales.

KEY TO THE ORDERS OF THE CLASS HYMENOMYCETES

1	Basidia septate or forked	- TULASNELLALES Page 31
	Basidia not as above	- 2
2	Fruit body fleshy	- AGARICALES*
	Fruit body of variable texture but not fleshy	- APHYLLOPHORALES Page 41

ORDER TULASNELLALES

This order includes members which are commonly referred to as jelly fungi bacause they develop fructifications of a jelly like consistency, the jelly substance swelling markedly when wet, but the mass collapsing and nearly disappearing when it is dry. However there are a number of species which form waxy or cartilagenous fructifications. They are generally saprophytic on wood. The hyphal system of the fructifications is monomitic. The basidium is divided by transverse or longitudinal septa or of the tuning fork type. The family Dacrymycetaceae include the members which have a hypobasidium which is thicker than the parent hypha and two long arms - the epibasidia, each of which terminates in a sterigma. The Tremellaceae have their basidia longitudinally divided into 4 quarters, each basidial cell producing an epibasidium which ends in a pointed sterigma. The Auriculariaceae and the Septobasidiaceae have a transversely or obliquely septate basidium which may or may not be differerentiated into a hypobasidium and epibasidium. A common feature of all the families is that the basidiospores germinate and may give rise to further spores - conidia or blastospores, germination described as repetitive.

KEY TO THE GENERA OF THE ORDER TULASNELLALES

1	Basidium with a cylindrical, base which forkes into two tapering arms (tuning fork type)	- 2
	Basidium not as above	- 4
2	Pileus erect, stalked	- 3
	Pileus not as above	- Dacrymyces (23)

*

Not further treated. See Coomaraswamy U. (1979)

3	Pileus only partially covered with hymenium (unilateral)	- Guepinia	(24)
	Pileus covered with hymenium on all sides (amphigenous)	- Calocera	(25)
4	Basidium transversely septate	- 5	
	Basidium not as above	- 7	
5	Septate part of basidium arising from a swollen thick cell; symbiotic-parasitic on scale insects	- 6	
	Not as above; saprophytic on fallen logs	- Auricularia	(26)
6	Mycelium covering colonies of scale insects	- Septobasidium	(27)
	Mycelium covering individual insects	- Uredinella	(28)
7	Pileus crustose, applanate or cupuloid	- 8	
	Pileus not as above	- 9	
8	Hymenium with setose papillae	- Heterochaete	(29)
	Hymenium without setose papillae	- Sebacina	(30)
9	Basidiocarp with nipple like projections; spore reniform	- Exidia	(31)
	Basidiocarp not as above; spore sub-globose	- Tremella	(32)

23. Dacrymyces Nees ex Fr (Plate VIII Fig. 23)
(frequently spelt as Dacryomyces)

Basidiocarp gelatinous or sub-gelatinous, homogenous; globose, sub-globose, tuberculate often becoming cup-shaped or flattened; hymenium covering all surfaces, smooth, wrinkled or folded; basidia bifurcate at the apex when mature; basidiospores cylindric-oblong, curved, variously septate or aseptate; conidia resemble basidiospores in size and form and are produced in chains.

Brightly coloured gelatinous fungus growing on dead wood.

1 species recorded.

D. furcifer B. & Br. P: 43
On wood

24. Guepinia Fr. (Plate VIII Fig. 24)
(= Tremiscus fide Donk)

Basidiocarp gelatinous to cartilagineo - gelatinous, versiform, the two surfaces diverse in structure; sessile or substipitate; hymenium unilateral, inferior, smooth or distinctly veined; basidia linear, deeply bifurcate; with long sterigmata, bisporous; basidiospores white, oblong or ovate, curved; conidia in chains on the surface opposed to the hymenium.

Brightly coloured and growing on the ground or wood.

2 species recorded.

1. G. cochleata B. & Br
On wood. Dolasbage P: 43

2. G. spathularia (Schw.) Fr.
On wood P: 43

25. Calocera (Fr.) Fr. (Plate VIII Fig. 25)

Basidiocarp gelatinous or gelatinoso - cartilagenous, horny when dry, vertical, cylindrical simple or branched, viscid without a distinct stem; hymenium amohigenous smooth; basidia furcate or lobed with two long sterigma; basidiospores white or yellowish, simple, becoming septate on germination and producing heads of ellipsoid sporidiola.
In habit this genus resembles Clavaria but can be differentiated by the furcate basidia and by being gelatinous when moist and horny when dry.

1 species recorded.

1. C. stricta Fr.
On wood. Dolosbage P: 41

26. Auricularia Bull. ex Merat (Plate VIII Fig.26)

Basidiocarp rosy to brown or black, rubbery, gelatinous and inflated, when moist, collapsing, when dry to thin horny and brittle structure, varying from resupinate to stipitate; hymenium unilateral on the lower surface; basidia cylindrical 3-5 celled, transversely septate, each cell producing slender epibasidium giving rise to a sterigma from its apical region; basidiospores oblong, curved, producing on germination a branched promycelium bearing several strongly curved sporidioles.

Plate VIII Figure 23 - 29

Figure 23 Dacrymyces spp

a) habit
b) basidia with unicellular basidiospores
c) germinating basidiospores
d) arthrospores

Figure 24 Guepinia peziza

a) fruit bodies x 2
b) section of fruit body

Figure 25 Calocera spp

a) C. viscosa habit x 1
b) C. cornea habit x 1 1/2
c) C. viscosa - basidia x basidiospores.

Figure 26 Auricularia auricula

a) fruit body
b) section of fruit body
c) basidia
d) stages in germination of basidiospores
e) entire

Figure 27 Septobasidium

a) section through hymenium showing probasidia, basidia & basidiospores.

Figure 28 Sebacina spp

a) globose, sessile, cruciate, septate metabasidium with developing probasidium.

Figure 29 Exidia glandulosa

a) entire x 1
b) section showing attachment on wood
c) basidium
d) spores x 500

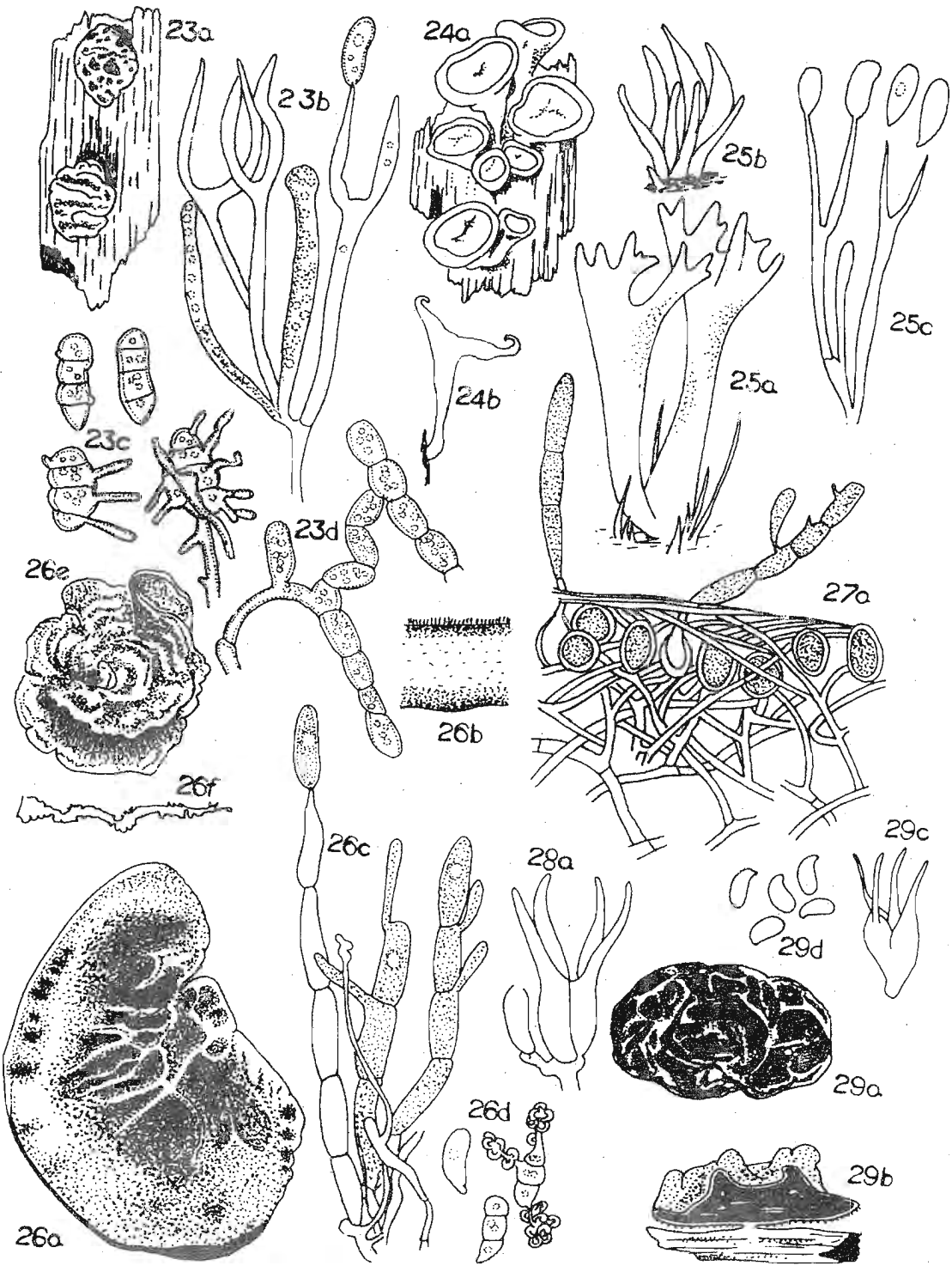


Plate VIII Figs. 23 - 29

2 species recorded.

1. A. mesenterica (Dicks.) Pers.
   On wood P: 41

2. A. polytricha (Mont.) Sacc.
   On wood P: 41

27. Septobasidium Pat. (Plate VIII Fig. 27)

Pileus coriaceous, gelatinous effuse; probasidium swollen thick walled, basidium (promycelium) growing out of probasidium well developed, firm walled, 4 celled, transversely septate, each cell giving rise to a sterigma producing a basidiospore; basidiospore, 1 - celled, obolong, hyaline, usually becoming septate after discharge and then apparently germinate only by yeast-like buds. In many species hypobasidium is dark coloured and serves as a resting spore.

22 species recorded.

1. S. accumbens (B. et Br.) Bres.
   On Oncosperma and trunks of trees P: 45

2. S. aligerum Petch
   Common above 4000 ft on shrubs, Citrus P: 45

3. S. alopecinum (B. et Br.) Petch
   On bark, Central Province P: 45

4. S. arachnoideum (B. et Br.) Bres.
   Hakgala P: 45

5. S. boedijnii Couch
   On Hedyotis and common on Lasianthus. Nuwara Eliya and Hakgala P: 45

6. S. bogoriense Pat
   On Citrus, Erythrina lithosperma and on Hemichionaspis aspidistras and on an unknown plant P: 45

7. S. capnodes (B. et Br.) Bres.
   On sticks, Central Province P: 45

8. S. curtsii (Berk.et Desm.) Boed. et Steinm
   On bamboo, Nuwara Eliya P: 46

9. S. dictyodes(B. et Br.) Eres.
With Aspidiotus Nuwara Eliya P: 46

10. S. hakgalanam Couch et.Petch apud Couch
On stems, Hakgala P: 46

11. S. leucostemum Pat.
On twigs, Central Province P: 46

12. S. lichenicola (B. et. Br.)
On bark and branches P: 46

13. S. murinum (B. et Br.) Petch
With scale insects on bark P: 46

14. S. petchii Couch
On Litsea, Murraya exotica, Psy chotria elongata, and common on Lascanthus and Cinnamomum-ovalifolium.
Nuwara Eliya and Hakgala P: 46

15. S. pteruloides (Mont.) Pat.
On branches and petioles P: 46

16. S. rhabarbarinum (Mont.) Pers.
On wood, southern area P: 46

17. S. rimulosum Petch et Couch apud Couch
On Camellia sinensis P: 46

18. S. scabiosum Couch et. Petch apud Couch
On leaves of Cordiaeum vatigatum,Peradeniya P: 46

19. S. subcarbonaceum (B.et Br.)Couch
On bark with scale insects. P: 46
Peradeniya

20. S. suffultum (B. et Br.) Pat.
On bark and on Eurya P: 46

21. S. theae Boed. et Steinm
On Camellia sinensis P: 46

22. S. thwaitesii (B. et Br.) Pat.
On Pouzolzia and Piper P: 46

28. Uredinella Couch

Forms minute circular patches overgrowing and parasitic on scale insects; colour chestnut brown toward outer part, greyish near the centre; in section composed of

hymenium and subiculum, latter made up of completely arranged septate brownish hyphae; hymenial cells of two types, one is deep brown thick walled, spherical or muriform teleutospores and other an elongated somewhat thinner walled, brown teleutospore like structure which gives rise to an allantoid spore. Basidia apparently arising from the spherical or muriform teleutospore, cylindrical 4-celled with pointed apical cell; basidiospores bent, elliptic, hyaline, smooth; basidiospore becoming septate and budding like in Septobasidium.

Single species recorded.

U. spinulosa Couch et Petch apud Couch
With Aspidiotus on leaves of
Psychotria sp. Nuwara Eliya P:46

29. Heterochaete Pat.

Basidiocarp resupinate, grey when moist, vivid brown when dry; hymenium pale brown; basidia cylindrical; basidiospores hyaline oblong to oval.

3 species recorded.

1. H. discolor (B. & Br) Petch
On bark Central Province P: 43

2. H. fimbriata Petch
On wood Peradeniya P: 43

3. H. tenuicula (Lev) Pat
Common P: 43

30. Sebacina Tul (Plate VIII Fig. 28)

Basidiocarp with a habit of a Corticium, resupinate, coriaceous gelatinous, membranous, waxy, floccose, or resupinate-effused; hymenium smooth or papillose; basidia longitudinally or cruciately divided; basidiospores white, variously shaped, producing sporidioles or conidia in clusters on germination.

Growing on ground or on wood.
Single species recorded.

S. rufochraceae. Hohnel apud Petch

On dead Hevea brasiliensis P:45

31. Exidia Fr. (Plate VIII Fig. 29)
-Ulocolla Bref.(Ainsowrh 1971)
Basidiocarp gelatinously distended, submarginate or effused, often papillose, sessile or substipitate; hymenium inferior, smooth, reticulately veined, foliaceous or papillose, basidia globose or ovoid,

typically longitudinally cruciately divided, deeply immersed in the gelatinous hyphae, sterigmata elongated and stout; basidiospores reniform 1-celled but becoming septate on germination, each cell of the spore giving rise to a promycelium, bearing sporidioles.

Single species recorded.

E.carnosa Holt.

On decaying twigs, Peradeniya P : 43

One species described under Ulocolla as U.pappilosa Holt.
On wood, Pidurutalagala P : 47

32. Tremella Dill. ex Fr. (Plate IX Fig. 30)

Basidiocarp tremelloid, generally smooth and not papillate without a defined margin; basidia globose longitudinally cruciately divided, each quandrant giving rise to a long stout sterigma; basidiospores subglobose, 1-celled, on germination forming a tube that is covered with elliptic sporidioles or tufts of conidia that bud in a yeast like manner. Conidia may also form on the fruit body before the basidia are formed.

Growing on wood.

7 species recorded.

1. T.ferruginea J.E. Sm.

On wood. Pidurutalagala P : 47

2. T.fuciformis Berk.

On wood P : 47

3. T.indurata B. & Br.

Ramboda P : 47

4. T.moriformis Berk.

On dead Orange twigs Peradeniya P : 47

5. T.scutelliformis B. & Br.

On wood. Central Province P : 47

6. T.sylvestris Holt.

   On bark P : 47

7. T.versicolor B. & Br.

   On Corticium-Peradeniya P : 47

ORDER APHYLLOPHORALES

This order with the Agaricales comprise the larger and the conspicuous Basidiomycetes. Donks (1964) concept of grouping the species into families will be followed in this treatment. Most members are saprophytic on soil, wood, litter and dung. Some species are very important plant pathogens, Basidiocarp development is gymnocarpic. The hymenium may grow on all the sides of the fruit body (amphigenous) or may restrict its growth to one side (unilateral). Hyphal system may be monomitic, dimitic or trimitic and is best seen when thick sections of the flesh of a fresh and young basidiocarp are teased out with needles under a dissecting thin microscope.

Many members of this group belong to the family Polyporaceae and are characterised by the porous nature of the hymenium, which in the most typical forms suggests the idea that the entire surface had been perforated with pinpricks closely crowded together. The little holes or pores are sometimes circular,in others angular,in outline giving a honeycomb appearance. The hymenium lines the tubes, basidia with their spores projecting into the cavity. The undersrface of the fruit body has myriads of closely packed tubes standing end on,one end of which is attached to the cap and other with its end open. In some the tubes are exceedingly shallow or practically nonexistent being reduced to very shallow pits outlined by slightly raised ribs or veins anastomosing to form an irregular net work. In some genera (Lenzites Daedalea) the elongate pores approach a gill like structure. The fruit bodies resemble crusts, shelves or mushrooms. The fruit bodies may be soft and pliable when young but are generally tough , leathery, corky or woody when mature. The group is important economically because it includes a number of serious plant pathogens. Ganoderma which belonged to this group earlier has now been separated into Ganodermafaceae because of its distinct type of basidiospore.

Hymenium may be spread over sharp pointed or awl shaped spines as seen in Hydanceae. The spines range from small granular warts, individual spines, clusters of spines to spines supported by various types of pileate basidiocarps. The basidiocarps may resemble crusts, mushrooms or corals.

Perfectly smooth hymenium is found in the families Thelephoraceae, Stereaceae, Corticiaceae, Coniophoraceae and Cantharellaceae. There is a great variety of form met with, from the perfectly flat thin films, in many cases so as to resemble a coating of grey or pink paint on a fallen twig; to a erect central stemmed species with a large thin deeply funnel shaped cap having the vague crinkles or folds in the hymenium.

Traditionally Schizophyllaceae has been classified with Agaricales but details of the fruit body development and the development of gills indicate that they are not agarics. Hymenium is uniform but spread on lamellae.

The forms included in Clavariaceae too have a smooth hymenium but the sporophores are fleshy, club shaped or much branched and coral in nature. The simplest forms are literally club shaped, growing erect and may be unbranched or bear one or more short branches. Others may show densely branched tufts. The flesh of the fungi is almost always brittle, and monomitic, with the generative hyphae sometimes inflating. Hymenium is amphigenous.

KEY TO THE GENERA OF THE ORDER APHYLLOPHORALES

1. Basidiospores truncated at the apex; ornamentations of the dark inner wall piercing the outer hyaline giving it a spiny surface - Ganoderma(33)

   Spores not as above - 2

2. Hymenium on numerous elongated tubes, free from each other; pileus present - Fistulina(34)

   Hymenium not on tubes; if tubular, tubes united laterally or tubular without a pileus - 3

3. Basidiocarps cupulate first, later discoid sometimes adjacent fruit bodies unite to form a pseudolamellate fruit body; spores hyaline and do not stain with Melzer's reagent - 4

   Not combining the above characters - 6

4. Hymenophore proliferating from marginal clefts to form longitudinally split-gills - Schizophyllum(35)

   Hymenophore not as above - 5

5. Basidiocarp seated on or in a stroma;stroma well developed, membraneous - fibrous - Stromatoscypha(36) (=Porothelium)

   Stroma very feebly developed - Henningsomvces(37) (=Solenia)

6. Basidiospores with a cynophillic wall (readily absorbing a gentian blue dye) - Coniphora(38)

   Basidiospores not cyanophilic - 7

7. Basidiocarp with hyphae of context of the pileus and trama yellowish brown in a water mount but turns dark brown permanently when moistened with 10% KOH; setae absent in most species; spores usually smooth, if ornamented not wavy or sinuose - 8

   Not combining above characters - 11

8. Hymenial setae present - 9

   Hymenial setae absent - 10

9. Surface bearing the hymenium smooth - Hymenochaete(39)

   Surface bearing the hymenium granular to tubular - 10

10. Basidiocarp stalked - Mucronoporus(40) (=Polystictus)

    Basidiocarp not stalked - Phellinus(41)

11. Context darkening or becoming greenish with 10% KOH; spores usually ornamented - 12

    Characters not as above - 13

12. Basidiocarp felt-like or hyphchnoid, composed of loosely interwoven hyphae - Tomentella(42)

    Basidiocarp not as above - Thelephora(43)

13. Hymenium on a number of projecting teeth or spines - 14

    Not as above - 20

14. Teeth or hymenium continuous from the pileus acute, smooth, connected at the base by slightly raised folds in a gill like manner or a horny-comb manner - Irpex(44)

    Not as above - 15

15. Basidiospores distinctly coloured, yellowish brown to brown - Sarcodon(45)

    Basidiospores colourless - 16

16. Basidiocarp almost exclusively terrestrial - Hydnum(46)

    Basidiocarp exclusively in or on wood - 17

17. Basidiospores amyloid - Gloidon(47)

    Basidiospores not amyloid - 18

18. Cystidia present in spines - 19

    Cystidia not present in spines - Grandinia(48)

19. Context zonate, dimitic - Steccherinum(49)

Not as above - Odontia(50)

20. Basidiocarp with short stipe, funnel shaped to trumpet shaped, fleshy; hymenium on the outer surface, hymenium on the outer surface, smooth or reticulate or with low broad rounded longitudinal ridges; spores smooth, hyaline; generative hyphae thin walled and inflating - Cantharellus(51)

Not combining the above characters - 21

21. Hymenium continuous on all the sides of,erect club-like or much branched fruit bodies - 22

Not as above - 33

22. Fruit body usually filiform; hyphae of two kinds, generative and skeletal (dimitic) - 23

Fruit body rarely filiform; hyphae of generative type only (monomitic) - 24

23. Fruit body simple to sparsely branched with a resupinate base - Pterulicium(52)

Fruit body highly branched without such a base - Pterula(53)

24. Setae loosely dichotomously branched - Lachnocladium(54)

Setae not as above - 25

25. Gloeocystidia present - Clavicorona(55)

Gloeocystidia absent - 26

26. Hyphae generally inflating; fruit bodies, fleshy, waxy or gelatinous - 27

Hyphae not inflating; fruit bodies tough - Scytinopogon(56)

27. Fruit bodies usually branched; spores coloured, if colourless then growing on or in wood or epiphytic and with thick walled hyphae - Ramaria(57)

Spores colourless, or brownish then globose and having oily drops; hyphae thin walled, if thick walled then with simple fruit bodies - 28

28. Basidiospores without oily drops - 29
Basidiospores with oily drops - 32

29. Cystidia thick walled - 30

    Cystidia if present, thin walled (except in Chaetotyphula) - 31

30. Head hollow inflated, subconical to subglobose - Physalaria (58)

    Head solid, clavate - Chaetotyphula (59)

31. Hymenium thickening - Clavariadelphus (60)

    Hymenium not thickening - Chaetotyphula (59)

32. Hyphae clamped, not secondarily septate - Clavulinopsis (61)

    Hyphae without clamps, mostly secondarily septate - Clavaria (62)

33. Basidiocarp resupinate or reflexed or stipitate; hymenial surface is increased by the development of shallow or deep pores; hyphae hyaline to brown; setae not present, spores usually smooth, not amyloid - 34

    Not combining the above characters - 52

34. Basidiocarps without a stipe but occasionally with an attenuated base - 39

35. Hymenium at the edge of tubes with sterile multicellular hairs - Elmerina (63)

    Not as above - 36

36. Pores distinctly radial - 37

    Not as above - Mucronoporus (40)

37. Pores distinctly hexagonal though often radially compressed - Favolus (64) (= Hexagonia)

    Pores not as above - Polyporus (65)

38. Hymenium on individual cups borne on a common stroma; dimitic; spores hyaline - Stromatoscypha (36)

    Not combining above characters - 39

39. Basidiocarp resupinate - 40

    Basidiocarp not resupinate - 44

40. Hymenium continuous over the edge of the dissepiments - Merulius (75)

    Hymenium discontinuous - 41

41. Cystidia or cystidioles present in the hymenium - Irpex (44)

    Not as above - 42

42. Tubes in layers - Poria(66)

    Tubes not in layers - 43

43. Basidiospores elongate - Trametes(64)

    Spores not as above - Rigidoporus(68)

44. Flesh of the pileus dark coloured from the first - 45

    Flesh pale coloured or white - 46

45. Basidiospores ellipsoid to cylindric; hyaline or dark at maturity - Daedalea(69)

    Not as above - Fomes

46. Tubes in layers - Rigidoporus (68)

    Tubes not in layers - 47

47. Pileus flesh coriaceous woody or cartilagenous - 50

    Pileus flesh not as above - 50

48. Clamp connections present - 49

    Clamp connections absent - Irpex (44)

49. Cystidia or cystidioles present in the hymenium - Lenzites (71)

    Above structures absent in the hymenium - Trametes (67)

50. Basidiocarp typically resupinate, may become dimidiate; hymenophore reticulate or with shallow irregular pores - Merulius (75)

    Not as above - Gloeoporus (74)

51. Basidiocarp effused or discoid to patelliform - 52

Basidiocarp not as above - 57

52. Catahymenial; hyphidia present - 53

Euhymenial; hyphidia absent - 54

53. Basidiospores turning blue in Melzer's reagent - Aleurodiscus(72) (=Cyphella =Dendracyphella)

Basidiospores not as above - Cytidia(73)

54. Basidiocarp hard and brittle on drying; hyphae nodulose with gelatined walls - 55

Not as above - 56

55. Hymenophore with small rounded pores - Gloeoporus(74)

Hymenophore folded like a fan or reticulate poroid - Merulius(75)

56. Cystidia present - Peniophora(76)
Cystidia absent - Corticium(74)

57. Basidiocarp spatulate and distinctly stiped - Cymatoderma(78) (= Cladoderis)

Not as above - 58

58. Basidiospores turning blue in Melzer's reagent - Stereum(79)

Basidiospores not as above - Lopharia(80)

33. Ganoderma (Plate IX Figure 31)

Basidiocarp sessile or stipitate, perennial, brown, woody fan shaped, covered with a resinuous laccate crust. Hyphal system trimitic, skeletal hyphae of two types: arboriform showing an unbranched basal part with a branched tapering end and aciculiform, unbranched end with a sharp tip. Hymenium stratified, tubes heterogenous, often stratose. Basidia globose or clavate, 4- spored; basidiospore with a truncate, apex double walled with a dark coloured inner layer ornamented;, spines of which pierce the outer hyaline layer.

Plate IX Figure 30 - 35

Figure 30 Tremella spp

a) T. mesenterica entire x 3
b) T. mesenterica section
c) T. reticulata
d) development of basidia & basidiospores.

Figure 31 Gonoderma spp

a) G. appalantum - sporophore attached to tree trunk.
b) sporophore split vertically to show two layers of hymenial tubes.
c) detail of basidiospore
d) Ganoderma sp.

Figure 32 Fistulina hepatica

a) group of basidiocarps
b) section
c) spores

Figure 33 Schizophyllum commune

a) lower side of fruit body
b) v.s of sporophore showing the divided inrolled 'gills'

Figure 34 Stometoscypha (Porothelium reticulata)

) habit x 1/2

Figure 35 Henningsomyces

a) habit x 6
b) habit x 12
c) v.s. of individual fructification
d) basidia & basidiospores
e) detail of section through fructification

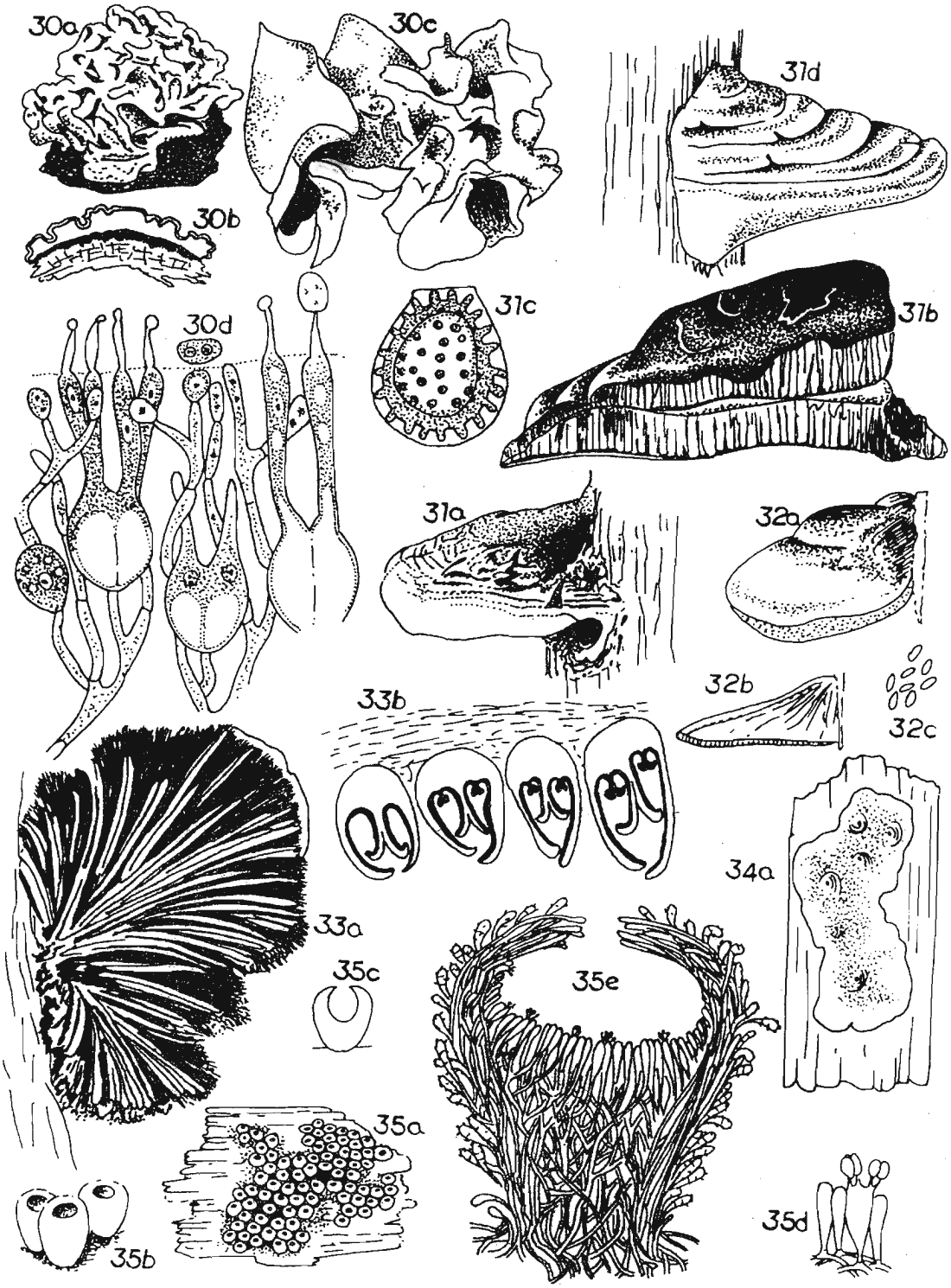


Plate IX Figs. 30 - 35

Especially tropical.

G.pseudoferreumis a root parasite of cocoa,coffee, rubber, tea etc. G.applanatum and G.lucidum are pathogens causing wood decay, of standing timber.

3 species recorded.

(1) G.applanatum (Pers.ex Fr.) Pat. P:49
(2) G.colossus (Fr.) Bres.
Eastern Ceylon P:49
(3) G.lucidum (Leyss.ex Fr.) Karst. P;49

34. Fistulina Bull. ex Fr. (Plate IX Figure 32)

Basidiocarp pileate, laterally stalked, occasionally sessile, fleshy subgelatinous in the upper layer; monomitic; hymenium on the under surface at first warted, the warts later developing into cylindrical tubes that remain distinct and free from each other; basidiospores smooth, hyaline or coloured, non-amyloid; conidia produced in cavities of the old hymenophore, coloured. Growing on wood. Annual.

Superficially resembles Polyporus but distinguished by the free tubes.

Single species recorded.
F.hepatica Fr.

On decaying wood.
Pidurutalagala
Popularly known as the beef steak fungus and is the cause of brown rot of oak.

35. Schizophyllum Fr.(Plate IX Figure 33)

Basidiocarp basically cupulate in origin,later fan shaped, sessile or laterally attached by a short base, marginal proliferations form split edge, commonly revolute, more curled in dry weather to protect the hymenium; spore print white to pinkish, spores colourless, smooth non-amyloid. Growing on wood. S.commune may rot wood.

Single species recorded.

S.commune Fr.
On wood. P:65

36. Stromatoscypha Donk (Plate IX Figure 34)

Rortheleum (Pers. ex Fr.) Fr. Ainsworth 1978

Basidiocarp cupuloid, sessile more or less crowded, distinct, seated on or immersed in a membranous or floccose stroma. Hymenium smooth, spores white smooth. Growing on wood.

Single species recorded.

P.reticulatum Petch

On wood. Hakgala and Peradeniya P;52

37. Henningsomyces O.Kuntze (Plate IX Figure 35)

= Solenia pers. ex. Fr. (Ainsworth 1978)

Basidiocarp basically cupuloid in origin, cups not expanding, scattered ordense, gregarious; seated on a felt-like thin floccose and fugaceous mycelium; monomitic; hymenium smooth, dichohyphidial hairs at least near the margins; spores smooth hyaline, non - amyloid. Growing on wood.

5 species described.

as Solenia

(1) S.candida pers.ex Fr.

On wood. P:46

(2) S.fasciculata pers.ex Fr.

On wood. P:46

(3) S.hydnoides B. & Br.

On wood, Peradeniya P:46

(4) S.ochracea Hoffm.ex Fr.

On sticks P:46

(5) S.willosa Fr.

On wood, Peradeniya P:46

38. Coniophora DC ex Merat (Plate X Figure 36)

Basidiocarp fleshy, waxy, subcoriaceous or membranous, resupinate, effused, margin definite or indeterminate; monomitic; hymenium smooth, subundulate, tubercular or granular; cystidia absent; spores smooth, brown, elliptical navicular or subfusiform, double walled, cyanophilic. Growing on wood or on the ground.

C.puteana is a cellar fungus causing rot in wood.

Single species recorded.

C.submembranacea (B. & Br.) Cooke apud Massee

Central Province P:42

39. Hymenochaete lev (Plate X Figure 37)

Basidiocarp entirely resupinate, effuso - reflexed or entirely free from the matrix and furnished with a central stem; hymenium smooth minutely velvety with rigid smooth coloured projecting setae; smooth, not amyloid. Perennial growing on wood.

Like Stereum but with brown setae in the hymenium. H.agglutianus causes canker of young hardwoods. (Ainsworth 1978)
13 species recorded.

(1) H.barbata Massee

On wood
(2) H.corrugata (Fr.)Lev. P:44

On wood
(3) H.crociereas B. & Br. P:44

On a palm
(4) H.depallens B.& Br. P:44

On dead brabches
Central Provinces
(5) H.floridea B. & Br. P:44

On tree trunks and
wood, Hakgala
(6) H.lictor Petch P:44

On fallen branches base
of Adam's peak
(7) H.nigricans (Lev) Bres. P:44

On wood
(8) H.pellicula B. & Br. P:44

On bamboo
(9) H.rheicolor (Mont) Lev P:44

Common on small dead
branches
(10) H.rigidula Berk. & Curt. P:44

decayed wood
(11) H.semistupposa Petch P:44

On bark of falled trees
Hakgala
(12) H.ubpurpurascens (B. & Br.) Massee P:44

On wood

(13) H. vagans petch

On dead twigs etc. and ascending living plants P:44

40. Mucronoporus Ellis & Everth. (Plate X Figure 38)

= Polystictus Fr (Ainsworth etal 1973)

Basidiocarp pileate; pileus coriaceous membranous or rather spongy, cuticle thick and rather fibrose, dimidiate, sessile, surface often zoned, hymenium poroid, tubes developing from the centre outwards; not stratose. Annual growing on wood often imbricate.

15 species recorded as Polystictus

(1) P. affinis (Nees) Fr.

Maha Illupallama P:51

(2) P. caperatus (Berk) Fr.

Damboul and Gannoruwa P:51

(3) P. cinerescens (Lev) Cooke.

Heneratgoda P:51

(4) P. elongatus (Berk) Fr.

Abundant at Hakgala P:51

(5) P. flabelliformis (klotz.) Fr.

Hakgala P:51

(6) P. gaudichaudii (Lev) Cooke P:51

(7) P. hirsutus (Fr.) Fr.

Nuwara Eliya P:51

(8) P. luteus-olivaceus (Berk) Cooke

Peradeniya P:51

(9) P.luteus (Blume & Nees) Fr.

Sigiriya P:51

(10) P. oblectans (Berk).) Cooke P:51

(11) P. perennis (Fr.) Cooke

Hakgala P:51

(12) P. setiporous (Berk) Cooke

Hakgala P:51

(13) P. tenuleuius Lloyd

Peradeniya P:51

(14) P. xanthopus (Fr.) Fr.

Common at low altitudes P:51

(15) P. zeylanicus (Berk) Cooke P:51

41. Phellinus Ques

Basidiocarp pileate, dimidiate; pileus surface with or without crust, context homogenous, dimitic, leathery or woody; hymenophore tubular, tubes often stratified. Annual or perennial. Common genus previously referred to under Fomes because of the perennial basidiocarps.
Single species described under Fomes as

F. annosus Corner P:48

42. Tomentella. Pat

Basidiocarp resupinate, floccose or felt like; hymenium smooth; spores globose to ellipsoid often even in outline, ornamented, brownish to colourless, non amyloid, non-cyanophilic. Flesh coloured soft. Growing on wood, mosses or on ground.
2 species recorded.
1) T. porphyrea Petch
– on wood and bark Hakgala P:47
2) T. rufobrunnea Petch
– on wood

43. Thelephora Ehrhart ex Fr (Plate X figure 41)

Basidiocarp resupinate or pileate sessile or stipitate, dimidiate; pileus coriaceous, destitite of a distinct cuticle, dry and fiborous hymenium smooth, faintly ribbed or papillose; spores coloured, globose elliptical or angular, ornamented, coloured. Growing on the ground or wood. Flesh coloured.

3 species recorded.
1) T. cristatella B. & Br.
– Peradeniya P:47
2) T. reticulata Petch
– on the ground, Peradeniya P:47

3) T. Terrestris Ehrh. ex Fr.

Hakgala

44. Irpex Fr(Plate X figure 42)

Basidiocarp resupinate or pileate; pileus coriaceous or membranous; dimidiate sessile; hymenium toothed from the first, teeth continuous from the pileus,acute,smooth, connected at the base by slightly raised folds in a gill like manner in sessile species, or like honeycomb in resupinate species. Spores white, smooth, or punctate. Growing on wood rarely on the ground.

Distinguished from Hydnum by flat irregular teeth more or less connected at the base.

5 species recorded.

1) I. depaudperatus B. & Br.

On wood, central province P:44

2) I. destruens Petch

Parasitic on Camellia sinensis P:44

3) I.flavus klotz.

On bamboo sticks P:44

4) I.subvinosus (B. & Br.) Petch

On Acacia decurrens,

Camellia sinensis, Tephrosia candida P:44

5) I.vellereus B. & Br.

On rotting logs, Hakgala P:44

45. Sarcodon P. Karst.

Basidiocarp pileate and stipitate. Pileus at first velutinous or felted, becoming glabrous, blackish-olive on drying. Spines on the underside of the pileus, whitish or pale coloured when young, becoming darker brown or reddish on drying; pileus context, brownish, turning greenish in KOH solution,monomitic, hyphae inflating, with clamp connections. Basidia clavate 4- spored,with a basal clamp; basidiospores of irregular outline, tubercular, brownish in mass. Cystidia absent.
Terrestrial or on decayed wood.

Single species recorded under Hydnum

S. thwaitesii (Berk. & Br.) Maas. G.

= Hydnum thwaitesii Berk & Br.

Peradeniya P:44

46. Hydnum L.ex Fr.(Plate X Figure 43)

Basidiocarp pileate and stipitate with central or lateral stipe or occasionally resupinate; pileus whitish to yellow or orange, fleshy, coriaceous or corky, covered with tomentum; context fleshy, monomitic, homogenous, hyphae inflating, thin walled, septate with clamp connections hymenophore covered with acute awl shaped spines on the undersurface of the pileus; spines whitish to paler or darker salmon; basidia cylindrical to clavate 3 - 6 spored, with basal clamps; basidiospores subglobose to obovoid smooth, hyaline, not amylaid. Terrestrial occasionally on decaying wood. Some species are the causes of heart wood rot in living trees

12 species recorded.

1) H. farinaceum pers. ex Fr.

On wood P:43

2) H. ferrugineum Fr. P:43

3) H. gilvum Berk.

On wood and rubbish P:43

4) H. glabrescens Berk. Rav.

On wood, Central Province P:43

5) H. hypochrum B. et Br.

On wood, Dolosbage P:43

6) H. hypoleucum B. et Br.

On wood P:43

7) H. membranaceum Bull. ex Fr.

On wood, Central Province P:43

8) H. polymorphum B. et Br.

On wood, Peradeniya P:43

9) H. pronum B. et Br.

On wood, Central Province P:43

10) H. pseudomucidum Petch

On wood P:43

11) H. scabrum Petch

On the ground, Peradeniya P:43

12) H. vagans Petch

On prunings of Camellia sinesis.

Ratnapura P:44

47. Gloiodon P. Karst.

Basidiocarp effused effuse - reflexed or pileate dimidiate to spatulate without a stipe; pielus covered with atomentum, consisting of generative hyphae, some(which)becoming skeletal hyphae. Spines on the matted underside of the reflexed portions or the pileus, dark brown or bluish; context dimitic, generative hyphae thin walled to solid without clamps; basidia clavate, 4 - spored; basidiospores subspherical to broadly ellipsoid, rough, colourless to pale brown with apicules and oil drop, amyloid. Cystidia present, cylindrical to fusiform projecting beyond the hymenium.
Single species described under Hydnum
G. nigrescens (Petch) Maas G.

= Hydnum nigrescens Petch

on decaying logs, Hakgala P:43

48. Grandinia Fr. (Plate X Figure 44)

Basidiocarp resupinate, crustaceous, effused, thin; hymenium covering the entire free surface spiny or granulose; spines or tubercles hemispherical or obtuse, or subulate or entire, apices more or less excavated; spores white or yellowish; cystidia absent, cystidioles present. Growing on wood.

Single species recored.

G. crustosa (Pers. ex Fr.) Fr.

49. Steccherinum S.F. Gray

Basidiocarp effused, effuso-reflexed or pileate; pileus tomentose or glabrous, white to brownish; spines cylindrical or flattened, pinkish to flesh in colour; context tough, whitish or pale, dimitic, hyphae not inflating, with basal clamps; spores obvoid to oblong to ellipsoid, smooth colourless, not amyloid; cystidia present. Growing on wood.

2 species recorded.

1) S. ochraceus (Pers. apud. Gmd. ex Fr.)

S. F. Gray.
= Hydnum ochraceum Pers. apud. Gmel. P:43
On sticks etc. Central Province

2) S. rawakense (Pers. apud. Gaud.) Banker
Mass 1971.

50. Odontia Fr.

Basidiocarp resupinate, effused membranaceous, crustaceous or prinose, rarely waxy gelatinous or subcartilagenous, hymenium spined; spines conical, penicillate or ciliate; cystidia present; spores white. Growing on wood.

3 species recorded.

1) O. conferta Petch

On wood P:45

2) O. membranacea Petch

Over wood, Hakgala P:45

3) O. pallida Petch

On bark, Central Province P:45

51. Cantharellus Adams. ex Fr. (Plate XI Figure 45)

Basidiocarp tubular or stalked and pileate; pileus fleshy or membranous, regular, eccentric or variously lobed; monomitic; hymenophore folded to form thick gill like structures; gills more or less decurrent, thick, margin blunt, rather waxy, narrow; spores smooth hyaline, non-amyloid.

C. cibarius, the edible chanterelle is mycorrhiza forming on several conifers and hardwoods.
(Trappe 1962)

6 species recorded.

1) C. decurrens Petch

On twigs Henaratgoda P:53

2) C. furfuraceus Petch

Amongst mosses Hakgala P:53

3) C. humilis B. & Br.

Among dead leaves and twigs P:53

4) C. inequalis B. & Br.

Peradeniya P:53

5) C. pellucidus Petch

On bark of living trees P:53

6) C. rabidus B. & Br.

On wood P:53

52. Pterulicium Corner (Plate XI Figure 46)

Basidiocarp Respinate Corticium like patch either rudimentory sterile or fertile disc or extensive with marginal growth. Hymenium sterile when facing down, the basidia and spores identical with those of the clavarioid fruit bodies. Hyphae monomitic. On this patch develops the clavarioid fruit bodies freely or sparingly branched. Hyphae dimitic with skeletal hyphae, Basidiospores white, smooth, aguttate. Basidiocarp tough with waxy hymenium.

Plate XI **Figure 45 - 47**

Figure 45 Cantharellus sp

a) mature fruit body
b) basidia & spores

Figure 46 Pterulicium sp.

a) mature fruit body x 2
b) sub-simple fruit body x 2
c) generative hypha, branching from the clamp x 1000
d) skeletal hyphae (thick walled x 1000)
e) basidia & spores x 800

Figure 47 Pterula spp

a) fruit body x 1

b) detail to show branching

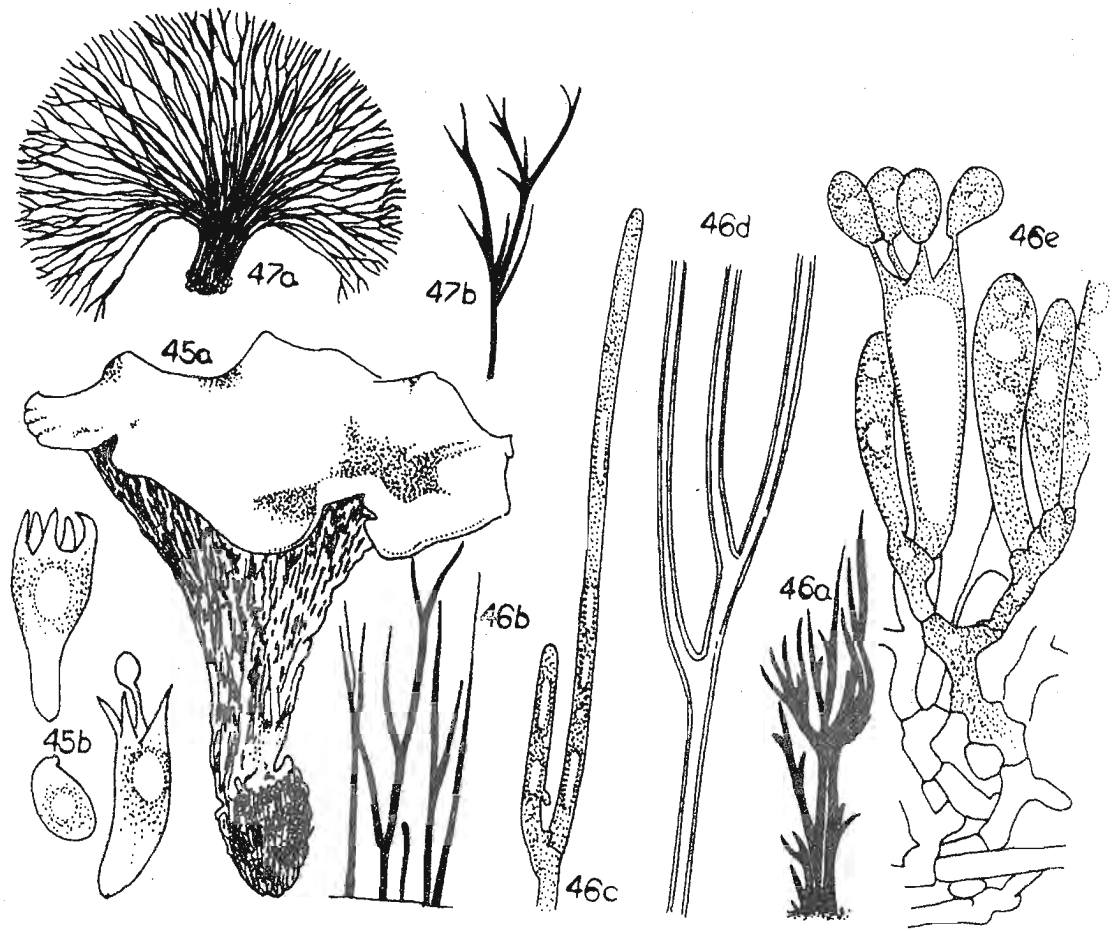


Plate XI Figs. 45- 47

Plate XII Figure 48 - 51

Figure 48 Lachnocladium aurantianum

a) fruit body x 1
b) Lachnocladium sp fruit body x 1
c) immature branch tips
d) medullary dichophysis x 500

Figure 49 Clavicorona candelabrum

a) full grown fruit body x 2
b) developing fruit bodies
c) L.S of thickened hymenium showing adjacent medullary hyphae and gleocystidia.

Figure 50 Scytinopogon sp

a) fruit body x 1

Figure 51 Ramaria spp

a) R. fragcllima fruit body x 1
b) R. fragcllima spores & basidia
c) R. zippelii fruit body x 1
d) R. zippelii normal and abnormal basidia
e) R. zippelii spores

Plate XII Figs. 48 - 51

Plate X Figure 36 - 44

Figure 36 Coniophora spp

a) fruit body
b) cords of mycelium
c) hyphae

Figure 37 Hymenochaete spp

a) fruit body growing on wood
b) detail of hymenium showing basidia & setae

Figure 38 Mucronoporus (Polystictus)

a) P. xanthopus
b) P. flabelliforms
c) P. crenatus

Figure 39 Phellinus (Fomes annosus)

a) fruit body x 1/2

Figure 40 Tomentella spp

a) fruit body x 1/2
b) spores

Figure 41 Thelephora spp

a) fruit bodies on herbaceous stem
b) fruit body
c) basidium
d) spores

Figure 42 Irpex spp.

a) I. aestrues
b) I. flavus
c) I. sp.

Figure 43 Hydnum sp.

a) fruit body entire
b) section of fruit body
c) ellipsoid hyaline spores.

Figure 44 Grandinia

a) entire

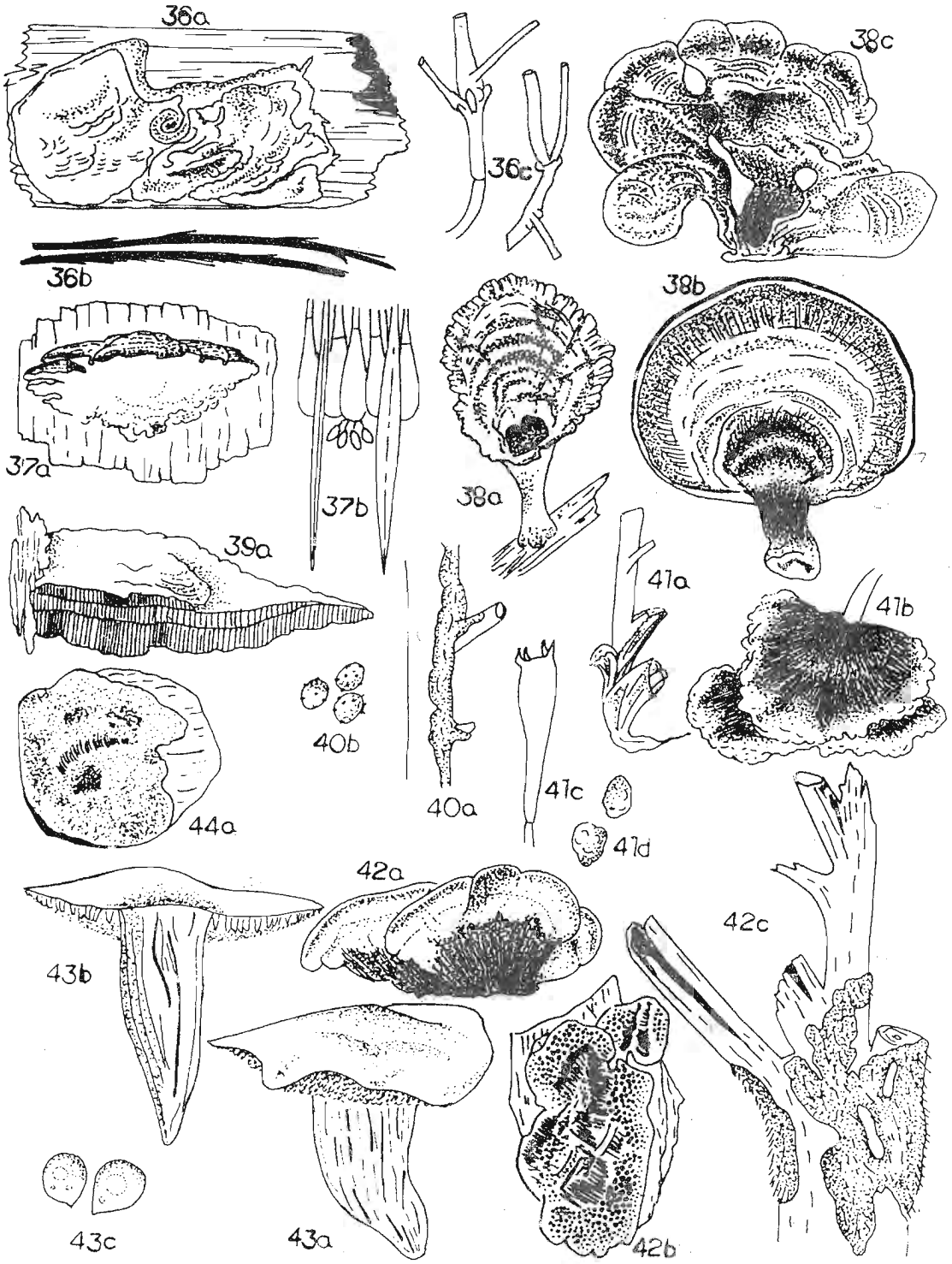


Plate X Figs. 36 - 44

Single species recorded.
Pterulicium xylogenum (B et Br) Corner

= Pterula xycogena (Bet Br) Petch
On wood and bamboo, Peradeniya P:45

53. Pterula Fr. (Plate XI Figure 47)

Basidiocarp simple or branched with a distinct short stem or with a disc; branching extensive sometimes tips reduced to single hyphae; hymenium waxy and restricted to the lateral branches; pileus flesh tough, horny and cartilagenous on drying; spores hyaline, smooth, ellipsoid to subglobose. Caulocystidia often present. Hyphae dimitic generative hyphae with clamps (few species may not have)

Growing on wood, plant remains and humus.

Single species recorded.

P. multifida Fr.

On the ground Peradeniya P:45

54. Lachnocladium Lev (Plate XII Figure.48)

Basidiocarp extensively branched, often in groups or tufts attached by a tomentose stem; branching flattened; hymenium waxy unilateral; yellowish ochraceous or rust - coloured; flesh coriaceous drying stiff and rigid. Basidiospores white smooth, aguttate. Gloeocystidia present; hyphae monomitic, septate, clamp connections absent, walls pale yellow or brown; dichopyses abundant in the mycelium and fruit body, not present in the hymenium.
Growing on wood or humus

2 species recorded
1) L. aurantiacum (B.et Br.) Petch

On decaying bark scales Hakgala P:44

2) L. furcellatum (Fr.) Lev.

Peradeniya P:44

55. Clavicorona Doty (Plate XII Figure.49)

Basidiocarp erect clavaroid, branched usually with a distinct stem or simple; branched verticillate; hymenium waxy mucilagenous; flesh toughly gelatinous dry and pliable or fibrous subcoriaceous, gloeocytidia present in hymenium and subhymenium; hyphae monomitic inflating, clamp connections present or dimitic with skeletal hyphae. Basidiospores smooth, or rough, hyaline.

Single species recorded
Clavicorona candelabrum (Massee) Corner

= Clavaria candelabrum Massee
On wood, Hakgala P:41

56. Scytinopogon Singer (Plate XII Figure.50)

Basidiocarp branched, branching in one plane, but branches may get twisted later; branches flattened; upper side of the branches sterile; flesh rather tough, fibrous, coriaceous; variously coloured or white; hyphae monomitic clamped. Cystidia absent, Basidiospores white or coloured, aguttate.

Single species recorded

S. echinosporous (B. et Br.) Corner

= Clavaria echinospora B et. Br.
Frequent amongst grass at Peradeniya P:41

57. Ramaria Gray (Plate XII Figure.51)

Basidiocarp radially branched generally coloured, flesh brittle, fleshy - fibrous, tough or gelatinous or coriaceous vinescent or rufescent; upper side of the branches sterile; hyphae monomitic, clamp connections present; cystidia absent spores coloured, guttulate in many species.

3 species recorded.

1) R. fragillima (Sacc. et. Syd.) Corner

= Clavaria fragillima Sacc. et Syd.
On the ground Hagkala P:41

2) R. megalorhiza (B. et Br.) Corner

= Clavaria untricata Ces.
Peradeniya
= Clavaria megalorhiza Bet. Br.
on the ground, on very rotten wood

3) R. zippelii(Lev) Corner

= Clavaria zippelii Lev
on the ground
P:42

58. Physalacria Pk. (Plate XIII Fig.52)

Basidiocarp simple, small, stalked, capitate, white or yellowish; head globose, conical or folded in various ways; waxy, firm; hymenium in the head, not in the stem; hyphae monomitic clamped and inflating; caulocystidia often present, Basidiospores white, smooth.

Single species recorded

P. villosa Petch

On dead leaves Hakgala P:45

59. Chaetotyphula Corner (Plate XIII Figure.53)

Basidiocarp simple very small with a head and stem; texture waxy-soft in the head, cartilagenous in the stem;

NA-88-4

Plate XIII Figure 52 - 55

Figure 52 Physalacria spp

a) fruit body x 1
b) hollow of head showin in black
c) fertile wall of head with immersed & projecting oleocystidia.
d) sterile basal part of head with lanceolate cystidia.

Figure 53 Chaetotyphula sp

a) fruit body x 5
b) developing cystidia & basidia
c) caulocystidia

Figure 54 Clavariadelphus junceus

a) fruit bodies x 1
b) rhizomorphs

Figure 55 Clavulinopsis amoena

a) variation in size of fruit bodies x 1
b) hymenium x 1000

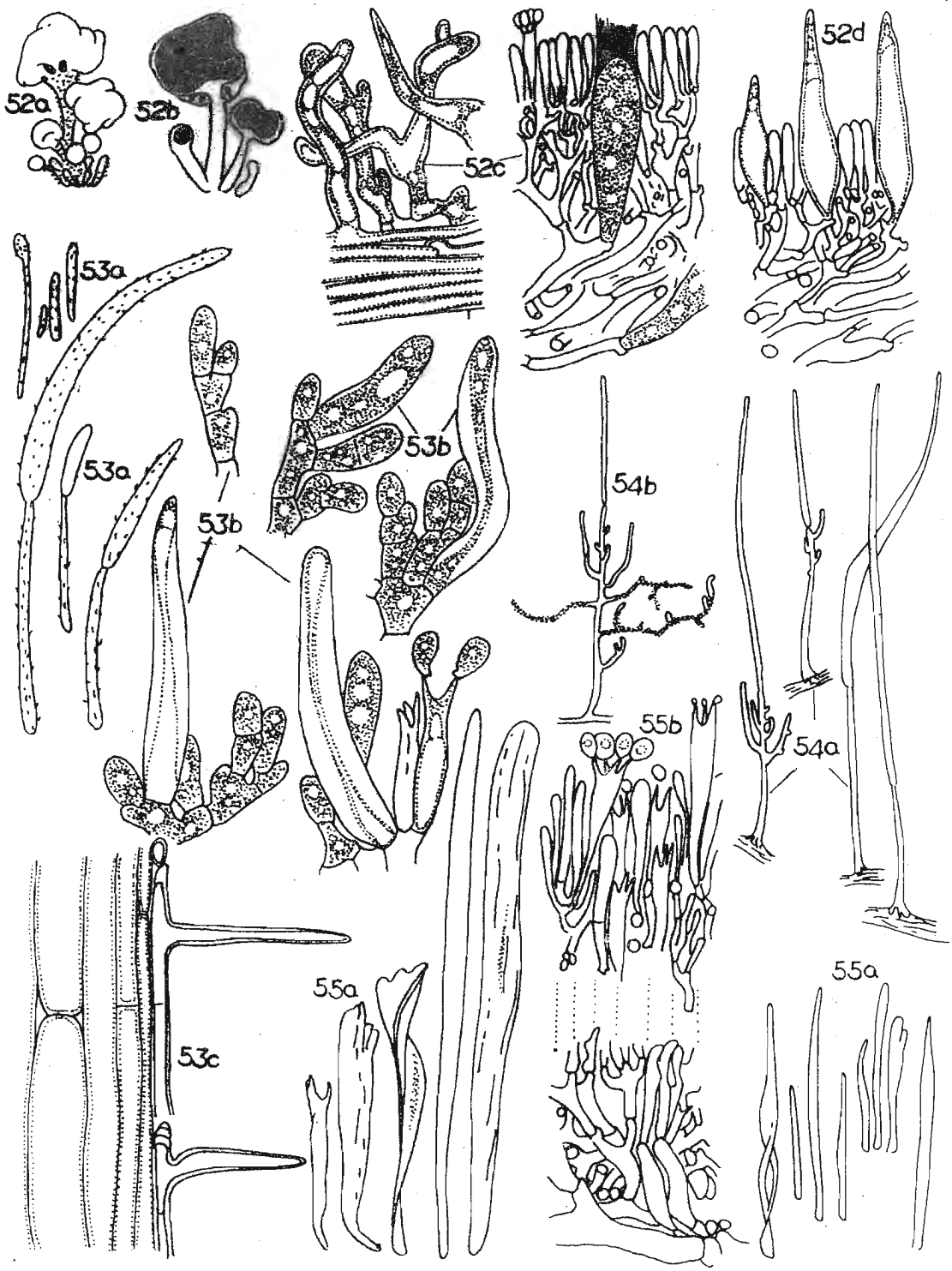


Plate XIII Figs. 52 - 55

hymenium continuous on the head absent from the stem; cystidia thick walled,projecting,setae like; hymenium monomitic inflating; clamp connections absent; basidiospores smooth hyaline.

Single species recorded.
C. actiniceps (Petch) Corner

= Pistillaria actiniceps Petch

on dead stems of Pteridium aquilinum and Rubus,

Hakgala P:45

60. Clavariadelphus Donk (Plate XIII Figure 54)

Basidiocarp massive or small;single, solitary occasionally in tufts; filiform to clavate, variously coloured; flesh firm and spongy in large fruitbodies; hyphae monomitic with clamp connections, inflating thin walled; basidiospores white or pale coloured; smooth thin walled.

Growing on wood, plant remainings or humus

Single species recorded.
C. junceus (Fr.) Corner

= Clavaria juncea Fr.

Among leaves etc. Peradeniya P:42

61. Clavulinopsis van Ov. (Plate XIII/XIV Figure 55)

Basidiocarp simple or branched radially, variously coloured with a distinct stem, stem sterile; flesh-waxy to tough, hymenium absent from the stem; hyphae monomitic clamp connections present, hyphae inflating; cystidia absent; basidiospores white or coloured, usually smooth.

Growing on the ground, occasionally on wood.

5 species recorded.

1) C. amoena (Zoll. et Mor) Corner

= Clavaria subaurantiaca P.Henn. & Nym.

On the ground, Peradeniya P:42

2) C. fusiformis (Fr.) Corner

= Clavaria fusiformis sow. ex Fr.

Amongst grass, Peradeniya P:41

3) C. luteo-tenerrima (V.Ov.) Corner

= Clavaria luteo-tenerrima v.Ov.

On the ground, Peradeniya P:42

4) C. miniata (B) Corner

= Clavaria miniata B.

On foot paths P:42

= Clavaria laeta B. & Br.

Amongst grass P:42

5) C. semivestita (B.et Br.) Corner

= Clavaria semivestita B. et Br

Frequent amongst grass at Peradeniya P:42

62. Clavaria Fr. (Plate XIV Figure 56)

Basidiocarps simple or branched; in tufts, brittle, variously coloured, with a distinct stem or no stem, branching radial; hyphae monomitic, clamp connections absent, thin walled inflating; basidiospores white or pink generally smooth.
Growing on the ground.

Plate XIV Figure 55 - 56

Figure 55 Clavulinopsis spp

a) C. fusiformis
b) C. miniata
c) C. semivestita
d) basidia
e) medullary hyphae

Figure 56 Clavaria spp

C. vermicularis a) hyphae of flesh x 500
C. vermicularis b) basidia
C. vermicularis c) spores x 1000

d) C vermicularis var. singaporensis spores x 1000

C zollingeri
e) various forms of fruit bodies
f) subsimple form
g) hymenium
h) part of old hymenium with inflated subhymenial cells.

i) C. xylarioides - habit x 1
j) C. vermiculati - habit x 1

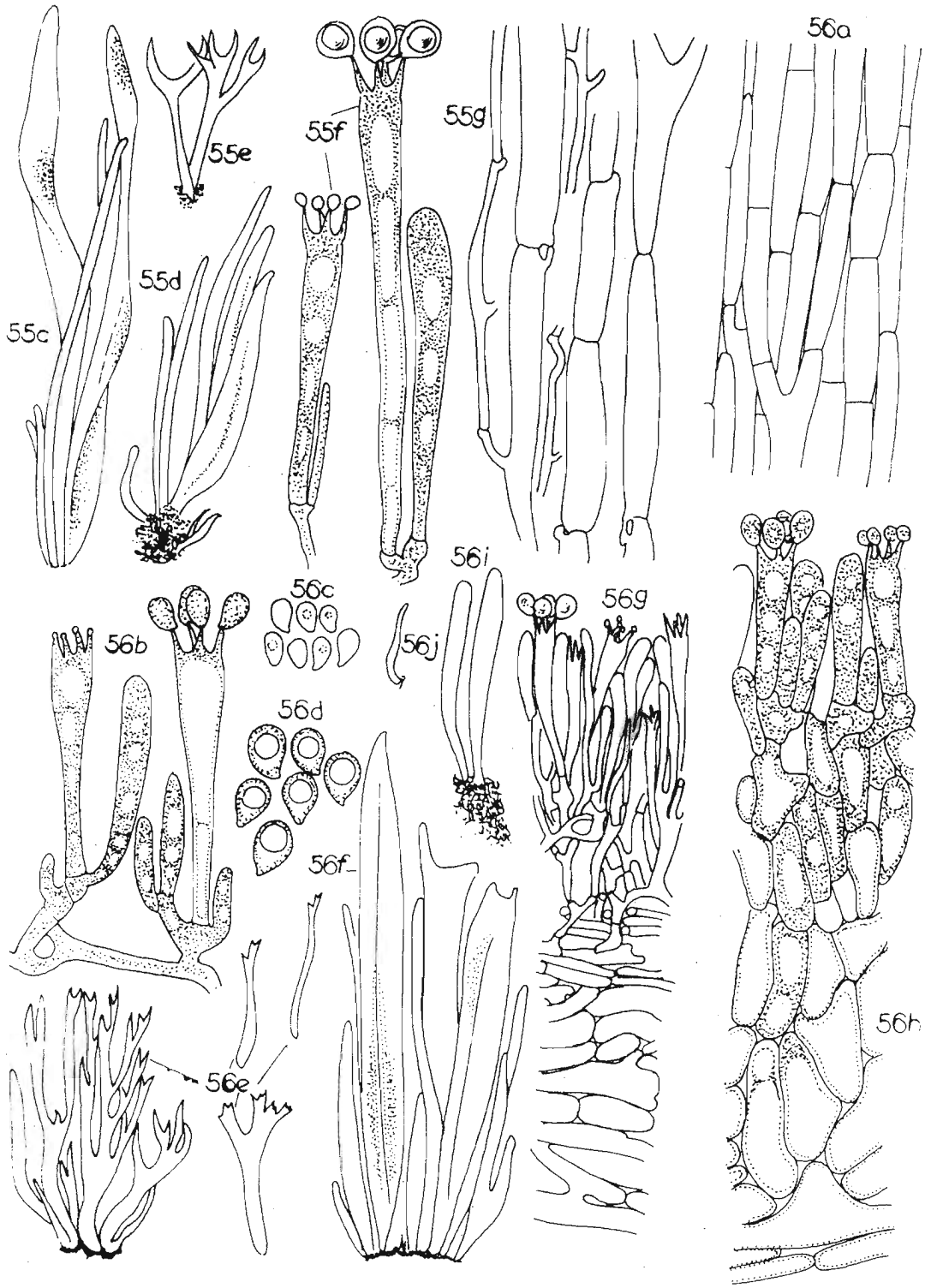


Plate XIV Figs. 55 - 56

4 species recorded.

1) C. vermicularis Fr.

Amongst grass, Peradeniya P:42

2) C. vermiculata Mich. ex. pers.

On the ground, Peradeniya P:42

3) C. zollingeri Lev

= C. violacea Petch

On the ground, Henaratgoda P:42

4) C. xylarioides Petch

On the ground P:42

63. Elmerina Bres.

Basidiocarp pileate, stipitate; stipe lateral as an attenuated base to the pileus; pileus flabelliform, thin coriaceous without a crust; context white becoming brown, monomitic; hymenium poroid, pluricellular hairs at the edge of the hymenium; spores 10 - 15 large.

Single species recorded.

E. berkeleyi (Sacc. & Cubb.) Petch

On a fallen log P:55

64. Favolus (Beauv. ex Fr.) Fr. (Plate XV Figure 57)

= Hexagonia Poll. ex Fr. (Ainsworth et al 1978)
Basidiocarp pileate, sessile or substipitate, dimidiate; tubes from the first, dilated in distinct hexagonal channels, although often radially compressed.;

2 species recorded

1) F. ciliaris Mont. P:48

2) F. multiplex Lev.

Common on wood at Peradeniya P:48
13 more species described as Hexagonia

3) H. adnata B. & Br.

4) H. apiaria (Pers) Fr.

Common in the dry zone P:49

Plate XV Figure 57 - 58

Figure 57 Favolus spp

F. discipoda

a) habit
b) lower surface
c) detail of lower surface

F. multiplex

d) habit (left of diagram depicts the lower surface)

e) detail of lower surface
f) V.L.S

F. tepelatus

g) habit
h) lower surface

F. ciliaris

i) habit

F. hirtus

j) habit

Figure 58 Polyporus sp.

P. rugosus

a) fruit body x 1

P. zonalis

b) fruit body

P. rupiceps

c) fruit body x 1

P. arcularius

d) fruit body
e) L.S. of fruit body

Polyporus sp

f) fruit body
g) thin walled filaments from flesh
h) spores

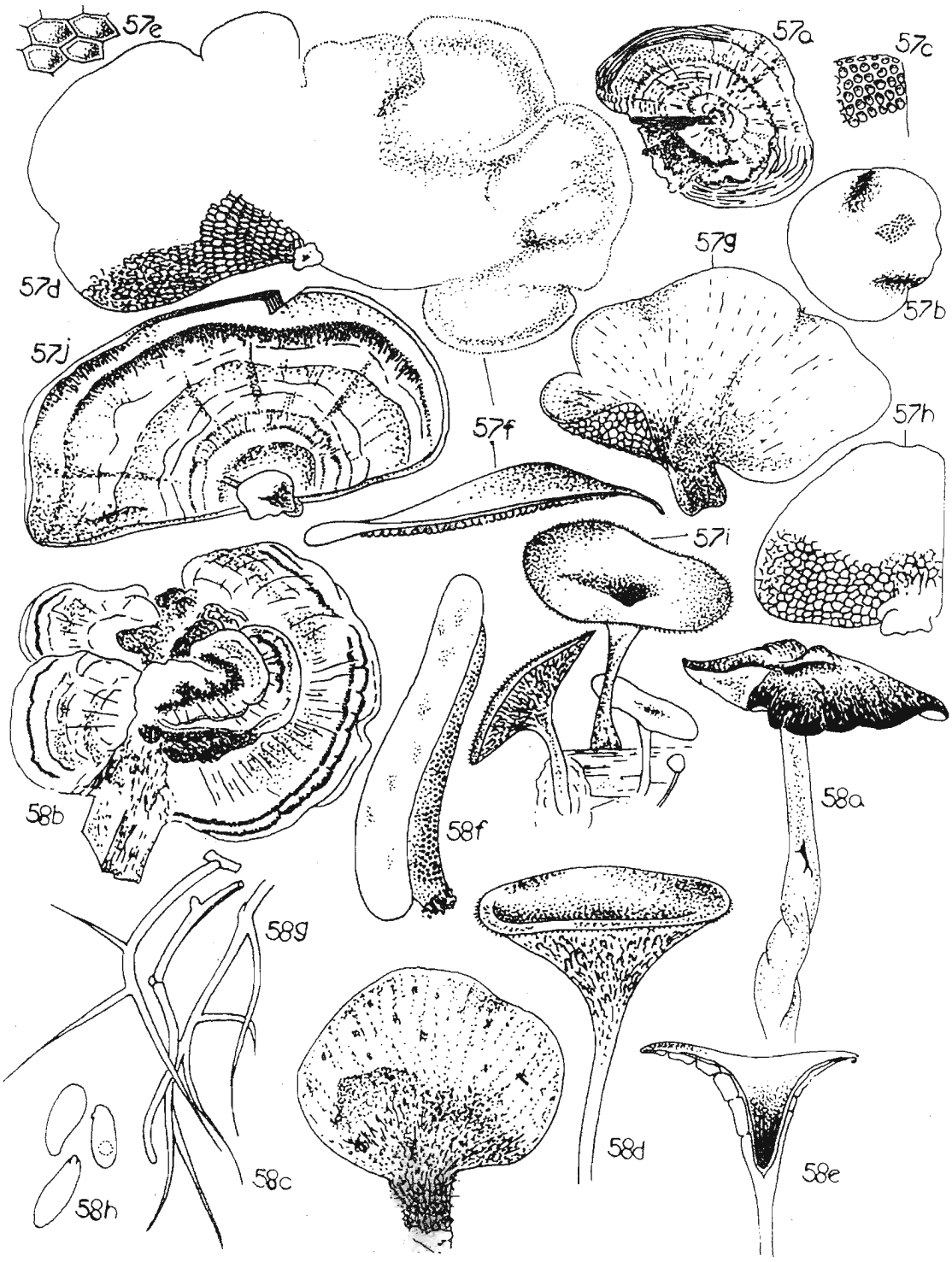


Plate XV Figs. 57 - 58

5) H. brevis Berk P:49

6) H. burchelii Lloyd. Hakgala

7) H. deschampsii Har. P:49

8) H. discopoda Pat. & Har.

9) H. miquelii (Mont.) Sacc. P:49
Frequent at Peradeniya P:49

10) H. pulchella Lev.
Peradeniya P:49

11) H. ruficeps (B. & Br.) Petch
Peradeniya P:49

12) H. scabra (B. & Br.) Petch
Peradeniya P:49

13) H. sulcata Berk.
On wood P:49

14) H. tenvis (Hooker) Fr.
Peradeniya P:49

15) H. velutina Mont. P:49

65. Polyporus (Mich.) Fr. ex Fr. Plate xv Figure 58

Basidiocarp pileate, central or lateral stemmed, dimidiate; pileus fleshy, tough, rather soft and moist, at length becoming harder; externally neither sulcate nor zones, but the internal texture consisting of radiating fibres often more or less zoned. Pores never stratose; tubes not separable from the sporophore, pores at first obsolete or none, then rounded, angular or torn.

Some species are important plant pathogens,

57 species recorded.

1) P. abruptus Berk P:50
2) P. agariceus Berk P:50
3) P. anebus Berk P:50
4) P. aneirinus Fr. P:50
5) P. appendiculatus B & Br. P:50
6) P. caesius Fr. at Hakgala P:50
7) P. carneofulvus Berk - Hakgala P:50
8) P. cervinogilvus Jungh P:50
9) P. elemensiae (Murri) Sacc. P:50
10) P. cupreus fr. P:50
11) P. dichrous Fr. Yattiellagalla P:50

12) P. dictyopus Mont P:50
13) P. didrichsenii fr. Mirihana P:50
14) P. discipes Berk P:50
15) P. durus Jungh /common at low altitudes P:50
16) P. emerici Berk. ex cooke Peradeniya P:50
17) P. fumoso-olivaceus Lloyd Diyatalawa P:50
18) P. gilvus Schw P:50
19) P. grammocephalus Berk Common at low altitudes P:50
20) P. hemicapnodes B. & Br. Dolosbagei P:50
21) P. heteroporus Fr. Hakgala P:50
22) P. hydnophorus B. & Br. on wood P:50
23) P. inornatus Petch, on wood, Henaratgoda P:50
24) P. intactillis Lloyd Hakgala P:50
25) P. interruptus B. & Br. on wood P:50
26) P. introfuscus Petch - Peradeniya P:50
27) P. licnoides Mont. Kalutara P:50
28) P. mesotalpae Lloyd, on rotten stumps and roots P:50
29) P. molliculus Lloyd Hakgala P:50
30) P. nongravis Lloyd - Peradeniya P:50
31) P. obovatus Jungh - on wood P:50
32) P. obscurus Petch - on rotten wood, Peradeniya P:50
33) P. obtusus Berk - Peradeniya P:50
34) P. ochroleucus Berk - common at Hakgala P:50
35) P. ostreiformis Berk - on wood P:50
36) P. pilosus Petch - Peradeniya P:51
37) P. resinaceus Bond - Hakgala P:51
38) P. rhipidium Berk - common in tropical forests P:51
39) P. rubidus Berk P:51
40) P. rugosus Nees fairly common on the ground round decaying stumps P:51
41) P. russiceps B. & Br. on wood P;51
42) P. sanguineus Fr. P:51
43) P. secernibilis Berk At higher altitudes P:51
44) P. semilaccatus Berk P:51
45) P. sideroides Lev
At low altitudes on palm stems;
at Hakgala on stumps of Dicotyledons P:51
46) P. slennicolor Berk ex. Cooke on tree trunks P:51
47) P. stereinus Berk Pundaluoya P:51
48) P. substygius B. & Br. ex cooke P:51
49) P. udus Jungh, Peradeniya P:51
50) P. velutinosus (Lloyd) Lloyd, Peradeniya and Kurunegala P:51
51) P. versicolor Fr. common at Hakgala P:51
52) P. vinosus Berk, Hapugastenne and Peradeniya P:51
53) P. violaceo-cinerascens Petch, Peradeniya P:51
54) P. vittatus Berk, Hakgala P:51

55) P. vivax Bert, Hakgala P:51
56) P. zonalis Berk, common at low altitudes P:51
57) P. zonatus fr.Pidurutalagala & Nuwara Eliya P:51

66. Poria Pers. ex S.F.Gray (Plate XVI Figure 59)

Pileus entirely resupinate, forming more or less extended patches or thin membranaceous expansions, coriaceous, or corky; pores round angular forming a continuous stratum springing from a thin layer which in some instances is exceedingly thin and rudimentary showing the mycelium; spores white or coloured. Growing on wood separated from Polyporus because of the entirely resupinate habit. Some species are serious root pathogens, but typically wood saprobes.

23 species recorded

1) P. albobrunnea petch

On Acacia decurrens Hakgala P:52

2) P. albocitrina Petch

On wood, Kiriwanaketiya P:52

3) P. calcicolor Sacc.

On wood, central Province P:52

4) P. callosa (Fr.) Cooke on wood, central Province P:52

5) P. contigua (Fr.) Karst P:52

6) P. diversipora B & Br. Cooke

On wood, central province P:52

7) P. endoxantha petch

On wood, Gollinda P:52

8) P. epilinti (B. & Br.) Cooke P:52

9) P. fuligo (B. & Br.) Cooke

On dead palm, Peradeniya P:52

10) P. glivoides Petch

On a dead branch, Peradeniya P:52

11) P. glaucescens Petch

Hakgala P:52

12) P. hypobrunnea Petch

Causing red root disease of Heavea brasiliensis, Camellia sinensis, Tephrosia candida P:52

13) P. hypolateritia (Berk) Cooke

A cause of of red root disease of Camellia sinensis; on stumps of Symplocos spicata P:52

Plate XVI Figure 59 - 61

Figure 59 Poria spp

a) P. ravenalae - fruit body on sugar cane
b) P. mellea - fruit body on bark
c) P. mellea - fruit body on tea
d) P. mellea - details to show pores x 15

Figure 60 Trametes spp

T. persoonii

a) fruit body

T. cingulatum

b) fruit body
c) dorsal & ventral views (fruit body)

T. occidenita

d) fruit body } dorsal &
e) fruit body } ventral

Figure 61 Rigidopous spp

a) fruit body

b) & (c) Fomes sesmitostus - fruit body dorsal & ventral views

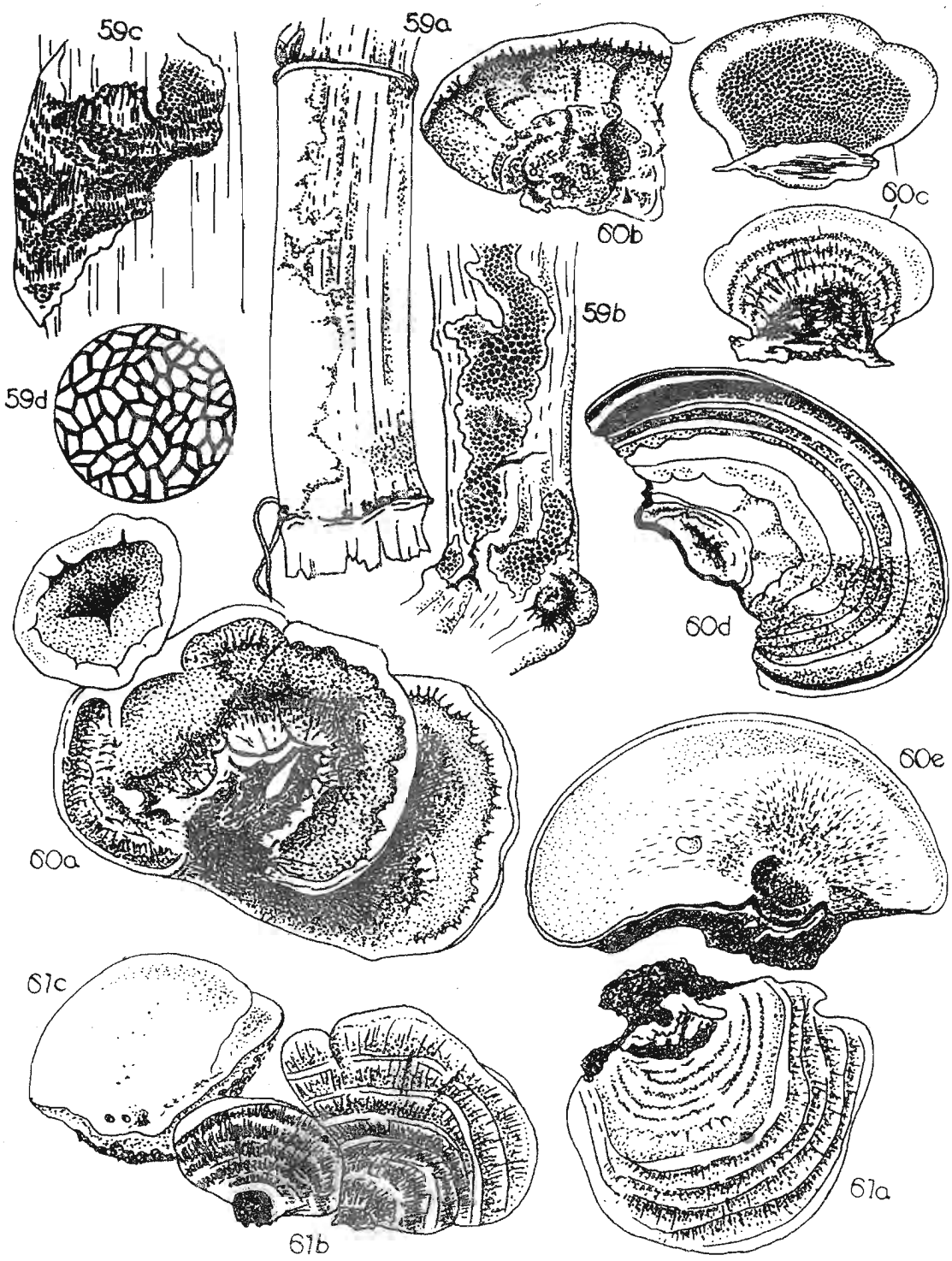


Plate XVI Figs. 59 - 61

14) P. leptoderma (B. & Br.) Cooke

On wood, Central Province P:52

15) P. mellea (B. & Br.) Cooke

Peradeniya P:52

16) P. purpureogilva Petch

On dead branch, Peradeniya P:52

17) P. ravenalae (B. & Br.) Cooke

Common at Peradeniya on dead palms P:52

18) P. rubescens Petch

on rotten wood, Hakgala P:52

19) P. rubrochorda Petch

At the base of clumps
Dendrocalamus gigantea Peradeniya P:52

20) P. subvincta (B. & Br.) Cooke

On wood, Dolosbagei P:52

21) P. sulphurea Petch

On wood Hakgala P:52

22) P. valantii (Fr.) Cooke

Over rotten wood and soil P:52

23) P. variolosa (B. & Br.) Cooke

On wood P:52

67. Trametes Fr. (Plate XVI Figure 60)

Basidiocarp rusipinate or pileate; pileus woody, coriaceous, or corky, sessile or attached by a lateral base, flabelliform, applanate or conchate;spores roundish or more or less elongated radially, sometimes two to three obscure strata; tubes of different lengths homogenous with the substance of the pileus and not forming a distinct layer, regular, round or oblong; hyphal system trimitic; spores white rarely yellowish. Annual or perennial. Growing on wood or very rarely on the ground, sometimes imbricate. setae absent, cystidia present in some species.

Living trees are attacked by T. pini and others.

19 species recorded.

1) T. badia Berk

Moratuwa and Korossa P:52

2) T. cingulata Berk. P:52

3) T. dubia (Berk) Petch

On wood P:52

4) T. glibosa (Pers. ex Fr.) Fr. P:52

5) T. lactinea (Berk) Sacc.

Peradeniya and Gannoruwa P:52

6) T. levis Berk.

7) T. lutescens (Pers.) Lloyd

Hakgala P:52

8) T. meyeni (Klotz.) Lloyd

Peradeniya P:52

9) T. mollis Fr.

Common at Hakgala on dead stumps of Acacia decurrens P:52

10) T. nubila (Fr.) Lloyd

Pitakande P:52

11) T. occidentalis (Klotz) Fr. P:52

12) T. persoonii (Fr.) Lloyd P;53

13) T. picta (Berk) Lloyd

Hakgala P:53

14) T. polyzona (Berk) lloyd

Hakgala P:53

15) T. roseola Pat. & Har.

Pallegodde P:53

16) T. straminea (Pat.) Lloyd

Peradeniya P:53

17) T. serpens (Fr.) Fr.

Peradeniya P:53

18) T. versatilis Berk.

19) T. versiformis B. & Br.

On wood, central Province P:53

68. Rigidoporus Murrill (Plate XVI Figure 61)

Basidiocarp usually resupinate occasionally dimidiate, lacking a stipe but may have a attenuated base,hymenophore tubular,tubes not stratified,tubes not arising independently, hymenium discontinuous over the dissepiments; context homogenous very thin, readily separable from the substrate; spores ovoid, globose or ellipsoid, smooth and hyaline.

Single species recorded.

Plate XVII Figure 62 - 64

Figure 62 *Daedalia spp*

Daedalia flavida

(a) & (b) fruit body, dorsal & ventral views x 1

Daedalia sp.

c) fruit body x 1

D. hobsoni

d) fruit body growing on wood x 1
e) under surface (detail)

Figure 63 *Formes spp.*

F. lucidus x 1

a) Top surface
b) under surface

F. setulosus x 1

c) top surface
d) under surface

Figure 64 *Lenzites rapanda*

a) fruit body x 1
b) lower surface

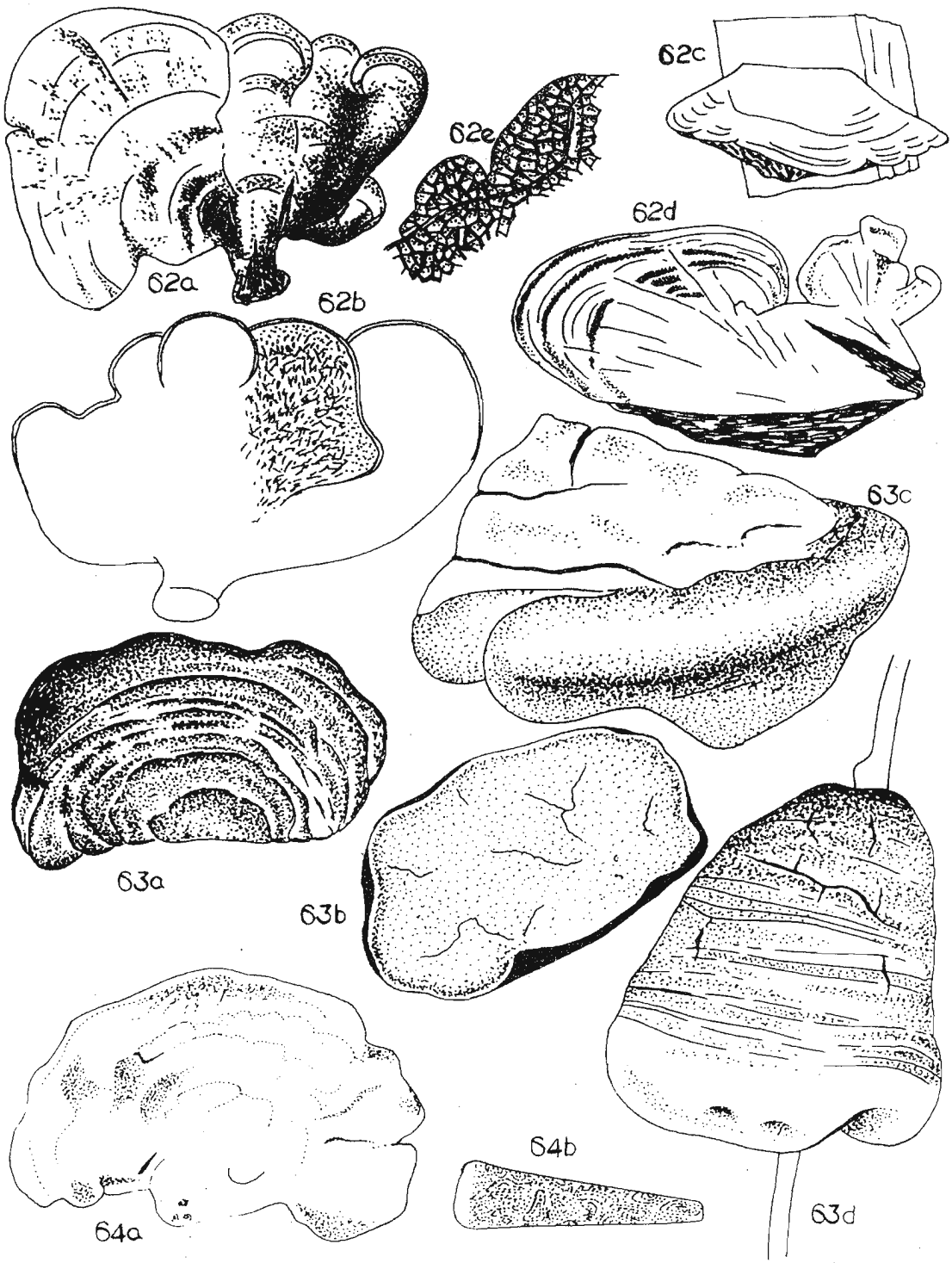


Plate XVII Figs. 62 - 64

R. lignosus

= Fomes lignosus (Klotz.) Bres.
Parasitic on Hevea brasiliensis
Camellia and Artocarpus P:48

69. Daedalea Pers. ex Fr. (Plate XVII Figure 62)

Basidiocarp annual or perennial thick,wood coloured to rust brown resupinate or dimidiate; stipitate or sessile, pileus firm, corky coriaceous or woody; hymenial tubes homogenous with the substance of the pileus and not forming a distinct layer; pores when fully formed, elongated irregularly sinuous, labyrintheform often becoming lacerated or toothed, in some species gill-like; hyphal system trimitic; cystidia absent; basidiospores white, variously shaped, smooth or punctate, 6 - 8 µmlong. Growing on wood, very rarely on the ground, sometimes imbricate.

4 species recorded.

1) D. flavida Lev P:48

2) D. pruinosa Lev
On wood, Peradeniya P:48

3) D. subsulcate B. et Br.
Peradeniya P:48

4) D. tenuis Berk.
Peradeniya P:48

70. Fomes (Fr.) Fr. (Plate XVII Figure 63)

Basidiocarp dimidiate, hoof shaped or resupinate, sessile often concentrically zoned and covered with a rigid crust, woody and hard; small at first attaining vary large size in many species; hymenium in tubes, tubes homogenous or heterogenous often stratose, the latest formed stratum alone living, if the basidiocarp in vertically definite layers of tubes can be seen clearly; spores white or variously coloured,smooth. Growing on wood and generally be recognised by the extremely minute pores.

32 Species recorded.

1) F. acupunctatus (B. et. Br.) Cooke
— ———— On wood P:48
2) F. atro-albus P. Henn
— ———— Hakgala P:48
3) F. caliginosus (Berk) Cooke
— ———— Hapugastenna and Peradeniya P:48
4) F. caryophylli (Racib.) Bres
— ———— On clove P:48
5) F. conchatus (Pers. ex Fr.) Cooke
— ———— On clove P:48
6) F. dochmius (B. et Br.) Cooke
— ———— Peradeniya P:48
7) F. endotheius (Berk) Cooke
— ———— Peradeniya P:48
8) F. epimiltinus (B. et Br.) Sacc.
— ———— On wood P:48
9) F. ferreus (Berk)
— ———— On wood P:48
10) F. floccosus Bres.
— ———— Peradeniya P:48
11) F. geotropus (Cooke) Sacc
— ———— Hakgala P:48
12) F. hornodermus (Mont.) Cooke
— ———— Kandapola P:48
13) F. imitator petch
— ———— Hakgala P:48
14) F. kermes (B. et Br.) Cooke
— ———— On wood P:48
15) F. lamaoensis (Murr.) Sacc.
— ———— Common on Hevea, Camellia P:48
16) F. melanodermus Pat.
— ———— Peradeniya P:48
17) F. mesoleucus Petch
— ———— On a stump, Warriapola P:48
18) F. obliquus (Fr.) Cooke
— ———— On wood P:48
19) F. pachyphloeus Pat
— ———— Peradeniya P:48
20) F. pallidus Petch
— ———— Common at low altitudes P:48
21) F. pectinatus (Klotz.) Gillet
— ———— Frequent at Hakgala P:48
22) F. petchii Lloyd
— ———— Hakgala P:48
23) F. rhinocerotis Cooke
— ———— Yatipanwa P:49
24) F. rimosus (Berk) Cooke
— ———— Common in the dry region P:49
25) F. robinsoniae (Murr.) Sacc. & Trott.
— ———— Hakgala P:49
26) F. sanfordil Lloyd
— ———— Hakgala P:49
27) F. senex (Nees & Mont) Sacc.
— ———— P:49

28. F. strigatus (Berk) Cooke
— ———— P:49

29. F. strigatus (Berk) Cooke
— ———— P:49

30. F. subresinosus Murr
— ———— Peradeniya P:49

31. F. ulmarius (Fr.) Cooke
— ———— Peradeniya P:49

32. F. yucatanensis Murr.
— ———— Hakgala P: 49

71. Lenzites Fr. (Plate XVIII Figure 64)

Basidiocarp dimidiate or respinate, sessile, pileus cork or leather- like or woody and cartilagenous in texture;

Plate XVIII figures 65 - 70

Figure 65 *Aleurodiscus* spp

a) (Cyphella) growing on rotting leaf
b) (Dendrocyphella) growing on rotting leaf
c) *Aleurodiscus* sp hymenium showing pseudophyses
d) *Aleurodiscus* sp hymenium showing dendrophyses & gleocystidia.

Figure 66 *Merulius* spp

a) entire
b) spores

Figure 67 *Peniophora* sp

a) section through the hymenium

Figure 68 *Corticium* spp

Corticium corneum

a) habit on wood

C. salmonicolor

b) habit on wood

C. perragium

c) cystidia

C. sp.

d) hymenium

Figure 69 *Stereum* spp

S. percome

a) habit on wood

S. elegans

b) habit
c) L.S of fruit body

Stereum sp

d) hymenium

Figure 70 *Podaxis pistillaris*

a) fruit body
b) L.S. of fruit body showing basal dehiscense.

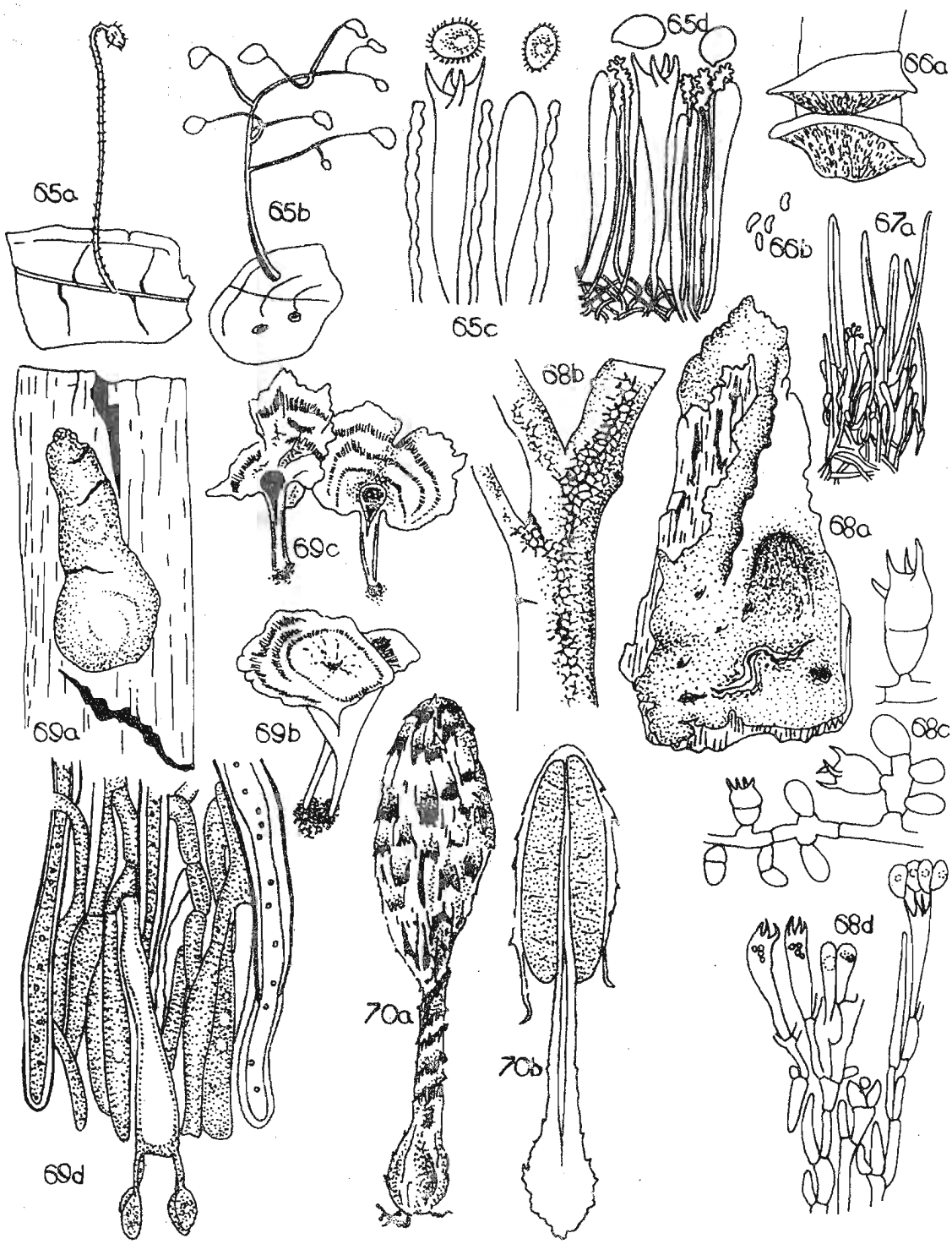


Plate XVIII Figs. 65 - 70

hymenophore lamellate, gills coriaceous anastomosing at the base and may become pore-like, homogenous with the substance of the pileus and not forming a distinct layer; context white or pale coloured, discolouring at maturity, trimitic, clamp connections present; thick walled cystidia present; basidiospores white, smooth. Growing on wood often imbricate annual or perennial not stratified.

L.sepiaria is a timber rot organism.

7 species recorded

1) L. abietina Fr.
   Hakgala P:49
2) L. aspera (Klotz.) Fr.
   On wood P:49
3) L. betulina (Fr.) Fr.
   Hakgala P:49
4) L. japonica (Berk.) curt.
   Peradeniya P:49
5) L. repanda (pers) Fr.
   Common P:49
6) L. striata (swartz ex Fr.) Fr.
   Kelaniya estate and Colombo P:49
7) L. suberruginea Berk.
   Logos estate P:49

72. Aleurodiscus Rabenh. ex Schroet.(PlateXVIII Figure 65)

Cyphella Fr.; Dendrocyphella. Petch.

Basidiocarp resupinate saucer - shaped with a free margin, or effused or adnate, stipitate, sessile or pendulous; hymenium smooth, pulverulent often containing much granular or crystalline matter; dendrohyphidia often poorly differentiated psuedohyphidia may be present; basidiospore white, echinulate rarely smooth, aculeate or asperate, amyloid. Growing on wood, scattered or gregarious.

3 species recorded.

1) A. lepra (B. et Br.) Hohnel & Litsch
   on wood P;41
2) A. miabilis (Berk.) & Curt.) H'o'hnel
   On wood P;41
3) A. scandens Petch
   On dead twigs and leaves
   Hakgala P:41

28) F. strigatus (Berk) Cooke
— ———— P:49
29) F. strigatus (Berk) Cooke
— ———— P:49
30) F. subresinosus Murr
— ———— Peradeniya P:49
31) F. ulmarius (Fr.) Cooke
— ———— Peradeniya P:49
32) F. yucatanensis Murr.
— ———— Hakgala P:49

10 species described under Cyphella

1) C. epileucina Sacc.
— ———— on dead leaves of Amomum Hakgala P:43
2) C. disseminata B. et. Br.
— ———— On old bark, Peradeniya P:43
3) C. flagellata Petch
— ———— On dead leaves Hakgala P:43
4) C. grisea Petch
— ———— On bark of living trees Hakgala P:43
5) C. parasitica B. et. Br.
— ———— Parasitic on some Sphaeria P:43
6) C. reticulata B.et.Br.
— ———— On wood P:43
7) C. spermoides B.et.Br.
— ———— On wood, Dolosbage P:43
8) C. versicolor B.et.Br.
— ———— Common on dead branches P:43
9) C. tuba (B. et Br.) Lloyd
— ———— Tropical forests P:43
10) C. villosa (Pers. ex. Fr.) B.et.Br.
— ———— On dead twigs P:43

1 species described under Dendrocyphella
On dead twigs P:43
D. setosa Petch
— ———— On dead leaves of Symplocus, Hakgala P:43

73. Cytidia Quel

Basidiocarp discoid to patelliform or shallow cupulate, coriaceous to membranous - gelatinous drying horny, sessile scattered crowded or confluent; hymenium smooth becoming wrinkled or veined; basidiospores white or slightly coloured, smooth, not - amyloid, cylindric to allantoid. Growing on wood.

Single species recorded
C. habgallae (B.et B.) Martin
— ———— On dead branches of Cinnamomum camphora, Hakgala P:43

74. Gloeoporus Mont.

Basidiocarp conchate, applanate, effuse - fredflexed to dimidiate, often laterally confluent, 3 - layered usually with a thick velutinote layer, gelatinised middle layer and the hymenium; gelatinous layer becoming horny when dry, hymenophore with small rounded pores usually grey, vinous or yellowish, hymenium continuous over the edge of the dissepinments at least in the early stage.

Single species recorded.
G. conchoides Mont.
— ———— Peradeniya P:49

75. Merulius Fr. (Plate XVIII Figure 66)

Basidiocarp effuse reflexed or pileate 3 layered usually with a thick velutinate or cottony abhymenial layer, gelatinised middle layer and a hymenium; hymenophore radiately plicate or reticulatehporoid sometimes obsoletely toothed; basidiospores white or pale coloured smooth, variously shaped. Growing on wood. Believed to be edible.

5 species recorded.

1) M. eurocephalus (B.et.Br.)Petch
— ———— Fairly common at Peradeniya in clumps of bamboos P:49
2) M. gelatinosus Petch
— ———— On a dead branch of Mangifera indica Peradeniya P:49
3) M. polychromus Petch
— ———— On walls of mud and wattle, Hakgala P:49
4) M. similis B.et.Br. P:50
— ———
5) M. versiformis B.et.Br.
— ———— P:50

76. Peniophora Cooke (Plate XVIII Figure 67)

Basidiocarp fleshy or coriaceous to densely agglutinated in texture, not very thin; hymenium waxy floccose or pulverulent, vividly coloured rosy, orange, to reddish lilac slategray, cinereous or purple brown; Cystidia present, hyphae usually densely agglutinate, hyaline to brown; spores vividly coloured in mass, ellipsoid - cylindrical.

10 species recorded.

1) P. ceracea Petch
— ———— On bark, central province P:45
2) P. decidua Petch
— ———— On dead Hevea, Palle godde P:45

3) P. excurrens Petch
— ———— On mosses leaves, Hakgala P:45
4) P. fisso-reticulata Petch
— ————————
On dead branch, Peradeniya P:45
5) P. fracta Petch
— ——— On Oncosperma Central Province P:45
6) P. gigantea (Fr.) Massee
— ———— On wood P:45
7) P. lilacina (B.et Br.) Cooke
— ———— On charred wood, Central Province P:45
8) P. papyrinum (Mont.) Cooke
— ———— On wood P:45
9) P. sparsa (B.et.Br.)
— ——— On bark P:45
10) P. stratosa Petch
— ———— On dead branch, Peradeniya P:45

77. Corticium Pers. ex Gray (Plate XVIII Figure 68)

Basidiocarp broadly effused entirely resupinate or with the extreme margin free, waxy crustaceous or floccose; hymenium smooth or tubercular waxy, continuous often cracked when dry; basidiospores white rarely coloured, variously shaped, smooth, rarely granular. Growing on wood rarely on leaves or ground. Corticium solani and Corticium salmonicolor are very important plant pathogens.

21 species recorded.
1) C. albovirescens Petch

On wood Hakgala P:42
2) C. ambiens B.et.Br.

On branches, Central Province P:42
3) C. caeruleum (Schrad. ex Pers.) Fr.

On wood Nuwara Eliya, Hakgala P:42
4) C. cacaoicolor Petch

On a dead branch, Peradeniya P:42
5) C. corneum Petch

On wood, Peradeniya P:42
6) C. emplastrum B.et.Br.

Common on dead branches of Hevea P:42
7) C. endovirgatum Petch
P:42
8) C. farctum Petch

On dead coriaceous leaves, Geekiyanakande P:42
9) C. flavocarneum Petch

On a dead branch Hakgala P:42

10) C. flavorubens B.et.Br.

On old bark, Hakgala P:42

11) C. hypochorum Petch

On a dead stem, Hakgala P:42

12) C. hypophyllum Petch

On leaves of Lasianthus, Nuwara Eliya P:42

13) C. invisum Petch

Parasitic on plants P:42

14) C. laeve (Pers. ex Fr.) Fr

On wood P:42

15) C. muscigenum B.et.Br.

On old decaying bark sometimes over mosses, on living trees; Hakgala P:42

16) C. pervagum Petch

Parasitic on leaves and twigs of Erythroxylon cocoa Peradeniya P:42

17) C. salmonicolor B. et Br.

The cause of pink disease on many plants in the tropics P:42

18) C. scariosum B.et.Br.

On wood , Hakgala P:42

19) C. simulans B.et Br.

Over running mosses P:42

20) C. solani (Prill. & Delacr) Bound. & Gaiz

On solanum tuberosum and many other plants P:42

21) C. tristiculum B.et.Br.

On dead twig, Central Province P:42

78. Cymatoderma Jungh

= Cladoderis Fr. (Ainsworth 1978)

Basidiocarp usually large and thick; surface bearing bladelike crests often covered with a thick tomentum of clamped hyphae; hymenophore inferior with fanlike folds or radiating woody branched ribs or veins. Fruit body leathery in texture semi-circular, fan shaped, infundibuliform, closely growing fruit bodies becoming confluent. Context trimitic; Basidiospores thin walled hyaline, non-amyloid. Growing on wood, dead stumps, trunks and on the ground under trees.

Single species described under Cladoderis

Cladoderis dendritica Pers.

On wood P:41

79. Stereum Pers. ex Gray (Plate XVIII Figure 69)

Basidiocarp entirely resupinate or pileate, sessile or with a distinct central stem, horizontal and attached by a broad base, infundibuliform, dimidiate or effusoreflesed; hymenium inferior in the stipitate or feflexed forms, superior in the resupinate species originating from a compact intermediate layer, smooth rarely regulose or ribbed sometimes setulose pubescent or velvety; context pale; cystidia formed from the ends of skeletal hyphae on or near the hymenium; basidiospores smooth, amyloid. Growing on wood or on the ground. Annual or perennial. Some species are the cause of tree and wood. rot.

26 species recorded

1) S. albocinctum B.et Br.
On wood P:46
2) S. annosum B.et. Br.
On wood P:46
3) S. coriacea (B.et Br.) Petch
On wood, Central Province P:46
4) S. curtum Fr.
On wood P:46
5) S. divisum Petch
On the ground P:46
6) S. duriusculum B.et. Br.
On wood P:46

7) S. elegans (Meyer ex Fr.) Fr.

On the ground, growing from buried wood P:46
8) S. endoleucum B.et. Br.

On dead palm, Central Province
9) S. floriforme Bres.

On wood, Peradeniya
10) S. glabrum Lev.

On wood, southern area P:47
11) S. insulare B.et.Br.

On bark P:47
12) S. lobatum Fr.

On wood P:47
13) S. malabarense Cooke

Kelupahani P:47
14) C. mellisii Berk

On wood P:47
15) C. modestum (B.et Br.) Petch

On wood, Central Province P:47
16) C. notatum B.et. Br.

On bark of logs
17) C. ochraceoflavum (Schw.) Ellis

Pidurutalagala P:47
18) C. percome B.et.Br.

On wood P:47
19) C. perlatum Berk.

P:47
20) C. pusillum Berk

P:47
21) C. rhabarbariaum (B.et Br.) Wakef

On wood P:47
22) C. rimosum Berk.

Hakgala and Peradeniya P:47
23) C. spathulatum Berk

24) C. surinamense lev

On wood P:47
25) C. tenerum Petch

Hakgala P:47
26) C. thwaitesii (B.et Br.) Petch

On decaying Dendrocalamus giganteus P:47

80. Lopharia Kalchbr. and MacOwan

Basidiocarp resembles that of Stereum in many features;

hymenium smooth or with anastomosing crests or shallow pores; cystidia usually strongly encrusted with crystals thick walled with a narrow lumen often subfused near apex. spores not amyloid.
Single species recorded.

L. mirabilis (B. et Br.) pat.

On wood P:44

CLASS - GASTEROMYCETES

This class includes the puff balls earthstars, the stinkhorns and the birds nest fungi. It is characterised by (a) the symmetrically poised basidiospores which are not violently discharged (Statisposporeș) and (b) the angiocarpic development of the basidiocarp where the fertile portion of the fruit body of the hymenium is enclosed by the fruit body, the fruit body remaining closed until disintegrated by weather, animals etc. or exposing the spores only after they are mature and basidia have disintegrated. The fruit body is covered by a compact wall or peridium which may be one to several layered. When there are more than one layer, the term exo refers to the outermost layer and endo - is applied to the innermost one.
The peridium may be firm and hard or soft and papery. In some species the peridium remains perfectly closed even after the spores are mature. In others the peridium may split in various ways leaving one or more apertures or ostioles for the spores to escape. Fleshy mycelial growth containing the hymenium lies within the peridium and is termed the gleba. Gleba may form a continuous mass or a series of closed chambers or may be separated by sterile plates (trama). Certain tramal hyphae give origin in some species to elongated, simple or branched hyphae termed capillitium. Usually the trama and basidia undergo autodigestion after the basidiospores have been formed.

All members of this group are saprophytic and grow on rotting wood, soil dung etc. Some like Scleroderama form mycorrhizae on forest trees.

Ainsworth's (1966) system of classification of Gasteromycetes is followed in this treatment. The class is divided into five orders.

KEY TO THE ORDERS OF THE CLASS GASTEROMYCETES

1. Peridium consisting of 2 or more distinct layers; Spores mixed with well developed capillitium - 2

   Not as above - 3

2. Fruit body truly stipitate - PODAXALES-Page 80
   Fruit body not truly stipitate - LYCOPERDALES-Page 81

3. Basidiospores when mature immersed in a mucilage and elevated out of the volva on a receptacle - PHALLALES-Page 86

   Basidiospores dry and powdery at maturity or if slimy not exposed - 4

4. Peridium indehiscent; Fruit body mostly subterranean - HYMENO - GASTRALES-Page 90

Peridium dehiscent:
fruit body mostly above ground - 5

5. Basidiospores enclosed in peridioles, peridiole globose or compressed, free at maturity within the peridium - NIDULARIALES-Page 92

Basidiospores not in peridioles - SCLERODERMATALES-P:

NA-88-5

ORDER PODAXALES

Sporocarps stipitate resembling Coprinus in outline. They are hypogeous at first surrounded by the universal veil part of which usually remains as a volva at the base of the elongated stalk and as quickly disappearing patches on the sporocarp. At maturity major contents of the gleba excepting the basidia, basidiospores and the capillitium, undergo autodigestion, Basidia are in fasciculate clusters. The stipe extends into the base of the sporocarp as a columella. Usually association with termite nests.

Single genus treated.

81. Podaxis Desv. Plate XVIII Figure 70

Podaxon Fr.

Sporocarp, pileate, cap supported on a firm, rigid slender woody stipe arising from a narrow volva and bearing pyriform rounded head; the central part of the stem extrude well into the gleba reaching up to the end and uniting with the endoperidium, dehiscing by splitting sometimes upwards slightly to expose the base of the glebal mass;

Common in the dry sandy districts after or during the rains of the monsoon.

Single species recorded.

P. pistillaris (pers.) Fr.

In dry sandy districts P:67

ORDER LYCOPERDALES

The fruit bodies may begin their development beneath the surface of the soil but at maturity all species are epigeal. The peridium is usually divisible into two or more layers. The peridium is either indehiscent and ruptures irregularly or form one or more apical ostioles. In most species, after the basidiospores have formed, the basidia along with the tramal plates deliquesce and totally disappear, becoming partly resolved into water that saturates the gleba of immature fruit bodies making them soggy and water soaked, Finally moisture disappear so that the mature gleba is dry, dusty and colored brown to purple depending upon the colour of the spores and of the capillitium. Two types of capillitium thick walled aseptate or frequently septate hyphae and the paracapillitium consisting of the walled often collapsed hyaline hyphae with many septa. Both types of capillitium often occur on the same genus.

As the wind or firm objects strike the gleba with its membranes, spores are puffed out through the ostioles or irregular slits the capillitium assisting in the dispersal of spores. Many fruit bodies are sessile while a few are stipitate with a pseudostem. Some grow on tree stumps decaying logs or ground. All species are edible.

The order contains the puff balls and the earthstars. In the puff balls the outer peridium lacks a fibrous layer and ruptures in various ways, scaling off in granules or larger pieces. The inner peridium may also break up in places or form one or apical ostioles. The earth stars have a fibrous layer in their outer peridium. The outer peridium splits stellately from the top towards the base, spreading out into a Star. The inner peridium form an apical ostiole.

KEY TO THE GENERA OF THE ORDER LYCOPERDALES

1. Peridium composed of three layers, outer two layers united and splitting in a stellate fashion - Geastrum(82)

   Peridium of one or two layers only; dehiscence not as above - 2

2. Fruit body borne on a subiculum, 0.5 - 1 cm in diameter, inner peridium dehising from the apex and becoming relaxed; capillitium septate - Lycogalopsis(83)

   Not as above - 3

3. Capillitium of more or less uniform hyphae - 4
   capillitium of thicker main stem and tapering branches - Bovista(84) (Bovistella)

4. Inner peridium breaking up into flakes or fragments - 5
   Inner peridium opening by an apical pore - Lycoperdon(85)

5. Capillitial hyphae tightly interwoven into a ball - Langermannia(86)
   Capillitium not as above - Calvatia(87)

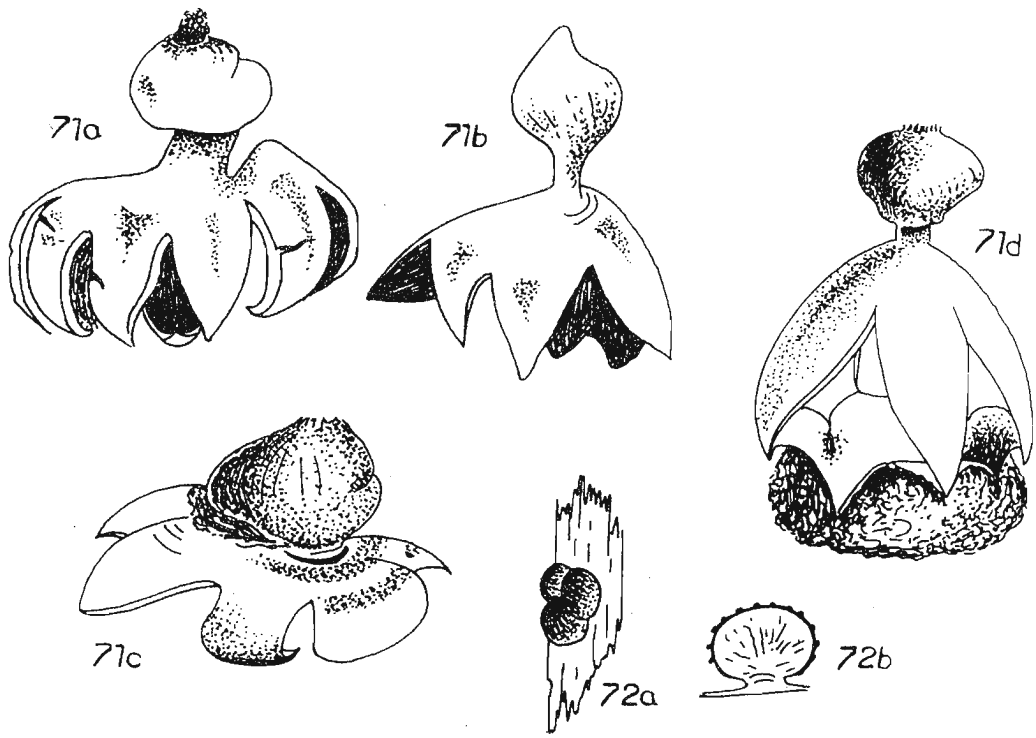


Figure 71 Geastrum spp

a) G. plicetum (thwartsii)
b) G. pectinatus
c) G. triplex
d) G. species

Figure 72 Lycogalopsis sp

a) fruit body on on wood
b) section

Plate XIX Figure 71 - 72

82. Geastrum Pers. (Plate XIX Figure 71)

= Geaster Misch. ex Fr.

Commonly known as 'earthstars'. Peridium three layered, at first closely investing the endoperidium but distinct, splitting at maturity from the apex downwards in a star-like fashion to reveal endoperidium; endoperidium papyraceous persistent with an apical ostiole; gleba usually with a prominent pseudo columella of highly compact unbranched aseptate capillitium; basidia capitate, sterigmat of equal lengths; basidiospores brown globose or elliptical. Fruit body sessile or stipitate. Growing on the ground under leaf litter, half buried at first then superficial.

G. finbriatum is considered a mycorhiza forming fungus of conifers. (Trappe 1962).

9 species recorded.

1) G. archeri Berk , Peradeniya P:66
2) G. bryantii Berk. Homagama P:66
3) G. minimum Schw. On a rock, Hakgala P:66
4) G. mirabile Hon. Common P:66
5) G. pectinatum pers. Hakgala P:66
6) G. plicatum Berk. On the ground P:66
7) G. saccatum Fr. On the ground P:66
8) G. triplex Jungh P:66
9) G. velutinum Morg. On the ground P:66

83. Lycogalopsis Fisch (Plate XIX Figure 72)

Fruit body sessile, usually clustered often angled by mutual pressure on or partly embedded in a subiculum growing on dead wood. Exoperidium white at first, thin tomentose, single layered, splitting into areolae and usually disappearing endoperidium buff or pale ochraceous or grey - white shining glabrous dehiscing from the apex and becoming reflexed; gleba radially arranged with small irregularly globose hyaline minutely spined spores; spines sometimes aggregated into reticulum; capillitium hyaline with clumps each branched thread surrounded by a gelatinuous sheath; basidia cylindrical; sterigma of markedly uneven lengths.

Single species recorded.
L. zeylanica Petch
Peradeniya P:66

84. Bovista Pers. (Plate XX Figure 73)

Bovistella Morg. (Ainsworth 1978)

Small fruit bodies 1 - 5 cm in diameter without a thickened base; exoperidium pale, membranous warted, fragile, breaking into pieces and disappearing at maturity; endoperidium membranous becoming papyraceous dehiscing by an apical pore; gleba homogenous to slightly heterogenous; capillitium free, short, several times dichotomously branched, main stem much thicker than the rest; spores globose to ovoid, smooth, spiny or warted, long pedicelled.

Small puff balls growing on the ground in fields and woods.

Single species recorded.
B. flavobrunnea Petch
— ———— On the ground P:65

4 species described under Bovistella

(1) B. aspera (Lev) Lloyd
— ——— Common at Hakgala P:65
(2) B. citrina (B. et Br.) Lloyd
— ——— On the ground P:65
(3) B. conspurcata (B. et Br.) Petch
— ———— On the ground P:65
(4) B. scabra Lloyd
— ——— Hakgala P:65

85. Lycoperdon pers. (Plate XX Figure 74)

Pyriform medium sized fruit bodies, sessile, or with a short base. Usually grown on the ground rarely on wood. Exoperidium single layered scurfy to spiny, often caducous, breaking up into scales, spines bristles or powdery masses; endoperidium opening by a regular apical pore; gleba heterogenous with a wall marked pseudocolumella of compact capillitium; capillitium simple or slightly branched; basidia cylindrical with sterigmata of unequal lengths; basidiospores globose, smooth to spine often with remains of a pedicel; sterile base chambered.

Commonly referred to as 'puffballs' because the dusty spores puffs out in quantities.

seven species recorded.
(1) L. echinellum (B.et Br.) Petch
— ———— On the ground P:67
(2) L. perlatum Pers.
— ———— Common at higher altitudes P:67

Plate XX Figure 73 - 78

Figure 73 *Bovista* sp

a) fruit body
b) L.S. of fruit body

Figure 74 *Lycoperdon* spp

a) L. pyriforme group of fruit bodies
b) L. pyriforme L.S. of fruit body
c) L. perlatum
d) L. citrinum fruit body
e) L. citrinum L.S. of fruit body

Figure 75 *Langermannia* sp

a) fruit body

Figure 76 *Calvatia* sp

a) C. gardineri
b) C. guatteriodes
c) L.S.C. guatteriodes
d) C. excipuliformis

Figure 77 *Protrubera clathroidea*

a) V.S. of mature fruit body showing absence of receptacle

Figure 78 *Clathrus crispatus*

a) young fruit body
b) old fruit body

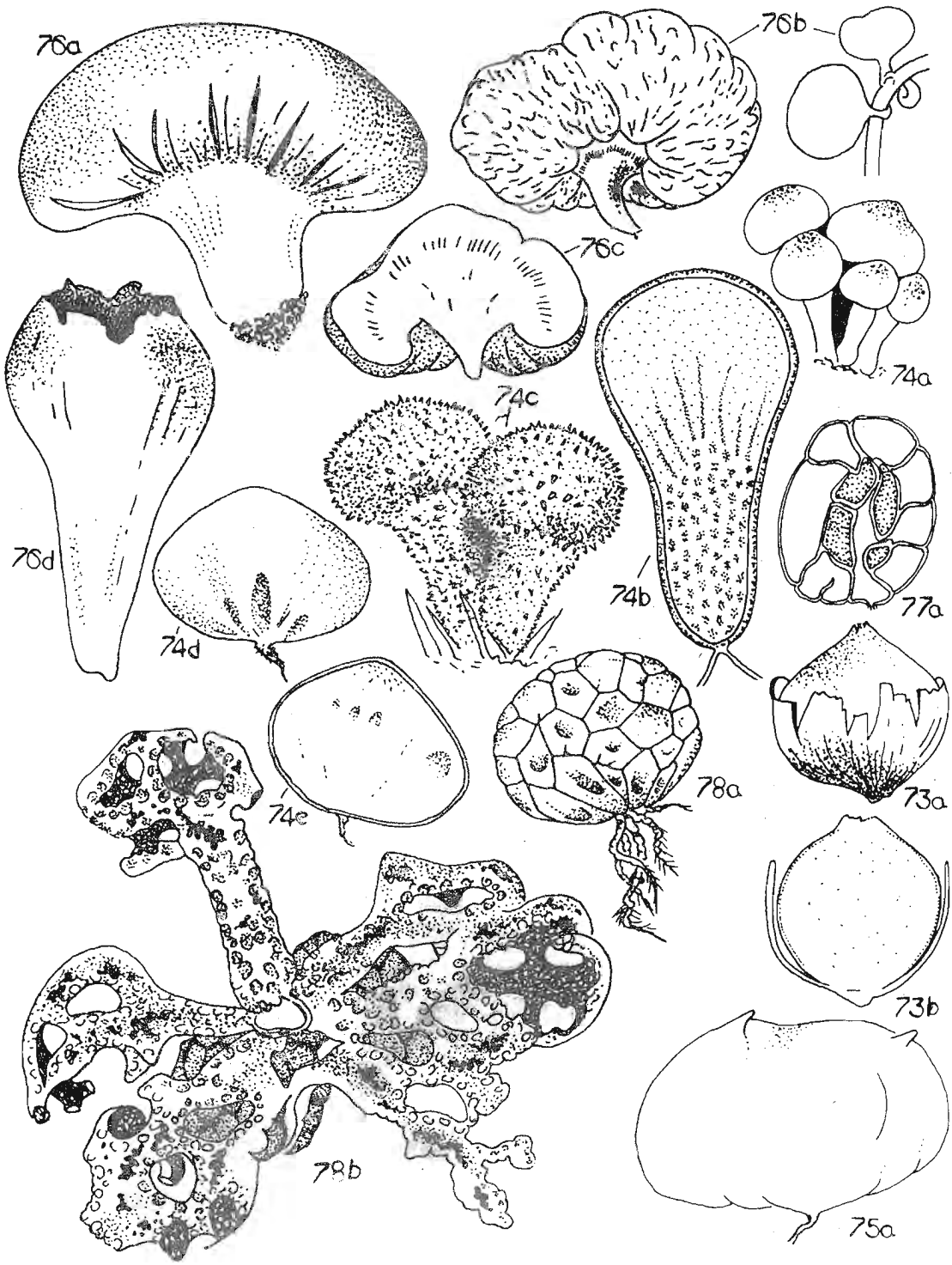


Plate XX Figs. 73 - 78

(3) L. polymorphum Vitt.
— ———— Peradeniya P:67
(4) L. purpurascens Berk
— ———— On rotting wood P:67
(5) L. pyriforme Pers
— ———
On rotting stumps. Hakgala P:67
(6) L. rubecula B.et Br.
— ———— On the ground P:67
(7) L. wrightii Berk. et Curt
— ———— On tree trunks P:67

86. Langermannia rostak. Plate XX Figure 75
———— = Lanopila Fr.(Arinsworthetal 1973)
= Lasiosphaera Reich (- do -)

Fruit bodies 7 cm to 1 metre in diameter, often elevated from the ground at maturity. Exoperidium single layered, caducous, pale, falling away; endoperidium brittle at maturity and falling away in patches; gleba homogeous; capillitium brown branched, basidiospores globose, spiny.
Single species described under Lanopila

L. bicolor (Lev.) Pat. P:66
— ———

Single species described under Lasiosphaera

L. fenzlii Reich.
— ———— On the ground P:66

87. Calvatia Fr. (Plate XX Figure 76)

Fruit bodies commonly referred to as 'giant puff balls'; pyriform, medium sized to large, sterile chambered base attached to the substratum by a strong mycelial cord to endoperidium a loosely woven and very fragile covering,breaking up into fragments from above downwards and gradually falling away; gleba homogeous globose or ellipsoid, spiny, sometimes with a short pedicel.

Puff balls of the largest size growing in grazing places and in forests mostly appearing during the rainy season.

Several species are considered to be mycorrhiza forming on conifers - Pinus sp. (Trappe 1962).

ORDER PHALLALES

The members are referred to as stinkhorns because of the strong, evil smell of the spore mass and the horn like receptacle of most species. Initially the fruit body is partially or completeley subterranean, more or less spherical, o.5 cm in diameter and develop on extensive white rhizomorphs. Peridium is firm and leathery and covers entirely a young fruit body. Outer portion of the gleaba is modified into a thick layer of jelly. The fertile layer is supported upon the surface of a-pileate receptacle or upon or between framework of radiating or anastomosing branches. When mature the rapidly expanding stipe of Phallaceae or the enlarging net-work of the receptacle of Clathraceae breaks open the peridium, leaving it around the base as a volva. The receptacle has a spongy texture and is columnar or clathrate. When the gleba undergoes autodigestion the spores become surrounded in a foul smelling, gelatinous, sweet matrix. The bright colored receptacle often pink or orange or scarlet with a dull olive green or black. Gleba and the sweet, evil smelling matrix attract flies especially blue bottles which feed on dung; also assisting in the dispersal of basidiospores.

The structure of the stalk and receptacle vary and constitute the basis on which the order is divided into families.

KEY TO THE GENERA OF THE ORDER PHALLALES

1. Peridium dehiscent at maturity, receptacle present, gleba gelatinous; above ground - 2

   Peridium indehiscent, receptacle absent, gleba not gelatinous, subterranean - Protubera(88)

2. Receptacle lattice - like or irregularly branched or lobed - 3

   Receptacle occupying the upper portion of a stout hollow stipe - 7

3. Receptacle lattice like or of divergent arms uniting at the tips - 4

   Not as above - 6

4. Stipe present or strongly narrowed below - 5
   stipe absent - Clathrus(89)

5. Stipe short, lower series of meshes much elongated - Colus (90)
   Stipe long, isodiametric mashes - Simblum(91)

6. Arms spreading horizontally from a margin from a disc-like widening of the upper end of the stipe - Aseroe((2)

   Arms vertically parallel, spreading at their tips - Lysurus (93)

7. Receptacle closely clothing the upper part of the stipe, not on a campanulate pileus - Mutinus (94)
   Receptacle forming a campanulate pileus attached centrally at the upper end of the stipe - 8

8. Indusium growing from between pileus and stipe - Dictyophora(95) (Clautriavia Pat)

   Indusium absent - Phallus(93)

88. Protubera Moller (Plate XX Figure 77)

Fruit body usually hypogeal, appear as eggs in clusters, sometimes in large rings half embeded in the earth and dead leaves; peridium indehiscent; gleba fleshy and cartilagenous, gelatinous layer interrupted by peridial sutures; gleba divided into many lobes, glebal masses are more or less oval and lobed, penetrating about half way to the centre, dark green externally and olive internally. Basidiospores narrow - oval, smooth, greenish. A mature fruit body when broken resembles rotting oranges and smells of ripe passion fruit.

Single species recorded.
P. maracuja Moller
- ———— At higher altitudes P:67

89. Clathrus Mich ex. Pers. (Plate XX Figure 78)

= Clathrella Fischer (Ainsworth 1978)

Volva universal, becoming torn into irregular lobes at the apex; receptacle sessile, white, pink or red with a distinct base and apex, a hollow network of which the inner surface is covered by the mucilagenous gleba; spores smooth colourless cylindrical.

Growing on the ground or on heaps of leaves and appear when rains follow a warm dry period.

Single species recorded.
C. crispatus Thwaites ex E. Fisch.
— ———— At elevations of about 4 - 5000 ft.

One species described under Clathrella

C. delicata (B. et Br.) E. Fisch.
- ———— On rotting wood, fronds Peradeniya P:66

90. Colus Caval (Plate XXI Figure 79)

Receptacle red, consisting of a short stipe hollow with a chambered wall dividing above into 6 arms which support a small fertile net work at the top.
Single species recorded.

C. gardneri (Berk.) Fisher - Petch (1919)

91. Simblum klotzch (Plate XXI Figure 80)

Receptacle pink, or orange consisting of a well developed stipe and fertile net work only, meshes anastomosing, small and gleba often straying into outside of receptacle.

Single species recorded.

S. periphragmoides klotz

Common at Peradeniya P:67

92. Aseroe Labill. ex Fr. (Plate XXI Figure 81)

Peridium globose, becoming torn at the apex into irregular lobes; receptacle stipitate, crowned at the apex by a disc from which arms radiate; arms bifid or united into pairs or if single then more numerous widely divergent; gleba borne on the disc between the arms or on the proximal part of the arms.

2 species recorded.

(1) A. arachnoidea E. Fisch.
Peradeniya P:65

(2) A. rubra Labill ex Fr.
P:65

93. Lysurus Fr. (Plate XXI Figure 82)

= Mycopharus Petch (Ainsworth 1978)

Receptacle stalked, stipe dividing into thick arms, stipe longer than arms, arms normally uniteat the apex, usually remaining upright occasionally slightly divergent in very mature fruit bodies; gleba on adaxial or lateral faces of arms.
Single species described under Mycopharus

M. gardneri (Berk. P Petch)
On the ground, Peradeniya P:67

94. Mutinus Fr. (Plate XXI Figure 83)

Peridium oval or oblong, becoming split at the apex into 2 or 3 lobes; receptacle hollow cylindrical or fusiform, wall with a single row of cavities, apex closed or perforated; the stalk-like column bears the mucilagenous gleba apically.

Fruit bodies brilliantly coloured, stipe rosy-pink, receptacle deep red and gleba olivaceous.

3 species recorded.
(1) M. bambusinus (Zoil.) E. Fisch.

On decaying lumps of bamboo, Peradeniya P:67

(2) M. fleischeri Pensz.
P:67

(3) M. proximus Berk. ex Massee

Plate XXI Figure 79 - 85

Figure 79 *Colus* sp

a) fruit body

Figure 80 *Simblum* spp

a) S. periphragmoides
b) S. gracila

Figure 81 *Aseroe* spp

a) A. zeylanica
b) A. rubra

Figure 82 *Lysurus* spp

a) L. gardeneri - fruit body

Figure 83 *Mutinus bambusinus*

a) fruit body

Figure 84 *Dictyophora* spp

a) fruit body

Figure 85 *Phallus* spp

a) fruit body

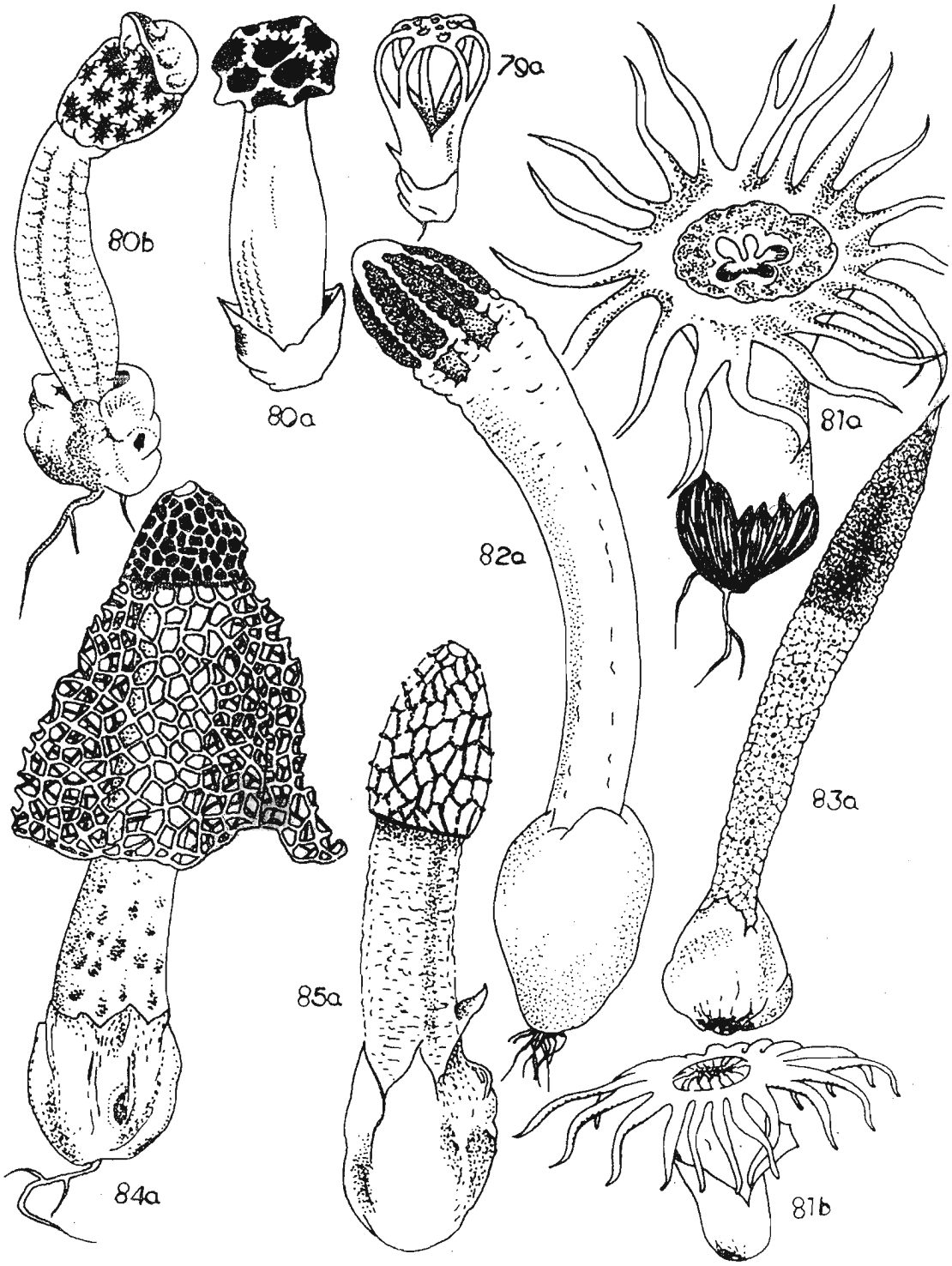


Plate XXI Figs. 79 - 85

95. Dictyophora Desv. (Plate XXI Figure 84)

Peridium globose, becoming torn into irregular lobes at the apex; receptacle hollow, cylindrical or fusiform, pileus reticulated, apical, attached only by the apex, covered on the outside with the mucilagenous gleba. From the upper part of the stall beneath the cap, hangs a bell shaped netted structure - the indusium.

Single species recorded.

D. indusiata (Vent. ex Pers.) E. Fisch.
Common upto 1600 ft. in the wet zone. P:66

C. irpicina (pat.) P Petch
Common upto 1600 ft. in the wet zone. P:66

96. Phallus Pers. (Plate XXI Figure 85)

This genus resembles Dictyophora but without an indusium.

Single species recorded.

P. tenuis (E. Fisch.) Kuntz.
Common on decaying logs at Hakgala P:67

ORDER HYMENOGASTRALES

These are mostly subterranean forms and are referred to as false truffles. The gleba are fleshy to cartilagenous or gelatinous. The gleba retains its structure till the spores are mature. Gleba may be of a uniform structure or traversed by veins or with a central columella. Peridium is 1 - 3 layered. Capillitium is absent. Mycelium grows on the ground and in some species forming mycorrhizal associations with roots.

KEY TO THE GENERA OF THE ORDER HYMENOGASTRALES

1. Peridium with vein-like fibres on the surface; spores smooth - Rhizopogon(97)

   Not as above - 2

2. Peridium with a well developed sterile base; spores elliptical or fusiforms - Hymenogaster(98)

   Peridium without a sterile base; spores globose - Hydnangium(99)

97. Rhizopogon Fr. & Nordholm (Plate XXII Figure 86)

Peridium globose or oblong, thick and persistent or thin and disappearing, covered on the surface with vein-like. strands of mycelium; cavities distinct, at first empty; basidia bearing 2 - 8 sessile spores; spores coloured oblong elliptical, smooth.

R. flarum is considered

a mycorrhiza forming fungus of some pines, several other species are reported to be mycorrhizal in Pinus, Picea, Cupressus and Pseudotsuga (Trappe 1962)

Single species recorded.
R. flavum Petch
Hakgala P:67

98. Hymenogaster Villad. (Plate XXII Figure 87)

Sterile base well developed; peridium of one or two indistinct layers, fleshy or thin continuous with the sterile base; gleba of a single labyrinthine cavity, empty at first; basidia fusiform 1 - 4 spored; spores large coloured, ellipsoid, longitudinally ribbed, irregularly warted or occasionally smooth with a papilla.

Plate XXII Figures - 86 - 92

Figure 86 Rhizopogon

a) R. flavum fruit body
b) R. flavum section of fruit body
c) Rhizopogon sp. fruit body
d) Rhizopogon section of fruit body

Figure 87 Hymenogaster spp

a) fruit body
b) section of fruit body
c) section through a mature fruit body
d) portion of mature gleba

Figure 88 Hydnangium

a) basidiospore

Figure 89 Sphaerobolus stellatus

a) Group of fruit bodies
b) fruit body with glebal mass (enlarged)
c) fruit body with glebal mass discharged (enlarged)
d) detail of fruit body with glebal mass (much enlarged)
e) detail of fruit body discharging the glebal mass (x 15)

Figure 90 Cyathus striatus

a) Group of fruit bodies (x 1)
b) Detail of fruit body

Figure 91 Nidularia sp.

a) Group of fruit bodies x 3/4

Figure 92 Scleroderma spp

S. endoxanthus

a) fruit body x 1
b) section of fruit body x 1

S. pseudostipilata

c) habit x 1
d) Scleroderma sp section of fruit body

e) basidia with sessile spores

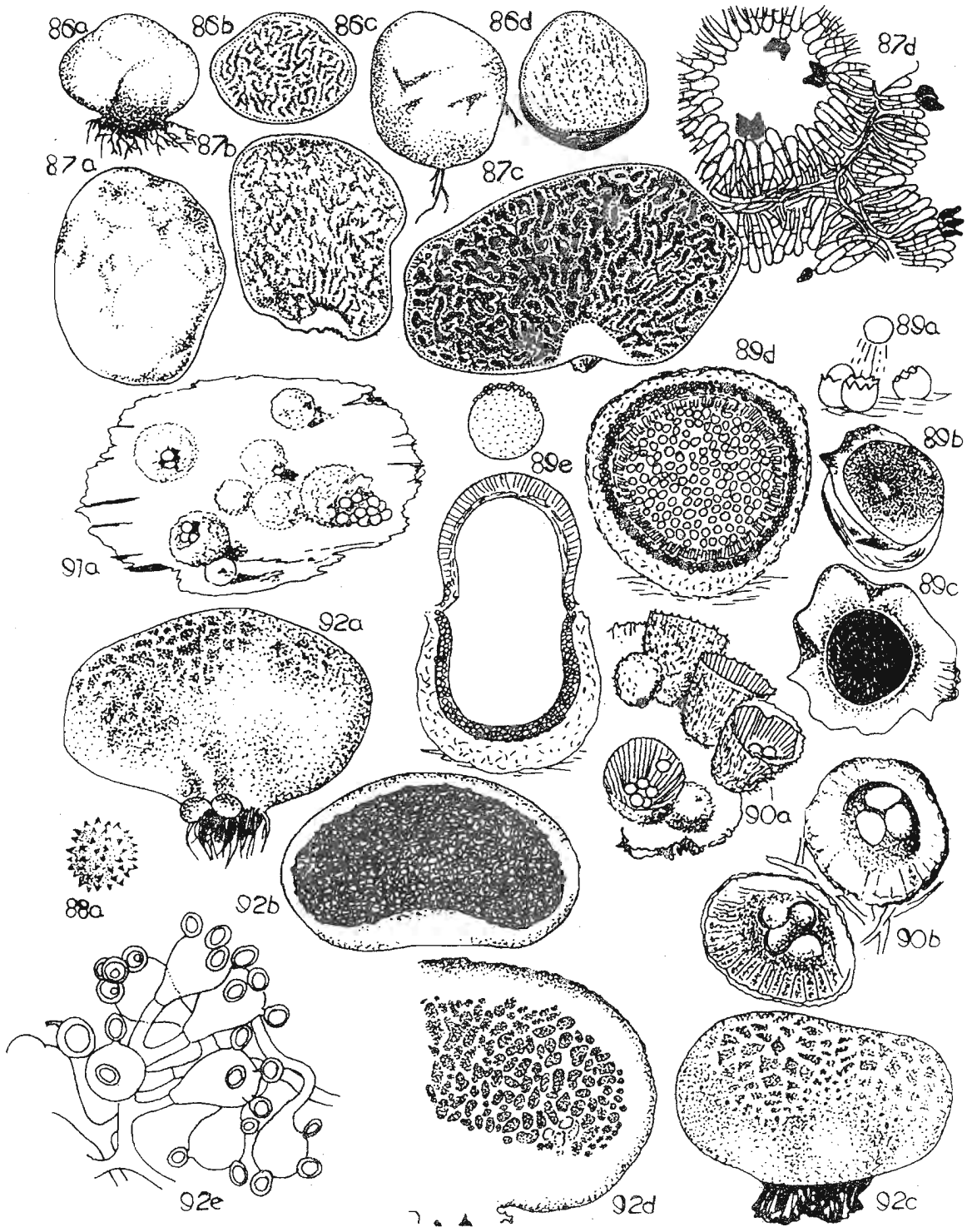


Plate XXII Figs. 86 - 92

Single species recorded.

R. zeylanicus Petch
Hakgala and Sita Eliya P:66

99. Hydnangium Wallr. (Plate XXII Figure 88)

Peridium oblong or roundish not separable from the gleba; fleshy or thin smooth or silky, sterile base absent; cavities minute, irregular at first empty, tramal plates not splitting; basidia 1 - 4 spored, globose or subglobose ochraceous, echinulate.

Single species recorded.

H. carneum Wallr. Var. purpureum Petch
Hakgala P:66

ORDER NIDULARIALES

Basidiocarps are epigeal; sessile, funnel shaped or almost spherical with a flattened tip. At first the fruitbody is entirely closed by 1 - 3 layered peridium but as it matures the peridium opens irregularly or by a rupture of a thin layer of peridium termed epiphragm. In some members (family Nidulariceae) when the fruit body is young gleba contains several hymenial cavities each lined by a layer of basidia. The tramal tissue between the cavities do not deliquesce at maturity but split along a control line thus forming one or more free, compact, closed, hollow bodies called the periodioles which are surrounded by a thick rind which may be composed of as many as 5 layers. The periodioles contain the basidiospores and capillitium threads and they lie free in the cavity of the fruitbodies or are connected to the peridium by long slender threads called funiculus. When the peridium on the upper portion of the fruit body rupture, the periodioles are exposed, resembling a cluster of eggs in a nest and hence the name birds nest fungi. Heavy rain drops will splash the periodioles out of the peidium. In few other members (family Sphaerobolaceae) entire gleba is differentiated into a single small globose periodiole. When mature the peridium splits irregularly but remain cup like towards the base. The whole glebal mass in ejected when one of the layers of the peridium suddenly everts under appropriate conditions.

KEY TO THE GENERA OF THE ORDER NIDULARIALES

1. Whole gleba expelled as a single ball - Sphaerobolus (100)
   Gleba at maturity enclosed in separate structures
   called periodioles - 2

2. Periodioles with funiculus - Cyathus (101)
   Periodioles without funiculus - 3

3. Epiphragm present - Nidula (102)
   Epiphragm absent - Nidularia (103)

100. Sphaerobolus Tode ex Pers. (Plate XXII Figure 89)

Fungus when immature is globose or subglobose upto 3 mm in diameter; immersed in white cottony mycelium. Peridium of many layers, at maturity splitting in a star like manner into pointed lobes leaving the single orange yellow glebal mass free in the peridial cup; inner peridial layer becoming detached from the outer peridium except at the tips of the rays, inner peridium then contracts suddenly and becomes inverted through the toothed opening, having in the act ejected the gleba to a considerable distance; basidia pear shaped bearing 5 - 8 sessile spores, spores hyaline, smooth, elliptical or oblong elliptical.

Growing on rotting wood, and on rotting twigs and leaves.

2 species recorded.

(1) S. rubidus B. et Br.

On elephants dung, Hakgala Nuwara Eliya P:67

(2) S. stellatus Tode ex Pers.

Hakgala, Pattipola P:67

101. Cyathus Haller ex Pers. (Plate XXII Figure 90)

Fruit body initially globose, dehiscing by a circumscissile thin membrane called the epiphragm, later this membrane sloughing off; at maturity cupulate remains of the peridium forming a thin tunica and or dark layered inner wall attached to the peridial cup by a funiculus thread composed of a sheath,middle piece and a purse, Peridioles dispersed by the rain drops falling into the cup; spores smooth, ellipsoid to ovoid, smooth.

Commonly known as Birds nest fungi growing on dead wood, soil and dung.

4 species recorded.

(1) C. limbatus Tul.

On dead wood and bamboo, Flower pots P:66

(2) C. poeppigii Tul P:66

(3) C. stereoreus (Schw.) de Toni

On deer dung, Pattipola P:66

(4) C. triplex Lloyd

Frequent on decaying stones of mango fruits P:66

102. Nidula White

Fruit bodies initially globose, eventually cupulate following the abscission of the circumscissile epiphragm; peridioles circular, flattened, dark brown, not attached to the wall of the peridial cup and lying free in the matrix of mucilage; spores thick walled greenish hyaline, oval or generally slightly pyriform. Growing on the ground, wood, or leaves.

Single species recorded.

N. emodensis (Berk) Lloyd.

At about 6000 ft, altitudes P:67

103. Nidularia Fr. (Plate XXII Figure 91)

Fruit body initially globose, eventually pulvinate dehiscing by irregular bursting or autolysis of peridium; epiphragm absent; peridioles lenticular, biconvex or compressed, numerous, without funiculi at maturity and covered in mucilage, spores hyaline, elliptical to subglobose, smooth.

Growing on the ground, wood, leaves.

Single species recorded.

N. reticulata Petch
Peradeniya P:67

ORDER SCLERODERMATALES

Mature fruit body is epigeal or hypogeal, sessile or attached by a pseudostem. The peridium may be thin but more often several layered thick and firm, at maturity dehiscing by splitting into lobes at the apex or usually by disintegration of the upper portion. Gleba containing numerous cavities, tramal plates disappearing or persistent as traversing veins.

KEY TO THE GENERA OF THE ORDER SCLERODERMATALES

1. Stipe present; capillitium present - 2
   Stipe absent; capillitium absent - Scleroderma(194)

2. Peridium relatively simple, usually not divisible into many layers; stipe well developed slender - Tylostoma(105)

   Peridium complex with clearly defined layers; stipe not so well developed - Calostoma(106)

104. Scleroderma Pers. (Plate XXII Figure 92)

Fruit body simple, strikingly yellow or orange; peridium not divided into separable layers subglobose obovate or turbinate, sessile or prolonged into a stem-like base consisting of one or two layers; dehiscing irregularly or by the exoperidium splitting at the apex in a star like manner, sharply separated from the gleba; gleba at maturity fully pulvirulent; glebal islands consisting pear shaped or clavate basidia bearing 2-5 shortly pedicillate spores early; spores spiny or reticulate or combination of both.

Scleroderma bovista is considered mycorrhiza forming on several species of Pinus pseudotsuga sp. and Eucalyptus sp; S.cepa on species of Eucalyptus; S. verrucosum on Eucalyptus gomphocephala (Trappe 1962).

3 species recorded.

(1) S. columnare B. et Br.

Fairly frequent at Peradeniya P:67

(2) S. endoxanthum Petch

On the ground, Peradeniya P:67

(3) S. pseudostipitatum Petch

Abundant at Hakgala P:67

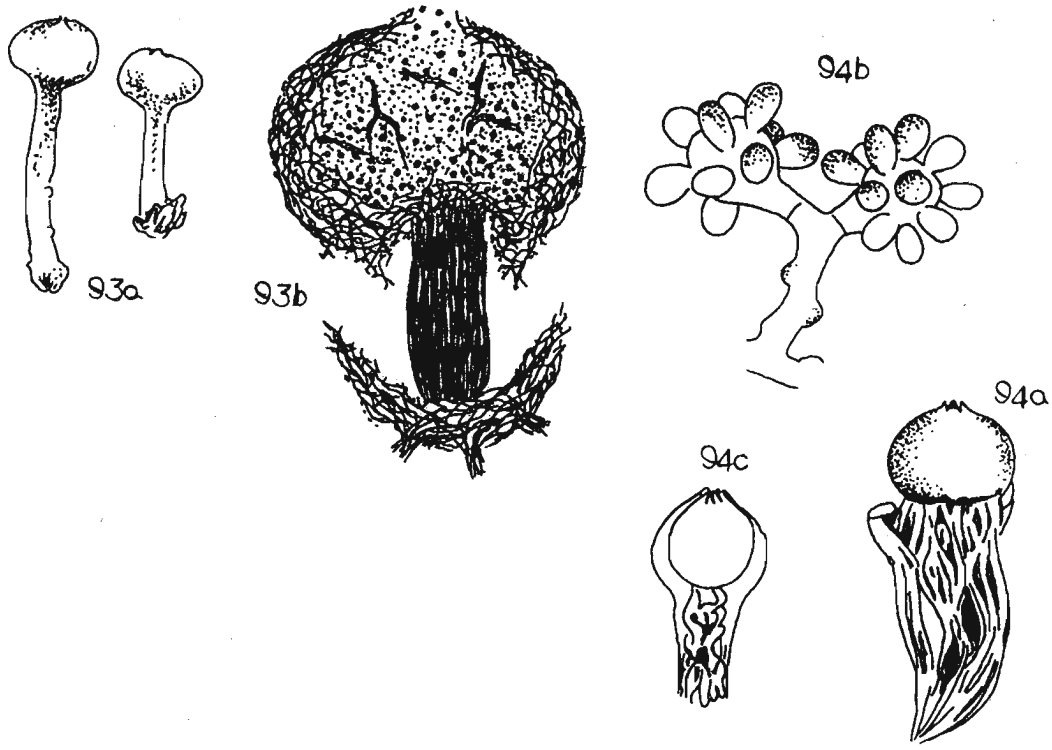


Figure 93 Tulostoma sp.

a) fruit body
b) detail of mature fructifiation x 3

Figure 94 Calostoma sp

a) Fruit body - volva disappeared
b) basidia with sessile spores on all sides
c) section of young fruit body to show the volva

Plate XXIII Figure 93 - 94

105. Tylostoma Pers. (Plate XXIII Figure 93)

Peridium depressed, globose well differentiated; exoperidium thin fugaceous; endoperidium tough and membraneous, not falling apart in irregular patches from the apex, dehiscing by a well defined apical pore; stipe slender usually cylindrical fitting into a socket in the fertile head; gleba brown homogenous at all stages; volva reduced to a disc at the base of the stipe; spores globose to irregular warted; capillitium well developed, threads hyaline, very long, much branched, attached to the endoperidium, interwoven. Commonly referred to as 'stalked puffball'.single species recorded.

T. mussooriens. P. Henn.

On the ground, Central Province P:67

106. Calostoma Desv. (Plate XXIII Figure 94)

Peridium complex, consisting of clearly defined layers, usually four, the innermost layer membraneous and attached to the outer layers only at the top around the star shaped apical pore and hence hanging loose. Stipe not well developed, consisting of the continuation of the outer peridial layers. Gleba pale coloured; capillitium well developed, annually thickened, may disintegrate at maturity; spores large and ornamented, heavily reticulated with deep bands which form a wide meshed net.

2 species recorded.

(1) C. berkeleyi Massee
— ———— On the ground P:66
(2) C. insigne (Berk) Masee
— ———— On the ground P:66

GLOSSARY OF TERMS

Abaxial - (of a basidiospore), the side away from the long axis of the basidium (Corner 1948).

abrupt - as if cut off transversely; truncate.

abscission - separating by disappearance of a joining layer or wall, as of conidia from a conidiosphore.

acervate - massed up; heaped; growth in heaps or groups.

acervulus - a saucer shaped conidioma (embedded in host tissue) in which the hymenium of conidiogenous cells develops on the floor of the cavity from a pseudoparenchymatous stroma beneath an integument of host tissue which ruptures at maturity;

acicular - slender and pointed; needle shaped.

aculeate - having narrow spines.

aculeolate - having somewhat spine-like processes.

acuminate - gradually narrowing to a point.

acute - pointed less than a right angle.

adaxial - (of a basidiospore) the side next to the long axis of the basidium, usually that with the apiculus;

adnate - (of lamellae or tubes), joined to the stipe; if lamellae, proximal end not notched sometimes restricted to lamellae widely joined to the stipe. (of pellicle, scales, etc.) tightly fixed to the surface.

adnexed - (of lamellae) narrowly joined to the stipe.

aduncate - bent, hooked, crooked.

agglutinate - fixed together as if with glue.

allantoid - (end of spores) slightly covered with rounded ends, sausage like in form.

alliaceous - having a taste or smell of onions or garlic; capaceous.

alveola - a small surface cavity or hollow; a pore of a polypore.

amyloid - (of spores etc.) stained blue-black by iodine.

anastomosis - (pl - es) the fusion between branches of the same or different hyphae (or other structures) to make a network;

anastomosing - running together irregularly to give a vein-like network.

annular - ring-like, ring-like arrangement.

annulus - (of basidiomata), a ring-like partial veil, or part of it, round the stipe after expansion of the pileus; hymenial veil; apical veil; ring;

apical - at the end.

apiculus - (of a spore), a short projection at one end; a projection by which it was fixed to the sterigma; apicule; hilar appendage.

apodial - having no stalk; sessile.

apophysis - a swelling or a swollen filament, eg; at the end of a sporangiophore below the sporangium in Mucorales (cf. columella) or on the stem of some species of Geastrum (in basidiomycetes), the swelling at the tip of a sterigma from which the basidiospores develops and which become the hilar appendage.

apothecium - (pl. appothecia) a cup or saucer like ascoma in which the hymenium is exposed at maturity; sessile or stipitate, the stipe sometimes lichenised.

appendage - a process (outgrowth) of any sort.

appendiculate - (of an agaric basidioma) having the edge of the expanded pileus fringed with tooth like remains of the veil, as in Psathyrella candolleana.

appressorium - a swelling on a germ-tube or hypha, especially for attachment in an early stage of infection, as in certain Uredinales and in Colletotrichum.

arachnoid - covered with, or formed of, delicate hairs of fibres, araneose.

arboricolous - growing on trees.

arcuate - arc - like

areolate - having division by cracks into small areas.

arescent - becoming crustose on drying

arid - dry.

armullate - edged, fringed, frilled.

errect - stiffly upright

ascigerous - having asci

ascocarp - pertaining to ascus containing fruit body.

ascospore - a spore produced in an ascus by free cell formation.

aseptate - having no cross walls.

asperate - rough with projections or points

assimilative - having to do with growth before reproduction; non-reproductive, vegetative.

atomate - having a powdered surface

auleate - (of gasteromycete, basidiomata), a closed basidioma in which pleated plates of trama project into the glebal cavity from top and sides.

axenic - (of cultures) consisting of one organism, uncontaminated, a pure culture.

baccate - soft throughout like a berry.

balanoid - acorn-shaped

ballistospore - a forcibly ejected basidiospore.

basipetal - development in the direction of the base i.e the apical part is oldest.

beaded - (of a lamella) having a line of small drops of liquid on the edge.

beak - (of perithecium or pycnidium) on elongated neck through which the spores are discharged.

botryose - racemose, grouped like grapes

bulbous - bulb-like (of a stipe) having a swelling at the base.

bullate - having bubble or blister-like swellings (of a pileus) having a rounded projections at the centre.

caducous - (of spores etc.) falling off readily, deciduous.

callose - hard or thick and sometimes rough.

capitellum - a little head

capitulum - a stalked globose apical lichen apothecium, as in the Coniocarpineae.

carbonaceous - dark coloured and readily broken; charcoal or cinder-like.

carbonicolous - living on burnt ground, pyrophilous

carinate - keeled, boat-like

cariose - decayed

cariose-cancellate - becoming latticed by decay.

carpogenous - living on fruit

carpophore - stalk of the sporocarp

cartilagenous - firm and tough but readily bent

catathecium - a flattened ascoma, having the wall more or less radial in structure, and with a basal plate.

catenate - in chains or end to end series

catenuliform - chain-like

cauda - tail, tail-like appendage.

caulescent - having a stem; becoming stemmed

caulicolous - living on herbaceous stems

cavernose - having hollows or cavities

centrict - (central) (of a stipe) at the centre of the pileus; (of oogonium of Saprolegniaceae) having one or two layers of fat droplets surrounding the central cytoplasm.

centrum - the structures within an ascoma, i.e asci and hamathecium;

chartaceous - paper-like

circinate - twisted round, coded.

circumcinct - having a band round the middle

cirrate - rolled round (curled) or becoming so.

cirrose - rolled round (curled) or becoming so.

clypeus - a shield-like stromatic growth, with or without host tissue over one or more perithecia or pycnidia.

collabent - falling in, collapsing

collariate - a closing join, a seam

commixt - mixed with, intermingled

comose - having hairs in groups or tufts.

compaginate - joined tightly together

complanate - flat, smooth

complicate - bent upon itself

Concatenate - in chains, catenulate

Compressed - (of a stipe) flattened transversely

concare - (of a pileus) hollowed out, basin-like.

conceptacle - any hollow structure producing spores or spermatia.

conchate - like a bivalve shell

concolorous - of one colour

concrescent - becoming joined

Confingent - touching

Constipate - crowded together

Contiguous - touching, joining

Connivent - touching but not organically joined,
- (of a pileus margin) touching the stipe.

continuous - (of spores, hyphae etc.) having no septa. (of a stipe) one with the tissue of the pileus or peridium.

convex - (of a pileus) equally rounded, broadly, obtuse

corniform - shaped like a horn

cornute - horned, horn-like in form,

coronate - crowned

cortex - a more less thick outer covering; peridium

corticolous - living on bark

cortina - (of agarics), a partial veil (or part of one) frequently web-like, covering the mature gills.

cortyliform - cup or crate like in form

corymobose - arranged in clusters

crenate - having the edge toothed with rounded teeth

cribose;cribriform - having a net-work live sieve

cruciate - in the form of a cross. (of basidial septa) vertical and at right angles.

crustaceous - crust-like, used for lichens having a thallus stretching over and firmly fixed to the substratum by the whole of their lower surface, such thalli generally lack rhizinae and a lower cortex.

culmicolous - living on stems esp. those of grasses

cumulate - massed together, heaped up

cuneate - thinner at one end then the others wedge-like.

cuneiform - wedge or axe blade shaped

cupulate - cup-like in form

cuspidate - (eg. of a pileus or cystidium) having a well marked sharp out growth or point at the top.

cutis - (of basidiomata), the outer layer consisting of compressed hyphae parallel to the surface;

cyanescent - becoming blue

cyathiform - like a cup, a little wider at the top than at the bottom, and sometimes stalked.

cymbiform - boat-shaped, navicular.

dacryoid - having one end rounded and the other more or less pointed; pear or tear like in form.

deciduous - (of spores etc.) falling away at maturity; shed either with (eg. teliospores) or without (eg. urediniospores) a fragment of the pedical or sporophore.

declinate - bent or curved down or forwards.

declivate - sloping

decorticate - having no cortex

decumbent - resting on the substratum with the ends turned up.

decurred - (of the pileus edge) bent down

decurrent - (of lamellae) running down the stipe

decussate - (of lichen thalli), having the surface divided and crossed by dark lines.

dehiscent - (of asci or fruit bodies), opening when mature, by pores or by becoming broken into parts.

deltoid - triangular in shape

dentritic - irregularly branched

dermatiaceous - (of mycelium, spores etc.) pigmented more or less darkly

dendroid - tree-like in form, dendritic

denigrate - blackened

dentate - toothed

denuded - uncovered or glabrous by loss of scales etc.

depauperate - of poor development

dependent - hanging down

deplanate - flat

depressed - (of a pileus) having the middle lower than the edge.

dermatiaceous - (of mycelium , spores etc.) pigmented more or less darkly.

determinate - clearly marked, definite, (of conidiophores) growth ceasing with the production of terminal conidia.

dextrinoid - (of spores etc.) stained yellowish - or reddish brown by Melzer's iodine.

diffluent - breaking up in water

diffract - (of a pileus surface) cracked into small areas; areolate.

diffuse - widely or loosely spreading and having no distinct margin.

dimidiate - appearing to lack one half, or having one half very much smaller than the other; (of a pileus), without a stalk and semi-circular; (of lamellae), stretching only half way to the stipe, (of a perithecial wall) having the outer wall covering only the top part.

dimorphic - having two forms

discoid - flat and circular, resembling a disk.

discolourous - of a different colour, as of the two surfaces of a lichen thallus.

discrete - separate, not joining; (of a conidiogenous cell,) not subtended by a conidiophore.

disjunctor - a cell or projection sometimes having a short existence between the spores of a chain.

dispore - one of the spores of a 2-spored basidium

dissepiment - a partition eg. that between the pores of a polypore.

distoseptate - (of conidial septation) having the individual cells each surrounded by a sac-like wall distinct from the outer wall.

divaricate - divergent at right angles

doliiform - barrel-like in form

doliiform - barrel-like in form

dorsal - back or upper surface; the surface facing away from the axis.

ecorticate - having no cortex

ectal - outer;

efflorescent - bursting out of

effuse - stretched out flat, esp. as a film like growth.

effused-reflexed - (of Hymenomycetes), stretched out over the substratum but turned up at the edge to make a pileus.

erose - (of a lamella etc.) having delicate tooth-like projections from the edge.

esculent - of use as a food.

exolete - (of perithecia, pycnidia etc.) long, over-mature, empty.

exotic - (adg.) of another country; not indigenous;

expallant - (of a pileus) becoming pale on drying

explanate - spread out

exserted - sticking out; protruding. (eg. a mature ascus of Ascobolus)

exsiccalus - dried or dry

extramatrical - living on or near the surface of the matrix or substratum

farctate - (of a stipe) having the centre softer than the outer layer; stuffed.

fasciate - massed or joined side by side

fastigiate - having parallel, massed, upright branches

fibril - a very small fibre. (in Usnea), short, simple branches perpendicular to the main branches.

fibrous cortex - (of lichens) made up of loosely woven distinct hyphae, parallel with the long axis of the thallus.

filamentous - thread like, filamentose (of lichens) the phycobiont forms a filament of cells which is surrounded by hyphae or cells of the mycobiont.

filiform - thread like

fimbriate - edged, delicately toothed, fringed

flabellate - like a fan; in the form of a half circle.

flexuous hypha - (of Uridinales) an unbranched or branched haploid hyphal projection from a pycnium, which may be diplodised by a pycniospore of opposite 'sex'.

flocci - cotton like groups of tufts.

flocculent - (of a liquid-culture) having small masses of cells throughout or as a deposit.

foliicolous - living on leaves.

forate - (of gasteromycete basidiomata), invagination of the primordial tissue resulting in a series of pits, the type of development generally known as coralloid of which it is the opposite.

foveate - having small holes or cavities; pitted

friable - readily powdered

fruiticolous - living on fruit

fugacious - evanescent

furcate - forked

furfuraceous - covered with bran-like particles; scurfy.

fuscous - dusty, too brown for a grey

fusiform - spindle-like; narrowing toward the ends.

fusoid - somewhat fusiform

galeate - hooded, hat or helmet shaped

gasterospore - (gasteroconidium), a thick-walled, globose, chlamydospore of Ganoderma probably apomictic.

geophilous - earth loving, eg. of fungi having under-ground fruit bodies.

glaborus - smooth, not hairy

glaireous - slimy

glaucous - having a bluish-grey waxy bloom.

gleba - the sporing tissue in an angiocarpous, sporocarp. esp. of Gasteromycetes and Tuberales.

glutinous - sticky, made up of, or covered with, gluten.

gongylidious - (pl.la) a bulbous structure developed by fungi cultivated by termites.

gyrate - curved to the back and to the front in turn; folded and wavy; convoluted like a brain; (of lichen apothecia) concentrically folded.

halonate - (of a leaf spot) having concentric ring one of the 'frog-eye' type; (of a spore), having a transparent coat around it.

hamate - hooked

hastate - like a spear - or arrow head in form

helicospore - a non-septate or septate spore with a through at least 180 but may describe one or more complete rotations in 2 or 3 dimensions.

heliophilous - preferring direct sunlight

helminthoid - worm-like in form; vermiform

herbicolous - living on herbs

histogenous - produced from tissue; (of spores) produced from hyphae or cells, without conidiophores.

hoary - (esp. of a pileus or stipe) covered thickly with silk-like hairs, canescent.

hyaline - transparent or nearly so; translucent; frequently used in the sense of colourless.

hyalo - (of spores) hyaline or brightly coloured, esp. for groups of Dueteromycotina.

hymenium - the spore-bearing layer of a fruit body.

hymenophore - a spore becoming structure esp. a basidiocarp, or that part of it bearing the hymenium.

hymenopodium - tissue under the hymenium, sub hymenium or hypothecium.

hyphidium - (pl. ia) a little or strongly modified terminal hypha in the hymenium of Hymenomycetes.

hyphoid - like hyphae; cobwebby;

hypochnoid - having effused, resupinate, dry, rather loosely intertwined hyphae, as in Tomentella. (formerly Hypochnus)

Imbricate - (of pilei, scales, squamules etc. partly covering one another like the tiles on a roof.

immaculate - not spotted

immarginate - having no well defined edge

immersed - embedded in the substratum

imperforate - having no opening

incrusted - (of hyphae), having matter excreted on the walls.

indefinite - not sharply limited

indehiscent - (of sporocarps, sporangia etc.) not opening, or with no special method of opening.

indeterminate - having the edge not well-defined, esp. of fruit bodies and leaf-spots. (of conidiophores) continuing growth indefinitely.

indumentum - a covering, such as hairs etc.

infarcte - solid, turgid

inferior - (of an annulus) low down on the stipe

inflexed - (of pileus margin) turned down

inate - imbedded in, immersed.

inoperculate - (of an ascus or sporangium), opening by an irregular apical slit to discharge the spores, as the ascus in the Helotiales.

inspissate - made thick

inspissate - made thick

intricate cortex - (of lichens) made up of hyphae twisted together

introrse - in the direction of the central axis; inwards

intumescence - a swelling

invaginated - covered by a sheath

involute - rolled in

laccate - polished, varnished, shining

lacerate - as if roughly cut or torn

laciniate - (of an edge etc.) as if cut into bands.

lamella - (pl - ae) (of an agaric) one of the characteristic hymenium covered vertical plates on the underside of the pileus, gill.

lanate - like wool, covered with short hair like processes.

languid - feeble, hanging down

latticed - cross - barred like a net work.

ligative hyphae - Pouzar's term for binding hyphae,

linear - long and narrow.

lorate - like a narrow band, strap like in form; ligulate.

lumen - the central cavity of a cell or other structure

lunate - like a new moon, crescentic

luteous - yellow

lysigenous - formed by the breaking down of cells

marginal veil - (of agarics) an incurving proliferation of the margin of the pileus which protects the developing hymenium.

marginate - having a well-marked edge. (of basal bulb of agaric stipe) having a gutter like rim as in Leucocortinarius bulbiger

medulla - (of lichen thalli), the loose layer of hyphae below the cortex and algal layer (of sporocarps of fungi), the part composed mainly or entirely of longitudinal hyphae.

monaxial - having one individual stem or axis

nervicolous - living on veins of leaves or stems

nitidous - smooth and clear, lustrous

nubilated - cloudy and semi opaque as viewed by transmitted light.

ob - (prefix) inversely or oppositely

obclavate - inversely clavate (widest at the base)

obligate - necessary; essential; (of a parasite) living as a parasite in nature, sometimes of one that has not been cultured on laboratory media.

oblong - (of spores) twice as long as wide and having somewhat truncate ends.

obovate - inversely ovate

obovoid - inversely ovoid

obpyriform - the riverse of pear-shaped

obsolete - (i) (of organs or parts) rudimentary or absent. (ii) (of terms) no longer in use.

obsubulate - very narrow, pointed at the base and a little wider at the tip.

obtuse - rounded or blunt greater than a right angle.

occluded - closed, often used of the lumina of hyphae

odontoid - tooth like dentate

operculate - (of an ascus or sporangium) opening by an apical lid to discharge the spores, as in the ascus of the Pezizales.

pachydermatous - (of hypahe) having the outer wall thicker than the lumen.

pannose - having the appearance of felt or woolen cloth.

papulose - covered with pimples or pustules.

paraphysis - (pl. paraphyses) a sterile upward growing, basally attached hyphal element in a hymenium, esp. in Ascomycetes where they are generally clavate or filiform, unbranched or branched and the free ends frequently make an epithecium over the asci.

patelliform - like a round plate having a well marked edge.

periclinal - curved in the direction of, or parallel to, the surface or the circumference.

peridium - the wall, or limiting membrane of a sporangium or other fruit body.

periphysis - (pl. periphyses) a hair like projection inside, or near, the ostiole of a perithecium, pycnidium or pycnium.

perithecium - (pl. perithecia) a sub-globose or flask-like ascoma, sometimes limited to ascohymenial types formed from the development of an ascogonium (not of stromatic origin). but now widely used as a general term regardless of the ontogenetic type.

peronate - sheathed, having a boot or covering esp. of the lower part of a stipe covered by a volva or veil.

persistent - (of spores) non-deciduous;

phialide - a cell which develops one or more open ends from which a basipetal succession of conidia are cut off.

pileus - the hymenium - supporting part of the basidioma of a non-resupinate higher fungus, esp. a hymenomycete.

pilose - covered with hairs

plage - a smooth, paler-coloured or colourless spot on a surface; (basidiospores) esp. a smooth spot above the hilar appendage.

plane - flat

prolate - (of a spore, sporocarp etc.) elongated in the direction of the poles.

proliferation - successive development of new parts, esp. of new sporangia within the old wall in Mastigomycotina, or conidiogenous cells.

protuberate - (of conidia) having short projections.

pruinose - having a frost-like or flour-like surface covering.

pyriform - pear like in form

pyrophilous - growing on burnt ground, steam sterilized soil etc.

rachis - a geniculate or zig-zag extension of a conidiogenous cell development.

radial - (of lichen thalli) radially symmetrical in transverse section.

radiate - spreading from a centre

radicating - (of stipes) like a root, rooting.

remote - (of lamella) proximal end free and at some distance from the stipe.

reniform - kidney-like in form,

repand - (of a pileus) having a waved edge which is turned back.

resupinate - (of basidiomata) flat on the substrata with the hymenium on the other side.

retrose - backward.

revolute - having the edge rolled back or up

rhizomorph - a root like aggregation of hyphae having a well defined apical meristem and frequently differentiated into a rind of small dark-coloured cells surrounding a central core of elongated colourless cells.

rhizo-plane - the surface of a root

rhychosporous - having beaked spores

rivulose - marked with lines like little rivers.

rostrate - beaked, see ascus

rosulate - in a rosette

saccate - like a sac or bag

scabrid - rough with delicate and irregular projections

scabrous - rough

scissile - (of the flesh of a pileus) separating into horizontal layers.

sclerocarps - sclerotium-like modified ascomata permanently lacking a sexual capacity and now acting as sclerotia as in Varicosperina ramulosa.

scobiculate - in fine grains, like sawdust

scrupose - rough with very small hard points.

scutate - like a round plate or shield

sinuate - (of lamellae) notched at the proximal end at junction with stipe; emarginate.

sparassoid - composed of interlaced flablliform branches forming ball like structures recalling Sparassis basidiomata.

spatulate - like a spoon in form

sporophore - a spore-producing or supporting structure esp. a conidiophore ascocarp, basidiocarp.

stalagmoid - (of spores, stalagmospores) like a long tear or drop.

stellate - like a star in form - a compound seta having several radiating arms.

stipe - a stalk

striate - marked with delicate lines, grooves or ridges.

strigose - rough with sharp pointed hairs

strobiliform - like a fir-cone in form

stroma - a mass or matrix of vegetative hyphae with or without tissue of the host or substrata, sometimes sclerotium like in form,in or on which spores are produced.

stuffed - (of a stipe) having the inside of a different structure to that outer layer.

stupose - of tissue formed from hyphae which are not gelatinized.

subulate - slender and tapering to a point, awl-shaped

symphogenous - formed from a number of hyphae

tartreous - having a thick rough crumbling surface

teratum - an abnormal modification.

terebrate - having scattered perforations

thecium - the part of an apothecium containing the asci between the epithecium and hypothecium. Some times used for the whole sporocarp or as equivalent to hymenium.

thyriothecium - an inverted flattened ascoma, having the wall more or less radial in structure.

trama - the layer of hyphae in the central part of a lamella of an agaric, a spine of Hydnaceae, or the dissepiment between pores in a polypore.

tremelloid - like jelly or wet gelatin, gelatinous.

troop - a group of sporocarps generally from one mycellium

truffle - an ascoma, generally subterranean

tumoid - swollen, inflated

umbilicate - having a small hollow; esp. of a pileus having a hollow on the top above the stipe.

umbilicus - the central hold fast occuring in some fuliose lichens. the pore in the perispore of an ascospore.

umbo - a central swelling like the boss at the centre of a shield. esp. one on the top of a pileus above the stipe.

ungulata - shaped like a horses hoof.

urceolate - pitcher like in form

velar - pertaining to a veil

venose - having veins

ventral - front, or lower surface, the surface facing the axis, frequently used for the lower surface of foliose lichens.

vertex - the top of an organ

viad - slimy, stichy, glutinus, lubricous, mucilaginous, viscous.

villous - covered with villi, which are not matted

viniscent - turning wine red

virose - poisonous, having strong and unpleasant smell.

viteline - yellow like egg yolk

volva - the cup like lower part of the universal veil round the base of the mature stipe or receptacle

Bibiliography

1. Ainsworth, G.C; (1966). A general purpose classification of fungi. Bibiliography of systamatic mycology. 1966 1 - 4 ; Kew C M I. Surrey.

2. Ainsworth, G.C; (1978). Ainsworth and Bisby's dictionary of the fungi. 7th Edition. C M I. Kew. Surrey.

3. Ainsworth, G.C; Sparrow, F.K. and Sussman, A.S; (1973). The Fungi, an advanced treatise. Vol. IV A,B.

4. Bohus, B., (1963) - New suggestion for preparing fleshy fungi for the herbarium. Mycologia. 55, 128 - 130.

5. Clements, E.F., and Shear, C.L; (1954) - The Genera of Fungi. 2nd Edition. Noble offset and Printing Company

6. Coomaraswamy, U; (1979) - Handbook to the Agarics of Sri Lanka UNESCO - MAB Handbook No. 5. Publishers. National Science Council of Sri Lanka. 68 pp - plates 25.

7. Corner, E.J.H; (1932) - A Fomes with two systems of hyphae. T.B.M.S. 17 pp. 51 - 81

8. Corner, E.J.H; (1950) - A monograph of Clavaria and allied genera. Oxford University Press. London.

9. Corner, E.J.H; (1957) - Construction of Polypores. Phytomorphology. 3 152 - 6

10. Dennis, R.W.C; (1960) - British Cup Fungi and their allies. Royal Society.

11. Donk, M.K; (1964) - A Conspectus of the families of Aphyllophorales. Persoonia, 3, 199 - 324.

12. Kendrick, W.P; (1968) - Preservation of fleshy fungi, for taxonomy. Mycologia 61, 392 - 95.

13. Onions, A.H.S; (1971) - Preservation of fungi. In Methods of Microbiology Booth (Ed.). 4, 113 - 151. London New YOrk Academic Press.

14. Petch, T; and Bisby, C.R; (1950) - The Fungi of Ceylon. Peradeniya Manuals VI.

15. Saccardo, P.A; (1882 - 1931) - Sylloge Fungorum Vols. 1 - 25.

16. Teixerrira, R.R; (1962) - Taxonomy of polyporaceae. Bot. Rev. 37, 51 - 81.

17. Watting, R. (1973) - Identification of the larger fungi. Ed. Anthony R. Kenney.

INDEX TO THE GENERA