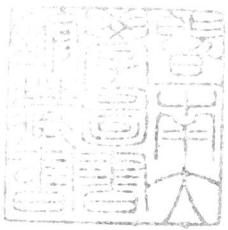
The POLYPORACEAE of the UNITED STATES, ALASKA, and CANADA

By LEE ORAS OVERHOLTS

Prepared for Publication
by JOSIAH L. LOWE

With a New Foreword
by ALEXANDER H. SMITH



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FOREWORD
by Alexander H. Smith

EACH group of higher fungi presents its own unique problems to the student. There is still much to be learned of the relationships of these organisms. Because of the sheer number of species, the generally imperfect specimens preserved in herbaria, and the discovery of previously unused or unrecognized features, our classification is relatively unstable. With the discovery of "new" features there must always follow a reevaluation of the position in our classification of the species showing them. Thus, it has been difficult to gain perspective in such orders as the Agaricales or Aphyllophorales to say nothing of the Hymenomycetes as a whole.

Investigators such as Overholts may be interested in many groups of fungi but are best known for their contributions in one group. Overholts worked with the nonfleshy pore fungi or Polyporaceae, as he termed them. His concept of the Polyporaceae as set forth in the first edition of his book was ultraconservative even for his time. But he had good reasons for his attitude. He could not see how the group could be divided into smaller genera with clear limits. Change for the mere sake of change was in his estimation not good science.

At the same time, the need for new generic concepts in the Polyporaceae has been recognized by all investigators working with the family from 1870 to the present day. Murrill's classification was an earlier attempt to fulfill this need. By the time Dr. Lowe assumed the tedious task of preparing the final copy of the first edition of Overholts' work for publication, the situation as regards the classification of the polypores was changing rapidly. The type of study in vogue was either a study of a cross section of the family, such as that of Bondarzew and Singer, or the description of numerous isolated genera, often based on one or very few species. Lowe, rightly, did not believe it desirable or proper to attempt a synthesis of this modern work and to use it as a framework for a classification under Overholts' name. His choice was a wise one as far as producing a treatment of

general use to the mycological public was concerned, though it admittedly did not suit the "splitters."

The features emphasized in modern classifications concern many hyphal characters such as the presence of clamp connections at the cross walls, thickness of the hyphal wall for hyphae of the various regions of the basidiocarp, the color of the wall as well as any irregularities in it or deposits of material on it, and the shape and size of the hyphal cells. Names have been applied to the hyphal state in the basidiocarps of the various species—being termed monomitic if only one kind (generative) of hypha is present, dimitic if two types, and so on. The recognition of these hyphal states has been of great help to our understanding of the polyporaceous basidiocarp, but has also brought in its wake a new set of difficulties.

As it is not the purpose of this Foreword to present a critical analysis of the virtues and pitfalls involving the "hyphal approach" to the taxonomy of pore fungi, one example will suffice.

The hyphal features of the polypore basidiocarp were actually recorded to a large extent in most of Overholts' descriptions, but his emphasis, following tradition, was mostly on hyphal end cells. The terminal cell of a hypha or hyphal branch has long been recognized as the most important category of the hyphal cells in the basidiocarp. The basidia, in which meiosis occurs and which produce the spores of the "sexual state," are the most important hyphal end cells in the fruiting body. Indeed, the whole basidiocarp in the Hymenomycetes has evolved about various ways of increasing number and effectiveness in producing and liberating spores. Because of their monotonous similarity morphologically, however, they furnish few taxonomic features at the generic level. Hymenial cystidia, a second type of hyphal end cell, have been emphasized in the classification of Hymenomycetes by most workers, including Overholts, throughout this century. The extensive gamut of morphological types which have evolved in this category can be seen by glancing at Plates 125–32. These and the features of the basidiospores, in addition to some hyphal features, made up the set of microscopic characters on which Overholts based his classification.

In the Agaricales hyphal end cells on the pileus (cuticle) and on the stipe are important features of taxonomic value. The same has now been found to be true for at least some of the polypores, but here they are much more difficult to demonstrate. All of these cate-

gories concern hyphal end cells which are at some exposed surface of the basidiocarp.

We have been slow to realize, however, that hyphal end cells in the interior of the basidiocarp have also evolved features constant for species and hence of taxonomic value. These have been observed and designated (or illustrated) as hyphal end cells by many workers, but because many elongate and in themselves assume more or less the shape of hyphae, they have often been termed hyphae, because they often become thick-walled and form the framework of some part of the basidiocarp. Thus, basidiocarps of some species described as dimitic (two hyphal systems), in reality may have but one system—in addition to a framework formed of hyphal-like endosetae, for instance. Classifying these structures as *hyphae* rather than *hyphal end cells,* it seems to me, opens a way of easily confusing the relationships of certain species with basidiocarps of generally similar aspect. A species with endosetae (or mycosclerids as Wright termed them) as "skeletals" is obviously more highly evolved than one in which the framework of the basidiocarp is made up entirely of hyphae rather than a category of hyphal cell. Since hyphal studies on the polypores are a tedious undertaking, making a correct hyphal analysis of a specimen on which one desires an identification, will not soon become routine in the polypores. As in the past, identification to species will most probably be made on correlated features once the basic studies have established a stable classification.

Certain neglected features of the polypores are now being studied more critically. The spore deposit color, for instance, is as important in the polypores as anywhere else in the Hymenomycetes. But for related groups one has to ascertain the spectrum—the color range for the group. This also applies to the agarics. This feature has in the past generally been unpopular with polypore students because so much of their material has been collected in a nonsporulating stage. However, it is futile to erect classifications ignoring a major character, and polypore classification will not become well stabilized until this feature is used in areas found to be critical. Spores under the microscope often appear hyaline, whereas in a deposit they will be seen to have distinctive color.

Most research in polypore taxonomy at the present time is concerned with recording the type of detail indicated here for the innumerable species, and when an odd combination of features is

discovered the species usually ends up as the type of a "new genus." One cannot help but reflect that the description of "new" genera might better wait until more information about the group as a whole is available, but this is not a realistic point of view for one to take as long as an author can place his name after that of a new genus and thereby immortalize himself. It seems to me that in certain groups the natural relationships of the fungi are now being obscured by the large number of genera proposed. Genetical studies are badly needed to ascertain the behavior of critical taxonomic features. This must be done before we can make truly meaningful judgments as to the value of the characters relative to a system of classification.

In the meantime, to give the users of the Overholts manual some idea of the generic names current in the literature of this decade, a partial list of the more important genera and of their species (with page numbers) is included as a guide:

1. Albatrellus
   A. ovinus 215
   A. confluens 216
   A. Flettii 218
   A. caeruliiporus 219
   A. cristatus 221
2. Antrodia
   A. mollis 146
3. Aurantioporellus
   A. alboluteus
4. Aurantioporus
   A. croceus
5. Bjerkandera
   B. adustus
   B. fumosus
6. Boletopsis
   B. griseus 228
7. Bondarzewia
   B. montanus 237
   B. berkeleyii 238
8. Coriolus
   C. versicolor
   C. biformis
   C. hirsutus
   C. pubescens
9. Cerrena
   C. unicolor 125

9a. Climacocystis
   C. borealis

10. Coriolellus
   C. sepium 136
   C. serialis 138
   C. malicola 150
11. Coltricia
   C. cinnamomea
   C. perennis
   C. montagnei
   C. greenei

11a. Cryptoporus
   C. volvatus

PREFACE

THE first draft of this manual was written by Dr. Lee Oras Overholts in 1933, after twenty years of work at Pennsylvania State College as the foremost American specialist in the Polyporaceae. Until his death in November, 1946, at State College, he corrected the manuscript continuously as new information became known, though he made no over-all revision. For six months before his death Dr. Overholts had been actively putting the manuscript in shape for publication, and, as left, it was substantially complete. The Introduction, the keys to the genera and the species, the specific descriptions, the Glossary, the legends for the illustrations, and about two thirds of the Bibliography were written in essentially the form in which they appear here.

At the request of Dr. Frank D. Kern, formerly head of the Department of Botany at Pennsylvania State College, and of Mrs. Overholts, I undertook to prepare the manuscript for publication. Insofar as possible the original wording has been retained, and only such changes as were required for accuracy, clarity, or uniformity of style have been introduced. The text keys to the arrangement of the species present Dr. Overholts' concepts of interrelations in the Polyporaceae as nearly as could be determined from his publications and from an incomplete arrangement for the genus *Polyporus* found with the manuscript. As required by the text, some sixty titles have been added to the Bibliography, and bibliographic citations of records of hosts and of geographic distribution have been supplied in the specific descriptions. Every literature citation has been checked against the original, and cited specimens have been checked against the originals in the Overholts Herbarium.

Because, no doubt, of his poor health, Dr. Overholts did not incorporate in his manual some thirty species and varieties which have been described since 1938, most of them by Dr. W. A. Murrill. To bring the present volume up to date, these are briefly characterized at the end of the proper genera, and are also referred to in the relevant text keys. I am indebted to Dr. Murrill for the loan of the type specimens of his species.

Grateful acknowledgment is made to Dr. Kern for encouragement and financial help, to Mrs. Overholts for constant assistance—including the exacting work of retyping the manuscript—and to the administrative officers of the New York State College of Forestry for the time and the travel funds required for the completion of the work. The University of Michigan Press generously undertook to publish the manual, and particular thanks are due Miss Grace Potter for her able and constructive editorial assistance, and to Dr. Alexander H. Smith for extensive aid. Sincere thanks are also due a number of individuals who assisted in ways too various to detail here.

Over a long and extraordinarily active mycological career Dr. Overholts gave freely of his time and wide knowledge to those who turned to him for assistance. As a specialist in the same field I received more than the usual amount of help, and came to know him as a personal friend. It is a privilege, therefore, to have been able to assist in the preparation of his lifework for publication, and to present to mycologists of the world the fruit of his lifetime study in the Polyporaceae.

JOSIAH L. LOWE

LIST OF PLATES

(The plates follow page 446.)