

Fungi on Trees and Shrubs in New Zealand

By P.D. Gadgil

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Reviewed by Wei-Young Wang

This book is the 4th volume of the series **The Fungi of New Zealand** that consists of taxonomic monographs of groups of fungi found in New Zealand. Over 700 fungi associated with trees and shrubs in New Zealand are described. These include plant pathogens, mycorrhizal fungi and saprophytic fungi that live on dead tissue of living trees. The information presented in this book is mainly from a fungal taxonomist point of view although the author does not hide his expertise as a forest pathologist. Peter Gadgil has been studying forest tree diseases at the New Zealand Forest Research Institute for nearly 40 years, and draws on this experience to make the book very user-friendly and readable.

The information in this book is arranged in a way that makes it easy to use. Fungi described in each chapter are grouped based on where they are found on a tree. For example, if a fungus is found mainly on leaves, you can find it in the chapter **Foliicolous Fungi**, which means "fungi growing on leaves". Similarly, if one wants to identify a fungus associated with tree roots, go to chapter **Radicicolous Fungi** or "Fungi growing in roots". Other chapters contain fungi growing on bark, twigs, sapwood, heartwood, etc. Within each chapter, fungal species are arranged by their taxonomic classes such as ascomycetes or basidiomycetes. Species in each taxonomic group are arranged alphabetically. Obligate parasitic fungi including downy mildews, powdery mildews, and rusts are treated separately each in their own chapters. Sooty moulds and mycorrhizal fungi are also treated separately. Several species of algae found on tree leaves that may be confused with true fungi were also described.

Information provided for each fungal species include species name; the associated plant hosts; a morphological description; distribution in New Zealand; economic significance; first published record in New Zealand; and references in case further information is needed. Due to the vast number of fungi included, information provided for each fungus is understandably limited to the essential.

A brief introduction of basic mycology, 16 pages of colour photos and a 10-page glossary at the beginning of the book will help readers to understand the terminologies commonly used by mycologists.

The 78-page Host-Fungus Index is probably the most useful section of this book. The index contains a list of over 800 species of trees and shrubs, together with all their associated fungi. The index can provide a quick diagnosis of the fungal species if the Latin name of the host is known. What happens if you only know the common name of the host? No problem, an Index of Common Names of Host Plants is also provided.

In the first chapter, the **Foliicolous Fungi**, over 200

species were described, by far the largest group of fungi associated with trees and shrubs. Special attentions were giving to *Cyclaneusma minus* and *Dothistroma pini*, two important pathogens that cause needle blight on pines.

Fifty-four species were described in the chapter **Caulicolous Fungi** (fungi growing on twigs). Several important pathogens are found in this group including *Chondrostereum purpureum*, causal agent of silver leaf disease in stone fruits; *Colletotrichum* spp. that causes stem canker and seedling die-back; *Seiridium* spp. that causes cypress canker; *Sphaeropsis sapinea*, also known as *Diplodia pinea* that causes diplodia canker in pines; and *Botrytis cinerea*, the fungus causing grey mould disease.

Twenty-seven fungi were described in the chapter **Corticicolous Fungi** (fungi growing on or in bark). The recently identified flute canker fungus, *Nectria fuckeliana*, is described here along with several other indigenous *Nectria* species.

The chapter **Radicicolous Fungi** contains the descriptions of 63 fungi that were found in tree roots or in the root collar region. Some of the most significant tree pathogens are found in this group including *Armillaria*, *Fusarium*, *Phytophthora* and *Pythium*.

Fungi included in the chapter **Xylophilous Fungi** (fungi found in sapwood of living trees) were the wood stainers, mainly in the genus *Ophiostoma*. Fungi described in the chapter **Lignicolous Fungi** (fungi found in the heartwood of living trees) were mainly the wood rotters.

Downy mildews, powdery mildews, rusts and smuts are all obligate parasitic fungi, which means they only grow on living plants and can not be cultured in artificial media. Rusts are the most economically damaging group of fungi in the world. It is fortunate that most of the 59 rust fungi described here do not cause serious damages. A few rusts are even beneficial, e.g. *Phragmidium violaceum* is used to control blackberry populations in pine forests.

Sooty moulds are dark-coloured saprophytic fungi grow superficially on plants and do not cause any direct damages to plant, and 34 species were described. The last major group of fungi included in this book is 46 species of mycorrhizal fungi, fungi that form a symbiotic relationship with trees that increases the water and nutrient uptake of the tree. The book ends with a comprehensive listing of 614 literatures cited. This is valuable information in itself.

In summary, **Fungi on Trees and Shrubs in New Zealand** is a well-organised, user-friendly reference book for professionals and amateurs. It provides basic information on over 700 fungi associated with woody species in New Zealand. It is a very useful reference book for mycologists, forest pathologists, horticulturists as well as foresters, biology and forestry students, or simply people who are interested in fungi and mushrooms.