

## The Entolomataceae of Tasmania



Photograph was taken at Kermandie Falls, May 2010.

From *left to right*: David Ratkowsky, Genevieve Gates, Machiel Noordeloos, and Michael Pilkington.  
*Sitting*: Fernanda Karstedt.

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Machiel E. Noordeloos • Genevieve M. Gates

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# The Entolomataceae of Tasmania

by Machiel E. Noordeloos & Genevieve M. Gates

**with photographs by the authors and with additional photographs by Michael Pilkington and with line drawings by Anita Walsmit-Sachs**

## Abstract

This book is the result of 14 years of collecting Entolomataceae in the native forests of Tasmania, Australia. Although initially involving only the Tasmanian residents Genevieve Gates and David Ratkowsky, who made twice- or thrice-weekly forays into the forests throughout the year, the project was subsequently joined by agaric specialist Machiel Noordeloos from the Netherlands and by fungi photographer Michael Pilkington from the United Kingdom. The international character of the project is further evidenced by the earlier contributions of American mycologist Tim Baroni to the Tasmanian *Rhodocybe* species which form the basis of the chapter on the now-expanded concept of *Clitopilus*, and a visit of several months in 2010 by Brazilian Ph.D. candidate Fernanda Karstedt, who helped to formulate the keys to the *Entoloma* species. Consequently, several thousand well-annotated collections were found during this inventory and form the basis of this monographic treatment of the *Entoloma* and *Clitopilus* of Tasmania. The resulting 90 *Entoloma* species and 10 *Clitopilus* species are well documented with standardized descriptions, line drawings of fruit bodies and diagnostic microscopic characters, and, when available, with colour photographs. Thanks to the intensive search, it was possible to illustrate most species in colour. Dichotomous keys facilitate identification of the species. The species concept used is morphologically based; in several cases, however, identification to species level is supported by molecular data.

The Entolomataceae mycota of Tasmania appears to be fairly unique, as 73 out of 90 species of *Entoloma* and 5 out of 10 *Clitopilus* species are new to science, with the majority of the remaining species shared with New Zealand. Only a few taxa have characteristics that match those of European species, and might have been introduced from Europe.

The large number of observations enabled the authors to use a statistical analysis of the phenological data, resulting in the recognition of five distinct fruiting patterns. Some species appear preferably in winter and spring, others in the summer and autumn months, where groups can be distinguished with a rather wide fruiting

spectrum, encompassing eight months, whereas others have a typical autumnal appearance in the months of April–June.

The introductory part contains chapters focussed on the taxonomy, phylogeny, and biogeography of Entolomataceae in Tasmania, in which the current state of knowledge is discussed. There are chapters dedicated specifically to the study of Entolomataceae, giving instructions how to collect, document, and preserve specimens for identification, and a well-illustrated chapter on characters and character states that are used in Entolomataceae identification and taxonomy. The introductory part concludes with a chapter dedicated to the ecology, distribution, and phenology of the Tasmanian Entolomataceae, based on the very many observations during this study.

Full references to the cited literature are given, as well as an index of species names and synonyms.

# Acknowledgments

This book is dedicated Dr. David Ratkowsky for his support, assistance during field trips and editing the final text, and to Johan van Dongen, for his support and patience.

Other persons played an important role in the production of this book. We are especially grateful to Michael Pilkington for his photographs, and also to Anita Walsmit-Sachs, who prepared the line drawings for publication.

We also wish to make special mention of the following individuals:

Alan Mills, formerly of the University of Tasmania, for his role in introducing G.M. Gates to many aspects of mycology and for his assistance in the laboratory;

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Mayo Kajitani of Forestry Tasmania, for the preparation of Figure 1.11;

Kim and Peter Eastman of Forester Road, Scottsdale, for their collection and photographs of *E. albomagnum*;

Sarah Lloyd and Ron Nagorecka for the collection of *E. percrinitum* from their property at Black Sugarloaf, Birralee.

Many *Entoloma* collections were made from frequent visits to the Donnellys Road, Geeveston, property of Drs. Laurie Bishop and Fiona Lewis, whom we thank.

Microscopic photographs were made with a Nikon Coolpix 950, a gift from Dr. Tim Baroni of the State University of New York, Cortland, to G.M. Gates.

Type studies were made possible through the kindness of the curator of the New Zealand Fungal Herbarium (PDD), Auckland, New Zealand.

Dr. Brian Spooner of the Herbarium KEW, United Kingdom, kindly assisted M.E. Noordeloos during a visit to the herbarium in November 2010 to study the types of Greta Stevenson.

We thank the following institutions: the Schools of Plant Science and Agricultural Science at the University of Tasmania, Forestry Tasmania, the Cooperative Research Centre for Forestry, CSIRO Sustainable Ecosystems and the Tasmanian Herbarium (HO), for logistic support.

## Author Biographies

**Dr. Machiel E. Noordeloos** was born in The Hague, The Netherlands, in 1949. He grew up in the outskirts of an expanding post-war town, with lots of opportunities to explore the plant life of the polders and nearby coastal dunes. Already as a small child he got interested in nature, particularly botany, and started collecting and making a herbarium. In 1967, he started his biology education at Leiden University and was trained as a mycologist by Dr. C. Bas working on a revision of *Marasmius* in the Netherlands. In 1981, he got his Ph.D. on a dissertation on the taxonomy and geographic distribution of *Entoloma* sensu lato in Europe. From 1987 to 1991 he was head of the Mycology Department of the Plant Protection Service in Wageningen where he studied plant pathogenic fungi and their ecology. From 1991 until his retirement in 2011, he was staff member and group leader of the Department for Plants and Cryptogams of the Netherlands and Europe at the National Herbarium of the Netherlands in Leiden. He is editor-in-chief of the series *Flora Agaricina Neerlandica* and has published many papers and books on various groups of Agaricales, including Entolomataceae, Marasmiaceae, and Strophariaceae, with a focus on Europe and Australia. In 2009, he was awarded the Clusius Medal of the Hungarian Mycological Society. He is an honorary member of the Dutch Mycological Society.

**Dr. Genevieve Gates** (née Piscioneri) was born in Pyramid Hill, Victoria, Australia, in 1952. Her father, an irrigation engineer, moved the family from the hot, dry, dusty Mallee of Victoria to the cooler climes of the island of Tasmania in 1959 where she continued her education, culminating in a B.Sc. degree majoring in botany and zoology at the University of Tasmania in 1974. She worked for several years as a laboratory technician at the Department of Agriculture at the University before becoming a full time mother. In 1998, in the middle of raising her three sons, she was drawn back to her botanical studies and became very interested in the taxonomy of Tasmanian fungi, particularly the family Entolomataceae. In 2009, she was awarded a Ph.D. in mycology and forest ecology for her study which investigated the macro-fungal assemblages associated with wood, soil, and litter in the wet eucalypt forests of southern Tasmania. Currently, she is an honorary research associate at UTAS.



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