



## LOVE, SEX & MUSHROOMS

ADVENTURES OF A WOMAN IN SCIENCE

Cardy Raper PhD



### *Love, Sex & Mushrooms: Adventures of a Woman in Science*

Cardy Raper

2018; Green Writers Press,  
Brattleboro, VT

Paper; 254 pages

ISBN-13: 978-1-7320815-2-9

\$19.95

One can easily relate to Cardy Raper's memoir of her life and adventures in science. The "loves" that she delved into the most were the affection for the mentor / professor that she married (Red) and the alluring accomplishments of the academic science in her life. The "sex" in the title was definitely not human sex—that was only faintly alluded to once. No, even though she went through abortion, two children, and infidelity, the sex in this book was all about mushrooms. She worked with *Achyla*, *Schizophyllum* and *Agaricus* and provides a window of interpretation into their sex lives and genetics, but this is no lecture in mycology. This is more about the adventures of a strong, matter-of-fact woman whose fitness for a career in

science led her into the mycological world.

When she subtitles her book *Adventures of a Woman in Science*, she implies that her experiences were different than those of a man. She relates a few experiences of discrimination, like when she had to go in the back door of the Harvard dining room because the front door was only for men, but most problems of sexism she successfully turned into mere hurdles. Working closely with her husband in the beginning (he died early at 62), she built a competence that seemed to open many doors. Later, she persevered and got the PhD at 52 that allowed her to continue her beloved mushroom work.

That work began with the water mold, *Achyla*, and research into the many options it seemed to have for reproduction. She and Red searched the world for strong mating strains of this organism. This was before Watson and Crick elucidated DNA and the field of genetics was flooded with lab assistants and funding. As their options for success dimmed, they found *Schizophyllum* more interesting. They cavalierly called their efforts to find all the signals and sensors for mating in *Schizophyllum* the "Kama Sutra Project." In fact, the genetics of fungal mating has become a hot topic because some of the mechanisms have relevance to humans. Some of the sensor chemicals are the same as those found in humans (Remember the pig pheromones in black truffles?) Now that the entire genome of *Schizophyllum commune* has been sequenced, even a few genes with potential for helping turn wood into paper have been found. So with over 100 pheromones to work with, *Schizophyllum* proved very interesting indeed.

Research into *Agaricus* sex was funded by Campbell's Soup. Since King Louis XVI this mushroom was cultivated in gardens and improved solely with spontaneous mutants that increased production. Unfortunately for the research, *Agaricus* did not have a sex life—it was hermaphroditic like some animals. There was no chance to improve it with sexual breeding.

So, the research of Cardy Raper was mycological, interesting, and

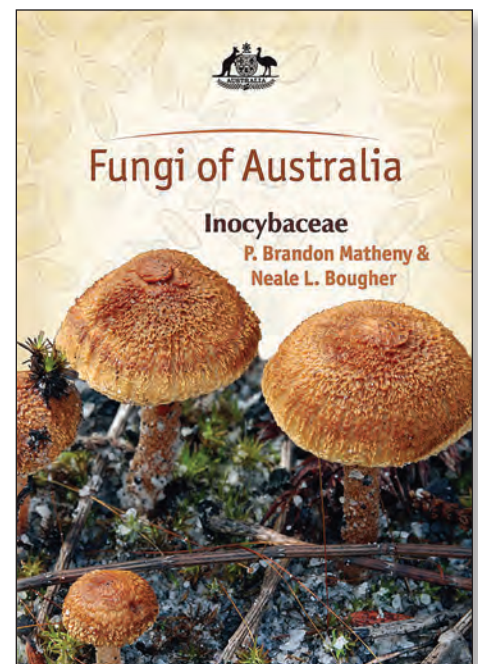
important. The way that she forged her way in a man's world was respectable and inspiring. This tale is told in such a matter-of-fact way that one is tempted to think she is ordinary, but there are many clues that she is an exceptional woman. Not only did she stand up to the rigors of a career in science, but she got her pilot's license, sailed in any weather, and took a knife out on the boat while pregnant (to cut the umbilical cord, in case her baby came). This book is a worthy read—if only just to meet her.

Kristine Ciombor

Vice President,

Wisconsin Mycological Society

This review first appeared in FUNGI vol.6, no.3, and was written for the publication of the first edition of this book.



### *Fungi of Australia: Inocybaceae*

P. Brandon Matheny  
and Neale L. Bougher

2017; Australian Biological Resources  
Study and CSIRO Publishing  
([www.publish.csiro.au/book/7650](http://www.publish.csiro.au/book/7650))

Distributor in the Americas:

Stylus Publishing

([www.styluspub.presswarehouse.com](http://www.styluspub.presswarehouse.com))

ISBN 978-1-4863-0666-4

(hardback; viii + 582 pages)

AU \$240.00 / \$179.95 from Stylus

Inocybes typically are dismissed as being "just LBMs" (Little Brown Mushrooms) and, with an occasional exception (for example, the *Inocybe*

*lilacina* group), certainly they are small and brown. But take a peek through the microscope and one finds that they definitely are cool, featuring some of the most wonderful spore shapes and crystal-studded cystidia in the mushroom world. Add to that their ecological importance as ectomycorrhizal symbionts and these LBMs become subjects worthy of much wider interest.

In 1973, Australia's Commonwealth Government established the Australian Biological Resources Study (ABRS) to document what plants and animals there are in Australia and where they occur. The ABRS brings together the expertise of scientists from around Australia and overseas, to prepare and publish authoritative information about Australia's flora and fauna (and, although not acknowledged in the promo blurb, its mycota). This is the eighth volume dedicated to fungi, following four introductory volumes, and monographs on the Hygrophoraceae, the genus *Septoria*, and smuts. Of the estimated 250,000 species of fungi in Australia only about 5% have been described. The ABRS program provides a major impetus for research on the other 95%.

And that is how this book came to be. Brandon Matheny is a professor at the University of Tennessee, occupying the position famously held for over half a century by mycological legends L.R. Hesler and Ron Petersen. He is well known for his work on the phylogeny of the fungi, especially the Agaricomycotina, and many would say he is the world's foremost authority on the mushroom family, Inocybaceae, which most of us would recognize as the genus, *Inocybe*. Neale Bougher, of the Western Australian Herbarium, is one of Australia's best-known mycologists. He has wide-ranging interests and some may recognize him as co-author, with Katrina Syme, of the beautifully illustrated, *Fungi of Southern Australia*.

The research on Australian Inocybaceae that led to this monograph was begun by Bougher and co-workers in the 1980s and 1990s. In 2001 and 2009–2013, he was joined by Matheny for collecting trips to various parts of the country. At the time they began working on the project, about 60 *Inocybe* species had been recorded in Australia. Their review of those records led them to conclude that there were many synonyms

and a few non-Inocybes among the 60 names so that they represented only 17 accepted species. Thus, the 137 species (101 new to science) presented in this book represent roughly an 800% increase in the knowledge of these mushrooms, with perhaps another 70 species ultimately to be described. Ninety percent (121) of these are, so far at least, found only in Australia.

As elsewhere, the family Inocybaceae in Australia corresponds to what most of us are used to calling the genus, *Inocybe*. However, after much study, Matheny felt that sufficient diversity existed to merit family level for the group, as proposed by Walter Jülich in 1982. See Matheny's 2009 article in NAMA's journal, *McIlvainea*, for a helpful discussion of inocybe diversity and the rationale for promoting family rank for the group: [http://www.namyo.org/docs/3\\_Matheny.pdf](http://www.namyo.org/docs/3_Matheny.pdf). Now, about the book ...

The front matter includes lists of Authors, Illustrator, Photographers, Keys, and Phylograms (a.k.a. "phylogenetic trees"), with the Acknowledgements section in the middle. The lengthy Introduction covers a wide range of subjects, including what the fungi in Inocybaceae are and how they can be recognized, a summary of their occurrence in Australia, History of the Family, Similar Genera, Ecology, History of the Study of Australian Inocybaceae, Biogeography of the group, a very useful (everywhere, despite the title, Studying Australian Inocybaceae) discussion of the morphological (macro and micro) and biochemical characters used to study the group and, finally, the specific Methods the authors used, including phylogenetic analyses and their basis for recognizing species.

The bulk of the book is in the simply-titled section, Inocybaceae, more on that below.

The presentation wraps up with three appendices: List of New Taxa, Excluded and Doubtful Taxa, and Table of DNA Sequences Used in this Study; Glossary; Bibliography; Abbreviations and Contractions; Publication Dates of Previous Volumes of *Fungi of Australia*; and the Index.

Phylogenetic studies provide support for the recognition of seven main monophyletic groups (a.k.a. "clades," which represent seven existing or likely future genera) within Inocybaceae

(*Inocybe sensu stricto*, *Nothocybe*, *Pseudosperma*, *Inosperma*, *Auritella*, *Tubariomyces*, and *Malloocybe*), of which six (no *Nothocybe*) are known to have members in Australia, making it one of the major centers of diversity for the family. The main section provides detailed descriptions for the 137 species, complemented with identification keys and phylograms, the latter based predominantly on DNA sequences generated by the authors. The descriptions include each species' MycoBank number, information concerning the type collection, macro features, micro features, distribution and fruiting time, information on the specimens examined, meaning of the specific epithet, key diagnostic features, and commentary. They are comprehensive and written with technical language as is typical for a professional monograph. The text is augmented with high-quality line drawings of microscopic features and nearly all species also include at least one color photo, usually two or three.

There are seven keys — one to the six major clades (or genera) in Australia, and one each to the species in each of the six clades. All the keys are very simple, with most leads including only one or a few characters, which often include microscopic ones, most often spore size.

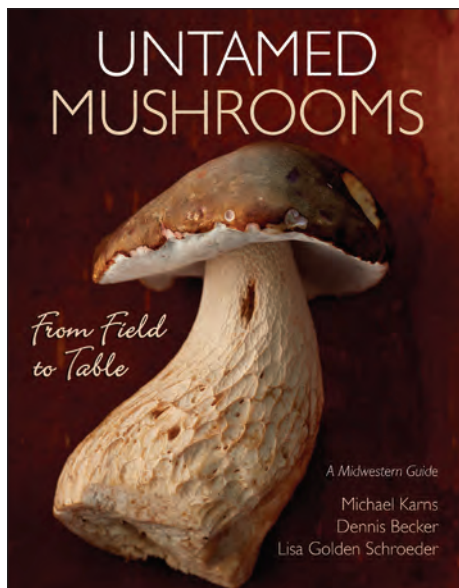
The excellent line-drawings all were done by Bougher. They are presented on full pages and show spores, basidia, cheilocystidia, pleurocystidia (when present), caulocystidia (when present), and, for some, pileipellis or velipellis hyphae. The photos are a mix of field and lab shots. In most cases, I found the field photos to be more useful, as they appear to show color more accurately. In part, this is due to there being less contrast between the fruitbodies and their surroundings than typically is the case in the lab setups. As a result, they tend to show detail, such as the surface texture of the cap, more clearly. Many of the lab photos are too dark (either underexposed or a printing artifact) to show the details and some have unnatural color casts. Most of the field photos would have been improved by a bit of fill flash or judicious use of a reflector to eliminate shadows on the upper stipe and gills of many of the specimens.

If one is an Aussie and has an interest in Inocybes in particular or in identifying



most of the fungi you encounter, this is a must-have book, despite the high price. Unfortunately, the fact that, as far as is known, most of the species are found only in Australia will greatly reduce the potential audience. The up-front general sections about the family (or genus, if you prefer) would be very useful wherever (despite the overuse of “Australian” in front of seemingly every “Inocybaceae”), but the price is likely to dissuade most folks from buying the book primarily for that small portion of it. Matheny is continuing to study the North American species and, although it might be too much to hope for a comparable volume covering our Inocybes, we can encourage him, and others with an interest in the family to share the information through outlets such as his fledgling website, [Inocybaceae.org](http://Inocybaceae.org).

–Steve Trudell



## ***Untamed Mushrooms: From Field to Table***

**Michael Karns, Dennis Becker,  
and Lisa Golden Schroeder**

2018, Minnesota Historical  
Society Press

ISBN: 9781681340869

Paper; 316 pages, 150 color photos,  
100 recipes, index, bibliography

Product Dimensions: 8x10 inches

\$24.95

**T**he most beautiful mushroom-themed cookbook ever produced in North America is now available! I swooned the moment I opened my copy of the brand new

*Untamed Mushrooms*. When you think of wild mushroom foraging, and cookery, your first thoughts likely go to the Pacific Northwest and indeed, up to now, most mushroom cookbooks have come from this region. So it's high time the Midwest was represented. And it turns out that the wait was worth it, as this book is spectacular. Kathy Yerich, vice president of the Minnesota Mycological Society and North American Mycological Association, and co-author of *Mushrooms of the Upper Midwest* calls *Untamed Mushrooms* “a love letter to the woodlands and seasons of the Midwest and its food traditions, old and new. This book offers an elegant answer to the familiar foraging

question: ‘What is this and can I eat it?’ by presenting a meticulous account of a baker’s dozen of the most desirable and easy to identify edible mushrooms. Hunting mushrooms is profoundly seasonal, and so are the lovingly collected and exquisitely photographed recipes in this book.”

I concur. But should you live and forage outside of the Midwest don't pass over this title. You have chanterelles, morels, and lobster mushrooms etc. in your region. And no matter, as other mushrooms will work with these recipes, many of them timeless classics but with added flare; some are new takes; all of them pretty easy to pull off. Not a cook? Not a problem. This book easily could









be the most gorgeous coffee table book in your home. (I suspect that even if you are not a cook, this book will motivate you to try your hand with a few dishes!)

Old traditions of foraging have seen a passionate resurgence of interest among midwestern chefs and home cooks intrigued by the vitality of foods growing just footsteps—or a healthy hike—from their doors. But many hesitate over collecting wild mushrooms: How do you know which ones are okay to eat? And once you do, how should you prepare them? *Untamed Mushrooms* is sort of two books in one, arranged to answer these two questions. The first section of the book briefly discusses, in turn, each of 13 major groups of edible wild mushrooms (e.g., oysters, boletes, morels, chanterelles) with great photos and info on how to recognize and know each. The second part dishes up the recipes—more than 100—nicely arranged by season. There are meat recipes of course, but all dishes are vegetable-heavy for those (like me) who enjoy a wide assortment of tastes and textures. Once you've arrived home with your woodland bounty, try grilled lake trout with a mess of morels, roasted corn soup with mushroom duxelles, prairie wheat berry salad with roasted mushrooms and chiongia beets, pork tenderloin with black trumpet sorghum and ground cherry salsa, game hens with creamy maitake pasta, or porcini-dusted chicken with wild mushroom farrotto. And there is an excellent section on preserving your wild mushrooms, and what to do with them in the off-season.

Accept this official invitation to begin your own mushroom stalking adventures ... and get ready for some seriously delicious eating!

—Britt A. Bunyard

## The Way Through the Woods: On Mushrooms and Mourning

Long Litt Woon

2019, Spiegel & Grau, New York

(an imprint of Random House)

ISBN 9781984801036

Hardback, 291 pages

\$26.00

As a young Malaysian exchange student, Woon met Eiolf Olsen, a fellow student, in her first month in Norway. They fell in love, married and lived in a creative, close and loving partnership for thirty-two years until the day Eiolf went to work and, at the age of fifty-four, without any prior warning, dropped dead.

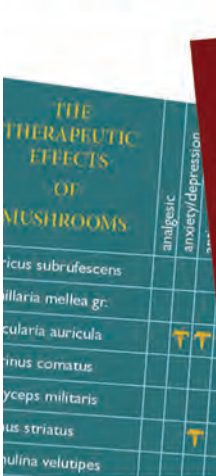
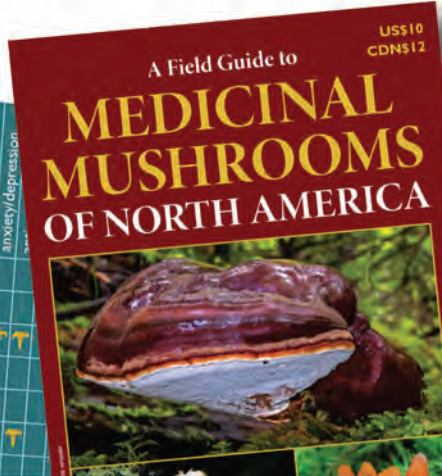
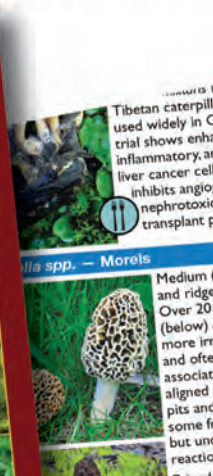
Woon is a spare writer. (The book is illustrated with lovely line drawings of mushrooms by Oona Viskari, which are also spare; so much so that I

# THE UTTERLY ESSENTIAL

## PORTABLE FIELD GUIDE TO

### MEDICINAL MUSHROOMS

BY DANIEL WINKLER & ROBERT ROGERS


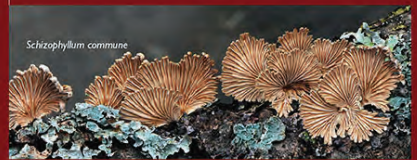
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### A Field Guide to

# MEDICINAL MUSHROOMS OF NORTH AMERICA


US\$10 / CDN\$12


**A Field Guide to Medicinal Mushrooms of North America** offers an overview of the 33 most important medicinal fungi in the US & Canada and helps uncover their healing powers. Each mushroom is presented with clear photographs that show key features and a descriptive text enabling readers to safely identify many of these fascinating organisms loaded with powerful healing agents. In addition, edibility, habitat and fruiting season is provided. Furthermore, all mushrooms are presented with a short reference to their historical use, current medical use, and documented bioactivity. A special section provides instructions on how to collect and process mushrooms in order to make one's own extracts, tinctures, teas and salves. An overview table gives quick access to the specific uses of all 33 mushrooms, many of them also distributed in Europe, Asia and beyond.

**Robert Rogers** has been an herbalist for over 45 years and is a professional member of the American Herbalist Guild. He published *The Fungal Pharmacy: The Complete Guide to Medicinal Mushrooms and Lichens of North America* in 2011, and *Mushroom Essences: Vibrational Healing from the Kingdom Fungi* in 2016. Robert lives in Edmonton, Alberta, Canada, and is an assistant clinical professor in Family Medicine at University of Alberta. He has authored over fifty books on medicinal plants and mushrooms of the boreal forest and presently teaches at the Northern Star College. He enjoys photography and giving mushroom walks and talks throughout North America.

[www.selfhealdistributing.com](http://www.selfhealdistributing.com)



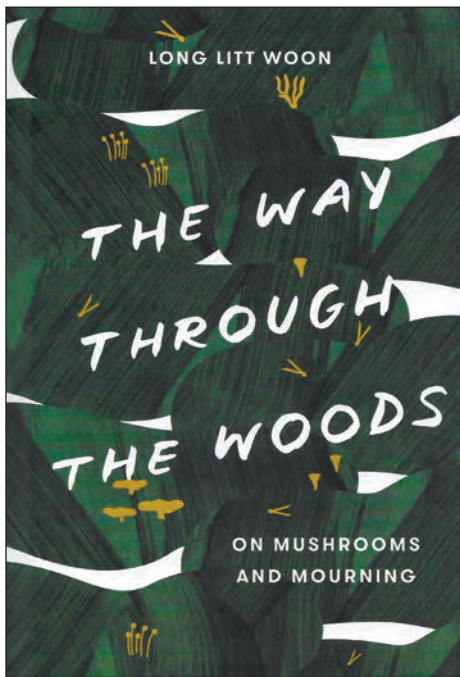
**Daniel Winkler** grew up collecting wild mushrooms in the Alps and studied ecology and geography in Munich and Berlin. Working on environmental issues in Tibet in the late 90s, Daniel focused his research on "Yartsa Gunbu" (*Ophiocordyceps sinensis*), a highly valued medicinal fungus fueling an enormous fungal economy. Through this research he became intrigued by the incredible healing potential of fungi. In 1996, Daniel moved to Seattle, where he continues to work as a mushroom educator, photographer and author of field guides and extensive webpages at [www.Mushrooming.com](http://www.Mushrooming.com). Since 2006, through his travel agency Mushrooming, Daniel leads eco-adventures in Tibet, Bhutan, Colombia, Bolivia, Austria, PNW & beyond.



Text: Robert Rogers & Daniel Winkler  
 All photos © Daniel Winkler (51) & Robert Rogers (9)  
 except: © Inigo & Hanyoung © W. Surpous  
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 Many thanks to: Tréid Cotter, Jürgen Gutmann,  
 Mate Schink, Christian Schwarz & David Spahr  
 Designed by Daniel Winkler

US\$10 / CDN\$12





was constantly surprised at how well they depicted the species indicated using so little detail.) There is a great deal of artistry in her apparently simple depiction of her paralyzing grief and how learning about mushrooms slowly eased her back into life; the title is both

literal and metaphorical. (And, since Woon wrote the book in Norwegian, one should probably also credit her translator: Barbara J. Haveland.)

This is not a book for those wishing to learn about mushrooms but, rather, a conversation with a fellow mycophile. It was a pleasure to see where we'd had the same experiences and thoughts (What is it about Scandinavians and *Gyromitra*? The American Museum of Natural History doesn't really deserve its exalted status, and so on), and to learn where Woon had taken a thought I'd carelessly discarded and run with it. Woon is an anthropologist who understands research. So, I was interested in her attempts to analyze the use of odor as a defining character of mushrooms, since I've never been very successful in smelling what others claimed to. When Woon hit the same wall, she followed through, pulling together a sensory panel of experts and demonstrating that — at least in Norway — the experts' definitions of the odors of various species coincided with the published profiles only half of the time. Odor and the other senses required for mushroom

identification (and the pleasures they offer) were especially important to Woon, whose senses had been numbed by grief.

Although I enjoyed Woon's journey into the world of mushrooms, I found myself more gripped by her parallel journey through the world of loss and mourning, and into (finally) healing. I had read other memoirs of mourning, but each person's experience is unique. And unlike the literary volumes I'd read, Woon used something besides the passage of time to emerge from the darkness of loss. Although she depicts signing up for a course on mushrooms while in the depths of despair, as an almost random act, the fact is that she did it, and allowed herself to become completely engaged, ultimately even passing an exam to become a certified mushroom inspector; a uniquely Norwegian form of assistance to foragers who can ask that their baskets be inspected. Or maybe this simply bears out my belief that nature is more satisfying than art. Particularly when it takes the way through the woods.

—Susan Goldhor

## AFTERPARTY

the server, handsome, mature  
responding, Yes you may have your afterparty here  
Antonioni's remains open for you, Congratulations  
seated, facing the darkness  
the guest studied the menu  
the afterparty pretty much this meal  
order to the strengths of the kitchen  
Mushrooms . . . ? mused the guest  
the server, attentive, Yes mushrooms  
individually selected, delivered by mycoenthusiasts  
the server leaned closer, tapped the menu with his pencil  
fettuccine al funghi  
the guest left a generous tip

*Chuck Joy*  
*Pennsylvania*

