

Annual Operational Report

Economically Important Macrofungi in British Columbia: Species Descriptions, Distribution and Commercial Status: R2003-0184



Submitted by

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Abstract

The province of British Columbia, Canada has a multi-million dollar wild mushroom industry. These mushrooms are referred to as non-timber forest products (NTFP) because they are harvested in forests as well as in other natural habitats. We have identified approximately one hundred NTFP mushrooms that are currently or potentially of economic importance to the province. This document describes in detail the characteristics of each mushroom. For this first year, we have chosen twelve major species that are harvested in the province for commercial purposes. We include the following species: *Cantharellus cibarius* var. *roseocanus* (Rainbow Chanterelle), *Cantharellus subalbidus* (White Chanterelle), *Craterellus tubaeformis* (Winter Chanterelle), *Polyozellus multiplex* (Blue Chanterelle), *Hydnum repandum* (Hedgehog Mushroom), *Hydnum umbilicatum* (Hedgehog Mushroom), *Clitocybe nuda* (Blewit), *Lyophyllum decastes* (Fried Chicken Mushroom), *Tricholoma magnivelare* (Pine Mushroom), *Sparassis crispa* (Cauliflower Mushroom), *Hypomyces lactifluorum* (Lobster Mushroom). We describe their morphology, synonyms, common names, ecology and habitats, look-a-likes, and we provide distribution maps and interesting facts about each mushroom. We will describe the remaining species over the next two years.

Key Words

Mushrooms, macrofungi, commercial harvest, sustainable harvest, species descriptions, distribution, World Wide Web, economic, non-timber forest product.

Summary of Activities

There were 8 major objectives for this research project.

- 1: Visit the national herbarium in Ottawa to document the location of the provinces economically important macrofungi or the non-timber forest product mushrooms (NTFP mushrooms).
- 2: List the species that will be described during each year of the project.
- 3: Review the scientific and technical literature for information on the NTFP mushrooms.
- 4: Complete fieldwork to describe and photograph fresh specimens.
- 5: Describe species.
- 6: Describe nomenclatural status and synonyms of all species.
- 7: Produce a World Wide Web document describing identified NTFP mushroom species.
- 8: Produce a readily accessible user-friendly document on the economically important macrofungi of British Columbia.

Results and Outputs Completed during the Year

All objectives were met, and we produce 2 outcomes, a user-friendly final report about some NTFP mushrooms and a World Wide Web about them.

1. In December 2002, Sharmin Gamiet visited the national herbarium in Ottawa, where she examined voucher specimens of the economically important macrofungi from British Columbia. In all over 685 specimens were examined and their locations were saved in a database for future use in digital maps that will record the location of each species.
- 2: We identified 12 species that we would describe in detail and either photograph the specimens ourselves, or locate appropriate images for each species. We successfully identified the best image for each species and their look-alikes. Table 1 indicates the status of each species on the NTFP mushroom list.
- 3: Throughout the year of this study, we comprehensively researched each specimen to produce an extensive description for each specimen. As well as using scientific and technical references we consulted many experts on specific mushroom species. For instance, the expert on the species *Lyophyllum decastes*

is Dr. J.M. Monclavo of the Royal Ontario Museum, Toronto, and we consulted with him extensively when we researched this species. He sent us many research papers about this species and he answered any questions and made suggestions about this species.

4: Due to the late start of the project we confined our field trips to readily accessible forest stands on the south coast. We had hoped to make field trips to other parts of the province, but due to weather conditions, we were unable to make extensive province wide field trips. We hope to collect specimens from other parts of the province during year 2 and year 3 of this study, so that we can examine local specimens for morphological variations.

5: Over the course of the year, we described each of the 12 species in detail. Results from our work can be seen in our final report submitted to FII on March 31 2003 and in the document posted onto the World Wide Web. See URL: <http://www3.telus.net/articulate> or <http://bcmushrooms.forrex.org/ntfp>. Each species included its macro and micro features, ecology and habitats, known range in the province, distribution maps, synonyms, scientific and common names (preferred and others) and interesting facts for each. We also included images and illustrations for each target species and images for their look-alikes.

6: In order to have current names for each specimen, we examined the scientific literature for nomenclatural changes for each species. As a result, we were able to identify all synonyms for all species. We consulted many Canadian and American agaricologists on the nomenclatural status of each species. For instance, Dr. L.L. Norvell, is one of the foremost researchers on the genus *Cantharellus*. We consulted with her on the nomenclatural status of *Craterellus tubaeformis*, and she advised us on how to name this species. According to Dr. Norvell, this species will have a name change soon, but currently we must use the name *Cr. tubaeformis*. For each species we presented the synonyms of each species.

7: We posted a final document onto the World Wide Web: see URL <http://bcmushrooms.forrex.org/ntfp> or <http://www3.telus.net/articulate>. At this date, the site is being reviewed for technical accuracies, after which the site will be sent for external peer review. The final document will be posted and hosted by FORREX.

8: We have submitted a final report that is readily accessible and is user-friendly to FII on March 31 2003.

Measurable Indicators of Success

We have 2 measurable indicators of the projects success of the project in achieving the desired outcomes.

1: We have an extremely easy to navigate and aesthetically pleasing document posted onto the World Wide Web. see URL's above.

2: A final report that is readily accessible and is user friendly is a measurable indicator of success.

Applicability of Results

The end – users of this project are: mushroom pickers and buyers, professional, para and amateur mycologists, ecologists, foresters and forest managers. Since the results from this study are posted onto the World Wide Web, they can be used province wide by the end – user to identify their local mushrooms. Pickers can use these results to ensure that they are picking the correct mushroom and not a poisonous or non-commercial look-alike. Mycologists can use the results from this project to compare provincial endemic species to other species collected in the Pacific Northwest part of North America. As well, species that are found globally can now be compared for variations within the species concepts from British Columbia. Foresters, managers and ecologists can use the results from this project to better understand forest mycology and ecology, because they now have a readily accessible reference for provincial mushrooms.

Results from this project must be published in hard copy form, in the format of a field guide so that end-users have a portable reference for provincial economically important mushrooms.

Contributions Towards Knowledge Gap

This project contributed greatly towards lessening the knowledge gap of provincial macrofungi. While there are references on vascular and non vascular plants, mammals, birds, insects relevant to British Columbia, there is no such reference on macro-fungi. This project is the first to initiate a publication in field guide format, a reference on provincial macrofungi.

Future research is required to complete this project and make it more relevant. Additional economically important macrofungi to those that are already included in this years project must be included in the document that is posted onto the World Wide Web. We have identified around 100 economically important mushrooms found in the province, but this project included only 12. Adding more species descriptions for each of the 100 identified species will make this project more relevant to the end-users.

Key Operational Variances

There were no operational variances from this project. We met all of our objectives and delivered all that we identified.

Table 1: Status of NTFP mushrooms to be included in Field Guide

Name of Species	Examined in Herbarium in Ottawa	Species Descriptions Completed	Species with Images	Species posted on the WWW
1 <i>Agaricus arvensis</i>	X			
2 <i>Agaricus campestris</i>	X			
3 <i>Agaricus silvaticus</i>	X			
4 <i>Aleuria aurantia</i>	X			
5 <i>Amanita muscaria</i>	X	X	X	
6 <i>Armillaria ostoyae and relatives</i>	X		X	
7 <i>Auricularia auricula</i>	X			
8 <i>Boletopsis leucomelaena</i>	X			
9 <i>Boletus edulis</i>	X	X	X	
10 <i>Boletus mirabilis</i>	X	X	X	
11 <i>Boletus smithii</i>	X	X	X	
12 <i>Boletus zelleri</i>	X	X	X	
13 <i>Calvatia gigantea</i>	X			
14 <i>Cantharellus cibarius var. roseocanus</i>	X	X	X	X
15 <i>Cantharellus formosus</i>	X	X	X	X
16 <i>Cantharellus infundibuliformis</i>	X	X	X	X
17 <i>Cantharellus subalbidus</i>	X	X	X	X
18 <i>Clavulina cristata</i>	X		X	
19 <i>Clitocybe nuda</i>	X	X	X	X
20 <i>Coprinus comatus</i>	X		X	
21 <i>Craterellus cornucopioides</i>	X			
22 <i>Dacrymyces palmatus</i>	X			
23 <i>Fomes fomentarius</i>	X			
24 <i>Fomitopsis officinalis</i>	X			
25 <i>Fomitopsis pinicola</i>	X		X	
26 <i>Ganoderma applanatum</i>	X		X	
27 <i>Ganoderma oregonense</i>	X			
28 <i>Ganoderma tsugae</i>	X			
29 <i>Gloeophyllum saeparium</i>	X			
30 <i>Gomphidius oregonensis</i>	X			
31 <i>Gomphidius subroseus</i>	X			
32 <i>Gomphus clavatus</i>	X		X	
33 <i>Grifola frondosa</i>	X			
34 <i>Gyromitra esculenta</i>	X		X	
35 <i>Gyromitra gigas</i>	X		X	
36 <i>Hericiium abietis</i>	X		X	
37 <i>Hericiium erinaceus</i>	X		X	
38 <i>Hericiium ramosum</i>	X		X	
39 <i>Hydnum repandum</i>	X	X	X	X
40 <i>Hydnum umbilicatum</i>	X	X	X	X
41 <i>Hygrophorus bakerensis</i>	X			
42 <i>Hypholoma capnoides</i>	X		X	
43 <i>Hypomyces lactifluorum</i>	X	X	X	X

44 <i>Inonotus obliquus</i>	X			
45 <i>Laccaria laccata</i>	X	X	X	
46 <i>Lactarius deliciosus</i>	X	X	X	
47 <i>Lactarius rubrilacteus</i>	X		X	
48 <i>Laetiporus sulphureus</i>	X		X	
49 <i>Leccinum aurantiacum</i>	X			
50 <i>Leccinum insigne</i>	X			
51 <i>Leccinum scabrum</i>	X		X	
52 <i>Leccinum testaceo-scabrum</i>	X			
53 <i>Lenzites betulina</i>	X			
54 <i>Lycoperdon perlatum</i>	X			
55 <i>Lycoperdon pyriforme</i>	X			
56 <i>Lyophyllum decastes</i>	X		X	X
57 <i>Marasmius oreades</i>	X		X	
58 <i>Morchella elata</i>	X		X	
59 <i>Morchella esculenta</i>	X		X	
60 <i>Phellinus ignarius</i>	X			
61 <i>Pleurocybella porrigens</i>	X		X	
62 <i>Pleurotus ostreatus</i>	X			
63 <i>Pluteus cervinus</i>	X		X	
64 <i>Polyozellus multiplex</i>	X	X	X	X
65 <i>Pseudohydnum gelatinosum</i>	X			
66 <i>Rozites caperata</i>	X		X	
67 <i>Russula xerampelina</i>	X		X	
68 <i>Schizophyllum commune</i>	X			
69 <i>Sparassis crispa</i>	X	X	X	X
70 <i>Suillus brevipes</i>	X			
71 <i>Suillus caeruleus</i>	X			
72 <i>Suillus cavipes</i>	X			
73 <i>Suillus granulatus</i>	X			
74 <i>Suillus lakei</i>	X		X	
75 <i>Suillus luteus</i>	X			
76 <i>Suillus subolivaceus</i>	X			
77 <i>Suillus tomentosus</i>	X			
78 <i>Trametes versicolor</i>	X			
79 <i>Tremella lutescens</i>	X			
80 <i>Tricholoma caligatum</i>	X		X	
81 <i>Tricholoma flavovirens</i>	X			
82 <i>Tricholoma magnivelare</i>	X	X	X	X
83 <i>Tricholoma portentosum</i>	X			
84 <i>Tuber gibbosum</i>	X			
85 <i>Verpa bohemica</i>	X			