

SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
Monroe Center, 1810 N.W. 65th St., Seattle, WA 98117

February 1986

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INTRODUCTION TO RUSSULA Ben Woo [Russula, Trial Key to the Pacific Northwest Species]

Russula is a genus of gilled mushrooms readily separated from all other gilled mushrooms by characteristics easily discerned by the amateur. Distinction between species, however, is another matter. Recognition of species is complicated by their large number (many, perhaps, not yet named), the variability within species, inconsistencies in the literature, and the necessity, in many cases, for microscopic examination and chemical testing to reveal important differences.

The family Russulaceae, which includes the genera Russula and Lactarius, is distinguished from most other agarics by a mixture of filamentous cells and large inflated cells called sphaerocysts. This structure makes the fruiting bodies stiff and brittle: the gills of a Russula will break when stroked with a fingertip, and when bent the stem will snap "like a piece of chalk." Lactarius, while not so brittle, will, when cut or bruised, exude a milky fluid, often white but also in colors of yellow, orange, red, or even blue.

Russula, then, is a brittle-fleshed, gilled mushroom with a central stem, without a universal veil, and, except in a few tropical species, without a partial veil. The spore color varies from pure white to ochre. The stipe is most commonly white but may have a surface tint of red or purple and, on handling, may stain yellowish or brownish in some species or ashy gray or black in others. The flesh is also normally white, but in some species discolors to red, brown, or black when injured or aged.

A number of Russula species can be recognized by a combination of macroscopic features. Many others can be keyed to a clump of lookalikes separable only by microscopic or chemical means. These limitations will probably never go away, but will represent frustration to some and a challenge to others.

In "Russula, Trial Key to the Pacific Northwest Species," the following characteristics are used to key out Russulas.

Color of the Cap. This characteristic typifies the maddening variability of Russula species which drives both amateurs and professional mycologists to strong drink. Russulas can vary in color within a single species, change in color due to aging, exposure to light, or washing with rain, or vary in color from population to population -- or all of the above.

Size of the Cap. Size is also subject to great variability, but we find it useful to indicate whether a Russula is small, medium, or large. In the key, the diameter of mature caps is broken into the following ranges:

- Small 2 to 6 cm
- Medium 5 to 9 cm
- Large 8 to 20 cm or larger

Shape of the Cap. Most Russulas will be hemispherical when young and will flatten out in age as they expand to expose their gills. In most, the margin will arch upward when fully expanded.

Surface of the Cap. Most Russulas will be somewhat to copiously viscid in wet weather. The character or appearance of the dry surface is worthy of careful examination. This can be shiny, simply smooth, matte, or even velvety, with some surfaces cracking into mud flat patterns or other distinctive designs. A distinct skin may be more or less separable when peeled from the margin. Finally, the margin of the cap will often develop grooves corresponding to the spacing of the gills below. Such grooved margins are called striate; ungrooved margins are called even.

Gills. All Russulas have gills. Some have short gills near the edge of the cap that do not extend to the stem. The species in the Compactae section have regularly occurring short or sub-gills. In some species, the gills will fork, sometimes near the stipe (basifurcate), sometimes near the margin, and sometimes in between. Most Russulas exhibit folds or veins between gills, a condition called "intervenose." Gill attachment is usually adnate to some degree, but varies from almost free to almost decurrent. The color of the gills will often, especially in darker spored species, give an indication of the color of the spore print, but it can also be misleading.

Color Changes of the Flesh and Other Parts. Many Russulas will show changes in color when cut or bruised, or in age. The sequence of color change is important in separating species. In some, an initial change to orange or red occurs, followed by darkening to brown or black. In others, a direct change to brown or gray occurs, with or without eventual blackening. Yellow staining is characteristic of a few species.

Taste. Those who aspire to identify Russulas must endure considerable self-inflicted abuse of their taste buds. While many Russulas have a mild taste, another, considerable number are ferociously acrid (hot, as in jalapeno). Some species are described as being slightly acrid, or acrid only in the young gills. A few are said to be bitter, although this is something not detected by every person. The usual test format is to break off a small piece (about 1/2" square) from the edge of the cap, including gills and cuticle, place on the tongue, and slowly nibble. Do not swallow. A few seconds will allow the tongue to come to judgement. With some species, considerable spitting is required to purge the oral cavity. We find red wine to be an effective decontaminant.

Odor. The detection and describing of odors is an aptitude of uneven distribution in the population. You may or may not find the descriptions of odors helpful to you. Sniffing the gill surface near the stipe is the usual technique. Russulas may have no odor, earthy or mushroomy smells, sweet or fruity

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*Spore
Prints*

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PUGET SOUND MYCOLOGICAL SOCIETY
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Calendar

- 2/10/86 Beginners' orientation class, 6:30 p.m.,
Monroe Center auditorium
PSMS monthly meeting, 7:30 p.m.,
Monroe Center auditorium
- 2/14/86 Spore Prints deadline (one week early).
- 2/24/86 PSMS board meeting, 7:30 p.m., Library
- 3/14/86 Survivors' Banquet, Quinn's at Shilshole

WELCOME TO THE FOLLOWING NEW MEMBERS:

Ager, Alan	324-1998
Ashby, Mike & Mary	932-5060
Boucher, Jean	362-4230
Daskal, Neal	329-4517
McInerney	632-3670

Membership Meeting

Monday, February 10, 1986, at 7:30 p.m. in the Monroe
Center auditorium, 1810 N.W. 65th Street, Seattle

The February program will feature PSMS member Edith Godar, who will speak on "Causes and Effects of Mushroom Poisonings." Edith has a Ph.D. in Chemistry from Loyola University in Chicago, did post-doctoral research at the University of Detroit, worked as an organic research chemist at International Minerals, and taught graduate level courses at Loyola. She will review the chemical makeup of poisonous mushrooms, their symptoms, and "what to do" for poisonings by different species. This promises to be a very special evening.

Beginners' Orientation Class: The topic this month is "How, When, and Where to Hunt Mushrooms." These tips help you in sharpening your expertise. Watch the March issue of Spore Prints for the announcement of the Spring Learning Field Trip.

BOARD NEWS

Betty Hamilton

Discussion of the nominations and the banquet took up most of the January board meeting. The board did vote to fix up the old IBM Executive typewriter that was used for Spore Prints and put it in the Library for use by members. They also voted to change the price of an adult admission to the Exhibit to \$3.00. Because both the president and vice-president will be out of town on the regular meeting date, the February board meeting will be held on the 24th instead of the 17th.

PRESIDENT'S MESSAGE

Margaret Dilly

Another month has just whizzed by and left me wondering where it went. Under the direction of our efficient Board, all seems to be progressing well. Brian Read has the Survivors' Banquet under control but could still use some help. Dennis Bowman and his exuberant new assistant, Caroline Irvin, are busy laying ground work for the Annual Exhibit. So this month I will just bring you up to date on the commercial harvesting issue.

As I reported at the January meeting, I continue to meet monthly in Olympia with the Department of Natural Resources and the task force they set up in an attempt to resolve the problems that have arisen as a result of commercial harvesting of mushrooms.

Everyone agrees that any resource taken freely from public or private lands and sold for profit without benefit to the land owner is wrong and often illegal. Many laws already in place are being circumvented and/or totally ignored. We also agree that private enterprise is a wonderful part of our democracy. Paul Stamets, whom many of you know, has now joined the task force and brings with him some great ideas. He cultivates and grows exotic mushrooms and offers some alternative ways of earning money for these unemployed pickers who have become the unfortunate pawns in this game we are playing with mushrooms.

However, a successful cultivating program does not solve the original problem of harvesting the chanterelle and other edible wild fungi for profit.

As any of you devout gatherers of good edibles can testify, these once abundant pleasures are becoming very scarce. Although the 1985 season was dry and not our best year, our annual exhibit displayed approximately the same amount of species as ever, but sadly lacked the common edible ones.

Other countries are experiencing these same problems. The reply from Switzerland (see following article) in response to an inquiry by Dr. Bill Koss of the State House of Representatives clearly points out their concerns. They suspect that overharvesting and excessive trampling of the forest floor adds to the decline of wild edible mushrooms. The European countries have had to take measures, some rather drastic, to prevent depletion of the species. Will that happen here?

There are no easy answers. Federal, State, and private lands are involved, and any equitable solution will come hard. Enforcement of laws at the picking level would be a nightmare and cost prohibitive. Eliminating commercial harvesting altogether sounds ideal, but when dollars can be made and some returned to land owners this often overshadows worries about depletion of the species or dangers to the environment.

In light of all these facts, State Representative Dick Nelson has introduced two bills in the House of Representatives. The first, "Draft H-3308, DNR Regulation of Mushroom Picking Activities," deals with adopting rules and penalties for collecting fungi for both commercial and recreational uses on DNR lands. The second bill is an amendment to include mushrooms in the "Special Forest Products Act" already in place. This includes all lands regardless of ownership, and requires permission for and imposes limits on gathering.

Sometimes it seems like a no-win situation. If we do nothing, in time there will be nothing to enjoy. If we do something, we may end up penalizing ourselves, too. We can only hope the outcome is in our favor. This will be up to YOU. Your legislators need to hear what you want. This helps to enforce the testimony of those who have appeared at the public hearings on this issue.

Reams of information on this whole issue can be found in our club Library. I urge you to go see them and be better informed.

MUSHROOM PROBLEMS IN SWITZERLAND

[This letter, dated December 5, 1985, is a reply to an inquiry by the House Natural Resources Committee about restrictions on mushrooming in Switzerland.]

Dr. Bill Koss
House Natural Resources Committee
222 House Office Building AL-21
Olympia, Washington 98504 USA

Dear Mr. Koss

Thank you for your letter of October 10, 1985. We are happy to forward such information as we have on the restrictions in force in Switzerland regarding the harvesting of wild mushrooms.

It is true that gathering mushrooms became very popular here during the 1970's. At the same time there

were repeated reports of the decrease of certain edible fungi, in particular Cantharellus cibarius and Boletus edulis, the decrease being linked to the increased harvesting activity. Some cantons immediately began to implement restrictions (see enclosure). In 1979 a project to establish a scientific basis regarding this problem was launched in the mushroom reserve 'La Chanéaz'. One of the objectives is to investigate the effects of systematic harvesting on the production of fruiting bodies. The project is still running, and statistically confirmed results are not yet available. However, it has already become clear that trampling of the floor has a strong negative effect (drastic reduction in production of fruiting bodies in years following intensive trampling).

Cantharellus cibarius occurs naturally in the La Chanéaz reserve. Observations to date have revealed a most peculiar feature in the behaviour of this fungus: colonies suddenly disappear for no obvious reason and just as inexplicably reappear elsewhere (possibly due to natural fluctuations). Regarding the threat to Cantharellus cibarius through intensive gathering, an important point is that this fungus has a relatively long theoretical lifespan (mean 27 days, maximum 84 days), and consequently a relatively small daily discharge of spores, so that if a fruiting body is picked while it is still young, it will have discharged only a small fraction of its spore reserves.

Although there are to date no definite findings as to whether factors other than harvesting by man are responsible for certain changes in the fungal flora, it must be assumed that this is the case. Here, we are thinking primarily of air and soil pollution.

Unfortunately, we have no figures allowing assessment of the efficacy of the conservation measures currently in force. We feel, however, that such measures are advantageous, if only because they draw attention to the problem and make the public aware of the situation.

It must also be mentioned that mushroom conservation is not solely a matter of conservation of species in general. Most of the fungi occurring in our forests act as mycorrhizae and fulfill important functions regarding the nutrition and condition of the trees.

We hope that this information is of some use to you. We are very much concerned with this problem and would be grateful for information on similar measures in Washington.

Yours sincerely,

S. Egli
Swiss Federal Institute of Forestry Research

SMRŽE (MORELS)

Marie Rosický
[Bohemian-American Cook Book, 1925]

Use only fresh morels, the dried mushrooms being indigestible and used only for flavoring. Wash in several tepid waters, being careful that no sand remains, slice, place in a saucepan with butter, minced onion, minced parsley, salt and nutmeg, and simmer until done. Blend butter and flour together, thin with beef soup, add this to the mushrooms and simmer a bit longer. Finally add lemon juice to taste and serve hot.

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smells, gassy unpleasant smells, or nauseating or vomity smells.

The Stipe (or Stem). Some *Russulas* have very short, stubby stems. Normal is a stem length equal to the cap diameter. A very few stems are longer. In virtually all species, the stem is round in section, brittle like chalk, hollow in age, and slightly wrinkled with longitudinal striations. Most are white or off-white, but may have a surface coloration of pink, red, or purple. Many will bruise brown near the base; some will turn brown or yellow on handling.

Russula Spores. It is very important to make a spore print for the identification of *Russula* species. Although often described as white-spored, *Russulas* have a range of spore colors, from pure white to cream, pale yellow to caution yellow, and egg yolk to Sunkist orange. While the gill color can give a hint in some cases, this is not always reliable.

White xerographic paper works fine for spore prints. A quarter of a letter-sized sheet with a de-stemmed cap lying gill-side down on it can be inserted into a wax paper baggie, and the opening folded to exclude drafts. This will show a good print in a few hours, and will work in your basket or the back of your car. The print can be dried and folded to save mature spores for later study.

At the microscopic level, *Russula* spores are found to be ornamented with warts or bumps that turn black in iodine, forming patterns that are helpful in separating species. The size and shape are also useful characteristics. A table of spore sizes and spore ornamentation is appended to the key.

Habitat. Most of the *Russulas* we find in the Pacific Northwest are associated with conifers, but some will be found in the vicinity of birches, oaks, or other deciduous trees. Species described from the eastern United States and from Europe will often be cited from deciduous or mixed forests. Tree associations are probably important, but many species seem to be rather promiscuous in their choice of partners.

Edibility.

Russulas are so abundant that the question of their edibility is always raised by beginners. My answer is usually a wry, "Well, if they taste mild, you can try eating them." The implication is that they are not particularly choice. I can definitely recommend *R. xerampelina* and *R. olivacea* for the pot. However, it's the plain truth that, given the availability of almost any other edible mushroom, *Russulas* come off a distant second. Almost all are either poor or unpalatable. Most complaints come from the dry quality and crumbly texture of the flesh.

On the other hand, few *Russulas* are known to be poisonous. Even the very hot species are apparently edible with proper preparation. One species, *R. foetens*, is considered slightly poisonous, and *R. subnigricans*, which is reported from Japan and therefore could occur here, has caused several fatalities. Two species from New Guinea, as reported by Rolf Singer, are hallucinogenic.

[The complete key covers 60 species of *Russula* that appear in Washington, Oregon, and Idaho. It can be obtained from members of the Pacific Northwest Key Council or by mail from Maggie Rogers, 1943 S.E. Locust Ave., Portland, OR 97214 for \$3.23 ppd.]

22nd ANNUAL SURVIVORS' BANQUET

Brian Read

The preparations continue for this year's banquet. Andy Green has agreed to be this year's M.C. Most of you know Andy and will agree that his speaking talents will make for a lively and entertaining evening.

This year we have decided to part with the tradition of having a guest speaker. Instead, we will present musical entertainment for your enjoyment.

Tickets will be available at the February membership meeting or can be obtained by sending a stamped, self-addressed envelope to

Brian Read
12827 1st Avenue NE
Seattle, WA 98125

Tickets are \$16.00 each.

We still need donations of frozen or dried wild mushrooms to include in the meal. Call me at 365-1074 or see me at the February meeting.

Lastly, volunteer, volunteer, volunteer! I can still use all the help you can give on every phase of the preparations from decorations to greeters. So do what makes this club work, volunteer!

CAESPITOSE "CHANTERELLES"? Spores Illustrated [Connecticut Westchester Mycological Association]

The *Berkshire Eagle* printed a picture showing a proud lady holding a two foot cluster of mushrooms. The caption read "Mary Ellen Ward found chanterelles, usually loners, congregating in a large cluster in Richmond. She's an experienced mushroom hunter." Actually, what Mary was holding was a chanterelle look-alike, the poisonous *Omphalotus olearius*.

MUSHROOM POISONING

El Paso Times,
dateline San Diego March 1985

Four undocumented aliens who ran out of food and money ate wild *Amanita* mushrooms, unaware they were extremely poisonous, officials said. Two of the men died Saturday, and the other two were critically ill. The men apparently entered the country illegally about a month ago. The men had been living in a shack near Escondido in northern San Diego County and apparently picked the mushrooms in the wild five days ago. Soon after, they became violently ill. There is no known antidote for the poison. Norman Green, a spokesman for one of the hospitals where they were taken, said the men began to suffer liver and kidney failure and were placed on respirators and dialysis machines to give their bodies a chance to counteract the effects of the poison. They all fell into comas Friday night.

Just because it's deadly doesn't mean you can't eat it once.
-- Gary Lincoff

Wanted for Spore Prints: Drawings, sketches, artistically arranged spore prints, recipes, articles, puzzles.