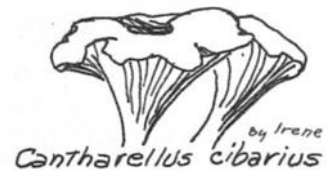


SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY
200 Second Avenue North, Seattle, Washington, 98109
June 1975

Number 113



TIPS FOR PRESERVING MUSHROOMS

The following article is repeated from the October 1968 and 1971 issues of Spore Prints and is for the benefit of those successful hunters whose mycological prowess exceed their mycological capacities.

Be certain of identification when collecting for the table.

Do your preliminary trimming in the field, discarding stem bases, overage mushrooms, wormy specimens, etc.

Don't collect more than you can use or reasonably process within a few days. Mushrooms will deteriorate in your refrigerator if not put up within a reasonably short period after picking. Nature is a better recycler than your garbage man.

CANNING: Wash mushrooms without soaking, trim stems & discolored parts. Leave buttons whole; halve or slice larger specimens. Heat gently with little or no added liquid for 15 minutes to shrink without flavor loss.

Pack hot in clean, hot containers. Add 1/2 tsp. salt to each pint. For white mushrooms add 1/8 tsp. ascorbic acid to preserve whiteness. Cover mushrooms with boiling water leaving 1/2" head space. Adjust lids. Process in pressure canner at 10 lb. pressure for 30 minutes for pints and half-pints. Follow directions for pressure canner. **PLAY SAFE!** Do not attempt to can by open kettle method. This is like Russian roulette, botulinum style.

Mushrooms successfully canned by PSMS members include *Armillaria ponderosa*, *Coprinus comatus* buttons, *Russula* all species, *Boletes* (they have a tendency to become slimy), *Sparassis*, *Hericium*, *Chanterelles*, *Agaricus*, *Dentinum*, *Morchella* and *Pleurotus*.

DRYING: Do not wash mushrooms. Dirt will wash out as you soak the dried mushrooms before use. Brush off debris and loose dirt. Slice not over 1/2" thick, thinner for more compact species. Then dry by one of the following methods:

1. String and hang in light, airy room (or in the sun during good weather).
2. Dry on hardware cloth (wire screen) over a heat register.
3. Lay in single layers on newsprint and turn daily until thoroughly dry.
4. Construct and use PSMS dryer (see May 1971 issue of Spore Prints for instructions on how to build. If we receive sufficient requests, we will reprint the design).

When thoroughly dry, store in air tight containers in a dry place. Oven drying is not recommended as it tends to cook the mushrooms and make them hard and as unreviving as fingernails.

For cooking, soak mushrooms in cold water for 30 minutes or in warm water for 15 minutes, then rinse them several times to eliminate sand.

Mushrooms successfully dried by PSMS members include: *Verpa*, *Morels*, *Boletes* (excellent), *Marasmius*, *Pleurotus*, *Clavarias*, and *Sparassis*.

FREEZING: Clean mushrooms thoroughly. Wash without soaking. Leave buttons whole; halve or slice larger specimens. Saute small amounts (4 - 6 cups) at a time in butter or oil.

If too much liquid cooks out, discard liquid rather than letting it evaporate. Cool. Pack in air tight containers and freeze.

Cottage cheese cartons make good freezing containers. Label or mark plainly with marker pen.

For *Boletus* species clean as above and trim the tubes if they are in poor condition. Slice and blanch 3 to 5 minutes in boiling water. Drain, cool and pack into freezing containers, adding enough water to cover. For *Leccinum aurantiacum*, 1/4 tsp. vinegar and 1/4 tsp. salt will prevent darkening. According to George Rafanelli who pioneered this method, *Boletes* frozen in this way will keep their flavor and texture for several years.

A member of the Spokane Mycological Club suggests that morels may be fresh frozen in water (glazed as in freezing fish) and will revive in fresh condition. This will offer an alternate to the recommended drying of morels.

In the next issue we will present an article by Margaret H. Lewis of the Boston Mycological Club, titled: "Longevity of Taste and Texture of Wild Mushrooms After Storage" which discusses specific species, rather than about the preservation of wild mushrooms in general.

FIELD TRIPS

Dave Schmitt

June 7 - 8 : **POSSIBLE** Fieldtrip. This fieldtrip will be held if a flyer is mailed to you together with this issue of Spore Prints. If no flyer is included there will be no fieldtrip. Dave and Jennie are on vacation at the time of the deadline for this issue, and are scouting a possible location. If it proves that the morels will be out in the burn, they will insert the flyer.

Oct. 24-25-26 Cispus II Foray - Make reservations NOW.

ASCOMYCETE WORKSHOP, AUGUST 12 - 15, 1975

The Mycological Society of America will hold an ascomycete premeeting workshop, August 12 - 15, 1975 at the University of Oregon, Eugene. The cost of the registration is \$20. The program will include taxonomy of the major groups, methods of manipulating and culturing, and special microscopic techniques. Specialists in each group of ascomycetes will serve as instructors. University dormitory facilities will be available to participants and families. Friday, August 15, will be reserved for a field foray if fungi are fruiting; if not, it will be devoted to laboratory work. Reservations (the workshop is limited to 60) will be accepted on a first-come, first-served, basis. The reservation deadline is July 1. Additional details can be obtained from J.M. Trappe, 3200 Jefferson Way, Corvallis, Oregon, 97330. Telephone (503) 752 - 4211.



≡ HAVE A NICE SUMMER ≡



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CALENDAR

June 7 & 8 Possible Fieldtrip. If held, the place is announced
in the inserted flyer. If you receive no flyer with
your Spore Prints - no fieldtrip.

June 9 Monday, Membership Meeting, 8:00 pm

- - - CLOSED JULY & AUGUST

August 18 Board Meeting, 8:00 pm

August 22 Actual Deadline for Spore Print Material. Send all
art work, articles, and photos to the Editor,
% 4029 E. Madison, Seattle, Wa., 98102

September 8 Monday, Membership Meeting, 8:00 pm

October 18 & 19 The 12th Annual Mushroom Exhibit

REMINDER ABOUT REGISTRATIONS FOR CISPUS II FORAY

PSMS members are given first opportunity to register for the
Educational Foray to held October 24-25-26, 1975 at the
Cispus Environmental Center. (Details in April 1975 issue
of Spore Prints). Two important items for clarification. The
fees, \$5 registration fee, and \$12 for meals and lodging, or
a total of \$17 applies PER PERSON. Also the correct address
of Jenny Schmitt is: 2100 Lake Washington Blvd. N., Space
#70, Renton, Wa., 98055 and you should mail your registra-
tions early. Make your checks payable to Jenny Schmitt -
Cispus II.

Membership Meeting

Monday, June 9, 1975, 8:00 pm, Eames Theater
Pacific Science Center.

Program: Dr. Robert G. Benedict from the Department of
Bacteriology at the University of Washington will talk about
a fungus called *Claviceps purpurea* and the suffering and
misery it has caused human beings.
If time permits, we will also hear about a timely genus.
It looks like we will have a good program for the last meeting
of the spring season.

BOARD NEWS

H.R.H.

The last Board Meeting of the spring season opened with com-
mittee reports. The educational committee chairman reported
on the successful educational fieldtrip which was held at Lake
Wenatchee (details are covered in another section of this issue)
All PSMS members are reminded once more to register for the
Cispus II Foray, October 24-25-26, 1975 since only a limited
number of places are available (first come - first served). De-
tails about registration appears in another section of this issue).
A lot of discussion was devoted to the scheduling of fieldtrips.
At the present time all information about coming fieldtrips is
announced in Spore Prints. Since the dates and locations now
have to be submitted for publication, sometimes up to six weeks
before the fieldtrips take place, the timing this spring has not
always coincided with the prime fruiting time of the fungi.
Our President appointed a committee which will try and come
up with suggestions on how the present system of scheduling
and announcing fieldtrips could be improved. It is probably
desirable to inform the PSMS members in advance of the dates
when fieldtrips will be scheduled. The problem is, how to
let the members know WHERE the fieldtrip will be held. How
could we communicate the location just a few days before the
outing takes place (when somebody had a chance to scout the
area and know that the fungi are there). Any suggestions from
the membership???

Other business: Every Trustee and Committee Chairman has
been asked to write a job description of his/her respective
tasks which will be kept on file so that when the chairman-
ships change, the new chairman can find out what his/her
duties and responsibilities are.

President Grout and Treasurer Mudge will develop an operat-
ing budget in order to run our organization in a business-like
manner.

The Board will reconvene August 18.

NEWS FROM THE JEFFERSON COUNTY MYCOLOGICAL SOCIETY

John D. Parker

The dates for the Show of the Jefferson County Mycological
Society are October 11 - 12. This year we are planning on
a different thing from last year. Saturday is set aside for the
gathering of specimens. A potluck supper will be held in the
evening. On Sunday we will exhibit the finds to the public.

We hope many PSMS members will come and have a good time.
The Show will again be held at the "Old Fort Townsend State
Park" and Larry Stevens, the ranger, is working now to pro-
vide clean, comfortable and convenient camping areas for us.
More and more of the Seattle members of PSMS are retiring
and moving over here, and they are the nucleus of our new
club. We set the date so that it would not conflict with any
PSMS activity. Please mark the dates on your calendar.

SETTING THE RECORD STRAIGHT W. Scott Chilton,
Associate Professor of Chemistry, University of Washington

Recently a 1974 pamphlet of the U.S. Consumer Product Safety Commission on poisonous plants was brought to my attention in which it was stated that muscarine is responsible for poisoning by Amanita muscaria and that the antidote is atropine. It has been known for more than ten years that ibotenic acid and muscimol are responsible for the major symptoms of A. muscaria poisoning and not muscarine. Ibotenic acid and muscimol were isolated independently in Switzerland, England and Japan between 1960 and 1964. Although each group worked completely independently, they all evolved very similar fly-killing or fly-stunning assays to guide them in the isolation work. Syntheses and pharmacological uses of these two toxins have been patented in Belgium, Switzerland and Japan. There is even a Japanese patent for using ibotenic acid as a flavor enhancer at low levels (like m.s.g.) And chemical modification of muscimol has led to a new synthetic pesticide undergoing testing in Japan.

Muscarine was isolated in extremely small amount from A. muscaria in 1869. Even early crude preparations, though toxic, failed to produce symptoms of A. muscaria poisoning in man and animals. By the turn of the century it was clear that muscarine, which causes sweating, salivation and tear formation could not possibly be responsible for A. muscaria poisoning which involves disequilibrium, mental confusion and drugged sleep. Nevertheless by that time muscarine had become a useful tool in pharmacological research on the nervous system. An antidote to true muscarine poisoning had been found in atropine, and the idea had become firmly entrenched in books that muscarine causes A. muscaria poisoning, and that atropine is an ideal antidote. Too many authors of subsequent texts in medicine and toxicology simply copied their predecessors' assertions without independently examining the primary evidence on this point, and, worse, authors unfamiliar with mycology equated A. muscaria with all mushrooms and assumed (incorrectly) that all mushroom poisoning was caused by muscarine. The 1954 edition of The Handbook of Emergency Toxicology even says that muscarine is present in A. phalloides. The 1971 edition of The Handbook of Poisoning claims muscarine as the toxin in A. muscaria and recommends atropine in the treatment. Toxicology of Drugs and Chemicals by Deichman and Gerarde (1969) lists, "A. muscaria containing inactive traces of muscarine," but contradicts itself on the preceding page: ". . . muscarine. This compound is the active ingredient of the poisonous fly mushroom A. muscaria."

Mycologically oriented authors have a slightly better record. Carter, a physician who conducted animal experiments with A. muscaria, wrote the section on mushroom poisoning in McIlvaine's One Thousand American Fungi (original 1902, available in reprint 1973). Carter concludes that his experiments "point to the existence of some other poison (than muscarine) in the A. muscaria to which atropine is not an antidote." Fischer, another physician, also has this point straight in Kauffman's Agariceae of Michigan (1918, Dover reprint 1971). Rolfe and Rolfe in The Romance of the Fungus World (1925, Dover reprint 1974) recognized that muscarine is not the only toxin in A. muscaria. However, they seem to advocate subcutaneous injection of atropine attributing (probably incorrectly) a role to atropine in elimination of muscarine. Krieger's The Mushroom Handbook (2nd edition 1936, Dover reprint 1967) claims symptoms of A. muscaria poisoning which are, in effect, the sum of those caused by muscarine poisoning and those caused by ibotenic acid (or muscimol) and recommends atropine as a perfect antidote for muscarine. Ramsbottom's Mush-

rooms and Toadstools (1953, with revisions in subsequent printings) has the correct story regarding A. muscaria and muscarine on page 47. McKenny & Stuntz have an accurate and more up to date review of this problem by Tyler in The Savory Wild Mushroom. (1971). Miller's richly illustrated book Mushrooms of North America (1972) also has the story straight. There is an error however (p.22). Analyses in my laboratory, as well as in several other laboratories, find no ibotenic acid or muscimol in A. solitaria sensu D.E. Stuntz (= A. smithiana Bas), A. porphyria, A. citrina, or Panaeolus campanulatus. Once this point is corrected, Miller's account of mushroom toxins is quite accurate and up to date.

Muscarine does occur in much higher amounts in many species of Inocybe and has been demonstrated in four species of Cliocybe. The symptoms of poisoning by these mushrooms is fully in accord with muscarine as the toxin. Dr. Buck of the Boston Mycological Society has suggested that it would be better if muscarine were renamed inocybine. It has recently been conclusively shown that the sweat-producing Boletus satanus does not contain a trace of muscarine. Clearly other muscarinic compounds await discovery in the mushroom world. It is probable from the work on the European B. satanus that our own rare B. eastwoodiae contains this unknown, sweat-producing substance also, and not muscarine.

The following account of an intentional ibotenic acid ingestion may help to emphasize the similarity between ibotenic acid poisoning and A. muscaria poisoning and the dissimilarity of muscarine poisoning to the two.

In connection with a study of the mode of action of ibotenic acid in poisoning cases, I drank 93 mg (1/300 oz.) of crystalline ibotenic acid dissolved in a cup of cold water at ten o'clock in the morning. Ibotenic acid has an unusual aftertaste which persists for a half hour to an hour and may be related to its use as a flavor enhancer in much smaller doses. There were no immediate effects other than the taste sensation. My experience, based on three separate occasions, is that symptom onset comes after 45 minutes to 1-1/2 hour as described for A. muscaria poisoning, but that the pronounced effects are not attained until 2 - 3 hours by which time most of the ibotenic acid ingested has appeared in the urine.

At 11:30 I still felt normal except that I had a slight tendency to wobble in walking. Unsteadiness continued to increase until by one o'clock I felt that any sudden movement might cause my head to roll off my shoulders. By 1:30 I began noting the feeling at the base of my skull. I had a feeling of being pressed down by a great weight distributed uniformly over my body and a feeling of foreshortening of my body. By this time my penmanship had deteriorated noticeably, but thought processes and speech articulation were unaffected. About two o'clock muscular twitches began, first in the fingers then in the legs. Very mild visual spasms soon followed, and my field of vision narrowed. The field of vision began to rotate slowly and sometimes to slide right, left, up or down. At no time did I hallucinate. At four o'clock I was able to read only laboriously since each word on the printed page was moving about aimlessly.

This period dominated by ever-increasing disequilibrium suddenly terminated in a deep but short sleep of about twenty minutes duration. On awaking I threw up briefly and immediately sank back into heavy, drugged sleep from which I was aroused about an hour later at five o'clock by the telephone. With the greatest effort I struggled to the phone against the great weight pressing me down and against the urge to lie down on the floor and sleep. I was able to talk very briefly on the phone, but then

===== continued on the back page =====

REPORT FROM THE EASTON FIELD TRIP H.R.H.

Since nobody turned in a report about the fieldtrip which had initially been scheduled for Crystal Springs on April 26 -27 I am reporting my experience which was Saturday. After briefly stopping at Crystal Springs where the snowbanks were about as high as the car, and no entrance plowed out, we continued on to Easton. Even there the snow had just disappeared at midweek. My family went on lower to Thorp where we found a handful of Verpas. After returning to camp, someone had left specimens of Hygrophorus subalpinus, and Jenny had found some Discina species right in camp. Twelve persons participated in a delicious potluck which featured the best boiled tongue I have ever eaten.

REPORT ON THE EDUCATIONAL FIELDTRIP TO ZANIKA - LACHE Judy Roger

The educational fieldtrip to Lake Wenatchee, May 17-18 was a resounding success. The Campfire Girl's Camp, Zanika - Lache, located by Scott Chilton, was an ideal place to meet. There was room for everyone; an open pavilion for our specimen table and fair-weather eating; kitchen facilities for heating our potluck; and a big hall for dinner and the slide show.

I want to thank the hosts, Mildred & Emory Bronner; Navarre & Jack Orth, and Estella & Martin Hansen for greeting everyone, setting up the tables and overseeing the dinner preparations. A good job was done by all. Martin Hansen is a good fire builder, too bad the chimney didn't want to cooperate at first.

Onehundred-and-three people signed in and looked for the sparse and scattered morels, verpas and gigas. Too bad those big, black Bulgarias are so useless. 29 specimens were brought to the identification table for Jennie and Fay to identify.

Seventy-five hunters stayed for our, as usual, delicious potluck, with most of them remaining afterwards for the program.

Howard Melsen led off with an excellent coverage of the Boletus family; Jennie Schmitt pretty well covered the Ascomycetes, which is not an easy subject to tackle. Well done, Jennie! Brian Luther "got inside" the tree destroying fungi, telling us about some polypores which ruthlessly attack trees, and told which parts of the tree are attacked and how. He did an outstanding job, and had to field many questions afterwards too. Coleman Leuthy's talk and guessing game of common fungi was delightful, easy to listen to; he had beautiful slides and should have been first for the beginners who left partway through the program.

I wish to thank the hosts, and especially the speakers, who made this type of field trip and program successful. I am sure everyone came away with a deeper understanding of our fungal world.

WELCOME TO THE FOLLOWING NEW MEMBERS

- Jody Aliesan 364 - 9936
- John Bierlein 524 - 6718
- Richard and Winifred Harmeling 567 - 4593
- Charles and Arvada McFarland 878 - 8012
- Ray and Judy Reed 852 - 0929
- Doreen and Roger Rose 365 - 5318
- Robert C. Rudine 325 - 6645
- Gale and Sharon Trip 827 - 6592

If you new members were not too successful in your spring hunts, don't despair! About four times as many mushrooms grow in the fall, the weather is usually more dependable mushroom wise (i.e. it rains) and fall will be here soon.

SETTING THE RECORD STRAIGHT (continued from the third page)

fell asleep again until seven when I stirred briefly, feeling somewhat cleared. At eight I woke up for good. Dizziness gradually disappeared, and all sensations were normal by 9:30 in the evening.

The symptoms I have described are those of a heavy intoxication. A dose as low as 53 mg is still readily detectable, the disequilibrium lasting from the second through the eighth hour. Sleep is then only a light dozing for an hour, and no vomiting occurs.

The intoxication can be compared to alcoholic intoxication in its effect on equilibrium, but it differs in two very striking points. Ibotenic acid is cleared from the body before major symptoms of intoxication come on. Alcohol, on the other hand, is present in the body during intoxication and its presence is frequently used in the legal definition of alcoholic intoxication. The other difference is that ibotenic acid has relatively little effect on speech articulation and intellectual processes while alcohol greatly degrades both.

IMPORTANT NOTICE H.R.H.

If you have missed reading it in the April issue of Spore Prints as well as in the new membership roster, our 1975 membership chairman is SIGRUN BUDNIK (her address is 16183 S. E. 42nd Street, Bellevue, 98006; and her phone 747 - 0578)

Any membership renewals, new memberships or change of address notices should be reported to her home address for speedier action. She only comes to the Science Center (which is PSMS official address) for board meetings and general membership meetings. If you therefore, address correspondence to the official address this could delay your Spore Prints, information about meetings, fieldtrips, etc.

AND while we are on the subject of who-does-what. If you do not receive your Spore Prints and you are a (paid-up) PSMS member in good standing you should call either Sigrun Budnik (phone 747 - 0578) or Chuck & Virginia Kessner (phone : 242 - 1305) who mail the Spore Prints every month. Your editor only writes the copy and sees to it that it gets into print. I want to take this occasion to thank Chuck and Virginia for doing this important, yet tedious task of addressing, stuffing and stamping the envelopes which bring you the Spore Prints (and they have been doing it for several years). They deserve a big hand and many thanks.

HELP!!!! OUR FUNGI ARE FALLING APART Judy Roger

The freeze-dried specimens of SPRING mushrooms - Verpas, Morels, Gigas, Puffballs, etc. - which are displayed at the Fall Exhibit are falling apart with age and need to be replaced. As you collect these fungi during this spring (and since we have a very late season, there is a lot of hunting left) could you please carefully select a few prime specimens with complete stems for our display case. Shake off most of the dirt and put separately in waxed paper sandwich bags or paper bags. Then call either Dr. Patricia Winter (486 - 4264) or Judy Roger (633 - 1201) and we will pick them up and deliver them to Dr. Stuntz for freeze-drying. Thank you.



CORRECTION IN THE NEW ROSTER

Please correct the phone number for Ed & Ella Cantelon to read: 242 - 6115.

Also please notify the editor of any other errors that might have crept in so that they can be corrected in the next issue.