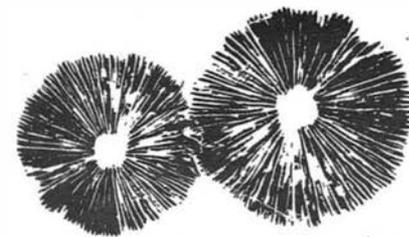


SPORE PRINTS

BULLETIN OF THE PUGET SOUND MYCOLOGICAL SOCIETY

Number 292

May 1993



A FUNGUS FACTORY FOR TAXOL? Richard Stone *Science*, 9 April (condensed)

In a secret location in an old growth forest in north-western Montana stands a yew tree unlike any other yew. Nestled in its bark is a fungus that appears to be producing the anticancer drug taxol on its own. Indeed, its finders, plant pathologist Gary Strobel and chemist Andrea Stierle of Montana State University, report that the fungus, called *Taxomyces andreanae*, produces taxol even after it's been removed from its host. If this discovery holds up, the end result could be enormous fermentation tanks producing vast quantities of (relatively) cheap taxol.

A study at Johns Hopkins in 1989 showed that taxol could greatly shrink tumors in about 30% of women whose ovarian cancers resisted other therapies. And taxol's promise extends beyond ovarian cancer to breast, head, and neck tumors. The National Cancer Institute estimates that the number of U.S. patients receiving taxol could grow from 15,000 to more than 50,000, if the FDA approves it as a treatment for breast cancer. But if taxol is to reach that kind of a mass market, the price will have to come down.

Taxol, made exclusively by Bristol-Myers, now costs \$986 a treatment. A minimum of three treatment cycles is needed simply to determine if the taxol is working; 10 are needed to complete treatment.

So far, cultures of the fungus produce only nanograms of taxol, whereas most other native wild fungi that have been developed as drug sources started out producing milligrams of the target compound. Still, Arnold Demain, a MIT industrial microbiologist, argues that learning how to supply enough oxygen to the fungal cultures and improving the genetics of the strain are possible and could produce a viable strain in about 5 years.

That possibility has made *Taxomyces andreanae* a hot commodity. In March 1992, the Montana team filed patent applications on fungal production of taxol. In January 1993, Strobel and Roger Flair, president of the nonprofit group that handles Montana State University's patent negotiations, invited several pharmaceutical firms to negotiate licensing rights.

SHOULD VEGETARIAN EAT FUNGI? Natalie Angier *New York Times* April 16, 1993 (condensed)

In a new analysis of genetic relationships among organisms with complex cells, including sponges, protozoa, algae, plants, and animals, researchers have concluded that animals and fungi share a common evolutionary history and that their limb of the genealogical tree branched away from plants perhaps 1.1 billion years ago. Fungi and animals then went their own ways some undetermined time after that.

The new findings suggest that the common ancestor of animals and fungi was a so-called protist, a single-celled creature that very likely possessed both animal and fungal characteristics—perhaps spending part of its early

life cycle in a membranous and mobile form and at a different stage growing a stiff cell wall similar to that seen in today's fungi.

Researchers said that the evolutionary affinity between animals and fungi could explain why fungal diseases in humans are so difficult to treat. "A lot of the metabolism is so similar that you can't target a fungus sufficiently without gravely affecting the human host as well," said Dr. Mitchell L. Sogin of the Center for Molecular Evolution at the Marine Biological Laboratory in Woods Hole, Massachusetts, the main author of the new report.

Dr. Sogin also suggested that the new results will buttress long-standing arguments among yeast geneticists that fungal cells offer a wonderfully tractable way of looking at essential biological problems of relevance to humans.

VICTORIAN NATURALIST'S DAY Agnes Sieger

It was Victorian Naturalist's Day at the Pacific Science Center April 17, and 12 members showed up to staff the PSMS booth, take in the Beatrix Potter exhibit, and, in general, try to introduce what seemed like thousands of small fry and their parents to the wonders of the fifth kingdom. In charge was Lynn Phillips, assisted by Mike Hess, Dick and Agnes Sieger, Sheila Parr, Mary Lynch, Katie Glew, Elsie Burkman, Patrice Benson, Dick Gough, Mike Gadau, and Carol Smith.



Lynn Phillips and Carol Smith at the PSMS booth, showing off Lynn's *Pleurotus* fruiting in an agar bottle

U.S. FOREST SERVICE NEEDS RESEARCHERS

Interested in helping on a survey of hypogeous fungi in a Douglas fir forest on the Fort Lewis Military Reservation? Field surveys will run for one week every six weeks, starting April 12. Evening assistance with fungi identification and preservation is also needed. Contact Caitlin Cray, U.S. Forest Service, Pacific Northwest Research Station, Forestry Sciences Laboratory, 3625 93rd Ave. SW, Olympia, WA 98512 - (206) 956-2345.

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PUGET SOUND MYCOLOGICAL SOCIETY

Center for Urban Horticulture, Mail Stop GF-15
University of Washington, Seattle, Washington 98195
(206) 522-6031

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SCI. ADVISOR:	Dr. Joseph F. Ammirati
EDITOR:	Agnes A. Sieger, 15555 14th N.E., Seattle, WA 98155

CALENDAR

- May 8 Field Trip, Tumwater Campground
- May 10 Barlow Pass Group, 7:00 p.m., room 244,
U.W. Hitchcock Hall
- May 11 Membership meeting, 7:30 p.m., CUH
- May 12 NAMA Foray storyboard session, 7:30 p.m.,
CUH large meeting room.
Herbarium Group, 6:00 p.m., U.W. Herbarium
- May 14-16 Cispus Foray, Randall, Washington
- May 17 Board meeting, 7:30 p.m., CUH
Barlow Pass Group, 7:00 p.m., room 244,
U.W. Hitchcock Hall
- May 18 Herbarium Group, 6:00 p.m., U.W. Herbarium
- May 21 *Spore Prints* deadline
- May 23 Cultivation Group meeting, 1:00 p.m., Rod &
Milly Myers, 8343 NE 175, Bothell
- May 25 Herbarium Group, 6:00 p.m., U.W. Herbarium
- May 28-30 Field trip, American River Ski Lodge

VERPA CONICA FOUND

Dick Sieger

Andrea, Emma, and Jamie Gallardo, a family with sharp eyes, found three *Verpa conica* at MacDonald County Park. We deposited their collection in the University of Washington herbarium. The mushroom fruits infrequently and is easy to overlook. It is similar to *Verpa bohemica* but its cap is almost smooth, not wrinkled. Spores from Northwest ascocarps are 28-34 x 15-19 μm , much larger than those from eastern North America and Europe, which measure 20-26 x 11-15 μm . Are our mushrooms an unnamed species?

Membership Meeting

Tuesday, May 11, at 7:30 p.m. at the Center for Urban Horticulture, 3501 N.E. 41st Street, Seattle



More Morels, this month's program, features a panel of disturbed ground browsers who will betray arcane mushrooming rituals. The experts will tell you how to stalk, bag, clean, cook, put down, and put up more morels than you thought possible.

Please bring some goodies to share after the meeting if your last name begins with I-M.

Note: All the monthly meetings are recorded on videotape by Chris Greenlee and Ron Post. VHS copies may be borrowed from the PSMS library.



MEET THE HARRISONS

Inga Wilcox



What brought Earl and Margo to the 1974 exhibit at the Science Center? Earl is a successful hunter who, with his brothers-in-law, kept noticing lots of mushrooms on the forest floor as they stalked their game. Matching fungi up with photos in the McKenny/Stuntz *Savory Wild Mushroom* provided only a partial answer. When a coworker of Earl's took them chanterelle hunting, they became hooked and decided to learn more about fungi.

They participated at every annual exhibit, often hunting for specimens for the show. Margo remembers years when they, along with their good friends Carl and Betty Hermanson, filled the back of a pickup truck with boxes of fungi along with vine maple and evergreens for decoration. Hunting with the Hermansons in the Lake Wenatchee area brought them good harvests. Margo remembers a foray to Tumwater when they found lots of shaggy manes along Icicle Creek. They showed newcomers how to prepare mushrooms for the pot and cooked up a tasty meal in their skillet with real butter! Before commercial pickers entered the scene and logging was stepped up, it was possible to go to areas where chanterelles popped up like buttercups. They have the photos to prove it! A few days ago, Margo discovered morels fruiting in their backyard. Just how lucky can one get?

Earl served as Treasurer for 4 years, and Margo was on the board for 2 years. She chaired the Survivor's Banquet when dinner was usually followed by music and dancing. Dr. Stuntz was the Scientific Advisor and was much respected and loved by all members. Close to the date of that banquet he had his 80th birthday. Margo baked him his "favorite cake" from the recipe he had shared with PSMS members. The Harrisons saved every copy of *Spore Prints* and tell me that the name and logo have been kept unchanged over the years.

Gardening, fishing, smelting, crabbing, and hunting are activities they enjoy. Both Earl and Margo love the great people of PSMS they have met and are still meeting. Their association with the Society has been both enjoyable and most rewarding.

BOARD NEWS

Agnes Sieger

Ron Post passed around the final draft of the Conservation brochure. We sold \$157.50 worth of books at the April meeting. Denis Benjamin will hold a storyboard brain-storming session on May 14 for the NAMA foray. Mike Hess and Bill Bridges will make boxes for the new microscopes. We finally have the fan for the HEPA filter. Denis Benjamin will chair a "Building Fund" Committee. We need a chair for the PSMS booth at the King County Fair in Enumclaw on July 25.

NAMA PLANNING MEETING

Dennis Bowman

It's time to start gearing-up for the final approach to our coming NAMA foray. Although many of the larger details for the foray have already been arranged, most of the operational tasks still lie in front of us.

At 7:30 on Wednesday, May 12 (the night following our next monthly meeting), we are planning a special "story board" evening to be held in the same room as our membership meetings. At this session Denis Benjamin will help guide us through an interesting and fun process of definition, planning, and sorting of the many necessary details that will ensure a successful foray.

If you have already signed up or if you have just thought about it, if you are planning to attend the foray or not, this meeting is for you. Bring your suggestions, ideas, and enthusiasm, and we'll see you all there.

HERBARIUM UPDATE

Dick Sieger

Lorelei Norvell and Kathy Cottrell are delighted with the accomplishments of the Herbarium Group, which had worked 137 hours through the middle of April. Volunteers in March and April included Marilyn Droege, Peter Gallombardo, Carl Hermanson, Steve Mongovin, Lisa Pedigo, Ron Post, and Scott Redhead. The work continues on Tuesday evenings (Wednesday on May 12th) from 6:00-9:00 p.m.

CULTIVATION GROUP

Scott Lieske

Despite the rainy day, about 25 cultivation wannabes met at Pat and Sue Murosako's home for the April meeting. Lynn Phillips provided six varieties of compost-loving mushroom cultures and plenty of Petri dishes of agar for everyone to make transfers. All who attended had the opportunity to work with laminar flow hoods, which help to cut down the risk of contamination of their cultures. Good luck, everyone!

After all participants had finished their work, several of us headed across the river to Rod and Milly Myers' to begin a compost pile for our May meeting. Again, Lynn provided direction and experience in getting the pile started. Members will be taking turns every few days to turn the heap which should be ready to inoculate with the spawn we got started earlier in the afternoon.

The May get-together will be Sunday, the 23rd, at Rod and Milly Myers' home, 8343 NE 175th, in Bothell. For more information or directions, feel free to call me at 789-1959. As always, all PSMS members are welcome.

For those without yards or storage space for large quantities of various mushroom growing paraphernalia, don't despair! Kathreen Otwell and Rachel Bruna are about to launch the "Confined Space Network" in which

interested members can pool their money to obtain straw, sawdust, etc., and then take home more usable quantities suited to their available space. If you're interested in this long overdue idea, please call Kathreen at 820-5479.

TOLT RIVER FIELD TRIP

Sheila Parr

A tisket, a tasket, they came with empty baskets (or pails, pillowcases, recycled grocery bags, etc). Thirty four hardy souls signed in and braved the WET muddy day. The first foray of the 1993 spring season was held at the Tolt River Campground on May 3. Camp hosts Mary Lynch and myself got to the shelter to find it full of Boy Scouts, who had camped there overnight. They did their good deed for the day by letting us use their spare camp stove after we found that the O-ring to ours had broken. So hot coffee and water were available along with cake that Mary had baked for the members as they began to arrive around 9:00 a.m. Meanwhile I made a trip into town to see if I could find an O-ring. No luck. Either too small, big, thick, or thin



Mary Lynch and Sheila Parr
keeping the coffee going

Back at camp, Mary gave an introductory talk on collecting, where to look, how to keep in touch with other members in your party, and, hopefully, how to find *Verpa bohemica* and oyster mushrooms which were fruiting at this time. Steve Handrahan was good enough to lead the people out into the cottonwood grove to give a visual demonstration and the directions. Members were encouraged to come back and check in periodically.

Meanwhile, the Boy Scouts were packing up, and we needed to keep the coffee hot. As a former Campfire Girl, I remembered the local QFC had dry firewood. A quick trip into town again, and we had a BBQ pit working. The rains tapered off, and some members began to come back in with fungi. A "newcomer" was the first to come in with about two dozen *Verpa bohemica*. She was very happy. All had one thing in common—they were damp and chilled but had a good time. They also can't wait for the next foray. Dick Sieger identified 14 species, and several others were taken for further study and identification



A bedraggled Mike Hess and Steve Handrahan
going over the day's find

NOTES ON THIS AND THAT

Telluride Mushroom Conference: The 13th annual Telluride Mushroom Conference will be held in Telluride, Colorado, August 26-29, 1993. For further information, write Fungophile, P.O. Box 480503, Denver, CO 80248-0503 or phone (303) 296-9359.

Photographers Needed: The Barlow Pass Study Group needs some field photographers. Please call Carol Smith (784-7699) afternoons if you can help.

Mushroom Missionary: Dick Sieger talked about spring mushrooms at the Tacoma Mycological Society's meeting on April 5th.

New Library Books: Our library is expanding. Carol Smith donated four classic books: *One Thousand American Fungi*, *Mushrooms of the Great Lakes Region*, and the two volume set of *The Gilled Mushrooms (Agaricaceae) of Michigan and the Great Lakes Region*. Patrice Benson donated her copy of *The Sacred Mushroom Seeker*. Ron Post contributed a new Forest Service publication, *Biology, Ecology, and Social Aspects of Wild Edible Mushrooms in the Forests of the Pacific Northwest: A Preface to Managing Commercial Harvest*. Thanks to Dave Schmitt for giving us these out of print books from Jennie's library: *Mushrooms of the Great Lakes Region* and *The Gilled Mushrooms (Agaricaceae) of Michigan and the Great Lakes Region*.

ONE LAST FIELD TRIP THIS SPRING

Mary Lynch

May 28-30

American River Ski Lodge
(elev. 3100 ft, 130 miles SE of Seattle)

To reach the American River Ski Lodge, drive east on Route 410 over Chinook Pass. About 17 miles past the summit, turn right onto Bumping Lake Road 174. Turn right again after 1/4 mile, and turn right to go uphill and through the gate. Continue for 1/2 or 3/4 mile to the ski lodge. A \$5.00 camping fee will pay for the weekend. This is a good area for morels and *Boletus edulis*.

FROM THE NEWS: BOGUS FUNGUS FLOWERS

They sprout from a species of wild mustard in Colorado. They are bright yellow and covered with sweet nectar. Bees, flies, and butterflies love them. Crab spiders and other predators of pollinating insects lurk inside them for prey. But they are really a clever hoax. The culprit? A species of the rust fungus *Puccinia*, which takes command of the growth pattern of immature plants, suppresses their normal flowers, and sends up highly attractive spikes covered with a spermatia-bearing substance. Researcher Barbara Roy of the University of California, Davis, reports that after insects visit the artificial flowers the plants soon die. But first the yellow leaves change to green and spores appear on the surface, ready to be blown by the wind to infect other plants.

NEWSLETTER WEEKEND CHICKEN

Dick Sieger

1 large frying chicken	1/2 C white wine
Matsutake or garlic	1/2 C evaporated milk
2 C fresh or revived dry morels	3/4 C chicken stock
1 chopped onion	Salt, pepper, MSG
4 T butter	Chopped parsley
3 TBS flour	Cooked noodles

Slit the chicken skin in about 20 places and insert small slivers of matsutake or garlic. Brown the breast and back of the chicken under a broiler. Sauté the onion in the butter until it is translucent. Add the flour and cook briefly. Add the wine and cook briefly. Add the evaporated milk and chicken stock, heating gently until the sauce thickens. Tear the morels into pieces and add them to the sauce with the salt, pepper, and MSG. Put the chicken in a pot and pour the sauce over it. Cook covered in a 300° F oven for 90 minutes, turning the chicken once. Lay the chicken on a bed of noodles. Remove most of the morel pieces and a few of the onions from the sauce and reserve them. Whirl the sauce in a blender until smooth and mix it with the reserved morel mixture. Add chopped parsley to the sauce and pour it over the chicken and noodles.

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Puget Sound Mycological Society
Center for Urban Horticulture
GF-15, University of Washington
Seattle, Washington 98195



SIEGER, Dick & Agnes
15555 14th Ave NE
Seattle, WA 98155