Spore Print

2006 No. 2 Quarterly Newsletter of the Edmonton Mycological Society

The mushroom event of the decade!

The most exciting mushrooming event that has ever happened in Alberta is set to go in Hinton this summer. August 17th through 20th The North American Mycological Association (NAMA) is holding its annual international foray and conference in Alberta for the first time. This event gathers mushroom enthusiasts and some of the foremost mycologists in the world to one place where we can all pursue our interest for a couple of days.

Foray participants will be going out on 5 separate forays to their choice of over twenty sites over the three-days event. Mushrooms collected will be brought back to the Hinton Training Centre where mushroom experts from all over North America diligently work to identify all the specimens found and prepare them for scientific storage. If you have ever found a mushroom that you can't identify (like that has never happened) now you will be able to see a name put to it. It is NAMA's policy to try to identify all collected specimens. Bring your camera and note book because many of the mushrooms identified do not appear in any of your regular field guides.

Along with mushroom picking there will also be a series of educational sessions. So if you get tired of picking then you have a choice of up to twenty lectures to attend on various topics.

NAMA is largely a amateur organization that gets a lot of support from professional mycologists. With this in mind the sessions presented are varied to appeal to both seasoned mushroom enthusiasts as well as beginners. There is a special beginners foray and follow-up identification session for all the rookies. Saturday afternoon holds a special event, the mycophagy session. This is where you will get an opportunity to taste a variety of mushrooms prepared in their own special dishes. This session is both eye opening and mouth watering.

Our Society is especially excited as the mushroom identifications will contribute greatly to our data base project which is starting this summer. We hope that the information gathered and the lessons learned will serve us for many years to come.

To help out NAMA and to make this foray one of the best (we want them to come back again) we will need some volunteers to help out over the three days. Some of this involves helping with registrations and pointing people in the right direction as well as helping out with getting people out to the foray sites, and providing some manpower for the cooking sessions, identifying and perhaps promoting our own club a bit.

The Foray is usually open to NAMA members only, but because our club is helping out with the organization of the foray, they are opening it up for EMS members. Registrations forms can be found on the NAMA web site at www.namyco.org, *just click on events. Since there is limited space for accommodations at the Hinton Training Centre, we are encouraging people to register early or reserve their own accommodations in Hinton (consider "Folding Mountain", "Pocohontas" or local bed and breakfasts). Hinton is booming right now and very busy with industrial activity.*

Martin Osis

President's Message

Markus Thormann, president of the Edmonton Mycological Society

The first two regular meetings have come and gone, and we're off to another mushroom season. Sadly I was unable to attend the first meeting in March. I was in Victoria, B.C., for three days, attending a National Forest Inventory (NFI) meeting. The weather was amazing, with temperatures near 15°C, almost everything was growing vigorously, and many flowers were already in full bloom…but I digress.

Here's some background on the NFI. In essence, the NFI initiative consists of a grid of permanent research plots across Canada. These plots are evenly spaced across the country and cover all forest ecozones. The purpose of the NFI is to assess and monitor the extent, state, and sustainable development of Canada's forests. Provincial, territorial, and federal forestry departments, such as my employer, the Canadian Forest Service, collect and report information to a set of uniform standards, which then allows for a consistent reporting on the extent and state of forest resources and how they are changing over time. In addition to providing consistent estimates for traditional forest inventory attributes, the NFI provides a framework for collecting additional data relevant to the reporting of progress towards sustainable development (e.g., socio-economic indicators), as well as data related to forest health (e.g., insect damage, disease infestation), biodiversity, and forest productivity. The Canadian Forest Inventory Committee recently thought of using lichens as indicators of forest health in future visits to their research plots. As you know, lichens are a symbiotic relationship between a fungus and a photosynthetic alga or bacterium. They are very sensitive to pollution and other disturbances and have been used successfully as indicators of forest health and climate change in Europe.

Since I had done some work on this topic a few years ago, I was invited to participate in this meeting and give a presentation on the suitability of specific lichen species to assess forest health in Canada. I hope that I was able to convince those in attendance to monitor lichen diversity in the NFI plots in the future. Needless to say, I brought up fungi as well, which currently are not being monitored as part of the regular sampling procedures. Sadly, due to a lack of sufficient expertise in Canada, fungi will continue to be ignored in future surveys. Clearly, we need more mycologists in Canada, and we need to convince local governments that fungi are very important organisms and should be monitored as well. We are already doing that through our soon-to-be-initiated databasing project and the educational materials we have developed over the past year (bookmarks and poster). Moreover, our provincial mushroom campaign has brought attention to fungi as well.

Speaking of our databasing project, the Edmonton Mycological Society was awarded a $12,500.00 grant from the Alberta Conservation Association to start this project this spring. We are very excited about this grant and will search for a suitable candidate to start compiling fungal distribution information very soon. I anticipate that we will learn a lot about fungal diversity in Alberta this year. We will hold the second annual Alberta foray in Bow Valley Provincial Park, which should be similarly successful as last year's foray near Rocky Mountain House, where we collected over 500 different species of fungi. In addition, the Edmonton Mycological Society and the North American Mycological Association will host a major foray near Hinton this summer. So, clear your calendars, sharpen your knives, and clean your baskets, another mushroom season is upon us.

Happy 'shrooming to you all, Markus

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Hydnum repandum - The Hedgehog

Hedgehog (hej hog) is a small nocturnal insectivorous mammal of Europe, having stout spines on the back and sides.

Not interested? Then what about *Hydnum repandum**(see page 4)? It too is called a hedgehog but these are much better to eat and are available in the wilds of Alberta, not just Europe. *Hydnum repandum* mushrooms are much sought after and are so popular that they are imported from Europe for the North American restaurant market. The only arguments about hedgehogs seem to be how to preserve and cook them. This is one mushroom that works as well frozen as it does dried. If you find enough you might want to preserve some in each way. The frozen specimens are quicker to defrost and use while the dried specimens make it easier to mix with other ingredients and take less storage room (especially if you had to get a second freezer just for your mushroom harvest). When it comes to cooking *Hydnum repandum* many people feel that its flavour is so desirable it is a crime to mix anything but the lightest of seasoning – others feel it is the best to include in savoury dishes to allow the flavour to blend with other ingredients. Either way it is a delicious addition to any meal.

Now that your appetite is whetted here is some information to help you find these elusive and delicious mushrooms.

Hydnum repandum is a fairly easy mushroom to identify.

Hydnum repandum is one species of fungus that has "teeth" rather than gills or pores. They are easy to spot if you are in their territory and very edible.
Photo courtesy: Loretta Puckrin.

Instead of gills it has a cluster of 'teeth' reminding one of the animal hedgehog's spines. All the 'teeth' descend and are closely packed. There are a variety of mushroom with this structure under the cap but only one is our delicious edible. From the top, this hydnum looks like a freshly baked loaf of bread popping out of the ground. Other species are scaly or a deep red colour - both of which you should leave where you found them.

The cap is a pale colour – from cream to tan and sometimes with an orange cast. It can grow from 2-25 cm in width which can be anywhere from broadly convex to plane or depressed. The spines or teeth tend to be very similar in colour to the caps. The stipe is thick and central or off-centre and usually paler than the cap but with a similar colour range. The spore print, if you can keep from cooking one long enough, is white. It may sound confusing and a lot of options, but once you find a hedgehog and get it confirmed you will find identification very easy. The look-alikes are substantially different in colour, size or scaliness of the cap and easy to differentiate.

(Hydnym repandum ...continued on page 4)

Hydnum repandum
(continued from page 3)

Hydnum repandum is not particular as to what trees it has as its neighbours but likes the company of others. When you find one look closely in a wide area as there are likely several more in the vicinity. Subject to few insect infestations, most hedgehogs are free of 'extra protein'. A quick check of the stipe will let you know immediately. The 'teeth' under the cap are part of the edible mushroom so there is no need to clean this mushroom before cooking.

In Alberta, *Hydnum repandum* has been found as early as July but is most often picked from late August to October depending on the weather. The early variety tends to be the smaller version. Specimens where one mushroom fills your hand have been found in the foothills of Alberta but are the exception rather than the rule. Regardless of the size it is still a delicious edible.

Although you can return to your special areas we have found that the mushrooms don't grow in the exact same spot. Go to where you found them (give about 2 weeks between) and then use the former picking spot as a centre for your hunt.

*This mushroom is also listed as *Dentinum repandum* in some publications.

The 'teeth' of Hydnum repandum makes this fungus look a lot like its namesake.

Photos courtesy: Loretta Puckrin

Loretta Puckrin

Scarcodon scabrosus or the bitter hedgehog is considered inedible because of its bitter taste.

The sample on the left is the normal size of mushroom found while the one on the right is a meal in itself and can sometimes be found in the foothills in the late fall.

Weird and wacky fungi – Gut check time – Bacteria? Check! Protozoans? Check! Fungi? Hhhmmmm...

Have you ever thought of what lives in your digestive tract and what it's doing there? First, here's a general description of how food is digested. Digestion starts in your mouth, continues in your stomach, and is completed in your intestine. Along the way, various enzymes break down the different components of your meal, e.g., fats, starches, and proteins. The products of digestion are then absorbed into your body, providing you with the energy you need to go about your daily business. Having said that, you are not the only benefactor of the food you eat. Most of us will have heard about tapeworms and bacteria that live in your intestines. While tapeworms are parasites and should be eliminated, bacteria are a natural, important, and dominant component of your digestive tract and form the bulk of your stool. What about fungi?

Although many animals produce their own digestive enzymes, others harbour a collection of micro-organisms in their digestive system which, in return for a protective environment, are responsible for the production of some of the digestive enzymes. Of particular importance to humans are mammalian herbivores, particularly farm ruminants (cattle, sheep, and goats), where a large proportion of the food ingested by the animals is digested by a mixed microbial population of bacteria, protozoans (single-celled, primitive organisms), and fungi that live in their guts. Here's the interesting part…the unusual thing about the digestive system in mammalian herbivores is that it is an anaerobic environment. Therefore, the microbes present in the gut are specialists, who must live, breed, and function in the complete absence of oxygen. To do this, they rely on fermentative processes for the generation of energy. In ruminants, micro-organisms live in the fore-gut, in a modified pouch called the rumen. Hence, microbial digestion is extensive and precedes the host digestive processes, which take place in the true stomach.

Since their recognition in 1975, anaerobic gut fungi have been classified as Chytridiomycetes based on their body morphology (Orpin 1975, 1977). Currently, there are five recognized genera of chytrids that occur in the guts of herbivores: *Neocallimastix* (Figure 1 below), *Piromyces*, *Orpinomyces*, *Anaeromyces*, and *Caecomyces*, which are delimited by body morphology and the number of flagella (a hair-like extension of a spore, used for motility) per motile zoospore (Munn *et al.* 1988). Species within these genera are defined according to zoospore ultrastructure (Heath *et al.* 1983). From a functional standpoint, these fungi are reported to be potent degraders of plant fibre by producing either an extensive network of branched and tapering rhizoids ("root-like" mycelial growth) to aid in substrate colonization or by forming a more limited body structure that contributes to the degradation of plant matter by expanding from within and rupturing the colonized tissues (Orpin 1977, Joblin 1989). In both cases, the fungi contribute significantly to the digestion of plant matter and the overall nutrition of the ruminant.

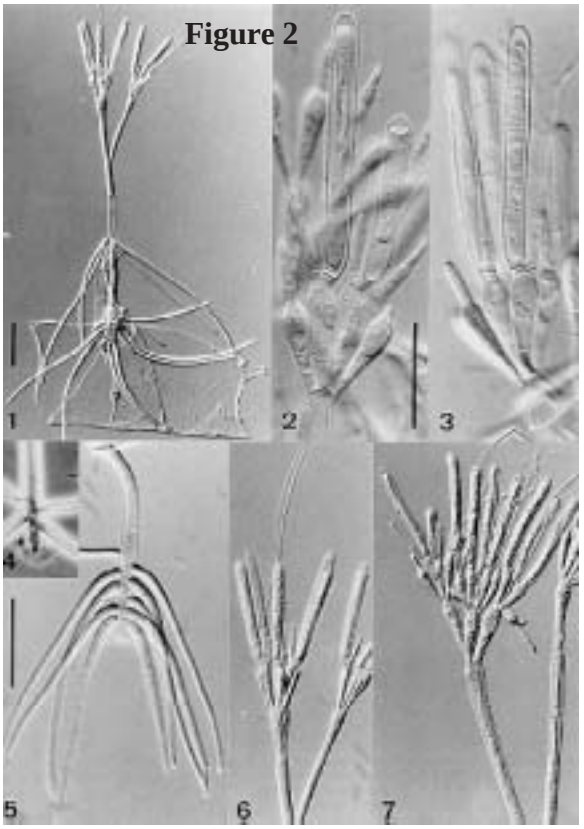


Figure 2

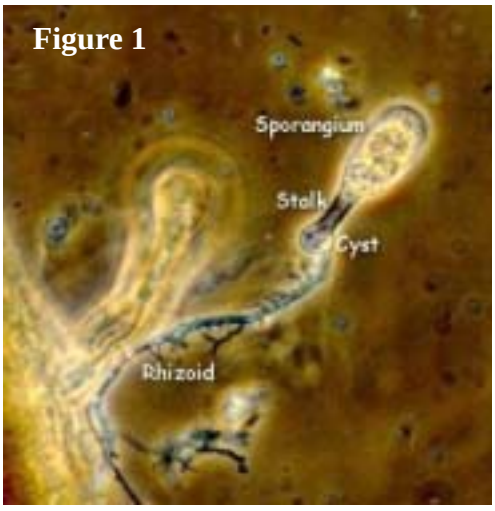


Figure 1

(Weird and Wacky ...continued on page 10)

Is it a Spruce or is it a Pine?????

Single needles are characteristic of spruce trees.

To the novice any tree with needle-like leaves is considered a 'pine' or a 'spruce' without thought about the species. When you are serious about picking mushrooms you need to learn what type of tree clusters to look for in order to find the mushrooms. Let's face it – it is much easier to spot a tree than a mushroom and looking for the mushrooms under the wrong type of trees means a long walk in the woods bent over checking the ground with little hope of finding your elusive mushroom species.

Just as with mushroom identification, there are some key indicators when it comes to understanding what type of evergreen tree you are seeing. The first basic indicator is that the tree produces needles rather than leaves and in many species these needles remain on the tree year round. This part we all seem to absorb without instruction.

How the needles grow and their shape is a key indicator to the species of tree.

Pine trees have needles with bundles of 2, 3 or 5. Larch, or tamarack, have bundles of 15 to 30 needles. An additional key, if you are in the woods late in the year, is that the larch species turns yellow in the autumn and loses their leaves in the winter. So not all 'evergreens' are green throughout the year.

The jack pine is a dominant species in this area but all needle-leaved trees can be very interesting in and of themselves. Lodgepole pine is one species that is commonly cited. This highly adaptable tree can grow in all sorts of environments, from water-logged bogs to dry sandy soils. Lodgepole pine is one of the first trees to grow in a wildfire area. Its cones are sealed with pitch that requires fire or heat to release the seeds. The pitch of lodgepole pine was used as a base for many medicines. It was boiled, mixed with animal fat and used as a poultice for rheumatic pain and all kinds of aches in muscles and joints. Pitch was also chewed to relieve sore throats.

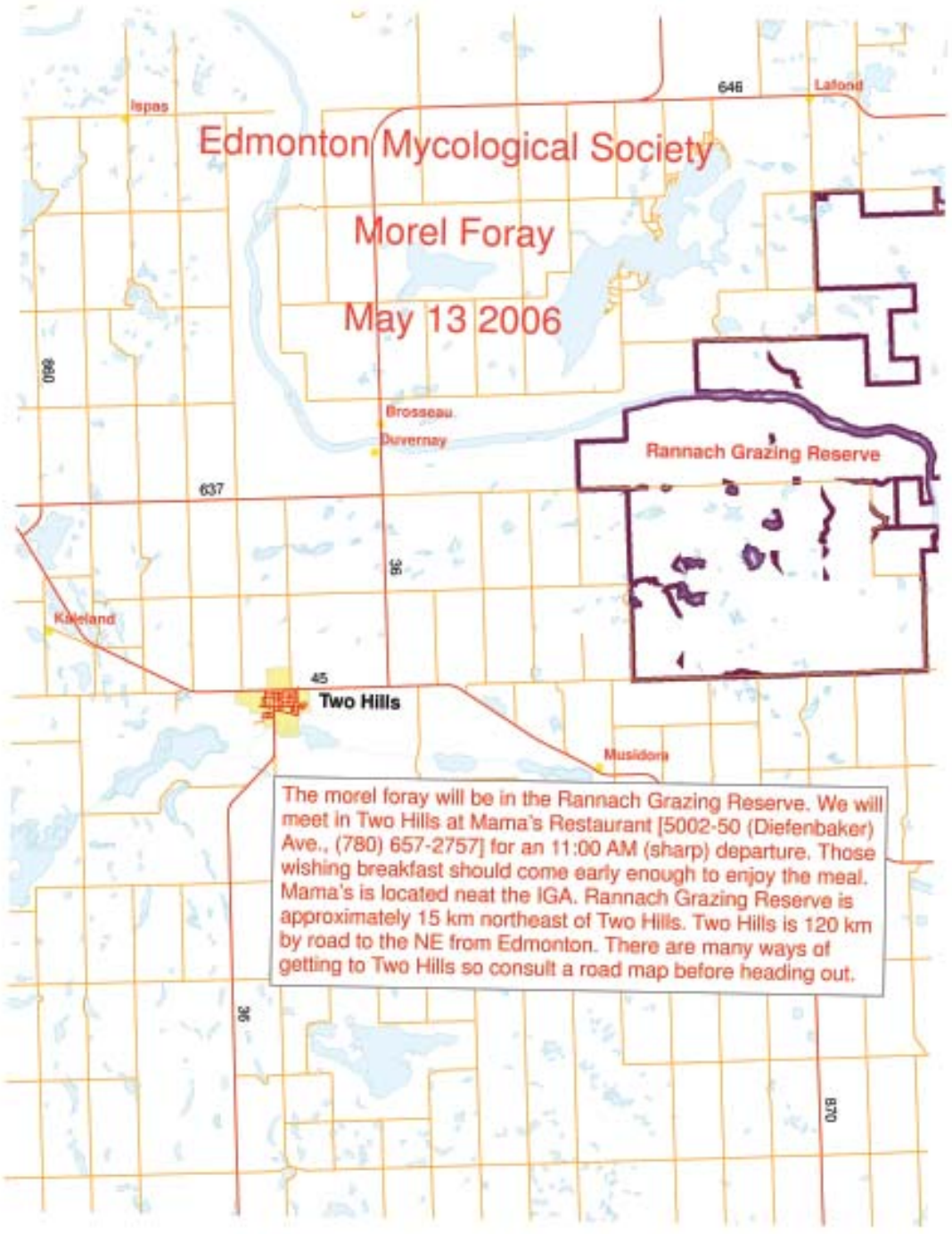
Multiple needles arranged in groups are typical of spruce trees.

Spruce, fir and hemlock are all species of evergreens which do not grow their needles in bundles. To differentiate between them you have to look at the needles and the cones.

Spruce trees tend to be the most commonly used Christmas trees. The needles are evenly spaced around the branch – each an individual. Spruce trees have needles with four sides and are sharp and stiff. You might remember that constant pricking that accompanies the arrangement of ornaments on your tree. White spruce grows in a wide variety of environments and is frequently found with lodgepole pine,

(Pine or Spruce? ...continued on page 11)

Foray Update



The annual morel foray on May 13, 2006 will be kicked off with a breakfast *(optional)* at Mama's Restaurant Two Hills *(see the attachments for details)*. We shall be visiting the Rannach Provincial Grazing Reserve on the south bank of the North Saskatchewan River. However, with this mild spring folks should be getting out soon to check for signs of an early harvest. Before this article goes to print I will be out checking soil temperatures in some forested areas. I know from personal experience that for morels the soil temperature needs to be greater that 12 degrees C (54 degrees F). I already have 16 degrees C in one very sunny portion of my yard but this is an area without shade or an insulating leaf cover. All we need now is a little more precipitation.

Our next foray will be June 17 ***(see page 8 for more details)***. Again to Poplar Creek Natural Area, not so much for oyster mushrooms as the habitat has changed in the last 15 years, though there are always some oysters to be found. EMS is a volunteer steward for this provincial natural area and as such we are expected to visit the site and note changes and concerns which we see. We have been sometimes a little negligent in this respect. Hopefully on this visit we can compile a species list for the non-fungal members of the site. It would be greatly appreciated if someone attending would act as a recorder for the plant species. With the general experience of members on these outings we can compile a fairly complete list, so be sure to ask what those plants are also.

The first evening foray will take place on June 21; we will start from the Kinsman Field Centre. Meet at 7:00 PM near the base of the High Level Bridge on the south side of the River.

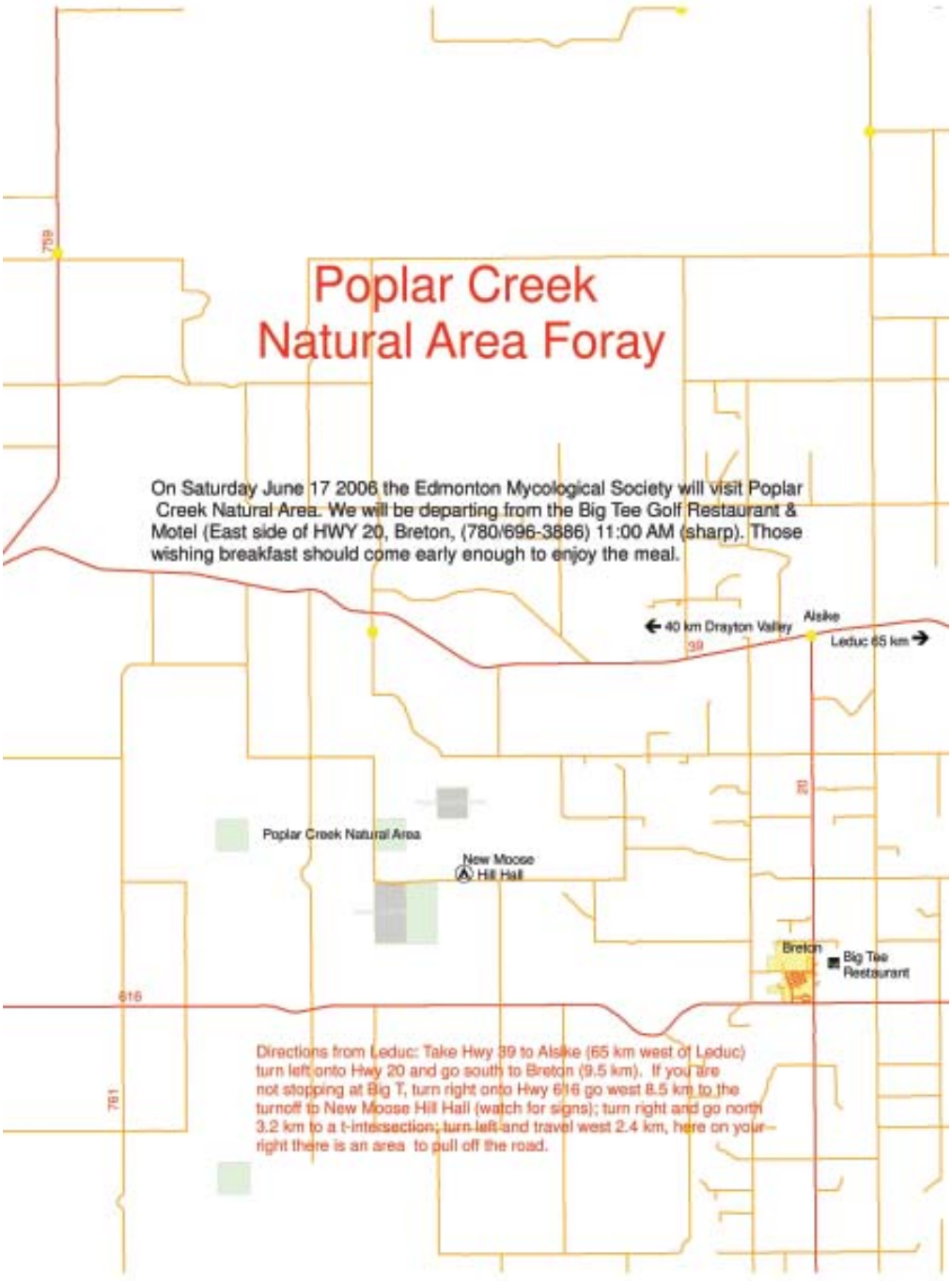
On July 8 and 9 we will be offering another New Members Field Orientation and Campout Foray at the Ashland Dam Site near Warburg. Here in addition to finding various seasonal fungi *(and possibly the King Bolete)* instruction keys will be given to help us get the most out of our field guides. *(The map for this foray will be placed in the next issue of Spore Print.)*

Have a great season!

Bill Richards

Oyster Mushroom Foray

We are planning to make this a weekend affair with a foray, roast and camp out. The pig roast would include a mushroom appetizer potluck. At the time of printing, the hall has not been confirmed. As soon as details are available, you will be made aware of them by email or phone. For now, June 17 will be a foray at Poplar Creek Natural Area.



EMS Annual Mushroom Photo Contest

Closing Date: September 30, 2006

Name: _____

Address: _____

City: _____ Postal Code: _____

Phone Number: _____

Email: _____

Competition Categories

1. Best overall mushroom photo.
2. Best edible mushroom photo.
3. Best mushroom identification series

Every entry should have a photo number (if you are submitting more than one) and the date taken.

Entry Fees:
Registration fee:
covers the first photo----------$5.00

Additional entries:
____ __x$1.00 = $____

Total: $_____

Submit entry fee by mail to:

Edmonton Mycological Society
1921 - 10405 JasperAvenue
Standard Life Building
Edmonton, AB T5J 3S2

Payment should accompany entries. Any entry not paid in full by the deadline date may be disqualified from the competition. Entries may be submitted by email to address above or emailed to **photocontest@wildmushrooms.ws**

You may also send as many photos in for the data base as you would like. Please indicate that they are for this purpose and NOT for the photo contest. There is NO fee for database photos.

EMS Calendar of Events for 2006

Please Join Us!!

All forays are undertaken at your own risk. You are responsible for transportation and accommodation.

March

22 **Meeting:** *New member orientation* by Alan Fleming *and Introduction to Field Guides* by Martin Osis

Done

April

26 **Meeting:** *Foray Fashion Show and some do's and don'ts* by Bill Richards

Done

May

13 *Aspen Parkland / Boreal Forest Regions*
Mushrooms: Morels, Verpas and Spring Agarics
Location: Rannach Provincial Grazing Reserve

24 **Meeting:** *Morels and other spring mushrooms* by Mike Schulz

June

17 *Volunteer Steward Commitment and Pig Roast*
Mushroom: Various seasonal
Location: Poplar Creek Natural Area

21 *Summer Evening Foray in the Edmonton River Valley*
Mushroom: Various seasonal
Location: TBA

28 **Meeting:** *Mushroom identification DVD/Video* by Taylor Lockwood

July

8/9 *New Members Field Orientation and Camp-out*
Mushroom: Various seasonal
Location: Ashland Dam Site

19 *Mid-Summer Evening Foray in the Edmonton River Valley*
Mushrooms: Various
Location: TBA

22/23 *Southern Alberta Foray*
Mushrooms: Leccinum, Russula, Lactarius and other Agarics
Location: Bow Valley Provincial Park

26 **Meeting:** *Mushroom identification aids - stains and other chemicals*
Final discussions and plans for the mushroom exposition at the Devonian

29 *Pre-exposition foray*
Mushrooms: As many different varieties as possible.
Location: Members choice.

30 *"City of Champignons" Mushroom Exposition*
Mushrooms: Any and all types of fungi
Location: Devonian Botanic Garden

August

17-20 *North American Mycological Association (NAMA) Foray*
Mushroom: Mushroom Collection for the Database.
Location: Hinton & Area

23 **Meeting:**
Talk and presenter TBA

30 *Summer Evening foray in the Edmonton River Valley*
Mushrooms: Various
Location: TBA

September

9/10 *Foothills Campout and Foray*
Mushroom: Honey Mushrooms, Hedgehogs and Chanterelles
Location: Lambert Creek Area

27 **Meeting:** *Honey mushrooms - the multiple faces of Armillaria* by Markus Thormann

October

25 **Meeting:** *Scary and nasty mushrooms* by Martin Osis
Photo Contest Recap

November

TBA *President's Dinner*

General Member Meetings

Fourth Wednesday of every month -

Time: 7:00 pm **Location: Riverbend Library**

Weird and Wacky
(continued from page 5)

Ruminants are not the only animals with fungi in their guts though. Many arthropods (insects and crustaceans) harbour a diverse fungal assemblage in their guts as well. These belong to the Zygomycetes, specifically the Class Trichomycetes, and live in the guts of some millipedes, aquatic insects, crustaceans, beetles, and bugs. There are 48 genera with about 190 different species in total. These fungi can only grow in the guts of these animals, often producing elaborate mycelial structures prior to spore production (Figure 2; *Orphella* catalaunica from the hindgut of a stonefly nymph; Santamaria and Girbal 1998). The exact nature of this association remains speculative, but it is assumed that the fungi absorb nutrients from the guts of the animals. In return, the fungi may be involved in the digestion of plant matter and provide some essential nutrients to their hosts. Some studies have shown that mosquito larvae with Trichomycetes in their guts live longer than those without (Horn and Lichtwardt 1981). Hence, the relationship appears to be symbiotic in nature, where both partners benefit from the association.

While the digestive tract seems to be a rather inhospitable environment, a very specialized myco-flora has been able to become established here too. These fungi aid in the digestion of organic matter, thereby helping their hosts acquire essential nutrients from their often unpalatable vegetarian diet. Remember, animals do not have the ability to digest cellulose, that's where the gut fungi come in and perform a vital role in their host's nutrition. Oh yes, humans do not appear to have any fungi living in their digestive tracts; perhaps a remnant from our mostly carnivorous past.

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Markus Thormann

Recipe

Hedgehog and Cauliflower Chowder

This meal freezes well

2 tbsp	butter or olive oil
1	onion
2 tbsp	garlic, minced
	salt & pepper to taste
1 lb	hedgehog mushrooms *(can mix with portobellos or button mushrooms)*. If you don't have enough to make a full meal, slice in some button mushrooms from the store. The wild mushroom flavour will dominate your dish.
1 cup	diced potatoes
4 cups	cauliflower, coarsely chopped
1	celery stalk, diced
3 tbsp	flour
2 cups	vegetable or mushroom stock
2 cups	milk
1 tbsp	rosemary, chopped
1 tbsp	sage, chopped
	parsley for garnish

In a pot heat butter, add onion and garlic and season with salt and pepper – sauté for 3-4 minutes. Add the mushrooms and sauté until they are soft and appear dry. Reduce the heat to medium and toss in potato, cauliflower and celery. Continue to cook for 5-6 minutes.

Sprinkle flour over the vegetables and stir well to mix. Cook for 2-3 minutes and add stock, milk and herbs. Stir well to dissolve the flour. Bring the mixture to a boil. Reduce the heat and simmer for 10 minutes or until the vegetables are tender. Garnish with parsley after pouring into soup bowls. Serve immediately or freeze after it cools.

Recipe courtesy of The Savoury Mushroom by Bill Jones.

Some Foray Essentials

So you are planning to go on an EMS foray!! Great!! They are 'tons' of fun and even more rewarding if you are prepared, have all your equipment and stay warm and dry.

Following is a check list, some items are more essential than others and a lot will depend on the type of terrain you are going into as well as the weather forecast for the day. It is a good idea to have everything with you that you might need for all types of weather, just in case.

VEST: a vest with many pocket will come in handy for storing all manner of tools and food that you will want or need at one time or another. Having everything stuffed into pockets, keeps your hands free for more important things, like picking mushrooms.

Whistle: this little item helps you locate your buddy if you get separated and warns wildlife of your presence.

COMPASS: it is always useful to know where you are in relation to your car and the group. Some people can get disoriented when walking in unknown areas.

GPS: useful for recording information about the location of the mushroom that you have picked and looking for the area where you found those beautiful hydnums. The location is also useful when filling out information for our data base.

KNIFE: a small knife is one of the most useful tools you will carry. It helps you in gathering your mushrooms, scraping and cutting to identify.

BASKET OR OTHER HANDY CARRY DEVICE: some place to put the mushrooms that you are picking is necessary. The loose weave of the basket allows spores to escape.

NOTEBOOK AND PENCIL: field notes are essential in identifying mushrooms and learning more about their habitat.

CAMERA: pictures for our database, the photo contest and your own information.

MAPS: maps showing terrain, vegetation and trails will come in handy when looking for specific sites, eg. boggy areas, pines, spruces.

MUSHROOM FIELD GUIDE AND KEY: for identification purposes.

MAGNIFIER: checking the gill and pore shapes and attachments of a mushroom are two of the steps in identifying and sometimes the naked eye is not enough.

CLOTHING: rain gear, a hat, rubber boots, hiking shoes or footwear that is comfortable when walking through bogs, over and under brush and fallen trees.

Other items include insect repellent, sun screen, water bottle, snacks and a small first aid kit.

Some of our "forayers" like to use a utility belt to hold their equipment. You can improvise as you see fit.

On our forays we pick for identifying and it is useful to have small bags to put individual mushrooms in along with some details about location.

Geraldine Kolacz

Is it a Pine or a Spruce

(continued from page 6)

subalpine fir, aspen, birch and willow. Aside from mushrooms look for gooseberry bushes around white spruce. We won't get into all the species of various spruce trees except for the black spruce which is associated with some wonderful edible mushrooms.

Black spruce is slow growing species that can be up to 20 metres tall and 25 cm in diameter. It often has a cluster of branches at the top forming a blub or 'crow's nest' shape. As with all spruce the needles are short, stiff and four-sided. On black spruce they are arranged in all directions along the twig but mostly pointing upwards. The seed cones are small and almost round in shape when opened. Black spruce tolerates poor growing conditions and can be found in cold, poorly drained areas. The aboriginal people used to use powdered resin from black spruce on their wounds to speed healing. Because of the long fibres in this species, it is a favourite for pulp and paper manufacturing.

Fir trees have flat needles, usually with a notch at the end, and the cones sit upright. Sub-alpine fir was an important medicinal plant. The pitch was used to clean teeth and the aboriginal people chewed the pitch of all the true firs for enjoyment. We have a number of species of trees we call firs which are not true fir trees. One such common variety is the Douglas-fir.

As with all things in nature, as you learn more about trees and other plants in the woods, you will gain more enjoyment from your excursions. As you learn about the plants that are most often found near your favourite mushroom species you will increase your chances of having great harvests.

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The spore carriers

The mushrooms that we all love to find, and sometimes pick, is the fruiting body of the fungus. You can compare these growths to the apple on a tree – the apple is like the entire mushroom and the seed hidden inside the core are the equivalent of the spores. Fungi have a variety of ways to produce and release their spores. One of the first ways of identifying a mushroom is noting the part of the fungus which carries the spores.

A large number of mushrooms carry their spores in an arrangement of gills on the underside of the cap. Others, which are normally easier to identify, have non-gilled carriers. Deciding on which category your sample mushroom belongs to is the first step in your identification. Pictured here are a number of non-gilled specimens.

Morels are one of the most well-known of the non-gilled mushrooms. Here the convoluted surface of the mushroom cap contains the spores. The difference between the edible verpa and morel mushrooms and the false morels is very easy to see and, for that reason, many people are very comfortable picking and identifying morels.

Other common edible mushrooms that do not have gills under the cap are *Hericium ramosum* (combs tooth), hedgehog (*Dentium*) and the Red Top (*Leccinum boreale*) with its entire family of boleteus which includes the suillus group. All of these have been covered in some detail in the following *Spore Print*s:

Morel	Spring 2005
Hericium	Winter 2005
Red Top	Fall 2005
Hedgehog	Spring 2006

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This sample of an Earth Star, a member of the puffball family, shows the round spore ball at the top of the mushroom.

Polypores, as the name suggests, have a number of pores on the underside, some almost like the boletes, which create a fairly hard spongy residence for the spores.

Club mushrooms have no discernable spore production features.

Clavicorona pyxidata has branches instead of a cap with almost a castle turret at the top and is referred to as castellated.

Verpa spore print - You can see the outline of the Verpa cap (the white parts) with the spores falling directly to the paper under the cap and broadcast in a spray effect from the side of the cap.

An example of Hericium showing the coral-like structure of the fruiting body.

Photos courtesy: Loretta Puckrin