Australia Revisted (strobie’s adventure)
by Gary Strobel

After a very rewarding and productive collecting trip to Australia in late 2000, another excursion was planned for there in May –June of 2002. The first collecting trip yielded an endophytic Streptomyces that makes a novel set of extremely bioactive peptides called the munumbicins. This endophyte and the munumbicins were isolated by Dr. Uvi Castillo in my lab. These compounds are active against drug resistant staphylococcus, TB, and the malarial parasite. The activity against the latter is in the range of 3-4 nanograms per ml as the LD₅₀. Dr. James Jensen has indicated that it is the most active compound that he has ever seen after working a lifetime in malarial parasitology. The source of the peptides is yet another interesting story in that it is probably the endophytic streptomyces ever to be isolated from a dicot with promising bioactivity. A complete story of the work will appear in the Sept 2002 issue of Microbiology. The host plant is the snakevine which grows in wet areas of northern Australia. Of course, immediately a multitude of scientific questions are to be answered including whether or not other snakevines in other areas of the country also support this endophytic streptomycete, and if the plants that support snakevine also have this streptomycete. Likewise, do the soils in the area support this streptomycete? The original snakevine plant was found on this trip by virtue of its GPS reading that was taken 1.5 years ago when it was sampled. It worked very nicely!

The 2002 excursion began via a 15 hr plane ride to Sydney, Australia, followed by a layover and then a full day’s trip to Darwin in the Northern Territory. After a full day’s journey south in a rented diesel 4WD Toyota vehicle, we ended up at the Aboriginal community of Manyallaluk. We camped here for two days and used the village as a staging ground for plant collections. The first night was one to remember with native folks singing and playing their didjeridoos until the wee hours of the morning. Manuel Pamkal, an aboriginal guide, provided his insight and help in finding other snakevine plants and numerous other species that have been a part of aboriginal culture and medicine over thousands of years. We gave the Toyota-Prado a real work out on so many roads that would make Hertz nervous if they only knew where we were. The lab folks are now anxiously engaged in learning what new things are present in the latest collection of Australian plants.

After a stay at Mantaranka, the place of the Elsey cattle station of turn of century fame, also known as the place of “We of the Never Never”, we did more collecting in this area which is about 100 km south of Katherine. Seeing the “never never” was just great after having rented the movie from Hastings just before we departed. The hot springs there are wonderful and so too are the birds, goannas and fruit bats.

We then headed towards Western Australia and the Kimberleys. Several days there were greatly rewarded by the discovery of the great boab trees of Northern Australia. These trees probably arrived to Australia via Africa thousands of years ago. They are probably rich in endophytes because of their pulpy-wet interiors. We sampled many of these trees and found snakevines in some of them in waterway areas of the Kimberleys. The main agricultural area of the Kimberleys is in Kununurra near the border with Northern Territory. About 20 years ago the Ord river was dammed creating Lake Argyle which is now the largest body of fresh water in all of Australia. This vast reservoir now is the water source for about 50,000 acres of cultivated land which is about to be doubled. The amazing thing is that the reservoir filled completely in one year’s wet season. They grow melons, cotton and of all things - sandalwood which is prized for its oil and fine wood. Directly south of the lake in a region called the bungle bungles which is a Devonian age deposit of beehive shaped large cone like mountains of alternating white red and green
lines - quite odd and very beautiful when one flies over these
geological formations in an open helicopter. The valleys of these
mountains are loaded with several plants that appear to be
unknown to botany.

Dr. Bill Hess (my ole buddy from BYU) and his wife
accompanied Suzan and me on this adventure. We then headed
over the Great Sandy Desert with its Jiliji lines towards the great
and biologically interesting area of Australia south of Perth. This
area has been identified as one of the top 20 areas of biodiversity
in the entire world. Yep, they have animals that I have never
heard of including the numbat, the phaseogale, the dibbler, the
mardo, the dunnart and the woylie. The animals occur no where
else in the world. In fact, the plant life there is also extremely
demic with some of the world’s tallest trees including the karri
which approaches nearly 300 feet. This was an ideal place to find
the rare tingles (red, yellow and rate’s), plus the marri, the giant
banksias, the jarrah, and the karri sheoak. This place is also
blessed with the snotty gobble and the Christmas tree which,
believe it or not, is a member of the Loranthaceae family
(mistletoe). The Aussies had a really good time naming these
plants early on. I guess it took some time for people like Banks
and others to straighten things out. In fact, the botany of this
place is still under investigation.

We arrived there in the wet season and did our best to stay dry. In
spite of the rain we discovered the forest tree walk at Walpole,
Western Australia. The steel walkway gradually ascends to the
tops of the red tingle, karri and sheoak trees reaching its
maximum elevation at about 200 feet above ground level and
directly in the tree tops. It is a wonderful experience and should
not be missed if one is ever there. We arrived there in the wet
season and did our best to stay dry. The Southwest Coast is also
home to the beautiful Tuart tree whose range, in the entire world,
had been reduced to an area about 25% the size of the city of
Bank. Only recently have the Aussies become aware of their
natural heritage and have taken drastic steps to preserve the plants
and animals that live there. The greatest threat has come from the
accidental and purposeful introduction of unwanted plants and
animals. These include such nasty things as the cane toad which
is decimating the population of goannas and other reptiles,
the red fox which finds virtually all native mammals to its
liking. Australia has the largest population of wild camels in
the world along with about 3 million wild pigs, feral cats,
rabbits, and a myriad of other undesirables.

We have recently isolated another antibiotic gas producing
fungus from the fern leafed grevillia in Kakadu National
Park. This is one that produces an entirely different set of
gases than M. albus. This one, because of its rose color, has
been named M. rosegus. It’s being tested along with M. albus
for their ability to decontaminate soils of plant pathogens.
The latest one from the Manu area of Peru (upper Amazon)
is M. vitigenus that makes naphthalene. The report on this
one was written by Bryn Daisy and was just accepted on
7-1-02 for publication in Microbiology. We are hopeful that
Ms. Castillo, Ms. Ezra, Dr. Ezra and other lab workers will
be able to find another set of interesting and novel microbes
and their products in this recent collection.

Rare Plant Discovered
by Matt Lavin
Ted Clack and Matt Lavin recently discovered the rare plant
Adoxa moschatellina along the Smith River of Meagher
County, Montana. This species goes by the common name of
moschatel root or moschatel, the latter of which is French for
town clock. Moschatel is considered a rare plant in
Montana. This recent discovery of a population of about 50
individuals was made under a dense canopy of Douglas Fir
on a shady north slope along the Smith River in northern
Meagher County, a few miles from the southern border of
Cascade County. The plants were growing in a dense carpet
of mosses and underneath fallen timber and ninebark shrubs.
According to Robyn Klein, a graduate student in our
Department and an active member in the Montana Native
Plant Society, this species had been known previously from
only 10 localities in Montana. All of these come from the
Absaroka-Beartooth Mountains, the Madison Range, the
phire Mountains, and the Continental Divide area near
Basin. These localities include Carbon, Granite, Jefferson,
Madison, Park, and Stillwater Counties. So this 11th
locality along the Smith River in Meagher County represents a
northeastern range extension within Montana. A small
collection of a three plants was made to document this find,
and these plants will be placed in the plant collection in the Montana State University Herbarium.

The inflorescence of moschatel has four distinct sides, each of which bears a flower that resembles the face of a clock (hence, one of the common names). Robyn Klein discovered some plant nursery literature from the UK that suggests that moschatel is a symbol of Christian watchfulness because the five tiny white green flowers, four of which face the four cardinal points and one up to heaven (see photo). Robyn suggests that moschatel leaves have medicinal properties, such as being used to ease digestive upset, and the root is used as part of a general anti-swelling agent, and has such applications as in the treatment of hemorrhoids.

(Photos courtesy of Jennifer Whipple)

Bob’s Byte
(Irene Decker filling in)
B-better about Element K in the March newsletter and I would like to give some feedback on it. To review, this is a program on the Internet designed to teach a variety of software for only $40 per year. I am currently learning Access (which I have struggled with in the past) and am finding it to be very helpful. If you are halfway through a lesson and have to stop, this program will keep track of where you left off. You can skip over parts you know and focus on the parts you don’t know. To check it out, go to elementk.com or to enroll, email Marty Dues at mdues@montana.edu and he will give you a username and password.

An email tip: To find related e-mails from a sender or on a specific topic:
1. Right click on an e-mail message.
2. Select Find All.
3. Choose between related messages or messages from sender.

Cauliflower and broccoli are closely related members of the Crucifer family (Cruciferae). They of course are grown for their fine-flavored flower heads, but sometimes those heads fail to develop normally. Instead, the plant forms a small head prematurely. It’s edible, but there’s not much there to make a meal of. The problem is called "buttoning". It has a simple cause and sometimes, a simple prevention.

Buttoning can occur in young succulent plants if they are exposed to several days of cold temperatures. It’s common on plants raised in the greenhouse and transplanted to the garden. If you transplant young sets that are overly large, the problem becomes worse. You can avoid this cause by adjusting the planting dates in spring so that the plants will either be large enough to yield a good-sized head or they will be too immature for premature heading when cold temperatures are likely to occur. Generally, a plant 4-6 inches tall is about right.

Buttoning can also be caused by any factor that limits leaf growth, such as insufficient water, frost, bird damage, a shortage of nitrogen, excessive salt, or weed competition. So, maintain a good fertilization and irrigation program and keep those weeds out of your garden. Keep the plants growing steadily and you should be okay.

Grants
Phil Bruckner, Montana Wheat & Barley Committee, “Winter Wheat Breeding/Genetics”
Suzanne Mickelson
-Montana Wheat & Barley Committee, “Developing and Releasing Improved Barley”;  
-MSU-LRES, “Barley Varieties Development for Coalbed Methane”  
-Oregon State University, “North American Barley Genome Project”

Luther Talbert, Montana Wheat & Barley Committee, “Spring Wheat Breeding & Genetics”

Nina Zidack, Noxious Weed Trust Fund, “Consortium for Biological Control of Weeds with Plant Pathogens”

Mike Giroux, Andreas Fischer, Jamie Sherman, Jack Martin, Phil Bruckner, Luther Talbert, Montana Board of Research & Commercialization Technology, “Improving productivity and value of wheat for Montana”

John Sherwood, USDA, “Fusarium Head Blight Research”
Tree Planted in Mathre Courtyard
This past week a honey locust tree was planted in the Mathre Courtyard. The tree was donated by the Montana Federation of Garden Clubs and dedicated on June 27. They wish this tree to be a memorial to the victims of September 11. Mary Olson, President of the MFGC spoke at the dedication, “Representing the very essence of the American spirit of freedom and achievement, we, the Montana Federation of Garden Clubs plant this honey locust tree in the Mathre Plaza Courtyard of Montana State University”.

Hi, my name is Joice Cathey and I am Dr. Weeden’s new assistant. I am a Senior majoring in Business Finance, with minors in Economics and Political Science. I am originally from Billings, MT, however I like to think of Bozeman as my home. My hobbies include sewing, quilting, hiking, camping, curling up with a good book and for now, wedding planning. My fiancé, Jesse, is an English Education major, here at MSU. I am excited about this position and look forward to learning more about the department. Stop by and say hi, I’d love to put some faces with the e-mail names.

Trees in Ag BioScience Hallway
We would like to say thank you to Petrea Hofer for letting us borrow the trees in the first floor hallway of ABS. There are 3 grapefruit trees and 1 mandarin orange tree. She planted the seeds for these trees 25 years ago. They outgrew her house and that is why she is loaning them to us. Also, she gives them 1 gallon or more of water every other day. Thank you Petrea!

Traveling information
Following is information you may find helpful this winter. The Montana Department of Transportation (MDT) is going to utilize 511 for telephone access to traveler information, and the code “511” will be used nationwide. The traveler information will include access to such information as weather, road conditions, etc. MDT is requesting that 511 be opened statewide by August 1, 2002.

The use of this dialing code from campus will require the local access code (9), and should be dialed as “9 511”.

Marie Jones, the regional director for the MFGC added, “Shell Oil Company has donated $2 million to projects pertaining to gardening since 1988. The collaboration between Shell Oil and the MFGC is successful because we share a commitment to doing good and being good stewards of our land.” Another reason the MFGC decided to donate a tree for the courtyard was because of all the trees Bozeman lost in the June snowfall last year.

Irrigation will be installed in the Courtyard in the next few weeks and benches and tables should be here shortly. Dick will be needing volunteers throughout the next few months to help plant, mulch, edge, etc. If you would like to help with this, please contact Dick at 994-5048 and leave a message.

New Employees
Curt Foster - 124, 125, and 238 ABS
My name is Curt Foster. I have recently accepted a position in the Cereal Quality Lab, Mike Giroux’s Lab, and Andreas Fischer’s Lab. I am no stranger to the department since I have worked full time for Deb and Andreas for the last year and a half and for Deb as a student before that. I graduated from Montana State in December 2000 with a degree in Agricultural Operations and Technology. Since I grew up in Montana, I find it hard to leave to find a job. My wife Wendy and I have a baby boy who was born on March 23, 2002. He takes up most of our free time. I enjoy hunting, fishing, and snowmobiling, all of which are good reasons to stay in Bozeman.

Joice Cathey - 303 ABS

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Vladimir Kanazin Takes a Bride
Congratulations to Vladimir and Hillary Kanazin! They were
married June 15 in Soldier's Chapel, Big Sky and are presently
spending their honeymoon in Hawaii. If you would like to see pi
ties of this joyous occasion, check out www.lpprints.com and
then click on search and then hillary-vladimir kanazin and the
password is hieres.

July Birthdays
Susie Couch 2
Katie Cash 3
Pat Hensleigh 5
Dan Bergey 7
Jack Riesselman 9
Hussein Abdel-Haleem 12
Jody Barney 13
Dorothy Morton 14
Eric Smidansky 20
Thais Hulting 20
Susan Siemsen 22
Petrea Hofer 28
Ray Ditterline 29

Recipe of the Month
Spring Steak & Spinach Salad
3 tablespoons Kikkoman Lite Soy Sauce, divided
3 tablespoons red wine vinegar, divided
1 clove garlic, pressed
1/4 teaspoon black pepper
3/___and boneless tender beef steak, about 3/4 inch thick
1/4 cup vegetable oil
1/4 teaspoon dried oregano leaves, crumbled
1 pound fresh spinach, washed, stems removed
and leaves torn into bite-size pieces
6 ounces fresh mushrooms, sliced
3 oranges, peeled and cut into sections

Blend 2 Tbsp. lite soy sauce, 1 Tbsp. vinegar, garlic and pepper;
pour over steak in large plastic food storage bag. Press air out of
bag; close top securely. Turn bag over several times to coat both
dsides. Marinate 30 minutes; turn bag over occasionally.
Meanwhile, combine remaining 1 Tbsp. lite soy sauce, 2 Tbsp.
vinegar, oil and oregano; set aside. Broil steak 4 minutes on each
side (for rare), or to desired degree of doneness. Cut steak across
grain into thin slices; combine with spinach, mushrooms and
oranges in large bowl. Blend lite soy sauce mixture; pour over
spinach mixture and toss to combine.