Plant Science Says

June, 2004

Adventures in Indonesia
By Gary Strobel

Indonesia, a land of a quarter of a billion people has few remaining primary forests. Finding at least two of these forests and arranging visits to them was the job of Mr. Bruce Hundertmark, an Australian business man, who invited me on an all expense trip to the island chain country of Indonesia. Our first stop was to Sumbawa - east of the Wallace line and a bit to the northwest of the islands of Timor and Flores. It was in this area that Wallace observed that the life forms (mostly animals) bore a greater resemblance to those of Australia than those of Asia. After much study, he drew a line (Wallace) that divides the Indonesia islands (thru the strait of Bali and Lombok) from the eastern (Australian) and from the western (Asian) influences (tigers, elephants, rhinos).

Pic Sipakura is the name of this interesting plant. In the jungles of the world it is quite common for younger leaves to express those pigments that can pick up light in the shorter wavelengths.

On Sumbawa, we were guests of the Newmont Mining Company whose original founder was

Getting into the Tesso Nilo site was not easy. We had hours of mud, rain and thoughts of despair.

Boyce Thompson of Virginia City, Montana (born in 1869). This company is now the largest gold mining company in the world. Strangely, its manager in Sumbawa is Mr. Phil Brommit, a graduate of Montana Tech. It was like old home week. The company holds many areas of prime wilderness and gave us access to all of it. The site is a model for the rest of the world since reclamation, support of local peoples and other activities for the benefit of all seem to be underway.

We also visited Northern Sumatra on the west side of the Wallace line. The people with World Wildlife Fund organized a 3 day visit to what will soon be the newest national park in Indonesia –Tesso Nilo. It is home to many Gibbon species, the Sumatran tiger, the Asiatic elephant, the Sumatran rhino, the Asiatic tapir, and the collared Scops owl, the later of which was of some interest. This small owl kept us awake each night as it bellowed weeeo-plop as it and its buddies signaled to each other all night. At day- break the gibbons came on

the sound scene with their cries and yells. What a deal!!! The temperature hovered at 100 each day and it cooled to 95 at night.

A sleeping bag consisting of a silk bag was all that was needed to stay cool. Each day, we bushwhacked through the jungle to collect plant specimens. One hundred foot trees were climbed by a very able native fellow who was absolutely outstanding in his climbing abilities. Water was drunk by the gallon and it seemed impossible to keep fully hydrated in the tropical sun.

Accompanying the group was Dr. Ines Atmosukarto who was recently the recipient of the L'Oreal –UN fellowship for women in science. Only 5 fellowships for women in science were given at a ceremony in Paris earlier this year. Ines won for the entire continent of Asia. When asked where she was going to do her study, she said, "Montana State University." Their reply was, "What?!! Where is that and why are you going there??" She will join the lab later this year to study the endophytes of Indonesia.

Ines in a Newmont company helicopter as we depart Sumbawa, Indonesia.

New Grants

Alice Pilgeram; Endemic Rust Pathogens for Biocontrol; Montana Department of Agriculture

Bob Sharrock; Arabidopsis phyB/D/E photochromes; NSF

Dave Sands; Amino Acids in Weed Control; Montana Department of Agriculture

Robyn Teaches in London

Robyn Klein, one of our recent Master's graduates, has been offered a 3-month teaching position in the BSc Health at Westminster University in central London. She will be teaching courses in medical botany and herbal medicine during the spring 2005 semester, as well as helping to develop research projects.

The School of Integrated Health has developed the widest range of complementary therapy courses in Europe. The BSc (Hons) degrees in acupuncture, herbal medicine, homeopathy, nutritional therapy and therapeutic bodywork were the first named degrees of their kind in the UK.

For more information on this program, see: www.wmin.ac.uk/sih/complementary/home_compl.htm

Field Days

Dates and places for Field Days this summer are:

Central Ag Research Center – Moccasin June 22
Forage and Research Hay Day

Southern Ag Research Center – Huntley July 6

Northwestern Research Center – Creston July 9

Eastern Ag Research Center – Sidney July 13

Central Ag Research Center – Moccasin July 14

Northern Ag Research Center – Havre July 15, 16
Field Day (morning)
Research Center Summer Conference
(afternoon and morning of the 16th)

Tech Tidbits
By Matt Moffet
Most Cost-Effective:

In the last couple of years the best money saving method for DNA electrophoresis that I have come across is the Sodium-Boric acid (SB) buffer system (BioTechniques 36:214-216; February 2004). Previously, we used Tris-Borate-EDTA (TBE) buffer system; which is very similar to Tris-Acetate-EDTA (TAE) and both are widely used electrophoresis buffer systems for general DNA electrophoresis. *Each system is slightly different from the other;* recently Biotechniques published an article on SB for general electrophoresis for resolving differences in agarose >10 base pair. For sequencing purposes, the most commonly used system is ultra-pure TBE. SB can replace TBE and TAE for general electrophoresis with added benefits usually associated with sequencing grade TBE. TBE and TAE are usually limited to a maximum voltage of ~120volts for proper resolution. SB, as reported in Biotechniques, can accommodate voltages up to 300volts. Currently, we have had success with a voltage range of 40-160volts, allowing us to cut our DNA electrophoresis almost in

half (unpublished: Weeden and Moffet). The best thing about SB is actually its cost. The cost of TBE is $1.029/L of 1X running/gel solution, but SB has a cost of $0.126/ L 1X running/gel solution. The last benefit of SB buffer is its inability to retain heat, while still allowing enough voltage to be carried. When running SB at 160volts the SB will stay within 5 degrees Celsius of room temperature, where TBE will be several degree higher or more. When running SB at voltages of less than 110 volts in a 1X solution, the buffer will be within 1 degree Celsius where TBE will be 3-5 degree Celsius or more higher, depending on usage. When re-melting agarose SB will also cool much more rapidly than TBE and still be re-melted the same four or five times.
We have experimented with different preparations of the SB buffer system and have had the best results when using it like TBE, 1x running/gel buffer and most commonly 2% agarose. We have been able to pour 0.5% gels that are less fragile than 0.8% TBE gels and 4% will give good resolution of small bands. When the DNA migrates through an SB gel it does not migrate as fast as TBE, so you get more of a logarithmic movement with large bands moving much slower than smaller bands. The DNA ladder takes on an appearance more like a metaphor agarose gel or polyacrylamide gel. We continue to experiment with different preparations such as TBE as the gel buffer and different running concentrations. SB like TAE can be made as a 50X stock, where TBE I find it easiest with a 5X or 10X stock.

So how is sodium boric acid made? There were two ways published in Biotechniques. The first, the easiest and the one I use (I haven't tried method two) is as follows:

For 4L of a 5X SB Stock ->
-To 3.8L dH20 add 8grams of NaOH crystals
-Titrate to a pH of 8.5 with Boric Acid ~40 grams)
-Bring to 4L volume
-COST-$2.50

For 4L of a 5X TBE Stock ->
-To 3.8L dH20 add 216grams of Tris
-110 grams Boric acid
-80 ml EDTA (0.5M soln.)
-Bring to 4L volume
-COST-$20.58

Most Overdue Tool for the Toolbox:
Everybody involved in expression analysis knows about fluorescence in quantitative analyses. SYBR green 1® has been used in qRT-PCR, melt curves, etc; but SYBR green 1 and its inability to intercalate into single-stranded oligionucleotides has limited the power of a simple mechanism. Now they have SYBR green 2 and also a pre-mix gel staining solution. If you need to run a denaturing gel it is now possible to use SYBR green 2®, and you won't have to wash the buffer out of the gel. Many people search out mutation and now you can get increased resolution in those experiments that were difficult before using ethidium bromide staining, like single-stranded conformation polymorphism (SSCP) analysis. You can achieve higher resolution in agarose or polyacrylamide and not have the higher cost associated with custom labeled primers that should be run on a DNA sequencer. As for a comparison to using the M13 tailed primer, I am not sure how the overall cost and time would be but it could be somewhat close.

What Will They Claim Next:
DO-COOP Technologies in Israel posted an advertisement in the April 15th Genetic Engineering News saying their new product Neowater® when used in biological experiments can help you achieve better reactions between biological molecules. As the name implies, Neowater is a nanoreagent additive that is added to water to control the physical properties of aqueous solutions. It is said to improve efficiency of nucleic acid and protein amplification/purification, transformation and transfection, cloning, cell cultures, antibody binding and even prolong enzyme activity.

Note: We would like Tech Tidbits to appear in every issue of this newsletter. If you have any tidbits you would like to contribute for future issues, please email me at decker@montana.edu. Thanks to Matt Moffet for coming up with this great idea and for contributing this month!

Bob's Byte by Bob Johnston
Disable the Insert key in Word (disable INS & OVR mode)

One of the stupidest designs in Microsoft Word is that it still recognizes the **Ins** (Insert) key on your keyboard and treats it the same way as early DOS word processors did in the 1980s.

In the heyday of DOS-based word processors and 5-1/4" floppy diskettes, the **Ins** was used to switch between "Insert mode" and "Overwrite / Overtype mode," at least before software developers learned that most people don't like Overtype mode (and nearly nobody knows how they got there when it happens).

by default, you're in "Insert mode" when you write in MS Word (or any word processor for that matter); this means that if your text cursor is between two words:

The lightning | scares me
and you type a word, it looks like this:
The lightning bug| scares me

But if you've accidentally press the **Ins** key beforehand, then you'd get this mess instead:
The lightning bug|ares me
he three characters " sc" are *overwritten* instead of simply pushed out of the way.

The simple solution is to press the **Ins** key again to go back to Insert mode, and then fix your mistake. But the better solution is to disable this simple (and very old) annoyance entirely, which, of course, is not obvious in Word. Instead, you'll need this workaround:

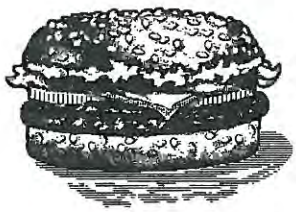
1. Select **Macro** from the **Tools** menu, and then select **Record New Macro**.
2. Type **DoNothing** for the Macro name (no spaces, please).
3. Click **Keyboard**.
4. Click in the **Press new shortcut key** field and press the **Ins** key. The word "Insert" will appear.
5. Click **Assign** and then **Close**.
6. You'll then be sent back to the main editing page, and a **Stop Recording** toolbar will appear floating above your page. *Immediately* press the little **Stop** button on toolbar (the tiny square).
7. That's it! You've just created a macro, activated by the **Ins** key, that does absolutely nothing. The next time you press the **Ins** key, that's exactly what you'll get: nothing!

*Note: if pressing **Ins** still does do something, it means you weren't quick enough when you clicked the **Stop** button. Anything you do between steps 5 and 6 will be recorded and played back every time you press **Ins**. To try again, go to **Tools** -> **Macro** -> **Macros**, select the macro you just created, and click Delete. Then, repeat the above procedure again.*
Thanks to Annoyances.org for this tip.

June Birthdays

Uvi Castillo	10
Ron Larson	12
Ron Ramsfield	15
Jackie Kennedy	15
Luther Talbert	18
Eileen Carpenter	22
David Ezra	26

Recipe of the Month



To Die for Burgers
1/2 cup minced onion
2 garlic cloves, pressed
ontreal Steak Seasoning
Avocados
1 red onion, sliced thin
1 jar roasted red peppers
6 large onion rolls

Mix together ground beef, minced onion and pressed garlic. Pat into patties and sprinkle with Montreal Steak Seasoning. Grill to your liking. Place hamburger patties on an onion roll and top with red onion, lots of roasted red peppers, and avocado slices.

Bob Gough and Cheryl Moore
Congratulations to Bob Gough and Cheryl Moore on their engagement! Bob presented Cheryl with a beautiful yogo sapphire and diamond ring on Sunday, May 30. No specific wedding plans have been made at this point, but (never fear), I will keep you informed as their plans evolve.

Farewell to David Ezra

David, Sigal and their four children will be moving back to Israel on June 11. David has been working in Gary Strobel's lab for the last 3 years. He has acquired a position with the USDA in Israel.

Please join us in wishing him well during a farewell coffee on Firday, June 4 at 10:00 a.m. in the Mathre Courtyard.