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## **PAAA Newsletter**

Autumn 2009

Pan-American Aerobiology Association [www.paaa.org](http://www.paaa.org)



*The Pan-American Aerobiology Association (PAAA) is an assemblage of individuals with diverse scientific backgrounds and expertise who have a common interest in the sources, dispersal, and deposition of airborne biological particles. The organization was officially constituted in June 1989 during the Second Canadian (and first Pan-American) Symposium on Aerobiology. The PAAA is an associated organization of the International Association of Aerobiology (IAA) and acts as the representative of the IAA in the Americas. You may join the PAAA at [www.paaa.org](http://www.paaa.org). PLEASE JOIN US!*

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## *PAAA Executive Committee – 2009-11*

President - James Scott – [jscott@sporometrics.com](mailto:jscott@sporometrics.com)  
Vice President - Charles Barnes – [barnescs@umkc.edu](mailto:barnescs@umkc.edu)  
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Maria Gabriela Murray – [mgmurray@criba.edu.ar](mailto:mgmurray@criba.edu.ar)

*You may join the PAAA at [www.paaa.org](http://www.paaa.org).*

*Full membership is \$25. Student membership is \$15.*

***Amigos y Miembros de la PAAA fuera de los Estados Unidos de América:**  
aceptaremos gustosos sus contribuciones en español, portugués o francés. Según  
las posibilidades de la edición, saldrán en el idioma original, o traducidas al  
inglés.*

**Don't miss!!! "Expanding aerobiology"**

*9th International Congress on  
Aerobiology  
and  
PAAA Annual meeting*

**Museo Argentino de Ciencias Naturales  
"Bernardino Rivadavia"**

**Buenos Aires - Argentina  
August 23-27, 2010**

**Link to Registration: <http://www.paaa.org/>**

**Abstract Submission Deadline.....February 15, 2010  
Early Registration fee Deadline...April 15, 2010**

**Contact: [9thica@aerobiologia.com.ar](mailto:9thica@aerobiologia.com.ar)**

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## **Newsletter Editor Note**

My first words are to thank Charles Barnes, Children's Mercy Hospital and Clinic for hosting the most recent PAAA meeting in Kansas City. In this newsletter publication, Charles is giving us feedback about this annual important event for our aerobiology community. I wish to mention that Charles gave those of us who could not be there, the possibility to attend the General Membership Meeting through the internet with "gomeeting.com" and this was very much appreciated.

You will find two new regular sections in this newsletter. The "Student Corner" will be a way for us to find out what is going on with our future aerobiologists. It will give them pen and ink to express their enthusiasm about their projects or their experience at the PAAA meeting, etc. The second new section "News from our friends" lets us catch up with friends that we miss and that miss us. A way for them to say "Hi!" and to share news. Our retired friend Janet Gallup has waved to us with a few lines and a happy picture.

As usual news from your labs and projects is included as you wish to submit them along with news from our committees. This time we have news from International Collaboration for Allergenic Pollen and from Penn State University.

Something very close to our own lab work is a report from Charles Barnes and one from me on recent Spore Trap Standard Methods. You will also find a procedure to make a permanent mounting media for spore or pollen slides.

Finally, another new section is "Our members' publications" where you can keep us informed about your latest accomplishments.

I invite you to renew your membership for 2010.

Wishing you a few minutes of relaxing reading,

And a healthy and fruit-full 2010 year.

Ginette Leclaire

## **Glance at the 2009 Aerobiology symposium in Kansas City**

Aerobiology 2009, the annual symposium of the Pan-American Aerobiology Association was hosted by Children's Mercy Hospitals and Clinics in Kansas City, Missouri on July 29 through August 1. The scientific sessions were funded by a generous donation from Clorox Corporation. An audience of up to 40 attendees participated in 17 various sessions and individual presentations. Topics ranged from "Molecular Strain Typing: A Tool to Examine the Evolution, Epidemiology and Nature of Fungal Diseases" to "Hypersensitivity Pneumonitis: Fifteen Cases Caused by Residential Bioaerosol Exposures". A lengthy discussion was held concerning the analytical precision of commercially available spore trap services and the general area of quality control for airborne spore quantification. For the first time this year members who could not attend the meeting in person were able to view the sessions over the internet using the internet service GOTOMEETING.COM. Members of the PAAA were able to catch up with significant life events of the members at the reception held in the Don Chisholm Center at Children's mercy hospital and the PAAA banquet held at Pierponts in Kansas City's historic Union Station pictured above. Spore camp on Saturday August 1 collected plant and fungal specimens as well as several specimens of equine feces in the morning at a local farm. The afternoon was spent viewing many different kinds of fungi. On behalf of the organizing committee at Children's Mercy Hospital I would like to thank all of you who were able to attend and make Aerobiology 2009 a success.

Charles Barnes. [barnescs@umkc.edu](mailto:barnescs@umkc.edu)

## **Student Corner**

**Melanie Joy - University of Massachusetts**

The subject of my studies have been on airborne fungal spores, in particular focusing on those recovered in historical buildings. I attended my first PAAA meeting back in August 2009 and couldn't have been more pleasantly surprised, excited, and interested in the growing field of aerobiology (from pollen and fungal spores to allergies and infectious disease and so much more). It was wonderful to meet people, make connections, and learn about the many facets of this organization. I'm thankful for the opportunity and the platform given to me by the PAAA to present the research I've been working on as a graduate student at the University of Massachusetts. It's nice to belong to an organization that has a strong commitment to student development. I left Kansas City with a renewed passion and understanding of the importance of aerobiology in today's growing world; and can't wait to attend the next one!"

Sincerely,

Melanie Joy

Environmental Health Sciences University of Massachusetts

Email: [mjoy@schoolph.umass.edu](mailto:mjoy@schoolph.umass.edu)

## **Aerobiology students – Penn State University**

Below are a few lines about 3 students from the PSU aerobiology lab who presented their research a few years back at the PAAA meeting.

**Jeremy Zidek** graduated with a M.S. in Ecology and is now a programmer in a small Information Technology company called ZedX Inc. Although Jeremy spends most of his time at ZedX managing meteorological data bases, from April to October each year he leads the Soybean Rust Ensemble Forecasting Team. In this capacity, he helps direct 3 undergraduate interns who interpret output from aerobiology transport and meteorological models to make forecasts of the risk of soybean rust spread throughout North America. These forecasts are distributed 3 times a week to Agricultural Extension Specialists and other stakeholders through the US Department of Agriculture Pest Information Platform for Extension and Education.

**Nick Dufault** completed his Ph.D. program in Plant Pathology in 2008. He is currently a post-doc in the Penn State aerobiology lab where he is developing automated technology to measure the fall velocity of spores and pollens. He is also involved in a field experiment to quantify the escape of spores from agricultural fields and the influence of characteristics of the air flow, the spores, and the crop canopy on the escape process.

**Maria Velez Climent** has completed her M.S. degree and is now pursuing a Ph.D. in Plant Pathology at Penn State University. Her thesis focused on germination stage progression and adhesion of */Phakopsora pachyrhizi/* urediniospores to soybean leaves.

Scott Isard  
Professor of Aerobiology  
Departments of Plant Pathology and Meteorology  
Penn State University  
[sai10@psu.edu](mailto:sai10@psu.edu)

## **Looking for graduate students**

A graduate research assistantship is available to study ragweed pollen production in current and future climate scenarios, with an emphasis on applications of datasets to public health needs. The research will involve field collection, air sampling, pollen counting, and allergen assays. The position can be associated with either an MS or PhD in Environmental Health Sciences in the School of Public Health and Health Sciences at the University of Massachusetts Amherst beginning summer 2010. This is a collaborative research project with Harvard Forest, Harvard University.

Applicants should have a science based B.S., M.S. or equivalent in areas such as aerobiology, ecology, environmental science, and excellent oral and written communication skills. Applicants must submit GRE scores (and TOEFL scores for foreign applicants) with their application to the Graduate School. The deadline for applications is February 1, 2009.

For more information please contact Dr. Christine Rogers at: [carogers@schoolph.umass.edu](mailto:carogers@schoolph.umass.edu).

## **International Collaboration for Allergenic Pollen – ICAP**

<http://pollen.zedxinc.com>

The International Collaboration for Allergenic Pollen (ICAP) is an initiative that emerged from the Pan-American Aerobiology Association (PAAA) Symposium held at the Pennsylvania State University in 2007. At the symposium, a ragweed discussion group met with the goal of promoting an international collaboration for the creation of an Internet-based platform to forecast aerial concentration of ragweed pollen in North America and Europe.

In the framework of ICAP, both short term and long term objectives have been delineated. The short term objectives focus on the development of a restricted access platform interface to access temporally and geographically referenced aerobiological, phenological, and land cover databases for the major allergenic pollen producing plants for North America and Europe. The long term objectives include the development of a public platform interface to access pollen forecasts for selected allergenic pollen.

Following the 2007 PAAA discussion group, a restricted access pilot website was developed and actively operated in 2007 and 2008. Over the two growing seasons, phenological observations for ragweed (*A. artimisiifolia*, *A. Psyllostachia*, *A. trifida*) have been collected from five countries in Europe (France, Hungary, Italy, Switzerland, Serbia), five states in United States (California, Florida, Pennsylvania, Massachusetts, Missouri), and two provinces in Canada (Ontario and Quebec) .

In 2009, thanks to the continued support of ZedX Inc - a private IT company which collaborates with the Computational Epidemiology and Aerobiology Laboratory (CEAL) at the Pennsylvania State University - the pilot website has been upgraded to include innovative functionalities. The new ICAP platform has now the capability of storing phenological observations for North America and Europe for multiple plants: ragweed, grasses, oak, cedar, birch, and olive. The upgraded system is organized by roles that are

assigned to the participants by the ICAP administrators. The roles presently active are the 'Phenologist' and the 'Surveyor'. The phenologist role enables the participant to enter phenological observations for a specific location and a specific Genus/species. The surveyor role enables the participant to enter land cover data on a specific Genus/species for an area ranging from a field to a large region or country. Concerted efforts have led to the development of various drawing tools that allow the phenologist to delineate and geographically reference both point monitoring locations and surveyed areas (Fig. 1). Drawing tools are also available for the surveyor, who can delineate geographically referenced areas and enter land cover data (Fig. 2).

In 2009 the phenological observations submitted to the ICAP have focused on ragweed. The countries that have participated are: United States (one location), Canada (six locations), France (four locations), Italy (one location), Poland (two locations), Serbia (one location), and Switzerland (one location).

Feedback regarding the various functionalities of the ICAP platform is very welcome. Phenological observations, land cover area surveys, and pollen forecast model calibrations are the major areas for which scientific collaboration is crucial. Since the project inception, participation has been fairly good and we hope that the interest in ICAP will continue to be strong in 2010. Sincere thanks go to all the participants who have dedicated time and effort to this project.

A password will be provided to the scientists interested in joining the ICAP.

To join or to obtain further information please contact the ICAP Administrators: Annalisa Ariatti (aia15@psu.edu), Scott Isard (sai10@psu.edu), or Regula Gehrig ([Regula.Gehrig@meteoswiss.ch](mailto:Regula.Gehrig@meteoswiss.ch)).

## **Aerobiology News from Penn State University**

This has been a very exciting year in Scott Isard's Computational Epidemiology and Aerobiology Lab. Marcelo Chamecki joined the PSU faculty in the Department of Meteorology. If you attended the 2008 PAAA meeting at Amherst, you may remember that Marcelo, then a graduate student at Johns Hopkins University, presented his research on the role of turbulent structures on ragweed pollen transport. This year Marcelo and Scott teamed up to launch a research program to explore how turbulent air flows and plant canopy structure influence the escape of spores and particles from crops. Nick Dufault, now a post-doc in CEAL, and two undergraduate interns joined our program this summer and we had a lot of fun conducting a number of field and laboratory experiments. We were able to initiate a wheat stem rust epidemic in one of our experimental fields and gather an extensive set of data as the epidemic progressed. We now believe that we have a good idea of what we can and cannot measure and how to accomplish our research objectives, so hopefully next year will be equally productive.

Scott is also leading team of agricultural researchers and extension specialist from across the U.S. who are preparing for the incursion into North America of new races of wheat stem rust (Ug99). In the first year of this large USDA BioSecurity Program grant, the team is developing rapid diagnostic procedures for identifying Ug99 and preparing to train appropriate diagnostic lab staff to use these PCR tools. We are also building the Information Technology to integrate observations from disease monitoring and spore collection networks with aerobiology modeling to provide growers with early warning of disease spread once Ug99 arrives. Finally we are working with stakeholders to enhance wheat rust monitoring programs and provide an Internet-based platform for communicating information critical for wheat disease management decision making. We have a research assistantship available for a graduate student with experience working in small grains who would like to study physical aerobiology.

Scott Isard, Professor of Aerobiology, email - [sai10@psu.edu](mailto:sai10@psu.edu)

## Notes from our friends

### Janet Gallup



Retirement is WONDERFUL! Although there are aspects about working with the beautiful microfungi that I really miss, I definitely don't miss the deadlines, worries, and frustrations of running a laboratory. These past retired years have been filled with dancing, long walks, reading, films, artsy-craftsy hobbies, and travel. However, last year my husband Don had two difficult back surgeries, plus some other 'skeletal' problems (shoulder and hip problems). Thus, life became much more home bound and quiet. He has made a good recovery to our great relief, and we are slowly resuming a more active lifestyle. My own health began to improve after I retired, in that, I changed my life style and lost some 65 pounds. I feel so much better!!

That's it in a nutshell. I don't know anything about what's happening in the world of aerobiology and indoor air. (I REALLY miss hearing anything about the EMPAT samples.....those were so much fun to do!) If anyone wants to say Hi, my e-mail is JMGallup@aol.com. I still love the fungi very much. A long time friend is coming to visit and the first thing I thought of doing was to grow up Botryosporium so that my friend could view it under the stereoscope!

Janet Gallup, December 16<sup>th</sup>, 2009

## **Methods and Procedures**

### **Standard Test Method for Counting Air Collections published by ASTM – note from Charles Barnes.**

Just this past April, WK8015 Standard Test Method for the Categorization and Quantification of Airborne Fungal Structures in an Inertial Impaction Sample by Optical Microscopy, was approved for publication by the American Society for Testing and Materials International (ASTM). The standard method has been under development for four years. Many members of the PAAA have been involved in formulating this standard; and, it is a pretty good compromise. I don't yet have a copy of the published standard, and since ASTM International makes its money publishing and selling books of standards I can't even share much of the working draft, but here are some of the highlights.

The test method is an analytical procedure using direct microscopy to determine the concentration of airborne fungal spores collected on typical greased or acetate laminated slides. The collections this is directed for will be those made with the Air O Cell or AllergencoD but a method is included for the round Micro-5 units also. The method is similar to that used by most of us in that it categorizes fungal spores by morphological type from genus as *Cladosporium* to class as ascospores. The method does not require a 1000X objective but does specify that the microscope must have sufficient resolution to render the pores of *Pleurosigma angulatum* as resolved dots. The method calls for counting a minimum of 20% of the trace but does allow for stopping for individual spore types at the end of the traverse where the 100th spore was counted. The method also provides for a debris reporting system on a scale of 0 to 5 with a debris level of 5 being greater than 90% occluded. The method requires a new sample for heavily occluded slides. The list of spore types that should be reported is just about what we typically use and *Aspergillus*/*Penicillium* are grouped together. The method gets very specific in some areas and seems to cover most of the important points of counting, but it is a compromise. Its main advantage is that it provides a standard method that can be referenced in reports and in legal proceedings. The approved method covers only the sample analysis. The method for collection is still in the formative stages.

## **An other Spore Counting Standard Method – note from Ginette Leclaire.**

Spore trap sampling is getting popular out of the USA. This is happening in the province of Quebec, in Canada. Teased by the obvious utility of this approach, the Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST)<sup>1</sup> have developed a Standard Method that is now mandatory in this province at least pertaining to Occupational Health.

The method that came out is called: Characterization and counting of mould spores sampled by impaction on cassette (Méthodes analytiques / Méthode MA-367, Montréal, IRSST, 2008, 14 pages. <http://www.irsst.qc.ca/files/documents/PubIRSST/M-367.pdf>.

What is special with this first version is that it requires counting the entire trace not just a fraction of it. As you know this can be long and tedious. It is particularly time consuming in summer and in autumn seasons here in Quebec with outdoor samples. Nevertheless, there is an evolution in this standardisation project. In parallel with the first version method coming out, IRSST have started a study to find out what is the fraction that has to be observed (counted) to get a 10% or a 25% error. To make it short, let me just say that researchers came out with a formula that shall be very useful. How to use it? Count one central traverse, plug the amount counted into the formula and the diameter (or length) of your graticule (reticle) and this formula give you how many traverses you have to count if you wish 10% error (or 25%). I have tried it and for a 10% error you still have to count a large amount of the trace. It is safe in many ways but time consuming. Evidently, it shall help to get a good relative standard deviation! If you are curious about this publication consult the section: “Our members’ publications” into this Newsletter, you will find the reference for it.

<sup>1</sup> Established in Québec since 1980, IRSST is a scientific research organization. The Institute is a private, non-profit agency. Its board of directors is composed of an equal number of trade union and employers' representatives, making it a joint body. The Commission de la santé et de la sécurité du travail (CSST) provides most of the Institute's funding from the contributions it collects from employers.

## Permanent mounting media

With the importance of spore trap counting standardization come the subjects of quality control and training and the need of creating permanent slides. For fungal spores recount of slides within a laboratory and inter laboratory Round Robins, for counters' training or for legal purposes, permanent slides are helpful. Here is a mounting media that was adapted by Estelle Levetin, Professor of Biology, Faculty of Biological Science, The University of Tulsa. Note that ASTM has included it into its first spore counting method (see Charles Barnes note on the ASTM method). Thank to Estelle's generosity. She taught me this recipe a few years ago as I was visiting her. This gave me a chance to bring it to the D22.08 Committee as we were working on the ASTM spore counting method. Permanent slides are such a useful tool for QC and training. So, here is the recipe for Lactophenol with PVA (Levetin 89). In the next Newsletter you will find more practical information about compatibility of this mounting media with stains and spore trap capture media.

Air sample mounted in September 2008



## **Lactophenol with PVA (Levetin 89, PVA-L)**

Polyvinyl alcohol powder (PVA): 7.5 gm

Distilled water: 50 ml

85% (or higher) Lactic acid: 22 ml

Phenol: 22 gm

These manipulations should be done in the fume hood.

1. Heat the distilled water to 80° C in a water bath <sup>1</sup>.
2. Add the polyvinyl alcohol (PVA) powder to the distilled water while stirring.
3. Continue stirring until the solution attains the viscosity of thick molasses. There may be a few small lumps that never dissolve. If so I remove them.
4. Add the lactic acid to the PVA solution and mix well.
5. In a separate beaker, melt the phenol using a water bath.
6. Add the phenol to the PVA solution and stir until homogeneous.
7. Store in tightly closed small vials. The shelf life is months. Over time, the phenol will cause the medium to darken, but the clarity of mounts will be unaffected.
8. Mounts may be examined immediately, but harden gradually over a few days.

## **Allergy, vol. 62, pp. 306-310 (1989)**

<sup>1</sup>: note from Estelle: To make the water bath, I boil some water and place it in a large beaker. Then I put the 50 ml of distilled water in a small beaker and place it in the large beaker and check temperature until it reaches 80°C.

## **Our members' publications**

This section is a way for us to have a glance at all PAAA members' latest publications as they wish to inform us of their work. If you wish, you can send such information with or without comments to the Newsletter Editor: [leclaireg@videoron.ca](mailto:leclaireg@videoron.ca).

This publication by Geneviève Marchand and allied was brought up to our attention:

« The effect of the number of counted traverses on the estimation of the total spore count sampled on a non-cultivable slit impactor » by Geneviève Marchand, Yves Cloutier, Carole Pépin and Daniel Drolet at IRSST.

This study is published in: Journal of Environmental Monitoring, 2008, 10, 1060-1063.

## **In the next edition**

In addition to the regular news sections, in order to get us prepared for 2010 Meeting, there shall be information about the 2009 General Membership Meeting also a review on Committees and Interest groups including a PAAA Round Robin and a PAACB update.

As promised, complement of information on compatibility of PVA-L mounting media with stains and capture media shall be in the “Methods and Procedures” section.

*Contribution to the PAAA Newsletter is always welcome. News from your lab or firm, news from students, aerobiology friends, reviews of books or articles, summaries of recent meetings, photos of interesting or unknown spores/pollen/other, etc. can be sent to Ginette Leclaire e-mail to: [leclaireg@videotron.ca](mailto:leclaireg@videotron.ca)*

## **Renew your 2010 membership**

All Pan-American Aerobiology Association (PAAA) members receive semi-annual newsletters and are entitled to **reduced** subscription rates to the journals **Grana** and **Aerobiologia** and to **Symposium registration fees**.

Check the options that apply and return this form with payment for the appropriate amount of money in U.S. Dollars.

Regular PAAA Membership dues. (25\$/yr)

Student PAAA Membership. (15\$/yr)

You may pay the above dues by check (in US\$). Make your check payable to: **PAAA**

Mail this form with payment to: PAAA c/o Michael L. Muilenberg, N239B Morrill-1, Univ. of Massachusetts – SPHHS, 639 N. Pleasant St., Amherst MA 01003, USA.

If you have any questions phone: Tel. +1 (413) 545-3052, Fax +1 (413) 545-0964, or e-mail: [mmuil@schoolph.umass.edu](mailto:mmuil@schoolph.umass.edu)

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