



Canadian Association for Plant Biotechnology Newsletter

Issue 2016.2

December 20, 2016

CAPB President's message

Dear CAPB Members,

As we are approaching the end of 2016, I wish you all a joyful and relaxing holidays, and another very productive and happy new year!

I was delighted to meet many of you during the CAPB-CSPB joint Plant Biotech 2016 Conference held at Queen's University from June 19-21. For this conference, the Organizing Committee from both societies made a unanimous decision to set the conference

theme as "Plant Biotech", with two plenary themes on "Securing global harvest: challenges, innovation, technologies and commercialization" and "New frontiers in plant biotechnology: plant-environment interaction".

There is little doubt that these are hot research themes as we saw the conference attracted more than 300 attendees from Canada, USA and internationally, with 23 sponsors and many exhibitors supporting the conference.

(Continued to Page 2)

IAPB President's message

Dear Members of the Canadian Association for Plant Biotechnology

It gives me great pleasure to communicate with our colleagues in Canada. We are delighted to see such growth in our membership from this part of the world. And on that note a particular thanks is due to Dr Yafan Huang as national correspondent.

The Executive and our newly appointed Administrative Assistant Ms Norma Cotter, have been working hard on your behalf to manage the Association to grow the membership, and to progress the plans for the organisation of the 14th Quadrennial Congress to be held in Dublin, Ireland in August 2018. Currently our membership (now standing at over 700) is drawn from 52 countries. The latest edition of our journal (Vol 52 Number 5) has just been distributed.

Communication with our membership is very important to us. A number of members have requested 'Membership Certificates' which Norma has been providing. If you would like one please contact Norma at : iapbhome@gmail.com We are active on various social media platforms and if you are interested please find us at the following locations; web-

site ; twitter; and facebook.

We would encourage you to 'Save the date' for the next IAPB symposium in Dublin, Ireland August 19th to 24th 2018. Keep up to date with latest news here. We have a collection of 'promotional tools' which you can use to help us to advertise the upcoming conference please see here. For example, you might consider using the IAPB email signature image to help us to advertise or the powerpoint slide when you go to your next conference. We will be offering reduced conference registration fee to all our members and in addition we will have a number of competitive student and early stage researcher bursaries to help with conference attendance. The preliminary programme and key dates is on line now, see here. We have signed up several keynotes speakers, details of which will be released to all members in an early communication in 2017. The official IAPB newsletter will be distributed to all members in mid-December 2016.

Season's greetings to all.

Barbara Doyle Prestwich

Dr Barbara Doyle Prestwich
President IAPB 2015-2018

Inside this issue:

CAPB President's Message	1
IAPB President's Message	1
Awards	2
Conferences	3
Report on CPAB 2016	3
Call for CAPB Membership Application / Renewal	3
Job Openings	4
Call for submission to CAPB Newsletter	4
Research Commentary	5
Research team Dr. A. Ferrie	6
Research team Dr. A. Kushalappa	7

(Continued from Page 1: CAPB President's message)

The strong interest in plant biotechnology in the Canadian plant science communities reinforces the importance of your research work, and will motivate us to continue to stride for further success in our respective research areas. So once again, I like to thank you for your contribution and participation in this wonderful conference. In particular, on behalf of CAPB, I would like to congratulate Dr. David T. Dennis for receiving the prestigious Pioneering & Distinguished Canadian Plant Biotechnologist Award. This Award is designed to recognize a biotechnologist who has made outstanding contributions to Canadian plant science & biotechnology development. I would also like to congratulate Jingpu Song, Israel Alfonso Ramirez, Aparna Singh, Livia Marques, Hong-Hanh Tran and Dhananjay Dhokane for receiving the CAPB Student Travel Awards, to Yasuko Togawa, Irena Peytchev, Gagandip Sidhu and Adam Chin Fatt for receiving the Best Student Oral Presentation Awards, and to Sripad Joshi for receiving the Best Student Poster Presentation Award. Well done and we are very proud of you!



Photo: Awarded students.

Here I like to thank Dr. Barbara Doyle Prestwish, President of IAPB, for writing a personal letter to all members of CAPB. IAPB is very important to us, as it provides an international forum for promotion, communication and publication of plant biotechnology. Members of CAPB receive IAPB memberships (personal certificates sent by Ms. Norma Cotter), and discounts for the IAPB conferences and access to the journal of *In Vitro Cellular & Developmental Biology* (hard copies for full-members only). Student members will receive the benefits such as access to the bi-annual publication of the newsletter, access to a global network of Scientists working in the area, development of collaborative opportunities through competitively awarded travel scholarships, additional social interaction with members through the use of media on IAPB website, Twitter, Facebook and LinkedIn, and reduced registration fees for attending the quadrennial symposia in Dublin 2018. Besides of IAPB, we are also a member Plant Canada, which is an umbrella association representing 7 plant science associations in Canada (<http://www.plantcanada.ca/eng/default.htm>). Rima and AI have been working hard with other board members of Plant Canada to prepare and organize their conference in 2019. This will be an exciting Canadian mega meeting so please stay tune to hear further announcements about the location and timing of it—it promises a rare opportunity to connect and interact with a broad spectrum of researchers from many different disciplines of plant sciences.

There is so much news to share in this issue of our Newsletter, such as association news, lab profiles, member achievements, up-coming conferences and career opportunities. The CAPB Executive Committee has been working hard to service our members and beyond, and we are very grateful to Xiu-Qing for putting this wonderful newsletter together—Kudos Xiu-Qing! We welcome you to come to visit our association website at <http://www.canadianplantbiotech.ca/> from time to time, to get to know the latest of what is happening. We will also welcome your comments and suggestion on how to increase our membership, and to promote collaboration and development of plant biotechnology.



Drs. Yafan Huang and David Dennis (left to right)

Best wishes,

Yafan

Yafan Huang, Ph.D.

President, Canadian Association for Plant Biotechnology

National Correspondent- IAPB Canada

Email: huangy@performanceplants.com

Website: <http://www.canadianplantbiotech.ca/>

Call for Membership Renewal

The International Association of Plant Biotechnology (IAPB) is an organization that covers all aspects of plant biotechnology research. One of the main goals of CAPB (IAPB Canada renamed in 2015 as Canadian Association for Plant Biotechnology) is to promote interaction among plant biotechnology researchers in Canada. Joining CAPB, you become a part of both the IAPB international network (over 80 countries) and Canadian network of plant biotechnologists. CAPB members will receive discounts for all CAPB, IAPB and Plant Canada conferences. Students and postdoc will also be eligible to receive travel awards and best poster and oral presentation awards. You will receive the “In Vitro Development and Cellular Biology – Plant” journal. This is a bi-monthly publication with topics covering: biotechnology/genetic transformation, developmental biology/morphogenesis, micropropagation, functional genomics, molecular farming, metabolic engineering, plant physiology, cell biology, somatic cell genetics, and secondary metabolism. You will have access to a website (<http://www.canadianplantbiotech.ca/>) that will promote plant biotechnology in Canada, describe upcoming conferences, foster collaborations with other researchers in Canada and around the world, and highlight books, papers and news about the plant biotechnology industry. The 2017 membership is due on January 1, Paper form is discontinued. Membership application and renewal can only be done through the CAPB website

<http://www.canadianplantbiotech.ca/memberships/>

Report on Plant Biotech-2016 Conference

Canadian Association for Plant Biotechnology (CAPB) in association with Canadian Society of Plant Biologists (CSPB) had organized Plant Biotech-2016 conference at Department of Biology, Queen’s University, Kingston, from June 19th to 21th, 2016 was great success.

Organizing a conference requires financial support and the participation of enthusiastic, organized and dedicated people. First, as a CAPB family we would like to thank the organizing committee, Wayne Snedden (Chair), Yafan Huang, Abdelali Hannoufa, Kenton Ko, Bill Plaxton, Sharon Regan, Gary Tian, Michael Stasiak for their hard work and dedication in putting forward a wonderful program.

We highly appreciate the help rendered by the executive committee members of CSPB and CAPB in managing and helping throughout the event. We would like to thank all our sponsors for their contributions, without which the event wouldn’t be a success. We also thank all the under graduate and graduate students from Queen’s university for all the hard work and efforts you put forward in organizing and make the event a huge success. Last we would like to thank all the participants for bringing this conference to life.

Great blend of plenary speakers, variety of oral talks addressing diverse areas of research and huge number of posters made Plant Biotech-2016 very productive and fruitful with lot of learning and knowledge sharing. As per CAPB legacy, we presented Dr. David Dennis, Professor Emeritus of Queen’s University (Biology) with the “The Pioneering & Distinguished Canadian Plant Biotechnologist Award” during the Plant Biotech-2016 conference. This prestigious award is designed to recognize Canadian researchers who have made major contributions in the field of basic plant science research, and made significant impact in the development of plant biotechnology for improvement of the quality of human life. Congratulations David! CAPB also awarded 11 student members with travel and presentation awards to encourage them in their scientific careers. Congratulations to all award winners!

Dhananjay Dhokane

Conferences

3rd Global Summit on Plant Science” August 07-09, 2017 Rome, Italy
<http://plantscience.global-summit.com/>

The Plant and Animal Genome XXV Conference (PAG-XXVI)- January 13-17, 2018 , San Diego , CA, USA, <http://www.intlpag.org/>

14th International Association for Plant Biotechnology Congress. 19th—24th August 2018, Dublin, Ireland. <http://iapb2018.com/>

Job Openings:

Three permanent research positions available in January 2017 at Performance Plants Inc.

A plant physiologist and 2 molecular biologist positions will be available in the Gene Discovery & Trait Assessment Program at Performance Plants Inc in January 2017.

The plant physiologist will be the leader of the Trait Assessment Team, responsible for planning, designing, organization and execution of the physiological and agronomic experiments for various plant species in growth chambers and field trials. Applicants should possess a M.Sc. or Ph.D. in plant physiology, crop science, breeding or agronomy with experience in agricultural biotechnology. Specialized research background working in the field of plant stress and experience involving in submissions for regulatory approval of transgenic crops are an asset. The applicants for the two positions of plant molecular biologist should have at least a B.Sc or an equivalent degree with broad molecular and biochemical laboratory skills. Experience in plant genetics, plant tissue culture and transgenic regeneration is preferred.

In general, the candidates for all 3 positions will ideally be detail-orientated, well-organized, enthusiastic and able to appreciate goal and team-based research and development.

Performance Plants Inc. is the 2014 international Agrow Award-winning Canadian agricultural biotechnology company, whose mission is to discover, develop and commercialize innovative plant biotechnologies that optimize crop performance and agricultural productivity while improving food & fuel security, preserving the environment and promoting global sustainability. The Company is located in the beautiful city of Kingston, Ontario of Canada.

Interested applicants should send their curriculum vitae (including the names of three references) to:

Human Resources
Performance Plants Inc.
700 Gardiners Road
Kingston, Ontario
K7M 3X9, Canada

Email: hr@performanceplants.com. Fax: 1-(613)-545-3618.

Performance Plants Inc. is an equal opportunity employer. Only applicants considered for an interview will receive further communication after their initial application.

Call for posters and oral presentations for the Somatic Genome Workshop at the Plant & Animal Genome Conference XXV (PAG-XXVI)- January 13-17, 2018 , San Diego , CA, USA, <http://www.intlpag.org/>

email the workshop organizer: Dr. Xiu-Qing Li
Xiu-Qing.Li@agr.gc.ca; tel 1-506-460-4511

Suggested areas for the somatic genome workshop: Genome instability; variation in somatic genome network (nuclear, chloroplast, mitochondrion) ; somatic genome characterization; somatic genome evolution; genomic characterization of somaclonal variation; somatic breeding (e.g., targeted mutation, breakthroughs in genetic engineering, and cultivars obtained through non-sexual crosses; protoplast fusion and cybrids, and graft-hybrids).

Call for posters and oral presentations for the Genome Features and Chromosome Functionality at the Plant & Animal Genome Conference XXV (PAG-XXVI)- January 13-17, 2018 , San Diego , CA, USA, <http://www.intlpag.org/>

Workshop co-organizers:

Dr. Xiyin Wang (wang.xiyin@gmail.com)

Dr. Xiu-Qing Li (Xiu-Qing.Li@agr.gc.ca).

This workshop is a forum for scientists working to understand how genomes and chromosomes function and evolve.

Call for news articles for the next issue of CAPB Newsletter

The following are some of the example areas:

- ◆ Job ads
- ◆ Conference briefings
- ◆ Scientific discovery and plant biotechnology advances
- ◆ Research commentary
- ◆ New books and new software packages
- ◆ Awards and important nominations
- ◆ Research team/lab profile

Each news article should be brief, less or up to one page (in Times New Roman, font 11).

Email to: Dr. Xiu-Qing Li (Editor, CAPB Newsletter)
Fredericton Research and Development Centre
Agriculture and Agri-Food Canada
850 Lincoln Road
Fredericton, NB
E3B 4Z7
Tel (506) 460-4511
Xiu-Qing.Li@agr.gc.ca or Xiu-Qing.Li@Canada.Ca

Research Commentary:

How to deal with Fusarium Head Blight?

Dhananjay Dhokane, Tejal Bhawar, and Shailesh Karre

Department of Plant Science, McGill University

Email: dhananjay.dhokane@mail.mcgill.ca

Fusarium head blight (FHB) also known as ‘head scab’ or ‘tombstone disease’ continues to affect small cereal grains like wheat, barley, oat, rye and triticale. It has become of increasing international importance in recent years and 2016 witnessed a severe year for FHB in North America. Though, several species of Fusarium cause the disease, Fusarium graminearum Schwabe [telomorph: Gibberella zeae Schw. (Petch)] is the most predominant causal agent leading to severe yield losses and reduces the quality of grains by contaminating with harmful mycotoxins, such as, deoxynivalenol (DON), nivalenol (NIV), making the grains unsuitable for food or feed. The disease normally occurs in hot and humid weather conditions, during anthesis. The severity of the disease depends upon the inoculum persisting and the weather conditions coinciding with the growing season.

Bearing in mind, the severe yield losses and rejection of the grains contaminated with mycotoxins at local mills and elevators, totalling in huge economic losses; hence, minimizing the incidence of FHB with solid integrated management practices would reduce the producer’s losses and risks to grow small cereal grain crops.

Management strategies for FHB

Although, several management practices are implemented to reduce the incidence of the disease, no single management practice is found to minimize the profound incidence of FHB significantly. Therefore, the producers need to integrate various management measures right from land preparation until harvesting to reduce the yield losses and the accumulation of mycotoxins in the grains.

(1) Cultural practices

When a producer makes a decision to go with sowing of small cereal grain crops such as, wheat, barley, oat etc., they should first follow proper cultural practices like, disposal of all the stubbles and residues of the previous crop infested with Fusarium inoculum and proper ploughing/tilling of the field that would help in reducing the inoculum and thus, reduce the incidence of FHB.

(2) Crop rotation patterns

Crop rotation with non-host cereals crops or legumes, helps in reducing the inoculum persisting in the fields. Cereal crops

should not be cultivated for at least two years in the same field. Maize which is also infected by Fusarium spp. should be avoided in crop rotations. Appropriate planning of crop rotations will provide enough time for Fusarium infested residue to decompose before the next cereal crop is seeded which will help producer’s to minimize the losses.

(3) Variety selection

Even though, no wheat variety is found highly resistant to FHB, selection of moderately resistant varieties for cultivation will help in reducing the incidence of FHB and minimize the risk of losses. Resistant cultivars like, Sumai-3, Wangshuibai, Frontana etc. and their descendants possessing higher levels of resistance to FHB should be selected for cultivation.

(4) Seed treatment

Treating of Fusarium infected seeds with fungicides before sowing will help in improving the seed germination and emergence rates and hence, will help in minimizing the losses occurring because of Fusarium seedling blight. It’s very appropriate and recommended to always treat seeds before sowing to reduce the risk of losses.

(5) Biological control

Use of biocontrol agents, along with treating of crop residues with antagonists, helps in reducing the Fusarium inoculum and hold considerable promise. Trichoderma isolates, T. gamsii 6085 and 6317 and T. velutinum 4837, are known to inhibit both fungal growth and DON production, among which with T gamsii 6085 is more promising. Gliocladium catenulatum, Pythium oligandrum, Clonostachys rosea, Streptomyces spp., and Trichoderma spp. could also be used to reduce the incidence of FHB.

(6) Fungicide applications

Application of fungicides at appropriate growth stages depending on the crop i.e. once after spike emergence and later when the anthers protrude out will reduce the risk of the disease. The timings of application of fungicides are very crucial for managing FHB. Fungicides such as, Caramba, Proline and Prosaro, and triazoles like, Metaconazole, Tebuconazole are recommended for management of FHB.

Research team profile:

Doubled haploidy research at NRC-Saskatoon

Lead: Alison Ferrie

The production of doubled haploid (DH) plants from microspores is an important technique used in plant breeding and basic research. DH technology is a rapid method for developing homozygous lines, which can be used to accelerate crop improvement programs. Commercial varieties developed through DH protocols have been reported for many crops. Haploidy technology can also be used in mutagenesis, transformation, and basic research such as genomic, biochemical, and physiological studies. There is no universal protocol that will result in the production of doubled haploids in all species, as differences occur among species and among genotypes within a species in terms of embryogenic response. Microspore embryogenesis can be influenced by genotype, donor plant growth conditions, stage of microspore development, composition of the culture medium, and environmental conditions during culture. The frequency with which microspore-derived embryos are produced will depend on whether or not these factors are favourable.

The NRC in Saskatoon has a long history of plant cell and tissue culture research. Our lab has been working in the area of doubled haploidy for over 25 years and has experience in developing protocols in a number of species including Brassica, other crucifers (Camelina, oilseed/vegetable radish), Apiaceae, Compositae, cereals, and nutraceutical species. Our Cell Technologies team also has experience in utilizing these doubled haploidy protocols in mutagenesis, transformation, and basic research. We have collaborated with plant breeders from Universities, industry, and other government organizations. One current project is on developing doubled haploidy protocols for spring and winter wheat. Improvements in embryogenic frequency and green plant production have been observed and these protocols have been validated using germplasm currently in breeding programs. Our goal is to assist plant breeders by accelerating the development of new varieties that can benefit the producer and ultimately all of us, the consumer.

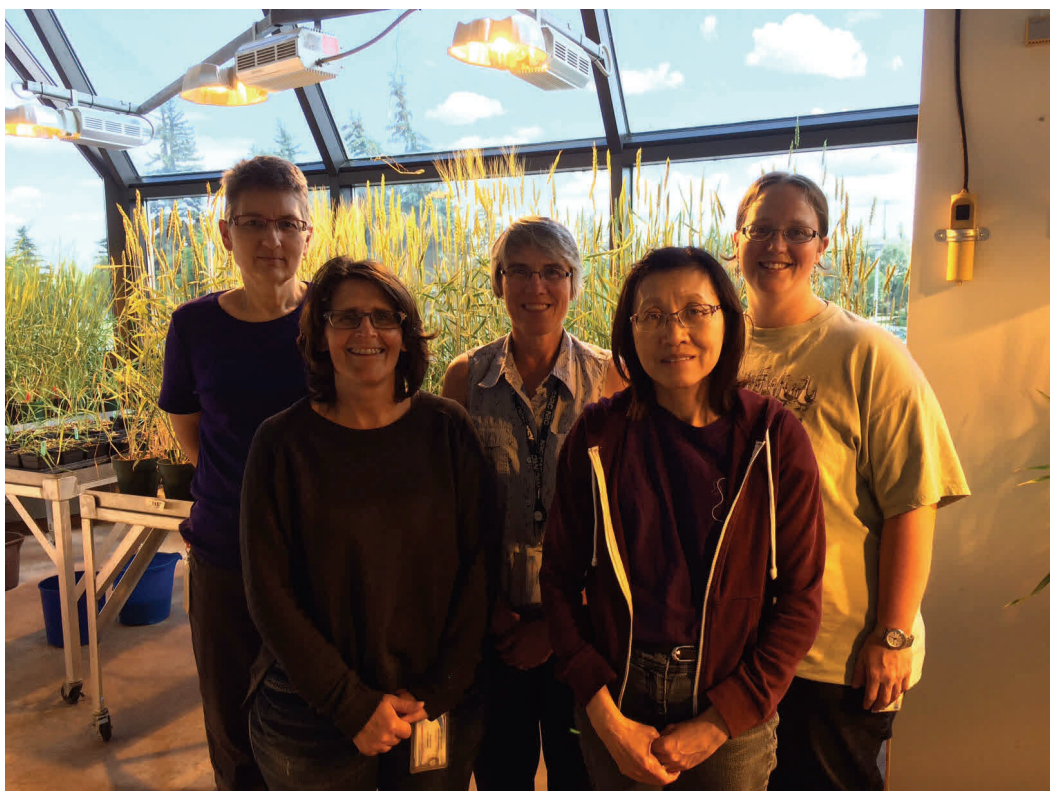


Photo
The wheat doubled haploidy group at NRC-Saskatoon
(L to R):

Jean Enns, Kim Nelson,
Alison Ferrie, Hung-Mei
Wang, and Jen Brost

Research team profile:

Dr. Kushalappa's Lab

(Engineering for Plant Biotic Stress Resistance)

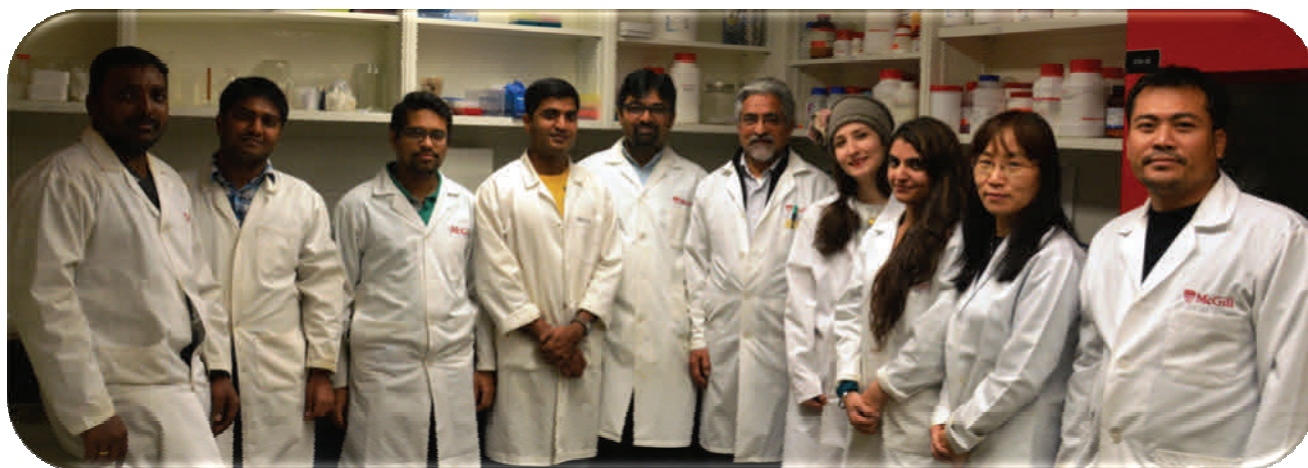
Department of Plant Science, McGill University, Montreal

Dr. Ajjamada C. Kushalappa is an associate professor in the Department of Plant Science, McGill University, Ste-Anne-de-Bellevue, Quebec. He obtained his Ph.D. from the University of Florida (USA), M.Sc (Plant Pathology) and B.Sc (Agriculture) from University of Agricultural Sciences (Bengaluru, India). He was awarded with Dr. and Mrs. DL Bailey Award, for an exceptional and distinguished contribution to plant pathology in 1990.

Lab research focus:

He and his group extensively work on identification of resistance genes and plausible mechanisms of resistance against Fusarium head blight in wheat and barley and against late blight in potato. The research group employ art of omics technologies to identify the candidate genes and further elucidate the resistance functions based on virus induced gene silencing and CRISPR-Cas.

Mainly based on experimental findings in his lab, they report that resistance in plants against biotic stress is due to hierarchies of genes. The pathogen produced elicitors are recognized by the plant membrane bound receptors, which trigger the downstream regulatory genes such as, MAP kinases and transcription factors that further regulate downstream R genes to biosynthesize resistance related proteins and metabolites. Any missing link i.e. non-functional allele in the hierarchy leads to susceptibility in plants. The resistance related metabolites, antimicrobial and cell wall reinforcing, which either prevent pathogen entry into the plant or reduce further spread of infection. Identification of such non-functional alleles in the hierarchy and replacement of them using CRISPR-Cas would enhance resistance against biotic stress, increasing yield and decreasing crop production cost and environmental impacts.



Lab photo: From right to left Dr. Shailesh Karre, Niranjan Hegde, Sripad Joshi, Shivappa Hukkeri, Dhananjay Dhokane, Dr. Ajjamada C. Kushalappa, Fatemeh Kalantari, Nancy Soni, Dr. Huali Xue, Russiachand Heikham.