ISPP INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY

PROMOTING WORLD-WIDE PLANT HEALTH AND FOOD SECURITY

INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY

ISPP NEWSLETTER

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Editor: Daniel Hüberli (**email**)

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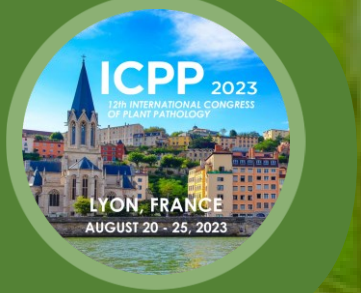


IN THIS ISSUE:

VALE, RICHARD N. STRANGE (1938-2023) - CO-FOUNDER AND FIRST EDITOR-IN-CHIEF OF FOOD SECURITY

With heartfelt regret we advise the death of Dr Richard N Strange on 19 January 2023. Richard was the co-founder and inaugural Editor-in-Chief (2008-2018) of the ISPP journal published by Springer, *Food Security: The Science, Sociology and Economics of Food Production and Access to Food*. An Obituary will be published in Food Security in the coming months.

Richard became a plant pathologist because he was attracted by its relevance to food security. During his career, he published numerous papers and wrote two books. He taught and researched for 34 years at University College London (UCL), where he held an Honorary Chair. He was elected a Fellow of the International Society for Plant Pathology at ICPP2013 in Beijing.

Richard will be remembered for his dedication to collaborative research in Africa and the Middle East, and for his mentorship of postgraduate students from across the world. They are his legacy, along with the journal.

In his spare time, Richard played the cello and he performed regularly with the UCL Chamber Music Club. We send condolences to his spouse, Lilian, a professional pianist, and their children and grandchildren.

Greg Johnson, Peter Scott, Jan Leach, and Serge Savary.

CALL FOR NOMINATIONS FOR ISPP FELLOWS 2023

JAN LEACH, ISPP PRESIDENT

At the 2023 International Congress of Plant Pathology (ICPP) in Lyon, France, the International Society for Plant Pathology (ISPP) intends to recognise the outstanding contributions of individuals to plant pathology, the aims of the ISPP, or both as Fellows of the ISPP. A call for nominations is now open. Nominations will close on 15th May 2023. Nominations should be sent with name and contact details of the nominee and the nominator. The nominator should state the rationale for the nomination by outlining in 500-700 words (Helvetica 9 point single-spaced text) how the individual nominated has made an outstanding contribution to plant pathology, the aims of ISPP, or both. A more detailed CV may also be sent with the nomination. Individuals cannot nominate themselves.

Nominations (and enquiries) should be sent to the ISPP President, Dr Jan Leach (Jan.Leach@colostate.edu) with the subject heading "ISPP Fellow Nomination". Nominations and deliberations of the Fellow's Selection panel will remain confidential.

ISPP Fellows elected by Council:

- 1988 in Kyoto:- Arthur Kelman dec.; RKS Wood dec.
- 1998 in Edinburgh:- Johannes Dekker dec.; Chiu Wei Fan dec.
- 2008 in Torino:- Chuji Hiruki dec.; Wenhua Tang; Peter Scott; Brian Deverall dec.; James Cook; Charles Delp.
- 2013 in Beijing:- Richard Falloon; Richard Strange dec.; Yaacov Katan.
- 2018 in Boston:- Gloria Abad, Thomas Evans, M. Lodovica Gullino, Michel Heath, You Liang Peng, Dov Prusky, Mauritz Ramstedt, Paul Teng, Shinji Tsuyumu, Peter Williamson.

A FEELING FOR THE ORGANISM: PERSPECTIVES ON A CAREER IN PLANT PATHOLOGY

PLANTOPIA, EPISODE 33, 26 JANUARY 2023

In this episode of Plantopia, Dr. Jan Leach, the Associate Dean for Research in the College of Agriculture and a University Distinguished Professor at Colorado State University, joins host Jim Bradeen for an engaging conversation about careers in plant pathology. The two chat about the importance of mentorship, working internationally, research, and how to get involved in various societies within the plant pathology field.

You can listen to the full interview here.

INTERNATIONAL CONGRESS OF PLANT PATHOLOGY ICPP2023

MATHIAS CHOQUER AND NATHALIE POUSSEREAU, CO-CHAIRS OF ICPP2023

We remind you that the registration to the ICPP2023 and its satellite events is open (https://icpp2023.europa-inviteo.com/registrations/). Abstract submission is open and will close on 15 February (https://icpp2023.europa-inviteo.com/callfor/). Hotels are available (https://www.icpp2023.org/practical-information/accommodation). Please check our website https://www.icpp2023.org/.

ICPP2023 BURSARIES

The ICPP Bursary Congress Fund will provide some financial support facilitating the participation in-person of postgraduate students and plant pathologists from nations in war or conflicts and developing or emerging countries. Bursaries will be allocated at the discretion of the ICPP2023 Bursary Task Force and may be for only part of the expected costs:

- Congress Registration Fee,
- Accommodation in a hotel specified by the organisers that will be confirmed at the same time as the bursary award,
- and for those selected for oral presentation, a portion of travel costs (e.g., economy airfare).

Each applicant must submit by e-mail to bursary.ICPP2023@univ-lyon1.fr **one single** PDF (the file name must be your "last name_first name") file including:

- a curriculum vitae (one page),
- a letter of motivation (one page), and
- the abstract(s) submitted for poster and/or oral communication indicating the concurrent session.

Bursary application deadline is 15 February 2023.

Contact: bursary.ICPP2023@univ-lyon1.fr

GPHA EVENTS AT ICPP2023 LYON

LAETITIA WILLOCQUET, ON BEHALF OF THE GPHA SECRETARIAT

Colleagues interested in the Global Plant Health Assessment (GPHA) will have the opportunity to learn more about this initiative during the upcoming ICPP2023 at Lyon in August where results, outcomes, and next steps will be presented and discussed via three outlets:

1 – A Workshop on Sunday 20 August (whole day).

The goal of the Workshop is to brainstorm on future steps to be taken a GPHA (writing, new or expanding activities, etc). Even if they were not involved in the GPHA, but would be interested to be in the future, colleagues are welcome to join the Workshop. This GPHA Satellite Event is included in the list of optional additional fees on the online registration platform of ICPP2023.

This Workshop will be chaired by Prof. Paul Esker (PennState U., USA).

2 – A Keynote Session will take place on Tuesday 22 August from 4.30 pm to 6 pm (session K4).

The session will include three talks:

Talk 1: State and evolution of plant health globally across Plant Systems and Ecoregions

Talk 2: Impacts of plant health on services rendered by Plant Systems in Ecoregions

Talk 3: Synthesis and implications of the findings from the GPHA

This Keynote Session will be chaired by Prof. Neil McRoberts (UC Davis, USA), and Dr. Pascal Frey (INRAE, France).

3 – A Round-Table Session will take place just after the Keynote Session, in the same room on Tuesday 22 August from 6 pm to 7.30 pm.

The Round-Table Session will allow engaging discussion with the audience on the multi-dimensional nature of findings and implications from the GPHA.

The Round-Table Session will be chaired by Prof. Bruce McDonald (ETH Zürich, Switzerland) and Prof. Andy Nelson (Twente U., the Netherlands).

TENTH UPDATE ON ISPP RESILIENCE BURSARY FOR PLANT PATHOLOGISTS

OLGA KUKINA, MAŁGORZATA JĘDRYCZKA, MAŁGORZATA MAŃKA AND GREG JOHNSON

As this update is being prepared, it is 11 months since the invasion of Ukraine by Russia on 24 February 2022, and as the first anniversary of this terrible event approaches, we hope that peace comes soon. On that day in 2022, an email exchange began between international colleagues and a scientist from Russia who said:

"I and my colleagues and friends, including those from Ukraine, have the feeling that we are seeing a terrible dream, and not all this catastrophe is happening in the reality. How did we manage to bring the country to a situation where it is impossible to go out into the street with the inscription "Peace to the world"?! I have a clear goal to live to see the change of the bandit regime in this country. But the optimism that was 40 years ago that this territory will someday be a civilised society is now drying up. What a terrible shame! Peace to the world! I am so sorry..." (24 Feb 2022)

This is how the ISPP responded: By 1 March 2022, discussions between the ISPP and the Polish Phytopathological Society about how to help had commenced. On 2 March, The ISPP posted a statement on social media and the Newsletter to condemn the invasion, and the first Ukraine candidates for potential support by ISPP were identified by 9 March 2022. ISPP Executive agreement for what has become the ISPP Resilience Bursary for Plant Pathologists was obtained, and initial funding identified by 11 March 2022. By 24 March 2022, we were also in contact with a plant pathologist still working in Kyiv and through him we have initiated contact for the future establishment of a Ukrainian Phytopathology Society and later, we reached agreement with the organisers of ICPP2023 for a special session in Lyon on "Impact of war and conflicts in plant pathology research and food safety of countries."

To date, seven ISPP associated societies and several individuals have contributed to the bursary fund and most recently one of us ran a bursary fundraiser in lieu of having a 70th birthday party. The birthday appeal for the Resilience Bursary suggested donating the cost of a cup of coffee (or more) and to date $630 has been raised, enough to support a scientist for more than two weeks.

As of 31 December 2022, ISPP Resilience Bursaries have supported nine Ukrainian scientists working in Polish laboratories for various times with some moving on to other funding sources or roles.

In discussions since the bursary fund was initiated, several people have commented that there are many other situations globally where potentially at least, plant pathologists need support. How long the need by Ukraine scientists will go on, we don't know, but in the future it is hoped the fund can be available for plant pathologists in need from other parts of the world as well. Perhaps as you read this you or your society may also wish to contribute to the fund (or organise a fundraiser) since the need remains urgent, while our funds are dwindling (donate here). Enquiries can be directed to resilience@isppweb.org.

This month we hear from forestry researcher, Dr Olga Kukina.

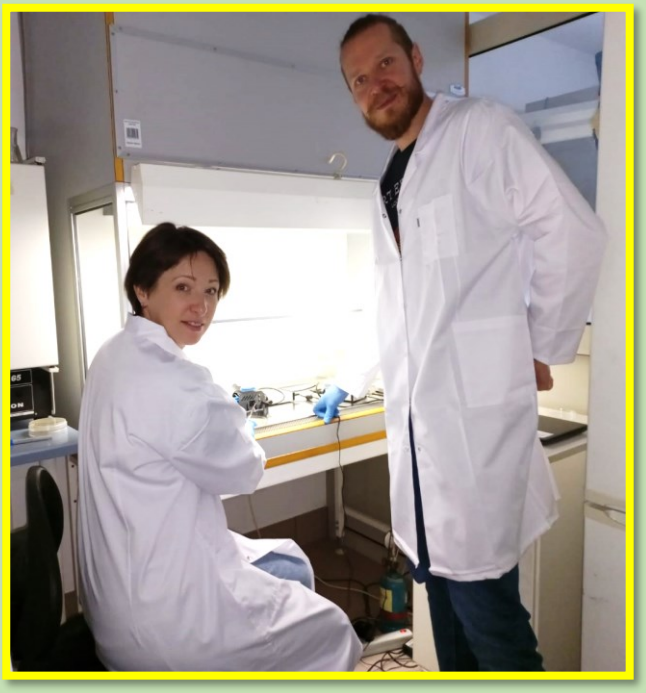
OLGA KUKINA

I have been working at the Ukrainian Research Institute of Forestry and Forest Melioration according to G. M. Vysotsky (Kharkiv, Ukraine) for almost twenty years. During this time, I have worked my way up from being a simple engineer, to a senior scientific officer in the Laboratory of Forest Protection (now the Department of Entomology, Phytopathology and Physiology). I have a Ph.D. in agricultural science, entomology, and I have devoted most of my scientific time to forest entomology.

I participated in studies of forest diseases and tree pathogens and was involved in a Ukrainian-Swedish project on transmission of forest pine pathogens by stem insects.

After the Russians invaded Ukraine, my life seemed to be destroyed, there was no future, let alone scientific activity. But thanks to my Polish colleagues, I have the opportunity to be safe with my 5-year-old daughter. I received a scholarship from the International Society of Plant Pathology (ISPP) and the Polish Phytopathological Society (PTFit), and now I've had the opportunity to work under the supervision of Prof. Dr. Tomasz Oszako in the Department of Forest Protection in the Forest Research Institute (IBL), Warsaw.

A group of scientists led by Prof. Oszako has several research areas in which I am directly involved. Research at the institute includes the use of an electronic nose to detect pathogenic fungi (*Fusarium oxysporum*, *Rhizoctonia solani*, *Cylindrocarpon destructans*), oomycetes (*Phytophthora plurivora*, *Pythium intermedium*), and insect pests (*Dendrolimus pini*). I am concerned with the detection of the pathogen *Ciboria batschiana* in acorns of *Quercus robur* stored in barrels. Prototypes of e-noses are provided by the Warsaw University of Technology, which collaborates with IBL. The research will lead to joint publications in high-impact international journals.



Collaborators of Prof. Oszako: Dr. Olga Kukina and Dr. Miłosz Tkaczyk in the IBL laboratory preparing for electronic nose measurements.

I am glad to have the opportunity to learn Polish in a scientific environment that also provides me with additional opportunities to learn about new techniques and equipment. I have gained experience here that will allow me to introduce new methods for research in forest pathology in Ukraine.

When the war is finally over with the victory of Ukraine, the gained experience, new knowledge, colleagues, and new friends will remain with me. I would like to express my special thanks to my Polish colleagues from the Forest Protection Department, who provided me and my daughter with all-round care and support. A heartfelt thank you and a deep bow to the Polish people who support the Ukrainians.

PLANT PATHOLOGY IN THE SOCIAL MEDIA AGE

GREG JOHNSON AND ANDREA MASINO

Enhancing social media delivery to plant pathologists

Time waster or community of trust? Views differ, but there is no denying the potential of social media to enhance plant disease research progress, record keeping and community engagement. Focussing on social media offered by plant pathology societies and plant pathologists, a session at ICPP2023 - *APP-titude for Social Media in Plant Disease Research* will consider the use and engagement with social media by plant pathologists and considers how to improve social media relevance.

The starting point is a survey of the plant pathology community during 2023 to gauge the ethical use of social media to

(a) improve access to the latest 'hot' findings in plant pathology and food security

(b) improve extension and enhance contact with farmers and supply chain people

(c) provide services and inspiration through plant pathology societies

(d) support mental health and inspire the spirit

(e) enhance the impact and access to journals and newsletters

(f) promote meetings and report social news about plant pathologists

We would like to publicise the survey as widely as possible and encourage a wide range of responses. Please help us by taking part in the survey and by publicising the survey among your Society and colleagues.

The survey will help us gain insights for the plant pathology societies and plant pathologists who use, or are considering use of, social media so they might reach their audiences more effectively.

At ICPP2023 and in our report via the ISPP newsletter, survey findings will be summarised under

(a) topics most important to social media readership
(b) platforms respondents use to access plant pathology related topics and inspiration
(c) scientific societies and other sources of plant pathology information and
(d) the demographic profiles of users and non-users.

Finally, we will hope to identify opportunities for improving social media use to enhance science outreach, career prospects and well-being of plant pathologists.

Participants in the survey will be asked to provide an email address to help avoid duplicate responses or SPAM but this information will remain confidential to ISPP. Here is the link to the survey.Your answer is important! Help us spread and get a large number of responses so that we can achieve meaningful results!

PARTICIPATE IN THE SURVEY!

THE IMPACT OF CLIMATE CHANGE ON PLANT–PATHOGEN INTERACTIONS

SHUNYUAN XIAO, AMERICAN SOCIETY OF PLANT BIOLOGISTS NEWS, AUTUMN 2022

The world faces a grand challenge: climate change, caused by the rapid accumulation of greenhouse gases, especially CO_2, in the atmosphere since the Industrial Revolution. Aside from the increase in the global average temperature, the impact of climate change is readily reflected in extreme weather, such as record-high local summer or winter temperatures and increasingly uneven precipitation causing more frequent and severe droughts and flooding.

Such unusual environmental changes have begun to have a profound impact on many aspects of human society, and especially on agriculture, affecting plants' growth and reproduction, their nutrient content, and their interactions with insects and pathogens. It is estimated that a >60% increase in crop production will be required to feed approximately 10 billion people by 2050 (Tilman et al., 2011). This presents another grand challenge: ensuring food security through sustainable agriculture in the face of climate change. In this article, I share my perspective on the impact of climate change on plant–pathogen interactions and plant diseases in relation to the crop protection essential for sustainable agriculture and food security. I then briefly discuss how the plant science society should respond to the challenges and direct our collective research efforts toward studies of plant–microbe interactions under altered environmental conditions.

A DESTABILISED DISEASE TRIANGLE

Every organism has optimal living conditions but can cope with certain variations in environmental conditions. As plant pathologists, we understand that the outcome of plant–pathogen interactions is determined by the genotypes of the engaged plant hosts and the invading pathogens as well as the environment in which the interactions occur. Plant disease develops only when host immunity is subverted by a virulent pathogen under environmental conditions favorable to pathogenesis. This plant–pathogen–environment relationship is known as the "disease triangle" model (Scholthof, 2007; Stevens, 1960).

Global warming and its associated extreme weather patterns will bring about imbalance in or even disruption of the established disease triangle relationship through its impact on growth and defense of the host and growth and pathogenicity of the pathogen. Such alterations may result in changes in disease severity, frequency, and prevalence, as well as the emergence of new diseases, creating heavier disease burden, higher disease risk, and uncertainty in how best to manage crop disease.

FUTURE PERSPECTIVES

We need future studies in the field of plant pathology to

- assess the disease outcomes of major plant–pathogen interactions using single or multiple changed environmental factors that simulate climate change,
- investigate molecular mechanisms underlying alterations in plants' immunity and pathogens' virulence using different pathosystems under changed environmental conditions,
- evaluate and model future disease outbreaks and infer the structure of sweeping pathogen populations of the future,
- monitor the emergence of new diseases as a consequence of host-range expansion of existing pathogens or revival of ancient pathogens from thawed permafrost, and
- engineer and breed disease-resistant crop cultivars that are more climate resilient.

Read full artile in ASPB News.

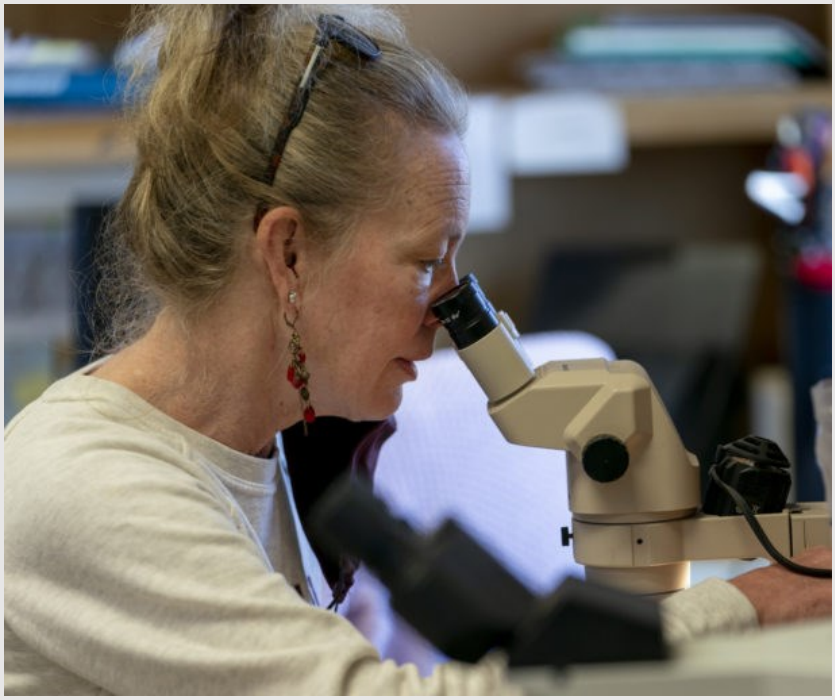
A PASSION FOR PLANT DIAGNOSTICS

BLAIR FANNIN, AGRILIFE TODAY, 27 JANUARY 2023

Plant diagnostics has always intriqued Sheila McBride. Whether it was her critical role in helping diagnose cotton root rot that devastated the Texas wine grape industry or assisting homeowners with drought-ravaged post oaks, McBride's career as a plant diagnostician with the Texas Plant Disease Diagnostic Laboratory of the Texas A&M AgriLife Extension Service has been checkered with helping people solve problems.

Plants and science have always been an intrigue for McBride, who said her initial interests began in sixth grade after working with her first microscope. "I was hooked when my teacher let us look at pond water under the microscope," McBride said.

Her career that spans 35 years with Texas A&M AgriLife culminated with her retirement on 31 January 2023.



Plants and science have always been an intrigue for Sheila McBride, who said her initial interests began in sixth grade after working with her first microscope (Credit: Texas A&M AgriLife photo).

PASSION FOR HELPING OTHERS

McBride said there's a lot of self-satisfaction in helping others solve problems. "My passion is helping homeowners, the green industry, growers and people," McBride said.

Her start in plant diagnostics came after graduating from Texas A&M University in 1985 with a bachelor's of science degree in microbiology.

A Houston native, McBride said the small-town allure of College Station drew her into establishing her roots and career. She began working on the Texas A&M campus in the nematology laboratory with Jim Starr, Ph.D., now professor emeritus, and later worked in fungal genetics under Dan Ebbole, Ph.D.

Those laboratory experiences prepped her for a safety coordinator role and building proctor duties before transitioning in 2007 into the newly opened position at the Texas Plant Disease Diagnostic Laboratory in College Station, TPDDL-CS. "I wish I had found Extension sooner," she said. "In addition to helping people, I also have thoroughly enjoyed mentoring undergraduate students. I don't think I would have gotten to this point in my career without my prior experiences."

"Sheila is a valuable member of the Department of Plant Pathology and Microbiology," said Kevin Ong, Ph.D., laboratory director. "In her role as the head diagnostician at the TPDDL-CS, she has touched the lives of many undergraduate students who at some point worked at the clinic. Several of these have gone on to pursue further studies, quite a few pursuing master's degrees or doctoral degrees in the plant pathology area."

COTTON ROOT ROT, WINE GRAPES

In 2012, growers were peppering the diagnostic laboratory with phone calls and emails, desperately seeking answers as to why their grapevines were dying. McBride and fellow plant pathologist David Appel, Ph.D., who retired from AgriLife Extension last year, worked tirelessly to find a solution to control the devastating cotton root rot pathogen that was attacking the vines. The effort would later be her graduate project as part of her master's degree in plant pathology which she received in 2016.

Her role as a diagnostician is one that takes both laboratory experience and a keen sense. "It's an art and science," she said. "It takes a lot to know what to look for and how to look for it."

PROFESSIONAL AFFILIATIONS AND FUTURE PLANS

McBride has served on the National Plant Diagnostic Network and the American Phytopathological Society, chairing and co-chairing the Extension committees.

She was also trained as a System for Timely, Accurate and Reliable Diagnostics accreditation auditor during the early implementation phase of the National Plant Diagnostic Network accreditation program.

Her retirement plans include breaking in a new camper she recently purchased, plus looking forward to spending time with her grandson and family.

"I also like to garden and would like to become a Master Gardener," she said.

MSc in Global Plant Health

STEPHEN BORNEMANN, 19 JANUARY 2023

Applications are now open for The Sainsbury Laboratory one-year taught MSc in Global Plant Health for September 2023 entry. Apply now tsl.ac.uk/msc.

This MSc focusses on integrated solutions to emerging plant pathogens. These are rooted in the science of molecular plant-microbe interactions, plant immunity, microbial pathogenesis and data science, together with leadership and management skills.

This MSc employs innovative teaching methods that encourage active and independent learning, rather than resting on solely traditional lectures. Learning is deepened with a five-month research project.

The MSc students are taught by TSL's world-leading Group Leaders, other members of TSL and international guest speakers involved in global plant health. MSc students have their own study space in our building and are integrated in the diverse TSL research community.

By completing this MSc, the students will ultimately be equipped with the skills and attributes for a career in research, agrobiotechnology, or policy making in diverse national and international organisations involved in managing and responding to plant disease.

Students will register for their degree at the University of East Anglia (UEA) through the School of Biological Sciences.

Students unable to cover the full cost of their studies who come from a lower-income country will be considered for one of our prestigious David Sainsbury International Full MSc Scholarships in Global Plant Health on a competitive basis. This covers full tuition fees and living/travel expenses. Applicants who come from all other countries will be considered for one of our David Sainsbury International 10% Fee Scholarships in Global Plant Health, which covers 10% of the tuition fees.

Enquiries msc@tsl.ac.uk

PLANT PROTECTION OF THE FUTURE MAY COME FROM THE PLANTS THEMSELVES

CAMILLA BRODAM GALACHO, AARHUS UNIVERSITY, DEPARTMENT OF AGROECOLOGY NEWS, 16 NOVEMBER 2022

At Aarhus University in Flakkebjerg, Denmark, researchers are studying plants, plant health and plant diseases. The ability of plants to fight plant pathogens, such as bacteria and fungi, is to a large extent determined by plant genes that regulate plant defence capabilities. In a new study, researchers from AU Flakkebjerg have studied how plants with different resistance traits interact with their microbes to respond to pathogen attack.

"We have investigated what happens in plants when they are attacked by a pathogen. What changes occur in the plant itself as well as its associated microbial communities (i.e., microbiome) during a pathogen attack? What makes some plants resistant while others are not? To answer these questions, we explored the interaction between plant chemical compounds and the plethora of microbial communities associated with the plant. This is not really a new research area, but by applying new and modern technologies in this study, we have been able to get a much more detailed insight into what is actually going on, in terms of interactions between plant chemicals and microbes," says Assistant Professor Enoch Narh Kudjordjie, one of the lead researchers from the Department of Agroecology at Aarhus University.

PLANTS HAVE THEIR OWN INTEGRATED DEFENCE SYSTEM

Like humans, plants have their own immune system, which plays a huge role in disease prevention. Plant defence is tightly regulated by plant secondary metabolites, hormones, and beneficial microbes in and around the plant. This defence system and its activation is complex, and we are yet to understand in detail how these components come together to help the plant protect itself from attack. However, there is light at the end of the tunnel as scientists are making strides in studying these defence components by analysing different plant genotypes, using new techniques such as next generation sequencing and analytical chemistry platforms.

"We have been working with a model plant known as *Arabidopsis thaliana*. *Arabidopsis* genotypes have different levels of resistance to *Fusarium oxysporum*, a fungal pathogen that attacks several plant species. In the present work we used two Arabidopsis genotypes; one that is resistant and another that is susceptible to *F. oxysporum*. These contrasting genotypes were chosen to enable us to gain a comprehensive insight into the metabolic and microbial changes which underline resistance and susceptibilities of plants during pathogen attack," explains Enoch Narh Kudjordjie.

DISEASE INFECTION

To begin with, the researchers infected two-week-old *Arabidopsis* genotypes growing in field soil in a greenhouse with *F. oxysporum*. To examine the changes during the period of infection, they collected root and shoot samples at 5 day intervals, starting from 5 and lasting until 25 days after infection. They confirmed the infections by qPCR and by monitoring disease symptoms.

"This way we were absolutely sure that the plants were actually infected. The qPCR test showed a clear difference between the two genotypes, with the resistant genotype having a much lower level of the pathogen than the susceptible one.

PLANT CHEMISTRY AND MICROBIOME ARE UNIQUE

"We then continued to explore the differences that may exist in the chemistry and microbiomes in the two genotypes., and we found large differences. As expected, the plant metabolites and hormones studied were distinct in both the healthy and diseased plants, confirming the involvement of certain plant chemical molecules in mediating plant defence. Likewise, we found that microbial composition, as well as microbial community networks, were distinct in healthy and diseased resistant and susceptible plants. Moreover, beneficial bacteria such as the genera Pseudomonas and Rhizobium were mostly enriched in the rhizosphere of infected plants, suggesting an active recruitment of microbes to resist pathogen invasion," explains Enoch Narh Kudjordjie.

PLANT GENES, CHEMISTRY AND MICROBIAL COMMUNITIES ARE KEY PLAYERS

"From a more comprehensive perspective, the present work has deepened our understanding of how plants defend themselves against a fungal pathogen. More importantly, we found a strong and unique association between individual defence metabolites and specific microbes in the healthy and diseased plants of the different genotypes. Further analysis of the genes responsible for plant defence against the pathogen revealed several mutations in various chemical and hormonal pathways in the susceptible plant compared with the resistant plant. These results strongly confirmed that three underlying host components (genes, metabolites and microbiomes), interactively control the plant defence," says Enoch Narh Kudjordjie.

"Simply put, we found that individual plant genotypes have a unique set of genes that regulate biological activities including metabolic processes mediating the assembly of specific microbiomes during different physiological states of the plant. However, the microbes in the soil also influence what happens in the plant," explains Enoch Narh Kudjordjie.

NATURAL PLANT PROTECTION IN THE FUTURE

Imagine a future where plants are cultivated with optimised yield and other agronomic and economic gains without the use of synthetic chemicals? That will improve human health and also eliminate environmental pollution from agrochemicals. So far, accumulating evidence is pointing to that possibility, and the current findings from the AU researchers are pivotal to future research efforts in developing natural products for plant protection.

"Although these findings are exciting, we need to harness our knowledge and integrate it into future disease control strategies. One approach from the plant side would be to develop plant genotypes with enhanced levels of defensive metabolites to attract certain microorganisms to fight specific pathogens. This implies that plant breeders would have to include the plant chemistry in their toolbox. Another strategy is to develop microbial inoculants including several beneficial microbes that can optimally enhance plant fitness in varying environments. We are quite optimistic of utilising microbiomes as plant protectants as well as a possibility to grow "super" crops that are capable of defending themselves against pathogens in the future," says Enoch Narh Kudjordjie

MODELING PLANT DISEASES UNDER CLIMATE CHANGE: EVOLUTIONARY PERSPECTIVES

A paper by Li-Na Yang *et al.* titled "Modeling plant diseases under climate change: evolutionary perspectives" was published on 31 December 2022 by *Trends in Plant Science* (early view). The abstract is as follows:-

Infectious plant diseases are a major threat to global agricultural productivity, economic development, and ecological integrity. There is widespread concern that these social and natural disasters caused by infectious plant diseases may escalate with climate change and computer modeling offers a unique opportunity to address this concern. Here, we analyze the intrinsic problems associated with current modeling strategies and highlight the need to integrate evolutionary principles into polytrophic, eco-evolutionary frameworks to improve predictions. We particularly discuss how evolutionary shifts in functional trade-offs, relative adaptability between plants and pathogens, ecosystems, and climate preferences induced by climate change may feedback to future plant disease epidemics and how technological advances can facilitate the generation and integration of this relevant knowledge for better modeling predictions.

Read paper.

PLANT IMMUNE MECHANISMS: FROM REDUCTIONISTIC TO HOLISTIC POINTS OF VIEW

A review paper by Jie Zhang *et al.* titled "Plant immune mechanisms: From reductionistic to holistic points of view" was published on 5 October 2020 by *Molecular Plant* (Vol. 13, p. 1358-1378). The abstract is as follows:-

After three decades of the amazing progress made on molecular studies of plant–microbe interactions (MPMI), we have begun to ask ourselves "what are the major questions still remaining?" as if the puzzle has only a few pieces missing. Such an exercise has ultimately led to the realization that we still have many more questions than answers. Therefore, it would be an impossible task for us to project a coherent "big picture" of the MPMI field in a single review. Instead, we provide our opinions on where we would like to go in our research as an invitation to the community to join us in this exploration of new MPMI frontiers.

Read paper.

MODELLING THE COLLECTIVE MOVEMENT OF BACTERIA

SPRINGER, 23 DECEMBER 2022

Biofilms form when microorganisms such as certain types of bacteria adhere to the surface of objects in a moist environment and begin to reproduce resulting in the excretion of a slimy glue-like substance. These biofilms aren't just unpleasant and unappealing however, they can be seriously troublesome. For example, in the medical field, the formation of biofilm can reduce the effectiveness of antibiotic treatments. The key to understanding biomass formation lies in understanding how bacteria behave en masse.

A new paper in *The European Physical Journal E* by researchers from Heinrich-Heine-Universität, Düsseldorf, Germany, presents a mathematical model for the motion of bacteria that includes cell division and death, the basic ingredients of the cell cycle. The team developed a mathematical model of bacterial movement in process creating a link between statistical physics and biophysics.

"Our new model belongs to a class of models for 'active matter' that currently encounter a lot of interest in statistical physics," Davide Breoni says. "This field studies the collective properties of particle systems that have their own energy source—bacteria are an exemplary case."

The model devised by the team delivered a surprise by suggesting that when it comes to movement bacteria can act as a unit. "In the course of our investigation, we found out that the model predicts that the formation of bacterial colonies can occur through the build-up of travelling waves, concentrated 'packages' of bacteria," Breoni adds. "We did not expect this to arise from such a simple model as ours."

He believes that the results should be interesting to the general public who may be aware of bacterial colonies, but not know how they move in a collective way.

Breoni concludes by pointing out this is a very simple model suggesting how the research could proceed from here. "We could try to make the model more realistic and confront the results to experiment to test its predictions," he says. "On the other hand, this research is very much curiosity-driven and results from intense discussions among the researchers—an approach we'd like to maintain so we can continue to surprise ourselves with our findings."

CURRENT VACANCIES

Professor and Chair - Department of Plant Pathology, University of Florida

The Institute of Food and Agricultural Sciences is committed to creating an environment of inclusive excellence that affirms diversity across a variety of dimensions, including ability, class, ethnicity/race, gender identity and expression. Inclusive excellence is the active process of including and respecting everyone as we strive for excellence and equitable outcomes in all we do at the University of Florida. We particularly welcome applicants who can contribute to such an environment through their scholarship, teaching, mentoring, and professional service. We strongly encourage historically underrepresented groups to apply.

For more information, and to apply, please visit: https://explore.jobs.ufl.edu/en-us/job/524899.

For full consideration, candidates should apply and submit materials by 1 February 2023. The position will remain open until a viable applicant pool is determined.

Assistant Professor of Plant Pathology (Potato Pathology) - Washington State University, Position # 128780

The Department of Plant Pathology at Washington State University (WSU) is recruiting a full-time (12 months), tenure-track position in plant pathology at the rank of Assistant Professor. The successful candidate will: 1) develop a nationally and internationally recognized research program leading to enhanced management of diseases of potatoes grown in Washington State and the Pacific Northwest; 2) develop an extension program relevant to Washington potato production; 3) contribute to the teaching mission of the department and the College of Agricultural, Human, and Natural Resource Sciences (CAHNRS); 4) provide service contributions to the department, college, and university; and 5) contribute to WSU's commitment to diversity, equity, and inclusive excellence. More info about the position and further instructions in the PDF.

Submit the application online (https://hrs.wsu.edu/jobs/). Screening begins on 8 March 2023.

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COMING EVENTS

3rd Global Soil Biodiversity Conference
13 March - 15 March, 2023
Dublin, Ireland
Website: gsb2023.org

68th Annual Conference on Soilborne Plant Pathogens and the 53rd Annual Statewide California Nematology Workshop
28 March - 30 March, 2023
California, USA
Website: soilfungus.wsu.edu

13th International Congress on Plant Biotechnology and Agriculture
12 June - 16 June, 2023
Cayo Guillermo, Cuba
Website: bioveg.bioplantas.cu

International Fusarium Laboratory Workshop
18 June - 23 June, 2023
Bari, Italy
Website: fusarium2023.ispacnr.it/

Plant Health 2023 – APS Annual Meeting
12 August - 16 August, 2023
Denver, Colorado, USA
Website:
www.apsnet.org/meetings/annual/Pages/default.aspx

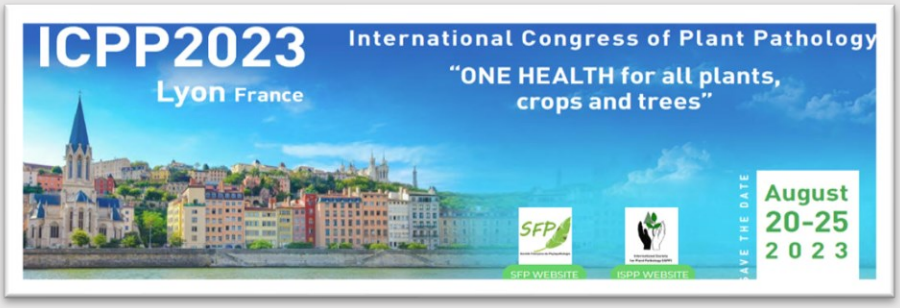
12th International Congress of Plant Pathology (ICPP2023)
20 August - 25 August, 2023
Lyon, France
Website: www.icpp2023.org

Plant Pathology 2023
5 September - 8 September, 2023
Birmingham, UK
Website: www.bspp.org.uk/conferences/plant-pathology-2023/

24th Australasian Plant Pathology Society Conference
20 November - 24 November, 2023
Adelaide, South Australia
Website: eventstudio.eventsair.com/apps2023/

XX International Plant Protection Congress
1 July - 5 July, 2024
Athens, Greece
Website: www.ippcathens2024.gr

9th ISHS International Postharvest Symposium
11 November – 15 November, 2024
Rotorua, New Zealand
Website: scienceevents.co.nz/postharvest2024



12th INTERNATIONAL CONGRESS ON PLANT PATHOLOGY

ICPP 2023

ONE HEALTH for all plants, crops and trees

LYON

20-25 August, France

ISPP INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY

www.icpp2023.org

SFP Société Française de Phytopathologie

The International Society for Plant Pathology & the French Phytopathological Society

INTERNATIONAL SOCIETY FOR PLANT PATHOLOGY (ISPP)

WWW.ISPPWEB.ORG

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