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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IN THIS ISSUE:

ANNOUNCEMENT – JAKOB ERIKSSON PRIZE RECIPIENT FOR 2023

JAN LEACH, ISPP PRESIDENT, ON THE RECOMMENDATION OF THE JAKOB ERIKSSON PRIZE COMMISSION

The Jakob Eriksson Prize for Plant Pathology is the highest international honour for achievement in plant pathology. It was established in 1923 to honor the memory of Jakob Eriksson, a prominent Swedish mycologist and plant pathologist who died in 1931. He was a dedicated internationalist who espoused the cause of international cooperation in plant pathology. The Prize will be awarded during the opening ceremony of the International Congress of Plant Pathology in Lyon, France on 21 August 2023. The Royal Swedish Academy of Sciences administers the Jakob Eriksson Prize Fund which provides for a gold medal award at Congresses of the International Society for Plant Pathology (ISPP).

2023 Jakob Eriksson Prize Recipient, Professor Silvia Restrepo.

On behalf of the Jakob Eriksson Prize Commission, the ISPP takes pleasure in announcing that the 13th Jakob Eriksson Prize for Plant Pathology will be awarded to Professor Silvia Restrepo of the Universidad de los Andes, Bogota, Colombia for her pioneering international work in mycology and plant pathology, with a focus on diseases that impact crops important to the developing world such as cassava and potato.

Restrepo, a native of Colombia, is a Professor and the Vice President for Research and Creation at Universidad de los Andes (Bogota, Colombia). She earned her Ph.D. in Plant Pathology at Pierre and Marie Curie University, Paris, France. Her research interests revolve around mycology, the food industry, and plant diseases, particularly cassava (yuca) and potato. Her early work, initiated during her PhD and continued during her postdoctoral work at the International Center for Tropical Agriculture (CIAT), was with the cassava bacterial blight, caused by *Xanthomonas axonopodis* pv. *manihotis*. She was the first to develop and apply molecular markers for the understanding of the population structure and evolution. She helped breeders create varieties of cassava resistant to the pathogen, significantly reducing losses to Latin American farmers who had been forced to burn their crops year after year due to the disease.

During her postdoctoral work at Cornell University, Restrepo turned her focus to mycology and to the study of diseases caused by the oomycete *Phytophthora*, focusing on their devastating impact on solanaceous crops in Latin America and worldwide. As a result, she is widely recognised for her contributions to our understanding of speciation in fungal and oomycete plant pathogens. One notable, heavily cited contribution is work of Restrepo

and her colleagues that described a new species, *Phytophthora betacei*, associated with tree tomato crops. The thorough description of the species guided the control efforts of this devastating disease.

Restrepo has been involved in large scale collaborative projects such as the Laboratoire Mixte International, funded by the IRD (Institut de Recherche pour le Développement) in collaboration with research groups in Ecuador and Montpellier, France, and the project GROW Colombia project (https://www.growcolombia.org) funded by the Research Councils-United Kingdom (RCUK). In these projects, she demonstrated tremendous talents in coordinating different areas of scientific research (social sciences, economy and natural sciences), organisation of teams and co-creation opportunities, and coordination and management of expertise navigating different disciplinary and cultural contexts.

Restrepo is committed to education and mentoring. At Universidad de los Andes, she designed a minor in bioinformatics and a graduate program in computational biology. She designed a Digital Humanities laboratory where scientific research and creation meet and collaborate. Restrepo has leveraged her creative ideas to build bridges with other universities in Colombia and internationally. Importantly, among her many publications are research papers that address topics in education and training.

In recognition of her excellence, Restrepo has received several prestigious awards, including the Louis Malassis International Scientific Prize for Agriculture and Food (Agropolis Foundation), the Merit Ordre from the French Government, and The World Academy of Sciences (TWAS) Award. She is a member of the Colombian Academy of Sciences. Due to her expertise and knowledge, Professor Restrepo is sought as an advisor, for example, she currently serves as a member of the Strategic Committee of IRD, and a member of the scientific committee of the Agropolis Foundation. She served as Associate Editor for Phytopathology, and as a Section Editor for CABI Agriculture and Bioscience.

FIFTH UPDATE ON ISPP RESILIENCE BURSARY FOR PLANT PATHOLOGISTS

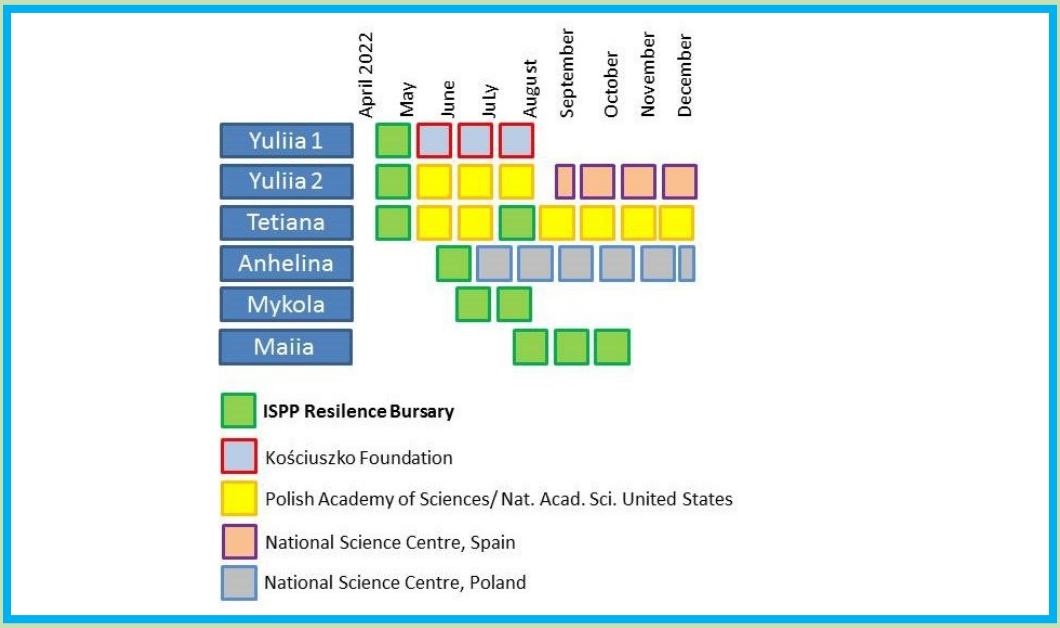
PREPARED BY GREG JOHNSON, YULIIA KOBYRENKO, AND MAŁGORZATA JĘDRYCZKA

During August, we passed a milestone that could never have been imagined a year ago – six months since the invasion of Ukraine by Russia. Thankfully, agreements were reached allowing the shipping of Ukraine commodities, and hopefully will reach the export target of 3 million tonnes in September. Meanwhile, the Resilience Bursary initiative by the ISPP in partnership with the Polish Phytopathological Society and Ukraine colleagues is continuing.

Maintaining efforts in plant pathology in times of conflict is not new. During World War II, crop protection for Australian agriculture remained a critical task as several of the Australian plant pathologists and entomologists were deployed in Europe and Papua New Guinea (PNG), applying their expertise in mosquito control programmes to reduce the transmission of malaria. The then Director of Plant Pathology in Queensland, Dr JH (Jack) Simmonds, a pioneer of research on tropical fruit pathogens, and vegetable disease specialist, Dr JEC (Jack) Aberdeen, who was my boss when I first started work in 1974, were involved in the malaria control programme in PNG. Meanwhile, the then student, later Dr Dorothy E Shaw, Government plant pathologist in PNG 1955 to 1976, worked in the Australian Women's Land Army in Australia during her University vacations.

Today, there are many plant pathologists around the world undertaking vital work in the most vulnerable communities and ecosystems to reduce crop and forest losses. Their efforts, and those of our colleagues in and from Ukraine are an inspiration, and the ISPP Resilience Bursary for Plant Pathologists plays a small part in this greater whole.

The Figure below shows status of funding support and bursary recipients as at 1 September 2022



Funding support for ISPP Resilience Bursary Fellows from Ukraine with one additional Scientist, Maiia, joining the program in August (Image courtesy of Małgorzata Jędryczka).

This month, we welcome a report from Dr Yuliia Kobyrenko on her work on Sclerotinia stem rot of oilseed rape. Her research will be reported at the scientific conference of Polish Phytopathological Society "A modern look at phytopathology" from 7-8 September, 2022 at Poznań, Poland and it can also be accessed online: https://sparrow.up.poznan.pl/ptfit2022/. The conference will also include virtual presentations, An update from the International Society of Plant Pathology from ISPP Immediate Past President, Dr Greg Johnson, and Plant pathology research at the Taras Shevchenko National University of Kyiv Ukraine from Oleksiy (Alex) Shevchenko and colleagues.

Greg Johnson

Dr Yuliia Kobyrenko

The war in Ukraine has changed the life of every Ukrainian. My life has changed too. For the sake of the children's safety, I was forced to leave my relatives and my native home and arrived in Poland. In Ukraine, before the Russian attack, I worked as a lecturer at the Department of Ecology and Biology of the Lviv National Environmental University. I had a PhD in agricultural sciences, and I also had several years of work experience at the Institute of Agriculture of the Carpathian Region of the National Academy of Sciences of Ukraine in the laboratory of fodder production. I was mainly engaged in studying the restoration of degraded grass stands by over-sowing with leguminous and leguminous-cereal grass mixtures.

When I had the opportunity to work with Professor Malgorzata Jędryczka at the Institute of Plant Genetics in the city of Poznań, I was very happy, because it was a new experience for me and a unique opportunity. In Poznań, my family was hospitably received by a British-Polish family, who helped me arrange my very small children (1.8 months and 4 years) in kindergartens so that I could work.

During my internship I had the opportunity to enrich my knowledge of phytopathology by working at the Department of Pathogen Genetics and Plant Resistance in the Institute of Plant Genetics, Polish Academy of Sciences. I participated in research tasks funded by the Ministry of Agriculture and Rural Development PB25 Resistance of oilseed rape plants to diseases caused by fungi and protists 2021/2026.

The purpose of the experiment was to evaluate the phenotypic effects of *Sclerotinia sclerotiorum* on oilseed rape after application of four inoculation methods in field conditions:

1) spraying with homogenised mycelium of *S. sclerotiorum* at a concentration of 1×10^7 fragments in 1 ml and sprinkling leaves with rapeseed petals, 2) spraying with homogenised mycelium of *S. sclerotiorum* at a concentration given above and sprinkling with filter paper discs, 3) inoculation with agar discs overgrown with the mycelium of *S. sclerotiorum*, and 4) inoculation with wheat kernels overgrown with *S. sclerotiorum*. All treatments were done at flowering stage of oilseed rape (BBCH 65).

Dr Yuliia Kobyrenko undertaking experimental work with Sclerotinia sclerotiorum and oilseed rape. Rapeseed plants in full blossom and blue sky resemble the flag of Ukraine!

While working in laboratory led by Professor Malgorzata Jędryczka, I've learned how to prepare microbiological media (agar: PDA, Corn, Pea Flour; liquid: PDB, Czapek-Dox with and without yeast), with and without antibiotics and to work in a sterile flow cabinet. I have also learned how to purify and subculture *Sclerotinia sclerotiorum* and prepare materials for field and glasshouse inoculation: Grow plants in the greenhouse, collect infected material from greenhouse experiments, collect sclerotia, inoculate in the field using five inoculation technique, assess infected plants, and make biometrical measurements of oilseed rape plants.

The research results will be presented at the scientific conference of Polish Phytopathological Society "Modern look at phytopathology" (7-8 September, 2022, Poznań, Poland, online; https://sparrow.up.poznan.pl/ptfit2022/).

I have deepened my theoretical knowledge by taking part in the international (European) conference IOBC / WPRS meeting of the Working Group 'Integrated Control in Oilseed Crops" (ICOC). At the international conference, I had the opportunity to take part in the discussion and talk about the agricultural sector of Ukraine. Despite Russian military actions, Ukraine maintains its leading position in the cultivation of very important crops and the country is a supplier of large volumes of oilseed crops. I also had the opportunity to point out the prospects of Ukraine in the coming years in the agricultural sector on the world.

The war showed me how cruel people can be when they attack the peaceful Ukrainians, and at the same time I realised how rich the world is in good, sincere persons, ready to help the others. I am very grateful to Professor Jędryczka and her laboratory for the opportunity to enrich my professional activity with new experiences. I am grateful to the family who has sheltered us in their home. I am grateful to everyone who helps Ukraine in the fight against the greatest evil and injustice.

Truth and victory are in front of us! Glory to Ukraine!

Yuliia Kobyrenko

For information on the ISPP Resilience Bursaries which are supporting displaced Ukrainian plant pathologists, see the April to August issues of the ISPP Newsletters or go to https://www.isppweb.org/PP_Resilience_Bursary.pdf.

JAN E. LEACH, ISPP IMMEDIATE PAST PRESIDENT 2023-2028

Over the past few years, plant pathologists have confronted unexpected challenges that have impacted our ability to find or provide solutions to plant health problems. Challenges have included a global human health pandemic, national and regional conflict, and weather disasters, as well as the many downstream consequences resulting from these events. Because our discipline is, by necessity, collaborative, these global challenges have been particularly disruptive. But plant pathologists are resilient. Working together, particularly through the alliances fostered by the International Society for Plant Pathology (ISPP), we will build upon opportunities afforded by the challenges to improving plant health.

During my presidency, ISPP Executive has collectively worked to enhance and stabilise the society alliances that are fundamental to ISPP. We have worked to improve our membership connections and outward face (updated website and logo, and promoted our Newsletter and activities). Despite interruptions by the COVID pandemic, we have strengthened our international presence through active participation in planning for meetings associated with the International Year of Plant Health, discussions for a Global Surveillance System for crop diseases, and efforts to integrate with EPPO, NPPO, and other international regulatory agencies.

We have worked with the publisher of Food Security (Springer) and the Editorial Board to strengthen the health of our journal. As Past-President of ISPP, I will support the incoming President as they work to promote ISPP's international alliances, work with members broadly, and advocate for the science of plant pathology. As the current Past-President Greg Johnson has done for me, I hope to provide historical knowledge and relevant guidance that will support the new President and Executive as ISPP moves forward.

MATHEWS PARET, ISPP TREASURER 2023-2028

I joined as the Treasurer of International Society for Plant Pathology (ISPP) in 2018. In this role, one of the first steps taken is to strategise moving ISPP's non-revenue generating funds to a revenue generating investment. This included working with ISPP bank finance advisor to develop 3-year ISPP investment portfolio contract, which has recently matured to create an interest of $14,500 for ISPP. I have routinely engaged with associated societies, established credit card payment option for memberships, manage ISPP Checking, Savings, Investment, and PayPal accounts, U.S tax filing, Audits, Liability insurance, Annual U.S registration, and other financial matters relevant to Food Security Journal revenue, contracts, executive and editorial board meetings etc. Most recently, I have led efforts with the executive board in establishing the framework for the newly established ISPP Resilience Bursary.

I am very thankful for the nomination to the ISPP Treasurer role from 2023-2028. My commitment is to continue strengthening the budget management of ISPP on all aspects noted above and study the process for 100% ownership of the Food Security Journal from Springer, work with Australasian Plant Pathology Society in financial planning of the 2028 International Congress of Plant Pathology in Gold Coast and improve transparency of ISPP finances to all members. An area of interest is to enhance partnerships with associated societies in financial matters, learning from their best practices, findings ways to engage with plant pathology societies of countries/regions which are currently not actively involved with ISPP. I like to continue to be a good listener to everyone and take ISPP to its optimum potential of financial independency and strength in the coming years.

National Centre For Technology in Agriculture (Agritech) led by Matteo Lorito in Italy

M. LODOVICA GULLINO, DIRECTOR, AGROINNOVA

In order to help recovering the European countries, strongly affected by the COVID-19 pandemics, the Next Generation Fund has been designed by the European Commission, in order to help the public and private sectors to become more competitive. In Italy, a relevant part of such funding has been devoted to research and innovation, with the development of five National Centres. One of such Centres is devoted to Technology in Agriculture. Its central administration (Hub) is located in Naples, at the University Federico II, whose Director is our colleague, Matteo Lorito. Resilience, low impact, circular economy, recovery, and traceability are the key words of the Centre, which involves a central Hub and 9 spokes, well distributed in the country, with a good balance between North and South. Twenty-four public and 4 private Universities, 5 Research Centres and 18 Companies work together with the aim to:

- combine the top research expertise required to adequately address in a truly multidisciplinary context the multifaceted problems associated with sustainable agriculture;
- integrate the research infrastructures and equipment available at each site;
- exploit and apply the most suitable Key Enabling Technologies (KET) that can allow a profitable advance in productivity, sustainability, ecological and digital transition in the agricultural sector;
- work with companies and farmers to co-design research efforts and exploit the best results to increase the resilience and economic competitiveness of agri-food supply chains; and
- train the next generation of Agritech scientists and managers to generate the necessary human capital and skills required.

The Centre, with a budget of about 354 Millions Euro for three years, also with the implementation of living labs, will perform research, exploit new technologies, and support experimental trials for companies.

An important part of the activities will be training new generations of agronomists able to carry on research in the private and public sector, work in the extension service as well as active in developing start-ups. Special attention will be devoted to hiring young female scientists, in order to reduce the still existing gender gap.

Matteo Lorito, a very well known and recognised plant pathologist, is the President of the newly developed Centre. To Matteo, the best wishes of the International plant pathology community.

VI INTERNATIONAL SYMPOSIUM ON POSTHARVEST PATHOLOGY, LIMASSOL, CYPRUS, 29 MAY– 2 JUNE 2022

SAMIR DROBY, CHAIR POSTHARVEST PATHOLOGY SMC, ISPP

The symposium was held under the aegis of the ISPP SMC postharvest pathology, ISPP and the Quality of Postharvest Horticulture Commission, ISHS. The symposium brought together 140 postharvest pathology researchers from 30 countries across the globe. In particular, it was encouraging to see many new young scientists and students participating along with the experienced colleagues and exchanging knowledge of postharvest pathology, developing new collaborations, and working towards postharvest innovations.

The theme of the VI international symposium on postharvest pathology was "Innovation and advanced technologies for managing postharvest pathogens" organised by the convener, Nikolaos Tzortzakis of the Cyprus University of Technology. The Scientific program of the symposium during the four days included invited lectures, contributed oral presentations, round table discussion sessions and poster sessions. The sessions were: 1) Management of postharvest – Industry perspective; 2) Detection and monitoring of postharvest pathogens and their toxic metabolites; 3) Interactions of postharvest pathogens with the host and its microbiome; 4) Innovative and sustainable technologies to manage postharvest pathogens; 5) Alternative control strategies – non-residual treatments; 6) Advances in applied research along the supply chain to reduce postharvest losses. Two round table discussions were held. The first was on "Industry perspective and consumer demands – quality vs. safety" moderated by Geoffroy de Chabot (Janssen, PMP), and the second was on "Research directions in postharvest pathology" moderated by Samir Droby (ARO, the Volcani Center).

From lift to right: Haissam Jijakli (Convener V Symposium), NiKolaos Tzortzakis (Covener VI Symposium), Antonio Ippolito (Convener III Symposium), Samir Droby (Covener the I symposium, Chair Postharvest Pathology SMC, ISPP), Lise Korsten (Convener IV symposium).

A joint business meeting of the ISPP SMC on postharvest pathology and the ISHS Postharvest Biocontrol working group was held in the last day to discuss future activities and select the location and the host of the 2024 symposium. Kerry Everett (Bioprotection, The New Zealand Institute for Plant and Food Research) will be the convener of the next Postharvest Pathology Symposium, which will be held in conjunction with the International Postharvest Congress in November 2024 in Rotoroa, New Zealand.

Group Picture of the participants.

On the third day of the symposium, the delegates participated in a field tour where they visited archeological sites outside of Limassol, beautiful ancient villages in the mountains and a family owned firm for production of essential oils.

ACTIVITIES OF ISPP SEED PATHOLOGY COMMITTEE

GIANFRANCO ROMANAZZI, CHAIR OF ISPP SUBJECT MATTER COMMITTEE ON SEED PATHOLOGY

The ISPP Seed Pathology Committee organised on 29 April 2022 the webinar titled "Highlights on Seedborne pathogens", with registered participants from over 50 Countries. After welcome by Gianfranco Romanazzi, ISPP Seed Pathology Committee interim Chair, and Baldissera Giovani, Euphresco Coordinator, two talks were focused on seedborne pathogens. Nicolas Denancé by GEVES and ISTA, and Benedicte Lebas by ISF, covered the updated knowledge on seed pathway of pests, focusing attention on risk management and future challenges. A second talk was delivered by Valerie Grimault and Justine Foucher of GEVES, that updated the audience with the talk "Pest detection and identification in seeds: the importance of method validation and verification of proficiency of laboratories linked to the need of characterized seed lots" on the opportunity to join a starting Euphresco project on infected seed collection. Talks were followed by a good discussion, and video are available on ISPP SeedPathology - YouTube or on the ISPP Seed Pathology Committee Facebook page. The ISPP Seed Pathology Committee is organising two concurrent sessions for ICPP2023 titled "Mind the gap: innovations and opportunities in seed health testing", moderated by Gerbert Hiddink and Valerie Grimault, and "The potential of seed microbiomes", moderated by Lindsey du Toit and Marie-Agnes Jacques. Further webinars will be planned in the next months on treatments for decontamination of infected seeds, that will be advertised on the ISPP Seed Pathology Committee Facebook page.

WHAT'S IN A NAME: WITHER IRISH POTATO FAMINE PATHOGEN?

SOPHIEN KAMOUN, 21 NOVEMBER 2021

The common vernacular names of the organisms we study are important for communicating science to a wider audience. But what if the name we select irritates some people?

Biologists assign to organisms scientific latin names but also like to give them common names, also known as vernacular names. In their wonderful "A Field Guide to the Tiger Beetles of the United States and Canada" — perhaps my favorite natural history guide — the authors David Pearson, C. Barry Knisley and Charles J. Kazilek went though the trouble of giving each of the 107 beetles they describe a common name. Cicindela splendida becomes predictably the splendid tiger beetle, reflecting the awe with which the original scientific name was given to these colorful insects. Still, common names for tiger beetles make sense given that one aim of the field guide was to encourage amateur naturalists to go "beetle watching" in a way analogous to bird watching. Common names help make science and the natural world more accessible to the general public. It makes sense to use them because scientific names are neither easily memorized nor understandable unless you are a Latinist or a taxonomist.

For most of my career, I have worked on the plant pathogen *Phytophthora infestans*. Now, try to remember how to spell that. For many years, I had to rely on the mnemonic of the three Hs, the number of times the letter H is in *Phytophthora*. Lucky me. Others apparently never learned this trick. Years ago, I caught a misspelling of *Phytophthora* in the title of a major grant proposal that my collaborator was about to submit to the National Science Foundation. "Last minute save by Sophie," was his reply. My friend and colleague Sebastian Schornack — Twitter handle @dromius, another gorgeous beetle — went through the trouble of counting how often *Phytophthora* got misspelled in the literature. While the correct *Phytophthora* got 1.8 million hits, Phytophtora had a whopping 130,000, Phytopthora 59,300, Pytophthora 6,640, even the rather weirdly sanitized Pytoptora got a 115 hits.

Read the full article.

MOLECULAR MECHANISMS UNDERLYING MULTI-LEVEL DEFENSE RESPONSES OF HORTICULTURAL CROPS TO FUNGAL PATHOGENS

A review article by Xiaodi Xu *et al.* titled "Molecular mechanisms underlying multi-level defense responses of horticultural crops to fungal pathogens" was published on 14 March 2022 by *Horticulture Research* (vol. 9, uhac066). The abstract is as follows:-

The horticultural industry helps to enrich and improve the human diet while contributing to growth of the agricultural economy. However, fungal diseases of horticultural crops frequently occur during pre- and postharvest periods, reducing yields and crop quality and causing huge economic losses and wasted food. Outcomes of fungal diseases depend on both horticultural plant defense responses and fungal pathogenicity. Plant defense responses are highly sophisticated and are generally divided into preformed and induced defense responses. Preformed defense responses include both physical barriers and phytochemicals, which are the first line of protection. Induced defense responses, which include innate immunity (pattern-triggered immunity and effector-triggered immunity), local defense responses, and systemic defense signaling, are triggered to counterstrike fungal pathogens. Therefore, to develop regulatory strategies for horticultural plant resistance, a comprehensive understanding of defense responses and their underlying mechanisms is critical. Recently, integrated multi-omics analyses, CRISPR-Cas9-based gene editing, high-throughput sequencing, and data mining have greatly contributed to identification and functional determination of novel phytochemicals, regulatory factors, and signaling molecules and their signaling pathways in plant resistance. In this review, research progress on defense responses of horticultural crops to fungal pathogens and novel regulatory strategies to regulate induction of plant resistance are summarized, and then the problems, challenges, and future research directions are examined.

Read paper.

ASCOCHYTA RABIEI: A THREAT TO GLOBAL CHICKPEA PRODUCTION

A review article by Ritu Singh *et al.* titled "*Ascochyta rabiei*: A threat to global chickpea production" was published on 1 July 2022 by *Molecular Plant Pathology* (vol. 23, pages 1241-1261). The abstract is as follows:-

The necrotrophic fungus *Ascochyta rabiei* causes Ascochyta blight (AB) disease in chickpea. *A. rabiei* infects all aerial parts of the plant, which results in severe yield loss. At present, AB disease occurs in most chickpea-growing countries. Globally increased incidences of *A. rabiei* infection and the emergence of new aggressive isolates directed the interest of researchers toward understanding the evolution of pathogenic determinants in this fungus. In this review, we summarize the molecular and genetic studies of the pathogen along with approaches that are helping in combating the disease. Possible areas of future research are also suggested.

Read paper.

HOW PLANTS REPROGRAM THEIR CELLS TO FIGHT INVADERS

ROBIN A. SMITH, DUKE TODAY, 25 AUGUST 2022

Crops and other plants are often under attack from bacteria, viruses, and other pathogens. When a plant senses a microbial invasion, it makes radical changes in the chemical soup of proteins inside its cells. In recent years, Duke University professor Xinnian Dong and her team have been piecing together just how they do it. In a new study published in the journal *Cell*, Dong and first author Jinlong Wang reveal the key components in plant cells that reprogram their protein-making machinery to fight disease.

Each year, around 15% of crop yield is lost to bacterial and fungal diseases, costing the global economy some $220 billion. Plants rely on their immune system to help them fight back, Dong said. Unlike animals, plants don't have specialised immune cells that can travel through the bloodstream to the site of infection; every cell in the plant has to be able to stand and fight to defend itself, quickly shifting into battle mode. When plants come under attack, they shift their priorities from growth to defense, so cells start synthesizing new proteins and suppress production of others. Then "within two to three hours things return to normal," Dong said.

The tens of thousands of proteins made in cells do many jobs: catalysing reactions, serving as chemical messengers, recognising foreign substances, moving materials in and out. To build a specific protein, genetic instructions in the DNA packed inside the cell's nucleus are transcribed into a messenger molecule called mRNA. This strand of mRNA then heads out into the cytoplasm, where a structure called a ribosome "reads" the message and translates it into a protein.

In a 2017 study, Dong and her team found that when a plant is infected, certain mRNA molecules are translated into proteins faster than others. What these mRNA molecules have in common, the researchers discovered, is a region at the front end of the RNA strand with recurring letters in its genetic code, where the nucleotide bases adenine and guanine repeat themselves over and over again.

In the new study, Dong, Wang and colleagues show how this region works with other structures inside the cell to activate "wartime" protein production. They showed that when plants detect a pathogen attack, the molecular signposts that signal the usual starting point for ribosomes to land on and read the mRNA are removed, which keeps the cell from making its typical "peacetime" proteins. Instead, ribosomes bypass the usual starting point for translation, using the region of recurring As and Gs within the RNA molecule for docking and start reading from there instead. "They basically take a shortcut," Dong said.

For plants, fighting infection is a balancing act, Dong said. Allocating more resources to defense means less is available for photosynthesis and other activities in the business of life. Producing too many defense proteins can create collateral damage: plants with an over-active immune system suffer stunted growth. By understanding how plants strike this balance, Dong said, scientists hope to find new ways to engineer disease-resistant crops without compromising yield.

BIOSENSOR THAT DETECTS HIDDEN ROT IN POTATOES

THE HEBREW UNIVERSITY OF JERUSALEM NEWS RELEASE, EUREKALERT, 23 AUGUST 2022

Biosensor System (Photo credit: Hebrew University).

Despite advances in increased food production, half of all world's harvested food is lost due to rot caused by microorganisms. Plants emit various volatile organic compounds into their surrounding environment, which can be monitored for early detection of plant disease and prevent food loss. New research study led by the Hebrew University of Jerusalem (HU) and the Israel's Agricultural Research Organization (Volcani Institute) details the success of a biological sensor for early detection of hidden disease in potato tubers, one of Israel's chief export industries at 700,000 tons a year.

Israeli farmers import European potatoes for planting in Israel. However, a certain percentage of them carry disease within that cause rot and significantly reduce the potato's quality. The Hebrew University-Volcani alliance is about to change that. They've developed a sensor that detects disease and can be used to inhibit the rot from growing and spreading. Their study, published in the upcoming edition of *Talanta*, was conducted by Dr. Dorin Harpaz and her PhD student Boris Veltman at HU's Faculty of Agriculture, Food and Environment, under the supervision of Dr. Evgeni Eltzov of the Volcani Institute. The team collaborated with the Volcani Institute's Dr. Sarit Melamed and Dr. Zipora Tietel, as well as Dr. Leah Tsror from the Gilat Research Center.

The sensor relies on smart bioengineering and optics. When the sensor is exposed to an infected potato, a bacterial compound within lights up—with the strength of the luminescence indicating the concentration and composition of the rot. "The intensity of the light given off by the bacteria panel makes it possible to quickly and quantifiably analyze the characteristics of the disease, which the sensor can 'smell,' before the appearance of visible symptoms," explained Eltzov. "The biosensor we developed will help identify diseased potatoes that do not yet have any external indications, and keep them away from healthy tubers, thus preventing the rot from developing or spreading to other healthy plants," Harpaz added.

To form the bacteria panel, the team created a compound of four genetically-engineered bacteria that measure biological toxicity. In this study, the biological sensor detected disease before there was any visible trace, and caused the optical sensor to shine twice as brightly as did the sensors in non-infected potatoes. Their capabilities were also demonstrated in a previous study that used the sensors to detect toxicity among artificial sweeteners in sport supplements.

According to the researchers, early discovery of disease before the potatoes are exported to foreign markets or replanted, offers a significant advantage to food growers. "The biological sensor can be used to quickly and economically identify hidden rot in potatoes, facilitate better post-harvest management, and reduce food wastage—particularly important given the current global food crisis," concluded Harpaz.

GLOBAL SPREAD OF POWDERY MILDEW THROUGH MIGRATION AND TRADE

UNIVERSITY OF ZURICH NEWS, 3 AUGUST 2022

The worldwide distribution of one of the most important cereal pathogens is the result of human activity. Researchers at the University of Zurich have traced the history and spread of wheat powdery mildew along wheat trade routes and found that mixing of genetic ancestries of related powdery mildew species played a central role in the evolution and adaptation of the pathogen. The work has recently been published in *Nature Communications*.

Wheat is one of the world's most important staple foods – its significance for global food security was recently thrown into focus by the loss of grain exports from Ukraine due to the war. A more common threat to crops are fungal diseases, which can result in economic losses and famine. One of the most destructive pathogens is powdery mildew, a fungus which drastically reduces crop yields.

AGRICULTURAL ARMS RACE

To prevent infestation, huge sums are currently invested in the breeding of mildew-resistant grain varieties. In order to infect the crop plant, the pathogen must be an optimal match for its host – with resistant varieties, the fungus cannot attack. But powdery mildew constantly and rapidly adapts to new hosts. To be able to keep the disease under control in the long term, it is vital that scientists gain a better understanding of the pathogen. This is where historical data is crucial: powdery mildew is as old as wheat itself, but until now, it was not known how it had been able to spread worldwide on different grains.

A MODERN GLOBETROTTER

A research team led by Thomas Wicker and Beat Keller of the University Research Priority Program (URPP) Evolution in Action at the University of Zurich has now managed to uncover the secret of the wheat mildew's success. To do so, they compared the genetic composition of 172 powdery mildew strains from 13 countries on five continents. "With our analyses we were able to prove that the mildew first appeared around 10,000 years ago in the Middle East, which is also the birthplace of agriculture and modern wheat," explains Alexandros Georgios Sotiropoulos, PhD candidate at the Department of Plant and Microbial Biology. "In the Stone and Bronze Ages, agriculture spread to Europe and Asia. The pathogen was also spread to these new regions through human migration and trade. Around 300 years ago, European settlers introduced powdery mildew along with wheat to North and South America."

ADAPTATION THROUGH RAPID EVOLUTION

The data confirmed what had previously been suspected: as wheat was introduced to more and more corners of the Earth, powdery mildew was brought with it and underwent hybridisation along the way, i.e. it genetically mixed with local powdery mildew species and formed hybrids that are better adapted to local agricultural environments. "This appears to be the cause of the rapid evolution of powdery mildew's pathogenicity," explains Kentaro Shimizu, co-director of the URPP. "A particularly clear example of this is seen in the many American wheat varieties brought to Japan over the past 120 years for cross-breeding with traditional East Asian wheat. The powdery mildew from the USA, which was also imported, hybridised with the resident Japanese mildew strains, and the resulting hybrids successfully attacked newly bred wheat varieties."

To study the spread of powdery mildew, researchers used theoretical analyses originally created to study the evolutionary history of mankind. "Our study shows once again that collaboration between academic disciplines and the use of unconventional methods to research complex topics offers great potential and has implications for modern crop breeding," says Kentaro Shimizu.

CURRENT VACANCIES

Cooperative Extension Advisor for vegetable crops at the University of California, Agriculture and Natural Resources

The University of California, Agriculture and Natural Resources (UC ANR), a statewide program with local development and delivery, is seeking a UC Cooperative Extension (UCCE) Advisor for vegetable crops. The Vegetable Crops Advisor will implement an innovative and effective extension education and applied research program to address issues related to sustainability, resiliency, innovation, and profitability of vegetable production in the target counties. This position will be headquartered in the CE Yolo County Office, and the geographic area includes Yolo, Solano and Sacramento counties (known as the Capital Corridor Multi-County Partnership).

A minimum of a Master's degree in horticulture, plant physiology, crop science, agronomy or related field is required at the time of appointment. Vegetable crop experience and a demonstrated understanding of soil science, nutrient and pest management, and irrigation are desirable. More info in the PDF.

If interested in this position, please visit: https://recruit.ucanr.edu/ and choose "applicants" (refer to position #22-41). To assure full consideration, application packets must be received by 25 July 2022. Contact Tatiana Avoce tavoce@ucanr.edu with questions.

ASST. PROFESSOR OF C.E. IN Nursery, Greenhouse & native crop PATHOLOGY in the Dept of Plant Pathology, UC Davis

The Dept. of Plant Pathology is seeking applications for an Asst Professor of Cooperative Extension. Full time, career-track faculty position. The successful candidate will conduct original applied research resulting in information that can be used towards managing diseases of nursery & greenhouse plants including native plants for ecological restoration, ornamentals, vegetable transplants, & hemp/cannabis. As a member of the UCANR, the candidate will be expected to develop an extension and outreach program that extends information to stakeholders. Mentoring of grad students & performance of depart & university service is expected.

Ph.D. degree in Plant Pathology required. Successful candidate must have a record that documents research as evidenced by pubs in peer-reviewed journals. Postdoctoral experience desirable but not required. More info in the PDF.

Submit at https://apptrkr.com/3134238 by 31 August 2022. Inquiries directed to Dr. Eskalen, Search Committee Chair, aeskalen@ucdavis.edu; 530-752-0304.

Assistant Professors – Extension Field Crop Plant Pathology

The Department of Entomology & Plant Pathology at North Carolina State University invites applications for **two** 12-month tenure-track positions at the Assistant Professor level in Extension Plant Pathology. Both faculty positions are located on the main campus in Raleigh, and incumbents are responsible for extension engagement and research related to their extension responsibilities. We are a top-ranked department for our disciplines and recently hired a new enthusiastic department head bringing us new vitality. We welcome energetic candidates that share our vision.

Minimum qualifications include a PhD in a field of study directly related to the position. A demonstrated background in plant pathology or related fields, and expertise in the biology, ecology, etiology, epidemiology, population biology and/or management of plant diseases are preferred. NC State University is especially interested in qualified candidates who can contribute, through their experience, research, teaching, extension, and/or service, to the diversity and excellence of the academic community. More info in the PDF.

Submit at: https://jobs.ncsu.edu/postings/166234

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COMING EVENTS

BSPP2022 – Microbial lifestyles: from symbionts to pathogens
5 September - 7 September, 2022
Newcastle University, UK
Website: www.bspp.org.uk/conferences/bspp2022/

International Phytobiomass Conference 2022
13 September - 15 September, 2022
Denver, Colorado, USA
Website: phytobiomesconference.org

1st International Plant Health Conference
21 September - 23 September, 2022
London, UK
Website: www.ippc.int/en/news/press-release-the-first-international-plant-health-conference/

8th International Cereal Nematodes Symposium
26 September - 29 September, 2022
Abant, Turkey
Website: www.cimmyt.org/events/8th-international-cereal-nematodes-symposium-icns/

13th Arab Congress of Plant Protection
16 October - 21 October, 2022
Le Royal Hotel, Hammamat, Tunisia
Contact: Dr. Asma Jajar, Chairperson of Organising Committee info@acpp-aspp.com
Website: acpp-aspp.com

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

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

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

The ISPP List is an e-mail list server which broadcasts messages and announcements to its subscribers. Its goal is to facilitate communication among members of the International Society for Plant Pathology and its Associated Societies. Advertised vacancies in plant pathology and ISPP Newsletter alerts are also sent to members of the ISPP List.

In accordance with the guidelines and recommendations established by the new EU General Data Protection Regulation 679/2016 (GDPR), the International Society for Plant Pathology has created a Privacy Information Notice containing all the information you need to know about how we collect, use and protect your personal data.

This policy explains when and why we collect personal information about our users, how we use it, the conditions under which we may disclose it to third parties, how we keep it safe and secure and your rights and choices in relation to your personal information.

Should you need further information please contact business.manager@issppweb.org

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