FunShield4Med
SECURING FOOD

NEWSLETTER

Volume 2

Dr P. Natskoulis (ELGO, COO)

Short message from the Coordinator

Together with our partners we are leveraging our Institute's and Greece's R&I capacity through training & external engagement that promote food safety awareness and encourage best practice on EU's food & feed regarding mycotoxins contamination. We bolster skills and knowledge by a European network of advanced universities, not only for our Institute personnel, but also for every interested individual, and especially for Food Safety early-stage researchers. The annual contamination of mycotoxins causes a significant decrease in economic growth and public health, attracting the attention of food scientists due to upcoming scientific advancements and climate change impact.

Figure 1: Members of the FunShield4Med after the 1st Grand Assembly meeting (29/11/2023), Athens, Greece: from left to right, Prof. C. Proestos (NKUA); Dr P. Natskoulis (ELGO); Dr G. Stavroulakis (invited speaker from Cyprus SGL); Prof. A. Medina (CU); Prof. V. Valdramidis (NKUA); Dr. O. Mihalache (UNIPR); Dr A. Patriarcha (CU); Dr D. Miliordos (ELGO).

ELGO - DIMITRA
HELLENIC AGRICULTURAL ORGANIZATION - DIMITRA

National and Kapodistrian University of Athens

UNIVERSITÀ DI PARMA

Cranfield University

Universitat de Lleida

This project has received funding from the European Union's Horizon Europe Research and Innovation FunShield4Med – HORIZON-WIDERA-2021-ACCESS-03Programme under Grant Agreement: 101079173 –

In this project Cranfield University has received funding from the UKRI Horizon Europe Guarantee Funding Programme in the UK

Prof. Charalampos Proestos
NKUA

Which are the main roles (duties) of your research group in the current Horizon Europe Twinning project, FunShield4Med?

NKUA role is to share knowledge with members of ELGO ITAP concerning mycotoxins EU rgulations, sampling techniques (official techniques), screening techniques for rapid detection of analysis, like ELISA technique and also isolation and determination of mycotoxins in food stuffs by using hyphenated analytical techniques like LC-MS/MS, obtaining results and using statistics and chemometrics for result dissemination to public, local authorities. Apart from training through seminars and workshops, some analysis will be performed to specific foods in collaboration and agreement with all partners but mainly through ELGO-ITAP as Project's Coordinator.

What do you perceive as the future of the Agri-food sector regarding the impact of climatic change in the presence of mycotoxins?

The large impacts of global warming projected on crops worldwide will subsequently influence not only food security, by reducing yields and thus food availability, but food and feed safety, mycotoxins being considered one of the most important food safety hazards affected by climate change. Future changes in temperature, precipitation, and atmospheric CO2 concentration are expected to carry along an increased risk of mycotoxin contamination of cereal crops in the field and might have an impact on the geographical distribution of certain cereals, mycotoxigenic fungi and their mycotoxins.

What are, according to your opinion, the potentials of the current FunShield4Med project and the achievements to be accomplished?

Greece is the main EU entry point for imports from the South and East (African and Asian countries). The potentials of the current project are high considering the advanced expertise of partners involved such as: starting from leveling up research & scientific cooperation of participants; increasing knowledge, expertise, and skills on toxigenic fungi & mycotoxins; developing educational/training activities; level-up administrative and financial staff's skills; and to raise public and scientific awareness on mycotoxins.

Prof. Sonia Marín Sillué
UdL

Which are the main roles (duties) of your research group in the current Horizon Europe Twinning project, FunShield4Med?
In the Funshield4Med project, we offer our expertise and training capabilities on fungal ecophysiology and food processing applied to mycotoxins risk management in the food and feed industry. Knowing and modelling the ecophysiology of fungi, and at the same time knowing the key points during food processing which may help to control mycotoxins, are the basis for giving crucial advice to food and feed processors. Also, we aim at sharing ideas, protocols, and ways of working with the other project partners to learn and advance all together in possible solutions for the mycotoxins problem.

What do you perceive as the future of the Agri-food sector regarding the impact of climatic change in the presence of mycotoxins?
In the last few years, we are noticing in our scientific-technical services an increasing worry in cereal processors about the mycotoxin problem, mainly feed companies. In spite of using cereals both national and from abroad, and applying quality management plans, aflatoxins, deoxynivalenol, zearalenone, and fumonisins are hazards that require increasing investment to be monitored and avoided, mainly in maize and by-products, to ensure animal health. On the other hand, while the presence of some fungal species is decreasing at local level, some others are increasing, with different mycotoxigenic potentialities, which makes the pre- and postharvest management quite challenging.

What are, according to your opinion, the potentials of the current FunShield4Med project and the achievements to be accomplished?
FunShield4Med aims primarily at the reinforcement of Research and Innovation (R&I) capacity of the Institute of Technology of Agricultural Products of the Hellenic Agricultural Organisation – DIMITRA (HAO-ITAP). Moreover, it is an excellent opportunity to share knowledge and strategies among different researchers working on mycotoxins in the Mediterranean area which deal with different approaches in risk management: pioneer analytical methods for monitoring, fungal ecophysiology and predictive mycology for decision making, etc. In addition, these tools, plus in-depth knowledge of the molecular basis behind fungal behaviour, will help to advance in the construction of quantitative risk assessment models for mycotoxins which will be definitely useful to cope with the mycotoxin problem under different climate change scenarios.

SEMINAR 2, 21/07/2023
ITAP CAMPUS, ATHENS, GREECE

The subject cured under the 2nd Seminar organized by the project was Food Contaminants. More precisely, Mycotoxins, Heterocyclic Amines, and Polycyclic Aromatic Hydrocarbons presence in food (Sampling, Determination & Regulation). Invited speakers, Prof. C. Proestos & Prof. M. Dasenaki from NKUA, and Prof. E. Öz & Prof. F. Öz from Atatürk University, Turkey. The event had more than 30 participants, most of them Early-Stage Researcher from ITAP personnel and post-graduate students from Greece and abroad.

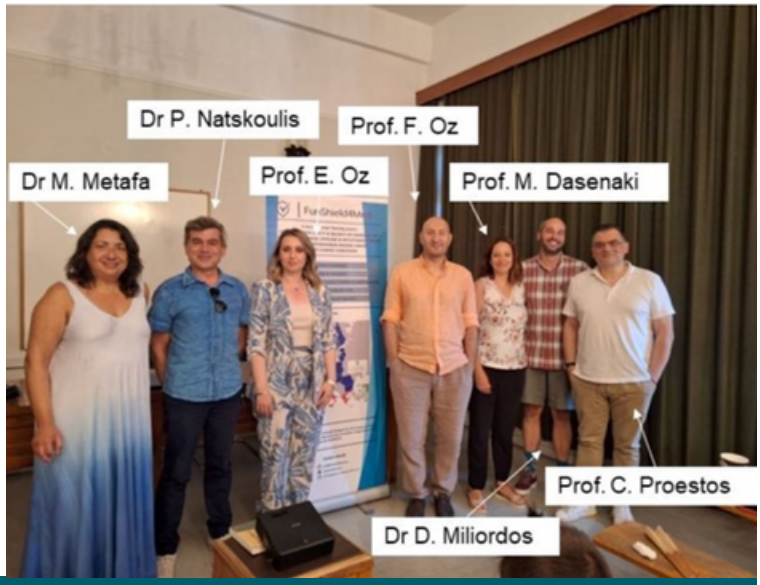

Figure 2: Members of the FunShield4Med project and invited lecturers of the Seminar 2

1ST SHORT-TERM STAFF EXCHANGE (STSE) OF ITAP PERSONNEL

Dr. Georgios Markou (2nd form right in the photo), coordinator of AQUATECH, had a short secondment for training and networking with the research team of Prof. A. Ramos & Prof. S. Marin (2nd & 3rd from left in photo), UdL, Food technology Department at Spain. It took place during October of 2023 and the subject of training was on a clay-based adsorbents to prevent the release of mycotoxin AFB1 from aquatic feed into a fish digestion system.

Figure 3: Dr Markou and the research team of Food Technology Department, UdL, Spain

WORKSHOP 2, 28/11/2023
NKUA CAMPUS, ATHENS, GREECE

Our 2nd Workshop on Predictive mycology included subjects such as Principles of Predictive Mycology and their application for the development of quantitative mycotoxin exposure assessments (QMEA) and Introduction to the open access ImProRisk platform. Additionally, hands-on training took place in both exposure assessments and the use of platform to contact QMEA. The event took place at NKUA - Laboratory of Food Chemistry, with the participation of CU, UNIPR and Cyprus State General Lab.

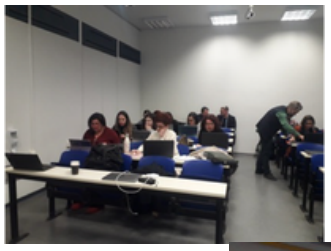

Figure 4: Participants of WS2 having hands-on training in exposure assessment for QMEA

Figure 5: Invited lecturer from Cyprus' SGL, Dr. G. Stavroulakis presenting the ImProRisk platform

10TH INTERNATIONAL CONFERENCE OF MIKROBIOKOSMOS, LARISSA, GREECE (30/11-02/12/2023)

FunShield4Med together with Hellenic Scientific Society MIKROBIOKOSMOS co-organized at Divani Larissa Hotel with great success the 10th International Conference of MIKROBIOKOSMOS "All microbes for a sustainable future".
Microorganisms have endured and thrived through the beginning of life on our planet, and this makes them the most resourceful biology "story-tellers" of all living beings. Thus, the role of the microbial world – 'mikrobiokosmos' in Greek – is considered more than ever crucial in the 'One Health' and 'One Planet' schools of thought.

Figure 6: Members of FunShield4Med and conference's Organizing Committee, Dr C. Tassou and Dr P. Natskoulis, together with Prof. Angel Medina, Invited speaker from CU

Figure 7: Prof. Angel Medina giving his plenary lecture

Prof. A. Medina gave a plenary lecture on "Making fungi travel through time to predict future mycotoxins contamination in food commodities". In this talk Prof. Medina made a review on the research the CU Applied Mycology Group has been developing in collaboration with colleagues around the world to figure out how the environmental fluctuations that Climate Change is bringing, are impacting the way some fungal pathogens grow, but most importantly their ability to produce toxin metabolites, mycotoxins. Mycotoxins are an important food safety issue around the world as it is estimated that a large proportion of food is contaminated. Thus, how is it going to be in 50 years' time, remains an important and vital question.

Figure 8: Session chaired by Dr P. Natskoulis (ELGO) & Prof. E. Papadopoulou (University of Thessaly)

ON GOING WORK: FUNSHIELD4MED JOINT RESEARCH PROJECT

FunShield4Med has foreseen a complementary joint research project (JRP) on mycotoxigenic spoilage fungi and mycotoxins in relation to one main EU entry point for imports (Greece) from the South and East (African and Asian countries). The status of the different mycotoxins' prevalence has been evaluated by an extended literature and scientific report review to pinpoint the mycotoxins and food products of interest. Now, the presence of parent, emerging, and/or modified mycotoxins, in key food products is being evaluated by all partners by applying selected analytical methods for their single- and/or multi-detection. More specifically, traditional Mediterranean food products such as wine, nuts, and fruits, with high import and export dynamics in region trade are being selected from the local and international markets and are set under analyses to determine mycotoxins presence and quantify consumer exposure. Finally, results of JRP will be communicated to the relevant authorities (i.e. EFET for Greece, and EFSA for Europe) and relevant Quantitative Mycotoxin Exposure Assessments will be delivered.

COMING SOON - STAY TUNED!

FunShield4Med 3rd Seminar at ITAP (21/03/2024)
For our 3rd seminar we expect speakers from UNIPR and NKUA with subjects related to the occurrence of non-regulated mycotoxins in foods and Fusarium mycotoxins (Commodities of interest, Determination, European legislation perspectives).

3rd FunShield4Med Workshop at CU (25-26/04/2024)
Within the subject of this event are the impact of Climate Change scenarios on food security, also a wide scope program on principles of molecular ecology, integration, and use of their ''big data'' under interacting environmental conditions, non-destructive detection of mycotoxins using IR and Hyperspectral Imaging and more. Tutors from CU, NKUA, and UdL.

Short-Term Staff Exchanges (2024)
Next STSEs of ITAP (ELGO) personnel going to take place within 2024 include secondments at the laboratories ofproject's partners, UNIPR and CU.

2nd FunShield4Med Summer School, Greece (10-14/06/2024)
Our 2nd Summer School is going to be held in Athens next June, with participation of all partners of the project, and invited speakers from AUA and AUTh of high calibre in in food safety.

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