



**GHENT
UNIVERSITY**

**MYTOX
SOUTH**

UGENT ACADEMIC RESEARCH IN NIGERIA: MYTOX-SOUTH

Prof. Sarah De Saeger & Dr. Marthe De Boevre

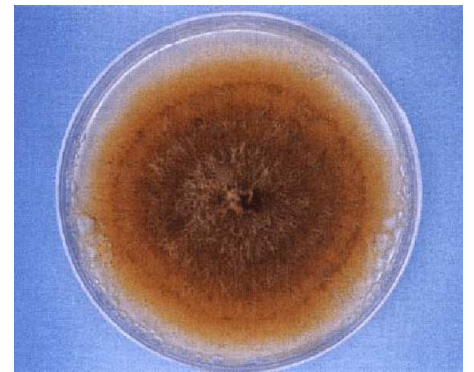
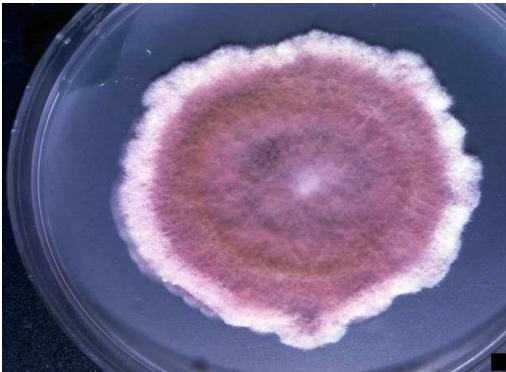
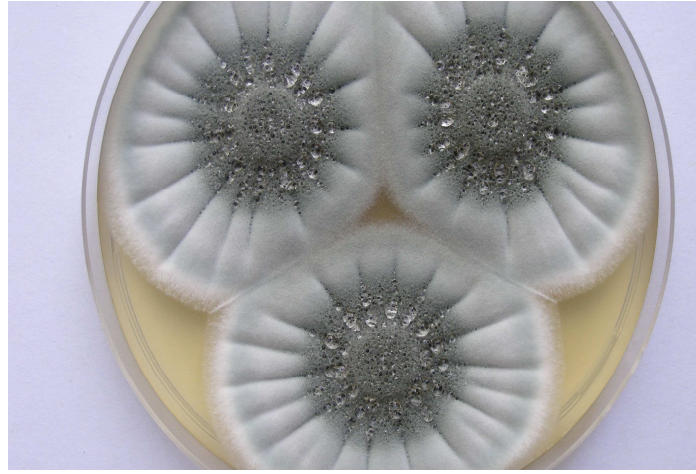
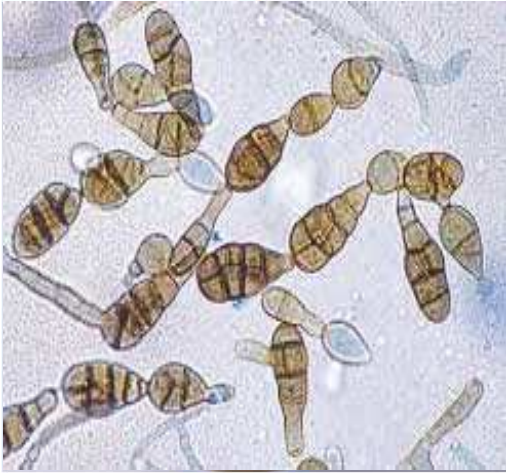
Annual Networking Event: investing in and collaborating with West Africa, 14/06/2019



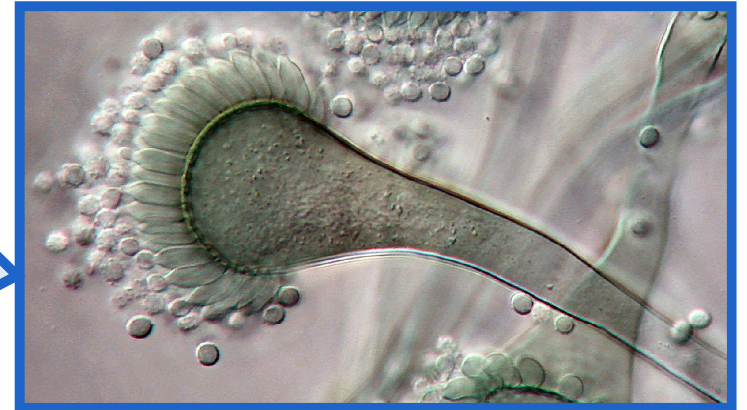
SAFE FOOD?

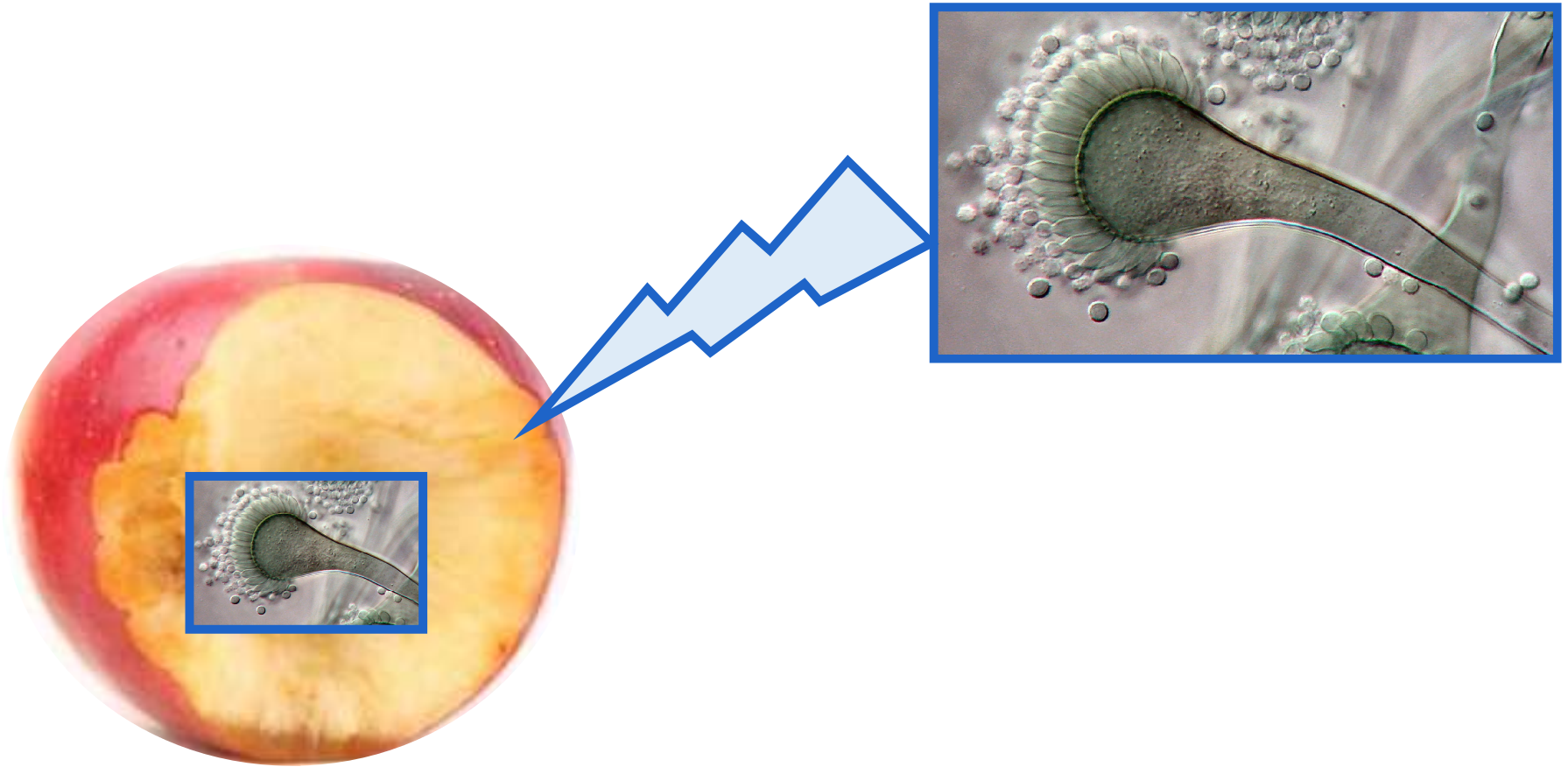


SAFE FOOD?

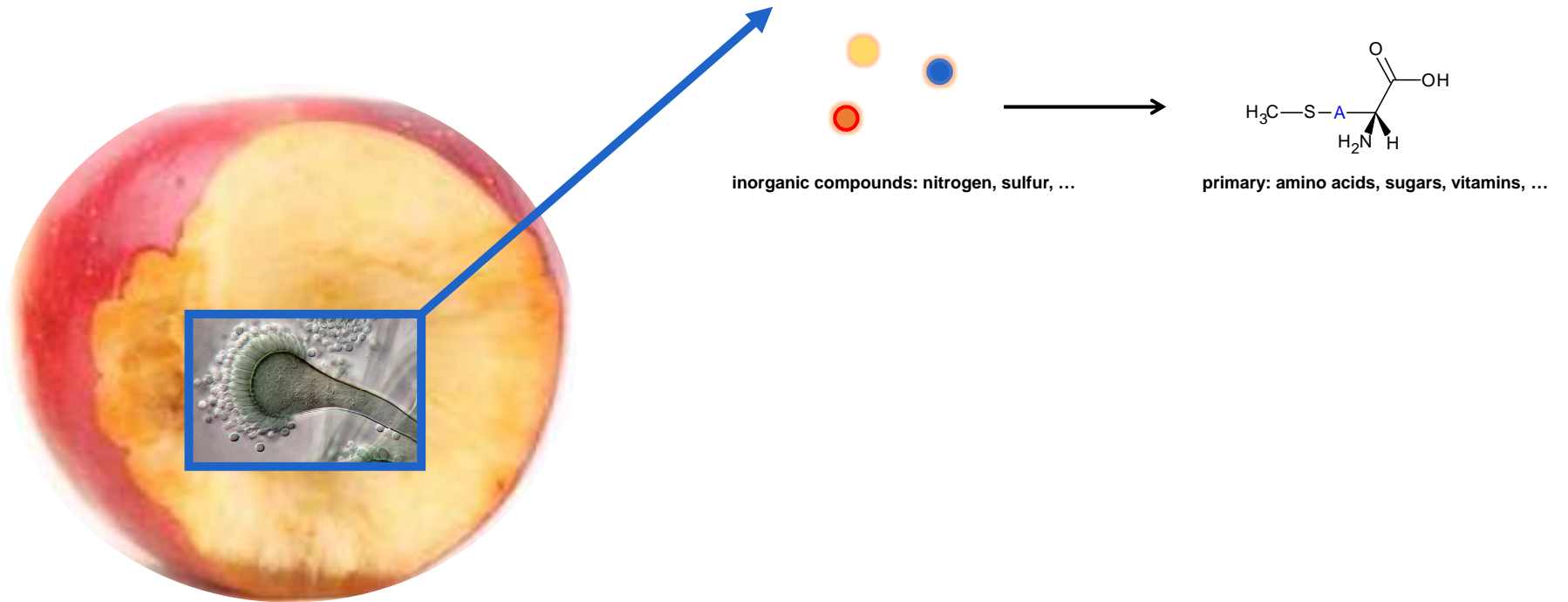


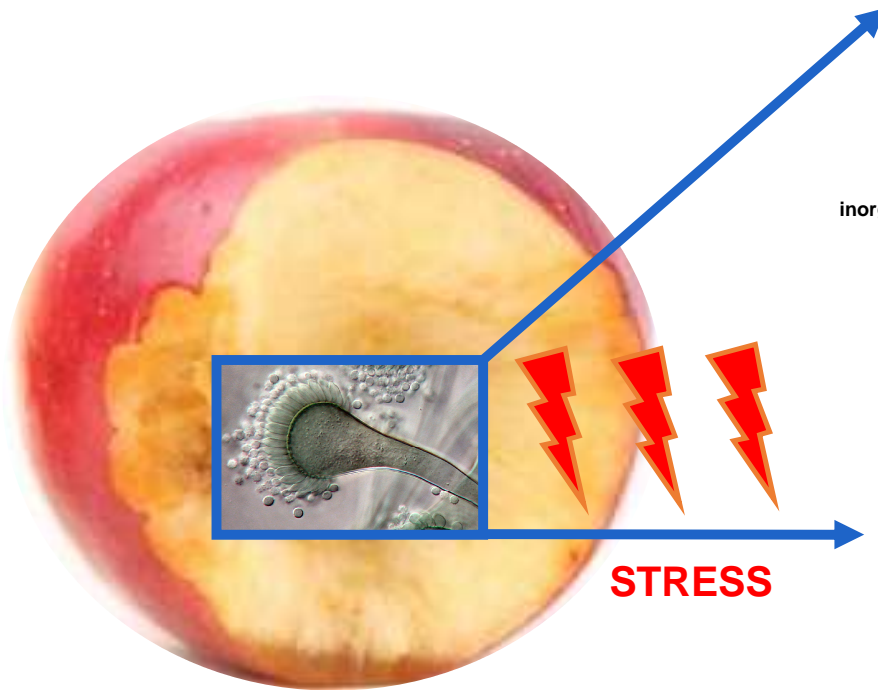






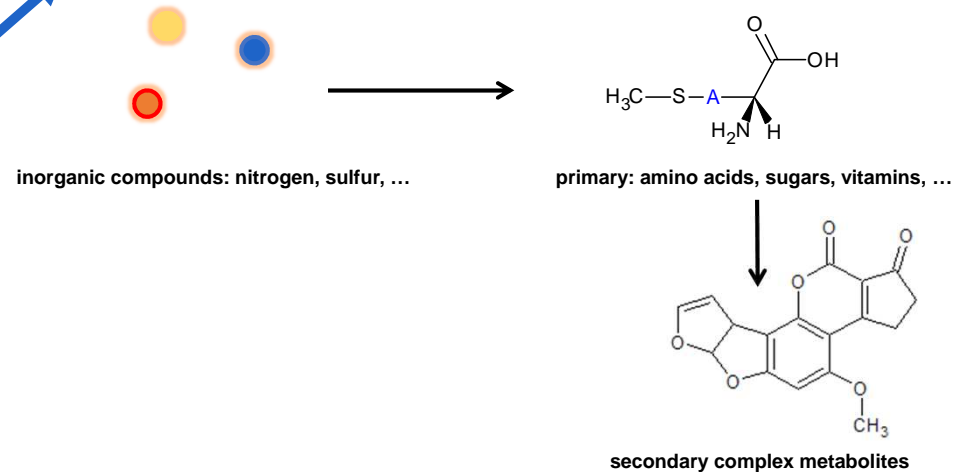
Production of PRIMARY metabolites
involved in normal growth, development and
reproduction of the organism





Production of PRIMARY metabolites

involved in normal growth, development and reproduction of the organism (eg amino acids)



Production of SECONDARY metabolites

not directly involved in normal growth, development or reproduction of the organism; absence of secondary metabolites does not result in immediate death.

= **MYCOTOXINS**



= μύκης *mykes*, 'fungus' & τοξικόν *toxikon*, 'poison'

MYCOTOXINS: A HIDDEN DANGER



MYCOTOXINS: ANIMAL & HUMAN HEALTH THREAT

ACUTE & CHRONIC TOXICITY

- **Death:** children died in Ibadan after eating *kulikuli*
- **> still birth**, neonatal mortality & growth stunting
- **Carcinogenic:** >>>7,761 liver cancer cases in Nigeria
- **Immune suppression:** aggravates malaria, HIV & pneumonia
- **gastro-intestinal manifestations**
- **skin irritations, ...**



THE CITIZEN

29 JULY 2016

Tanzania: Food Poisoning Linked to 14 Deaths in Two Regions

Tagged: Food and Agriculture • East Africa • Health • Tanzania

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Photo: Daily News

By Syriacus Buguzi

Dar es Salaam — Results of laboratory tests conducted on blood and urine samples of people who died or fell ill after eating food believed to have

RELATED TOPICS

Food and Agriculture »

- ▣ Zimbabwe: Partisan Food Distribution Alarms WFP
- ▣ Malawi: Nation Commemorates World Food Day
- ▣ Namibia: Better to Be Safe Than Sorry, Says Vet
- ▣ Uganda: New Chicken Firm

MYCOTOXINS: ECONOMIC IMPACT

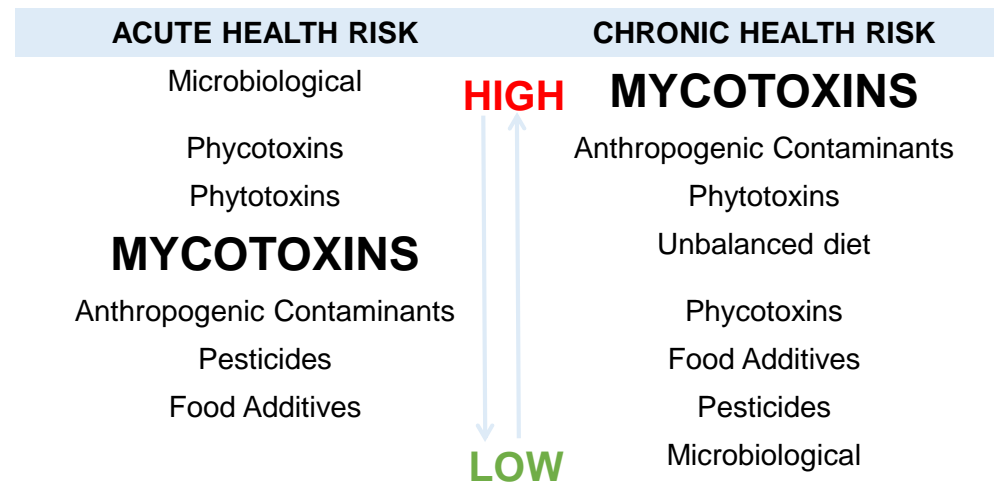
- **FAO stats:** >50% of world's food crops are lost to mycotoxins yearly: >>> food waste Africa
- **Nigeria:**
 - annual loss of **\$670M** to meet EU regulations on aflatoxins (Otuki *et al.* 2001)
 - **NAFDAC:** destroyed aflatoxin-contaminated food worth >>>US\$200,000 (SFI, 2005)
 - 2007-2016: **EU-rejections of Nigerian produce due to aflatoxins**
 - = **import ban** restricting export five agricultural produce from Nigeria to any EU-country
 - = ° decline of **\$1,866,000 billion or 34.6%** non-crude component of trade including processed and unprocessed food items (National Bureau of Statistics)
- Africa loses **40% labor productivity** in Africa due to diseases and deaths exacerbated by aflatoxins (Miller, 1995)
- But...how do we assess the **economic losses** following increased pre-five mortality rates, death of the primary school pupils in Ibadan and many others after eating molded foods?

WHY MYCOTOXIN RESEARCH?

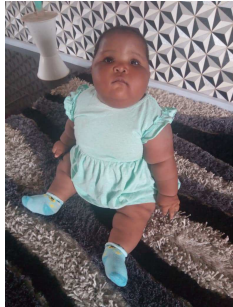
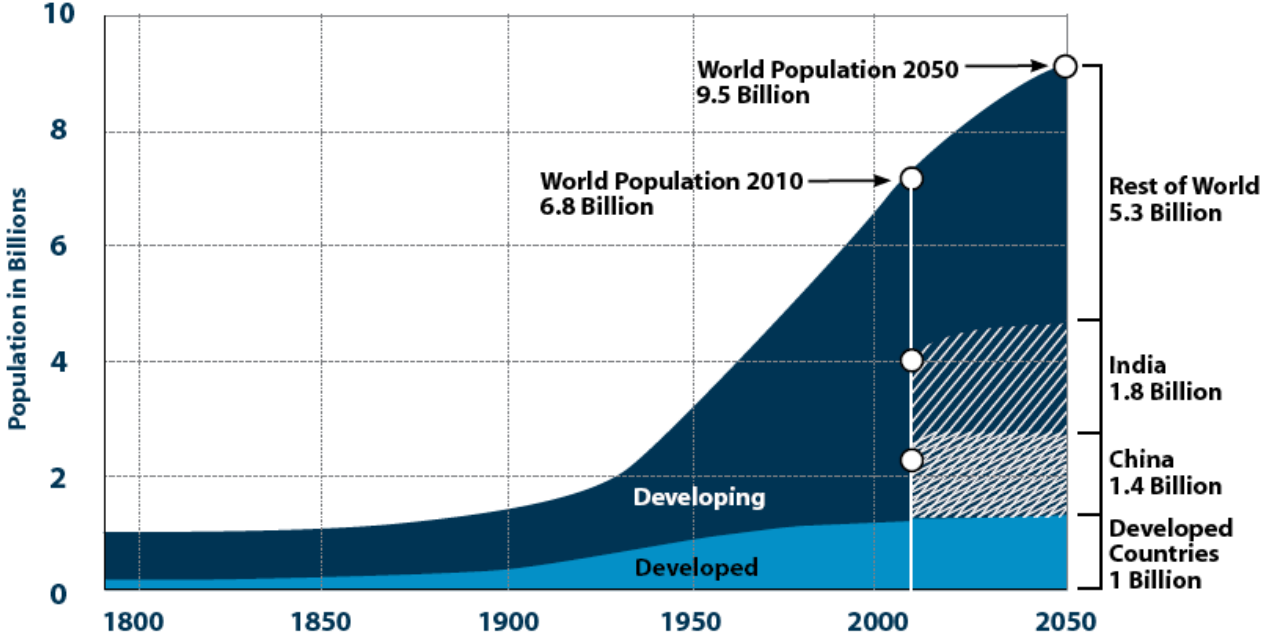
FOOD SECURITY vs FOOD SAFETY

'FOOD SECURITY exists when all people at all times, have physical and economic access to sufficient, SAFE and nutritious food that meets their dietary needs and food preferences for an active and healthy life' (World Summit, 1996)

FOOD SAFETY AS PART OF FOOD SECURITY



WHY MYCOTOXIN RESEARCH?



With permission of B. Koroma & Y. Agboola

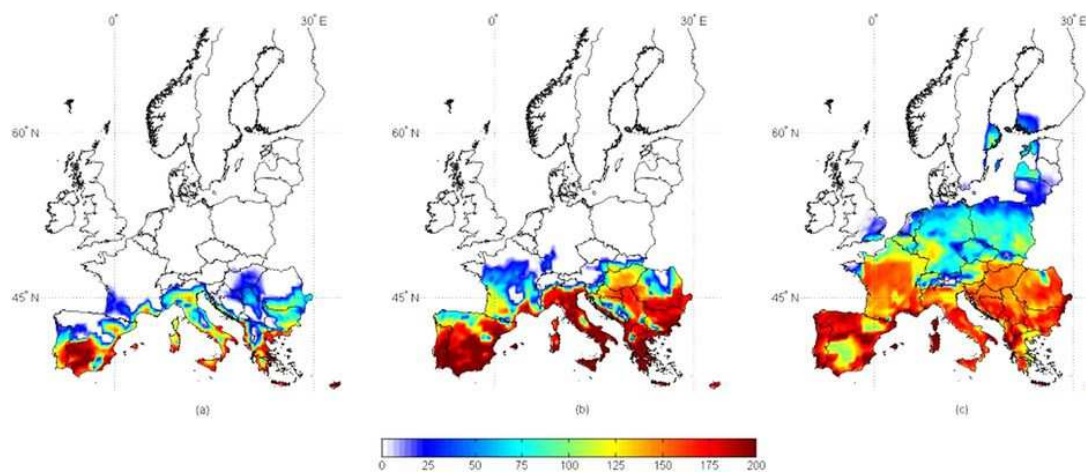
WHY MYCOTOXIN RESEARCH?



SUSTAINABLE
DEVELOPMENT
GOALS

Crop pests and pathogens move polewards in a warming world

Daniel P. Bebber¹, Mark A. T. Ramotowski² and Sarah J. Gurr^{1*}



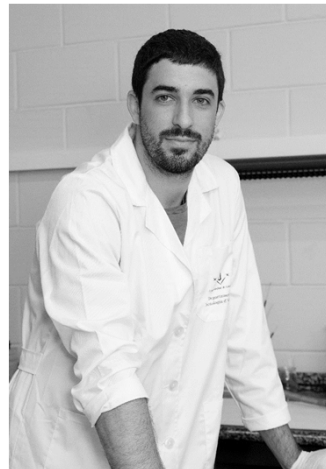
**INTERCONTINENTAL PARTNERSHIP TO IMPROVE FOOD
SECURITY & FOOD SAFETY IN DEVELOPING COUNTRIES:
MITIGATION OF MYCOTOXINS - MYTOX-SOUTH**

MERGING WORLD TOP-LEVEL EXPERTISE

GHENT UNIVERSITY - CoE in Mycotoxicology and Public Health – info@mytoxsouth.org

Prof. Dr. Sarah De Saeger & Dr. Marthe De Boevre (Coordinators)

Dr. Arnau Vidal & Prof. Dr. Carl Lachat (Operations Manager)



MERGING WORLD TOP-LEVEL EXPERTISE



BioIntellipro Inc.

Dr. Martin Lo



WFPC

Dr. Charlie Wilson



ISPA-CNR, Italy

Dr. Antonio Moretti



CAS, Shanghai

Prof. Aibo Wu



Complutense Uni, Madrid

Dr. María C. Moreno-Bondi

GHENT UNIVERSITY

G. Haesaert & K. Audenaert

B. De Meulenaer, C. Lachat, L. Jacxsens & P. Kolsteren

S. Croubels & G. Antonissen

M. Eeckhout

P. Dubruel

S. Dehenauw & S. Abbeddou

EXPERTISE DOMAINS

1. TOXIGENIC MOULDS

2. MYCOTOXINS

3. MYCOTOXINS & ANIMAL HEALTH

4. MYCOTOXINS & HUMAN HEALTH

MYTOX-SOUTH PARTNERS

Prof. Sheila Okoth & Dr. Johanna Lindahl - Dr. Delia Grace ILRI (Kenya)

Prof. Obadina Adewale, Prof. Atanda Olusegun, Prof. Hussaini Makun & Prof. Yemisi Jeff-Agboola

Prof. Loveness Nyanga (Zimbabwe)

Dr. Limbikani Matumba (Malawi)

Prof. Ashagrie Woldegiorgis (Ethiopia)

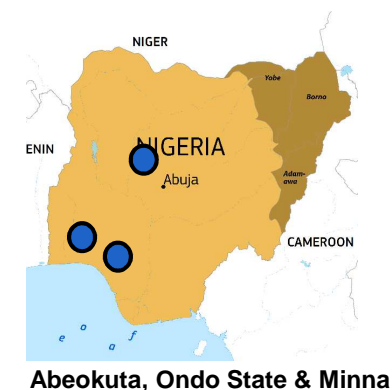
Dr. Lindy Rose & Prof. Patrick Njobeh & Prof. Mulunda Mwanza (South Africa)

Dr. Happy Magoha & Prof. Martin Kimanya (Tanzania)

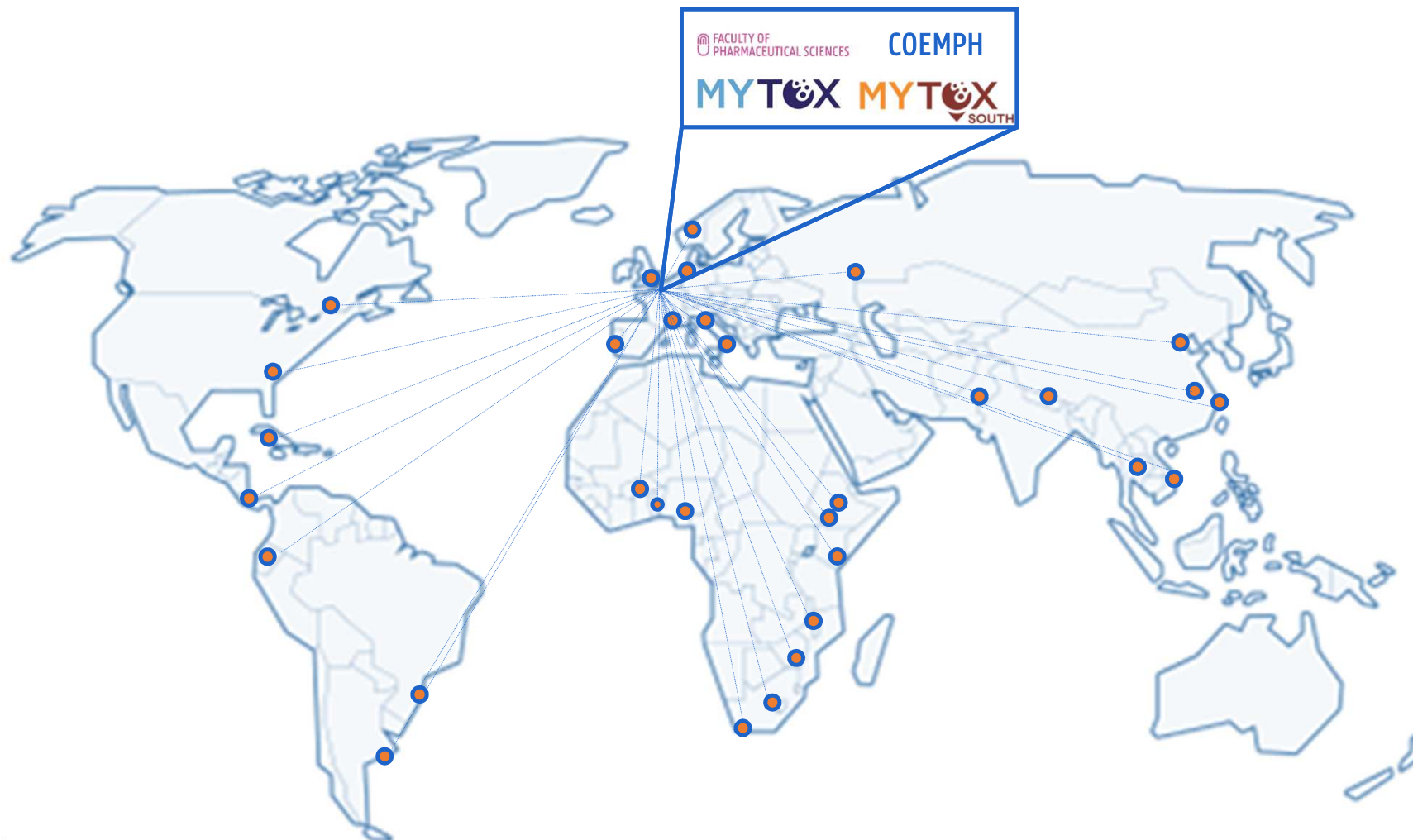
Dr. Richard Echodu (Uganda)

Prof. dr. Andrea Patriarca & Prof. Sofia Chulze (Argentina)

(PAEPARD) Platform for an Africa-Europe Partnership for Agricultural Research for Development (François Stepman)

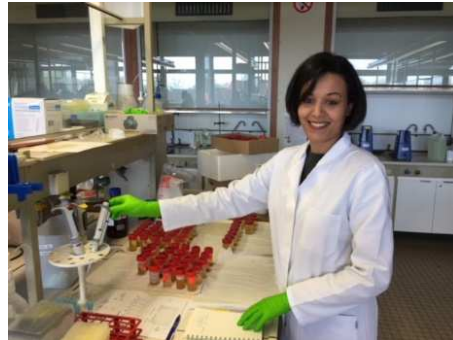


MYTOX-SOUTH PARTNERS



GLOBAL SOCIETAL IMPACT: MYTOX-SOUTH

- Educating and training young students & scientists from developing countries with programs suited for their countries
- Building infrastructural capacity
- Conducting research and developing innovative technologies in terms of suitable mitigation strategies applicable in their countries



MYTOX-SOUTH: WORLD BANK

January 2019

The World Bank grant (ACE Impact) for Mycotoxin Research in Africa



The Food and Toxicology Research Group (FTRG) of the Federal University of Technology Minna (Nigeria) together with MYTOX-SOUTH were awarded to establish the “**African Centre of Excellence (ACE) for Mycotoxin and Food Safety**”, \$4,800,000

The creation of ACEMFS will create learning opportunities and research results to address Africa’s shortage of expertise and applicable solutions to ensure a safe, controlled and sufficient food supply that will support economic growth and public health.



Association of
African Universities
Association des universités africaines
اتحادية الجامعات الأفريقية



MYTOX-SOUTH: WORLD BANK

1. ACE will create an **interdisciplinary experiential education** model focused on the rapidly emerging need for innovations at the nexus of food safety.
2. ACE will foster **impactful interdisciplinary research and implement solutions** that improve the quality of life of Africans.

Focus on **mycotoxins, food borne pathogens, veterinary drugs, pesticides and industrial residues**: farm to fork
Most consumed and economically competitive crops, foods and feed in Central and West Africa

maize, rice, sorghum, millet, wheat, soybean, cassava, sesame, groundnut, animal feed, livestock products including milk, egg and fish, fruits and vegetables

Focus on production of **world-class (non)-graduates in food safety** → transformation of Nigeria's natural resources into goods and services, driven by **entrepreneurship & information and communication technology (ICT)**, to positively affect the **economy** and thus the quality of life for the people.

MYTOX-SOUTH: WORLD BANK IN FIGURES

- **MONITORING** programs for mycotoxins, heavy metals, veterinary drug and pesticide residues
 - 200 samples/year of each of 16 crops from each of 25 countries = 80,000 samples
- **EDUCATION & HUMAN CAPACITY BUILDING**
 - 23 PhDs, 72 MScs and 5 postdoctoral fellows
 - 30 - 50% foreign students (30 PhDs on scholarship)
 - 12 Food Professionals
 - 150 actors in the food value chain.
 - Research collaboration with >40 partners: 128 Q1-publications
 - Industrial internships
 - Patent and commercialization of six products



MYTOX-SOUTH: WORLD BANK: 46 PARTNERS



Prof. Sarah De Saeger & Dr. Marthe De Boevre

CENTRE OF EXCELLENCE IN MYCOTOXICOLOGY & PUBLIC HEALTH

E sarah.desaeger@ugent.be; marthe.deboevre@ugent.be

T +32 9 264 81 37/17

 Ghent University

 @ugent @mytoxsouth

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www.ugent.be – www.mytox.be – <https://mytoxsouth.org>

