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Assessment and monitoring of polluted soils using nematodes: results of a meta-analysis

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Institiúid Teicneolaíochta Cheatharlach



INSTITUTE of
TECHNOLOGY
CARLOW

At the heart of South Leinster

ASSOCIATION OF APPLIED BIOLOGISTS

President: Professor Christine Watson

A two day conference

**at the Institute of Technology Carlow,
Ireland**

on 28 – 29 June 2017

PROGRAMME

3rd International Symposium on Nematodes as Environmental Bioindicators

Comesomatid (*Sabatieria* sp.) from the East Coast of Malaysia - Image reproduced by kind permission of Dr Marcus Trett of Physalia Limited - Applied Sciences, Consultant & Forensic Ecologists

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3rd International Symposium on Nematodes as Environmental Bioindicators

The Organising Committee of the 3rd International Symposium on Nematodes as Environmental Bioindicators (3ISNEB) are delighted to invite you to participate in this event which will take place on the:

28 – 29 June 2017
at the Institute of Technology Carlow, Ireland

PROGRAMME

(9 BASIS Points have been awarded as follows: 3CP, 3E & 3PD)

This will be the third conference of its kind at an international level, after the successes of its predecessor events in June 2007 in Heriot Watt University, Edinburgh, UK, and in July 2012 in Ghent University, Ghent, Belgium, and it will happen under the auspices of the Association of Applied Biologists

<http://www.aab.org.uk/>.

Many anthropogenic factors have a negative impact on the quality of soil, air and water leading to detrimental environmental changes. This conference will bring together experts working to understand the response of key food web organisms to these changes. Scientists from across the world using a common platform, the phylum Nematoda, will present their studies on these environmentally important organisms to address questions of habitat and ecosystem changes at community, individual organism and molecular levels in terrestrial, freshwater and marine ecosystems. Furthermore, this event will aid towards the dissemination of information by ecologists who aim to understand the underlying mechanisms leading to nematode community change. It is envisaged that it will disseminate high impact science that could influence not only other scientists, but also regulators and policy makers.

Wednesday 28 June 2017

08:45 **COFFEE and REGISTRATION**

09:30 **WELCOME and INTRODUCTION**

THOMAS KAKOULI-DUARTE (Institute of Technology Carlow, Ireland)

Keynote lecture 1

9:40 **Sustaining soils: the critical role of soil biodiversity**

DIANA WALL (Colorado State University, USA)

Session 1: Nematode indicators: Rationale and efficiency

Chair: THOMAS KAKOULI-DUARTE (Institute of Technology Carlow, Ireland)

10:30 **What makes a good indicator?**

BRYAN GRIFFITHS (SRUC, Edinburgh, UK) & ROY NEILSON (The James Hutton Institute, Dundee, UK)

- 10:50 **Comparing molecular with morphological methods for assessing soil nematodes as indicators**
 STEFAN GEISEN (Netherlands Institute of Ecology (NIOO-KNAW), Wageningen, The Netherlands; University of Wageningen, The Netherlands), FREDDY TEN HOOVEN, HENK DUYTS (Netherlands Institute of Ecology (NIOO-KNAW), Wageningen, The Netherlands), L BASTEN SNOEK (Netherlands Institute of Ecology (NIOO-KNAW), Wageningen, The Netherlands; University of Wageningen, The Netherlands), HENK MERTENS, JANNEKE BLOEM, OLGA KOSTENKO (Netherlands Institute of Ecology (NIOO-KNAW), Wageningen, The Netherlands), CASPER W QUIST, JOHANNES A HELDER (University of Wageningen, The Netherlands) & WIM H VAN DER PUTTEN (Netherlands Institute of Ecology (NIOO-KNAW), Wageningen, The Netherlands; University of Wageningen, The Netherlands)
- 11:10 **COFFEE and POSTERS**
- 11:40 **Nematode based tools in environmental risk assessment**
 SEBASTIAN HÖSS (Ecosa, Starnberg, Germany; University of Bielefeld, Germany), ARNE HÄGERBÄUMER & WALTER TRAUNSPURGER (University of Bielefeld, Germany)
- 12:00 **Flexible nematode community indices for soil quality assessment**
 CARMEN VAZQUEZ & RON GM DE GOEDE (University of Wageningen, The Netherlands)
- 12:20 **DNA metabarcoding to characterize soil nematode communities**
 LIEVEN WAEYENBERGE, ANNELIES HAEGEMAN, NANCY DE SUTTER, NICOLE VIAENE & MARTINE MAES (ILVO, Flanders Research Institute for Agriculture, Belgium)
- 12:40 **LUNCH**
- Session 2: Nematode indicators of ecosystem functioning and services*
Chair: SARA SÁNCHEZ MORENO (National Institute for Agricultural and Food Research and Technology, Madrid, Spain)
- 13:30 **Cryptic diversity matters: implications for ecosystem functioning and pollution monitoring**
 NELE DE MEESTER, LUANA MONTEIRO, SOFIE DERYCKE & TOM MOENS (Ghent University, Belgium)
- 13:50 **Elevated CO₂ increases fungal-based micro-foodwebs in soils of contrasting plant species**
 MARIE DAM (University of Copenhagen, Denmark; Zealand Institute of Business and Technology, Slagelse, Denmark), LASSE BERGMARK (University of Copenhagen, Denmark; Novo Nordisk, Gentofte, Denmark) & METTE VESTERGÅRD (University of Copenhagen, Denmark)
- 14:10 **Compost application on managed rangelands for carbon sequestration: effects on soil food web structure using nematode indicators**
 GISELE HERREN, HANNE STEEL & WIM BERT (Ghent University, Belgium)
- 14:30 **Bacterial - and fungal feeding nematode carbon derives from different soil organic matter pools**
 METTE VESTERGÅRD (University of Copenhagen, Denmark), MARIE DAM (Zealand Institute of Business and Technology), LOUISE HINDBORG MORTENSEN (University of Copenhagen, Denmark), BENT T CHRISTENSEN (Aarhus University, Tjele, Denmark) & JENS DYCKMANS (Georg-August Universität Göttingen, Germany)
- 14:50 **The impact of Muirburn on soil nematode communities**
 ROY NEILSON, JUSTIN IRVINE, DEBBIE FIELDING, RUSSELL HOOPER, JAVIER PEREZ BARBERIA (The James Hutton Institute, Dundee, UK), KATHARINE PREEDY (BioSS, Edinburgh, UK) & TIM DANIELL (The James Hutton Institute, Dundee, UK)

15:10 **TEA and POSTERS**

Session 3: Nematode indicators for monitoring metal-polluted soils

Chair: ROY NEILSON (The James Hutton Institute, Dundee, UK)

15:40 **Assessment and monitoring of polluted soils using nematodes: results of a meta-analysis**

CECILE VILLENAVE, CAMILLE CHAUVIN (ELISOL environnement, Congénies, France), MICKAEL HEDDE (INRA, Versailles, France), HELENE CEREMONIE, ANNE JIMENEZ & MANON TRAMBOLHO (ELISOL environnement, Congénies, France)

16:00 **Classical and novel approaches in using nematodes as indicators of endophytic bacterial bioremediation in an oilseed rape crop**

AOIFE EGAN & THOMAS KAKOULI-DUARTE (Institute of Technology Carlow, Ireland)

16:20 **Nematodes in experimentally PAH and Cu contaminated soils**

MARIA VIKETOFT (Swedish University of Agricultural Sciences, Uppsala, Sweden)

16:40 **Results of a meta-analysis to reveal copper and zinc effects on nematological parameters in field experiments**

PÉTER NAGY, GÁBOR BAKONYI (Szent István University, Gödöllő, Hungary), GERARD KORTHALS (NIOO-KNAW Centre for Soil Ecology, Wageningen, The Netherlands), SLAVKA GEORGIEVA (Sofia University, Bulgaria) & TIBOR MAGURA (University of Debrecen, Hungary)

20:00 **SYMPOSIUM DINNER**

Thursday 29 June 2017

Keynote lecture 2

09:00 **Juggling essential and toxic metals - a worm's eye view of a Toxicogenomic challenge**

STEPHEN STÜRZENBAUM (King's College London, UK)

Session 4: Nematode bio-indicators in agroecosystems

Chair: MARIA VIKETOFT (Swedish University of Agricultural Sciences, Uppsala, Sweden)

09:50 **Management strategies to manipulate soil biodiversity and disease suppressiveness**

GERARD W KORTHALS (Centre for Soil Ecology, NIOO-KNAW, Wageningen, The Netherlands), WIM V D BERG, LEENDERT P G MOLENDIJK & JOHNNY H M VISSER (Wageningen Plant Research, Wageningen UR, The Netherlands)

10:10 **Response of soil nematode faunal assemblage to phosphate and sulfate fertilization in grassland columns**

ISRAEL IKOYI & ACHIM SCHMALENBERGER (University of Limerick, Ireland)

10:30 **COFFEE and POSTERS**

11:00 **Entomopathogenic nematodes: insect slayers or providers of sustenance in the soil food web**

CARO KAPP (Stellenbosch University, South Africa), SHEILA G STOREY (Nemlab, Klapmuts, South Africa) & ANTOINETTE P MALAN (Stellenbosch University, South Africa)

11:20 **Tillage and traffic effects on nematode communities**

MOHAMMED AHMED (Harper Adams University, Newport, UK), THOMAS PRIOR (Fera, North Yorkshire, UK), MELANIE SAPP (Heinrich Heine University, Düsseldorf, Germany), IAN ADAMS (Fera, North Yorkshire, UK), PAULA MISIEWICZ (Harper Adams University, Newport, UK), GERRIT KARSSSEN (National Plant Protection Organization, Wageningen, The Netherlands) & MATTHEW BACK (Harper Adams University, Newport, UK)

11:40 **Insight into micro and mesoscale distribution of 48 nematode taxa in agro-ecosystems as well as semi-natural habitats**

CASPER W QUIST, GERRIT GORT, DICK J BRUS, PAUL MOOIJMAN, SVEN VAN DEN ELSEN (Wageningen University and Research Centre (WUR), The Netherlands), OLGA KOSTENKO (Netherlands Institute of Ecology (NIOO-KNAW), Wageningen, The Netherlands), MARIETTE VERVOORT, WIM VAN DER PUTTEN (Wageningen University and Research Centre (WUR), The Netherlands; Netherlands Institute of Ecology (NIOO-KNAW), Wageningen, The Netherlands), JAAP BAKKER & JOHANNES HELDER (Wageningen University and Research Centre (WUR), The Netherlands)

12:00 **LUNCH and POSTER SESSION**

Session 5: Nematode bioindicators of human impact in marine ecosystems

PÉTER NAGY (Szent István University, Gödöllő, Hungary)

14:00 **Nematode and macrofauna communities associated with different recovery stages of *Zostera noltii* beds in an estuarine system**

ANA SOFIA ALVES (MARE, University of Évora, Portugal), FÁTIMA LOPEZ, PAULA CHAINHO (MARE, University of Lisbon, Portugal), CARLOS RIBEIRO (University of Évora, Portugal), BERNARDO DUARTE, ISABEL CAÇADOR (MARE, University of Lisbon, Portugal) & HELENA ADÃO (MARE, University of Évora, Portugal)

14:20 **Do harvesting activities in *Zostera noltii* beds affect nematode and macrofauna communities? A field experiment approach**

HELENA ADÃO, ANA SOFIA ALVES (University of Évora, Portugal) & PAULA CHAINHO (University of Lisbon, Portugal)

14:40 **TEA and POSTERS**

15:10 **Impact of the water-soluble fraction of a crude oil on marine nematode communities**

LUANA C MONTEIRO (Ghent University, Belgium; Bielefeld University, Germany), WALTER TRAUNSPURGER (Bielefeld University, Germany) & TOM MOENS (Ghent University, Belgium)

15:30 **CONCLUDING REMARKS**

15:40 **CLOSE**

Posters

Nematode communities associated with greenhouse-grown tomato plants in conventional and organic farms

SOFIA R COSTA (Mountain Research Centre (CIMO), Ponte de Lima, Portugal; University of Minho, Braga, Portugal), M TERESA ALMEIDA (University of Minho, Braga, Portugal) & ISABEL MOURÃO (Mountain Research Centre (CIMO), Ponte de Lima, Portugal)

Cross examination of plant parasitic nematode population and soil microbiome in Taiwan farms
JIA-JIN LAW & JIUE-IN YANG (National Taiwan University, Taipei city, Taiwan)

Soil nematode communities in the initial stage of agroecosystem formation and under sustainable functioning of potato fields

ELIZAVETA MATVEEVA, ANNA SUSHCHUK, DARIA KALINKINA & VICTORIA LAVROVA
(Institute of Biology of Karelian Research Centre, Petrozavodsk, Russia)

Effects of cover crops on soil suppressiveness against *Pratylenchus* spp. under experimental conditions
LAURA MORALES, SARA SÁNCHEZ-MORENO, DIANA MARTÍN-LAMMERDING, JOSE LUIS TENORIO (National Institute for Agricultural and Food Research and Technology, Madrid, Spain)

Assessment of contaminated microplastics using nematodes as environmental indicators
LORIANE MWANA-SCOE, KIERAN GERMAINE, THOMAS KAKOULI-DUARTE & JOHN CLEARY
(Institute of Technology Carlow, Ireland)

Computer assisted identification, counting, sorting and monitoring in biological systems
JASON UHLEMANN, THOMAS KAKOULI-DUARTE & OISIN CAWLEY (Institute of Technology Carlow, Ireland)

Assessment of soil quality using a bioindicator
ROY NEILSON, KENNETH LOADES, TIM DANIELL, AURORA LOZANA (The James Hutton Institute, Dundee, UK), BRYAN GRIFFITHS (SRUC, Edinburgh, UK), ERIC ANDERSON (Scottish Agronomy Ltd, Kinross, UK), HARRY WILDER (Barfoots of Botley Ltd, Bognor Regis, UK), JIM WILSON, ALISON EASSON, PETER BEATTIE (SoilEssentials Ltd, Brechin, UK), KATHARINE PREEDY (BioSS, Edinburgh, UK) & DAVID ROBERTS (The James Hutton Institute, Dundee, UK)

A loop-mediated isothermal amplification method for the rapid detection of *Aphelenchoides besseyi* on rice
GUAN-YI YU & JIUE-IN YANG (National Taiwan University, Taipei City, Taiwan)

Development of a sequence-specific PCR assay for burrowing nematode (*Radopholus similis*) detection
CHI-SHUEN CHANG & JIUE-IN YANG (National Taiwan University, Taipei City, Taiwan)

Stable isotope analysis ($\delta_{13}\text{C}$ and $\delta_{15}\text{N}$) of soil nematodes from four feeding groups
CAROL MELODY (University College Dublin, Ireland), BRYAN GRIFFITHS (SRUC, Edinburgh, UK), JENS DYCKMANS (Georg-August Universität Göttingen, Germany) & OLAF SCHMIDT (University College Dublin, Ireland)

Plant-parasitic nematodes intercepted in UK trade and their use as indicators of soil sterility
REBECCA LAWSON & THOMAS PRIOR (Fera, York, UK)