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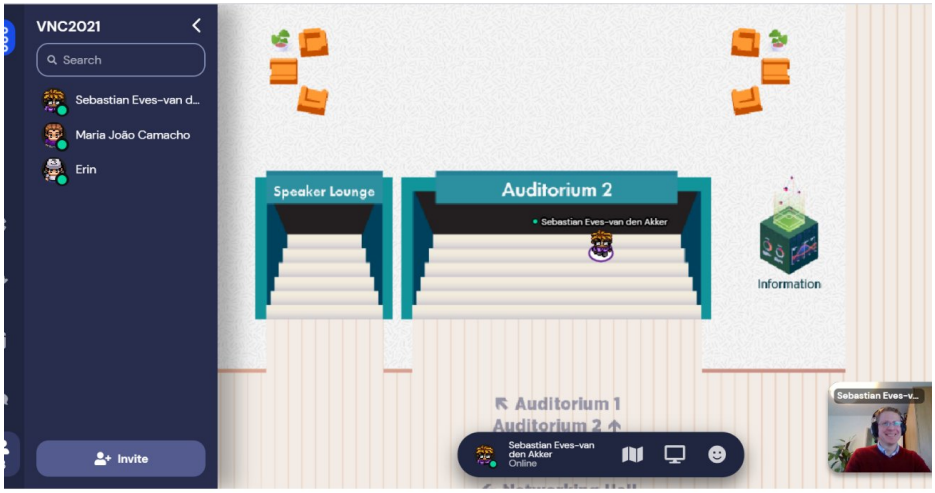
Nematology News

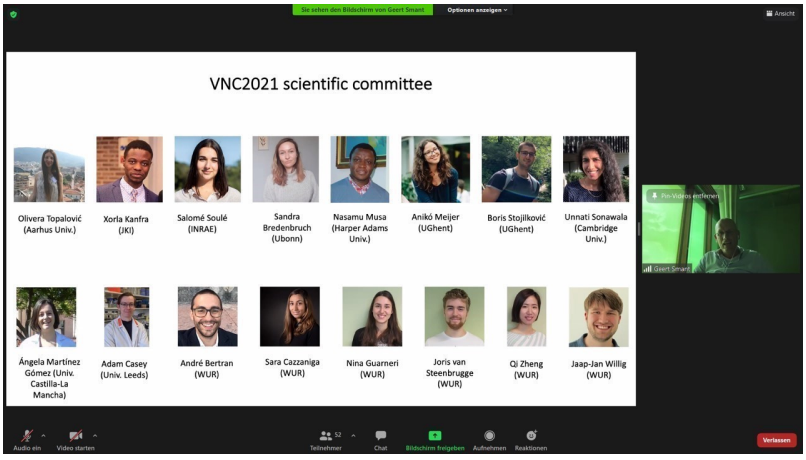
Virtual Nematology

This year, in response to the covid-imposed delay of the Seventh International Congress of Nematology, ESN decided to support the current cohort of early-stage nematology researchers through a virtual conference aimed specifically at PhD students and postdocs. The Virtual Nematology Conference in 2021 (VNC 2021) was held between the 26th and 28th of May using the virtual platforms Gathertown and Zoom and was aimed at boosting the networking amongst young nematologists and providing a platform for presentation of their ongoing research.

The main organizing institution of this event was the Laboratory of Nematology at Wageningen University, while the scientific and organization committee consisted of sixteen PhD students and postdocs from around Europe, and was led by Prof. Geert Smant. The scientific program consisted of three plenary and 22 parallel sessions that covered all aspects of nematology, ranging from nematode genomes to multitrophic interactions involving nematodes in complex ecosystems.



VNC2021 Platform



Poster pitch presentations were also part of the program. In total, 154 PhD students and postdocs attended the event with almost as many of their supervisors. There were separate Speakers Lounges, where the speakers of the day were able to directly interact with their peers and exchange ideas.

Event of the year for young nematologists

Virtual Nematode Conference 2021

In addition to the scientific program, the participants had an opportunity to attend one of the three workshops during the second day of the event. The workshops tackled topics on PhD and postdoc challenges and solutions, tips and tricks for basic statistical analyses, and grant proposal writing. Moreover, there were plenty of social activities for the fun-loving young nematologists at the end of each conference day, be it a quiz night with loads of interesting facts about nematodes (and nematologists), virtual board games, or a contest for the best Nematode cocktail (no nematodes were added to the cocktails, hopefully).

As a small act of retribution to the restrictions that were justifiably brought up by the covid pandemic, the students shared with us their favorite pictures from the travels worldwide, being able to win the award for the best picture.

Contributed by Olivera Topalović
also thanks to Catherine Lilley for connecting to the VNC organizers.

What did attendees say?

"Thank you to organizers for the wonderful event. Pandemic did not let me attend any of the conference until third year of my PhD, but due to VNC2021 I was able to attend one. It was amazing experience to connect and to know the amazing work of nematologists around the globe through VNC2021."

Sonal Channale, PhD student, University of Southern Queensland

"The organization was amazing, presentations were wonderful and the chosen venue was incredible; a completely virtual yet interactive setup, allowing you to move your avatar around, like you would in real life, and interact with peers along the way. Great immersive experience and by far the best virtual conference I have attended!

If you ever need tips on how to host a virtual event, ask the VNC 2021 organizing committee!"

David Pires, PhD student, University of Évora/INIAV, I.P.

““VNC2021 was really a fantastic experience because it gave me a platform where I was able to share my ideas with the best Nematologists of the world. The ideas of different speakers broadened my vision of Nematode world. Now, I can honestly say that seminars or conferences like VNC2021 are really praise worthy. #10/10ForVNC2021”

Shaheen Majeed, PhD student, Baba Ghulam Shah Badshah University Rajouri, J&K, India

“Organizing the VNC2021 was a great experience. Also organizing one of the workshops was a nice experience. During the conference, I met many fellow PhD students from different universities. The talks were great and it was nice to see and hear that people enjoyed it a lot. Thank you VNC2021!”

Jaap-Jan Willig, PhD student, Laboratory of Nematology, Wageningen University

“Having begun my PhD in October 2019, the opportunity to attend my first conference albeit online was welcome. The niche international online ESN (European Society of Nematologist) congress in May 2021 tailored towards PhD students was a pleasant event. Apart from getting acquainted with the recent advances in nematology, I also had the opportunity to present my research which was a valuable experience. The knowledge of being around literal peers (fellow PhD students) gave it a more relaxed vibe fostering more interaction especially in the speakers lounge where you could interact with the previous presenters. The session on challenges facing PhD students was one of the highlights for me as it was comforting knowing that some of the challenges were not unique to me. All in all, I think it was a very high-quality successful conference. Kudos to the organizers for a terrific job in ensuring everything ran smoothly. I think it would be a great idea to have this niche conference annually as not every PhD student will have the opportunity to present in the larger conferences.”

Christopher Ogaya, PhD student at e-nema, Germany

From the president

Dear colleagues, friends and all ESN members,

I hope you are doing well and manage with online conferences, home office and all restrictions coming along with the pandemic. Although we are still concerned about the Covid-19 pandemic and hoping it will soon end, we continue with the plan to hold the 7th International Congress of Nematology 2022 from 1-6 May 2022 at the Palais des Congrès in Antibes Juan-Les-Pins (France). Pierre Abad is updating us about the planning in this new addition of NN.

Another important news is coming from the journal Nematology. David Hunt has retired from his position as editor. I like to thank David for his dedication to this journal, which is so important to all of us. David`s expertise and commitment to the journal much contributed to its increasing reputation among the nematologists community. Many of us have had publications published in the journal and we always knew they were in good hands and profited from his comment for improvement. I wish to express particular gratitude for David´s long-lasting, remarkable relation with the journal.

I like to welcome Andrea Skantar as new co-Editor-in-Chief. She is working at USDA, Beltsville at the Mycology and Nematology Genetic Diversity and Biology Laboratory. Some information is also provided in the NN.

Also in this edition you will find an extensive report on the First Virtual Nematology Conference 2021. In these days with limited chances to meet with colleagues face to face to discuss and exchange views on our work it is very important to keep up contacts. Another important activity of our society is to attract young scientists to nematology. This event was an excellent idea initiated by Geert Smant (WUR, NL) and supported and organized by several PhD students. Reading the report, you will see how important this event was to keep up with the latest science and interact with young colleagues distributed all over the globe. Thanks for organizing this conference and I can assure you that the board will do everything that such activities will be continued in the future.

And this was not the only on-line event. A first symposium presented work on entomopathogenic nematodes and their bacteria. Thanks to Adler Dillman and Helge Bode for their contribution to and IFNS for organizing the event.

I like to remind you two members of the board, Philippe Castagnone and myself are leaving the governing board. We have come to the end of our mandate and need to be replaced. I herewith invite the membership to nominate candidates for these vacancies.

Last not least, I wish to thank Bart Vandenbossche, who provided professional support for Wim Wesemael in editing this edition of the NN. Many thanks to our secretary Eric Grenier for keeping us on track and communicating with the membership and Rolo Perry for proving the latest news of some interesting publications in the journal Nematology.

We are living in times of change. People´s opinions drift apart, dividing our societies. This is often going along with a lack of respect and tolerance. But on the other hand, we also see an increasing awareness, particularly of younger people, for the problems related with the climate change and many take actions to save the planet. International exchange and cooperation is a powerful tool to overcome ignorance and lack of knowledge. I have experienced lots of fruitful activities of our society members during this year. This makes me confident for the future of our society. Taking about little animals we have made a contribution to make this world a better place.

I wish all of you a peaceful and relaxing holiday season.

Ralf-Udo Ehlers

"Crossing borders: a world of nematode diversity and impact to discover"

7th International Congress of Nematology
ICN 2022
Antibes Juan-les-Pins - France

ICN 2022 Registration Re-Opening Soon!

The Seventh International Congress of Nematology will occur 1-6 May 2022 at the Palais des Congrès in Antibes Juan-Les-Pins (France). All previous arrangements made by registrants for the pandemic-delayed ICN 2020 have been maintained. Early-bird registration and abstract submission for new delegates will open 15 November 2021 and continue through 28 February 2022.

• If you registered for ICN 2020, you need do nothing at this time. You will be contacted later this year to confirm/modify your registration/lodging details and you will have the opportunity to submit a new abstract.

• Registration substitutions (due to laboratory personnel changes, etc.) are permitted.

• Options for online viewing of sessions are being explored in the event conditions in some regions warrant their implementation.

• If you were an ICN 2020 bursary recipient, the award remains valid. You will be contacted soon to confirm your participation.

• Depending on availability there may be opportunities for new students to compete for bursaries.

• The scientific program will be maintained as nearly as possible in its current form, but with revised dates. Authors will have the opportunity to change/revise their original abstracts and session organizers will have the ability to review and revise their agendas. We kindly ask authors not to contact us at this time as conference arrangements are being adjusted.

Registration for the Seventh International Congress of Nematology is currently six hundred and eighty-two nematologists from 57 countries, including 100 student and early career scientist bursary recipients. The scientific program comprises 32 concurrent sessions with 288 oral presentations, 12 workshops, 12 keynote speakers, and poster sessions with more than 500 presentations. The mid-meeting excursions will provide outstanding opportunities to explore the splendid nature and the rich culture of the French Riviera. We look forward to welcoming you in Antibes in 2022, to celebrate gathering together again at a truly memorable scientific meeting.

Dr. Pierre Abad, 7th ICN Chair
Ernesto San-Blas, Scientific Program Chair
Larry Duncan, IFNS President

Nematology labs in the picture!

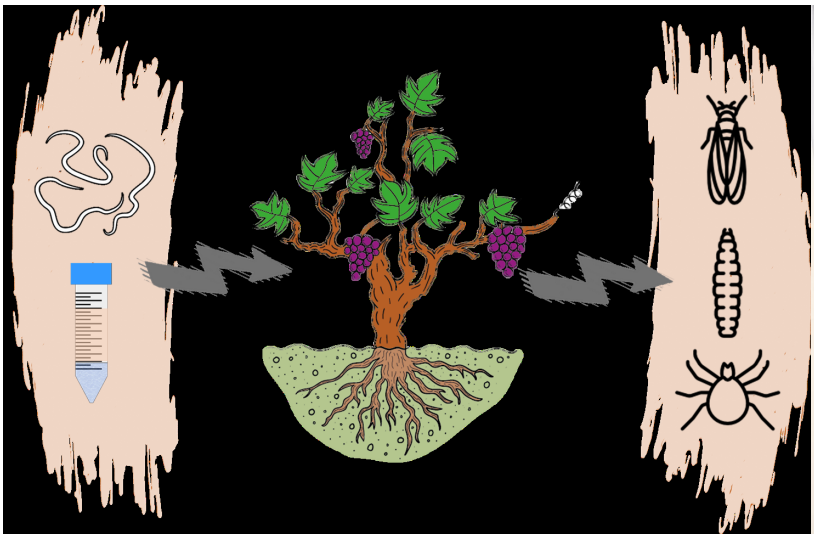
Raquel Campos-Herrera

Entomopathogenic nematodes and sustainable control of arthropod pests in vineyards (SOS-VINE)

Several biotic threats compromise the quantity and quality of grapevine for achieving the best standard for the wine industry. These include the European vine moth Lobesia botrana (Lepidoptera: Tortricidae) and the spider mite, Tetranychus urticae (Acari: Tetranychidae), the arthropod pests with the highest impact on a global scale. However, the current climate change urges the management of other pests threatening the immediate future of the vineyard. In this regard, the foaming cicada Phillaenus spumarius (Hemiptera: Aphrophoridae), the vector of Xylella fastidiosa (Proteobacteria: Xanthomonadaceae) in Europe, is a pest-disease complex that threatens vital crops in the Mediterranean basin. Likewise, the biotic stress caused by these pests can alter the physiological functions of the plant, for example, modifying the composition of secondary metabolites involved in defense mechanisms that disturb basic properties of the grape such as color, flavor, or aroma, to the detriment of the final quality of the product.

In this context, the group lead by Dr. Raquel Campos-Herrera at the Instituto de Ciencia de la Vid y del Vino (ICVV-CSIC, Spain), is working on the project "Novel strategies for persistent and emergent arthropod pest management on the vine and their impact on the grape quality" (SOS-VID, referencePID2019-104112RB-I00). The aim is to develop new management strategies for a wide range of pests (persistent and emerging) of arthropods of the vine, as well as to evaluate their impact on the quality of the grape, based on the use of entomopathogenic nematodes (NEPs) and the secondary metabolites of their symbiotic bacteria.

Researchers at ICVV will develop the grant supported by a multidisciplinary team from USDA (Georgia, USA) and the universities of ETH-Zurich (Switzerland), Western University (Canada), and Adan University (Turkey). This project is funded as part of the Ministry of Science and Innovation through the State Research Agency (AEI, Retos 2019) and has a term of 3 years.



Nematology labs in the picture!

Sara-Sanchez Moreno

In Southern Europe, climate change will seriously threat Mediterranean agriculture in the near future. Heat waves and drought episodes have increased in the last 60 years, and have already produced relevant crop losses in cereal-growing areas. Mediterranean agricultural soils, with low soil C and subjected to desertification risks, are especially vulnerable to climate change. In the last 50 years, soil C has continuously decreased in Mediterranean semi-arid areas mainly due to the decline of C inputs into agricultural soils after the green revolution. In such soils, increasing soil C is a key mitigation strategy to face climate change. Increasing soil C also benefits the thousands of species that inhabit soils, including soil nematode communities and other organisms responsible of agroecosystem functions and services.

The project "Soil organic carbon and biodiversity as mitigation tools of the effects of climate change on crops, CLIM BIOSOIL", lead by Dr. Sara Sánchez-Moreno at the National Institute for Agricultural and Food Research and Technology (INIA) joins the efforts of a multidisciplinary team from several Spanish institutions (IFAPA, CIAPA, UCM, UNAV) to assess the effects of climate change in semi-arid agricultural systems. To achieve such goals, we have established two field experiments in Central and Southern Spain using open-top chambers and rain-out shelters to experimentally increase air temperature and decrease water availability in wheat-legume rotation experiments. For four years, we will assess crop physiology, crop yield and quality, nutrient cycling, and soil biodiversity in soils subjected to climate manipulation. Besides, several experiments on the efficiency of organic inputs and biodegradable mulches to mitigate the effects of climate change on soil biodiversity and functioning will be performed. Within such context, the study of soil nematode communities will be key aspect to determine the role of soil diversity in the adaptation of agricultural systems to drought and warming.

This project is funded by the Ministry of Science and Innovation through the National Research Agency (AEI, Retos 2019) and has a duration of 4 years.

Sara Sánchez Moreno, INIA.
Miguel Talavera Rubia, IFAPA.

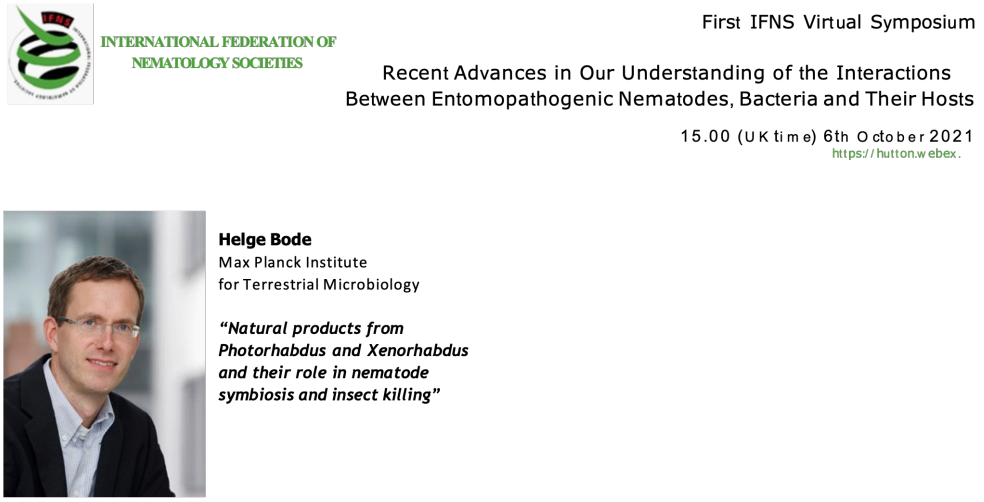
Open-top chambers and rain-out shelters established in two experimental fields with contrasting climatic conditions in Madrid and Cádiz (Spain).

Your lab here? Contact Bart (b.vandenbossche@e-nema.de) or Wim (wim.wesemael@ilvo.vlaanderen.be)

First IFNS Virtual Symposium highly attended

A first IFNS symposium was organized titled: Recent Advances in Our Understanding of the Interactions Between Entomopathogenic Nematodes, Bacteria and Their Hosts. Thanks to Adler Dillman and Helge Bode for their magnificent talks and John Jones and IFNS for organizing the event.

The meeting recording is available under: https://www.ifns.org/first-ifns-virtual-symposium



IFNS 3 minutes thesis contest videos online!

INTERNATIONAL FEDERATION OF
NEMATOLOGY SOCIETIES

IFNS received for its first 3 Minute Thesis contest 22 applications representing different countries: Brazil (2), Chile (2), USA (3), Belgium (4), England (2), Ireland (2), Portugal (1), Kenya (3), Australia (1), India (1) and South Africa (1). Three entries each from 3 "regions" (Americas, Europe, All Others) were selected by separate judging panels of IFNS councilors. These nine finalists will be judged by a panel of 6 nematologists and 3 'non-experts' from other areas of plant sciences.

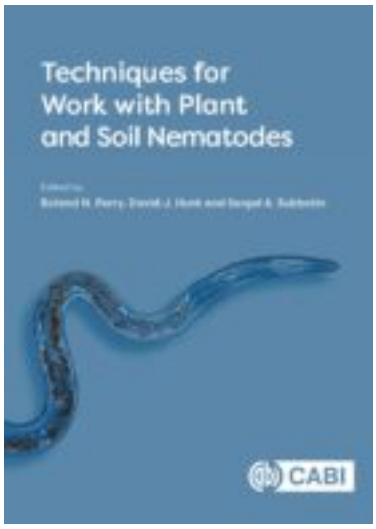
Congratulations to all the students who put together some amazing talks! Everyone can already enjoy the videos of the nine finalists on the IFNS website.

Link: https://www.ifns.org/ifns-3-minute-thesis-advances-to-final-round

Book reviews (reproduced from Nematology with permission)

ROLAND N. PERRY, DAVID J. HUNT & SERGEI A. SUBBOTIN (Eds).

Techniques for work with plant and soil nematodes.



Wallingford, UK, CAB International, 2021, 312 pp. ISBN: 9781786391759 ePub 9781786391773. Price: £95.00; €110.00; $130.00

It was a great pleasure to receive and review *Techniques for work with plant and soil nematodes*. Indeed, no sooner than it had been unwrapped from the stiff carboard packaging, I found myself leafing through the pages to look for information on extraction methods for one of our newest Ph.D. students, who is working on stubby root (*Trichodorus* spp.) and needle nematodes (*Longidorus* spp.). For many years, our group, like others, have referred to the MAFF/ADAS Reference Book, *Laboratory methods for work with plant and soil nematodes* edited by John Southey (1986) for standard methodology. Despite being a 'fount of knowledge' for all things nematology, this book was desperately in need of an update with regard to more recent techniques (35 years' worth) and also the unavailability of noxious reagents that have been banned subsequently due to their risk to human health and/or the environment. Despite the similar titles, the current book differs from the book edited by Southey in a number of ways. Firstly, and as expected, there is a far more comprehensive and up-to-date range of content to assist those studying plant-parasitic and free-living nematodes. The book covers everything from sampling, extraction, traditional enumeration, handling, preparation of mounts and nematode measurements, in addition to electron microscopy, resistance screening, molecular techniques, staining chromosomes and even designing assays to assess behaviour and physiology. This extensive range of topics provides everything needed to support those who are new to nematology, such as postgraduate students, as well as those with experience. As well as having a good topic range, this book is easier to use than the book by Southey or unpublished manuals for nematology courses. Each chapter has a helpful introduction that provides background based upon reviewed literature and the personal experiences of the author(s).Before progressing to the individual techniques/methods, I would recommend taking the time to read the introductory material, as it contains general principles and guidance on selecting specific methods. The techniques themselves are laid out with the details of the materials needed and stepwise instructions for performing the task. There are often useful introductory notes that provide the reader with a critical evaluation of the technique, *e.g.*, suitability for nematode genera, links to websites for supplies and technique modifications or variations. Details on topics such as the best nematode picks are simple, but important – I will certainly be looking to obtain some EndoHandles for our group!

Moreover, the book is packed with colour photographs, schematic diagrams, graphs and tables of collated information. These figures add quality and improve accessibility; a photograph or diagram is really helpful when trying a new technique or assay in the laboratory.

As already indicated, the book has chapters on modern techniques that would otherwise only be available in a condensed form through peer reviewed publications, or in unpublished research group literature. An example would be the chapter on resistance screening, which describes and illustrates a range of different set ups, such as closed container systems, seedling growth pouches and the 'Rootrainer book' used by the James Hutton Institute for screening resistance to potato cyst nematodes. For molecular diagnostics, there are helpful notes on DNA extraction and PCR, as well as a fantastic table that collates the currently available published universal (ribosomal RNA genes) and species-specific primer pairs. The final chapter provides detail on DNA sequencing and phylogenic analysis covering everything from choice of programs to management of sequence data and searching of sequence databases *i.e.*, BLAST.

I have no doubt that *Techniques for work with plant and soil nematodes* will be an invaluable reference to both students and experienced nematologists for identifying traditional and molecular techniques. This is not a book that will sit pristinely on our bookshelves; it is a book that will travel in and out of the laboratory or back home for some evening study.

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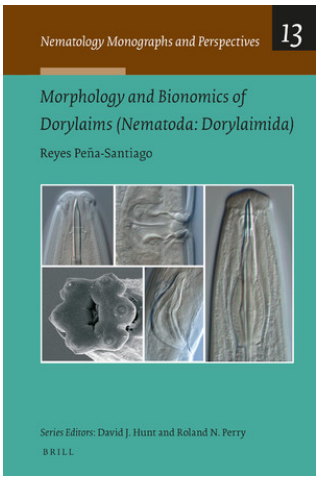
REYES PEÑA-SANTIAGO.

***Morphology and bionomics of Dorylaims (Nematoda, Dorylaimida). Nematology Monographs and Perspectives 13*. (Series editors: David J. Hunt and Roland N. Perry)**



Leiden, The Netherlands, Brill, 2020, 278 pp. ISBN: 978-90-04-43999-3. Price: €116; US$140.

Dorylaimida, generally referred to simply as dorylaims, are maybe the most diverse and widespread group of free-living nematodes, represented by more than 3300 valid species. They are an object of interest for people dealing both with faunistic surveys and with the ecology of soil and

freshwater environments, dorylaims being very common in such habitats where they make a large contribution to nematode biomass and are considered to be good bioindicators of environmental quality. Some taxa of Dorylaimida are plant parasites and are well studied all over the world. For these reasons, the literature concerning dorylaims is very abundant, covering many different branches and is scattered in an impressive number of publications, mostly concerning specific groups of this taxon. The most recent, important monographs on the whole group are those by Jairajpuri & Ahmad (1992) and by Andrássy (2009), which mainly deal with the taxonomic aspects. The present book, whose author, Reyes Peña-Santiago, has dedicated most of his scientific and academic activity to the study and teaching of dorylaims, is the first to provide an in-depth study of the morphological and biological aspects of the taxon.

Dorylaims, which constitute a monophyletic taxon, are characterised by some autapomorphic characters, namely the stoma armed with a protrusible structure, the pharynx divided in two parts, the presence of a prerectum, one pair of precloacal genital papillae, and the absence of caudal glands. Still, this basic pattern has undergone considerable morphological variation which, during adaptive radiation in the course of their evolution, has resulted in many different patterns in a very complex and intricate way. Though the most recent works on the taxonomy of dorylaims try to throw some light on the true phylogenetic relationships between taxa with the aid of molecular analysis, the data available are still very few and therefore the knowledge and correct interpretation of the detailed morphology of the various body traits is still fundamental in the study and comprehension of the phylogeny and the taxonomy of this very rich and complex group of nematodes.

The book is divided into 14 chapters. The first chapter (*Concept*) provides a synthesis of the taxon: main diagnostic characters, biology, diversity and distribution. The succeeding nine chapters, which constitute the bulk of the book, deal in a detailed way with the main aspects and structures of the body, namely: *General aspect* (size, shape, habitus, colour); *Body wall and pseudocoel* (cuticle, body pores, epidermis and lateral chords, somatic musculature, pseudocoel and its components); *Lip Rregion and amphids* (lip region shape: profile, anterior margin, tapering, differentiation; lips and their papillae: general pattern, lips, papillae, oral aperture, oral field; amphids: basic structure, position, aperture, fovea); *Stoma and feeding apparatus* (cheilostom, guiding ring, guiding sheath, mural tooth, axial odontostyle, odontophore, musculature); *Digestive tract* (pharynx general morphology, sectors, ultrastructure, anterior section, enlargement, basal expansion and pharyngeal glands, basic patterns, pharyngo-intestinal junction, intestine, prerectum, rectum); *Female genital system* (General concept and terminology, ovary, oviduct, sphincter, uterus, vagina, vulva, malformations or abnormalities); *Male genital system* (General concept, testes, genital tract, spicules, lateral guiding pieces, gubernaculum, genital and other papillae, specialised

musculature, associated glands); *Nervous system and receptors* (central nervous system, nerves, cephalic nervous system, pharyngeal nervous system, rectosympathetic nervous system, and sensory structures such as chemoreceptors and mechanoreceptors); and *Caudal region* (general concept, tail shape, tail sexual dimorphism, postembryonic changes in tail shape, functional and evolutionary aspects). The text of each of these chapters is accompanied by fine illustrations, both line drawings and LM and SEM photographs, which are useful to enhance understanding of the descriptions.

The remaining chapters are devoted to the main aspects of the biology of the group: *Feeding habits and feeding behaviour*. Although being considered mainly as predatory or omnivorous, dorylaimids appear to have a wider spectrum of feeding habits. this chapter there is a compilation of predatory species and their corresponding prey, with an indication of the type of study carried out and the associated references, together with a compilation of all the other feeding sources of these nematodes; *Reproduction and development*. All the aspects related to sexual reproduction and embryonic and postembryonic development are treated. An overview of the life cycles and life span of numerous species is furnished; *Ecology and biogeography*. This chapter deals with many aspects of the role of dorylaimids in soil and freshwater communities. Different parameters, such as species richness and abundance, biomass, vertical distribution and habitat, are considered. An overview of the main aspects of their distribution in the world is also given; and in the last chapter, *Diversity*, in addition to a historical outline running from the origins of the group up to the most recent integrated analysis, morphological and molecular aspects, an approach to the construction of a taxonomy based on phylogeny, and an updated inventory of dorylaimid taxa are also provided. The order includes 18 families, 363 nominal (290 valid) genera, and 3410 nominal (3029 valid, 245 synonymous, 136 *incertae sedis* or *inquirendae*) species. An outline classification of subordinal, family, subfamily and generic rank taxa, based on updated compilation from the available literature, is presented. Each chapter of the book is supplemented by a list of pertinent references.

In summary, this book, due to the richness and the high quality of information supplied, is a fundamental tool and a valuable resource both for students and for scientists involved with the study of this very important group of nematodes.

References

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Jairajpuri, M.S. & Ahmad, W. (1992). *Dorylaimida. Free-living, predaceous and plant-parasitic nematodes.* Leiden, The Netherlands, Brill.

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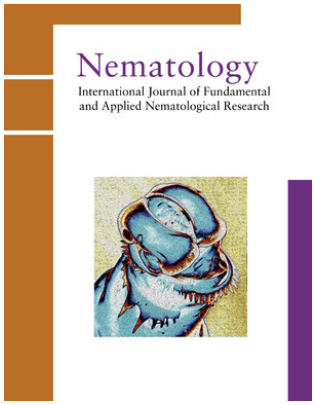
Highlights of *Nematology* volume 23 (2021)

This year's volume of *Nematology* contains 75 full Research Papers, six Short Communications, one Forum Article, one Review Article and two Book Reviews. The Impact Factor is 1.442. Each volume of *Nematology* contains 10 issues. All articles are available online with a DOI immediately corrected proofs are returned. *Nematology* papers, including the earlier papers of *Nematologica*, are available on Brill's online platform at: http://booksandjournals.brillonline.com/content/15685411

ESN/SON/ONTA members can subscribe to Volume 24 (2022) of *Nematology* at the special individual e-only member subscription rate of €141/US$159 (excluding VAT). Please send your order to brill@turpin-distribution.com, quoting action code 70258. Price group/type to be entered as 'society/member'.



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Below, Roland Perry highlights **five papers from Volume 23**.

1. **Research paper**

Gene expression analysis of oxidative stress tolerance in the entomopathogenic nematode *Heterorhabditis bacteriophora*

Nanette Hope SUMAYA *et al*.

Nematology 23 (2021) 15-31. DOI:10.1163/15685411-bja10025

The entomopathogenic nematode (EPN) *Heterorhabditis bacteriophora* is used as a biological control agent against diverse insect pests. Nematode-based products contain third-stage Dauer juveniles (DJ), whose longevity can be limited by stress conditions. This study reports a comparative transcriptomic analysis on the early stage of oxidative stress induction (4 h) in two *H. bacteriophora* inbred lines with contrasting oxidative stress tolerance, HU2-IL1 (stress-tolerant) and PT1-IL1 (stress-sensitive). For assessing the transcriptome, MACE, a versatile RNA-seq variant was applied. The de novo transcriptome assembly generated more than 20,000 transcripts, from which 10,290 were linked to 9776 different Uniprot accessions. A total of 630 and 461 transcripts were up-regulated (log2 fold-change (FC) 2.0) in the stress-sensitive and the stress-tolerant line, respectively. The proportion of down-regulated transcripts was higher for both lines. However, down-regulation in the stress-sensitive line (5207 transcripts) exhibited a larger proportion than in the tolerant line (1844 transcripts), which indicates that targeted suppression of biological processes is also a crucial factor for the survival of *H. bacteriophora* under oxidative stress. Indications are that the stress-sensitive line fails to maintain vital biological processes in contrast to the tolerant line. This study will open ways for the selection of DJ longevity predictor genes and allow the design of molecular markers for the breeding of improved lines.

2. Review article

***Meloidogyne enterolobii*, a threat to crop production with particular reference to sub-Saharan Africa: an extensive, critical and updated review**

Raymond Lesley COLLETT *et al.*

Nematology 23 (2021) 247-285. DOI: 10.1163/15685411-bja10076 (Open access)

Since its description in 1983, *M. enterolobii* has become a pest of great concern, particularly due to its virulence, which renders controlling this nematode pest a challenge. In this Review article, the global distribution of *M. enterolobii* is summarised, with emphasis placed on limited research done for the species in sub-Saharan Africa where food production and security is threatened by root-knot nematode parasitism. Novel advances in methods used to detect *M. enterolobii* are mentioned, especially the improvement in advanced molecular techniques that complements shortcomings in morphology and morphometic approaches. Despite these exciting developments, the employment of effective management strategies to combat the species remains problematic. Future research on various aspects of *M. enterolobii* is crucial, with focus to be placed on the use of available resources to contain damage caused by this species.

3. Forum article

Comparing the efficiency of six common methods for DNA extraction from root-lesion nematodes (*Pratylenchus* spp.)

Valeria ORLANDO *et al.*

Nematology 23 (2021) 415-423. DOI: 10.1163/15685411-bja10049

Robust and accurate identification of root-lesion nematodes (*Pratylenchus* spp.) is an essential step for development of an effective management strategy. DNA-based techniques provide rapid identification, and efficient and repeatable DNA extraction is central to molecular methodologies. In this Forum article, six common DNA extraction protocols were compared to evaluate their efficiency to obtain quality DNA samples for *Pratylenchus penetrans*. Samples with five and ten individuals of *P. penetrans* were successfully extracted and amplified by all extraction methods tested, whereas samples with a single nematode presented challenges for DNA amplification. Among all methods tested, the DNA extraction protocol with glass beads proved to be efficient for *P. penetrans* as well as *P. crenatus*, *P. neglectus* and *P. thornei*, generating high quality DNA at comparatively low cost and with a rapid sample throughput.

4. Research paper

Combined effect of *β*-aminobutyric acid and silver nanoparticles on eggplants, *Solanum melongena*, infected with *Meloidogyne javanica*

Samaneh S. SHEKOOHI *et al.*

Nematology 23 (2021) 1077-1092. DOI**:** 10.1163/15685411-bja10096

The acquired resistance of plants to root-knot nematodes (*Meloidogyne* spp.) can be achieved by applying chemical inducers, such as *β*-aminobutyric acid (BABA). Recently, the use of metal nanoparticles with multifunctional use against plant-parasitic nematodes has been presented. The effect of different concentrations of silver nanoparticles (AgNPs), synthesised from aqueous leaf extract of *Malva sylvestris*, on hatching and mortality of the second-stage juveniles (J2) of *Meloidogyne javanica* was investigated *in vitro*. The effects of AgNPs on eggplants infected with 0, 1, 2, 4 and 8 eggs (cm^3 soil)$^{-1}$ were investigated under glasshouse conditions. The combined effects of AgNPs and BABA on eggplants infected with 4 and 8 eggs (cm^3 soil)$^{-1}$ were investigated in a further study. The results showed that increasing the concentration of AgNPs the hatching of *M. javanica* decreased and the mortality of J2 increased. The number of eggs, galls, egg masses and reproduction factor in plants treated with AgNPs infected with 4 eggs (cm^3 soil)$^{-1}$ decreased by 43.4, 24.7, 23.5 and 43.2%, and in plants infected with 8 eggs (cm^3 soil)$^{-1}$, decreased by 64.5, 25.5, 63.1 and 64.5%, respectively, compared to control plants. The reproduction factor in infected plants with 4 and 8 eggs (cm^3 soil)$^{-1}$ that were treated with BABA (1 mM) and AgNPs decreased by 51.6 and 55.9%, respectively, compared to control plants. The results demonstrated the effects of BABA, AgNPs and the combination of these two substances in reducing the damage of different inoculum densities of *M. javanica* in eggplant.

5. Research paper

Transcriptome analysis of nematode-responsive genes in two susceptible Indica rice cultivars

Jiansong CHEN *et al.*

Nematology 23 (2021) 1109-1124. DOI**:** 10.1163/15685411-bja10098

Meloidogyne graminicola is a major plant pathogen damaging rice. Altering a plant susceptibility gene that critically facilitates compatibility is considered one of the most effective strategies to control plant pathogens. However, no resource is currently available regarding *M. graminicola* susceptibility genes in Indica rice cultivars. In this study, transcriptome analysis was used to elucidate nematode-responsive genes to the two susceptible Indica rice cultivars ‘Guinongzhan’ and ‘Wushansimiao (R534)’ with distinct levels of susceptibility to *M. graminicola* at 3 days post-inoculation (dpi). A total of 33157 transcripts corresponded to

the predicted genes in the Indica rice genome. Among these, 2062 and 1386 differentially expressed genes (DEGs) were identified in 'Guinongzhan' and 'Wushansimiao (R534)', respectively, as a result of nematode infection. Cluster analysis showed that 2184 DEGs were commonly regulated and 503 DEGs were differentially regulated in 'Guinongzhan' and 'Wushansimiao (R534)'. These DEGs were involved in defence, the Ca^{2+} signal pathway, cell wall, hormone pathways, the ubiquitin proteasome system and transcription factors. In addition, candidate genes that may be involved in rice defence responses and susceptibility to *M. graminicola* were identified, and some of them were further validated by quantitative real-time RT-PCR. The transcription data reveal insights into the susceptible rice gene expression pattern changes upon nematode infection, and provide a novel set of candidate defence-related and susceptibility genes in Indica rice cultivars for *M. graminicola*.

Roland N. Perry
Editor-in-Chief, *Nematology*

Change in Editorial Board Nematology - David Hunt has retired after 20 years

Next year's volume of Nematology will mark a change. After 20 years as co-Editor-in-Chief, David Hunt has retired. David has been instrumental in editing taxonomy papers, and during his tenure he has overseen the increasing importance of molecular techniques and integrating these approaches into nematode descriptions. His care and attention to detail have been the hallmarks of the pre-eminent scientific quality of the papers for which he has been responsible. As well as assessing scientific content, he has interacted effectively with authors to ensure that high standards, both of illustrations and grammar, are maintained. His occasional intractable stance on such matters was motivated by the need to retain the premier status of Nematology; that he has done so effectively is a testament to his outstanding contribution and scientific integrity.

It is my pleasure to welcome Andrea Skantar as co-Editor-in-Chief. Andrea will process the spectrum of papers for which David was responsible. Her wide knowledge of nematology, especially current molecular techniques, will be an asset to the journal and her input on all aspects will be especially important in ensuring the effective development of Nematology.

Have an enjoyable Christmas and a Covid-free New Year!

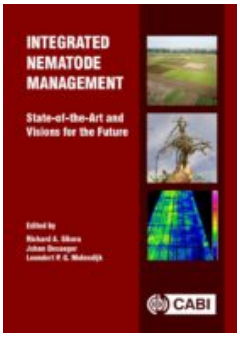
Rolo

Andrea Skantar: new co-editor Nematology

Dr. Andrea M. Skantar earned a Bachelor's degree in Cell and Molecular Biology from Pennsylvania State University in 1984 and a Ph.D. in Biochemistry from Duke University in 1993. After postdoctoral research at North Carolina State University, she joined the USDA-ARS Nematology Laboratory (now known as the Mycology and Nematology Genetic Diversity and Biology Laboratory) in Beltsville, MD as a Research Molecular Biologist. Her laboratory focuses on nematode phylogenetics and developing molecular diagnostics for plant-parasitic nematodes of regulatory or agronomic concern. In 2008, she received the Syngenta Award for Research Excellence in the Field of Nematology. She's been very active in the Society of Nematologists since 1997, serving as Secretary, as reviewer and editor for the Journal of Nematology, and as appointed Editor-in-Chief from 2015-2017. She just recently finished her term as President, where she spearheaded several initiatives to improve communication and society operations, and served on the board of the Nathan A. Cobb Foundation. She has also served as Secretary and established a social media presence for SON. She has served on the Editorial Board of Nematology since 2010 and as an ad-hoc reviewer for many journals and grant panels. Thanks to David, Rolo, and Stefan for this opportunity. It is a true honor to be chosen for this role. I will do my best to maintain the high standards you have come to expect from Nematology.

~Andrea

Tip: New book on Integrated Nematode management available



This great book edited by Richard Sikora, Johan Desaeger and Leendert Molendijk tackles in a systematic crop by crop approach the state-of-the-art management strategies that have been developed to reduce nematode impact, and outlines their limitations. It contains 65 chapters written by 80 experts and contains more than 300 coloured pictures showing symptoms of damage.

"Integrated Nematode Management: State-of-the-art and visions for the future"
The book is available as an open-access e-Book, and is free to anyone interested in the download.

https://www.cabi.org/bookshop/book/9781789247541/

2022 Governing board elections

Dear ESN member,

ESN constitution foresees the election of new members of the governing board. Two members of the board (Ralf-Udo Ehlers and Philippe Castagnone) have come to the end of their mandate and need to be replaced. I herewith invite the membership to nominate candidates for these vacancies. “Each nomination shall be made by a member of the Society and shall be seconded by another member of the Society” (article VI B, internal rules). So each nomination should be supported by an independent member of ESN in writing. In view of the next General Assembly that will occur during the ICN in early May 2022, **the deadline for submission of nominees is February 11, 2022**. **Nominations and supporting letters should be sent to the secretary (**eric.grenier@inrae.fr**)**. I’m looking forward to receiving nominations

Eric Grenier

Why join the ESN? - the movie

Please have a look at our video “Why join the ESN ?” made from some interviews during the 2016 ESN meeting. You can access this video via the homepage of our website https://www.esn-online.org

Also available at this address

https://www.dropbox.com/sh/ebk0lvge179crq2/AABu_zaqEM-YJayZB1Zr9ZC8a?dl=0

Twitter link : https://twitter.com/ESNematologists/status/869574031032365056

Upcoming meetings

1 to 6 MAY 2022 - CONFERENCE CENTRE OF ANTIBES JUAN-LES-PINS - FRANCE

“Crossing borders: a world of nematode diversity and impact to discover”

7th International Congress of Nematology

ICN 2022

Antibes Juan-les-Pins - France

European Society of Nematologists

73rd ISCP - 24th May 2022 (online event)

https://www.ugent.be/bw/plants-and-crops/iscp/en

ISCP

INTERNATIONAL SYMPOSIUM ON CROP PROTECTION

61st Annual Meeting of the Society of Nematologists - Sept 26 - 29, Anchorage, Alaska

https://nematologists.org/2022_ALASKA

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Information needed for the newsletter

The ESN Governing Board would like this newsletter to be a Forum that is more widely used by the membership to share news and information. So, if you have any information and/or images that might be of interest to ESN members please send a note to the editors (Wim Wesemael - wim.wesemael@ilvo.vlaanderen.be or Bart Vandenbossche - b.vandenbossche@e-nema.de). All that is needed is a small amount of text in a word file or an email message, along with an accompanying image.