European Society of Nematologists

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Nematology News

ESN Ghent: 9 - 13th September 2018

The 33rd ESN Symposium will take place in the medieval city of Ghent, Belgium. Lonely planet called Ghent "Europe's best kept secret" and in Rough Guides we read "Off all cities in Belgium, it's hard to trump Ghent"

ESN Gent 2018 is organised by the Flemish research institute for agriculture, fisheries and food (ILVO) and Ghent university.

Check out the ESN website for regular updates on the ESN Gent 2018 symposium https://www.esn-online.org/

2017 Governing board elections

The ESN constitution foresees the election of new members of the governing board. Two members of the board (Jim Baldwin and John Jones) 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. The nominees who fulfil the requirements for the Governing Board membership shall be listed as candidates for election and be published two months prior to the electronic vote that will be organized at the end of 2017 (note that only members who have paid their 2017 fee will be allowed to vote). **The deadline for submission of nominees is September 30th, 2017. Nominations and supporting letters should be sent to the secretary (eric.grenier@inra.fr).** I'm looking forward to receiving nominations.

Eric Grenier

Membership renewal

If you have not yet paid your ESN membership for 2017, please RENEW YOUR MEMBERSHIP NOW!

Paid memberships include:

- Special individual e-only subscription rate to Nematology
- Discounted registration fees at the meetings of the Society
- ESN Newsletter "Nematolgy News" sent by email twice a year.
- Student members are eligible to apply for bursaries that provide a contribution towards the costs of attending ESN meetings.

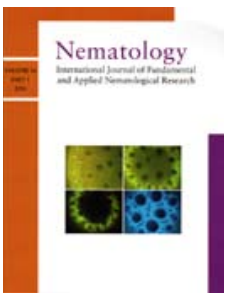
How to renew your membership:

Please visit our website https://www.esn-online.org/. Memberships costs 20€/year. Please pay your dues on time and don't wait until just before the next ESN meeting. Once log in to your "Member" area you can update your profile and see if you need to renew your membership. Don't delay – memberships run on a calendar year basis.

You can now also pay on-line by bank transfer. Contact your country representative if you prefer not to purchase online.

Remember that the names and the subscription years must be clearly indicated to the treasurer when a payment is made from another bank account than your personal one.
For any further questions regarding payment or website access, please contact, respectively, our treasurer (hans.helder@wur.nl) or our website manager (wim.bert@UGent.be).

Discounted subscription to *Nematology* for ESN members



Members are reminded that they can subscribe to the 2017 Volume of *Nematology* at the special individual e-only member subscription rate of € 133/US$ 166 (excluding VAT). Please send your order to brill@turpin-distribution.com, quoting action code 70258.

Highlights from recent Nematology issues can be found on pages 4-5

21st Symposium of the nematological society of Southern Africa

7-11th May 2017

For the first time in 20 years the NSSA symposium travelled to KwaZulu-Natal. The venue was the Fairmont Zimbali Resort. And what a special symposium it was! From ocean views, to photo booth silliness and a touch of luxury, it was definitely a symposium full of great memories.

The theme of the symposium was 'New beginnings: adapting to a changing environment' referring to climate change but also the changing research landscape in nematology. There were 96 full delegates including 4 invited international guest speakers, 10 additional international delegates and 26 students. A total of 87 presentations, of which 32 posters, were given. The proceedings can be downloaded from http://www.sanematodes.com/Documents/Proceedings_2017.pdf

Day 1 was opened by Prof. Roland Schulze (University of KwaZulu-Natal), who took us for a meal, in the context of climate change of course. The many talks on EPNs and free living nematodes were preceded by keynote speaker Dr Raquel Campos-Herrera (Universidade do Algarve, Portugal). She focussed on multi-trophic interactions in the soil to enhance the biocontrol of insects. The day ended with an evening workshop held to discuss a risk assessment procedure for the introduction of exotic EPN species into South Africa. A workshop on the economic impact of nematodes on various crops started **day 2** that was further filled with a variety of topics nut mainly focussed on management of plant-parasitic nematodes. The symposium photo was taken at tea time and the day ended with a craft beer tasting from a local brewery and some pampering massages. On **day 3** the poster session was held and Adoration Shubane closed the scientific part with a very enthusiastic presentation on the carrot cyst nematode *Heterodera carotae*.

The gala dinner was held at the Oyster Box Hotel, an iconic Durban venue. Sheer elegance is the only way to describe this venue and we saw that from all our delegates as well. This night was not only the culmination of a great symposium but years of hard work on the book titled "Nematology in Southern Africa: A view from the 21st century" which was launched at the gala dinner. The jazz band provided the perfect background music for the occasion. Loads of fun was had by all and the symposium ended on a high note.

The best word used to describe the symposium was by far EXTRAVAGANCE* and that is the parting shot I would like to leave you with!

Until next time

Prabashnie Ramouthar (Symposium chairperson)

* For further details see at the bottom of page 5

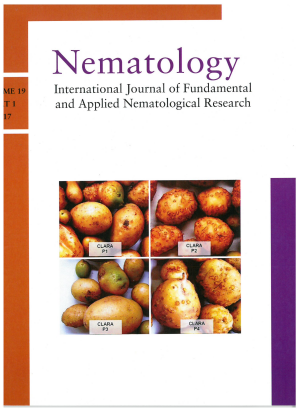
Nematology highlights

Nematology will now consider Review articles for publication, in addition to the full Research papers, Forum articles and Short Communications that are currently published. *Nematology* papers, including the earlier papers of *Nematologica*, are available on Brill's online platform at: http://booksandjournals.brillonline.com/content/15685411; all articles are available online with a DOI immediately corrected proofs are returned.

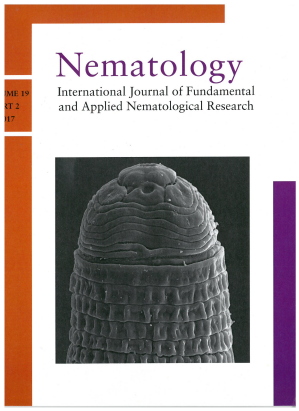
The first five issues of *Nematology* volume 19 (2017) comprised 3 Forum articles, 43 full research papers and 1 book review. Here, Roland Perry highlights a paper from each of the last five issues.

Highlights of Vol. 19 (2017) Issues 1-5

Issue 1



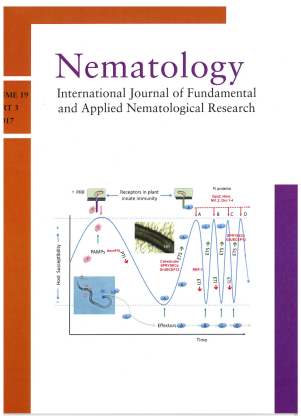
Root-lesion nematodes (*Pratylenchus* spp.) are a major global nematode pathogen. Detection is important as species such as *Pratylenchus crenatus*, *P. neglectus* and *P. penetrans* are quarantine organisms. In a paper (pp. 81-91) entitled *Hydrolysis probe-based PCR for detection of* Pratylenchus crenatus, P. neglectus *and* P. penetrans, Claudio Oliveira and colleagues describe the development and evaluation of a diagnostic method for detection of the three species based on a hydrolysis probe qPCR assay. The assays were developed for use in routine sample screening to detect and quantify each of these three species, and increase sample throughput and accuracy.



Issue 2

The genus *Ditylenchus* contains more than 60 species, some of which are agriculturally important pests. *Ditylenchus dipsaci*, the type species of the genus, contains several cryptic species previously identified as *D. dipsaci*. Andrzej Skwiercz and colleagues authored a paper (pp. 197-209) entitled Ditylenchus laurae *sp. n. (Tylenchida: Anguinidae) from Poland – a new species of the* D. dipsaci *complex associated with a water plant,* Potamogeton perfoliatus *L.* in which they report on *D. laurae* a new species from Poland. As is now essential in descriptions of new species, the paper includes molecular characterisation using the ITS rRNA, COI and hsp90 gene sequences and phylogenetic analyses revealed that *D. laurae* belongs to the *D. dipsaci* complex.

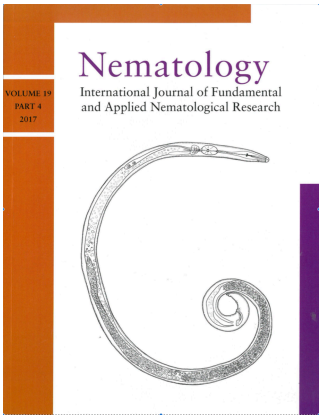
Issue 3



Interactions of plant pathogens with their hosts are mainly mediated by effectors, which can be described as any molecule from a pathogen that influences the host in order to provide food to the pathogen. In plant-parasitic nematodes effectors originate mainly from the subventral and dorsal pharyngeal gland cells. Work identifying and characterising effectors has not always made clear the potential translational outputs. In a very useful Forum article, (pp. 251-261) entitled *Translational biology of nematode effectors. Or, to put it another way, functional analysis of effectors – what's the point?*, Sophie Mantelin and colleagues summarise how developments in effector biology have allowed, or will allow, new control strategies to be developed, drawing on examples from nematology and from other pathosystems.

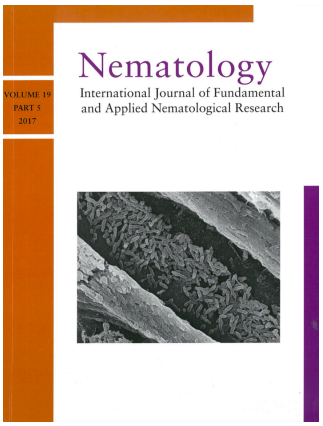
Issue 4

The term ‘model nematode’ is most commonly associated with, especially, *Caenorhabditis elegans* and, more recently, *Pristionchus pacificus*. In a Forum article (pp. 375-387) entitled Phasmarhabditis hermaphrodita - *a new model to study the genetic evolution of parasitism*, Robbie Rae considers that these current nematode models have limitations for studying the evolutionary genetic mechanisms that are responsible for the transition of free-living nematodes to parasites. He proposes the gastropod parasite, *Phasmarhabditis hermaphrodita*, as a new model to dissect the molecular mechanisms involved in the evolution of parasitism. *Phasmarhabditis hermaphrodita* can be maintained easily under laboratory conditions and the phylogenetic position of *Phasmarhabditis* is ideal for genomic comparison with other Clade 9 species, such as *C. elegans* and *P. pacificus*, as well as mammalian and insect parasites. Robbie Rae considers that these attributes could make *P. hermaphrodita* an excellent choice of model to study the evolutionary emergence of parasitism.



Issue 5

A Forum article, entitled *Lifespan extension in* Caenorhabditis elegans *insulin/IGF-1 signalling mutants is supported by non-vertebrate physiological traits* (pp. 499-508) by Bart Braeckman and Ineke Dhondt, explores the insulin/IGF-1 signalling (IIS) pathway, which connects nutrient levels to metabolism, growth and lifespan in eukaryotes, including nematodes such as *Caenorhabditis elegans*. Reduced IIS signalling activates a genetic survival program resulting in a drastic lifespan extension. The IIS mutant daf-2, bearing a mutation in the insulin/IGF-1 receptor, recapitulates the dauer survival program, including accumulation of fat and glycogen. Fat can be converted into glucose and glycogen *via* the glyoxylate shunt, a pathway absent in vertebrates. These carbohydrates can be used as substrates for trehalose synthesis, also absent in mammals. Trehalose stabilises intracellular components and is responsible for almost half of the lifespan extension in IIS mutants. Thus, the molecular mechanisms by which lifespan is extended under reduced IIS may differ substantially between phyla that have an active glyoxylate cycle and trehalose synthesis, such as ecdysozoans and fungi, and vertebrate species such as mammals. The authors consider that interest in this pathway may have future relevance to medical or pharmaceutical applications, which may support human longevity or reduce frailty at advanced age.

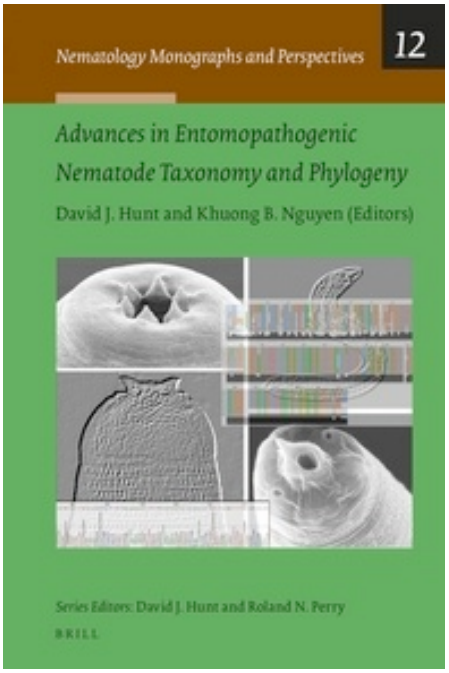


Roland N. Perry

Page 3 continued

Book review

David J. Hunt & Khuong B. Nguyen (Eds). *Advances in Taxonomy and Phylogeny of Entomopathogenic Nematodes of the Steinernematidae and Heterorhabditidae. Nematology Monographs and Perspectives*, Vol. 12 (Series Editors: David J. Hunt & Roland N. Perry); Leiden, The Netherlands, Brill, 2016, xvi + 438pp. ISBN13 9789004285330, E-ISBN 9789004285347. Price: €138.00, US$166.00.



Today, entomopathogenic nematodes (EPN) are worldwide accepted as very suitable and ecological save biological agents for the control of harmful insect pests. Their success led to a dramatic increase in the number of new species described and the need for an overview of the literature, a good identification tool and guidelines on methodology and taxonomic descriptions. In 2006, Drs K.B. Nguyen and D.J. Hunt as editors and contributing authors published a monograph on entomopathogenic nematodes entitled *Entomopathogenic Nematodes: Systematics, Phylogeny and Bacterial Symbionts*. The book became a must for all researchers dealing with EPN.

Correct identification is the basis to knowledge and can only be achieved by a strive to combine information obtained from a more holistic approach i.e. including data from different fields (morphology, ecology, behaviour and phylogeny) and at different levels of biological organization (morphological characteristics, molecular data) using different techniques. The currently more general integrated approach, combining morphological data and molecular information, provided a more powerful discriminatory tool for entomopathogenic nematodes (EPN). It clarifies the spectacular increase in literature on EPN and the increase in the number of new species discovered, raising from 55 to 95 valid *Steinernema* species and from 11 to 16 valid *Heterorhabditis* species in the last decade.

An update of the initial 2006 monograph was necessary to document the large number of new species, to improve the description of known species and to provide an updated list of valid species. The new book includes six main chapters, all of them dealing with different aspects of taxonomy and systematics of Steinernematidae and Heterorhabditidae. For information on the bacterial symbionts and on techniques, the authors refer to 2006 monograph. In the first chapter of the updated volume, the authors explain that this volume is NOT a replacement for the previous one but should be considered as a companion volume. They discuss the current situation in entomopathogenic systematics and the need for improve. The authors elaborate on the perspectives of the powerful tool of molecular methodology in EPN taxonomy, pointing to its possible pitfalls due to error or misinterpretation, mistakes in miss-labelling/confusion of sequences and lack of understanding of the intrinsic variability of sequence data. They illustrate this by explaining possible confusion in some species in *Steinernema* and some doubtful species in *Heterorhabditis*.

In chapter 2, the authors provide the diagnoses at family and genus level. They are largely similar to the original monography but with addition of variations observed and replacement of cephalic region by labial region. It's a pity that at species level, no separate diagnosis is given but is considered within relationships. A list of new synonyms is proposed on the basis of sequence analysis, including seven *Steinernema* species of which three species (*S. anatoliense* Hazir, Stock & Keslin, 2003, *S. meghalayense* Ganguly, Rathour & Singh, 2011 and *S. websteri* Cutler & Stock, 2003) are junior synonyms of *S. carpocapsae* (Weiser, 1955); *S. dharanai* Kulkarni, Rizvi, Kumar, Paunikar & Mishra, 2012 is a syn. of *S. hermaphroditum* Stock, Griffin & Chaerani, 2004; *S. everestense* Khatri-Chhetri, Waeyenberge, Spiridonov, Manandhar & Moens, 2011 a syn. of *S. akhursti* Qiu, Hu, Zhou, Mey, Nguyen & Pang, 2005; *S. maqbool* Fayyaz, Khanum, Gulsher & Javed, 2013 a syn. of *S. pakistanense* Shahina, Anis, Reid, Rowe & Maqbool, 2001 and *S. tbilisiense* Gorgadze, Lortkhipanidze, Ogier, Tailliez & Burdjanadze, 2015 a syn. of *S. thesam*i (Gorgadze, 1988).

Two species of *Heterorhabditis*, *H. gerrardi* Plichta, Joyce, Clarke, Waterfield & Stock, 2009 and *H. pakistanense* Shahina, Tabassum, Salma, Mehreen & Knoetze, 2016 have been synonymized with *H. indica* Poinar, Karunakar & David, 1992; H*. somsookae* Maneesakorn, An Grewal & Chandra Patya, 2015 with *H. baujardi* Phan, Subbotin, Nguyen & Moens, 2003 and *H. sonorensis* Stock, Rivera-Orduño & Flores-Lara, 2009 with *H. taysearae* Shamseldean, Abou El-Sooud, Abd-Elgawad & Saleh, 1996. For both genera, *Steinernema* and *Heterorhabditis*, a complete list of valid species, a list of *species inquirendae* and *nomina nuda* is given together with notes which explain the synonymization or invalidity of species. One of the main problems for separating a new species appears to be the interpretation of similarity and intraspecific variability.

Chapter 3 includes the tabular keys to species of *Steinernema* and *Heterorhabditis* for all new species described since the previous volume and till December 2015; the species described in 2016 are not included. However, the authors made the effort to add in an addendum to chapter 4 their diagnostic features so that the key can be completed.

Chapter 4 compiles the descriptions of all species since the previous volume. To limit repetition of conserved morphological features of the anterior region of male, female and infective juveniles, the authors omit them from most descriptions and focussed on features of higher diagnostic importance. Few incorrect use of terminology for example for spicule structures where manubrium is referred to as 'labial region' in *S. arasbaranense*, *S. cameroonense* and the description of a 'manubrium' of gubernaculum in original descriptions have not been adapted in *S. boemarei*, *S. puntauvense* and *S. tophus*. For many species, all original illustrations are included but depending on the author who revised the description, for other species a new compilation plate was made showing the most important diagnostic features. Due to the restrictions of the book format, the quality of a few illustrations is less than the original and sometimes too small to observe details.

Chapter 5 deals with the species descriptions of *Heterorhabditis* using a similar approach as for *Steinernema* species to reduce repetition of the conserved anterior region. For completeness, the latter is described at the start for male and hermaphroditic female. A note is added on the interpretation of presence or absence of 'cephalic' papillae. However, no distinction is made between outer labial and cephalic papillae being referred to as 10 cephalic papillae.

Chapter 6 on Phylogeny and phylogeography of *Heterorhabditis* and *Steinernema* by S. E. Spiridonov and S.A. Subbotin, two experts in the field give a very clear and interesting overview on current phylogenetic analyses of both genera. The analyses of ITS r RNA and D2-D3 of 28S rRNA genes revealed resolved relationships whereby three clades: 'Indica', 'Bacteriophora' and 'Megidis' are recognised. The authors also explored their distribution pattern. The phylogeny of the genus *Steinernema* shows more controversies in the literature. The authors analysed a ITS rRNA dataset of 58 *Steinernema* species and one of D2-D3 of 28S rRNA of 55 *Steinernema* species. The phylogenetic trees inferred from Bayesian analyses differentiated 12 multispecies clades and three monospecies clades whereby ten of these clades can be combined into three superclades. The authors also explore the use of morphological features for clade diagnosis and it would be useful to plot some characters on the phylogenetic trees in the future to better understand the clades.

For the first time, a phylogeographic analysis was made and presented on a phylogenetic tree inferred from Bayesian analyses of sequences of two genes (D2-D3 of 28S rRNA and ITS rRNA) with reconstruction of ancestral areas using RASP tool (Yu *et al.* 2015 in *Molecular Phylogenetics and Evolution* 87). It revealed an ancestral diversification of the genus *Steinernema* in Asia whereby nearly 60% of the species currently inhabit various parts of Asia.

In conclusion, this new book together with the 2006 monograph provide a unique high standard coverage of entomopathogenic nematodes of the families Steinernematidae and Heterorhabditidae. It is a basic and indispensable work for all researchers in the field from student to experienced nematologists. It also illustrates the importance of an integrated approach as well as the value of morphology for phylogenetic purposes and also illustrates the value of phylogeographic analyses, a field that is largely unexplored but promising to better understand the evolution and distribution of EPN.

Frieda Decraemer

Upcoming meetings

56th Annual Meeting of the Society of Nematologists, August 13-16, 2017. Colonial Williamsburg, Virginia, USA. https://nematologists.org/

Advances in Nematology, aab, December 12th 2017. London, UK.

http://www.aab.org.uk/contentok.php?id=184&basket=wwsshowconflist

33rd Symposium of the European Society of Nematologists, September 9-13, 2018. Ghent, Belgium. https://www.esn-online.org/conference

ESN 2018 Gent

Why join the ESN? - the movie

Please have a look at our video “Why join the ESN ?” made from some interviews during the last 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

ESN 2022 host selection

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Blagoevgrad 2006 Vienna 2010 Adana 2012 Braga 2016 Gent 2018

Bids for the organization of the ESN Symposium 2022 should be sent to the Secretary and Treasures (Eric Grenier and Hans Helder) **by 1st July 2018**. For further directions (Guidelines for the host selection) contact the Secretary Eric Grenier.

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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 editor (Wim Wesemael - wim.wesemael@ilvo.vlaanderen.be). All that is needed is a small amount of text in a word file or an email message, along with an accompanying image.