

Dr. Fahiem E. EL-Borai Kora

Director of International Outreach
Strawberry Breeding and Genetics program

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Dr. EL Borai Kora's duties include:

International outreach and dissemination of information to academic and private institutions worldwide involved in the research and/or propagation of University of Florida strawberry varieties.

His research on strawberry will focus on biological control, plant parasitic and entomopathogenic (insect parasitic) nematodes, microbial interactions including (nematodes, fungi and bacteria) and general plant pathology.

Education:

- Ph.D. in Nematology (2001) Entomology and Nematology Department, University of Florida
- M.S. in Agricultural Zoology (Nematology) (1993) Plant Protection Department, Zagazig University, Egypt
- B.S. in Plant Protection (1987) Plant Protection Department, Zagazig University, Egypt

Publications

Research Publications

- Shaohui Wua, Michael B. Blackburnb, Russell F. Mizell, Larry W. Duncan, Michael D. Toewsa, Michael E. Sparksb, **Fahiem El-Borai**, Clive H. Bocke; David. Shapiro-Ilan 2021. Novel associations in antibiosis stemming from an insect pupal cell. *Journal of Invertebrate Pathology*. <https://doi.org/10.1016/j.jip.2021.107655>
- Alexandros Dritsoulas; **Fahiem E. El-Borai**; Ibrahim E. Shehata; Mostafa M. Hammam; Ramadan M. El-Ashry; Moawad M. Mohamed; Mahfouz M. Abd-Elgawad and Larry W. Duncan. **2021**. Reclaimed desert habitats favor entomopathogenic nematode and microarthropod abundance compared to ancient farmlands in the Nile Basin. Article | DOI: 10.21307/jofnem-2021-047. 147.2021-47 | Vol. 53.
- Ibrahim E. Shehata; Mostafa M.A. Hammam; **Fahiem E. El Borai**; Larry W. Duncan; Mahfouz Abd El Gawad. **2020**. Traits of the entomopathogenic nematode, *Heterorhabditis bacteriophora* (Hb-EG strain), for potential biocontrol in strawberry fields. *Egyptian Journal of Biological Pest Control* 30-40. <https://doi.org/10.1186/s41938-020-00233-0>.

- Mahnaz Hassani-Kakhki, Javad Karimi, **Fahiem El Borai**, Nabil Killiny, Mojtaba Hosseini, Lukasz L. Stelinski, Larry Duncan. **2020**. Drought Stress Impairs Communication between Potato (*Solanum tuberosum*) and Subterranean Biological Control Agents. *Annals of the Entomological Society of America*, Volume 113, Issue 1, Pages 23–29, <https://doi.org/10.1093/aesa/saz050>.
- Sheng-Yen Wu, **Fahiem E. El-Borai**, Jim H. Graham, and Larry W. Duncan. **2019**. Geospatial relationships between native entomopathogenic nematodes and *Fusarium solani* in a Florida citrus orchard. *Applied Soil Ecology*, 140, 108-114.
- Ibrahim E. Shehata; Mostafa M.A. Hammam; **Fahiem E. El Borai**; Larry W. Duncan; Mahfouz Abd El Gawad. **2019**. Comparison of virulence, reproductive potential, and persistence among local *Heterorhabditis indica* populations for the control of *Temnorhynchus baal* (Coleoptera: Scarabaeidae) in Egypt. *Egyptian Journal of Biological Pest Control*. (2019) 29:32, <https://doi.org/10.1186/s41938-019-0137-5>.
- Raquel Campos-Herrera, Robin J. Stuart, Ekta Pathak, **Fahiem E. El-Borai**, Larry W. Duncan. **2019**. Temporal patterns of entomopathogenic nematodes in Florida citrus orchards: Evidence of natural regulation by microorganisms and nematode competitors. *Soil Biology and Biochemistry* 128 193-204.
- Sheng-Yen Wu, **Fahiem E. El-Borai**, Jim H. Graham, and Larry W. Duncan. **2018**. The saprophytic fungus *Fusarium solani* increases the insecticidal efficacy of the entomopathogenic nematode *Steinernema diaprepesi*. *Journal of Invertebrate Pathology*, 159: 87-94.
- William K. Heve, **Fahiem E. EL-Borai**, Evan G. Johnson, Daniel Carrillo, and Larry W. Duncan. **2018**. Responses of *Anastrepha suspensa*, *Diachasmimorpha longicaudata* and Sensitivity of Guava Production to *Heterorhabditis bacteriophora* in Fruit Fly Integrated Pest Management. *Journal of Nematology*. Issue 3 | Vol. 50. DOI: 10.21307/jofnem-2018-039.
- Stock, S.P., Campos-Herrera, R., **El-Borai, F.E.**, Duncan, L.W. **2018**. *Steinernema khuongi* n. sp. (Panagrolaimomorpha, Steinernematidae) a new entomopathogenic nematode species from Florida, USA. *Journal of Helminthology* 93(2):226-241. doi: 10.1017/S0022149X18000081.
- William K. Heve, **Fahiem E. EL-Borai**, Daniel Carrillo, and Larry W. Duncan. **2018**. Increasing entomopathogenic nematode biodiversity reduces efficacy against the Caribbean fruit fly *Anastrepha suspensa*: interaction with the parasitoid *Diachasmimorpha longicaudata*. *Journal of Pest Science*, 91 (2) 799-813.
- Ekta Pathak, Raquel Campos-Herrera, **Fahiem E. El-Borai**, Larry W. Duncan. **2017**. Spatial associations between entomopathogenic nematodes and nematophagous fungi in Florida citrus orchards. *Journal of Invertebrate Pathology*, 144: 37–46.
- William K. Heve, **Fahiem E. EL-Borai**, Daniel Carrillo, and Larry W. Duncan. **2017**. Biological control potential of entomopathogenic nematodes for management of Caribbean

fruit fly, *Anastrepha suspensa* Loew (Tephritidae). *Pest Management Science*. 73: 1220-1228.

- **Fahiem EL-Borai**, Nabil Killiny, and Larry W. Duncan. **2016**. Conciliency in entomopathogenic nematode responses to water potential and their geospatial patterns in Florida. *Frontiers in Microbiology*, 7:356.
<http://journal.frontiersin.org/article/10.3389/fmicb.2016.00356>.
- Camila Cramer Filgueiras¹, Denis S. Willett, Alcides Moino Junior, Martin Pareja, **Fahiem EL-Borai**, Donald W. Dickson, Lukasz L. Stelinski, Larry W. Duncan. **2016**. Stimulation of the Salicylic Acid Pathway Aboveground Recruits Entomopathogenic Nematodes Belowground. *PLOS ONE*. 2016; 11(5): e0154712. DOI: 10.1371/journal.pone.0154712
- Raquel Campos-HERRERA, **Fahiem E. EL-Borai** , Jose Antonio Rodríguez Martín, Larry W. Duncan. **2016**. Entomopathogenic nematode food web assemblages in Florida natural areas. *Soil Biology and Biochemistry* 93, 105-114.
- R. Campos-Herrera, **Fahiem E. EL-Borai**, and L.W. Duncan. **2015**. Modifying soil to enhance Biological control of belowground dwelling insects in citrus groves under organic Agriculture in Florida. *Biological Control* 84, 53-63.
- Campos-Herrera, **Fahiem E. EL-Borai**, T.E. Ebert, A. Schumann, L.W. Duncan. **2014**. Management to control citrus greening alters the soil food web and severity of a pest-disease complex. *Biological Control* 76, 41–51.
- David I. Shapiro-Ilan, Dana Blackburn, Larry Duncan, **Fahiem E. EL-Borai**, Heather Koppenh" Fer, Patrick Tailliez and Byron J. Adams. **2014**. Characterization of Biocontrol Traits in *Heterorhabditis floridensis*: A Species with Broad Temperature Tolerance. *Journal of Nematology* 46 (4):336–345.
- Raquel Campos-Herrera, Ekta Pathak, **Fahiem E. EL-Borai** , Robin J. Stuart, Carmen Gutiérrez, Jose Antonio Rodríguez-Martín, James H. Graham, Larry W. Duncan. **2013**. Geospatial patterns of soil properties and the biological control potential of entomopathogenic nematodes in Florida citrus groves. *Soil Biology & Biochemistry* 66 163-174.
- Campos-Herrera, R, Pathak, E., **EL-Borai**, Fahiem, Schumann, A., Abd-Elgawad, M.M.M., Duncan, L.W. **2013**. New citriculture system suppresses native and augmented entomopathogenic nematodes. *Biological Control* 66, 183–194.
- L.W. Duncan, R.J. Stuart, **Fahiem E. EL-Borai**, R. Campos-Herrera, E. Pathak, M. Giurcanu, and J.H. Graham. **2013**. Modifying orchard planting sites conserves entomopathogenic nematodes, reduces weevil herbivory and increases citrus tree growth, survival and fruit yield. *Biological Control*, 64, 26–36.
- Campos-Herrera, R; **EL-Borai. Fahiem E** and Duncan LW. **2012**. Wide interguild relationships among entomopathogenic and free-living nematodes in soil as measured by real time qPCR. *Journal of Invertebrate Pathology*, 111, 126-135.

- Raquel Campos-Herrera, **Fahiem E. EL-Borai** and Larry W. Duncan. **2012** .Real-time PCR as an effective technique to assess the impact of phoresy by *Paenibacillus* sp. bacteria on *Steinernema diaprepesi* nematodes in nature. *Molecular Ecology Resources*, 12, 885–893.
- Ekta Pathak, **Fahiem E. EL-Borai**, Raquel Campos-Herrera, Evan G. Johnson, Robin J. Stuart, James H. Graham, Larry W. Duncan. **2012**. Use of real-time PCR to discriminate parasitic and saprophagous behaviour by nematophagous fungi. *Fungal Biology*, 116, 563-573.
- **Fahiem E. EL-Borai**, Robin J. Stuart, Raquel Campos-Herrera, Ekta Pathak, Larry W. Duncan. **2012**. Entomopathogenic nematodes, root weevil larvae, and dynamic interactions among soil texture, plant growth, herbivory, and predation. *Journal of Invertebrate Pathology*, 109: 134-142.
- Raquel Campos-Herrera, **Fahiem E. EL-Borai**, Robin J. Stuart, James H. Grahama, Larry W. Duncan. **2011**. Entomopathogenic nematodes, phoretic *Paenibacillus spp*, and the use of real time quantitative PCR to explore soil food webs in Florida citrus groves. *Journal of Invertebrate Pathology*, 108: 30–39.
- **Fahiem E. EL-Borai**, Raquel Campos-Herrera, Robin J. Stuart and Larry W. Duncan. **2011**. Substrate modulation, group effects and the behavioral responses of entomopathogenic nematodes to nematophagous fungi. *Journal of Invertebrate Pathology*, 106: 347–356.
- Campos-Herrera, Raquel, E.G. Johnson, **Fahiem E. EL-Borai**, J.H. Graham, and L.W. Duncan. **2011**. Long-term stability of entomopathogenic nematode spatial patterns in soil as measured by sentinel insects and real-time PCR assays. *Annals of Applied Biology* 158: 55-68.
- **EL-Borai, Fahiem E**, D. Bright, J.H. Graham, R J. Sturat, and L. W. Duncan. **2009**. Differential Susceptibility of Entomopathogenic Nematodes to Nematophagous Fungi from Florida Citrus Orchards. *Nematology*, 11 (2), 233-243.
- Stuart, R. J., **Fahiem E. EL-Borai**, and L. W. Duncan. **2008**. From Augmentation to Conservation of Entomopathogenic Nematodes: Trophic Cascades, Habitat Manipulation and Enhanced Biological Control of *Diaprepes abbreviatus* Root Weevils in Florida Citrus Groves. *Journal of Nematology* 40 (2) 73-84.
- **EL-Borai, Fahiem E**, C.F. Brentu, and L.W. Duncan. **2007**. Augmenting Entomopathogenic Nematodes in soil from a Florida Citrus Orchard: Non-Target Effects of a Trophic Cascade. *Journal of Nematology*, V39 (2) 203-210.
- **EL-Borai, Fahiem E**, J. D. Zellers, and L.W. Duncan. **2007**. Suppression of *Diaprepes abbreviatus* in Potted Citrus by Combinations of Entomopathogenic Nematodes with Different Lifespans. *Nematropica* 37: 33-41.
- Duncan, L. W., J. H. Graham, J. Zellers, D. Bright, D. C. Dunn, **Fahiem E. EL-Borai** and D. L. Porazinska. **2007**. Food web responses to augmenting entomopathogenic nematodes in bare and animal-manure-mulched soil. *Journal of Nematology*, 39 (2): 176-189.

- **EL-Borai, Fahiem E, L.W. Duncan, and J. F. Preston. 2005.** Bionomics of a Phoretic association between a putative *Paenibacillus* sp. and entomopathogenic nematode *Steinernema diaprepesi*. *Journal of Nematology* 37 (1) 18-25.
- **EL-Borai, Fahiem E, and L. W. Duncan. 2004.** *Paenibacillus* sp. Impairs the Insecticidal Efficacy of the Entomopathogenic Nematode *Steinernema diaprepesi*. *Proceeding of the International Society of Citriculture*; Volume III; 904-909.
- **EL-Borai, Fahiem E., L. W. Duncan, J. H. Graham and E. Dickstein. 2003.** *Tylenchulus semipenetrans* alters the microbial community in the citrus rhizosphere. *Journal of Nematology*, 35 (2) 167:177.
- **EL-Borai, Fahiem E., L. W. Duncan, and J. H. Graham. 2002.** Infection of citrus roots reduces root infection by *Phytophthora nicotianae*. *Journal of Nematology* 34 (4): 384-389.
- **EL-Borai, Fahiem E., L. W. Duncan, and J. H. Graham. 2002.** Eggs of *Tylenchulus semipenetrans* inhibit growth of *Phytophthora nicotianae* and *Fusarium solani* *in vitro*. *Journal of Nematology*, 34 (3) 267:272.

Contributed Book Chapters:

- **J. Alfonso Cabrera and Fahiem E. El Borai. 2018 (revision). Nematode Parasites of Subtropical and Tropical Fruit Trees.** Plant parasitic nematodes in subtropical and tropical agriculture, PB: **Commonwealth Agricultural Bureau International, U.K** (CAB International); Wallingford; UK. (477-503).
- Raquel Campos-Herrera, Fahiem E El-Borai, and Larry W Duncan. **2015. It takes a village: entomopathogenic nematode community structure and conservation biological control in Florida (US) orchards.** In: R. Campos-Herrera (Ed.), *Nematode pathogenesis of insects and other pests - ecology and applied technologies for sustainable plant and crop protection*. Series: Sustainability in Plant and Crop Protection., A. Ciancio (series Ed.). Vol 1, Springer International Publishing Switzerland, pp. 329-351.
- Raquel Campos-Herrera, Robin Stuart, Fahiem El-Borai, Carmen Gutiérrez, and Larry Duncan. **2010. Entomopathogenic Nematode Ecology and Biological Control in Florida Citrus Orchards.** A. Ciancio & K. G. Mukerji (eds.), *Integrated Management of Arthropod Pests and Insect Borne Diseases. Integrated management of Plant Pests and Diseases 5*, DOI 10.1007/978-90-481-8606_5 © Springer Science + Business Media B.V.2010, 97-126.
- **Fahiem E. El Borai and Larry W. Duncan. 2004. Nematode Parasites of Subtropical and Tropical Fruit Trees.** Plant parasitic nematodes in subtropical and tropical agriculture, PB: **Commonwealth Agricultural Bureau International, U.K** (CAB International); Wallingford; UK. (467-492).

Extension and Outreach Publications:

- Fahiem EL-Borai and Vance M. Whitaker. 2021. UF/IFAS Strawberries beyond the USA: A Success Story from Egypt. HS1411, (the Horticultural Sciences Department, UF/IFAS Extension. publication date May 2021. Visit the EDIS website at <https://edis.ifas.ufl.edu> for the currently supported version of this publication.
- Egypt Strawberry success for EMCO CAL. June 2021. Fresh Produce Journal. https://desktop.fpj.co.uk/2021/06/19/egyptian-strawberry-success-for-emco-cal/pugpig_index.html
- Fahiem EL-Borai Kora 2021. Erfolgreiche Partnerschaft für Erdbeeren by Maura Maxwell. FRUCHTHANDEL

Professional Societies and Honorary Memberships

- Society of Nematologists (SON) (currently Vice present)
- Organization of Nematologists of Tropical America (ONTA).
- Afro-Asian Society of Nematologists (AASN).
- The Egyptian Society of Agricultural Nematology (ESAN).
- International Society of Citriculture.
- International Society for Pest Information (ISPI).
- Arab Scientist organization. (<http://www.arabscientist.org/english/page/1117/>)