

DAFTAR PUSTAKA

- Adams, B. J. and K.B. Nguyen. 2002. Taxonomy and Systematics. *In*: Gaugler, R. 2002. Entomopathogenic Nematology. CABI Publishing, New York.
- Afifah, L., B.T. Rahardjo, and H. Tarno. 2013. Eksplorasi nematoda entomopatogen pada lahan tanaman jagung, kedelai dan kubis di Malang serta virulensinya terhadap *Spodoptera litura* Fabricius. Jurnal HPT (Hama Penyakit Tumbuhan 1(2): 1-9.
- Ami, S. N., I.B. Taher, F.S. Hussien, and A.I. Ahmed. 2019. First molecular identification of wheat seed gall nematode races parasitized on wheat in Iraq. Acta Universitatis Sapientiae, Agriculture and Environment 11(1): 5-15.
- Bedding, R.A. and R.J. Akhurst. 1975. A simple technique for the detection of insect parasitic Rhabditid nematodes in soil. Nematologica 21(1): 109-110.
- Bhat, A. H., A.K. Chaubey, E. Shokoohi, and R.A. Machado. 2021. Molecular and phenotypic characterization of *Heterorhabditis indica* (Nematoda: Rhabditida) nematodes isolated during a survey of agricultural soils in Western Uttar Pradesh, India. Acta Parasitologica 66: 236-252.
- Blaxter, M.L., P. De-Ley P., J.R. Garey, Liu L.X., P. Scheldeman, A. Vierstraete, J.R. Vanfleteren, L.Y. Mackey, M. Dorris, L.M. Frisse, J.T. Vida, and W.K. Thomas. 1998. A molecular evolutionary framework for the phylum Nematoda. Nature 392(6671): 71-5.
- Chaerani, H. Prabowo, and I.G.A.A. Indrayani. 2018. Isolation and molecular identification of entomopathogenic nematodes (*Steinernema* and *Heterorhabditis*) from East Java and Bali. Jurnal AgroBiogen 14(2): 85–96.
- Ciche, T.A., C. Darby, R.U. Ehlers, S. Forst, and H. Goodrich-Blair. 2006. Dangerous liaisons: the symbiosis of entomopathogenic nematodes and bacteria. Biological Control 38(1): 22-46.
- Dilman, A.R., J.M. Chaston, B.J. Adams, T.A. Ciche, H. Goodrich-Blair, S.P. Stock, and P.W. Sternberg. 2012. An Entomopathogenic nematode by any other name. PLoS Pathog Article. <https://journals.plos.org/plospathogens/article?id=10.1371/journal.ppat.1002527> Diakses pada 8 Desember 2023.
- Djamilah, Nadrawati, and M. Rosi. 2010. Isolat *Steinernema* spp. dari tanah pertanian jagung di Bengkulu Bagian Selatan dan potensinya terhadap *Spodoptera litura* F. Jurnal Ilmu Pertanian Indonesia 12(1): 34-39.
- Dowds, B.C.A. and A. Peter. 2002. Virulence Mechanisms. CABI Publishing, Wallingford.
- Du Preez, F., A.P. Malan, and P. Addison. 2022. Potential of entomopathogenic nematodes for the control of *Plangia graminea* (Orthoptera: Tettigoniidae) under

- laboratory conditions. South African Journal of Enology and Viticulture 43 (2): 103-112.
- Forst, S. and D. Clarke. 2002. Bacteria-Nematode Symbiosis. CABI Publishing, Wallingford.
- Garcia del Pino, F. and A. Palomo. 1996. Natural occurrence of entomopathogenic nematodes (Rhabditida: Steinernematidae and Heterorhabditidae) in Spanish soils. Journal of Invertebrate Pathology 68(1): 84–90.
- Garcia-del-Pino, F., A. Morton, and D. Shapiro-Ilan. 2018. Entomopathogenic Nematodes as Biological Control Agents of Tomato Pests. *In: Sustainable Management of Arthropod Pests of Tomato*. Academic Press, London.
- Garriga, A., A. Morton, D. García-López, and F. García-del-Pino. 2019. Compatibility of entomopathogenic nematodes with natural enemies for horticultural pest control. Biological Control (138): 1-7.
- Gaugler, R. 2002. Entomopathogenic Nematology. CABI Publishing, New York.
- Gaugler, R. and H.K. Kaya. 1990. Entomopathogenic Nematodes in Biological Control. CRC Press, Boston.
- Glazer, I. and A. Gol'Berg. 1993. Field efficacy of entomopathogenic nematodes against the beetle *Maladera matrida* (Coleoptera: Scarabaeidae). Biocontrol Science and Technology 3(3): 367-376.
- Glazer, I. and E.E. Lewis. 2000. Bioassays of Entomopathogenic Nematodes. *In: Navon, A. and K.R.S. Ascher. Bioassay of Entomopathogenic Microbes and Nematodes*. CABI Publishing, New York.
- Gokte-Narkhedkar, N., K. Bhanare, P. Nawkarkar, P. Chilliveri, B. Fand, and S. Kranthi. 2019. Parasitic potential of entomopathogenic nematode *Heterorhabditis indica* against two Lepidopteran insect pests of cotton, *Helicoverpa armigera* (Hubner) and *Spodoptera litura* (Fabricious). Phytoparasitica 47: 31-41.
- Hazir, S., H.K. Kaya, S.P. Stock, and N. Keskin. 2003. Entomopathogenic nematodes (Steinernematidae and Heterorhabditidae) for biological control of soil pests. Jurnal Biologi 27: 181-202.
- Hominick, W.M. 2002. Biogeography. *In: Gaugler, R. 2002. Entomopathogenic Nematology*. CABI Publishing, New York.
- Indrayani, I.G.A.A., S. Subiyakto, and C. Chaerani. 2018. Pathogenicity of entomopathogenic nematode on sugarcane white grub *Lepidiota stigma* (Coleoptera: Scarabaeidae). Buletin Plasma Nutfah 24 (2): 83-88.
- Indriyanti, D.R., B.A. Fauzi, and Y.A. Maretta. 2017. The pathogenicity of entomopathogenic nematodes against *Spodoptera exigua*. ARPN Journal of Engineering and Applied Sciences 12 (24): 7161-7164.

- Indriyanti, D.R., N.F. Awalliyah, and P. Widiyaningrum. 2014. Perbanyakkan nematoda entomopatogen (NEP) pada berbagai media buatan. *Saintekno: Jurnal Sains dan Teknologi* 13(1): 111-118.
- Jean-Baptiste, M.C., A.L. de Brida, D. Bernardi, S. da Costa Dias, J. de Bastos Pazini, L.G. Leite, S.R.S. Wilcken, and F.R.M. Garcia. 2021. Effectiveness of entomopathogenic nematodes against *Ceratitis capitata* (Diptera: Tephritidae) pupae and nematode compatibility with chemical insecticides. *Journal of Economic Entomology* 114 (1): 248–256.
- Johnigk, S.A. and R.U. Ehlers. 1999a. Endotokia matricida in hermaphrodites of *Heterorhabditis* spp. and the effect of the food supply. *Nematology* 1 (7-8): 717-726.
- Johnigk, S.A. and R.U. Ehlers. 1999b. Juvenile development and life cycle of *Heterorhabditis bacteriophora* and *H. indica* (Nematoda: Heterorhabditidae). *Nematology* 1(3): 251–260.
- Kamali, S., J. Karimi, M. Hosseini, R. Campos-Herrera, and L.W. Duncan. 2013. Biocontrol potential of the entomopathogenic nematodes *Heterorhabditis bacteriophora* and *Steinernema carpocapsae* on cucurbit fly, *Dacus ciliatus* (Diptera: Tephritidae). *Biocontrol Science and Technology* 23 (11): 1307-1323.
- Kasi, I.K., M. Singh, K.M. Waiba, S. Monika, S., M.A. Waseem, D. Archie, and H. Gilhotra. 2021. Bio-efficacy of entomopathogenic nematodes, *Steinernema feltiae* and *Heterorhabditis bacteriophora* against the Cabbage butterfly (*Pieris brassicae* L.) under laboratory conditions. *Egyptian Journal of Biological Pest Control* 31 (125): 1-7.
- Koppenhöfer, A.M., C.R. Rodriguez-Saona, S. Polavarapu, and R.J. Holdcraft. 2008. Entomopathogenic nematodes for control of *Phyllophaga georgiana* (Coleoptera: Scarabaeidae) in cranberries. *Biocontrol Science and Technology* 18 (1): 21-31.
- Koppenhöfer, AM. 2007. Nematodes. In: *Field Manual of Techniques in Invertebrate Pathology: Application and Evaluation of Pathogens for Control of Insects and Other Invertebrate Pests*. 2nd Ed. Springer, Dordrecht.
- Krizova, K.M.C., M. Seifertova, V. Barus, I. Hodova, S. Masova, W. Nurcahyo, and I. Foitova. 2023. First study of *Ascaris lumbricoides* from the semiwild population of the Sumatran orangutan *Pongo abelii* in the context of morphological description and molecular phylogeny. *Life* 13 (1016): 1-20.
- Kumar, D., P. Kumari, R. Kamboj, A. Kumar, P. Banakar, and V. Kumar. 2022. Entomopathogenic nematodes as potential and effective biocontrol agents against cutworms, *Agrotis* spp.: present and future scenario. *Egyptian Journal of Biological Pest Control* 32 (42): 1-10.

- Kumar, K.K., A. George, G.T. Behere, Y.E. Thorat, D. Ingle, and D.P. Sinh. 2022. Pathogenicity of *Heterorhabditis indica* against developmental stages of *Eudocima materna* L. (Lepidoptera, Erebidæ). Egypt J Biol Pest Control 32 (65): 1-8.
- Lacey, AL., R. Frutos, H. Kaya, and P. Vail. 2001. Insect pathogens as biological control agents: Do they have a future? Biological Control 21(3): 230–248.
- Latina, R. A., C.H.R. Tabernilla, and A.H.M. Ramirez. 2023. Detection of root-knot nematodes infecting weedy rice in San Juan, Batangas, Philippines. Archives of Phytopathology and Plant Protection 56(9): 753-759.
- Lortkipanidze, M., K. Hwseynov, M. Kokhia, O. Gorgadze, and M. Kuchava. 2019. Effect of temperature on the virulence of Entomopathogenic nematodes. Advances in Ecological and Environmental Research 32-38.
- Maulida, H.C. 2021. Patogenitas Nematoda Entomopatogen yang Berasal dari Lahan Kopi terhadap *Crocidolomia pavonana*. Fakultas Sains dan Teknologi. Universitas Islam Negeri Sunan Ampel. Skripsi.
- Maulida, H.C., S. Rokhim, and E. Zahroin. 2021. Patogenitas nematoda entomopatogen *Heterorhabditis* spp. terhadap larva *Spodoptera litura*. Jurnal Al-Azhar Indonesia Seri SAINS dan Teknologi 6(2): 96-101.
- McMullen-II, J. G. and S.P. Stock. 2014. In vivo and in vitro rearing of entomopathogenic nematodes (Steinernematidae and Heterorhabditidae). JoVE: Journal of Visualized Experiments 91: 1-7.
- Mulyadi. 2009. Nematologi Pertanian. Gadjah Mada University Press, Yogyakarta.
- Navarez, M.L., R. Sangcopan, S. Aryal, N.P.D. Sumaya, A.H. Bhat, and N.H. Sumaya. 2021. Native Philippine *Heterorhabditis indica* isolates from banana and rice fields and preliminary results of their virulence against the larvae of super worm (*Zophobas morio* Fabricius Coleoptera: Tenebrionidae). Egyptian Journal of Biological Pest Control 31: 1-10.
- Nguyen, K.B. and G.C. Smart. 1996. Identification of entomopathogenic nematodes in the Steinernematidae and Heterorhabditidae (Nemata: Rhabditida). Journal of Nematology 28(3): 286–300.
- Nguyen, K.B., J. Maruniak, and B.J. Adams. 2001. The diagnostic and phylogenetic utility of the rDNA internal spacer sequences of *Steinernema*. Journal of Nematology 33(2–3):73–82.
- Nguyen, C.N. and A.T. Do. 2022. The virulence and reproduction of six entomopathogenic nematode strains of species *Steinernema longicaudum* to mealworm *Tenebrio molitor* in the laboratory conditions. Vietnam Journal of Biotechnology 20(1): 25-34.

- Nguyen, C.N., A.T. Do, P.K. Hoang, and L.X. Truong. 2018. Pathogenicity of four entomopathogenic nematode strains against Asian corn borer, *Ostrinia furnacalis* (Guenée) in Vietnam. *Nematology* 20 (8): 729-736.
- Nugrohorini. 2010. Eksplorasi nematoda entomopatogen pada beberapa wilayah di Jawa Timur. *Jurnal Pertanian Mapeta* 12(2): 132-136.
- Oliveira, C.M., A.M. Auad, S.M. Mendes, and M.R. Frizzas. 2014. Crop losses and the economic impact of insect pests on Brazilian agriculture. *Crop Protection* 56: 50-54.
- Patil, J., V. Linga, R. Vijayakumar, K. Subaharan, O. Navik, N. Bakthavatsalam, P.H. Mhatre, and J. Sekhar. 2022. Biocontrol potential of entomopathogenic nematodes for the sustainable management of *Spodoptera frugiperda* (Lepidoptera: Noctuidae) in maize. *Pest Management Science* 78 (7): 2883-2895.
- Poinar, G.O. 1990. *Nematodes for Biological Control of Insects*. CRC Press, Boston.
- Poinar, G.O. and P.S. Grewal. 2012. History of entomopathogenic nematology. *Journal of Nematology* 44 (2): 153-161.
- Prasetya, G. I., A.Z. Siregar, and M. Marheni. 2022. Intensitas dan persentase serangan *Spodoptera frugiperda* JE Smith (Lepidoptera: Noctuidae) pada beberapa varietas jagung di Kecamatan Namorambe Kabupaten Deli Serdang. *Jurnal Pertanian Cemara* 19(1): 77-84.
- Rahoo, A.M., T. Mukhtar, B.A. Bughio, and R.K. Rahoo. 2019. Comparison of infectivity and productivity of *Steinernema feltiae* and *Heterorhabditis bacteriophora* in *Galleria mellonella* and *Tenebrio molitor*. *Pakistan Journal of Zoology* 51(2): 717.
- Ramos, E. D., R.A. Latina, and B.L. Caoili. 2022. Characterization of three Philippine *Heterorhabditis indica* isolates based on morphometric, molecular, and virulence data. *Phipipp Ent* 36 (1): 25-43.
- Rehman, G. and M. Mamoon-ur-Rashid. 2022. Evaluation of entomopathogenic nematodes against red palm weevil, *Rhynchophorus ferrugineus* (Olivier) (Coleoptera: Curculionidae). *Insects* 13(8): 1-12.
- Rini, M.S., R. Rahardian, M. Hadi, and D. Zulfiana. 2018. Uji efikasi beberapa isolat bakteri entomopatogen terhadap kecoa (Orthoptera) *Periplaneta americana* (L.) dan *Blattella germanica* (L.) dalam skala laboratorium. *J. Biol.* 1(1): 1-7.
- Ronquist, F., M. Teslenko, P. Van Der Mark, D.L. Ayres, A. Darling, S. Höhna, B. Larget, L. Liu, M.A. Suchard, J.P. Huelsenbeck. 2012. MrBayes 3.2: efficient bayesian phylogenetic inference and model choice across a large model space. *Syst. Biol.* 61 (3): 539-542.
- Rusique, L., F. Nóbrega, C. Serra, and M.L. Inácio. 2022. The Northern root-knot nematode *Meloidogyne hapla*: new host records in Portugal. *Biology* 11(11): 1567.

- Sahin, Y.S., A. Bouchari, T.C. Ulu, B. Sadic, and A. Susurluk. 2018. New application method for entomopathogenic nematode *Heterorhabditis bacteriophora* (Poinar, 1976) (Rhabditida: Heterorhabditidae) HBH strain against *Locusta migratoria* (Linnaeus, 1758) (Orthoptera: Acrididae). *Turkish Journal of Entomology* 42 (4): 305-312.
- Seinhorst, J.W. 1959. A rapid method for the transfer of nematodes from fixative to anhydrous glycerin. *Nematologica* 4(1):67–69.
- Shapiro, D.I., J.R. Cate, J. Pena, A. Hunsberger, and C.W. McCoy. 1999. Effects of temperature and host age on suppression of *Diaprepes abbreviatus* (Coleoptera: Curculionidae) by entomopathogenic nematodes. *Journal of Economic Entomology* 92(5): 1086-1092.
- Shapiro-Ilan, D.I., R. Han, and C. Dolinski. 2012. Entomopathogenic nematode production and application technology. *Journal of Nematology* 44(2):206–217.
- Shapiro-Ilan, D.I., S. Hazir, and I. Glazer. 2017. Basic and applied research: Entomopathogenic nematodes. *In: Microbial Agents for Control of Insect Pests: from discovery to commercial development and use*. Academic Press, Amsterdam.
- Subbotin, S. A., M. Madani, E. Krall, D. Sturhan, and M. Moens. 2005. Molecular diagnostics, taxonomy, and phylogeny of the stem nematode *Ditylenchus dipsaci* species complex based on the sequences of the internal transcribed spacer-rDNA. *Phytopathology* 95 (11): 1308-1315.
- Subbotin, S.A., D. Sturhan, H.J. Rumpenhurst, and M. Moens. 2003. Molecular and morphological characterisation of the *Heterodera avenae* species complex (Tylenchida: Heteroderidae). *Nematology* 5(4): 515-538.
- Sucipto. 2009. Nematoda entomopatogen *Heterorhabditis* isolat local Madura sebagai pengendalian hayati hama penting tanaman hortikultura yang ramah pada lingkungan. *Agrivor* 2 (1): 47-53.
- Treviño-Cueto, D., S.A. Subbotin, S.R. Sanchez-Peña. 2021. Larvicidal activity of entomopathogenic nematodes isolated from Mexico against *Aedes aegypti* (Diptera: Culicidae). *Journal of Entomological Science* 56 (1): 12-23.
- Uhan, T.S. 2008. Bioefikasi beberapa isolat nematoda entomopatogenik *Steinernema* spp. terhadap *Spodoptera litura* Fabricius pada tanaman cabai di rumah kaca. *J. Hort* 18(2):175-184.
- Usman, M., W. Wakil, and D.I. Shapiro-Ilan. 2021. Entomopathogenic nematodes as biological control agent against *Bactrocera zonata* and *Bactrocera dorsalis* (Diptera: Tephritidae). *Biological Control* 163: 104706.
- White, G. F. 1927. A method for obtaining infective nematode larvae from cultures. *Science* 66:302–303.

- Woodring, J.L. and H.K. Kaya. 1988. Steinernematid and Heterorhabditid nematodes: a handbook of biology and techniques. Southern Cooperative Series Bulletin 331. Arkansas Agricultural Experiment Station, Fayetteville, Arkansas.
- Yan, X., M.S. Arain, Y. Lin, X. Gu, L. Zhang, J. Li, and R. Han. 2020. Efficacy of entomopathogenic nematodes against the tobacco cutworm, *Spodoptera litura* (Lepidoptera: Noctuidae). Journal of Economic Entomology 113 (1): 64-72.
- Yogaswara, D.A. 2020. Peran nematoda hidup bebas di dalam tanah. In Prosiding Seminar Nasional Biologi 6 (1): 232-238.
- Zulaihah, Z. 2022. Uji Efektivitas Nematoda Entomopatogen (NEP) Isolat Lokal Lamongan terhadap Larva *Spodoptera litura*. Fakultas Sains dan Teknologi. UIN Sunan Ampel Surabaya. Skripsi.