

DAFTAR PUSTAKA

- Bedjo, 2004. Pemanfaatan *Spodoptera litura* Nuclear Polyherosis (SINPV) untuk pengendalian ulat grayak (*Spodoptera litura* Fabricius) pada tanaman kedelai. Palawijaya, 7:1.
- Bobrowski VL, Pasquali G, Bodanese-Zanettini MH, Pinto LM, Fiuza LM. 2002. Characterization of two *Bacillus thuringiensis* isolate from South Brazil and their toxicity against *Anticarsia gemmatilis* (Lepidoptera: Noctuidae). Biol. Control 25: 129-134.
- Branco, Marina Castelo and Alexander G. Gatehouse. 1997. Insecticide Resistance in *Plutella xylostella* (L.) (Lepidoptera: Yponomeutidae) in the Federal District, Brazil. An. Soc. Entomol. Brasil, (1) 26: 75-79.
- Brown E.S., Dewhurst, C.F. 1975. The genus *Spodoptera* in Africa and the near bull. Ent. Res, 65: 221.
- Burges, H., Croizier, G., and Huber J.. 1980. A review of safety tests on *baculovirus*. Biol. Control, 25: 329-339.
- Butarbutar, R., M.C. Tobing dan M.U. Tarigan. 2013. Pengaruh beberapa jenis pestisida nabati untuk mengendalikan ulat grayak *Spodoptera litura* F. (Lepidoptera: Noctuidae) pada tanaman tembakau Deli di lapangan. Jurnal Online Agroteknologi 1 (4): 1484-1485.
- Cardona, E.V., Ligat, C.S. and Subang, M.P. 2007. Life history of common cutworm, *Spodoptera litura* Fabricius (Noctuidae: Lepidoptera) in Benguet. BSU Res. J., 56: 73-78.
- Che, Wunan, Tian Shi, Yidong Wu, and Yihua Yang. 2012. Insecticide resistance status of field populations of *Spodoptera exigua* (Lepidoptera: Noctuidae) from China. Journal of Economic Entomology, 106 (4): 1855-1862.
- Chen, Y., Y. Deng, J. Wang, J. Cai and G. Ren. 2004. Characterization of melanin produced by a wildtype strain of *Bacillus thuringiensis*. J. Gen. Appl. Microbiol., 50: 183-188.
- Crickmore, N.. 2017. *Bacillus thuringiensis* toxin classification. *Bacillus thuringiensis* and *Lysinibacillus sphaericus*. 41-52.

- De Vos, P., Garrity, G. M., Jones, D., Krieg, N. R., Ludwig, W., Rainey, F. A., Schleifer, K. H. & Whitman, W. B. 2009. Bergey's manual of systematic bacteriology. 2nd Ed. Springer Dordrecht Heidelberg, New York 3: 21-28.
- Dhir, B.C., Mohapatra, H.K. and Senapati, B. .1992. Assessment of crop loss in groundnut due to tobacco caterpillar, *Spodoptera litura* (F.). Indian J. Plant Protect. 20: 215-217.
- Disney, R. H. L. 2008. Natural History of the Scuttle Fly, *Megaselia scalaris*. *Annu. Rev. Entomol.* 53 : 39-60.
- El-Sharkawey, Asmaa. Z.; *et al.*,. 2009. Laboratory evaluation of antioxidants as UV-protectants for *Bacillus thuringiensis* against potato tuber moth larvae. Australian Journal of Basic and Applied Sciences, 3 (2): 358-370.
- Fand, Babasaheb B., Nitin T. Sul, Santanu K. Bal, P. S. Minhas. 2015. Temperature Impacts the Development and Survival of Common Cutworm (*Spodopteralitura*): Simulation and Visualization of Potential Population Growth in India under Warmer Temperatures through Life Cycle Modelling and Spatial Mapping. ICAR-National Institute of Abiotic Stress Management (NIASM), India.
- Finney, D.J. 1971. Probit Analysis, 3rd Ed. Cambridge University, Cambridge, UK.
- George, P. Georghiou and Margaret C. Wirth. 1996. influence of exposure to single versus multiple toxins of *Bacillus thuringiensis* subsp. *israelensis* on development of resistance in the mosquito *Culex quinquefasciatus* (Diptera: Culicidae). Applied and Environmental Microbiology. 1095-1101.
- George, Z., Crickmore, N. 2012. *Bacillus thuringiensis* application in agriculture. In: Sansinenea, E. (Ed.). *Bacillus thuringiensis* Biotechnology. Springer Science + Business Media, Brighton. UK. Pp 19-39.
- Gifani, A., Marzban, R., Safekordi, A., Ardjmand, M. and Dezianian, A.. 2015. Ultraviolet protection of *nucleopolyhedrovirus* through microencapsulation with different polymers. Biocon. Sci. Technol., 25: 814-827.
- Gomez, K. A. & Gomez, A. A. 2010. *Prosedur Statistik untuk Penelitian Pertanian : Edisi Kedua*. Penerbit Universitas Indonesia : Depok.

- Griego, V.M. and K.D. Spence. 1978. Inactivation of *Bacillus thuringiensis* spores by ultraviolet and visible light. *Appl. Environ. Microbiol.*, 35: 906-910.
- Hadapad, A. B., Vijayaakshmi, N., Hire, R.S., Dongre, T.K.. 2008. Effect of ultraviolet radiation on spore viability and mosquitocidal activity of an indigenous ISPC-8 *Bacillus sphaericus* Neide strain. *Acta Trop*, 107: 113-116.
- Harivaindaran K. V., Rebecca O. P. S., Chandran S.. 2008. Study of optimal temperature, pH and stability of dragon fruit (*Hylocereus polirhizus*) Peel For use as potential natural colorant. *Pak. J. Biol. Sci.*, 11 (18): 2259-2263.
- Hasinu JV.2009. Isolation and *B. thuringiensis* pathogenicity test against *Crociodolomia binotalis* Zell. *Agriculture cultivation journal* 5(2),84-88.
- Hikmat Kasmara, Melanie, Dea Audia Nurfajri, Wawan Hermawan, and Camellia Panatarani. 2018. The toxicity evaluation of prepared Lantanacamara nano extract against *Spodoptera litura* (Lepidoptera: Noctuidae). AIP Publishing: Jawa Barat, Indonesia. Pp 2-5.
- Hofte, H. and H.R. Whiteley. 1989. Insecticidal crystal proteins of *Bacillus thuringiensis*. *Microbiol. Rev.*, 53: 42-255.
- Ignoffo, C.M., Garcia, C.. 1978. UV.-photo inactivation of cells and spores of *Bacillus thuringiensis* and effects of peroxidase on inactivation. *Environ. Entomol.*, 7: 270-272.
- Jaafar, Ali, R., Nazri, M., and Khairuddin, W.. 2009. Proximate analysis of dragon fruit (*Hylecereus polyhizus*). *American Journal of App. Sciences*, 6: 1341-1346.
- Javar S, Ahmad SS, Mohamed R, Lau WH. 2013. Suitability of *Centella asiatica* (Pegaga) as a food source for rearing *Spodoptera litura* (Fab.) (Lepidoptera: Noctuidae) under laboratory conditions. *Journal of Plant Protection Research*. 53 (2): 184 -189.
- Jones DJ, Karunakaran V, Burges HD, Hacking AJ. 1991. Ultraviolet resistant mutation of *Bacillus thuringiensis*. *J Appl Bacteriol* 70: 460–463
- Kalshoven, L. G. E., 1981. *The Pest of Crops in Indonesia*. Revised and Translated By P.A. Van der laan. Jakarta: PT. Ichtiar Baru-Van Hoeve.

- Kandagal AS, Khetagoudar MC. 2014. Study on larvicidal activity of weed extracts against *Spodoptera litura*. *Journal of Environmental Biology*, 34: 253-257.
- Lambert, Bart and Marnix Peferoen. 1992. Insecticidal Promise of *Bacillus thuringiensis*. University of California Press on behalf of the American Institute of Biological Sciences. *BioScience*, (42) 2: 112-122.
- Latha, M., Shivanna, B.K., Manjunatha, M. and Kumaraswamy, M. C.. 2014. Biology of *Spodoptera litura* on chewing tobacco in vitro. *J. Eco-friendly Agric.*, (1) 9: 43-47.
- Le Bellec F, Vaillant F, Imbert E. 2006. Pitahaya (*Hylocereus* spp.): a new fruit crop, a market with a future. *Fruits*, 61: 237-250.
- Lestari, S., Trisnowati Budi Ambarningrum, Hery Pratiknyo. 2013. A life table of *Spodoptera litura* Fabr. with different artificial diets. (5): 2.
- Madigan, M. T. Martinko, J. M., Bender, K. S., Buckley, D. H., & Stahl, D. A. 2011. *Brock Biology of Microorganism : 13th Edition*. Pearson: USA.
- Manasherob R, Ben-Dov E, Zaritsky A, & Barak Z. 2002. Germination, growth, and sporulation of *Bacillus thuringiensis* subsp.*israelensis* in excreted food vacuoles of the protozoan *Tetrahymena pyriformis*. *Appl Environ Microbiol*, 64: 1750-1758.
- Marwoto dan Suharsono. 2008. strategi dan komponen teknologi pengendalian ulat Grayak (*Spodoptera litura* Fabricius) pada tanaman kedelai. *Jurnal Litbang Penelitian*. (4): 27.
- Miyahara, Y., Wakikado, T. and Tanaka, A. (1971) [Seasonal changes in the number and size of the egg-masses of *Spodoptera litura*]. *Japanese J. Appl. Entomol. Zool.* 15: 139-143.
- Natkar, P. K. And R. A. Balikai. 2017. Present status on bio-ecology and management of tobacco caterpillar, *Spodoptera litura* (Fabricius). *International Journal Of Plant Protection* (10): 193-202.
- Nethravathi, C. J., Hugar, P. S. Krisnaraj, P. U. & Vastard, A. S. 2010. Bioefficiency of Native *Bacillus thuringiensis* Isolates Against Cabbage Leaf Webber, *Crociodomia binotalis* Z. *Karnataka J. Agric. Sci.* (23): 51-55.

- Nurmahani, M.M., Osman, A., Abdul Hamid, A., Mohamad Ghazali, F. dan Pak Dek, M.S. 2002. Short communication antibacterial property of *Hylocereus polirhizus* and *Hylocereus undatus* peel extracts. Int. Food Res. J. (1) 19: 7784.
- Pozsgay, M., B. Fast, H. Kaplan and P.R. Carey, 1987. The effect of sun light on the protein crystals from *Bacillus thuringiensis* var. *kurstaki* HD-1 and NRD-12. A Raman spectroscopy study. J. Invertebr. Pathol., (50): 620-622.
- Priatni, S., Aulia Pradita. 2015. Stability study of betacyanin extract from red dragon fruit (*Hylocereus polyrhizus*) peels. Procedia Chemistry: 438-439.
- Price, P. W., Denno, R. F., Eubanks, M. D., Finke, D. L. & Kaplan, I. 2011. *Insects Ecology*. Cambridge University Press: New York.
- Pusztai, M., P. Fast, H. Gringorten, H. Kaplan, T. Lessard and P.R. Carey. 1991. The mechanism of sunlight-mediated inactivation of *Bacillus thuringiensis* crystals. J. Biochem., 273: 43-47.
- Ramaiah, M. and T. U. Maheswari. 2018. Journal of entomology and zoology studies; (5) 6: 2284-2289.
- Rao, M. S., Dammu Manimanjari, Anantha Chitiprolu R. R., Pettem Swathi, Mandapaka Maheswari. 2014. Effect of climate change on *Spodoptera litura* Fab. on peanut: a life table approach. Crop Protection: 98-99.
- Rebecca, O.P.S., A. N. Boyce and S. Chandran.. 2010. Pigment identification and antioxidant properties of red dragon fruit (*Hylocereus polyrhizus*). African Journal of Biotechnology, (10) 9: 1450-1454.
- Sanchis, V., Bourguet, D.. 2008. *Bacillus thuringiensis*: application in agriculture and insect resistance management: a review. Agron. Sustain. Dev. 28, 11-20.
- Saxena, D., Eitan Ben-Dov, Robert Manasherob, Ze'ev Barak, Sammy Boussiba, Arieh Zaritsky. 2002. A UV. tolerant mutant of *Bacillus thuringiensis* subsp. *kurstaki* producing melanin. An International Journal: 25-26.
- Schnepf, E., Crickmore, N., Van Rie, J., Lereclus, D., Baum, J. and Feitelson, J. *et al.* 1998. *Bacillus thuringiensis* and its pesticidal crystal protein. Microbiol. Mol. Biol Rev., 62: 775-806.

- Schowalter, T. D. 2011. *Insects Ecology: An Ecosystem Approach. 3rd Edition*. Academic Press: USA. 151-153.
- Shapiro, Martin, Said El Salamouny and B. Merle Sheparda. 2008. Green tea extracts as ultraviolet protectants for the beet armyworm, *Spodoptera exigua*, nucleopolyhedrovirus. Clemson University. Biocontrol Science and Technology, (18) 6: 591-603.
- Shorey, H., H., and R. L. Hale. 1965. Mass rearing of the larvae of nine noctuid species on a simple artificial medium. Departement of Entomology, University of California, Riverside. (58) 3: 522-524.
- Souza, Thiago Sampaio, Elen de Lima Aguiar-Menezes, André Luis Santos Resende, Thalles Platiny Lavinsky Pereira, Vinícius Siqueira Gazal. 2019. *Megaselia* Rondani (Diptera: Phoridae) larvae as a Sphingidae (Lepidoptera) parasitoid. Arq. Inst. Biol., Brazil, (86): 1-3.
- Stephen RT, Elkinton JS. 2004. Pathogenicity and virulence. Journal of Invertebrate Pathology 85: 146–151.
- Sukirno Sukirno, M. Tufail, K. Ghulam Rasool, S. El Salamouny, K. D. Sutanto and A. Saad Aldawood. 2018. The efficacy and persistence of *Spodoptera littoralis* Nucleopolyhedrovirus (SpliMNPV) applied in UV. protectants against the Beet Armyworm, *Spodoptera exigua* (Hübner) (Lepidoptera: Noctuidae) under Saudi field conditions. Pakistan J. Zool. (50) 5: 1895-1902.
- Supriya, G.B., T.V.K. Singh, V. Sunitha, S.K. Vinod, and C. Narendraredy. 2018. Life Table Study of Tobacco Caterpillar *Spodoptera litura* (F.) (Noctuidae: Lepidoptera) on Different Bt Cotton Hybrids During 120-150 DAS (Days after Sowing). ICRISAT, Patancheru, Hyderabad, India.
- Taborsky, V. 1992. *Small-Scale Processing of Microbial Pesticides, Food and Agriculture*. Organization of The United Nations: Rome.
- Tarigan, Analisa, Siti Sumarmi, Sukirno. 2020. Effectiveness of Aloe (*Aloe vera* L.) as a protectant of *Bacillus thuringiensis* var *kurstaki* against ultraviolet light and biological control agent of (*Spodoptera litura* Fab.). AIP Publishing LLC, 2260: 030003.

- Wrolstad, R. E. and Giusti, M.M.. 2001. Characterization and measurement of anthocyanin by UV.-visible spectroscopy : Current Protocols in Food Analytical Chemistry, John Wiley and Son. New York.
- Wu, L., Hsu, H., Chen, Y., Chiu, C., Lin, Y. dan Ho, J.A.. 2006. Antioxidant and antiproliferative activities of red pitaya. J. Food Chem., (95) 2: 319327.
- Zulfiana, D., Krishanti, N. P. R., Bramantyo Wikantyo, dan Apriwi Zulfitri. 2017. Entomopathogenic bacteria as biocontrol agent against *Spodoptera litura* (F.) larvae. Jurnal Ilmu-ilmu Hayati. Vol. (16) 1. Pusat Penelitian Biologi-LIPI, Bogor.