

## DAFTAR PUSTAKA

- Abrahamson, W.G. 1989. Plant-animal interaction. McGraw-Hill Book Company. Toronto. p. 1-22
- Agisimanto, D. dan A. Supriyanto. 2007. Genetic diversity of Pamelo in Indonesia based on random primers of DNA amplified polymorphic. J. Hort. 17(1):17.
- Akhtar A., Hissamudin, Abbasi and R. Shraf. 2012. Antagonistic effect of *Pseudomonas fluorescens* and *Bacillus subtilis* on *Meloidogyne incognita* infecting *Vigna mungo* L. International J. of Plant, Animal and Environmental Science. 2. (1) : 55-63.
- Alexopoulos, C and C.W. Mins. 1979. Introductory mycology. John and Sons. New York.
- Alphen, J.J.M. Van and M.A. Jervis. 1996. Foraging behaviour. Di dalam: Jervis MA, Kidd NAC, Editor. Insect Natural Enemies Practical Approaches to Their Study and Evaluation. United Kingdom: Chapman & Hall. p. 40-44.
- Altieri, M.A. 1999. Applying agroecology to enhance productivity of peasant farming systems in Latin America. Environ Dev Sustain 1: 197–217.
- Abrahamson, W.G. 1989. Plant-animal interaction. McGraw-Hill Book Company. Toronto. p. 1-22
- Altieri, M.A. and Nicholls. 2004. Biodiversity and pest management in agroecosystems. Food Product Press. New York. 236 p.
- Altieri, M.A., C.I. Nicholls and M.A. Fritz. 2005. Manage insects on your farm. Sustainable Agriculture Network, Beltsville. 119 p.
- Altieri, M.A., L. Ponti and C.I. Nicholls. 2007. Mengendalikan hama dengan diversifikasi tanaman. hlm. 10–13. <http://www.salamleisainfo> (diakses 4 Februari 2014).
- Amanda, U.D. 2017. Pemanfaatan tanaman refugia untuk mengendalikan hama dan penyakit tanaman padi. Buletin IKATAN vol.7 No.2 Tahun 2017
- Aminatun, T. 2012. Pola interaksi serangga-gulma pada ekosistem sawah surjan dan lembaran. [Disertasi]. Sekolah Pasca Sarjana Universitas Gadjah Mada. Yogyakarta
- Amin, F., Adiwirman dan Sri Yosefa. 2015. Studi waktu aplikasi pupuk kompos leguminosae dengan bioaktivator *Trichoderma* sp. terhadap pertumbuhan

dan produksi tanaman cabai merah (*Capsicum annum* L.). Jurnal Faperta Vol. 2 Universitas Riau.

- Andow, D.A. 1991. Vegetation diversity and arthropod population response. *Annual Review of Entomology* 36: 561–586.
- [Anonim] 2002. Model budidaya tanaman sehat. Budidaya tanaman sayuran secara sehat melalui penerapan PHT, Dirjen Perlindungan Tanaman. Jakarta
- Arambiza, E. and Painter M. 2006, Biodiversity conservation and the quality of life of indigenous people in the Bolivian Chaco. Human Organization Spring 2006. ABI/INFORM Research,
- Arifin, M., I.B.G. Suryawan, B.H. Priyanto dan A. Alwi. 1997. Diversitas arthropoda pada berbagai teknik budidaya padi di Pemalang, Jawa Tengah. *Penelitian Pertanian Puslitbangtan*. 15 (2): 5-12.
- Baco, D. 1984. Biologi wereng batang coklat (*Nilaparvata lugens* Stal.) dan wereng punggung putih (*Sogatella furcifera* Horvath) serta interaksi antara keduanya pada tanaman padi. [Tesis]. Institut Pertanian Bogor. 150 Hal.
- Baehaki, S.E. 1985. Studi perkembangan populasi wereng coklat (*Nilaparvata lugens* Stal.) asal imigran dan pemencarannya di pertanaman. [Disertasi]. Pascasarjana Institut Pertanian Bogor.
- Baehaki, S.E. 1986. Dinamika populasi wereng batang coklat *Nilaparvata lugens* Stal. Edisi Khusus No 1. Wereng Coklat.
- Baehaki, S.E. 1989. Dinamika populasi wereng batang coklat. *Jurnal Natur Indonesia* 1:16-30.
- Baehaki, S.E. 1991. Peranan musuh alami mengendalikan wereng batang coklat. [Prosiding]. Seminar Sehari Tingkat Nasional. Fakultas Pertanian Universitas Jenderal Sudirman. Hal 1-9.
- Baehaki, S.E. dan M. Iman. 1991. Status hama wereng pada tanaman padi dan pengendaliannya. Di dalam: Soenarjo E, Damardjati DS, Syam M, editor. Padi. Ed ke-3. Bogor: Badan Penelitian dan Pengembangan Pertanian, Puslitbangtan. Hal. 681-712.
- Baehaki, S.E. 1992. Teknik pengendalian wereng coklat terpadu. Hal. 39-49.
- Baehaki, S.E. 2004. Case histories of pests control in Indonesia. Paper presented on Workshop: Ecological methods in agro-biodiversity and pest management research held in IRRI, Philippines on 30 August - 3 September 2004.

- Baehaki, S.E. dan A. Kartohardjono. 2005. Penilaian penurunan hasil berdasar skor kerusakan akibat wereng coklat dan wereng punggung putih. [Prosiding]. Seminar Nasional dan Kongres Biologi XIII. Yogyakarta. p.351-357.
- Baehaki, S.E. 2007. Perkembangan wereng coklat biotipe 4. Balai Besar Penelitian Padi Sukamandi. Tabloid Sinar Tani [diakses 1 Agustus 2007].
- Baehaki, S.E. dan I.N. Widiarta. 2008. Hama wereng dan cara pengendaliannya pada tanaman padi. Dalam: Daradjat AA, Setyono A, Makarim AK, Hasanudin A, editor. Padi 2: Inovasi Teknologi Produksi. Jakarta: LIPI Press.
- Baehaki, S.E. 2011. Pengelolaan wereng coklat sebagai hama dan vektor penyakit kerdil hampa dan kerdil rumput. [Prosiding]. Seminar Nasional Pengendalian Tungro dan Hama Utama Padi Lainnya Mendukung Swasembada Padi Berkelanjutan. Puslitbangtan. p.48-68.
- Baehaki, S.E. 2012. Perkembangan biotipe hama wereng coklat pada tanaman padi. Iptek Tanaman Pangan 7(1): 8-17
- Baggen, L.R., G.M. Gurr and A. Meats. 1999. Flower in tri-trophi systems: mechanism allowing selective exploitation by insect natural enemies for conservation biological control. *Entomologia Experimentalis et Applicata* 91: 155–161.
- Bahagiawati, A.H., E. Sembiring, dan U. Kartosuwondo. 1985. Perbandingan reaksi wereng coklat *Nilaparvata lugens* populasi Sumatera Utara dan Sulawesi Tengah terhadap varietas padi pembeda. Laporan Kemajuan Penelitian. Balai Penelitian Tanaman Pangan Bogor.
- Bahagiawati, A.H. dan I.N. Oka. 1987. Perkembangan biotipe wereng coklat (*Nilaparvata lugens* Stal.) di Indonesia. Edisi Khusus No. 1: Wereng Coklat, Badan Penelitian dan Pengembangan Pertanian, Balittan Bogor. p. 31-42.
- Bahagiawati, A.H. 2001. Manajemen resistensi serangga hama pada pertanaman tanaman transgenik Bt. *Buletin AgroBio*. 4(1).
- Bahagiawati, A.H dan H. Rizjaani. 2005. Pengelompokan biotipe wereng coklat berdasarkan RAPD-PCR. *Hayati* 25(1): 1-6.
- Bahagiawati, A.H., D. Buchari, Nurindah, H. Rizjaani, D.W. Utami, dan B. Sahari. 2006. Struktur populasi *Trichogramma armigera*, parasitoid telur *Helicoverpa armigera* berdasarkan analisis RAPD-PCR. *Jurnal AgroBiogen* 2(2): 52-59.

- Bambaradeniya, C.N.B and F.P. Amerasinghe. 2004. Biodiversity associated with the rice field agroecosystem in Asian countries; A brief review. Working Paper 63, Colombo, Sri Lanka: International Water Management Institute.
- Banks, J.E. 2004. Divided culture: integrating agriculture and conservation biology. *Frontiers in Ecology and the Environment* 2: 537–545
- Barbosa, P. 1998. Conservation biological control. Academic Press. USA.
- Barbour, M.G, J.H. Burk and W.D. Pitts. 1987. Terrestrial plant ecology. Inc. California: The Benjamin.
- Bardakoi, F. 2001. Random amplified polymorphic DNA (RAPD) markers. *Turk. J. Biol.* 25:185-196.
- Batra, S.W. 1982. Biological control in agroecosystems. *American Association for the Advancement of Science* 215: 134–139. Beaverstool, J.,
- Bayram, A., G. Salerno, A. Onofri and E. Conti. 2010. Lethal and sublethal effects of preimaginal treatments with two pyrethroids on the life history of the egg parasitoid *Telenomus busseolae*. *J Biocontrol* 55(6):697-703.
- Bednarek, A.E, N. Popowska, E. Pezowicz and M. Kamionek. 2004. Integrated methods in pest control: effect of insecticides on entomopathogenic fungi *Beauveria bassiana* (Bals.) Vuill., *B. brogniartii* (Sacc.), and nematodes (*Heterorhabditis megidis* Poinar, Jackson, Klein, *Steinernema feltiae* Filipjev, *S. glaseri* Steiner). *Polish Journal of Ecology*, 52(2), 223-228.
- Begon, M, Townsend C and J. Harper. 2003. Ecology-from individuals to ecosystems. Oxford (UK): Blackwell Publisher Begon M, Townsend C, Harper J. 2003. Ecology - From Individuals to Ecosystems. Oxford (UK): Blackwell Publisher.
- Bottrell, D.G. and K.G. Schoenly. 2012. Resurrecting the ghost of green revolutions past: the brown planthopper as a recurring threat to high-yielding rice production in tropical Asia. *J. Asia-Pac. Entomol.* 15(1): 122–140.
- [BPS] Badan Pusat Statistik. 2014. Luas produksi padi di Sumatera Barat Tahun 2014. [www.bps.go.id](http://www.bps.go.id) [diakses 26 Januari 2015]
- [BPS] Badan Pusat Statistik. 2015. Luas panen padi menurut provinsi (ha) Tahun 1993-2015. <http://www.bps.go.id> [diakses 23 Agustus 2018]
- [BPS] Badan Pusat Statistik. 2016. Luas panen padi menurut provinsi (ha) Tahun 2016. <http://www.bps.go.id> [diakses 23 Agustus 2018]
- [BPS] Badan Pusat Statistik. 2017. Luas panen padi menurut provinsi (ha) Tahun 2017. <http://www.bps.go.id> [diakses 23 Agustus 2018]

- [BPTPH] Balai Perlindungan Tanaman Pangan dan Hortikultura Sumatera Barat. 2013. Laporan Tahunan. Padang.
- [BPTPH] Balai Perlindungan Tanaman Pangan dan Hortikultura Sumatera Barat. 2014. Laporan Tahunan. Padang.
- [BPTPH] Balai Perlindungan Tanaman Pangan dan Hortikultura Sumatera Barat. 2015. Laporan Tahunan. Padang.
- [BPTPH] Balai Perlindungan Tanaman Pangan dan Hortikultura. 2015. Laporan Setengah Bulanan Periode Tanam Januari-Juni 2015 di Sumatera Barat. Padang.
- [BPTPH] Balai Perlindungan Tanaman Pangan dan Hortikultura Sumatera Barat. 2016. Laporan Tahunan. Padang.
- [BPTPH] Balai Perlindungan Tanaman Pangan dan Hortikultura Sumatera Barat. 2017. Laporan Tahunan. Padang.
- Brower, J., J.H. Zar and C.N.V. Ende. 1989. Field and laboratory methods for general ecology. Fourth Edition. 273McGraw-Hill Publication Boston, USA
- Brower, J., Z. Jernold and C.N.V Ende. 1990. Field and laboratory methods for general ecology. Third Edition. USA : W, M, C. Brown Publishers.
- Brown, R.J., C.A. Malcolm, P.L. Mason and R.A. Nicholls. 1997. Genetic differentiation between and within strains of the saw-toothed grain beetle, *Oryzaephilus surinamensis* (Coleoptera: Silvanidae) at RAPD. Insect Mol Biol 6:285-289 p.
- Brunner, K., S. Zeilinger, R. Ciliento, S.L. Woo, M. Lorito, C.P. Kubicek, and R.L. Mach. 2005. Improvement of the fungal biocontrol agent *Trichoderma atroviride* to enhance both antagonism and induction of plant systemic disease resistance, Appl. Environ. Microbiol 71 (7):3959–3965.
- Budi, A.S., A. Afandhi dan R.D. Puspitarini. 2013. Patogenitas jamur entomopatogen *Beauveria bassiana* (Deuteromycetes: Moniliales) pada larva *Spodoptera litura* Fabricus (Lepidoptera: Noctuidae). Jurnal Hama Penyakit Tumbuhan, 1(1), 57-65.
- [CABI] Commonwealth Agricultural Bureaux International. 2005. Crop protection compendium. Wallingford, UK: CABI.
- Carmo, E.L, A.F. Bueno and R.C.O.F. 2010. Pesticides selectivity for the insect egg parasitoid *Telenomus remus*. J Biocontrol 55(4):455-464.
- Carruthers, R.I. and K. Hural. 1990. Fungi as naturally occurring entomophagous, pp. 115-138. In R.R. Baker and P.E. Dunn (eds.). New

Directions in Biological Control; Alternative for suppressing agricultural pests and diseases. Alan R. Liss, Inc.

Cassman, K.G. and P.L. Pingali. 1995. Intensification of irrigated rice systems: learning from the past to meet future challenges. *GeoJournal* 35: 299–305.

Castrillo, L.A. and W.M. Brooks. 1998. Differentiation of *Beauveria bassiana* isolates from the Darkling Beetle, *Alphitobius diaperinus*, using isozyme and RAPD Analyses. *J Invert Pathol* 72:190-196 p.

Caton, B.P. 2010. A practical field guide to weeds of rice in Asia. Second Edition. International Rice Research Institute, Los Baños, Philippines.

Catindig, J.L.A., G.S. Arida, S.E. Baehaki, J.S. Bentur, L.Q. Cuong, M. Norowi, W. Rattanakarn, W. Sriratanasak, J. Xia and Z. Lu, 2009. Situation of plant hoppers in Asia. In K. Heong and B Hardy, Proc. Planthopper-new threat to the sustainability on intensive rice production system in Asia. International Rice Research Institute, Los Banos, Philippines. p.191220.

[CBOL] The Consortium for the Barcode of Life. 2008. DNA barcoding: A new tool for identifying biological specimens and managing species diversity. Washington: CBOL.

Channa, N.B, Bambaradeniya and Felix P. Amarasinghe. 2004. Biodiversity associated with the rice field agroecosystem in asian countries: A Brief Review. IWMI. Ghana, Pakistan, South Africa, Srilanka, Thailand.

Chen, W.H., T.M. Chen, Y.M. Fu, R.M. Hsieh and W.S. Chen. 1998. Studies on somaclonal variation in *Phalaenopsis*. *Plant Cell Reports* 18:7-13.

Chiu, S.C. 1979. Biological control of the brown planthopper, *Nilaparvata lugens* Stal. pp. 335-356. In *Brown Planthopper Threat to Rice Production in Asia*. International Rice Research Institute, Los Banos, Philippines.

Costanza, R. 2012. Ecosystem health and ecological engineering. *Ecol. Eng.* 45: 24-29.

Craigh, T.K., S. Joanne, G. Cathleen, J.D.H Warren, J.D.H James and V. Craigh. 2000. The influence of host plant variation and intraspecific competition on oviposition preference and offspring performance in host races of *Eurosta solidaginis*. *Ecological Entomology* 25: 7-18 p.

Crowder, D.W., T.D. Northfield, M.R. Stand and W.E. Snyder. 2010. Organic agriculture promotes evenness and natural pest control. *Nature. Letters*.

[CSIRO] Commonwealth Scientific and International Research Organization. 1970. *Insects of Australia: A textbook for students and research workers*. Melbourne: University Press, Victoria, Australia.

- Den, M.F. dan S. Dumatang. 2010. Potensi parasitoid *Leefmnesia bicolor* untuk mengendalikan hama kelapa *Sexava rubilla* di Kabupaten Kepulauan Talaud. Jurnal Eugenia. Vol.163. Hal.181-189.
- Dellaporta, S.L. J. Wood and J.B Hicks. 1983. A plant DNA minipreparation: Version II. Plant Mol. Biol Rep. 1 (14):19-21.
- De Kraker, J. 1996. The Potential of natural enemies to suppress rice leafhopper populations. [PhD Thesis]. The Netherlands: Wageningen Agricultural University.
- [DEST] Departement of the environment, sport and territories. 2004. Biodiversity and its value.
- Dianawati, Meksy, Sujitno dan Endang. 2015. Kajian berbagai varietas unggul terhadap serangan wereng batang.
- Diani, D., W.R. Atmadja, D. Kusdianan dan Supriyadi. 1992. Komposisi parasitoid pada telur wereng (*Nilaparvata lugens* Stal.). Makalah disampaikan pada Kongres Entomologi IV. Yogyakarta, 28-30 Januari 1992.
- Diani, D. dan Dwinita W. Utami. 2014. Pendugaan gen *Bph1*, *bph2*, *Bph3*, dan *bph4* pada galur-galur padi terpilih tahan hama WBC (*Nilaparvata lugens* Stal.). Balai Besar Penelitian dan Pengembangan Bioteknologi dan Sumber Daya Genetik Pertanian. Jurnal AgroBiogen10(1):1-8.
- [DIPERTAHOR] Dinas Pertanian Tanaman Pangan dan Hortikultura Provinsi Sumatera Barat. 2014. Laporan Peningkatan Produksi Padi. Padang
- Doutt, R.L and J.Nakata. 1973. Rubus leafhopper and its egg parasitoid: an endemic biotic system useful in grape pest management. Environ.Entomol. 3:381-386 p.
- Drinkwater, L.E., D.K.Letourneau, F.Workneh, A.H.C. van Bruggen and C. Shennan. 1995. Fundamental differences between conventional and organic tomato agroecosystems in California. Ecological Applications 5: 1098-1112.
- Dryer, L.E. and D.A. Landis. 1997. Influence of non-crop habitat on distribution of *Eriborus terebrans* (Hym: Ichneumonidae) in cornfields. Environ. Entomol. 26: 924-932 p.
- Effendi, B.S. 2010. Strategi pengendalian hama terpadu tanaman padi dalam perspektif praktek pertanian yang baik (*Good Agriculture Practices*).
- Elfina, Y., A. Arsyad, A. Salim, J. Efendi dan E. Rahmi. 2001. Penggunaan agens hayati *Trichoderma* lokal Riau sebagai biofertilizer dan biopestisida dalam

PHT untuk mengendalikan penyakit dan meningkatkan produksi padi. Laporan Penelitian. Universitas Riau dan Litbang Pertanian.

- Evans, G.A. and C.A. Serra. 2002. Parasitoids associated with whiteflies (Homoptera: Aleyrodidae) in Hispaniola and descriptions of two new species of *Encarsia Förster* (Hymenoptera: Aphelinidae). *J Hym Res* 11 (2): 197-212.
- Evans, E.W. 2009. Lady beetles as predators of insects other than Hemiptera. (A review). *Biol Contr* 51: 255-267.
- Fachrul, M.F dan C.S. Listari. 2005. Komunitas fitoplankton sebagai bioindikator kualitas perairan Teluk Jakarta. Seminar Nasional MIPA 2005. Universitas Indonesia Depok.
- Fachrul, N.F. 2007. Metode sampling bioekologi. Bumi Aksara. Jakarta
- Krebs, C.J. 1999. *Ecological Methodology*, Second Edition. Addison Wesley Longman, Inc. California
- Fitriana, Y.R. 2006. Keanekaragaman dan kelimpahan makrozoo-bentos di hutan mangrove hasil rehabilitasi Taman Hutan Raya Ngurah Rai Bali. *Biodiversitas* 7(1):67-72.
- Fitriana, Y.R. 2006. Keanekaragaman dan kelimpahan makrozoo-bentos di hutan mangrove hasil *rehabilitasi* Taman Hutan Raya Ngurah Rai Bali. *Biodiversitas* 7(1):67-72.
- Forman, R.T.T and M. Godron. 1986. *Landscape ecology*. New York: John Wiley and Sons
- French, B.W, N.C. Elliot, R.C. Berbert and J.D. Burd. 2001. Effect of riparian and grassland habitats on ground beetle (Coleoptera: Carabidae) Assemblages in adjacent wheat fields. *Environmental Entomol* 2:225-121. doi: <http://dx.doi.org/10.1603/0046225X-30.2.225>.
- Fu, Y.M, W.H. Chen, W.T. Tsai, T.S. Lin, M.S. Chyou and Y.H. Chen. 1997. Phylogenetic studies of taxonomy and evolution among wild species of *Phalaenopsis* by Random Amplified Polymorphic DNA markers. Dept. Taiwan. *Sugar Res. Inst.* 157:27-42.
- Ghislain, M., D. Andrade, F. Rodríguez, R.J. Hijmans and D.M. Spooner. 2006. Genetic analysis of the cultivated potato *Solanum tuberosum* L. Phureja Group using RAPDs and nuclear SSRs. *Theor. Appl. Genet.* 113:1515–1527.
- Goulet, H. and J.T. Huber. 1993. *Hymenoptera of the world: An identification guide to families*. Ottawa: Research Branch Agriculture Canada Publication.



- Godfray, H.C.J. 1994. Parasitoids: behavioral and evolutionary ecology. New Jersey (US): Princeton University Press.
- Griffin, M.L. and K.V. Yeargan KV. 2002. Oviposition site selection by the spotted lady beetle *Coleomegilla maculata* (Coleoptera: Coccinellidae): choices among plant species. *Environ. Entomol* 31: 107-111 p.
- Gullan, P.J. and P.S. Cranston, 2000. The insect: an outline of entomology Malde: Blackwell Science. p. 155-156
- Gunawan, C.S.E., Mudjiono, Gatot dan L.P. Astuti. 2015. Kelimpahan populasi WBC *Nilaparvata lugens* Stal. (Homoptera: Delphacidae) dan laba-laba pada budidaya tanaman padi dengan penerapan Pengendalian Hama Terpadu dan konvensional. *Jurnal HPT* 1(3): 117 – 122.
- Gurr, G.M., S.D. Wratten and M.A. Altieri. 2004. Ecological engineering: Advances in habitat manipulation for arthropods. CSIRO Publishing, Melbourne (Australasian publisher)/CABI International, Wallingford (European Publisher)/Cornell University Press, Ithaca (America"s publisher). 244 Hal.
- Gurr, G.M. 2009. Prospects for ecological engineering for planthoppers and other arthropod pests in rice. Hlm 371 - 389. In Heong, K.L. and Hardy, B. (eds.) *Planthoppers – New threats to the sustainability of intensive rice production systems in Asia*. International Rice Research Institute, Los Banos, Philippines.
- Gurr, G.M. 2010. Final report. Ecological engineering to reduce rice crop vulnerability to planthopper outbreaks. Charles Sturt University. Australia.
- Hadi, M., U. Tarwotjo dan R. Rahadian. 2009. *Biologi insekta: entomologi*. Graha Ilmu. Yogyakarta.
- Hanafiah KA., 2012. *Dasar – Dasar Ilmu Tanah*. Rajawali Press, Jakarta
- Haydak, M.H. 1970. Honeybee nutrition. *Annual Review of Entomology* 15:143–156.
- Harahap, I.S dan B. Tjahjono B. 1999. Pengendalian hama penyakit padi, Penebar Swadaya. Jakarta, Hal 10-18. *Dalam* Fatimah Zahara (2001). *Tanggap WBC Nilaparvata lugens* Stal (Homoptera: Derlphacidae) terhadap mikroba bio tani Rumah Kasa. Laporan Penelitian. Medan.
- Harti, D.L 1988. *Population genetics: A primer*. Academic Press, New York.
- Hasanuddin. 2003. Peningkatan peranan mikroorganismen dalam sistem pengendalian penyakit tumbuhan secara terpadu. [Skripsi]. Digitized by USU digital library. Universitas Sumatera Utara.

- Hasyifah, R.D. 2016. Pengendalian hama wereng batang coklat (*Nilaparvata lugens* Stal.) yang menyerang tanaman padi (*Oryza sativa*) dengan minyak serai wangi dan minyak daun cengkeh. BALITTRO. Prodi Biologi, FMIPA Universitas Pakuan Bogor. 8 p.
- Hebert, P.D.N., A. Cywinska, S.L. Ball and J.R. de Waard. 2003. Biological identification through DNA barcodes. *Proc R Soc* 270: 313-321.
- Heong, K.L, G.B. Aquino and A.T. Barrion. 1991. Arthropod community structure of rice ecosystem in the Philippines. *Buletin of Entomol. Research* 81: 407-416 p.
- Heong, K.L. 2002. Arthropod diversity: looking beyond the ricefields. [www.irri.org/Science.htm](http://www.irri.org/Science.htm). [diakses tanggal 1 April 2015]
- Heong et al. 2012. The three planks for ecological engineering. <http://allplantprotection.blogspot.com/2012/05/cultivating-flowers-on-rice-field-edges.html> [diakses tanggal 5 November 2018]
- Herlinda, 1999. Analisis artropoda predator di ekosistem persawahan daerah Cianjur, Jawa Barat. [Disertasi]. Program Pascasarjana Institut Pertanian Bogor.
- Herlinda, S., D.S. Kondowanko, I.W. Winasa dan A. Rauf. 2000. Fauna arthropoda penghuni habitat pinggiran di ekosistem persawahan. Hlm. 163-174 dalam: E. Sunaryo ed. *Prosiding Simposium Keanekaragaman Hayati Artropoda pada Sistem Produksi Pertanian Perhimpunan Entomologi Indonesia 16-18 Oktober 2000*. Cipayung.
- Herlinda, S. dan Effendy. 2003. Jenis artropoda predator penghuni tajuk dan permukaan tanah di ekosistem tanaman padi. [Prosiding]. *Seminar Lokakarya Nasional Ketahanan Pangan dalam Era Otonomi Daerah dan Globalisasi*. Palembang 2-4 Maret 2003, Hlm.1-7.
- Herlinda, S, Y. Pujiastuti, J. Pelawi, A. Riyanta, E. Nurmawati dan Suwandi. 2005a. Patogenisitas isolat-isolat *Beauveria bassiana* (Bals.) Vuill. terhadap larva *Plutella xylostella* (L.) (Lepidoptera: Plutellidae) di rumah kaca. *Inovasi* 2(2):85-92.
- Herlinda, S., Hamadiyah, T. Adam & R. Thalib. 2006a. Toksisitas isolat-isolat *Beauveria bassiana* (Bals.) Vuill. terhadap nimfa *Eurydema pulchrum* (Westw.) (Hemiptera:Pentatomidae). *Agria* 2:34-37.
- Herlinda, S. 2007. Struktur komunitas dan potensi kumbang predator (Carabidae dan Laba-laba) penghuni ekosistem sawah dataran tinggi Sumatera Selatan. [Prosiding]. *Seminar dan Konferensi Nasional Konservasi Serangga 2007, Konservasi Serangga pada Bentang Alam Tropis. Peluang dan Tantangan*, Bogor, 27-30 Januari 2007.

- Herlinda S, Indah S, Mulyati, Suwandi. 2008. Jamur entomopatogen berformulasi cair sebagai bioinsektisida untuk pengendalian wereng coklat. *Agritrop* 27(3):119-126.
- Herlinda, S., Waluyo, S.P. Estuningsih and I. Chandra. 2008. Comparison of species diversity and abundance of arthropod predators habitat on the land in lowland rice fields with insecticide application and non application. *J. Entomol, Ind.* 5(2):96-107.
- Hess, G.R. and R.A. Fischer. 2001. Communicating clearly about conservation corridors. *Landscape and Urban Planing* 55:195-208 p.
- Hodge, K.T., A.J. Sawyer and R.A. Humber. 1995. PCR-RAPD for identification of *Zoophthora radicans* isolates in biological control of potato leafhopper. *J Invert Pathol* 65: 1-9 p.
- Huang, C., T. Wang, S. Chung and C. Chen. 2005. Identification of an antifungal chitinase from a potential biocontrol agent, *Bacillus cereus*. *Journal of Biochemistry and Molecular Biology* 38(1):82–88.
- Hyene, K. 1987. Tumbuhan berguna Indonesia. Jakarta: Yayasan Sarana Wana Jaya.
- [IRRI] International Rice Research Institute. 1986. IRRRI Annual Report. Manila: IRRRI. p.92-98.
- [IRRI] International Rice Research Institute. 1988. IRRRI Annual Report. Manila: IRRRI. p.103-105.
- [IRRI] International Rice Research Institute. 2003. Masalah lapang hama, penyakit, hara pada padi. IRRRI. 71 hal.
- Iswanto E.H, Rahmini dan B. Nuryanto. 2016. Antisipasi ledakan wereng batang coklat (*Nilaparvata lugens*) dengan penerapan teknik pengendalian hama terpadu biointensif. *IPTEK Tanaman Pangan* vol.11 No.1 tahun 2016.
- Jena, B.C., N.C. Patnaik and N. Panda. 1985. Gallmidge activity and parasitization by *Platigaster oryzae* in Jaya Stuble and wild rice at Bhubaneswar, India. *IRRN*. 10(5):20.
- Jervis, M.A. and M.J.W. Copland. 1996. The Life-cycle. Di dalam: Jervis MA, Kidd NAC, editor. *Insect Natural Enemies Practical Approaches to Their Study and Evaluation*. United Kingdom: Chapman & Hall. p. 78-214.
- Jiaan, C, Hangzhou, L. Zhongxia and C. Guihua. 2013. President of the Chinese Academy of Agriculture Sciences (CAAS) visits ecological engineering sites in Zhejiang province. <http://iasvn.org/en/tin-tuc> [diakses 1 April 2015]

- Jing, S., B. Liu, L. Peng, X. Peng, L. Zhu, Q. Gu and G. He. 2011. Bulletin of Entomological Research p. 1-10. DOI:1017/S0007485311000435.
- Johnson, M.W. 1987. Biological control of pests. Hand out compilation of 1987 spring season course. Department of Entomology University of Hawaii at Manoa. Honolulu Hawaii.
- Joshi, R.J. and S. Nayak. 2008. Gene pyramiding-A broad spectrum technique for developing durable stress resistance in crops. Biotechnology and Molecular Biology Review Vol. 5(3): 51-60.
- Jumar. 2000. Entomologi pertanian. Jakarta: PT Rineka Cipta.
- Kalshoven, L.G.E. 1981. Pest of crops in Indonesia. Jakarta : PT Ichtiar Baru.
- Kardin, M.K, Y. Suryadi, Y.A. Betty dan S. Kartikaningrum. 1997. Aplikasi teknik molekuler (RAPD) untuk analisis keragaman genetik pada anggrek Vanda. Laporan Proyek Balai Penelitian Tanaman Hias. Jakarta. Tidak dipublikasikan. 6 pp
- Karindah, S. 2006. The use of weeds plant species to enhance the conservation of *Metioche vittaticollis* Stal (Orthoptera: Gryllidae), generalist predator of rice hoppers [Disertasi]. Malang: Program Pasca Sarjana Universitas Brawijaya.
- Karindah, S., A. Purwaningsih, A. Agustin dan L.P. Astuti. 2011. Ketertarikan *Anaxipha longipennis* Serville (Orthoptera: Gryllidae) terhadap beberapa jenis gulma di sawah sebagai tempat bertelur. Jurnal Entomologi Indonesia. April 2011. Vol. 8 No. I, Hal. 27-35.
- Kartikaningrum, S. 2002. Analisis hubungan kekerabatan antar genus anggrek subtribe sarcanthinae berdasarkan fenotip dan pola pita DNA melalui teknik random amplified polymorphic DNA. Tesis Pascasarjana UNPAD. 108 pp.
- Kartohardjono, A., T. Teryana, W.R. Atmadja dan Nursasongko. 1989. Peranan predator *Cyrtorhinus sp.* dalam memangsa wereng coklat pada tanaman padi. Edisi Khusus No. 2. Penelitian Wereng Coklat 1987/1988. Balai Penelitian Tanaman Pangan Bogor.
- Kartohardjono, A. 1992. Pengaruh parasitoid telur *Anagrus sp* dan *Gonatocerus sp* terhadap wereng coklat pada dua jenis tanaman inang [Kumpulan Abstrak]. Disampaikan pada Kongres Entomologi IV, Yogyakarta, 28-30 Januari 1992. p.93.
- Kartohardjono, A dan W.R. Atmadja. 1997. Pelestarian parasitoid (*Anagrus sp.* dan *Oligosita sp.*) pada WBC (*Nilaparvata lugens* Stal.) dengan menyemprotkan ekstrak inang dan gula. Prosiding III, Seminar Nasional Biologi XV. PBI Cabang Lampung dan Unila.

- Kartohardjono, A. 2011. Penggunaan musuh alami sebagai komponen pengendalian hama padi berbasis ekologi. *Pengembangan Inovasi Pertanian* 4 (1):29-46
- Kartosuwondo, U. 1984. Beberapa hama penting tanaman pangan. Bogor: Fakultas Pertanian, Institut Pertanian Bogor.
- Kartosuwondo, U. 1994. Populasi *Plutella xylostella* L (Lep: Yponomeutidae) dan parasitoid *Diadegma semiclausum* Helen (Hym: Ichneumonidae) pada kubisan dua jenis Brassicaceae liar. *Bul HPT* 7: 39-49 p.
- Khashaveh, A., Y. Ghosta, M.H. Safaralizadeh and M. Ziaee, 2011. The use of entomopathogenic fungus, *Beauveria bassiana* (Bals.) Vuill. in assays with storage grain beetles. *Journal Agricultural Science and Technology*, 13(1), 35-43.
- Kidd, N.A.C. and M.A. Jervis. 1996. Population dynamics. Di dalam: Jervis MA, Kidd NAC, editor. *Insect Natural Enemies Practical Approaches to Their Study and Evaluation*. United Kingdom: Chapman & Hall. p. 293-374.
- Koestarmans, A.J.G.H, Wirjahardja, S, Dekker and R.J. 1987. The weeds: deskriptio, ecology and control. Di dalam: Soerjani M, Kostermans AJGH, Tjitrosoepomo G, editor. *Weed of rice in Indonesia*. Jakarta. Balai Pustaka. Hal 24-566.
- Konstantopoulou, M.A. and B.E. Mazomenos. 2005. Evaluation of *Beauveria bassiana* and *B. brongniartii* strains and four wild-type fungal species against adults of *Bactrocera oleae* and *Ceratitis capitata*. *BioControl*, 50, 293-305.
- Krebs, C.J. 1989. *Ecological methodology*. Harper Collins Publisher, Inc. New York.
- Krebs, C.J. 1999. *Ecological methodology*. Second edition. New York: An imprint of Addison Wesley Longman, Inc.
- Kromp, B and K.H. Steinberger. 1992. Grassy field margins and arthropod diversity: A case study on ground beetles and spiders in Eastern Austria (Coleoptera: Carabidae; Arachnidae: Araneae). *Agric. Ecosyst. Environ.* 40: 71-93 p.
- Kruess and Tschardtke. 1994. Habitat fragmentation, spesies loss and biological control. *Science* 264: 1581-1584 p.
- Kuno, E. 1979. Ecology of brown planthoppers in temperate regions. In: *Brown planthopper: threat to rice production in Asia*. Manila (Philippines): International Rice Research Institute. p.45-60.

- Kusbiantoro H. 2006. Potensi *Bacillus subtilis* sebagai agens penginduksi ketahanan tanaman cabai terhadap Cucumber Mosaic Virus. [Skripsi]. Institut Pertanian Bogor.
- Laba, I.W. dan A. Kartohardjono. 1998. Pelestarian parasitoid dan predator dalam pengendalian hama tanaman. *Jurnal Penelitian dan Pengembangan Pertanian XVII*: 121-129.
- Laba, I.W. 2001. Keanekaragaman hayati artropoda dan peranan musuh alami hama utama padi pada ekosistem sawah. Makalah Falsafah Sains, Program Pascasarjana/S3, IPB, Bogor.
- Laba, I.W. 2010. Analisis empiris penggunaan insektisida menuju pertanian berkelanjutan. Naskah disarikan dari bahan Orasi Profesor Riset Bogor. *Pengembangan Inovasi Pertanian*, 3(2), 120-137.
- Lahaye. 2008. DNA barcoding the floras of biodiversity hotspots. *PNAS* 105(8): 2923-2928.
- Landis, D.A. and F. Menaed. 1998. Ecological consideration in conservation of effective parasitoid communities in agricultural system. Di dalam: Barbosa P, editor. *Conservation Biological Control*. San Diego: Academic Press, CA. 101-121p.
- Landis, D.A., S.D Wratten and G.M. Gurr. 2000. Habitat management to conserve natural enemies of arthropoda pest in agriculture. *Annual review of entomology*, 45:175-201.
- Landis, D.A and D.B. Orr. 2004. *Biological control: Approaches and applications*. <http://www.ipmworld.umn.edu> [diakses 2 April 2015]
- Landis, D.A., F.D. Menalled, and A.C. Costamagna. 2005. Manipulating plant resources to enhance beneficial arthropods in agricultural landscapes. *Weed Sciences*, 53:902-908.
- Latief, M.A., M.Y. Rafii, M.Z. Mazid, M.E. Ali, F. Ahmed, M.Y. Omar dan S.G. Tan. 2012. Genetic dissection sympatric populations of brown planthopper, *Nilaparvata lugens* (Stal), using DALP-PCR molecular markers. *The Scientific World Journal*, Article ID 586831.
- Laumonier, E.K.W., R. Megia and H. Veenstra. 1987. The seedling. Di dalam: Soerjani M, Kostermans AJGH, Tjitrosoepomo G, editor. *Weed of rice in Indonesia*. Jakarta. Balai Pustaka. Hal 567-686.
- Liu, C.H. 1983. Study on the long distance migration of the brown planthopper in Taiwan. Division of Crop Environment. Taitung District Agriculture Improvement Station. Taitung, Taiwan.

- Loo, A.H.B., H.T.W. Tan, P.P. Kumar and L.G. Saw. 1999. Population analysis of *Licuala glabra* Griff. var. *glabra* (Palmae) using RAPD profiling. *Ann Botany* 84: 421-427 p.
- Lubis, I.W. 2005. Peranan keanekaragaman hayati artropoda sebagai musuh alami pada ekosistem padi sawah. *Jurnal Penelitian Bidang Ilmu Pertanian* Volume 3, Nomor 3 Desember 2005: 16-24
- Ludwig, J.A. and J.F. Reynolds. 1988. *Statistical ecology, a primer on methods and computing*. John Wiley & Sons, New York, USA. pp. 89-95
- Luque, C., L. Legal, H. Staudter, C. Gers, M and Wink. 2002. Brief report: ISSR as genetic markers in Noctuids (Lepidoptera). *Hereditas*. 136:251-253.
- Lynch, M., B.G. Milligan, 1994. Analysis of population genetic structure with RAPD markers. *Mol. Ecol.* 3:91-99
- Macfayden, S., R. Gibson, A. Polaszek, R.J. Morris, P.G. Craze, R. Plangue, W.O.C. Symondson and J. Memmott. 2009. Do differences in food web structure between organic and conventional farms affect the ecosystem service of pest control. *Ecology Letters* (2009).12: 229-238.
- Mackenzie, A., A.S. Ball and S.R. Virdee. 1998. Instant note. In: *Ecology*. London: Bios Scientific Publishers.
- Magurran, A.E. 1996. *Ecological diversity and 1<sup>st</sup> measurement*. London: Chapman and Hall.
- Magurran, A.E. 1987. *Ecological diversity and its measurement*. Princeton Univ. Press, New Jersey.
- Magurran, A.E. 1988. *Ecological diversity and its measurement*. Croom Helm Ltd. London.
- Mangoendihardjo, S. 1982. Serangga pemakan tumbuhan pada beberapa jenis gulma air di Indonesia. [Disertasi]. Universitas Gadjah Mada. Yogyakarta.
- Maniatis T, E.F. Fritsch and J. Sambrook. 1989. *Molecular cloning: A Laboratory Manual*. United State of America: Cold Spring Harbor Laboratory Press.
- Manly, B.F.J. 1997. *Randomization, bootstrap and methods in biology*. Chapman & Hall, London, p. 281.
- Manti, I., S. Sosromarsono, M. Iman dan R.T.M. Sutamihardja. 1982. Biologi predator *Cyrtorhinus lividipennis* Reuter dan predatisme terhadap wereng coklat (*Nilaparvata lugens* Stål.). *Penelitian Pertanian* 2(2):56-59.

- Marc, P., A. Canard and F. Ynes. 1999. Spiders (Araneae) useful for pest limitation and bioindication. *Agriculture, Ecosystems and Environment*. 74:229-273. doi: [http://dx.doi.org/10.1016/S0167-8809\(99\)00038-9](http://dx.doi.org/10.1016/S0167-8809(99)00038-9).
- Mardiyanti, E.D., P.W. Karuniawan and B. Medha. 2013. Dynamics of plant species diversity post-planting rice. *J. Plant Production* 1(1):24-35.
- Maredia, K.M., D. Dakouo and D. Mota-Sanchez. 2003. Integrated pest management in the global area. CABI Publishing. USA
- Marheni, 2004. Kemampuan beberapa predator pada pengendalian wereng batang coklat (*Nilaparvata lugens* Stal.). *Jurnal Natur Indonesia*. [www.unri.ac.id/jurnal/jurnal\\_natur/vol6\(2\)/Mar](http://www.unri.ac.id/jurnal/jurnal_natur/vol6(2)/Mar) [diakses 31 Maret 2015]
- Marino, C.P and D.A. Landis. 2000. Parasitoid community structure (implication for biological control in agriculture landscapes). Di dalsam: Ekbon B, Irwin ME, Robert Y, editor. *Interchanges of insect between agriculture and surrounding landscape*, Boston: Kluwer Academic Publishers. 183-193p.
- Marpaung, A. 2009. Apa dan bagaimana mempelajari analisa vegetasi. <http://boymarpaung.wordpress.com/2009/04/20/apa-dan-bagaimana-mempelajari-analisa-vegetasi> [diakses 5 Desember 2018]
- Martinez, I. and L.A.Pastene. 1999. RAPD-typing of Central and Eastern North Atlantic and Western North Pacific minke whales, *Balaenoptera acutorostrata*. *ICES J Marine Sci* 56:640-651.
- Marwoto, Era Wahyuni dan K.E Neering. 1991. Pengelolaan pestisida dalam pengendalian hama kedelai secara terpadu. Departemen Pertanian. Malang
- Maryeni, *et al.* 2009. Teknologi pemanfaatan limbah buah kakao sebagai pupuk organik ramah lingkungan di Nagari Kamang Hilir Kecamatan Kamang Magek Kabupaten Agam. [www.respository.unand.ac.id/3286/1/renimaryeni.pdf](http://www.respository.unand.ac.id/3286/1/renimaryeni.pdf).
- McCouch, S.R, L.Teytelman, Y. Xu, K.B. Lobos, K. Clare, M. Walton, B. Fu, R. Maghirang, Z. Li, Y. Xing, Q. Zhang, I. Kono, M. Yano, R. Fjellstrom, G. DeClerck, D. Schneider, S. Cartinhour, D. Ware and L. Stein. 2002. Development and mapping of 2240 new SSR markers for rice (*Oryza sativa* L.). *DNA Research* 9:199–207. doi: <http://dx.doi.org/10.1093/dnares/9.6.199>.
- McCullough, D.R. 1996. *Metapopulations and wildlife conservation*. Island Press. Covelo, California. 432 p.
- McNaughton, S.J. and L.L. Wolf. 1998. *Ekologi umum*. S.Pringgoseputro, penerjemah. Yogyakarta: Gajah Mada University Press. Terjemahan: *General Ecology*.



- Mensah, R.K. 1999. Habitat diversity: Implications for the conservation and use of predatory insects of *Helicoverpa* spp. in cotton systems in Australia. *International Journal of Pest Management* 45: 91–100.
- Mikkelsen, S.R and E. Corton, 2004. *Bioanalytical chemistry*. New Jersey: John Wiley & Sons.
- Minarni, E.W, A. Suyanto dan Kartini. 2017. Potensi predator dalam mengendalikan hama wereng batang coklat pasca terjadinya ledakan di Kabupaten Banyumas. [Prosiding]. Seminar Nasional Pengembangan Sumberdaya Pedesaan dan Kearifan Lokal Berkelanjutan VII. 17-18 November 2017.
- Mochida, O., T. Okada and Suryana. 1977. Recent outbreaks of the brown planthopper in Southeast Asia (Special reference to Indonesia). Di dalam: *The rice brown planthopper*. Taipei, Taiwan: Penerbit. p.21-44.
- Mochida, O., 1979. Brown planthopper reduced rice production. *Indonesia Agric.Res and Development*. 1: 2-7p.
- Mochida, O and T. Okada, 1979. Taxonomy and biology of *Nilaparvata lugens* Stal. (Homoptera : Delphacidae). pp.21-44. In *brown planthopper threat to rice production in Asia*. IRRI. Los Banos, Phillipines.
- Moenandir, J. 1993. *Persaingan tanaman budidaya dengan gulma*. Ilmu Gulma (Buku III). PT Raja Grafindo Persada. Jakarta.
- Mooney, K.A., R.T. Pratt and M.S. Singer. 2012. The tri-trophic interactions hypothesis: interactive effects of host plant quality, diet breadth and natural enemies on herbivores. *PloS one*. 7(4): 34403-34403.
- Mudjiono, G. 1998. *Hubungan timbal balik serangga tumbuhan*. Malang: Lembaga Penerbitan Fakultas Pertanian Universitas Brawijaya.
- Mudrončková, S., M. Mazáň, M. Nemčovič and I. Šalamon, 2013. Entomopathogenic fungus species *Beauveria bassiana* (Bals.) and *Metarhizium anisopliae* (Metsch.) used as mycoinsecticide effective in biological control of *Ips typographus* (L.) *Journal Molecular Biotechnology and Food Science*, 2(6), 2469-2472.
- Noda, H. 2009. How can planthopper genomics be useful for planthopper management. p. 429-446. In K.L. Heong and B Hardy (Eds.). *Planthoppers: New threats to the sustainability of intensive rice production systems in Asia*. International Rice Research Institute, Los Banos, the Philippines.

- Norris, R.F. and M. Kogan. 2000. Interactions between weeds, arthropod pests, and their natural enemies in managed ecosystems. *Weed Science* 48: 94–158.
- Norris, R.F., E.P. Caswell-Chen and M. Kogan. 2003. Concepts in integrated pest management. New Jersey: Prentice Hall.
- Nugroho, A.S. and A.M. Tria. 2015. Analysis of fruits plant diversity in Surokonto forest protected, Kendal, Central Java and potential as birds conservation areas. *Proceeding of Biodiversity National Seminary, Indonesia*. pp.472-476.
- Nyffeler, M and K.D. Sunderland. 2003. Composition, abundance and pest control potential of spider communities in agroecosystem: a comparison of European and US studies. *Agric Ecosyst Environ* 95:576-612.
- Obara-Okeyo and S. Kako. 1998. Genetic diversity and identification of *Cymbidium* cultivars as measured by Random Amplified Polymorphic DNA (RAPD) marker. *Euphytica* 99:95-101.
- Odum, E.P. 1993. *Dasar-dasar Ekologi*. Edisi Ketiga. Yogyakarta. Universitas Gadjah Mada Press.
- Odum, E.P. 1996. *Dasar-dasar ekologi*, Edisi ketiga. Terjemahan: Tjjahyono Samingan. Gadjah Mada University Press, Yogyakarta.
- Odum, E.P. 1998. *Dasar-dasar ekologi*, Edisi ketiga. Terjemahan: Tjahyono Samingan. Gadjah Mada University Press. Yogyakarta.
- Oktarina, R. 2009. Tanggap fungsional predator *Cyrotorhinus lividipennis* Reuter (Hemiptera: Miridae) terhadap hama wereng batang coklat *Nilaparvata lugens* Stal. (Hemiptera: Delphacidae). Fakultas Pertanian. Institut Pertanian Bogor.
- Orhan, E., A. Esitken, S. Ercisli, M. Turan and F. Sahin. 2006. Effects of plant growth promoting rhizobacteria (PGPR) on yield, growth and nutrient contents in organically growing raspberry. *Scientia Horticulturae*. 111(1) : 38–43.
- Panda, N. and G.S. Khush. 1995. Host plant resistance to insects. Wallingford: CABI.
- Paulitz, T.C and R.R. Belanger. 2001. Biological control in greenhouse systems. *Annu.Rev.Phytopathol* 39:103-133.
- Pedigo, L.P. 1999. Entomology and pest management. Iowa University. Prentice Hall, Upper Sadle River. NJ. 07458. Third Edition.
- Pimm, S.L. 1979. The structure of food webs. *Theo Pop Bio*. 16(2):144-158.

- Pimm, S.L. and R. Kitching. 1987. The determinants of food chain lengths. *Oikos*. 50(3):302-307.
- Poinar, G.O. and C.M. Thomas. 1984. Laboratory guide to insect patogen and parasites. Plenum Press, New York.
- Powell, W. 1986. Enhancing parasitoid activity in crop. In: J.Waage, D. Greathed, editor. Insect parasitoids. Orlando: Academic Press. 319-340 p.
- Pratiwi, P. 2012. Analysis of genetic variation *Globba leucantha* Miq. Population in West Sumatra with *Random Amplified Polymorphic DNA* (RAPD) [Disertation]. Graduate Program Andalas University, Padang.
- Price, P.W., C.E. Bouton, P. Gross, B.A. McPheron, J.N. Thompson and A.E. Weis. 1980. Interactions among three trophic levels: influence of plants on interactions between insect herbivores and natural enemies. *Ann Rev Ecol Syst.* 11:41- 65.
- Primack, R.S. 1998. Biologi konservasi. Primack, R.S, J. Supriatna, M. Indrawan, P. Kramadibrata (Penerjemah). Jakarta: Yayasan Obor Indonesia. Terjemahan: A Primer of Conservation Biology.
- Purvis, A. and A. Hector. 2000. Getting the measure of biodiversity. *Nature* 405: 212-219.
- Rachmawati, D. 2013. Karakteristik habitat dan keanekaragaman Arachnida family Araneidae di Cagar Alam Tukung Gede Serang Banten. [Prosiding]. Semirata FMIPA Universitas Lampung.
- Rahmini, H. Purnama, R. Endang Sri, W. I Wayan dan M. Syafrida. 2012. Respon biologi wereng batang coklat terhadap biokimia tanaman padi. *Penelitian Pertanian Tanaman Pangan No. 2* (31):117-123.
- Reddy, K.D., J. Nagaraju and E.G. Abraham. 1999. Genetic characterization of the silkworm *Bombyx mori* by simple sequence repeat (SSR) anchored PCR. *Heredity* 83:681-687.
- Roderick, G.K. 1996. Goegraphic structure on insect population: gene flow, phylogeography, and their uses. *Ann. Rev. Ent.* 41:325-352.
- Rohlf, F.J. 2000. Program NTSYS-pc:numerical taxonomy and multivariate analysis system: version 2.1. Exeter Software, NewYork, p. 83.
- Rojas, M.R, R.L Gilbertson, D.R. Russell, D.P Maxwell. 1993. Use of degenerate primers in the Polymerase Chain Reaction. *Plant Dis.* 77(4):340-347.
- Rondelli, V.M., J.R. de Carvalho, D. Pratisoli, R.A. Polanczyk, J.R. De Conte Carvalho de Alencar, F.D. Zinger and S.M.A. Pereira, 2012. Selection of

- Beauveria bassiana* (Bals.) Vuill. isolates for controlling *Sitophilus zeamays* (Mots.) (Coleoptera: Curculionidae). IDESIA (Chile), 30(3), 97-102.
- Rubia, E.G. and B.M. Shepard. 1987. Biology of *Metioche vittaticollis* (Stal.) (Orthoptera: Gryllidae), a predator of rice pest. Bull Ent. Res. 77:669- 676.
- Rukmana, R. 1999. Gulma dan teknologi pengendalian. Yogyakarta. Penerbit Kanisius.
- Rukmana, R. dan Sugandi. 2002. Hama tanaman dan teknik pengendaliannya, Kanisius. Yogyakarta.
- Ryszkowski L, L.Karg, G. Margalit, M.G.Paoletti and R. Zlotin. 1993. Above ground insect biomass in agricultural landscape of Europe. In: R.B.H. Bunce, L.Ryszkowski, M.G.Paoletti, editor. Landscape ecology and agroecosystems. Michigan: Lewis, Ann Arbor. 71-82 p.
- Sadeghi, H. and T. Gilbert. 2000. Oviposition preferences of aphidophagus hoverflies. Ecological Entomology 25: 91-100.
- Safavi, S.A., A. Kharrazi, R. Rasoulia and A.R. Bandani, 2010. Virulence of some isolates of entomopathogenic fungus, *Beauveria bassiana* on *Ostrinia nubilalis* larvae (Lepidoptera: Pyralidae). Journal Agricultural Science Technology 12(1):13-21.
- Sahad, K.A. and Y. Hirashima. 1984. Taxonomic studies on the genera *Gonatocerus* nees and *Anagrus* holiday of Japan and adjacent regions, with notes on their biology (Hymenoptera; Mymaridae) Bull. Inst. Trop. Agr. Kyushu Univ.
- Salbiah, D., L.J. Hennie dan Nurmayani. 2013. Uji beberapa dosis *Beauveria bassiana* Vuill. terhadap larva hama kumbang tanduk *Oryctes rhinocerus* (Coleoptera: Scarabaeidae) pada kelapa sawit. Jurnal Teknobiologi, IV(2):137-142.
- Saleh, S., M. Iris, C.W. Thomas and T. Teja. 2016. Habitat management on multiple spatial scales can enhance bee pollination and crop yield in tropical homegardens. Agriculture Ecosystems & Environment 223:144-151. DOI:10.1016/j.agee. 2016.03.001.
- Salma, S. dan L. Gunarto. 1996. Aktivitas trichoderma dalam perombakan selulosa. Penelitian Pertanian Tanaman Pangan.
- Santosa, S.J. dan S. Joko. 2007. Role of natural enemies in the paddy ecosystem. J. Inovasi Pertanian 6(1):1-10.
- Santosa, E. dan S.E. Baehaki. 2009. Optimalisasi pemanfaatan musuh alami dalam pengendalian hama terpadu pada budidaya padi intensif untuk sistem

pertanian berkelanjutan. Makalah Inovasi Teknologi Padi Menuju Swasembada Beras Berkelanjutan. Balai Penelitian Tanaman Padi Sukamandi. Jawa Barat.

Sastroutomo dan S. Soetikno. 1990. Ekologi gulma. Jakarta: PT. Gramedia Pustaka Utama.

Schoenly, K., J.E. Cohen, K.L.Heong, J.A.Litsinger, G.B.Aquino, A.T. Barrion and G. Arida. 1996. Food web dynamics of irrigated rice fields at five elevations in Luzon, Philippines. *Bulletin of Entomological Research* (1996) 86, 451-466

Setiadi, D., I. Muhadiono dan A. Yusron. 1989. Penuntun praktikum ekologi. Bogor: IPB Press.

Settle, W.H., H. Ariawan, E.T. Astuti, W. Cahyana, A.L. Hakim, D. Hindayana, A.S. Lestari and Pajarningsih. 1996. Managing tropical rice pest through conservation of generalist natural enemies and alternative Prey. *Ecology*. 77: 1975-1988 p.

Settle, W.H dan H. Ariawan. 1997. Mengelola hama padi daerah tropis melalui konservasi musuh alami generalis dan mangsa alternatif. Malang: Program Nasional Pengendalian Hama Terpadu Departemen Pertanian Fakultas Pertanian Universitas Brawijaya.

Setyadi, Y., S.H. Abida, H. Azzimuddin, F. Rahmah dan A.S. Leksono. 2017. Efek refugia tanaman jagung (*Zea mays*) dan tanaman kacang panjang (*Vigna cylindrica*) pada pola kunjungan serangga di sawah padi (*Oryza sativa*) Dusun Balong, Karanglo, Malang. *Jurnal Biotropika* Vol.5 No.2 Tahun 2017.

Sheeba, G., S. Seshadri, N. Raja, S. Janarthanan and S. Ignacimutu, 2001. Efficacy of *Beauveria bassiana* for control of the rice weevil *Sitophilus oryzae* (L.) (Coleoptera: Curculionidae). *Applied Entomology Zoology*, 36(1), 117-120.

Shepard, B.M, A.T. Barrion and J.A. Litsinger. 1987. Helpful insect, spiders and pathogens (Revised Edition). Los Banos: International Rice Research Institute (IRRI).

Shepard, B.M., H.R. Rapusas and D.B. Estano. 1989. Using rice straw bundles to conserve beneficial arthropod communities in rice fields. *Int.Rice.Res.Newl.* 14(5):30-31.

Shepard, B.M., A.T. Barion dan J.A. Litsinger. 1994. Mitra petani, serangga laba-laba dan patogen yang membantu. Kasumbogo Untung dan Samino Wirjosuharjo (Penerjemah). Los Banos: International Rice Research Institute.

- Shepard, B.M., A.T. Barrion dan J.A. Litsinger. 1995. Serangga, laba-laba, dan patogen yang membantu. Jakarta: Program Nasional Pengendalian Hama Terpadu. Helpful insect, spiders, and pathogens (Terjemahan).
- Shufran, K.A. and M.E. Whalon. 1995. Genetic analysis of brown planthopper biotypes using random amplified polymorphic DNA-polymerase chain reaction (PCR-RAPD). *Insect Sci Applic* 16: 27-33 p.
- Sianipar. 2017. Populasi hama wereng coklat dan produksi padi di lahan sawah Kabupaten Garut, Jawa Barat. *Pros.Sem.Nas.Masy. Biodiv. Indon.*4(1):868-873.
- Sigsgaard, L. 2004. Oviposition preference of *Anthocoris nemorum* and *A. nemoralis* for apple and pear. *Entomol. Exp. Appl.* III: 215-223.
- Sivapragasam, A. 1983. Weed host for *Cyrtorhinus lividipennis* Reuter, a brown planthopper predator. *Int.Rice.Res.Newl.*8(6):9.
- Slatkin, M. 1994. Gene flow and population structure. In Real. LA (Ed). *Ecological genetics*. Princeton University Press.Princeton. New York. pp. 3-17.
- Soegawa K. 1982. The rice brown planthopper: feeding physiology and host plant interactions. *Ann Rev.Entomol.*27:49-73 p.
- Soegiarto dan Baco. 1993. Strategi dan program penelitian hama-hama tanaman pangan pada PJP II dalam pemantapan penelitian hama tanaman pangan. *Risalah Lokakarya*. Balai Penelitian Tanaman Pangan. Sukarami. Sumatera Barat.
- Soegianto dan Agus. 1994. Ekologi kuantitatif. *Metode Analisis Populasi dan Komunitas*. Usaha Nasional Surabaya. p. 21-27.
- Soenarjo, E. 1986. Keberadaan parasit ganjur padi *Orseoli oryzae* (wordmason) pada ganjur alang-alang *Orseoli japonica* Kieffer. *Risalah Seminar Hasil Penelitian Tanaman Pangan di Sukamandi*, 16-18 Januari 1986. Vol.2: hal. 352-356.
- Soenarjo, E. 2000. Analisis ledakan dan pengendalian hama wereng coklat di wilayah endemik. *Pusat Penelitian dan Pengembangan Tanaman Pangan*, Bogor. 60 hal.
- Soerianegara, I. dan I. Andry. 2005. *Ekologi hutan Indonesia*. Fakultas Kehutanan Instiitut Pertanian Bogor.
- Sorati, M., M. Newman, and A.A. Hoffman. 1996. Inbreeding and incompatibility in *Trichogramma nr. brassicae* : evidence and implications for quality ontrol. *Entomol. Experiment. et Appli.* 78:289-290.

- Sosromarsono, S. dan K. Untung. 2000. Keanekaragaman hayati artropoda predator dan parasitoid di Indonesia serta pemanfaatannya. Di dalam: Prosiding Simposium Keanekaragaman Hayati Artropoda pada Sistem Produksi Pertanian; Cipayung, 16-18 Oktober 2000. Cipayung: PEIKEHATI p. 33-46.
- Southwood, T.R.E. 1986. Ecological methods: With particular reference to the study of insect populations. Chapman and Hall, New York.
- Speight, M.R., M.D. Hunter and A.D. Watt. 1999. Ekology of insect. Concept and aplication. Blacwell Science. Osney Mead. Oxford.
- Spellberg, I.F. 1995. Monitoring ecological change. Melbourne: Cambridge University Press.
- Stanley, R.G. and H.F. Linskens. 1974. Pollen: Biology, Biochemistry, Management. Springer-Verlag, New York. 289 p
- Strong, L.J.H. and W.R. South. 1984. Insect on plants. Boston: Harvard University Press.
- Suana, I.W. dan H. Haryanto 2007. Keanekaragaman laba-laba pada ekosistem sawah monokultur dan polikultur di Pulau Lombok. Mataram: Universitas Mataram.
- Subandi, M., L. Chaidir dan U. Nurjanah. 2016. Keefektifan insektisida BPMC dan ekstrak daun suren terhadap hama wereng batang coklat dan populasi musuh alami pada padi varietas Ciherang. Jurnal Agrikultura 27(3):160-166. ISSN 0853-2885.
- Sunjaya, P.I. 1970. Dasar-Dasar Serangga. Bagian Ilmu Hama Tanaman Pertanian. IPB. Bogor.
- Swift, M.S., J. Vandermer, P.S. Ramakrishnan, J.M. Anderson, C.K. Ong and B.A. Hawkins. 1996. Biodiversity and agroecosystem function, In: Fungsional Roles of Biodiversity: A Global Perspective. John Wiley and Sons, New York. pp.261-298.
- Symondson, W., K.D Sunderland and M.H. Greenstone. 2002. Can generalist predators be effective biocontrol agents. Annu.Rev.Entomol.47:561-594.
- Tanaka, 1999. Quantitative genetic analysis of biotypes of planthopper of *Nilapavarta lugens*; heritability of virulence to resistant rice varieties. Entomologia Experimentalis et Applicata Vol. 90:279-287.
- Tandiabang, J., Koesnang dan A. Muis. 2001. Fluktuasi populasi wereng hijau (*Nephotettix virescens*) dan intensitas penyakit tungro di Lanrang, Sidrap, Sulawesi Selatan. J.Fitopat.Ind.5:24- 29.

- Tandjung, S.D. 2003. Ilmu lingkungan. Yogyakarta: Laboratorium Ekologi Fakultas Biologi Universitas Gadjah Mada.
- Tauruslina, E.A. 2014. Daerah sebaran wereng batang coklat *Nilaparvata lugens* Stal. (Homoptera : Delphacidae) pada tanaman padi di Sumatera Barat Tahun 2009-2013 [Laporan Penelitian]. Program Doktor Pada Program Studi Ilmu Pertanian Universitas Andalas Padang.
- Tauruslina, E.A. 2017. Uji reaksi ketahanan varietas padi berdasarkan *honeydew* wereng batang coklat di Sumatera Barat [Laporan Kegiatan]. Balai Perlindungan Tanaman Pangan dan Hortikultura Sumatera Barat. Padang.
- Thalib, R., T.A. Effendy dan S. Herlinda. 2002. Struktur komunitas dan potensi artropoda predator hama padi penghuni ekosistem sawah dataran tinggi di daerah Lahat, Sumatera Selatan. [Makalah]. Seminar Nasional Dies Natalis Fakultas Pertanian Universitas Sriwijaya dan Peringatan Hari Pangan Sedunia, Palembang, 7-8 Oktober 2002.
- Thalib, R., R. Fernando, Khodijah, D. Meidalimadan S. Herlinda. 2013. Patogenisitas isolat *Beauveria bassiana* dan *Metarrhizium anisopliae* asal tanah lebak dan pasang surut Sumatera Selatan untuk agens hayati *Scirpophaga incertulas*. Jurnal Hama Penyakit Tumbuhan Tropika, 13(1), 10-18.
- Thungrabeab, M. and S.Tongma, 2007. Effect of enthomopatogenic fungi, *Beauveria bassiana* and *Metarhizium anisopliae* on non target insect. Journal Technology 7(1):8-12.
- Tirtowiyono, S.,I. Sahi dan Santika, 1988. Evaluasi beberapa galur harapan padi pertanaman cadangan transgenik tahan wereng coklat. Badan Pemeliharaan dan Pengembangan Pertanian. Balai Penelitian Tanaman Pangan, Bogor. 18-31 p.
- Tjitrosoedirdjo, S. 1984. Pengelolaan gulma di perkebunan. Gramedia. Jakarta.
- Townsend, R.J. V.W. O'Callaghan and J. Jackson, 2003. Compatibility of microbial control agents *Serratia entomophila* and *Beuaveria bassiana* with selected fertilizers. New Zealand Plant Protection, 56:118-122.
- Trizelia dan F. Nurdin, 2010. Virulence of entomopathogenic fungus *Beauveria bassiana* isolates to *Crocidolomia pavonana* (Lepidoptera: Crambidae). Agrivita, 32(3):254-261.
- Tumlinson, J.H. 1988. Contemporary frontiers in insect semiochemical research. Journal of Chemical Ecology, 14(11):2109-2130.



- Tylianakis, J.M., T. Tscharntke, O.T. Lewis. 2007. Habitat modification alters the structure of topical host-parasitoid food webs. *Nature Letters*. Vol 445III January 2007 Idoi:10.1038/nafixe05429. pp.202-205
- Untung, K. 1992. Konsep dan strategi pengendalian hama terpadu. Makalah Simposium Penerapan PHT. PEI Cabang Bandung. Sukamandi, 3-4 September 1992. 17 p.
- Untung, K. 1993. Pengantar Pengelolaan Hama Terpadu. Yogyakarta. Gajah Mada University Press.
- Untung, K dan Sudomo. 1997. Pengelolaan serangga secara berkelanjutan. Simposium Entomologi, Bandung.
- Untung, K. 2006. Pengantar Pengelolaan Hama Terpadu. Edisi kedua. Gajah Mada University Press. Yogyakarta.
- Valverde, A.J and J.M. Lobo. 2007. Determinants of local spider (Araneidae and Thomisiidae) species richness on a regional scale; climate and altitude vs habitat structure. *Ecological Entomology* 32:113-122. doi: <http://dx.doi.org/10.1111/j.1365-2311.2006.00848.x>.
- Van Emden, H.F. 1991. Plant diversity and natural enemy efficiency in agroecosystems. In: Mackkauer M, Ehler LE, Roland J, editor. *Critical Issues in Biological Control*. Great Britain: Atheneum Press. 63-80 p.
- Van Veen, F.J.F, C.B.Muller, J.K. Pell, H.C.J. Godfray. 2008. Food web structure of three guilds of natural enemies: predators, parasitoids and pathogens of aphids. *Journal of Animal Ecology* 2008, 77: 191-200 p.
- Verhoef, H.A and P.J. Morin. 2010. *Community ecologist, processes, models and applications*. Oxford University Press.
- Vet, L.E. and M. Dicke. 1992. Ecology of infochemical use by natural enemies in a tritrophic context. *Ann Rev Entomol*. 37(1):141-172.
- Vijayan, K., H.J. Anuradha, C.V. Nair, A.R. Pradeep, A.K. Awasthi, B. Saratchandra, S.A.S. Rahman, K.C. Singh, R. Chakraborti and S.U. Raje. 2006. Genetic diversity and differentiation among population of the indian Eri Silkworm, *Samia cynthia ricini*, revealed by ISSR markers. *J. Ins. Sci.* 6(30):1-11.
- Virgilio, M., K. Jordaens and F. Breman. 2012. Turning DNA barcodes into an alternative tool for identification: African fruit flies as a model (Poster). Consortium for the Barcode of Life (CBOL).

- Wada, T., K. Ito, A. Takahashi dan J. Tang. 2007. Variation of preovipositional period in the brown planthopper, *Nilaparvata lugens*, collected in tropical, subtropical and temperate Asia. *J. Appl. Entomol.* 131(9-10):698-703.
- Wada, T., K. Ito, A. Takahashi dan J. Tang. 2009. Starvation tolerance of macroptera brown planthopper, *Nilaparvata lugens* from temperate, subtropical and tropical populations in East and South-East Asia. *Entomologia Experimentalis et Applicata* 130:73-80 p.
- Wanta, N. N. 2009. Bahan Ajar Pengendalian Hayati. LP3AI – Universitas Sam Ratulangi, Manado.
- Wardojo, S. 1986. Penggunaan serangga mandul, patogen, hormon dan feromon dalam pengelolaan hama tanaman. Aspek-aspek pestisida di Indonesia. Bogor.
- Welsh, J. and M. McClelland. 1990. Fingerprinting genomes using PCR with arbitrary primers. *Nucl Acids Res* 18:7213-7218 p.
- Wheeler, A.G. 2001. Biology of the plant bugs (Hemiptera: Miridae): pests, predators, opportunists. New York: Cornell University Press.
- Widiarta, I.N., M. Muhsin and D. Kusdianan. 1998. Effect of andrographolide and two synthetic insecticides, antifeedant against *Nephotettix virescens*, to the rice tungro virus transmission. *Indonesian J. Plant Protection* 4:1-8 p.
- Widiarta, I. N., D. Kusdianan, S.S. Siwi dan A. Hasanuddin. 2004. Variasi efikasi penularan tungro oleh koloni-koloni wereng hijau *Nephotettix virescens* Distant. *J. Entomol.Ind.* 1:50-56 p.
- Wiedenmann, R.N. and J.W. Smith. 1997. Attributes of natural enemies in ephemeral crop habitat. *Biol. Contr.* 10:16-22 p.
- Williams, J.G.K., A.R. Kubelik, K.J. Kivak, J.A. Rafalski and S.V. Tingey. 1990. DNA polymorphisms amplified by arbitrary primers are useful as genetic markers. *Nucl Acids Res* 18: 6531-6535 p.
- Wissinger, S.A. 1997. Cyclic colonization in predictably ephemeral habitat: A template for biological control in annual crop systems. *Biol. Contr.* 10: 4-15 p.
- Wiyono, S. 2007. Perubahan iklim dan ledakan hama dan penyakit tanaman. [Makalah]. Seminar Keanekaragaman Hayati di Tengah Tantangan Masa Depan Indonesia, diselenggarakan oleh KEHATI, Jakarta, 28 Juni 2007.
- Wraight, S.P. and M.E. Ramos. 2002. Application parameter affecting field efficacy of *Beauveria bassiana* foliar treatments against Colorado potato beetle, *Leptotarsa decemlineata*. *Biol. Control* 23:164-178 p.

- Yaherwandi. 2005. Keanekaragaman hymenoptera parasitoid pada beberapa tipe lanskap pertanian di daerah aliran sungai (DAS) Cianjur Kabupaten Cianjur Jawa Barat [Disertasi]. Sekolah Pascasarjana Institut Pertanian Bogor.
- Yedidia, I, N. Benhamou and I. Chet. 1999. Induction of defense responses in cucumber plants (*Cucumis sativus* L.) by the biocontrol agent *Trichoderma harzianum*, *Applied and Environmental Microbiology* 65(3):1061–1070.
- Zibae, I., A.R. Bandani and J.J. Sendi. 2013. Pathogenicity of *Beauveria bassiana* to fall webworm (*Hyphantria cunea*) (Lepidoptera: Arctiidae) on different host plants. *Plant Protection Science*, 49(4): 169-176.





