DAFTAR PUSTAKA

Agbor, G.A., J.A. Vinson, J.E. Oben & J.Y. Ngogang. 2006. Comparative Analysis of the in Vitro Antioxidant Activity of White and Black Pepper. Nutrition Research 26: 659-663.

Agrios, G.N. 2005. Plant pathology. 5th Ed. Gainesville: Elsivier, Academic Press.

Allan, C & L.A Hadwiger. 1979. The Fungicidal Effect of Chitosan on Fungi of Varying Cell Wall Composition. Experimental Mycology Journal. 3: 285–287.

Balai Penelitian Tanaman Rempah dan Aneka Tanaman Industri. 2007. Teknologi Unggulan Tanaman Lada. http://balittri.litbang.deptan.go.id/database/ unggulan/bookletlada.pdf. [Diakses 27 Agustus 2016].

Balfas, R., I. Lakani., Samsudin & Sukamto. 2007. Penularan Penyakit kerdil dengan tiga jenis serangga vektor. Jurnal Penelitian Tanaman Industri. 13: 136 – 141.

Bang, J & D.H. Oh Choi H.M. 2009. Anti-Inflammatory and Antiarthritic Effects of Piperine in Human Interleukin 1β- Stimulated Fibroblast Like Synoviocytes and in Rat Arthritis Models. Arthritis Research andTherapy 2009. 11:49.

Bhat, A.I., S. Devasahayam., Y.R. Sarma & R.P. Pant. 2003. Association of a Badnavirus Transmitted by Mealybug (Ferrisia virgate) with Black Pepper in India. Current Science. 84:1547-1550.

Bhat, A.I., T.H. Faisal., R. Madhubala., P.S. Hareesh & R.P. Pant. 2004. Purification, Production of Antiserum and Development of Enzyme Linked Immunosorbent Assay-Based Diagnosis for *Cucumber mosaic virus* Infecting Black Pepper (*Piper nigrum* L.). Journal of Spices Aromatic Crops. 13: 6-21.

Bhat, A.I & S.Siju. 2007. Development of a Single-Tube Multiplex RT-PCR for the Simultaneous Detection of *Cucumber mosaic virus* and *Piper Yellow Mottle Virus* Associated with Stunt Disease of Black pepper. Current Science. 93:973-976.

Bhat, A.I & A. Siljo. 2014. Detection of Virus Infecting Black Pepper by Sybr Green-Based Real Time PCR Assay. Journal of plant pathology. 96:105-109.

Bhat, A.I., T. Hohn & R. Selvarajan 2016. Badnaviruses: The Current Global Scenario. Viruses. 8:1-29.

Blackman, R.L & V.F. Eastop. 1984. Aphids in the world's crop. J. Wiley, Chichester. 466pp.

Blackman, R.L & V.F. Eastop. 2000. Aphids on the World's Crops. An Identification and Information Guide. 2nd ed. John Wiley & Sons, Chichester, 414 pp.

Boonlertnirun, S., C. Boonraung & R. Suvanasara. 2008. Application of Chitosan in Rice Production. Journal of Metal Materials and Mineral. 18: 47-52.

Bos, 1994. Pengantar Virologi Tumbuhan. Penerjemah Triharso. Gadjah Mada University Press.

Bozzola, J.J & L.D. Russell. 1992. Electron Microscopy. Jones and Bartlett Publishers Inc., Boston.

Brunt, A.A., K. Crabtree., M.J. Dallwitz., A.J. Gibbs., L. Watson & E.J. Zurcher. 1996. Plant virus online: Descriptions and Lists from the VIDE database. Version:20th August 1996.'URL(http://biology.anu.edu/groups/MES/Vide/).

Carter, J.B & V.A. Saunders. 2007. Human Immunodeficiency Viruses' in Virology Principles and Applications, UK, Jhon Wiley & Sons Ltd. pp.197–211.

Chirkov, S.N. 2002. The Antiviral Activity of Chitosan (review). Appl. Biochem. Microbiol. 38:1–8.

Chirkov, S.N., S.N. Kulikov., A.V. Il'ina., S.A. Lopatin & V.P. Varlamov. 2006. Effect of the Molecular Weight of Chitosan on Its Antiviral Activity in Plants. Prikladnaya Biokhimiyai Mikrobiologiya. 42:224–228.

Damayanti, T.A, Haryanto & S. Wiyono. 2013. Utilization of Chitosan to Control *Bean commom mosaic virus* (BCMV) on Yard Long Bean. Jurnal Hama Penyakit Tumbuhan Tropika. 13: 110–116.

Daryono, B.S., S. Somowiyarjo & K.T. Natsuaki. 2003. New source of resistance to *Cucumber mosaic virus* in Melon. Sabrao Journal of Breeding and Genetics 35:19-26.

Daryono, B.S & K.T. Natsuaki. 2009. Survey on The Occurrence of Viruses Infecting Cucurbits in Yogyakarta and Central Java. Jurnal Perlindungan Tanaman Indonesia. 15:83-89.

Deepthi, S.P., V. Junis, P. Shibin, S. Senthiil & R.S. Rajesh. 2012. Isolation, Identification and Antimycobacterial Evaluation of Piperine from Piper longum. Dermatology Pharmacia Letter 2012: 863-868.

De Silva, D.P.P., P. Jones & M.W. Shaw. 2002. Identification and Transmission of *Piper yellow mottle virus* and *Cucumber mosaic virus* Infecting Black Pepper (*Piper nigrum* L.) in Sri Lanka. Plant Pathology. 51: 537-545.

Direktorat Jenderal Perkebunan. 2014. Statistik Perkebunan Indonesia 2013-2025. Lada. Direktorat Jenderal perkebunan. Jakarta. 38 hlm.

Dixon, G.R. 1981. Vegetable Crop Disease. First American Edition. The AVI Publishing company. Inc.Westport, Connecticut. Hong Kong.

Edwards, M.C & D. Gonsalves. 1999. Grouping Seven Biologically Defined Isolates of *Cucumber mosaic virus* (CMV) by Peptide Mapping. Phytopathology. 73: 1117-1120.

Faoro, F & M. Iriti. 2007. Callose Synthesis as a Tool to Screen Chitosan Efficacy in Inducing Plant Resistance to Pathogens. Caryologia. 60: 121- 124.

Faoro, F. 2013. Induced Systemic Resistance Against Systemic Viruses: a Feasible Approach?. International Organization for Biological and Integrated Control-West Palaearctic Regional Section Bulletin. 89: 199-203.

Firdausil, A.B., S. Rusmilah & D. Sitepu. 1992. Stunted Disease of Black Pepper, p. 220-226. *In* P.Wahid, D.Sitepu, S. Deciyanto, & U. Superman (eds.), *Proceeding of the International Workshop on Black Pepper Diseases, Bander, Lampung, Indonesia*. Institute for Spice and Medicinal Crops, Bogor, Indonesia.

Flegler, S.L., J.W. Heckman Jr & K.L. Klomparens. 1993. Scanning and Transmission Electron Microscopy. W.H. Freeman and Company, New York.

Francki, R.I.B., D.W. Mossop & T. Hatta. 1979. Description of Plant Virus, CMI/AAB, Kew, England 123, p.6.

Freeman, W.M., S.J. Walker & K.E. Vrana. 1999. Quantitative RT-PCR: Pitfalls and Potential. Biotechniques. 26:112- 125.

Gibbs, A.J. & B.D. Harrison. 1970. *Cucumber mosaic virus*.p 1-4. *in* Gibbs AJ, Harrison BD, Murant AF, editor. Description of Plant Viruses. Scotland: Common wealth Mycologycal Institute and Association of Applied Biologist.

Gonçalves, M.C., J. Vega., J.G. Oliveira & M.M.A. Gomes. 2005, *Sugarcane yellow leaf virus* infection leads to alterations in photosynthetic efficiency and carbohydrate accumulation in sugarcane leaves, Fitopatol. Bras. 30(1), Jan–Feb. 2005, (http:// www.scielo.br/pdf/fb/v30n1/a02v30n1.pdf).

Gonzalves, D & S.M. Garnsey. 1989. Cross protection techniques for control of plant virus diseases in tropic. Plant Disease Reporter journal p. 592–597.

Hadrami, A.E., L.R. Adam., E.I. Hadrami & F. Daayf. 2010. Chitosan in Plant Protection. Marine Drugs 5: 968-987.

Hanada, K & H. Tochihara. 1981. Some properties of an isolate of the *Soybean Stunt Strain* of *Cucumber mosaic virus*. The American Phytopathological society 72:761-764.

Hartati, S.Y., R. Balfas., R. Noveriza., G. Suastika & I. Lakani. 2005. Identification of *Piper yellow mottle virus* and *Cucumber mosaic virus* from Pipper spp. Proceeding of the 1st International Conference on Crop Security 2005 (ICCs 2005). Malang, September 20th – 22nd ,2005. 314-319.

Haryanto. 2010. Pemanfaatan Kitosan untuk Menekan Infeksi Virus Mosaik pada Tanaman Kacang Panjang (*Vigna unguiculata* subsp. sesquipedalis) [skripsi]. Bogor [ID]: Fakultas Petanian, Institut Pertanian Bogor.

Henson, J.M & R. French. 1993. The polymerase chain reaction and plant disease diagnosis. Annual Review of Phytopathology. 31: 500-504.

Hirano, S., T. Nakahira., M. Nakagawa & S.K. Kim. 1989. The Preparation and Applications of Functional Fibres from Crab Shell Chitin. Journal of Biotechnology 70:373–377.

Holliday, P. 1959. Suspected Virus in Black Pepper. Common Wealth Phytopathological News

5: 49–52.

Iriti, M., M. Sironi., S. Gomarasca., A.P. Casazza., C. Soave & F. Faoro. 2006. Cell Death Mediated Antiviral Effect of Chitosan in Tobacco. Plant Physiol Biochem 44: 893-900.

Kaper, J.M & H.E. Waterworth. 2001. Cucumoviruses. in: E. Kurstak (ed.) Handbook of Plant Virus Infections: Comparative Diagnosis. Elsevier/North Holland Biomedical Press. pp: 257-332.

Kessing, J.L.M & R.F.L. Mau. 2007. *Aphis gossypii* (Glover). Departement of Entomology. Honolulu, Hawaii. Http: www.extento.hawaii.edu/Kbase/crop/Ty pe/aphis_g.htm [3 Maret 2017]

Klug, W.S & M.R. Cummings. 1994. Concept of Genetics. 4th ed. Prentice Hall, Englewood cliffs: 779p

Kulikov, S.N., S.N. Chirkov., A.V. Il'ina., S.A. Lopatin & V.P. Varlamov. 2006. Effect of the Molecular Weight of Chitosan on its Antiviral Activity in Plants. App. Biochem. Microbiol 42: 200–203.

Kumar, S., G. Stecher & K. Tamura. 2016. MEGA7: Molecular Evolutionary Genetics Analysis version 7.0 for bigger datasets. Molecular Biology and Evolution. Mol Biol Evol. doi: 10.1093/molbev/msw054.

Kusvianti, D., Widodo & D. Prijono. 2014. Pengendalian Penyakit Busuk Pangkal Batang (*Phytophthora Capsici* Leonian) Pada Lada (*Piper Nigrum* L.) dengan Ekstrak Pinang, Gambir, Sirih, dan Kapur Sirih. Jurnal Fitopatologi Indonesia.10:103-111.

Lee, S., H. Choi., S. Suh., I. Doo., K. Oh., E. Choi., A. Taylor., P. Low & Y. Lee. 1999. Oligalacturonic Acid and Chitosan Reduce Stomatal Aperture by Inducing the Evolution of Reactive Oxygen Species from Guard Cell of Tomato and Commelina Communis. American of Plant Physiologist. 121: 147-152.

Lie, Y, H. Yin., Q. Wang., X. Zhao., Y. DU & F. Li. 2009. Oligochitosan Induced *Brassica napus* L Production of NO and H2O2 and Their Physiological Function. Carbohydrate Polymers. 75: 612- 617.

Lockhart, B.E.L., K.A. Kirtisak., P. Jones., D.S. Padmini., N.E. Olsziewski., N. Lockhart., D. Nuarchan & J. Sangalang. 1997. Identification of *Piper yellow mottle virus*, a Mealybug–Transmitted Badnavirus Infecting Piper spp. in southeast Asia. European Journal of Plant Pathology. 103: 303-311.

Manohara, D & D. Wahyuno. 2013. Pedoman Budidaya Merica. Balai Penelitian Tanaman Rempah dan Obat bekerja sama dengan Agfor Sulawesi. Bogor.

Mansyur, A. 1980. Budidaya Tanaman Lada dan Kopi. Institut Pertanian Bogor, Bogor.

Mardiningsih,T.L & S. Deciyanto. 2000. Biologi Aphis gossypii pada tanaman nilam dan preferensi pada beberapa tanaman rempah dan obat. Prosiding Seminar Biologi Menuju Milenium III. Yogyakarta, 20 November 1999.

Marganov. 2003. Potensi Limbah Udang sebagai Penyerap Logam Berat (Timbal, Kadmium, dan Tembaga) di Perairan, Disertasi. Institut Pertanian Bogor. Bogor.

Mariana, M & Miftakhurohmah. 2016. Detection of Viruses on Black Pepper Seedling (*Piper nigrum* L.) by ELISA Technique. Buletin Penelitian Tanaman Rempah dan Obat. 27:155-62.

Matthews, R.E.F. 1992. Fundamentals of Plant Virology. Academic Press. New York.

Meghwal, M & T. K. Goswami, 2012. Nutritional Constituent of Black Pepper as Medicinal Molecules: A Review. 1: 129.

Miftakhurohmah & R. Balfas. 2014. Karakteristik Biologi dan Molekuler serta Pengendallian Virus Penyebab Kerdil pada Lada. Perspektif. 13: 53-62.

Miftakhurohmah & R. Noveriza. 2015. Virus Nilam: Identifikasi, karakter Biologi dan Fisik serta Upaya Pengendaliannya. Jurnal Litbang Pertanian. 34:1-8.

Mishra, S., K.S. Jagadeesh., P.U. Krishnaraj & S. Prem. 2014. Biocontrol of *Tomato leaf curl virus* (ToLCV) in Tomato with Chitosan Supplemented Formulations of *Pseudomonas* sp. Under Field Conditions. Australian Journal of Crop Science. 8:347-355.

Murant, A.F & A.M. Mayo. 1982. Satellites of Plant Viruses. Ann.Rev.Phytophatologi. 20 : 47 - 70.

Muzzarelli, R.A.A., R. Tarsi., O. Filippini., E. Giovanetti., G. Biagini & P.E. Varaldo. 1990. Antimicrobial Properties of *N*-carboxybutyl Chitosan. Antimicrob. Agents Chemother. 34: 2019–2023.

Namara, F. M. 2005. Effects of Piperine, the Pungent Component of Black Pepper, at the Human Vanilloid Receptor (TRPV1), British Journal of Pharmacology 144, 781–790.

National Center for Biotechnology Information. 2015. Sequences producting significant alignment. http://www.NCBI.nlm.nih.gov. [Diakses 27 Januari 2017].

Noiket, N., T. Boonthip & K. Riangwong. 2014. Evaluation of Potential for Chitosan to Control TYLCV Disease and Promote the Growth of Sridathip 3 Tomato, p. 252-259. *In* The 26th Annual Meeting of The Sea Thai Society for Biotechnology and International Conference. Thai society for biotechnology. Mae Fah Luang university Chiang Rai. Thailand 26th -29th November 2014.

Owen, J & P. Palukaitis. 1998. Characterization of *Cucumber mosaic virus*. Molecular heterogeneity mapping of RNA 3 in eight CMV strains. *Virology*. 166: 495-502.

Piazolla, P., J.R. Diaz-Ruiz & J.M. Kaper. 2000. Nucleic Acid Homologies of Eighteen *Cucumber mosaic virus* Isolates Determined by Competition Hybridization. Jurnal of General Virology. 45: 361-369.

Pongprayoon, W., S. Roytrakul., R. Pichayangkura & S. Chadchawan. 2013. The Role of Hydrogen Peroxide in Chitosan-Induced Resistance to Osmotic Stress in Rice (*Oryza sativa* L.). Plant Growth Regulation. 70: 159-173.

Pospieszny, H., S. Circov & J. Atabekov. 1991. Introduction of Antiviral Resistance in Plants by Chitosan. Plant science. 79:63-68.

Prakasam, V., K.T. Subbaraja & C.M. Bhakthavasalu. 1990. Mosaic Disease–a New Record in Black pepper in Lower Palneys. Indian Cocoa, Arecanut and Spice Journal. 13: 104.

Premi, B. R. 2000. Essential Oils and Oleoresins in India. Beverage and Food World 27(4), 12-19.

Rabea, E.I., M.T. Badawy., C.V. Stevens., G. Smagghe & W. Steurbaut. 2003. Chitosan as Antimicrobial Agent: Applications and Mode of Action. Biomacromolecules. 4:1457–1465.

Rahayu, W. P., M. Arpah & E Diah. 2005. Penentuan waktu kadaluwarsa dan model sorpsi isometric biji dan bubuk lada hitam (*Piper nigrum* L.). Jurnal Teknol dan Industri Pangan 16(1);31-38.

Randles, J & H. Ogle. 1997.Viruses and Viroid as Agents of Plant Disease.In Plant Pathogen and Plant Disease. Rockvale Publications, Armidale.

Ruan, S.L & Q.Z. Xue. 2002. Effects of Chitosan Coating on Seed Germination and Salt-Tolerance of Seedlings in Hybrid Rice (*Oryza sativa* L.). Acta Agron. Sinica. 28: 803–808.

Rukmana, R. 2003. Usahatani Lada Perdu. Kanisius. Yogyakarta.

Saleh, N. 2003. Ekobiologi dan optimalisasi pengendalian penyakit virus belang pada kacang tanah melalui pengelolaan tanaman secara terpadu. Jurnal Litbang Pertanian. 22: 41–48.

Sarma, Y.R., G. Kiranmai., P. Sreenivasulu., M. Anandaraj., M. Hema., M. Venkatramana., A.K. Murthy & D.V.R. Reddy. 2001. Partial Characterization and Identification of a Virus Associated with Stunt Disease of Black Pepper (*Piper nigrum*) in South India. Current Science. 80: 459-462.

Silju, S., R. Madhubala & A.I. Bhat. 2007. Sodium Sulphite Enhances RNA Isolation and Sensitivity of *Cucumber mosaic virus* Detection by RT-PCR in Black Pepper. Journal of Virological Methods. 141:107-110.

Siregar, E.B.M. 1993. Assosiasi Virus Mentimun –Satelit RNA-5 dalam Memproteksi Tanaman Tomat (*Lycopersicon esculentum* Mill.) dan Cabai Merah (*Capsicum annum* L) terhadap Virus Mosaik Ketimun Patogenik. Laporan Penelitian Program Pascasarjana. Institut Pertanian Bogor. Bogor.

Sitepu, D & I. Mustika. 2000. Diseases of black pepper and their management in Indonesia. In: Black pepper (*Piper nigrum*) Ed. P.N. Ravindran. Hardwood Academic Publishers. P. 297–308.

Somowiyarjo, S., Y.B. Sumardiyono & S. Martono. 2001. Inaktivasi CMV dengan ekstrak *Mirabilis jalapa*. Prosiding Kongres Nasional XVI dan Seminar Ilmiah, PFI. Bogor. 22-24 Agustus 2001.

Stevens, W.A. 1983. Virology of Flowering Plants. Springer Science Bussiness Media. New York. 177p.

Sudjarwo, S.A. 2005. The Potency of Piperine as Anti-inflammatory and Analgesic in Rats and Mice. Folia Medica Indonesiana 2005; 41:190- 194.

Sulandari, S., S. Hartono, Y.M.S. Maryudani & Y.B. Paradisa. 2014. Deteksi dan Sebaran *Soybean mosaic virus* (SMV) dan *Soybean stunt virus* (SSV) di Berbagai Sentra Produksi Kedelai di Indonesia. Jurnal Perlindungan Tanaman Indonesia 18:71-78.

Sumardiyono, Y.B., S. Sulandari & E. Purnawan. 1996. Banana Mosaic Disease, Host Reaction and Virus purification. Jurnal Perlindungan Tanaman Indonesia. 2:45-49.

Suparman, U., A. Supandi & A. Burhan. 1992. Some Advantages of Using Pepper Seeds from Cuttings of One Segment. Buletin Penelitian Tanaman Rempah dan Obat. 7: 5-9.

Suptijah, P., M.J. Agoes & M. Sugara. 2010. The Role of Chitosan in Tomato Growth Enhancement (*Lycopersicum esculentum*) during Vegetative Phase. Akuatik-Jurnal Sumberdaya Perairan. 4: 9-14.

Sutarno & G. Andoko. 2005. Budi Daya Lada Si Raja Rempah-Rempah. Jakarta: Agro Media Pustaka.

Sopandie, D., M.A. Chozin., S. Sastrosumarjo., T. Juhaeti & Sahardi. 2003. Toleransi Padi Gogo terhadap Naungan. Hayati. 10: 71-75.

Sopialena. 2014. Efektivitas beberapa cara penularan virus pada tanaman cabai. Jurnal Agrifor. 8:207-212.

Taufik, M., G. Hidayat & S.H. Astuti. 2005. Survei Infeksi *Cucumber mosaic virus* dan *Chili vein mottle virus* pada tanaman Cabai. Jurnal Agrikultura. 16:146-152.

Tjitrosoepomo, G. 2007. Taksonomi Tumbuhan (Spermatohyta). Gadjah Mada University Press. Yogyakarta. 119p.

Uthairatanakij, A., J.A.T. de Silva & K. Obsuwan. 2007. Chitosan for Improving Orchid Production and Quality. Orchid Science and Biothechnology. 1: 1-5.

Van Regenmortel., M.H.V. Fauquet., C.M. Bishop., H.L. Carstens., E.B. Eates., M.K. Lemon., S.M. Maniloff., J. Mayo., D.J. McGeoch., C.R. Pringle & R.B. Wickner. 2000. Virus Taxonomy. Classification and Nomenclatur of virus. Seventh report the International Commite on Taxonomy of virus. Academic press, CA,USA.

Wahid, P. 1996. Sejarah Perkembangan dan daerah Perkembangannya. Monograf Tanaman Lada, Balittro. 1-11.

Wahyuni, W.S & R.I.B. Francki. 1996. Responses of Some Grain and Pasture Legumes to 16 strains of *Cucumber mosaic virus* (CMV). Australian Journal of Agriculture. 43: 465-477.

Wahyuni, W.S. 2005. Dasar-Dasar Virologi Tumbuhan. Gadjah Mada University Press.

Wang, W.Q., K.T. Natsuaki., S. Okuda & M. Teranaka. 1998. Comparison of *Cucumber mosaic virus* (CMV) Isolates by Double-Stranded RNA Analysis. Annal Phytophathological Society of Japan. 54: 536-539.

Wanichpongpan, P., K .Suriyachan & S. Chandkrachang. 2001. Effect of Chitosan on the Growth of Gebera Flower Plant (*Gerbera jamesonii*), p. 198- 201. .*In* Urgami, T., K. Kurita, & T. Fukamizo (eds.), Chitin and Chitosan in Life Science,Yamaguchi Inc., New York.

Wylie, S., C.R. Wilson., R.C.C. Jones & M.G.K. Jones. 1993. A Polymerase chain reaction assay for Cucumber mosaic virus in lupin seeds. Australian journal of Agriculture *Res*. 44:41-51.

Zaim, M., A. Ali., J. Joseph & F. Khan. 2013. Serological and molecular studies of a novel virus isolate causing yellow mosaic of patchouli [*Pogostemon cablin* (Blanco) Benth]. Plos ONE. 8: 1–10.

Zhao, X.M., X.P. She., W. Yu., X.M. Liang & Y.G. Du. 2007. Effects of Oligochitosans on Tobacco Cells and Role of Endogenous Nitric Oxide Burst in the Resistance of Tobacco to TMV. Journal of Plant Pathology. 89: 55-65.