

## DAFTAR PUSTAKA

- Aemmr, A., Abo-El-Seoud, M. A., Ibrahim, G. M., & Kassem, B. W. 2013. Stimulating of Biodegradation of Oxamyl Pesticide by Low Dose Gamma Irradiated Fungi. *Journal of Plant Pathology and Microbiology*, 4, 201.
- Alen, Y., Zulhidayati, Z., & Suharti, N. 2015. Pemeriksaan residu pestisida profenofos pada selada (*Lactuca sativa L.*) dengan metode kromatografi gas. *JSFK (Jurnal Sains Farmasi & Klinis)*, 1(2), 140-149.
- Alvarenga, N., Birolli, W. G., Seleghim, M. H., & Porto, A. L. 2014. Biodegradation of methyl parathion by whole cells of marine-derived fungi *Aspergillus sydowii* and *Penicillium decaturense*. *Chemosphere*, 117, 47-52.
- Alvarenga, N., Birolli, W. G., Nitschke, M., de O Rezende, M. O., Seleghim, M. H. R., & Porto, A. L. M. 2015. Biodegradation of Chlorpyrifos by Whole Cells of Marine-Derived Fungi *Aspergillus sydowii* and *Trichoderma* sp. *J Microb Biochem Technol*, 7, 133-139.
- Arora, D., Sharma, N., Singamaneni, V., Sharma, V., Kushwaha, M., Abrol, V., & Jaglan, S. 2016. Isolation and characterization of bioactive metabolites from *Xylaria psidii*, an endophytic fungus of the medicinal plant *Aegle marmelos* and their role in mitochondrial dependent apoptosis against pancreatic cancer cells. *Phytomedicine*, 23(12), 1312-1320.
- Asemoloye, M. D., Ahmad, R., & Jonathan, S. G. 2017. Synergistic rhizosphere degradation of  $\gamma$ -hexachlorocyclohexane (lindane) through the combinatorial plant-fungal action. *PloS one*, 12(8), e0183373.
- Ayu, D. K., Nawfa, R., & Purnomo, A. S. 2016. Pengaruh Penambahan Bakteri *Ralstonia picketti* terhadap Biodegradasi DDT oleh Jamur Pelapuk Putih *Phlebia brevispora*. *Jurnal Sains Dan Seni Pomits*

- [BSN] Badan Standardisasi Nasional. 2008. Batas maksimum residu pestisida pada hasil pertanian. SNI, 7313(2008).
- Barnett, H.L. and Hunter, B.B., 1972. Illustrated genera of imperfect fungi. *Illustrated genera of imperfect fungi.*, (3rd ed). Burgess Publishing Company.
- Barzman, M., Bärberi, P., Birch, A. N. E., Boonekamp, P., Dachbrodt-Saaydeh, S., Graf, & Lamichhane, J. R. (2015). Eight principles of integrated pest management. *Agronomy for sustainable development*, 35(4), 1199-1215.
- Bhalerao, T. S., & Puranik, P. R. 2007. Biodegradation of organochlorine pesticide, endosulfan, by a fungal soil isolate, *Aspergillus niger*. *International Biodeterioration & Biodegradation*, 59(4), 315-321.
- Birolli, W. G., Yamamoto, K. Y., de Oliveira, J. R., Nitschke, M., Seleg him, M. H., & Porto, A. L. 2015. Biotransformation of dieldrin by the marine fungus *Penicillium miczynskii* CBMAI 930. *Biocatalysis and Agricultural Biotechnology*, 4(1), 39-43.
- Bisht, J., Harsh, N. S. K., Palni, L. M. S., Agnihotri, V., & Kumar, A. 2019. Biodegradation of chlorinated organic pesticides endosulfan and chlorpyrifos in soil extract broth using fungi. *Remediation Journal*, 29(3), 63-77.
- [BPS Sulawesi Selatan] Badan Pusat Statistik Provinsi Sulawesi. 2019. *Statistik Tanaman Hortikultura Sulawesi Selatan 2019*. Badan Pusat Statistik Provinsi Sulawesi Selatan. ISBN : 978-623-7581-50-
- [BPS] Badan Pusat Statistik. 2020. Produksi Tanaman Sayuran 2020. <https://www.bps.go.id/indicator/55/61/1/produksi-tanaman-sayuran.html>
- Camacho-Morales, R.L., Guillén-Navarro, K. and Sánchez, J.E., 2017. Degradation of the herbicide paraquat by macromycetes isolated from southeastern Mexico. *3 Biotech*, 7(5), pp.1-10.
- Carranza, C. S., Aluffi, M. E., Barberis, C. L., & Magnoli, C. E. 2016. Evaluation of chlorpyrifos tolerance and degradation by non-toxigenic

- Aspergillus* section Flavi strains isolated from agricultural soils. Int J Curr Microbiol AppSci, 5, 1-18.
- Chen, S., Hu, Q., Hu, M., Luo, J., Weng, Q., & Lai, K. 2011. Isolation and characterization of a fungus able to degrade pyrethroids and 3-phenoxybenzaldehyde. Bioresource technology, 102(17), 8110-8116.
- Chen, S., Luo, J., Hu, M., Geng, P., & Zhang, Y. 2012. Microbial detoxification of bifenthrin by a novel yeast and its potential for contaminated soils treatment. PloS one, 7(2), e30862.
- Choironi, N. A., Soetomo, S., & Baroroh, H. N. 2018. Eksplorasi Fungi Endofit Umbi Lapis Bawang Merah (*Allium cepa*) sebagai Antifungi dan Antikolesterol. Acta Pharmaciae Indonesia, 6(1), 12-19.
- Choudhury, P. P., Singh, A., & Singh, R. 2019. Biodegradation of topramezone by a *Trichoderma* isolate in soil. Weeds – Journal of Asian-Pacific Weed Science Society, Volume 1 (Issue 1) 2019
- Dewi, E., Rosmana, A. and Kuswinanti, T., .2021. The use of endophyte fungal isolates in controlling *Fusarium oxysporum*, the causal agent of wilt disease on chilli (*Capsicum annuum*). IOP Conference Series: Earth and Environmental Science (Vol. 807, No. 2, p. 022104). IOP Publishing.
- Dewi, T., Handayani, C. O., & Sudin, A. F. 2017. Sebaran Residu Insektisida Klordan, Diazinon, Dan Klorpirifos Di Lahan Sayuran Provinsi Sulawesi Selatan. Prosiding Seminar Nasional Inovasi Pestisida Ramah Lingkungan Mendukung Swasembada Pangan. ISBN 978-602-459-013-0. 139-144.
- Dhanya, M.S., George, T. and Kumar, S.V., 2016. Persistence of Carbosulfan Formulations in Laterite and Coastal Alluvium Soils of Kerala. Pesticide Research Journal, 28(2), pp.210-214.
- El-Ghany, A., & Masmali, I. A. 2016. Fungal biodegradation of organophosphorus insecticides and their impact on soil microbial population. Journal of Plant Pathology and Microbiology, 7(5), 1-7.

- [FAO] Food and Agricultural Organization, 2000. FAO Pesticide Disposal Series 8 Assessing soil contamination A reference manual. Food and Agricultural Organization of the United Nations Rome. <http://www.fao.org/3/x2570e/X2570E07.htm#ch9.15>.
- [FAO] Food and Agricultural Organization, 2021. FAO Specifications And Evaluations For Agricultural Pesticides Mancozeb Manganese Ethylenebis (Dithiocarbamate) (Polymeric) Complex With Zinc Salt. Food and Agricultural Organization of the United Nations.
- Fitriadi, B. R., & Putri, A. C. 2016. Metode-Metode Pengurangan Residu Pestisida pada Hasil Pertanian. Jurnal Rekayasa Kimia & Lingkungan, 11(2), 61-71.
- Hai, F. I., Modin, O., Yamamoto, K., Fukushi, K., Nakajima, F., & Nghiem, L. D. (2012). Pesticide removal by a mixed culture of bacteria and white-rot fungi. Journal of the Taiwan Institute of Chemical Engineers, 43(3), 459-462.
- Huang, Y., Xiao, L., Li, F., Xiao, M., Lin, D., Long, X., & Wu, Z. (2018). Microbial degradation of pesticide residues and an emphasis on the degradation of cypermethrin and 3-phenoxy benzoic acid: a review. Molecules, 23(9), 2313.
- IRRI. 2013. Statistical Tool for Agricultural Research, Plant Breeding Genetics and Biotechnology, Biometrics and Breeding Informatics.
- Jaiswal, S., Bara, J.K., Soni, R. and Shrivastava, K., 2017. Bioremediation of Chlorpyrifos Contaminated Soil by Microorganism. International Journal of Environment, Agriculture and Biotechnology, 2(4), p.238833.
- Jamal, Erizal. 2020. Diskusi Pestisida di Indonesia: Industri, Rantai Pasok, dan Penggunaan. Pusat Perlindungan Varietas Tanaman dan Perizinan Pertanian. <http://pvtpp.setjen.pertanian.go.id/cms2017/wp-content/uploads/2020/12/Pestisida-Erizal-Jamal-30-Des-2020-materi.pdf>.

- Javaid, M. K., Ashiq, M., & Tahir, M. 2016. Potential of biological agents in decontamination of agricultural soil. *Scientifica*, 2016.
- Karolin, K. P., Meenakumari, K. S., & Subha, P. 2015. Isolation and Characterization of Novel Chlorpyrifos Degrading Fungus Isaria Farinosa. *J. Chem*, 9, 403-407.
- Kaur, H., Kapoor, S., & Kaur, G. 2016. Application of ligninolytic potentials of a white-rot fungus Ganoderma lucidum for degradation of lindane. *Environmental monitoring and assessment*, 188(10), 588.
- Kaur, R., Mavi, G. K., Raghav, S., & Khan, I. 2019. Pesticides classification and its impact on environment. *Int. J. Curr. Microbiol. Appl. Sci*, 8, 1889-1897.
- Khastini, R. O. 2018. Isolasi dan Penapisan Cendawan Endofit Akar Asal Rhizosfer Talas Beneng. *Jurnal Biotek*, 6(2), 25-36.
- Khorram, M. S., Zhang, Q., Lin, D., Zheng, Y., Fang, H., & Yu, Y. 2016. Biochar: a review of its impact on pesticide behavior in soil environments and its potential applications. *Journal of environmental sciences*, 44, 269-279.
- Manalu, J.N., Soekarno, B.P.W., Tondok, E.T. and Surono, S., 2020. Isolation and Capability of Dark Septate Endophyte Against Mancozeb Fungicide. *Jurnal Ilmu Pertanian Indonesia*, 25(2).
- Merlinkamala, I. and Chandrasekaran, S., 2015. Degradation and persistence of Carbosulfan 25 EC in black, red and alluvial soils. *IOSR Journal of Agriculture and Veterinary Science.*, 8(6), pp.12-14.
- Nicolopoulou-Stamateli, P., Maipas, S., Kotampasi, C., Stamatis, P., & Hens, L. 2016. Chemical pesticides and human health: the urgent need for a new concept in agriculture. *Frontiers in public health*, 4, 148.
- Ong, G. H., Chee, L. J., Chin, H. R., Wong, K. K., & Wong, L. S. 2019. Preliminary Study on the Tolerance of Soil Fungi to Methyl Parathion. *Transactions on Science and Technology Vol. 6, No. 1-2*, 60 – 65.

- Pandya, I. Y. (2018). Pesticides and their applications in agriculture. *Asian J Appl Sci Technol*, 2(2), 894-900.
- [Permentan] Peraturan Menteri Pertanian. 2007. Daftar Bahan Aktif Pestisida yang Dilarang dan Pestisida Terbatas. Nomor:01/Permentan/OT. 140/1/2007.
- [Permentan] Peraturan Menteri Pertanian. 2019. Pendaftaran Pestisida. Nomor 43 Tahun 2019.
- Peter, L., Gajendiran, A., Mani, D., Nagaraj, S., & Abraham, J. 2015. Mineralization of malathion by *Fusarium oxysporum* strain JASA1 isolated from sugarcane fields. *Environmental Progress & Sustainable Energy*, 34(1), 112-116.
- Prawitasari, S., Jannah, S. N., & Akhdiya, A. 2018. Seleksi dan Identifikasi Secara Molekuler Bakteri Pendegradasi Insektisida Piretroid dari Tanah. *Indonesia Journal of Halal*, 1(1), 8-14.
- Purwantisari, S., & Budi Hastuti, R. 2009. Isolasi dan Identifikasi Jamur Indigenous Rhizosfer Tanaman Kentang dari Lahan Pertanian Kentang Organik di Desa Pakis, Magelang. *Bioma*, 11(2), 45-53.
- Ramadhani, S.H., Samigan, dan Iswadi. 2017. Isolasi dan Identifikasi Jamur Endofit Pada Daun Jamblang (*Syzygium cumini*). ETD Unsyiah. *Jurnal Ilmiah Mahasiswa Fakultas Keguruan dan Ilmu Pendidikan Unsyiah Vol 2, No 2 (2017)*.
- Rakshith, D., Santosh, P., & Satish, S. 2013. Isolation and characterization of antimicrobial metabolite producing endophytic *Phomopsis* sp. from *Ficus pumila* Linn.(Moraceae). *International Journal of Chemical and Analytical Science*, 4(3), 156-160.
- [RPIJM Bantaeng]. 2016. Dokumen Review Rencana Program Investasi Jangka Menengah Bidang Keciptakaryaan Kabupaten Bantaeng 2017-2021. [https://sippa.ciptakarya.pu.go.id/sippa\\_online/ws\\_file/dokumen/rpi2jm/DOCRPIJM\\_3a3df11b26\\_BAB%20IIBAB%20II%20Pprofil.pdf](https://sippa.ciptakarya.pu.go.id/sippa_online/ws_file/dokumen/rpi2jm/DOCRPIJM_3a3df11b26_BAB%20IIBAB%20II%20Pprofil.pdf).

- Sanyaolu, A. A. A. 2018. Verification of *Aspergillus Niger* as a Myco-remediation Agent of Lambda-Cyhalothrin and Associated Heavy Metals in *Lactuca Sativa* (L.) Leaf. Journal of Applied Sciences and Environmental Management, 22(5), 621-624.
- Sari, F.A., Ali, A., dan Junda, M. 2019. Isolasi dan Karakterisasi Actinomycetes dari Beberapa Sentra Perkebunan Bawang Antagonis *Fusarium oxysporum* F. Sp. Cepae dan Uji Kemampuan Perkecambahan Tanaman Bawang Merah (*Allium Ascalonicum* L.) Varietas Tuktuk Super. Doctoral dissertation, Universitas Negeri Makassar.
- Sawhney, P. K., Kumar, A., Devi, U., Kumar, L., Kumar, N., Chhillar, A. K., & Saini, A. K. 2015. Isolation And Analysis Of Biodegradation Potential Of The Bacterial Endophytes *Acinetobacter Beijrenckii*, B5 And *Enterobacter Aerogens*, B8, Against Chlorpyrifos In Vitro And In Plantae. Octa Journal of Environmental Research, 3(4).
- Sharma, D., Pramanik, A., & Agrawal, P. K. 2016. Evaluation of bioactive secondary metabolites from endophytic fungus *Pestalotiopsis neglecta* BAB-5510 isolated from leaves of *Cupressus torulosa* D. Don. 3 Biotech, 6(2), 210.
- Singh, R., Singh, P., and Sharma, R., 2014. Microorganism as a tool of bioremediation technology for cleaning environment: a review. Proceedings of the International Academy of Ecology and Environmental Sciences, 4(1), p.1.
- Soesanto, L., Mugiaستuti, E., Rahayuniati, R.F., Manan, A. and Dewi, R.S., 2018. Compatibility test of four *Trichoderma* spp. isolates on several synthetic pesticides. AGRIVITA, Journal of Agricultural Science, 40(3), pp.481-489.
- Subowo, Y. B. 2012. Seleksi Jamur Tanah Pendegradasi Selulosa dan Pestisida Deltamethrin dari Beberapa Lingkungan di Kalimantan Barat. Jurnal Teknologi Lingkungan, 13(2), 221-230.

- Subowo, Y. B. 2013. Kemampuan Beberapa Jamur Tanah dalam Menguraikan Pestisida Deltametrin dan Senyawa Lignoselulosa. BERITA BIOLOGI, 12(2), 231-238.
- Sud, D., Kumar, J., Kaur, P. and Bansal, P., 2020. Toxicity, Natural And Induced Degradation Of Chlorpyrifos. Journal of the Chilean Chemical Society, 65(2), pp.4807-4816.
- Sulaiman, Amran. 2019. Mewujudkan Sektor Pertanian yang Berdaya Saing Melalui Peningkatan SDM Pertanian Berkualitas dan Pembangunan Infrastruktur Pertanian. Arahan Menteri Pertanian Musyawarah Perencanaan Pembangunan Pertanian (Musrembangtan) Nasional. Bogor, 18 Juni 2019.
- Suswanto, I., Simamora, C. J. K., & Anggorowati, D. 2018. Penggunaan Cendawan Endofit Sebagai Agens Pengendali Hayati Pada Lada (*Piper nigrum L.*). Jurnal Agroqua. Vol. 16 No. 2.
- Swarczewicz, M.K. and Gregorczyk, A., 2012. The effects of pesticide mixtures on degradation of pendimethalin in soils. Environmental Monitoring and Assessment, 184(5), pp.3077-3084.
- Trizelia, Rahma, H., dan Martinius. 2016. Laporan Akhir Penelitian Hibah Riset Guru Besar Universitas Andalas Diversitas Genetik Dan Karakterisasi Cendawan Endofit Tanaman Cabai Yang Berpotensi Sebagai Biopestisida Dan Biofertilizer. Fakultas Pertanian, Universitas Andalas.
- UTZ. 2015. List of Banned Pesticides and Pesticides Watchlist Version 1.0. Standard and Certification Department. Netherlands. <https://www.utz.org>.
- Wahyuni, S., Sulaeman, E., & Ardiwinata, A. N. 2018. Pelapisan Urea dengan Arang Aktif yang Diperkaya Mikroba Dapat Mempercepat Penurunan Konsentrasi Residu Insektisida Heptaklor di Lahan Sawah. Informatika Pertanian, 25(2), 155-162.
- Yadav, M., Srivastva, N., Shukla, A. K., Singh, R. S., Upadhyay, S. N., & Dubey, S. K. 2015. Efficacy of *Aspergillus* sp. for degradation of

- chlorpyrifos in batch and continuous aerated packed bed bioreactors. *Applied biochemistry and biotechnology*, 175(1), 16-24.
- Ye, X., Dong, F., & Lei, X. 2018. Microbial resources and ecology-microbial degradation of pesticides. *Natural Resources Conservation and Research*, 1(1).
- Zakaria, L., Yaakop, A. S., Salleh, B., & Zakaria, M. 2010. Endophytic fungi from paddy. *Tropical life sciences research*, 21(1), 101.
- Zhan, H., Huang, Y., Lin, Z., Bhatt, P., & Chen, S. 2020. New insights into the microbial degradation and catalytic mechanism of synthetic pyrethroids. *Environmental Research*, 182, 109138.

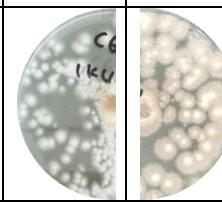
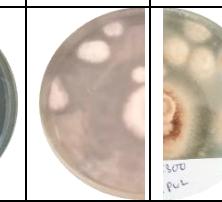
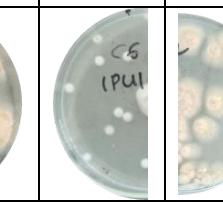
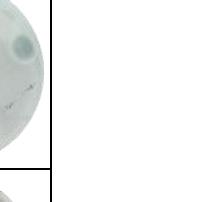
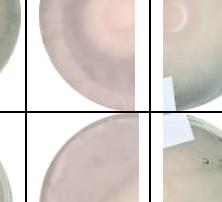
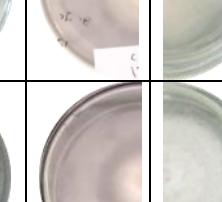
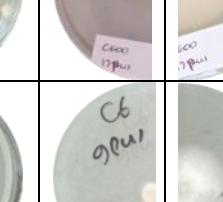
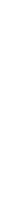
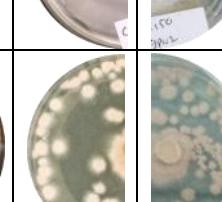
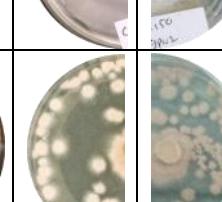
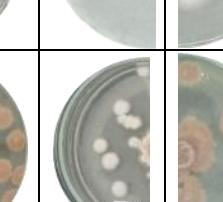
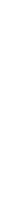
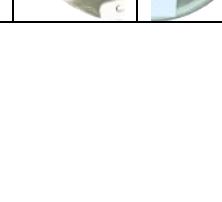
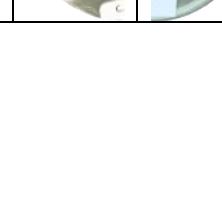
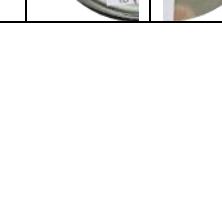
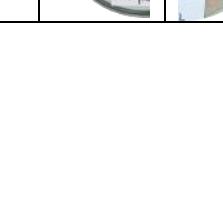
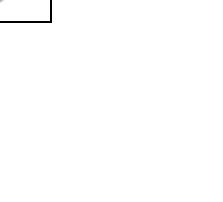
## **LAMPIRAN**

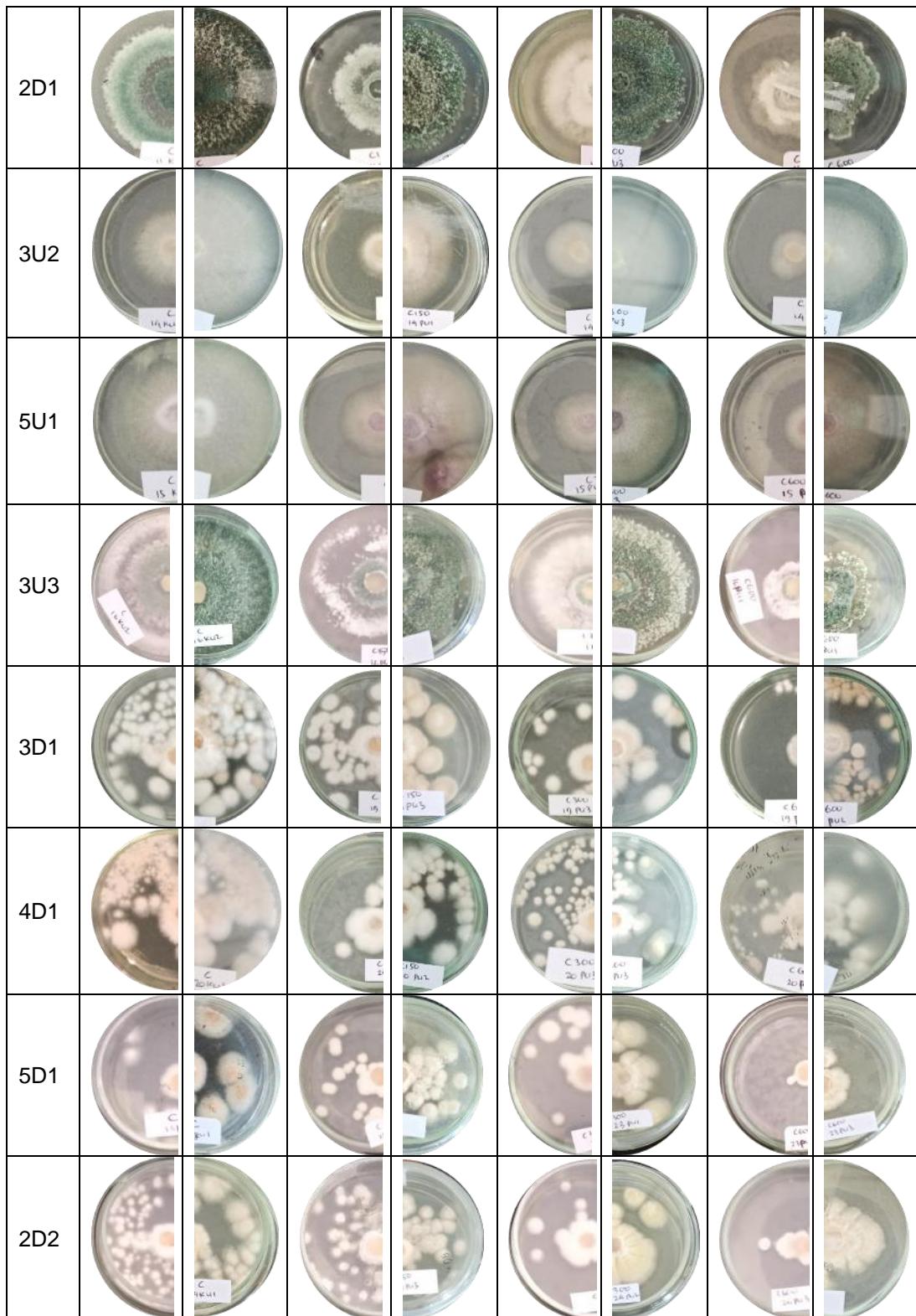
Lampiran 1. Kondisi lingkungan dan perilaku petani pada pertanaman bawang merah pada setiap lokasi sampling.

Lokasi	Luas Lahan	Umur Lahan	Umur	Jenis Pestisida yang digunakan	Dosis	Teknik Penyemprotan	Frekuensi Semprompot
I	1 ha	10 th IP 300	2 bulan	Deltamethrin, mankozeb,	Sesuai label	Dicampuran	2 hari sekali
II	2 ha	10 th IP 300	2 bulan	Deltamethrin, mankozeb,	Sesuai label	Dicampuran	2 hari sekali
III	0,5 ha	10 th IP 300	3 bulan	Klorpirifos, dinotefuron	Sesuai label	Dicampuran	1-3 hari sekali
IV	0,5 ha	3 th IP 300	2 bulan	Sipermetrin, dimetoat, difenokonazol	Sesuai label	Dicampuran	2-3 hari sekali
V	0,5 ha	5 th IP 300	2 bulan	mankozeb, asam fosfit, beta siflutrin, sipermetrin	Sesuai label	Dicampuran	1 hari sekali

Sumber: Data primer setelah diolah.

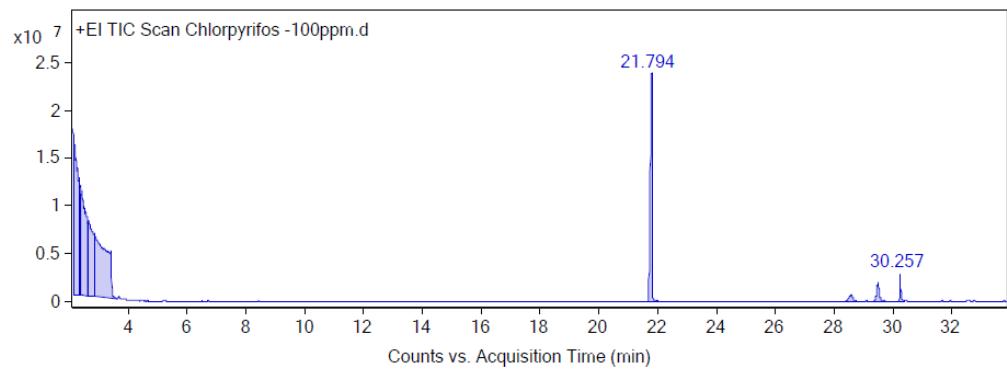
Lampiran 2. Pertumbuhan berbagai isolat cendawan endofit pada media PDA pada setiap perlakuan pestisida klorpirifos pada 3 dan 7 hsi.

Kod e Isola t	0 x dosis		$\frac{1}{4} \times$ dosis		$\frac{1}{2} \times$ dosis		1 x dosis	
	3 hsi	7 hsi	3 hsi	7 hsi	3 hsi	7 hsi	3 hsi	7 hsi
1U1								
2U1								
2A2								
1U1								
4U1								
2A1								
3U1								



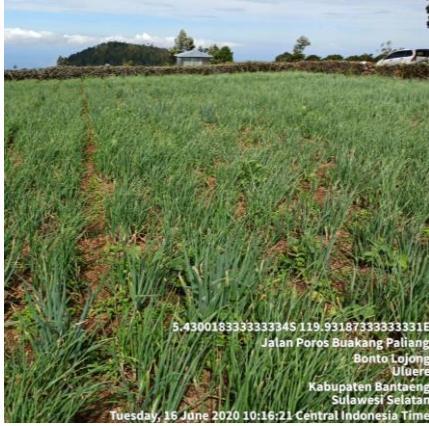
Lampiran 3. Hasil analisis residu pestisida pada tanah pada lima lokasi pertanaman bawang merah

No	Lokasi	Kadar Klorpirifos (ppm)
1	I	5.59
2	II	5.38
3	III	7.02
4	IV	6.65
5	V	8.60

**Lampiran 4. Grafik kromatogram standar klorpirifos 100 ppm pada GCMS****Integration Peak List**

Peak	Start	RT	End	Height	Area	Area %
1	2.139	2.144	2.305	16077869.89	137961812.06	72.61
2	2.305	2.31	2.333	12249899.57	20455137.01	10.77
3	2.333	2.339	2.39	11614078.8	37970878.43	19.98
4	2.39	2.408	2.608	10901758	120178385.73	63.25
5	2.608	2.614	2.825	7974677.65	93131444.6	49.02
6	2.825	2.848	3.606	6561729.47	189999391.68	100
7	21.634	21.794	21.937	23970304.81	114911254.7	60.48
8	28.346	28.58	28.946	762950.69	7211498.2	3.8
9	29.347	29.496	29.77	1976163.75	12830826.47	6.75
10	30.203	30.257	30.4	2849804.58	7349582.37	3.87

Lampiran 5. Lokasi pengambilan sampel tanah dan tanaman di Desa Bonto Lojong, Kecamatan Uluere, Kabupaten Bantaeng

		
Lokasi I	Lokasi II	Lokasi III
		
Lokasi IV		Lokasi V

## CURICULUM VITAE

### A. Data Pribadi

1. Nama : Ria Fauriah M.
2. Tempat, tgl lahir : Tanete, 27 Desember 1992
3. Alamat : Cluster Akasia Blok B4/8, Tallasa City,  
Kawasan Parangloe Indah, Tamalanrea,  
Makassar, Sulawesi Selatan
4. Status Sipil : Belum menikah

### B. Riwayat Pendidikan

#### a. Pendidikan Formal :

- Tamat SD tahun 2004 di Sidenreng Rappang
- Tamat SLTP tahun 2007 di Pinrang
- Tamat SLTA tahun 2010 di Pinrang
- Sarjana (S1) tahun 2014 di Universitas Hasanuddin

#### b. Pendidikan Non Formal :-

### C. Pekerjaan dan Riwayat Pekerjaan

- Pekerjaan : Aparatur Sipil Negara
- NIP : 199212272015032002
- Pangkat/Jabatan : Penata Muda Tk I/Peneliti Ahli Pertama