DAFTAR PUSTAKA

Ackers, GR., D. Moss, B. E. Picton, S. M. K. Stone, & C. C. Morrow. 2007. Marine Conservation Society : Sponges of The British Isles ("Sponge V"). Marine Conservation Society. Belfast.

Agustina, S., S. Karina, V. Kurnianda, R. Rahmi, & K. Khairunnisa. 2018. Manzamine C, An Alkaloid Indole As An Inhibitor of The Cancer Cells Adapted to Nutrient Starvation, from An Indonesian Marine Sponge of *Xestospongia muta*. *IOP Conference Series: Earth and Environmental Science* 216 (1).

Akiyama, T., K. Takada, T. Oikawa, N. Matsuura, Y.i Ise, S. Okada, & S. Matsunaga. 2013. Stimulators of Adipogenesis from The Marine Sponge *Xestospongia testudinaria*. *Tetrahedron* 69 (32): 6560–64.

Al-saif, SSA., N. Abdel-raouf, & I. A. Aref. 2014. Antibacterial Substances from Marine Algae Isolated from Jeddah Coast of Red Sea, Saudi Arabia. *Saudi Journal of Biological Sciences* 21 (1): 57–64.

Andersen, RJ. 2017. Sponging Off Nature for New Drug Leads. *Biochemical Pharmacology* 139: 3–14.

Ankisetty, S., & M. Slattery. 2012. Antibacterial Secondary Metabolites from The Cave Sponge *Xestospongia* sp. *Marine Drugs* 10 (5): 1037–43.

Annam, VR. 2015. Vibriosis in Shrimp Aquaculture Vibriosis in Shrimp Aquaculture. Neopark Ltd. India.

Arai, M., K. Kamiya, D. Shin, H. Matsumoto, T. Hisa, A. Setiawan, N. Kotoku, & M. Kobayashi. 2016. N-Methylniphatyne A, A New 3-Alkylpyridine Alkaloid As An Inhibitor of The Cancer Cells Adapted to Nutrient Starvation, from An Indonesian Marine Sponge of *Xestospongia* sp. *Chemical and Pharmaceutical Bulletin* 64 (7): 766–71.

Aratake, S., A. Trianto, N. Hanif, N. J. De Voogd, & J. Tanaka. 2009. A New Polyunsaturated Brominated Fatty Acid from A Haliclona Sponge. *Marine Drugs* 7 (4): 523–27.

Asaf, R., A. N. Samsi, A. Athirah,& M. Paena. 2018. Bioactive Compounds of Sponge For Aquaculture and Potential Methods For Sponge Cultivation. *Natural* 18 (October): 107–14.

Astuti, P., S. U. T. Pratiwi, T. Hertiani, G. Alam, A. Tahir, & S. Wahyuono. 2002. Marine Sponge *Jaspis* sp., A Potential Bioactive Natural Source against Infectious Diseases. *Berkala Ilmu Kedokteran* 34 (3): 135–40.

Atmadja, WS., & P. V. Reine. 2014. Checklist of The Seaweed Species Biodiversity of Indonesia with Their Distribution and Classification: Green Algae (Chlorophyta) and Brown Algae (Phaeophyceae, Ochrophyta). Leiden & Indonesia: Naturalis Biodiversity Centre, Indonesian Institute of Sciences (LIPI).

Atmomarsono, M., & Rachmansyah. 2011. Pencegahan Penyakit Pada Budidaya Udang Windu di Tambak Melalui Aplikasi Bakteri Probiotik Rica. *Prosiding Forum Inovasi*

Teknologi Akuakultur, 621–30.

Austin, B, & X-H Zhang. 2006. *Vibrio harveyi*: A Significant Pathogen of Marine Vertebrates and Invertebrates. *Letters in Applied Microbiology* 43: 119–24.

Ayyad, SEN., D. F. Katoua, W. M. Alarif, T. R. Sobahi, M. M. Aly, L. A. Shaala, & M. A. Ghandourah. 2015. Two New Polyacetylene Derivatives from The Red Sea Sponge *Xestospongia* sp. *Zeitschrift Fur Naturforschung - Section C Journal of Biosciences* 70 (11–12): 297–303.

Bansemir, A., M. Blume, S. Schröder, & U. Lindequist. 2006. Screening of Cultivated Seaweeds for Antibacterial Activity against Fish Pathogenic Bacteria. *Aquaculture* 252 (1): 79–84.

Barrow, RA, & RJ Capon. 1994. Carduusynes (A-E): Acetylenic Acids From a Great Australian Bight Marine Sponge *Phakellia carduus*. *Australian Journal of Chemistry* 47 (10): 1901.

Bauer, AW., W. M. Kirby, J. C. Sherris, & M. Turck. 1966. Antibiotic Susceptibility Testing by A Standardized Single Disk Method. *Technical Bulletin of the Registry of Medical Technologists* 36 (3): 49–52.

Bergquist, PR. 1968. The Marine Fauna of New Zealand: Porifera, Demospongiae, Part 1 (Tetractinomorpha and Lithistida). New Zealand Department of Scientific and Industrial Research. New Zealand Oceanographic Institute Memoirs No. 37.

Bergquist, PR. 1970. The Marine Fauna of New Zealand: Porifera, Demospongiae, Part 2 (Axinellida and Halichondrida). New Zealand Department of Scientific and Industrial Research. New Zealand Oceanographic Institute Memoirs No. 51.

Bergquist, PR., & Fromont. 1988. The Marine Fauna of New Zealand: Porifera, Demospongiae, Part 4 (Poecilosclerida). New Zealand Department of Scientific and Industrial Research. New Zealand Oceanographic Institute Memoirs No. 96.

Bergquist, PR., & Warne. 1980. The Marine Fauna of New Zealand: Porifera, Demospongiae, Part 3 (Haplosclerida and Nepheliospongida). New Zealand Department of Scientific and Industrial Research. New Zealand Oceanographic Institute Memoirs No. 87.

Berman J., M. Burton, R. Gibbs, K. Lock, P. Newman, J. Jones, & J. Bell. 2013. Testing The Suitability of A Morphological Monitoring Approach for Identifying Temporal Variability In A Temperate Sponge Assemblage. *Journal for Nature Conservation* 21 : 173-182.

Bezić, N., M. Skočibušić, V. Dunkić, & A. Radonić. 2003. Composition and Antimicrobial Activity of *Achillea clavennae* L. Essential Oil. *Phytotherapy Research* 17 (9): 1037–

Bindu, D., T. Vinoth Kumar, & D. Geetharamani. 2018. Bioprospecting of Marine Sponge (*Callyspongia diffusa*) for Antibacterial Compound. *Asian Journal of Pharmaceutical and Clinical Research* 11 (1): 150–53.

Blunt, JW., A. R. Carroll, B. R. Copp, R. A. Davis, R. A. Keyzers, & M. R. Prinsep. 2018. Marine Natural Products. *Natural Product Reports* 35 (1): 8–53.

Blunt, JW., B. R. Copp, R. A. Keyzers, M. H.G. Munro, & M. R. Prinsep. 2017. Marine Natural Products. *Natural Product Reports* 34 (3): 235–94.

Bourguet-Kondracki, ML., M. T. Rakotoarisoa, M. T. Martin, & M. Guyot. 1992. Bioactive Bromopolyacetylenes from the Marine Sponge *Xestospongia testudinaria*. *Tetrahedron Letters* 33 (2): 225–26.

Boury-Esnault, N., & Rutzler. 1997. Thesaurus of Sponge Morphology. *Smithsonian Contributions to Zoology* 596:1-55.

Brantley, SE., & T. F. Molinski. 1995. Brominated Acetylenic Fatty Acids from *Xestospongia* sp., A Marine Sponge-Bacteria Association. *Tetrahedron* 51 (28): 7667–72.

Breijyeh, Z., B. Jubeh, & R. Karaman. 2020. Resistance of Gram-Negative Bacteria to Current Antibacterial Agents and Approaches to Resolve It. *Molecules* 25: 1340.

Calcul, L., A. Longeon, A. A. Mourabit, M. Guyot, & M. L. Bourguet-Kondracki. 2003. Novel Alkaloids of The Aaptamine Class from An Indonesian Marine Sponge of The Genus *Xestospongia*. *Tetrahedron* 59 (34): 6539–44.

Campos, P-E., E.l Pichon, B. Illien, P. Clerc, C. Moriou, N. de Voogd, & C. Hellio. 2018. (2S*,5S*,6Z)-2,5-Epoxydocosan-6-En-21-Ynoic Acid, New Fatty Acid from the Marine Sponge *Haliclona fascigera*. *Natural Products Chemistry & Research* 06 (05): 19–22.

Carroll, AR., B. R. Copp, R. A. Davis, R. A. Keyzers, & M. R. Prinsep. 2020. Marine Natural Products. *Natural Product Reports* 37 (2): 175–223.

Chamberlain, NR., B. G. Mehrtens, Z. Xiong, F. A. Kapral, J. L. Boardman, & J. I. Rearick. 1991. Correlation of Carotenoid Production, Decreased Membrane Fluidity, and Resistance to Oleic Acid Killing in *Staphylococcus aureus* 18Z. *Infection and Immunity* 59 (12): 4332–37.

Chanda, S., R. Dave, M. Kaneria, & K. Nagani. 2010. Seaweeds : A Novel , Untapped Source of Drugs from Sea to Ombat Infectious Diseases. *Current Reasearch, Technology, and Education Topics in Applied Microbiology Dan Microbial Biotechnology*, 473–80.

Chandrakala, & Priya. 2017. Antivibrio Activity of Marine Sponge *Callyspongia diffusa* against Vibriosis of Diseased *Penaeus monodon* Fab. *International Journal of Current Innovation Research* 3 (1): 2–5.

Cheng, ZB., H. Xiao, C.Q. Fan, Y. N. Lu, G. Zhang, & S. Yin. 2013. Bioactive Polyhydroxylated Sterols from The Marine Sponge *Haliclona crassiloba*. *Steroids* 78 (14): 1353–58.

Christobel, GJ., A. P. Lipton, M. S. Aishwarya, A. R. Sarika, & A. Udayakumar. 2011. Antibacterial Activity of Aqueous Extract from Selected Macroalgae of Southwest Coast of India. *Seaweed Research Utilin* 33 (2000): 67–75.

Chu, J., Y. Wang, B. Zhao, X. M. Zhang, K. Liu, L. Mao, & E. Kalamiyets. 2019. Isolation and Identification of New Antibacterial Compounds from *Bacillus pumilus*. *Applied Microbiology and Biotechnology* 103 (20): 8375–81.

Cita, YP., F. K. Muzaki, O. K. Radjasa, & P. Sudarmono. 2017a. Screening of Antimicrobial Activity of Sponges Extract from Pasir Putih, East Java (Indonesia). *Journal of Marine Science: Research & Development* 07 (05): 1–5.

Cita, YP., A. Suhermanto, O. K. Radjasa, & P. Sudharmono. 2017b. Antibacterial Activity of Marine Bacteria Isolated from Sponge *Xestospongia testudinaria* from Sorong, Papua. *Asian Pacific Journal of Tropical Biomedicine* 7 (5): 450–54.

Dawson, EW. 1993. The Marine Fauna of New Zealand: Index to the Fauna 2. Porifera. National Institute of Water and Atmospheric Research. New Zealand Oceanographic Institute Memoirs No.100.

Decaisne, J. 1841. Plantes de l'Arabie Heureuse, recueillies par M. P.-E. Botta et décrites par M. J. Decaisne. *Archives du Muséum d'Histoire Naturelle, Paris* 2(2): 89-199.

Desbois, AP., & V. J. Smith. 2010. Antibacterial Free Fatty Acids: Activities, Mechanisms of Action and Biotechnological Potential. *Applied Microbiology and Biotechnology* 85: 1629-42.

Desqueyroux-Faúndez, R. 1984. Description de la Faune des Haplosclerida (Porifera) de la Nouvelle-Calédonie. I. Niphatidae-Callyspongiidae. *Revue suisse de Zoologie.* 91(3): 765-827.

Dewick, M. 2002. Medicinal Natural Products. Second Edition. John Wiley & Sons Ltd. School of Pharmaceutical Sciences, University of Nottingham.

Dinas Kelautan dan Perikanan (DKP) Provinsi Sulawesi Selatan. 2016. https://sulselprov.go.id/pages/potensi_daerah/perikanan-kelautan

Dinas Kelautan dan Perikanan (DKP) Provinsi Sulawesi Selatan. 2018. https://sulselprov.go.id/pages/potensi_daerah/perikanan-kelautan

Dinas Kelautan dan Perikanan (DKP) Provinsi Sulawesi Selatan. 2019. https://sulselprov.go.id/pages/potensi_daerah/perikanan-kelautan

Dinas Kelautan dan Perikanan (DKP) Provinsi Sulawesi Selatan. 2020. https://sulselprov.go.id/pages/potensi_daerah/perikanan-kelautan

Edny, G., J. Rebecca, A. A. Crystalia, & L. Y. Hartiadi. 2020. A Review on The Antimicrobial Properties of Giant Barrel Sponge-*Xestospongia* sp. *Indonesian Journal of Life Science* 02 (02): 96–112.

El-Gamal, AA., S. M. Al-Massarani, L. A. Shaala, A. M. Alahdald, M. S. Al-Said, A. E. Ashour, A. Kumar, M. S. Abdel-Kader, W. M. Abdel-Mageed, & D. T. A. Youssef. 2016. Cytotoxic Compounds from The Saudi Red Sea Sponge *Xestospongia testudinaria*. *Marine Drugs* 14 (5): 1–9.

El-Hawary, SS., A. M. Sayed, R. Mohammed, H. M. Hassan, M. E. Rateb, E. Amin, & T. A. Mohammed. 2019. Bioactive Brominated Oxindole Alkaloids from the Red Sea Sponge *Callyspongia siphonella*. *Marine Drugs* 17 (8): 1–13.

Esquer-Miranda, E., N. Soto, Mario, R. Vega, M. Elisa, M. Baeza, Anselmo, P. Valdez, & Pablo. 2016. Effects of Methanolic Macroalgae Extracts from *Caulerpa sertularioides* and *Ulva lactuca* on *Litopenaeus vannamei* Survival in The Presence of Vibrio Bacteria. *Fish and Shellfish Immunology*.

Fahy, E., T. F. Molinski, M. K. Harper, B. W. Sullivan, D. J. Faulkner, L. Parkanyi, & J. Clardy. 1988. Haliclonadiamine, An Antimicrobial Alkaloid from The Sponge *Haliclona* sp. *Tetrahedron Letters* 29 (28): 3427–28.

Fehér, D., R. Barlow, J. McAtee, & T. K. Hemscheidt. 2011. Highly Brominated Antimicrobial Metabolites from A Marine *Pseudoalteromonas* sp. *Journal Natural Product* 73 (11): 1963–66.

Fenical, W., & V. J. Paul. 1984. Antimicrobial and Cytotoxic Terpenoids from Tropical Green Algae of The Family Udoteaceae. *Hydrobiologia* 116: 135–40.

Fusetani, N., H. Li, K. Tamura, & S. Matsunaga. 1993. Antifungal Brominated C18 Acetylenic Acids from the Marine Sponge, *Petrosia volcano* Hoshino. *Tetrahedron* 49 (6): 1203–10.

Galbraith, H., T. B. Miller, A. M. Paton, & J. K. Thompson. 1971. Antibacterial Activity of Long Chain Fatty Acids and The Reversal with Calcium, Magnesium, Ergocalciferol and Cholesterol. *Journal of Applied Bacteriology* 34 (4): 803–13.

Gazali, M., & E. Safutra. 2016. Skreening Potensi Antibakteri Ekstrak *Padina australis* Hauck terhadap Bakteri *Vibrio harveyi* Potency Screening of Antibacterial of *Padina australis* Hauck to *Vibrio harveyi* Bacteria. *Jurnal Perikanan Tropis* 3: 163–76.

Govindasamy, C., S. Narayani, M. Arulpriya, P. Ruban, K. Anantharaj, & R. Srinivasan. 2011. In Vitro Antimicrobial Activities of Seaweed Extracts against Human Pathogens. *Journal of Pharmacy Research* 4 (7): 2076–77.

Guiry, MD., & Guiry. 2021. AlgaeBase. World-wide Electronic Publication. National University of Ireland, Galway. http://www.algaebase.org

Gunawan, IWG., I. G. Bawa, & N. L. Sutrisnayanti. 2008. Isolasi dan Identifikasi Senyawa Terpenoid yang Aktif Antibakteri pada Herba Meniran (*Phyllanthus niruri* Linn). *Jurnal Kimia* 2 (2): 31–39.

Gupta, P. 2019. Chemical Constituents of Haliclona : An Overview. *Journal of Pharmacognosy and Phytochemistry* 8 (1): 823–27.

Handayani, D., R. F. Ahdinur, & R. Rustini. 2015a. Antimicrobial Activity of Endophytic Fungi from Marine Sponge *Haliclona fascigera*. *Journal of Applied Pharmaceutical Science* 5 (10): 154–56.

Handayani, D., N. Sandrawaty, M. Murniati, & R. Regina. 2015b. Screening of Endophytic Bacteria Isolated from Marine Sponge *Haliclona fascigera* for Inhibition against Clinical Isolates of Methicillin Resistant *Staphylococcus aureus* (MRSA). *Journal of Applied Pharmaceutical Science* 5 (9): 139–42.

Handayani, D., M. Murniati, & R. Rustini. 2016. In Vitro Inhibitory Activity of Ethyl Acetate Extract of Symbiotic Bacteria Isolated from The Marine Sponge *Haliclona fascigera* against Multidrug Resistant Organism (MDRO). *Journal of Applied Pharmaceutical Science* 6 (11): 218–22.

Harborne, JB. 1984. Phytochemical Methods. A Guide to Modern Techniques of Plant Analysis. 2nd.Ed.Chapman and Hall Ltd.,London, New York.

Haris, A., S. Werorilangi, S. Gosalam, & A. Mas'ud. 2014. Komposisi Jenis dan Kepadatan Sponge (Porifera: Demospongiae) di Kepulauan Spermonde Kota Makassar. *Biota* 19 (1): 36–42.

Hasnawati, & E. Prawita. 2010. Isolasi dan Identifikasi Senyawa Antibakteri dari Daun *Eupatorium odoratum* L. terhadap Bakteri *Staphylococcus aureus* ATCC 25923 dan *Escherichia coli* ATCC 25922. *Majalah Obat Tradisional* 15 (1): 41–50.

Hasniar, Firman, & Yunarti. 2013. Efektifitas Penggunaan Probiotik dan Antibiotik terhadap Kualitas Air dalam Meningkatkan Sintasan Post Larva. *Jurnal Galung Tropika* 1: 14–22.

Hauck, F. 1887. Ueber Einige Von J.M. Hildebrandt im Rothen Meere und Indischen Ocean Gesammelte Algen III, IV. Hedwigia 26: 18-21, 41-45.

He, F., L. H. Mai, A. Longeon, B. R. Copp, N. Loaëc, A. Bescond, L. Meijer, & M. L. Bourguet-Kondracki. 2015. Novel Adociaquinone Derivatives from The Indonesian Sponge *Xestospongia* sp. *Marine Drugs* 13 (5): 2617–28.

He, W. F., L. F. Liang, Y. S. Cai, L. X. Gao, Y. F. Li, J. Li, H. L. Liu, & Y. W. Guo. 2015. Brominated Polyunsaturated Lipids with Protein Tyrosine Phosphatase-1B Inhibitory Activity from Chinese Marine Sponge *Xestospongia testudinaria*. *Journal of Asian Natural Products Research* 17 (8): 861–66.

He, WF., D. Q. Xue, L. G. Yao, J. Li, H. L. Liu, & Y. W. Guo. 2016. A New Bioactive Steroidal Ketone from The South China Sea Sponge *Xestospongia testudinaria*. *Journal of Asian Natural Products Research* 18 (2): 195–99.

Helber, SB., D. J. J. Hoeijmakers, C. A. Muhando, S. Rohde, & P. J. Schupp. 2018. Sponge Chemical Defenses Are A Possible Mechanism for Increasing Sponge Abundance on Reefs in Zanzibar. *PLoS ONE* 13 (6): 7–10.

Hendri, M., Darmanto, Prayitno, & O. K. Radjasa. 2015. Antibacterial Potential Screening of *Halimeda* sp. on Some Types of Pathogenic Bacteria. *International Journal of Marine Science* 5: 1–6.

Hentschel, E. 1912. Kiesel- und Hornschwämme der Aru- und Kei-Inseln. *Abhandlungen herausgegeben von der Senckenbergischen naturforschenden Gesellschaft.* 34 (3): 293-448.

Hooper, JNA., & Van Soest. 2002. Systema Porifera : A Guide to the Classification of Sponges. Kluwer Academic/Plenum Publishers. New York.

Hooper, JNA. 2003. Sponguide : Guide to Sponge Collection and Identification. Queensland Museum. South Brisbane, Australia.

Hutchinson, DR. 1945. Coral Reefs and Cays of The Makassar Straits. [S.l.] Headquarters Allied Air Forces.

Ichiba, T., & P. J. Scheuer. 1993. Sponge-Derived Polyunsaturated C16 Di- and Tribromocarboxylic Acids. *Helvetica Chimica Acta* 76 (1003): 2814–16.

Indira, K., S. Balakrishnan, M. Srinivasan, S. Bragadeeswaran, & T. Balasubramanian. 2013. Evaluation of In Vitro Antimicrobial Property of Seaweed (*Halimeda tuna*) from Tuticorin Coast, Tamil Nadu, Southeast Coast of India. *African Journal of*

Biotechnology 12 (3): 284–89.

Irianto, A. 2005. Patologi Ikan Teleostei. Gadjah Mada University Press. Yogyakarta.

Isnansetyo, A., & Y. Kamei. 2003. MC21-A , A Bactericidal Antibiotic Produced by A New Marine Bacterium, *Pseudoalteromonas Phenolica* sp. Nov. O-BC30T against Methicillin-Resistant *Staphylococcus aureus*. *Antimicrobial Agents and Chemotherapy* 170 (2): 481–90.

Jayasree, L., P. Janakiram, & R. Madhavi. 2006. Characterization of *Vibrio* spp. Associated with Diseased Shrimp from Culture Ponds of Andhra Pradesh (India). *Journal of the World Aquaculture Society* 37 (4): 523–32.

Jiang, W., D. Liu, Z. Deng, N. J. De Voogd, P. Proksch, & W. Lin. 2011. Brominated Polyunsaturated Lipids and Their Stereochemistry from The Chinese Marine Sponge *Xestospongia testudinaria*. *Tetrahedron* 67 (1): 58–68.

Karunasagar, I., M. M. Shivu, S. K. Girisha, G. Krohne, & I. Karunasagar. 2007. Biocontrol of Pathogens in Shrimp Hatcheries using Bacteriophages. *Aquaculture* 268 : 288–92.

Kelly, M., & Herr. 2015. Splendid Sponges : A Guide to the Sponges of New Zealand. Version 1. National Institute of Water and Atmospheric Research.

Khairunnisa, & V. Kurnianda. 2017. Bioactivity from Indonesian's Marine Sponge *Xestospongia* sp. as Antibacterial Resistance *Escherichia coli*. *Natural Products Chemistry & Research* 05 (06): 3–6.

Kodicek, E., & A. N. Worden. 1944. The Effect of Unsaturated Fatty Acids on *Lactobacillus helveticus* and Other Gram-Positive Micro-Organisms. *Biochemistry Journal* 39 (1939): 79–84.

Kolanjinathan, K., P. Ganesh, & M. Govindarajan. 2009. Antibacterial Activity of Ethanol Extracts of Seaweeds against Fish Bacterial Pathogens. *European Review for Medical Dan Pharmacological Sciences* 13: 173–77.

Kong, CJ., L. Li, M. Chen, F. Cao, & C. Y. Wang. 2016. Brominated Polyunsaturated Lipids and Steroids From the South China Sea Sponge *Haliclona subarmigera*. *Chemistry of Natural Compounds* 52 (5): 1–3.

Lamarck, JB. 1815. Suite des Polypiers Empâtés. *Mémoires du Muséum d'Histoire Naturelle, Paris.* 1: 69-80, 162-168, 331-340.

Lantah, PL., L. A. Montolalu, & A. R. Reo. 2017. Kandungan Fitokimia dan Aktivitas Antioksidan Ekstrak Metanol Rumput Laut *Kappaphycus alvarezii*. *Jurnal Media Teknologi Hasil Perikanan* 5 (3): 167–73.

Latifah, LA., N. H. Soekamto, & A. Tahir. 2019. Preliminary Study : *Padina australis* Hauck 's Antibacterial Activity and Phytochemical Test Against Pathogenic Shrimp Bacteria. *Journal of Physics: Conference Series* 1341:0–6.

_____. 2020. Green Algae *Halimeda macroloba* in Spermonde Archipelago: Phytochemical and In Vitro Antibacterial Studies. *Pharmacognosy Journal* 12 (5): 1000–1004.

_____. 2021. Antibacterial Assay of Crude Extracts from Marine Sponge *Haliclona fascigera* in Badi Island of Spermonde Archipelago against Shrimp Pathogenic Bacteria. *IOP Conference Series: Earth and Environmental Science Series* 763:1–6.

_____. 2021. New Antibacterial Activities of Brominated C_{18} And C_{20} Fatty Acids Isolated from Marine Sponge *Xestospongia testudinaria* Against Shrimp Pathogenic Bacteria. *Rasayan Journal of Chemistry* 14 (1): 460–65.

Lee, OO., P. Y. Lai, H. Wu, X. Zhou, L. Miao, H. Wang, & P. Qian. 2012. Marinobacter *Xestospongiae* sp., Isolated from the Marine Sponge *Xestospongia testudinaria* Collected from the Red Sea. *International Journal of Systematic and Evolutionary Microbiology* 62: 1980–85.

Lee, Y., K. H. Jang, J. E. Jeon, W. Y. Yang, C. J. Sim, K. Bong Oh, & J. Shin. 2012. Cyclic Bis-1,3-Dialkylpyridiniums from The Sponge *Haliclona* sp. *Marine Drugs* 10 (9): 2126–37.

Levi, C., Loboute, Bargibant, & Menou. 1998. Sponges of the New Caledonian Lagoon. Orstom Editions.

Liang, LF, T. Wang, Y. S. Cai, W. F. He, P. Sun, Y. F. Li, Q. Huang, O. Taglialatela-Scafati, H. Y. Wang, & Y. W. Guo. 2014. Brominated Polyunsaturated Lipids from the Chinese Sponge *Xestospongia testudinaria* as A New Class of Pancreatic Lipase Inhibitors. *European Journal of Medicinal Chemistry* 79: 290–97.

Liu, D., J. Xu, W. Jiang, Z. Deng, N. J. De Voogd, P. Proksch, & W. Lin. 2011. Xestospongienols A-L, Brominated Acetylenic Acids from The Chinese Marine Sponge *Xestospongia testudinaria*. *Helvetica Chimica Acta* 94 (9): 1600–1607.

Lu, Y., Y. Chen, Y. Wu, H. Hao, W. Liang, J. Liu, & R. Huang. 2019. Marine Unsaturated Fatty Acids: Structures, Bioactivities, Biosynthesis and Benefit. *Royal Society of Chemistry* 9: 35312–27.

Maharany, F., Nurjanah, R. Suwandi, E. Anwar, & T. Hidayat. 2017. Kandungan Senyawa Bioaktif Rumput Laut *Padina australis* dan *Eucheuma cottonii* Sebagai Bahan Baku Krim Tabir Surya. *Jurnal Pengolahan Hasil Perikanan Indonesia* 20 (1): 10–17.

Manilal, A., M. Mama, T. Gezmu, B. Merdekios, S. E. John, & A. Idhayadhulla. 2016. An In Vitro Antibacterial and Cytotoxic Potentials of Bioactive Metabolites Extracted from *Padina tetrastromatica*. *Translational Biomedicine* 7 (1): 1–2.

Marzuki, I. 2018. Eksplorasi Spons Indonesia : Seputar Kepulauan Spermonde. Nas Media Pustaka. Nas Media Pustaka. Makassar.

Mehbub, MF., J. Lei, C. Franco, & W. Zhang. 2014. Marine Sponge Derived Natural Products Between 2001 and 2010: Trends and Opportunities for Discovery of Bioactives. *Marine Drugs* 12 (8): 4539–77.

Mishra, JK., T. Srinivas, Madhusudan, & S. Sawhney. 2016. Antibacterial Activity of Seaweed *Halimeda opuntia* from The Coasts of South Andaman. *Global Journal of Bio-Science and Biotechnology* 5 (3): 345–48.

Mpila, DA., Fatimawali, & W. I. Wiyono. 2012. Uji Aktivitas Antibakteri Daun Mayana (*Coleus atropurpureus* [L] Benth) terhadap *Staphylococcus aureus*, *Escherichia coli* dan *Pseudomonas aeruginosa* Secara In-Vitro. *Pharmacon* 1 (1): 13–21.

Natrah, FMI., Z. M. Harah, B. J. Sidik, NMS. Izzatul, & Syahidah. 2015. Antibacterial Activities of Selected Seaweed and Seagrass from Port Dickson Coastal Water against Different Aquaculture Pathogens. *Sains Malaysiana* 44 (9): 1269–73.

Nguyen, HM., T. Ito, N. N. Win, H. Quoc Vo, H. Thi Nguyen, & H. Morita. 2019. A New Sterol from The Vietnamese Marine Sponge *Xestospongia testudinaria* and Its Biological Activities. *Natural Product Research* 33 (8): 1175–81.

Nguyen, XC., A. Longeon, V. C. Pham, F. Urvois, C. Bressy, T. T. Van Trinh, & H. N. Nguyen. 2013. Antifouling 26,27-Cyclosterols from The Vietnamese Marine Sponge *Xestospongia testudinaria*. *Journal of Natural Products* 76 (7): 1313–18.

Nigrelli, RF., & M. F. Stempien. 1963. The Possible Presence of An Abnormal Nucleic Acid in The Sponge *Crytotethya crypta*. *Journal of Histochemistry and Cytochemistry* 11: 395–400.

Nurdin, N. 2020. Informasi Geopasil Gugusan Pulau Kecil Kepulauan Spermonde. Andi. Makassar.

Nursid, M., & D. Noviendri. 2017. Kandungan Fukosantin dan Fenolik Total pada Rumput Laut Coklat *Padina australis* yang Dikeringkan dengan Sinar Matahari. *Jurnal Pasca Panen Dan Bioteknologi Kelautan Dan Perikanan* 12 (2): 117–24.

Nuzul, P., D. Lantang, & S. Dirgantara. 2018. Uji Aktivitas Antibakteri Alga Coklat Jenis *Padina* sp. dari Pantai Sorido Biak terhadap Bakteri *Staphylococcus aureus* dan *Shigella dysenteriae*. *Pharmacy Medical Journal* 1 (1): 16–25.

Oumaskour, K., N. Boujaber, S. Etahiri, & O. Assobhei. 2012. Screening of Antibacterial and Antifungal Activities in Green and Brown Algae from The Coast of Sidi Bouzid (El Jadida, Morocco). *African Journal of Biotechnology* 11 (104): 16831–37.

Pangal, A., M. Gazge, V. Mane, & J. A. Shaikh. 2013. Various Pharmacological Aspects of Couamrin Derivatives : A Review. *International Journal of Pharmaceutical Research and Bio-Science* 2 (6): 168–94.

Patil, AD., W. C. Kokke, S. Cochran, T. A. Francis, T. Tomszek, & J. W. Westley. 1992. Brominated Polyacetylenic Acids from the Marine Sponge *Xestospongia muta*: Inhibitors of HIV Protease. *Journal of Natural Products* 55 (9): 1170–77.

Paul, VJ., & W. Fenical. 1983. Isolation of Halimedatrial : Chemical Defense Adaptation in the Calcareous Reef-Building Alga Halimeda. *Science* 221: 747–749.

_____. 1984. Novel Bioactive Diterpenoid Metabolites from Tropical Marine Algae of The Genus Halimeda (Chlorophyta). *Tetrahedron* 40: 3053–62.

Pejin, B., A. Talevska, A. Ciric, J. Glamoclija, M. Nikolic, T. Talevski, & M. Sokovic. 2014. Anti-Quorum Sensing Activity of Selected Sponge Extracts: A Case Study of *Pseudomonas aeruginosa*. *Natural Product Research* 28 (24): 2330–33.

Peng, Y., J. Hu, B. Yang, X. Lin, X. Zhou, X. Yang, & Y. Liu. 2015. Chemical Composition of Seaweeds. *Seaweed Sustainability*. Elsevier Inc.

Perdicaris, S., T. Vlachogianni, A. Valavanidis. 2013. Bioactive Natural Substances from Marine Sponges: New Developments and Prospects for Future Pharmaceuticals. *Natural Products Chemistry & Research* 01 (03): 1–8.

Pérez, MJ., E. Falqué, & H. Domínguez. 2016. Antimicrobial Action of Compounds from Marine Seaweed. *Marine Drugs* 14 (52): 1–38.

Pham, NB., M. S. Butler, J. N. A. Hooper, R. W. Moni, & R. J. Quinn. 1999. Isolation of Xestosterol Esters of Brominated Acetylenic Fatty Acids from the Marine Sponge *Xestospongia testudinaria*. *Journal of Natural Products* 62 (10):

Post, G. 1987. Texbook of Fish Health. T.F.H. Publications Inc. USA.

Puasa, ES., D. M. H. Mantiri, & A. Rumengan. 2018. Analisis Antibakteri Alga *Padina australis* Hauck di Perairan Teluk Totok dan Perairan Blongko. *Jurnal Pesisir Dan Laut Tropis* 1 (1): 14–20.

Pushparaj, A., D. Rajan, B. Sj, R. Murugesan, M. Kannan, & R. S. Raubbin. 2014. An Antimicrobial Activity of The Brown Seaweed *Padina tetrastromatica* Extract in Different Concentration against Human Pathogenic Bacteria. *International Journal of Applied Biology and Pharmaceutical Technology* 5 (1): 135–38.

Puspitasari, I., C. D. Mulyasari, & IGP G. R. Yudayana. 2020. Korelasi Populasi Vibrio terhadap Faktor Lingkungan pada Kolam Pemeliharaan Larva Udang Vannamei (*Litopenaeus vannamei*) di Situbondo, Indonesia. *Chanos Chanos* 18 (2): 73–81.

Putra, MY., & T. Murniasih. 2016. Distribution and Diversity of Marine Natural Products from Indonesian Marine Organisms. *Journal of Coastal Life Medicine* 4 (2): 104–7.

Qaralleh, H., S. Idid, S. Saad, D. Susanti, M. Taher, & K. Khleifat. 2010. Antifungal and Antibacterial Activities of Four Malaysian Sponge Species (Petrosiidae). *Journal de Mycologie Medicale* 20 (4): 315–20.

Quinn, RJ., & D. J. Tucker. 1985. A Brominated Bisacetylenic Acid From The Marine Sponge *Xestospongia testudinaria*. *Tetrahedron Letters* 26: 1671–72.

———. 1991. Further Acetylenic Acids from The Marine Sponge *Xestospongia testudinaria*. *Journal of Natural Products* 5 (1): 290–94.

Raharjo, TJ. 2012. Kimia Hasil Alam. Pustaka Pelajar. Yogyakarta.

Rahman, MM., F. Rahman, F. Afroze, F. Yesmin, K. K. Fatema, & K. Kanta. 2012. Prevalence of Pathogenic Bacteria in Shrimp Samples Collected from Hatchery, Local Markets and the Shrimp Processing Plant. *Bangladesh Journal Microbiology* 29 (1): 7–10.

Ramakrishna, A., & G. A. Ravishankar. 2011. Influence of Abiotic Stress Signals on Secondary Metabolites in Plants. *Plant Signaling and Behavior* 6 (11): 1720–31.

Ravikumar, S., N. Thajuddin, P. Suganthi, S. J. Inbaneson, & T. Vinodkumar. 2010. Bioactive Potential of Seagrass Bacteria against Human Bacterial Pathogens. *Journal of Environmental Biology* 31 (5): 387–89.

Rohana, & S. Wahyuni. 2019. Inventarisasi Potensi Wisata Pulau Berbasis Sistem

Informasi Geografis (SIG) (Studi Kasus: Pulau-Pulau Kecil di Kota Makassar). *Talenta Conference Series: Energy and Engineering (EE)* 2 (1): 1–6.

Rosaline, XD., S. Sakthivelkumar, S. Chitra, & S. Janarthanan. 2017. Antibacterial Activity of The Seaweeds *Chaetomorpha linum* and *Padina gymnospora* on Human Bacterial Pathogens. *Journal of Environment and Biotechnology* 6 (1): 43–52.

Rosmiati, R., A. Parenrengi, & E. Suryati. 2015. Marine Sponge *Aaptos suberitoides*, It's Potential Source of Natural Antibacterial for Controlling *Vibrio harveyi* on Tiger Shrimp (*Penaeus monodon*) Culture. *Indonesian Aquaculture Journal* 10 (1): 33.

Rozirwan, I. Iskandar, M. Hendri, R. Apri, & N. Azhar. 2018. Antibacterial Activity As Inhibitors Pathogen Bacterial on Pond Shrimp of Extract Marine Biota Collected From Maspari Island, South Sumatera, Indonesia. *Jurnal Ilmu Dan Teknologi Kelautan Tropis* 10 (3): 617–27.

Rumampuk, YBJ., P. M. Wowor, & C. D. Mambo. 2017. Uji Daya Hambat Ekstrak Spons Laut (*Callyspongia aerizusa*) terhadap Pertumbuhan Bakteri *Salmonella typhi* dan *Streptococcus pyogenes*. *Jurnal E-Biomedik (EBm)* 5 (2): 3–8.

Sahidin, I. 2018. Mengenal Senyawa Alami. Pembentukan dan Pengelompokan Secara Kimia. UHO Press. Kendari.

Sarjito, MA., D. Afriani, & A. H. C. Haditomo. 2015. Agensia Penyebab Vibriosis Pada Udang Vaname (*Litopenaus gariepinus*) yang Dibudidayakan Secara Intensif di Kendal. *Jurnal Kelautan Tropis* 18 (3): 189–96.

Sartika, RAD. 2008. Pengaruh Asam Lemak Jenuh, Tidak Jenuh dan Asam Lemak Trans terhadap Kesehatan. *Kesmas: National Public Health Journal* 2 (4): 154.

Silva, PC., Basson, & Moe. 1996. Catalogue of The Benthic Marine Algae of The Indian Ocean. *University of California Publications in Botany* 79: 1-1259.

Sipkema, D., M. C. R. Franssen, R. Osinga, J. Tramper, & R. H. Wijffels. 2005. Marine Sponges as Pharmacy. *Marine Biotechnology* 7 (3): 142–62.

Spivey, AC. 2015. Biosynthesis of Natural Products. Imperial College London. London.

Sugrani, A., H. Natsir, M. N. Djide, & A. Ahmad. 2019. Antibacterial and Anticancer Activity of Protein Sponges Collected From the Waters of Kapoposang Island of South Sulawesi, Indonesia. *International Research Journal Of Pharmacy* 10 (1): 82–87.

Syah, YM. 2016. Dasar-Dasar Penentuan Struktur Molekul Berdasarkan Data Spektrum ^{1}H dan ^{13}C NMR. Laboratorium Spektroskopi Massa dan NMR FMIPA ITB. Bandung.

Tangko, AM., & B. Pantjara. 2007. Dinamika Pertambakan Perikanan Di Sulawesi Selatan Kurun Waktu 1990-2005. *Media Akuakultur* 2 (2): 118–23.

Taniguchi, M., Y. Uchio, K. Yasumoto, T. Kusumi, & T. Ooi. 2008. Brominated Unsaturated Fatty Acids from Marine Sponge Collected in Papua New Guinea. *Chemical and Pharmaceutical Bulletin* 56 (3): 378–82.

Thirumurugan, D., A. Cholarajan, S.S. S. Raja, & R. Vijayakumar. 2018. An Introductory Chapter : Secondary Metabolites. IntechOpen Ltd. London.

Thormar, H. 2010. Lipids and Essential Oils as Antimicrobial Agents. John Wiley & Sons Ltd. Chichester, West Sussex, United Kingdom.

Tianero, MDB., N. Hanif, N. J. De Voogd, R. W. M. Van Soest, & J. Tanaka. 2009. A New Antimicrobial Fatty Acid from the Calcareous Sponge *Paragrantia* Cf. *waguensis*. *Chemistry and Biodiversity* 6 (9): 1374–77.

Trono, G. 1988. Philippine Seaweed. National Book Store. Philippine.

Tsukamoto, S., M. Takahashi, S. Matsunaga, N. Fusetani, & R. W. M. Van Soest. 2000. Hachijodines A-G: Seven New Cytotoxic 3-Alkylpyridine Alkaloids from Two Marine Sponges of The Genera Xestospongia and Amphimedon. *Journal of Natural Products* 63 (5): 682–84.

Tuminah, S. 2012. Efek Asam Lemak Jenuh dan Asam Lemak Tak Jenuh 'Trans' terhadap Kesehatan. *Media Penelitian Dan Pengembangan Kesehatan* 19 (3): 13–20.

Uli, H., A. Noor, F. W. Mandey, & A. Sapar. 2017. Isolation, Identification and Bioactivity Test of Non Polar Compounds on N-Hexane Extract of *Haliclona* (Reniera) *fascigera* from Samalona Island-Spermonde Archipelago. *Marina Chimica Acta* 17 (2): 1–50.

Verheij, E., & W. F. P. Van Reine. 1993. Seaweeds of The Spermonde Archipelago, SW Sulawesi, Indonesia. *Blumea* 37 (2): 385–510.

Wagoner, RMV., J. Jompa, A. Tahir, & C. M. Ireland. 1999. Trypargine Alkaloids from A Previously Undescribed *Eudistoma* sp. Ascidian. *Journal of Natural Products* 62 (5): 794–97.

Wagoner, RMV., J. Jompa, A. Tahir, & C. M. Ireland. 2001. A Novel Modified Pterin from A Eudistoma Species Ascidian. *Journal of Natural Products* 64 (8): 1100–1101.

War, WR., R. Ross, E. E., N. F. A. Rahim, B. S. Faridon, & K. A. Radzun. 2018. Antimicrobial Activity of Marine Green Algae Extract against Microbial Pathogens. *Malaysian Journal of Biochemistry and Molecular Biology* 2: 42–46.

Warbung, YY., V. NS. Wowor, & J. Posangi. 2014. Daya Hambat Ekstrak Spons Laut *Callyspongia* sp. terhadap Pertumbuhan Bakteri *Staphylococcus aureus*. *Journal of E-GIGI* 1: 1–12.

Watkins, PA. 2012. Fatty Acids: Metabolism. *Encyclopedia of Human Nutrition* 2–4: 220–30.

Wattimena, JR. 1991. Pharmacodynamics and Antibiotic Therapy. Gadjah Mada University Press. Yogyakarta.

Wei, CC., H. S. Ling, & W. C. Lee. 2015. Antibacterial Activity of *Sargassum polycystum* C. Agardh and *Padina australis* Hauck (Phaeophyceae). *African Journal of Biotechnology* 10 (64): 14125–31.

Wille, JJ., & A. Kydonieus. 2003. Palmitoleic Acid Isomer (C16:1Δ6) in Human Skin

Sebum Is Effective against Gram-Positive Bacteria. *Skin Pharmacology and Applied Skin Physiology* 16 (3): 176–87.

Williams, DE., J. B. Telliez, J. Liu, A. Tahir, R. V. Soest, & R. J Andersen. 2004. Meroterpenoid MAPKAP (MK2) Inhibitors Isolated from The Indonesian Marine Sponge *Acanthodendrilla* sp. *Journal of Natural Products* 67: 2127–29.

Winarno, FG. 1991. Kimia Pangan dan Gizi. PT. Gramedia Pustaka Utama. Jakarta.

World Register of Marine Species. http://www.marinespecies.org

Yang, M., L. F. Liang, L. G. Yao, H. L. Liu, & Y. W. Guo. 2019. A New Brominated Polyacetylene from Chinese Marine Sponge *Xestospongia testudinaria*. *Journal of Asian Natural Products Research* 21 (6): 573–78.

Yoon, BK., J. A. Jackman, E. R. Valle-González, & N. J. Cho. 2018. Antibacterial Free Fatty Acids and Monoglycerides: Biological Activities, Experimental Testing, and Therapeutic Applications. *International Journal of Molecular Sciences* 19 (4): 1-40.

Yulianti, R., H. Rante, G. Alam, & A. Tahir. 2011. Skrining Dan Analisis Klt-Bioautografi Senyawa Antimikroba Beberapa Ekstrak Spons Asal Perairan Laut Pulau Barrang Lompo, Sulawesi Selatan. *Majalah Obat Tradisional* 16 (2): 88–94.

Yulneriwarni, H. Silfia, & S. Handayani. 2016. Aktivitas Antibakteri Ekstrak Makroalga *Padina australis* dan *Laurencia nidifica* di Kepulauan Seribu terhadap Bakteri *Staphylococcus aureus* dan *Escherichia coli*. *Jurnal Pro-Life* 3 (3): 153–66.

Yusriana, Rosmawati, & K. T. Muda. 2019. Lae-Lae Sebagai Destinasi Wisata Arkeologi di Makassar, Indonesia. *Pariwisata Pesona* 04 (1): 1–10.

Zailanie, K. 2016. Study of *Padina australis* Using UV-VIS, HPLC and Antibacterial. *Journal of Life Science and Biomedics* 6 (42): 1–5.

Zainuddin, EN., H. Anshary, H. Huyyirnah, R. Hiola, & D. V. Baxa. 2019. Antibacterial Activity of *Caulerpa racemosa* against Pathogenic Bacteria Promoting 'Ice-Ice' Disease in The Red Alga *Gracilaria verrucosa*. *Journal of Applied Phycology* 31 (5): 3201–12.

Zainuddin, EN. 2006. Chemical and Biological Investigations of Selected Cyanobacteria (Blue-Green Algae). Ph.D. Thesis. University Greifswald. Germany.

Zhang, H., S. T. Loveridge, K. Tenney, & P. Crews. 2016. A New 3-Alkylpyridine Alkaloid from The Marine Sponge *Haliclona* sp. and Its Cytotoxic Activity. *Natural Product Research* 30 (11): 1262–65.

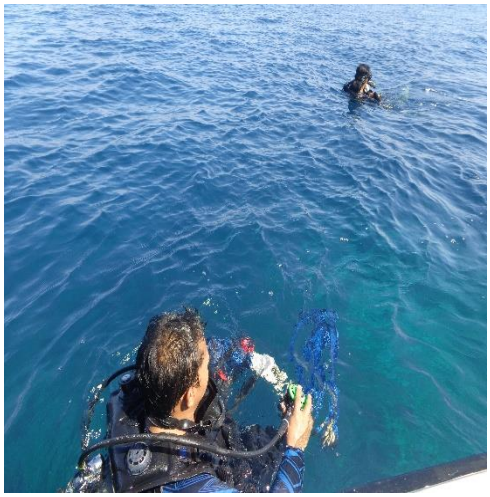
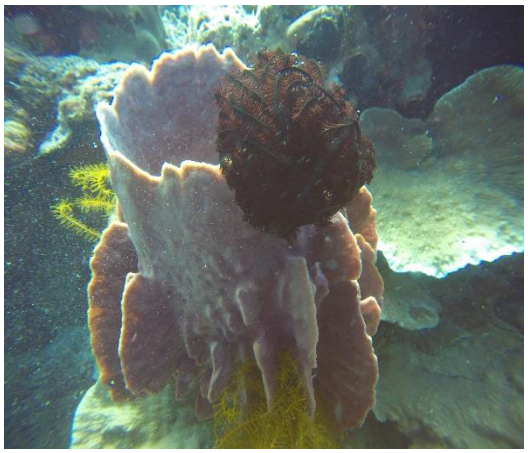
Zhou, X., Y. Lu, X. Lin, B. Yang, X. Yang, & Y. Liu. 2011. Brominated Aliphatic Hydrocarbons and Sterols from The Sponge *Xestospongia testudinaria* with Their Bioactivities. *Chemistry and Physics of Lipids* 164 (7): 703–6.

Zhou, X., T. Xu, X. W. Yang, R. Huang, B. Yang, L. Tang, & Y. Liu. 2010. Chemical and Biological Aspects of Marine Sponges of the Genus Xestospongia. *Chemistry and Biodiversity* 7 (9): 2201–27.

LAMPIRAN

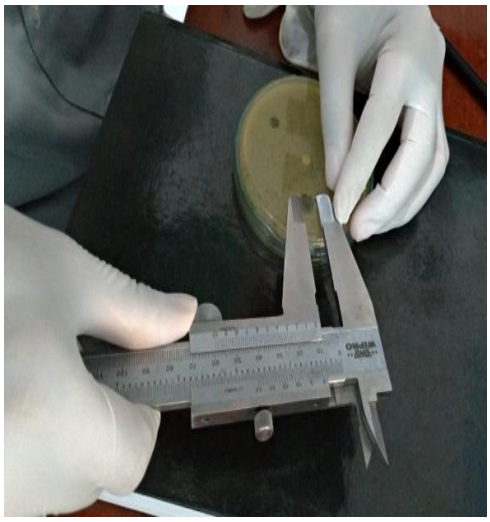
Lampiran 1. Dokumentasi penelitian

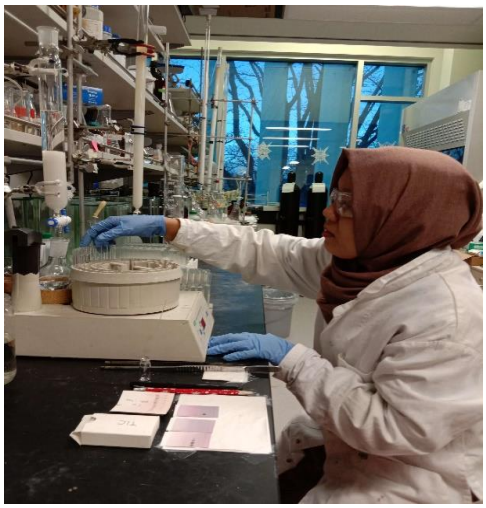
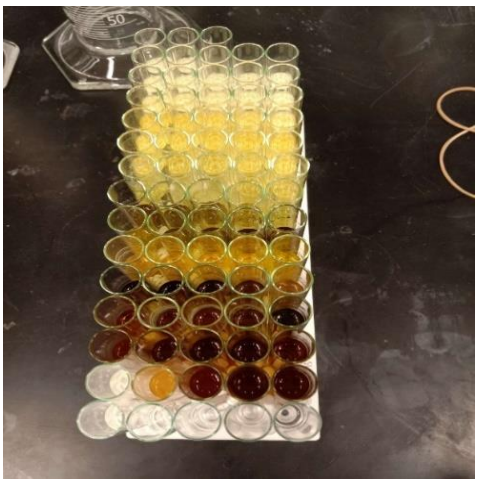
1.1. Lapangan

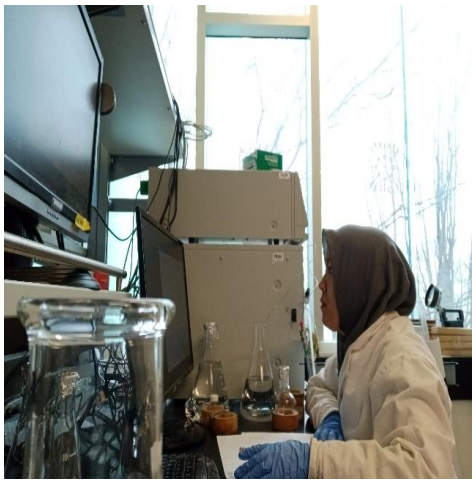
	
1. Sampling Pulau Lae-Lae	2. Sampling Pulau Badi
	
3. Sampel Rumput Laut	4. Sampel Rumput Laut
	
5. Sampel Spons	6. Proses Pencucian

1.2. Laboratorium

	
7. Proses Pengeringan	8. Proses Penghalusan (*Grinding*)
	
9. Simplia Sampel	10. Penimbangan
	
11. Maserasi	12. Filtrasi

	
13. Ekstrak Kental	14. Eluensi
	
15. Distilasi Pelarut	16. Uji Fitokimia
	
17. Uji Antibakteri	18. Pengukuran Zona Hambat

	
19. Proses Fraksinasi/Kolom	20. Sephadex LH-20 *Chromatography*
	
21. Fraksi Sampel 2 Etil Asetat	22. Evaporasi
	
23. *Fraction Collector*	24. Waters Sep Pack Vac Silica 2g

	
25. Proses HPLC	26. RP- HPLC
	
27. Pengeringan Nitrogen	28. *Heat Gun*
	
29. NMR	30. Lab Kimia Organik UBC

Lampiran 2. Uji Statistik

2.1. *Halimeda macroloba* Decaisne (*Vibrio alginolyticus*)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Konsentrasi1	Between Groups	.381	2	.191	33.583	.001
	Within Groups	.034	6	.006		
	Total	.415	8			
Konsentrasi2	Between Groups	1.429	2	.715	29.690	.001
	Within Groups	.144	6	.024		
	Total	1.573	8			

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Pelarut	(J) Pelarut	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Konsentrasi1	Nheksan	EtOac	-.43667*	.06152	.001	-.6254	-.2479
		Aseton	.00000	.06152	1.000	-.1888	.1888
	EtOac	Nheksan	.43667*	.06152	.001	.2479	.6254
		Aseton	.43667*	.06152	.001	.2479	.6254
	Aseton	Nheksan	.00000	.06152	1.000	-.1888	.1888
		EtOac	-.43667*	.06152	.001	-.6254	-.2479
Konsentrasi2	Nheksan	EtOac	-.81000*	.12667	.002	-1.1986	-.4214
		Aseton	.06667	.12667	.862	-.3220	.4553
	EtOac	Nheksan	.81000*	.12667	.002	.4214	1.1986
		Aseton	.87667*	.12667	.001	.4880	1.2653
	Aseton	Nheksan	-.06667	.12667	.862	-.4553	.3220
		EtOac	-.87667*	.12667	.001	-1.2653	-.4880

* The mean difference is significant at the 0.05 level.

2.2. *Halimeda macroloba* Decaisne (*Vibrio harveyi*)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Konsentrasi1	Between Groups	.094	2	.047	13.000	.007
	Within Groups	.022	6	.004		
	Total	.116	8			
Konsentrasi2	Between Groups	2.127	2	1.064	234.046	.000
	Within Groups	.027	6	.005		
	Total	2.154	8			

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Pelarut	(J) Pelarut	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Konsentrasi1	Nheksan	EtOac	-.21667*	.04907	.011	-.3672	-.0661
		Aseton	.00000	.04907	1.000	-.1505	.1505
	EtOac	Nheksan	.21667*	.04907	.011	.0661	.3672
		Aseton	.21667*	.04907	.011	.0661	.3672
	Aseton	Nheksan	.00000	.04907	1.000	-.1505	.1505
		EtOac	-.21667*	.04907	.011	-.3672	-.0661
Konsentrasi2	Nheksan	EtOac	-.91667*	.05504	.000	-1.0856	-.7478
		Aseton	.20000*	.05504	.025	.0311	.3689
	EtOac	Nheksan	.91667*	.05504	.000	.7478	1.0856
		Aseton	1.11667*	.05504	.000	.9478	1.2856
	Aseton	Nheksan	-.20000*	.05504	.025	-.3689	-.0311
		EtOac	-1.11667*	.05504	.000	-1.2856	-.9478

* The mean difference is significant at the 0.05 level.

2.3. *Padina australis* Hauck (*Vibrio harveyi*)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Konsentrasi1	Between Groups	.922	2	.461	23.809	.001
	Within Groups	.116	6	.019		
	Total	1.038	8			
Konsentrasi2	Between Groups	.559	2	.280	27.332	.001
	Within Groups	.061	6	.010		
	Total	.621	8			

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Pelarut	(J) Pelarut	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Konsentrasi1	Nheksan	EtOac	.36667*	.11359	.041	.0181	.7152
		Aseton	.78333*	.11359	.001	.4348	1.1319
	EtOac	Nheksan	-.36667*	.11359	.041	-.7152	-.0181
		Aseton	.41667*	.11359	.024	.0681	.7652
	Aseton	Nheksan	-.78333*	.11359	.001	-1.1319	-.4348
		EtOac	-.41667*	.11359	.024	-.7652	-.0681
Konsentrasi2	Nheksan	EtOac	-.33000*	.08260	.017	-.5834	-.0766
		Aseton	.28000*	.08260	.034	.0266	.5334
	EtOac	Nheksan	.33000*	.08260	.017	.0766	.5834
		Aseton	.61000*	.08260	.001	.3566	.8634
	Aseton	Nheksan	-.28000*	.08260	.034	-.5334	-.0266
		EtOac	-.61000*	.08260	.001	-.8634	-.3566

* The mean difference is significant at the 0.05 level.

2.4. *Padina australis* Hauck (*Vibrio parahaemolyticus*)

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Konsentrasi1	Between Groups	.180	2	.090	675.000	.000
	Within Groups	.001	6	.000		
	Total	.181	8			
Konsentrasi2	Between Groups	1.679	2	.840	277.779	.000
	Within Groups	.018	6	.003		
	Total	1.697	8			

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Pelarut	(J) Pelarut	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Konsentrasi1	Nheksan	EtOac	-.30000*	.00943	.000	-.3289	-.2711
		Aseton	.00000	.00943	1.000	-.0289	.0289
	EtOac	Nheksan	.30000*	.00943	.000	.2711	.3289
		Aseton	.30000*	.00943	.000	.2711	.3289
	Aseton	Nheksan	.00000	.00943	1.000	-.0289	.0289
		EtOac	-.30000*	.00943	.000	-.3289	-.2711
Konsentrasi2	Nheksan	EtOac	-1.03333*	.04489	.000	-1.1711	-.8956
		Aseton	-.71333*	.04489	.000	-.8511	-.5756
	EtOac	Nheksan	1.03333*	.04489	.000	.8956	1.1711
		Aseton	.32000*	.04489	.001	.1823	.4577
	Aseton	Nheksan	.71333*	.04489	.000	.5756	.8511
		EtOac	-.32000*	.04489	.001	-.4577	-.1823

* The mean difference is significant at the 0.05 level.

2.5. *Xestospongia testudinaria* (*Vibrio parahaemolyticus*)

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	6.360	2	3.180	8.889	.016
Within Groups	2.147	6	.358		
Total	8.507	8			

Multiple Comparisons

Tukey HSD

(I) Solvent	(J) Solvent	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Nheksan	EtOac	-.60333	.48837	.477	-2.1018	.8951
	Aseton	1.40333	.48837	.064	-.0951	2.9018
EtOac	Nheksan	.60333	.48837	.477	-.8951	2.1018
	Aseton	2.00667*	.48837	.015	.5082	3.5051
Aseton	Nheksan	-1.40333	.48837	.064	-2.9018	.0951
	EtOac	-2.00667*	.48837	.015	-3.5051	-.5082

* The mean difference is significant at the 0.05 level.

2.6. *Xestospongia testudinaria* (*Vibrio alginolyticus*)

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	21.549	2	10.774	90.626	.000
Within Groups	.713	6	.119		
Total	22.262	8			

Multiple Comparisons

Tukey HSD

(I) Solvent	(J) Solvent	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Nheksan	EtOac	-1.30000*	.28153	.009	-2.1638	-.4362
	Aseton	2.43333*	.28153	.000	1.5695	3.2971
EtOac	Nheksan	1.30000*	.28153	.009	.4362	2.1638
	Aseton	3.73333*	.28153	.000	2.8695	4.5971
Aseton	Nheksan	-2.43333*	.28153	.000	-3.2971	-1.5695
	EtOac	-3.73333*	.28153	.000	-4.5971	-2.8695

* The mean difference is significant at the 0.05 level.

2.7. *Xestospongia testudinaria* (*Vibrio harveyi*)

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	33.236	2	16.618	51.219	.000
Within Groups	1.947	6	.324		
Total	35.182	8			

Multiple Comparisons

Tukey HSD

(I) Solvent	(J) Solvent	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Nheksan	EtOac	-2.86667*	.46508	.002	-4.2936	-1.4397
	Aseton	1.80000*	.46508	.019	.3730	3.2270
EtOac	Nheksan	2.86667*	.46508	.002	1.4397	4.2936
	Aseton	4.66667*	.46508	.000	3.2397	6.0936
Aseton	Nheksan	-1.80000*	.46508	.019	-3.2270	-.3730
	EtOac	-4.66667*	.46508	.000	-6.0936	-3.2397

* The mean difference is significant at the 0.05 level.

2.8. *Haliclona fascigera* (*Vibrio parahaemolyticus*)

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8.062	2	4.031	152.747	.000
Within Groups	.158	6	.026		
Total	8.220	8			

Multiple Comparisons

Tukey HSD

(I) Pelarut	(J) Pelarut	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Nheksan	EtOac	2.18333*	.13264	.000	1.7764	2.5903
	Aseton	.41667*	.13264	.046	.0097	.8236
EtOac	Nheksan	-2.18333*	.13264	.000	-2.5903	-1.7764
	Aseton	-1.76667*	.13264	.000	-2.1736	-1.3597
Aseton	Nheksan	-.41667*	.13264	.046	-.8236	-.0097
	EtOac	1.76667*	.13264	.000	1.3597	2.1736

* The mean difference is significant at the 0.05 level.

2.9. *Callyspongia aerizusa* (*Vibrio parahaemolyticus*)

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.400	2	.700	183.676	.000
Within Groups	.023	6	.004		
Total	1.423	8			

Multiple Comparisons

Tukey HSD

(I) Pelarut	(J) Pelarut	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Nheksan	EtOac	-.83667*	.05041	.000	-.9913	-.6820
	Aseton	.00000	.05041	1.000	-.1547	.1547
EtOac	Nheksan	.83667*	.05041	.000	.6820	.9913
	Aseton	.83667*	.05041	.000	.6820	.9913
Aseton	Nheksan	.00000	.05041	1.000	-.1547	.1547
	EtOac	-.83667*	.05041	.000	-.9913	-.6820

* The mean difference is significant at the 0.05 level.

2.10. *Callyspongia aerizusa* (*Vibrio alginolyticus*)

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.514	2	.757	17.112	.003
Within Groups	.265	6	.044		
Total	1.779	8			

Multiple Comparisons

Tukey HSD

(I) Pelarut	(J) Pelarut	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Nheksan	EtOac	-.87000*	.17172	.006	-1.3969	-.3431
	Aseton	.00000	.17172	1.000	-.5269	.5269
EtOac	Nheksan	.87000*	.17172	.006	.3431	1.3969
	Aseton	.87000*	.17172	.006	.3431	1.3969
Aseton	Nheksan	.00000	.17172	1.000	-.5269	.5269
	EtOac	-.87000*	.17172	.006	-1.3969	-.3431

* The mean difference is significant at the 0.05 level.

2.11. *Callyspongia aerizusa* (*Vibrio harveyi*)

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.000	2	1.000	12.000	.008
Within Groups	.500	6	.083		
Total	2.500	8			

Multiple Comparisons

Tukey HSD

(I) Pelarut	(J) Pelarut	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Nheksan	EtOac	-1.00000*	.23570	.013	-1.7232	-.2768
	Aseton	.00000	.23570	1.000	-.7232	.7232
EtOac	Nheksan	1.00000*	.23570	.013	.2768	1.7232
	Aseton	1.00000*	.23570	.013	.2768	1.7232
Aseton	Nheksan	.00000	.23570	1.000	-.7232	.7232
	EtOac	-1.00000*	.23570	.013	-1.7232	-.2768

* The mean difference is significant at the 0.05 level.

Lampiran 3. Artikel

The 3rd International Conference On Science IOP Publishing
Journal of Physics: Conference Series **1341** (2019) 022005 doi:10.1088/1742-6596/1341/2/022005

Preliminary study: *Padina australis* Hauck's antibacterial activity and phytochemical test against shrimp pathogenic bacteria

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Abstract. The potential of aquaculture organism, Shrimp, need extra watchfulness to prevent it against the pathogenic bacteria attack. The use of synthetic antibiotics in shrimp can make pathogenic bacteria resistant and pollute the environment. Lately, Marine Natural Products

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Original Article

Green Algae *Halimeda macroloba* in Spermonde Archipelago: Phytochemical and *In Vitro* Antibacterial Studies

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ABSTRACT

Background: Green algae *Halimeda macroloba* compounds active against human, fish, and shrimp pathogenic bacteria. It is one of the marine natural organisms (MNO) which is a diverse source of secondary metabolites. **Objective:** We have set our goal towards determining the antimicrobial potential of crude extracts of green algae *H. macroloba*. **Materials and Methods:** Three crude mixtures of Marine Natural Product (MNP) were obtained from macroalgae *Halimeda macroloba* (Lae-Lae island, Spermonde Archipelago) by extraction (n-hexane, ethyl acetate, and methanol were used as solvents). **Results:** Theses mixtures (phytochemical tests showed they contained steroids, terpenoids, and alkaloids) were screened for their activity against shrimp pathogenic bacteria (*Vibrio harveyi* (M-120), *Aeromonas hydrophilla*, and *Vibrio parahaemolyticus* (T-170)). The obtained results confirmed weak antibacterial activity of studied extracts of *H. macroloba*. The ethyl acetate extract was the most potent antimicrobial agent at a concentration of 4 µg/25 µl. The inhibition zones for the growth of *A*

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Antibacterial assay of crude extracts from marine sponge *Haliclona fascigera* in Badi Island of Spermonde Archipelago against shrimp pathogenic bacteria

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Abstract. The marine Sponge *Haliclona fascigera*, belonging to the genus Haliclona, Family Haliclonidae, Order Haplosclerida, is a source of potentially valuable marine natural products, including diverse bioactive secondary metabolites. These bioactive secondary metabolites could be used as alternative antibiotics for managing pathogenic bacteria in aquaculture. The study aimed to determine the *in vitro* antibacterial activity of n-hexane, ethyl acetate, and acetone crude extracts against three shrimp pathogenic bacteria and to carry out phytochemical screening. The three crude extracts were produced from *H. fascigera* collected around Badi Island, Spermonde Archipelago, Indonesia. The crude extracts were screened for their activity against three shrimp pathogenic bacteria: *Vibrio harveyi* (M-120), *Vibrio alginolyticus* (B-425), and *Vibrio parahaemolyticus* (T-170). Antibacterial activity assays used the agar diffusion method; the paper discs were impregnated with extract concentrations of 2 mg/25μL. Phytochemical screening was carried out using standard protocols to provide supporting data. N-hexane and acetone crude extracts of *H. fascigera* were able to inhibit *V. parahaemolyticus* with inhibition zone diameters of 8.07 mm and 7.62 mm, respectively. The inhibition zone of ciprofloxacin (positive control) was 10.45 mm. The phytochemical analysis indicated that steroid, terpenoid, and alkaloid compounds were present in *H. fascigera*. Further studies are needed to reveal the compounds causing the observed antimicrobial effect.

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NEW ANTIBACTERIAL ACTIVITIES OF BROMINATED C_{18} AND C_{20} FATTY ACIDS ISOLATED FROM MARINE SPONGE *Xestospongia testudinaria* AGAINST SHRIMP PATHOGENIC BACTERIA

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ABSTRACT

The two known brominated C_{18} and C_{20} fatty acids (methyl ester) possessing acetylenic bonds (**1,2**) have been obtained from ethyl acetate extract of *Xestospongia testudinaria* collected in Badi island, Spermonde Archipelago, Makassar, Indonesia. The C_{18} and C_{20} compounds were determined using NMR and mass spectral data. Both C_{18} and C_{20} exhibited antibacterial activities against the shrimp pathogenic bacteria (*Vibrio* sp.). Compound **1** (C_{18}) showed significant inhibitory activity with the highest inhibition zone of 7.86 mm against *Vibrio harveyi* (inhibition zone of positive

Marine Resilience and Sustainable Development

CERTIFICATE
of Appreciation

THIS CERTIFICATE IS PRESENTED TO

Lulu Adilla Latifah

as Presenter

at the 2nd Marine Resilience and Sustainable Development (MARSAVE) International Symposium
organised by the Faculty of Marine Science and Fisheries, Universitas Hasanuddin
with the theme: "Strengthening Marine Resilience for Sustainable Development Goals",
held online on 10th October 2020

Dr. Ir. St. Aisyah Farhum, M.Si
Dean of
Faculty of Marine Science and Fisheries

Dr. Ir. Nadiarti, M.Sc.
Chair of the committee

CERTIFICATE

ICOS

This is to certify that the work by

L A Latifah, N H Soekamto and A Tahir

Preliminary Study: Padina australis Hauck's antibacterial activity and phytochemical test against pathogenic shrimp bacteria

had been presented

at

The Third International Conference on Science
(ICOS 2019)

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Tanggal Masuk : 22 Agustus 2019
Jumlah Sampel : 2
Jenis Sampel : Rumput laut
Asal Sampel : Pulau Lae-Lae, Kota Makassar
Kegiatan : Penelitian S3

DATA HASIL IDENTIFIKASI

Klasifikasi	Kode Sampel	
	Sampel 1	Sampel 2
Kingdom	Plantae	Plantae
Divisi	Phaeophyta	Chlorophyta
Class	Phaeophyceae	Ulvophyceae
Ordo	Dictyotales	Bryopsidales
Famili	Dictyotaceae	Sargassaceae
Genus	Padina	Halimeda
Spesies	*Padina australis Hauck*	*Halimeda macroloba* Decaisne

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2015	:	Action Planning for Aquatic Conservation Training by NGO Coral Triangle Center
2021	:	NMR (MarkHerb)

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2020	:	2nd Marine Resilience and Sustainable Development (MARSAVE), Makassar
2020	:	The 4th International Conferences on Science (ICOS 2020), Makassar

6. Publikasi Ilmiah

No	Judul	Vol/No/Hal	Publisher
1	Green Algae *Halimeda macroloba* in Spermonde Archipelago: Phytochemical and In Vitro Antibacterial Studies	12(5) : 1000-1004	Pharmacognosy Journal
2	New Antibacterial Activities of Brominated C_{18} and C_{20} Fatty Acids Isolated from Marine Sponge *Xestospongia testudinaria* Against Shrimp Pathogenic Bacteria	14 (1) : 460-465	Rasayan Journal of Chemistry
3	Preliminary Study: *Padina australis* Hauck's Antibacterial Activity and Phytochemical Test against Shrimp Pathogenic Bacteria	10.1088/1742-6596/1341/2/022005	IOP Conference Series : Journal of Physics
4	Antibacterial Assay of Crude Extracts from Marine Sponge *Haliclona fascigera* in Badi Island of Spermonde Archipelago against Shrimp Pathogenic Bacteria	10.1088/1755131 5/763/1/012029	IOP Conference Series : Earth and Environmental Science
5	Trophic State Index (TSI) di Habitat Rajungan (*Portunus pelagicus* Linnaeus, 1758) Pantai Betahwalang, Kabupaten Demak	4 (4) : 42-50	Diponegoro Journal of Maquares