

## **BAB 5**

### **KESIMPULAN DAN SARAN**

#### **5.1      Kesimpulan**

Didasarkan pada Kajian Pustaka yang telah dilakukan terhadap 15 artikel yang terkait dengan aktivitas antibakteri daun Jambu Biji (*Psidium guajava* L.) terhadap bakteri Gram positif dan Gram Negatif serta Kajian Pustaka terhadap efek antibakteri senyawa metabolit sekunder dari ekstrak daun Jambu biji ( *Psidium guajava* L.) dapat disimpulkan bahwa :

1.      Ekstrak daun Jambu biji ( *Psidium guajava* L.) memiliki aktivitas antibakteri terhadap Gram positif dan Gram negatif.
2.      Kandungan metabolit sekunder yang terdapat pada daun *Psidium guajava* L. Fenol, Tanin, Terpenoid, Flavonoid, Glikosida, Alkaloid, Kuinon dan Steroid. Terdiri atas senyawa Garcimangosone D, Guajaphenone A dan Guaijaverin merupakan senyawa golongan glikosida benzofenon, serta Kuersetin, asam vanilat, *syringic acid*, *m-coumeric acid* dan asam sinamat yang merupakan golongan fenol,

#### **5.2      Saran**

Pada penelitian selanjutnya dapat dilakukan penelitian eksperimental mengenai bagian tanaman Jambu Biji (*Psidium guajava* L.) yang menunjukkan aktivitas antibakteri.

## DAFTAR PUSTAKA

- AB, A. I. H. I., Jamaluddin, A. W., dan Arifah, S., 2018, Uji Efek Ekstrak Daun Jambu Biji (*Psidium guajava L.*) Terhadap Bakteri *Salmonella pullorum* secara In Vitro. *Jurnal Ilmiah Ibnu Sina*, **3(2)**: 353-360.
- Abdullah, M. S., Nas, F. S., and Ali, M., 2019, Antibacterial activity of Psidium Guajava leaf and stem bark extracts against clinical isolates of *Staphylococcus aureus* and *Salmonella typhi*, *Int. J. Res. Pharm. Biosciences. Lewes, DE*, **6(5)**: 11-17.
- Abushaheen, M.A., Muzaheed, Fatani, A.J., Alosaimi, M., Mansy, W., George, M., Acharaya S., Rathod S., Divakar D.D., Jhugroo C, Vellappally S., Khan A.A., Shaik J. and Jhugroo P., 2020, Antimicrobial resistance, mechanisms and its clinical significance. *Disease-a-Month*.
- Addienillah, M. B.. 2021, Aktivitas Antibakteri Kombinasi Ekstrak Daun Jambu Biji (*Psidium guajava L.*) dan Biji Pala (*Myristica fragrans*) terhadap *Escherichia coli*, Doctoral dissertation, Universitas Jenderal Soedirman.
- Afifi, R., 2018, Uji Anti Bakteri Ekstrak Daun Jambu Biji (*Psidium guajava L.*) Terhadap Zona Hambat Bakteri Jerawat *Propionibacterium acnes* Secara In Vitro. *Jurnal Kesehatan Bakti Tunas Husada: Jurnal Ilmu-ilmu Keperawatan, Analis Kesehatan dan Farmasi*, **17(2)**: 321-330.
- Afzal, M., Iqbal, R., Mahmood, Z., Zeshan, B., and Wattoo, J. I., 2019, Study of GC-MS and HPLC characterized metabolic compounds in guava (*Psidium guajava L.*) leaves, *Pakistan Journal of Agricultural Sciences*, **56(3)**.
- Akena, C., Akampa, G. M., Munanura, E. I., Otto, R. B., Kaggwa, B., Rubayiza, P., and Ndagire, M., 2021, In vitro assessment of the antibacterial activity of combinations of methanolic extracts of *Mangifera indica L.* bark and *Psidium guajava L.* leaf on multidrug-resistant *Pseudomonas aeruginosa*, *Journal of Pharmacy & Bioresources*, **18(2)**: 87-94.
- Alexander, P., Sudi, I. Y., and Tizhe, M., 2019, Phytochemical and Antimicrobial Studies of the Crude Extracts of the Leaves of *Carica*

*papaya* Linn (Pawpaw) and *Psidium guajava* Linn (Guava), *Microbiology Research Journal International*, **28(1)**: 1-7.

ALhaidari, S. A. A., Al-Deen, A. M. T., Al-Kaf, A. G., Al-Hadi, F. A., Abdullah, Q., Mahbashi, A. A., and Al-Dubai, F. A., 2019, Antimicrobial and Antioxidant Activity of *Psidium guajava* (Guava) Medicinal Plant Leaves Used in Folk Medicine for Treatment of Wounds and Burns in Hufash District Al Mahweet Governorate–Yemen, *Journal of Pharmaceutical Research*, **4(2)**: 6-13.

Anand, V., Kumar, V., Kumar, S., and Hedina, A., 2016, Phytopharmacological overview of *Psidium guajava* Linn. *Pharmacognosy Journal*, **8(4)**.

Anbuselvi, S., and Rebecca, J., 2017, Phytochemical Biochemical and Antimicrobial Activity of *Psidium guajava* leaf extract. *Journal of Pharmaceutical Sciences and Research*, **9(12)**: 2431-2433.

Andrade, J.N., Costa, N.E.M. and Brandao, H., 2015, Using Ichthyotoxic Plants as Bioinsecticide: A literature review, *Rev. Bras. Pl. Med., Campinas*, **17(4)**: 649-656.

Anggraito, Y. U., Susanti, R., Iswari, R. S., Yuniaستuti, A., Nugrahaningsih, W. H., Habibah, N. A. dan Dafip, M., 2018, Metabolit Sekunder dari Tanaman: Aplikasi dan Produksi, *Fakultas Matematika dan Ilmu pengetahuan Alam*, Universitas Negeri Semarang (UNNES), Semarang.

Ariani, S.R.D., Susilowati, E., Susanti VH, E. dan Setiyani., 2008, Uji Efektivitas Ekstrak Metanol Daun Jambu Biji (*Psidium guajava* L.) Sebagai Antifertilitas Kontrasepsi Pada Tikus Putih (*Ratus norvegicus*), *Indonesian Journal of Chemistry*, **8(2)**: 264- 270.

Arina, Y., dan Ningsih, S. N. C., 2020, Uji Aktivitas Ekstrak dan Fraksi Daun Jambu Biji (*Psidium guajava* L.) Terhadap Pertumbuhan Bakteri, *Babul Ilmi Jurnal Ilmiah Multi Science Kesehatan*, **12(2)**.

Asif, M., 2017, Antimicrobial Agents, *Journal of Analytical & Pharmaceutical Research*, **4**: 1-6.

Aswarita, R., 2013, Interaksi ekstrak daun lidah buaya (*Aloe vera* L.) dan daun jambu biji (*Psidium guajava* L.) terhadap daya hambat *Escherichia coli* secara in vitro. *Jurnal EduBio Tropika*, **1(2)**.

- Azizan, N. A., Zarina, N., Wahab, A., Mohamad, N. A., Sham, A., dan Othman, A. S., 2020, Antimicrobial Activity of Psidium Guajava Leaves Extract Against Foodborne Pathogens. *International Journal of Psychosocial Rehabilitation*, **24**(7).
- Barbalho, S. M., Farinazzi-Machado, F. M., de Alvares Goulart, R., Brunnati, A. C. S., Otoboni, A. M., and Ottoboni, B. J. M. A. P., 2012, *Psidium guajava* (Guava): A plant of multipurpose medicinal applications, *Med Aromat Plants*, **1**(4): 1-6.
- Bhambar, R. S., 2021, A Review on Antimicrobial Activity of *Psidium guajava* L. Leaves on Different Microbial Species, Antioxidant Activity Profile and Herbal Formulations, *Journal of Pharmaceutical Sciences and Research*, **13**(7): 406-411.
- Biswas, B., Rogers, K., McLaughlin, F., Daniels, D. and Yadav, A., 2013, Antimicrobial Activities of Leaf Extract Of Guava (*Psidium guajava* L.) on Two Gram-Negatifand Gram-Positive Bacteria, *International Journal of microbiology*, **2013**: 1-7.
- Bobbarala, V., 2012, Antibacterial Activity of Naturally Occurring Compounds from Selected Plants, In: *Antimicrobial Agent*, Croatia: InTech, pp. 1-24.
- Bosch, A. A., Biesbroek, G., Trzcinski, K., Sanders, E. A. and Bogaert, D., 2013, Viral and bacterial interactions in the upper respiratory tract. *PLoS pathogens*, **9**(1): 1-12.
- Braga, T. , Dores, R. , Ramos, C. , Evangelista, F. , Tinoco, L. , Varotti, F. , Carvalho, M. and Sabino, A., 2014, Antioxidant, Antibacterial and Antitumor Activity of Ethanolic Extract of the *Psidium guajava* Leaves. *American Journal of Plant Sciences*, **5**: 3492-3500.
- Cahyono, B., 2010, Sukses Budidaya Jambu Biji di Pekarangan dan Perkebunan, Lily Publisher, Yogyakarta.
- Chrismonita, I., 2021, Aktivitas antibakteri ekstrak etanol daun jambu biji Australia (*Psidium guajava* L.) terhadap bakteri *Shigella dysenteriae* secara in vitro, Disertasi, Universitas Islam Negeri Maulana Malik Ibrahim.
- Departemen Kesehatan RI, Direktorat Pengawasan Obat Tradisional, 2000, Pedoman Pelaksanaan Uji Klinik Obat Tradisional, Jakarta: Departemen Kesehatan RI

- Deshpande, S. N., 2020, Preliminary Phytochemical Analysis and Antibacterial Activity of Leaf Extract of *Psidium guajava* Against Bacterial Pathogen, *World journal of Pharmaceutical Research*, **(9)3** : 1167- 1174.
- Dey, Prasanta., 2020, Recent Advances in Natural Products Analysis || Analysis of alkaloids (indole alkaloids, isoquinoline alkaloids, tropane alkaloids). , (), 505–567.
- Dhiman, A., Nanda, A., Ahmad, S., and Narasimhan, B., 2011, In vitro antimicrobial activity of methanolic leaf extract of *Psidium guajava* L., *Journal of Pharmacy and Bioallied Sciences*, **3(2)**: 226.
- Diaz, A., Nurhussen, H. A., and Odeh, F. R., 2017, Antimicrobial activity of *Psidium guajava* leaves extract against *Staphylococcus Aureus* using pure extracts, *World Journal of Pharmaceutical Research*, **6(9)**: 14-17.
- Díaz-de-Cerio, E., Verardo, V., Gómez-Caravaca, A. M., Fernández-Gutiérrez, A., and Segura-Carretero, A., 2017, Health effects of *Psidium guajava* L. leaves: an overview of the last decade, *International journal of molecular sciences*, **18(4)**: 897.
- Diyan Meitasari, A., Yuliani, R., dan St, M. B. (2017). Skrining Ekstrak Etanol Daun Jambu Biji (*Psidium guajava*), Daun Mint (*Mentha Piperita*), Daun Serai (*Cymbopogon Nardus*), Rimpang Jahe (*Zingiber Officinale*), Dan Pelelah Pisang Ambon (*Musa Paradisiaca*) Terhadap Methicillin Resistant *Staphylococcus Aureus*, Doctoral dissertation, Universitas Muhammadiyah Surakarta.
- Evb uomwan, L., Jacob, I. B., Ebiala, F. I., and Chukwuka, E. P., 2018, Antibacterial Activity of Aqueous and Ethanolic Leaves Extract of *Psidium guajava*, *FUW Trends in Science & Technology Journal*, **3(1)** :39 – 42
- Fadhilah, A., Susanti, S. dan Gultom, T., 2018, Karakterisasi Tanaman Jambu Biji (*Psidium guajava* L.) di desa Namoriam Pancur Batu kabupaten Deli Serdang Sumatra Utara, *Prosiding seminar Nasional Biologi dan Pembelajaran*. Universitas Negeri Medan, Medan.
- Farhana, J. A., Hossain, M. F., dan Mowlah, A., 2017, Antibacterial effects of guava (*Psidium guajava* L.) extracts against food borne pathogens. *Int. J. Nutr. Food Sci*, **6**: 1-5.

- Fauziah, N., Yuliani, R., dan St, M. B., 2018, Skrining Aktivitas Antibakteri Ekstrak Etanol Daun Jambu Biji, Daun Mint, Daun Serai, Pelepas Pisang Ambon, Dan Rimpang Jahe Terhadap *Salmonella parathyphi A*, Doctoral dissertation, Universitas Muhammadiyah Surakarta.
- Febryana, S. F. A., 2020, Uji Fitokimia dan Aktivitas Antioksidan Ekstrak Daun dan Buah Jambu Biji Ungu (*Psidium guajava* L.) menggunakan Pelarut yang Berbeda, Doctoral dissertation, Universitas Islam Negeri Maulana Malik Ibrahim.
- Fernandes, M. R. V., Dias, A. L. T., Carvalho, R. R., Souza, C. R. F., dan Oliveira, W. D., 2014, Antioxidant and antimicrobial activities of *Psidium guajava* L. spray dried extracts, *Industrial Crops and Products*, **60**:39-44.
- Fitria, N. N., 2020, Uji Daya Hambat Ekstrak Daun Jambu Biji (*Psidium guajava* L.) terhadap Bakteri *Propionibacterium acnes*, Disertasi, STIKes BTH Tasikmalaya.
- Fratiwi, Y., 2015, The Potential of Guava Leaf (*Psidium guajava* L.) for Diarrhe, *Jurnal Majority*, **4(1)**: 113– 118.
- Funatogawa, K., Hayashi, S., Shimomura, H., Yoshida, T., Hatano, T., Ito, H. and Hirai, Y., 2004, Antibacterial Activity of Hydrolyzable Tannins Derived from Medicinal Plants against (*Helicobacter pylori*), *Microbiology and Immunology*, **48(4)** : 251–261.
- Gaitedi, H., dan Ngadiani, N., 2014, Efektivitas Sari Daun Jambu Biji (*Psidium guajava* L.) Sebagai Zat Anti Bakteri *Escherichia coli*, dan *Staphylococcus epidermidis*, *STIGMA: Jurnal Matematika dan Ilmu Pengetahuan Alam Unipa*, **7(02)**.
- Girsang, G. E., Indriarini, D., dan Woda, R. R., 2020, Uji Aktivitas Antibakteri Ekstrak Etanol Daun Jambu Biji (*Psidium Guajava* LINN) Terhadap Pertumbuhan Bakteri *Escherichia coli*, *Cendana Medical Journal (CMJ)*, **8(1)**: 450-455.
- Gupta, V., Kumar, R., Chaudhary, D., and Yadav, N., 2016, In-vitro analysis of potential antibacterial activity of three medicinal plants. *Journal of Applied and Natural Science*, **8(3)**: 1497-1500.
- Gurnani, P., Krishnan, C. G. A., Gurnai, R., Ghosh, A., dan Shah, A., 2016, Antibacterial activity of Guava leaves extract against *Lactobacillus acidophilus*: an in-vitro study. *Int J Oral Health Med Res*, **2(6)**: 37-40.

- Habib, M. M. A., Bar, F. M. A., and Badria, F. A., 2017, Antioxidant and Antibacterial compounds from the leaves of *Psidium guajava*, *World Journal of Pharmaceutical Sciences*, 56-63.
- Hackman, H. K., Arhin, R. E., Azumah, B. K., Boateng, D., Nwosu, B., and Apenteng, M., 2020, In vitro antibacterial activity of *Psidium guajava* (Guava) leaves extract on carbapenem-resistant *Klebsiella pneumoniae* causing multi-drug resistant systemic infections, *Journal of Medicinal Plants Research*, 14(9): 475-479.
- Handarni, D., Putri, S. H., dan Tensiska, T., 2020, Skrining Kualitatif Fitokimia Senyawa Antibakteri pada Ekstrak Daun Jambu Biji (*Psidium guajava* L.). *Jurnal Keteknikan Pertanian Tropis dan Biosistem*, 8(2): 182-188.
- Handayani, F., Sundu, R., dan Sari, R. M., 2017, Formulasi dan uji aktivitas antibakteri *Streptococcus mutans* dari sediaan mouthwash ekstrak daun jambu biji (*Psidium guajava* L.), *Jurnal Sains dan Kesehatan*, 1(8): 422-433.
- Hapsoh, H.Y. dan Yaya, H., 2011, Budidaya Tanaman Obat Dan Rempah, USU Press, Medan.
- Harianto, D., Laila Vifta, R., dan Susilo, J., 2020, Aktivitas Antibakteri Ekstrak Daun Jambu Biji (*Psidium Guajava* L.) Terhadap *Staphylococcus aureus* dan *Escherichia coli* Dengan Metode Sumuran, Disertasi, Universitas Ngudi Waluyo.
- Hassan, M. M., Shahinuzzaman, A. B. M., Khan, S. A., Uddin, M. B., and Mahabub-Uz-Zaman, M., 2011, Anti-diarrhoeal, antimicrobial and cytotoxic effect of ethanol extracted guava (*Psidium guajava*) leaves, *Vet Scan/ Online Veterinary Medical Journal*, 6(2): 91-91.
- Hermawan, R., Prasetyo, A. dan Noorhamdani., 2012, Uji Efektivitas Ekstrak Daun Jambu Biji Sebagai Antimikroba Terhadap bakteri Penyebab Karies *Streptococcus mutans* secara in Vitro, Skripsi, Universitas Brawijaya, Malang.
- Hidjrawan, Y., 2020, Identifikasi Senyawa Tanin pada Daun Belimbing Wuluh (*Averrhoa bilimbi* L.). *Jurnal Optimalisasi*, 4(2): 78-82.
- Hirudkar, J.R., Parmar K.M., Peasad R.S., Sinha S.K., Jogi M.S., Itankar P.R., and Prasad S.K., 2020, Quercetin a Major Biomarker of *Psidium guajava* L. Inhibits SepA protease activity of *Shigella*

- flexneri in Treatment of Infectious diarrhoea, *Microbial pathogenesisis*, **138** : 103807.
- Istiqomah, I., 2014, Antibacterial Activity Combination of Lactobacilli Probiotic Milk and Guava Leaf Water Extract (*Psidium guajava*) Against Diarrhea-Causing Bacteria, Doctoral dissertation, UNIVERSITAS AIRLANGGA.
- Jain, D., Dasar, P., Nagarajappa, S., Kumar, S., Airen, B., and Warhekar, S., 2014, In vitro activity of ethanolic and water extract of guava leaves at various concentrations against *Lactobacillus acidophilus*. *Journal of Indian Association of Public Health Dentistry*, **12(3)**: 232.
- Jaisinghani, R. N., 2017, Antibacterial properties of quercetin. *Microbiology Research*, **8(1)**
- Jani, N. A., Azizi, N. A. A., and Aminudin, N. I., 2020, Phytochemical Screening and Antioxidant Activity of Psidium Guajava, *Malaysian Journal of Analytical Sciences*, **24(2)**: 173-178.
- Kafle, A., Mohapatra, S. S., Reddy, I., and Chapagain, M., 2018, A review on medicinal properties on *Psidium guajava*, *Journal of Medicinal Plant studies*, **6(4)**: 44-47.
- Kenneth, E., Paul, T., Istifanus, N., Uba, U., Rejoice, A., Victor, O., and Mohammed, S., 2017, Phytochemical analysis and antibacterial activity of *Psidium guajava* L. leaf extracts, *GSC Biological and Pharmaceutical Sciences*, **1(2)**.
- Kew. R., 2021, Diakses pada 10 November 2021, <http://www.plantsoftheworldonline.org/taxon/urn:lsid:ipni.org:names:600841-1>
- Ki, V. and Rotstein, C., 2008, Bacterial Skin and Soft Tissue Infections in Adults: A Review of Their Epidemiology, Pathogenesis, Diagnosis, Treatment and Site Of Care. *Canadian Journal of Infectious Diseases and Medical Microbiology*, **19(2)**: 173–184.
- Kristanto, R. W., 2012, Uji Aktivitas Antibakteri terhadap *Propionibacterium acne* dan Evaluasi Karakteristik Fisik Krim Ekstrak Daun Jambu Biji (*Psidium guajava* L.).
- Kurnia, K. A., Widyatamaka, S. Q., Masyrofah, D., Prayuda, E. M., dan Andriani, N., 2020, Khasiat Daun Jambu Biji Sebagai Antidiare

- Kuttiyawong, A., and Panich, S., 2021, Antibacterial activity of guava leaf extract and guava leaf extracted hand sanitiser gel preparation. Skripsi
- Lahlou, Y., El Amraoui, B., and Bamhaoud, T., 2019, The antibacterial activity screening of the extracts of some Moroccan medicinal plants. *International Journal of New Technology and Research (IJNTR)*, **5**: 31-38.
- Lin, D., Xiao, M., Zhao, J., Li, Z., Xing, B., Li, X., Kong, M., Li L., Zhang, Q., Liu Y., Chen, H., Qin, W., Wu, H. and Chen, S., 2016, An overview of plant phenolic compounds and their importance in human nutrition and management of type 2 diabetes. *Molecules*, **21(10)** : 1374.
- Majdanik, M.M., Kepa, M., Wojtyczka, R.D., Idzik, D. and Wasik, T.J., 2018, Phenolic Compounds Diminish Antibiotic Resistance of *Staphylococcus aureus* Clinical Strains, *International Journal of Environmental Research and Public Health*, **15**: 1-18
- Maknah, N., Ustiawaty, J., dan Kurniawan, E., 2018, Uji Aktivitas Ekstrak Etanol Daun Jambu Biji (*Psidium guajava* L.) Terhadap Pertumbuhan Bakteri *Staphylococcus epidermidis* Penyebab Bau Badan, *Media of Medical Laboratory Science*, **2(1)**: 26-34.
- Maysarah, H., Apriani, R., and Misrahanum, M., 2016, Antibacterial Activity Test of Ethanol Extract of White and Red Flesh From Guava Leaf (*Psidium guajava*. L) Againts *Staphylococcus aureus* and *Escherichia coli*, *Jurnal Natural*, **16(1)**: 51-56.
- Metwally, A. M., Omar, A. A., Ghazy, N. M., Harraz, F. M., and El Sohafy, S. M., 2011, Monograph of *Psidium guajava* L. leaves. *Pharmacognosy Journal*, **3(21)**: 89-104.
- Millones-Gómez, P. A., Maurtua-Torres, D., Bacilio-Amaranto, R., Calla-Poma, R. D., Requena-Mendizabal, M. F., Valderrama-Negron, A. C., and Huauya\_Leyuacc, M. E., 2020, Antimicrobial activity and antiadherent effect of peruvian *Psidium guajava* (Guava) leaves on a cariogenic biofilm model, *J Contemp Dent Pract*, **21(7)**: 733-40.
- Misrulloh, A., Rosiani, E., dan Liawati, I., 2017, Uji Daya Hambat Esktrak Daun Jambu Biji Putih Dan Merah Terhadap Pertumbuhan Bakteri Karies Gigi (*Lactobacillus acidophilus*), *Prosiding SNST Fakultas Teknik*, **1(1)**.

- Mohsin, F., Rehman, G., Iqbal, S., Iqbal, Z., Khan, M. Z., and Saddique, U., 2013, In vitro antimicrobial activity of guava leaves extract against important bacterial and fungal strain, *International journal of bioscience*
- Morais-Braga, M. F. B., Carneiro, J. N. P., Machado, A. J. T., Dos Santos, A. T. L., Sales, D. L., Lima, L. F., et al., 2016, *Psidium guajava* L., from ethnobiology to scientific evaluation: Elucidating bioactivity against pathogenic microorganisms, *Journal of ethnopharmacology*, **194**: 1140-1152.
- Naili, M., Errayes, A., Alghazeer, R., Mohammed, W. A., and Darwish, M., 2020, Evaluation of Antimicrobial and Antioxidant Activities of *Psidium guajava* L. growing in Libya, *International Journal of Advanced Biological and Biomedical Research*, **8(4)**: 419-428.
- Naseer, S., Hussain, S., Naeem, N., Pervaiz, M., and Rahman, M., 2018, The phytochemistry and medicinal value of *Psidium guajava* (guava), *Clinical Phytoscience*, **4(1)**: 1-8.
- Natali, O., Tarigan, A. I., Sarumpaet, E., Salim, S., Dewani, Y., Hanida, W., dan Yensuari, Y., 2021, Uji efektifitas antibakteri ekstrak daun jambu biji (*Psidium guajava*) terhadap pertumbuhan bakteri *Bacillus cereus*, *Jurnal Prima Medika Sains*, **3(1)**: 29-33.
- Ningrum, R., Purwanti, E., dan Sukarsono, S., 2016, Alkaloid compound identification of *Rhodomyrtus tomentosa* stem as biology instructional material for senior high school X grade. *Jurnal Pendidikan Biologi Indonesia*, **2(3)**: 231-236.
- Novard, M.F.A., Suharti N. dan Rasyid R., 2019, Gambaran bakteri penyebab infeksi pada anak berdasarkan jenis spesimen dan pola resisintensinya di laboratorium RSUP DR. M. Djamil Padang tahun 2014-2016. *Jurnal Kesehatan Andalas*, **8(2S)**: 26-32.
- Nurfitriyana, N., Yanuarti, R., dan Pangesti, I. D., 2021, Formulasi, Evaluasi dan Uji Antibakteri Sediaan Gel Ekstrak Etanol Daun Jambu Biji (*Psidium guajava* L.) sebagai Anti Jerawat : *ISTA Online Technologi Journal*, **2(2)**:50-59.
- Nurwaini, S., dan Nasihah, R. H., 2018, Formulasi dan Uji Aktivitas Antibakteri Sediaan Hand Gel Ekstrak Daun Jambu Biji (*Psidium guajava* L.). *Proceeding of The URECOL*, 24-30.

- Nuryani, S., 2017, Pemanfaatan Ekstrak Daun Jambu Biji (*Psidium guajava* Linn) Sebagai Antibakteri dan Antifungi. *Jurnal Teknologi Laboratorium*, **6(2)**: 41 - 45.
- Oetomo, T. M., 2020, Aktivitas antibakteri permen jeli ekstrak daun jambu biji (*Psidium guajava linn.*) pada *staphylococcus aureus* dan *pseudomonas aeruginosa* = *Antibacterial activity of guava leaf (Psidium guajava linn.) jelly candy on staphylococcus aureus and pseudomonas aeruginosa*, Doctoral dissertation, Universitas Pelita Harapan.
- Oluwajobi, I., Kabiru, Y. A., and Jigam, A. A., 2019, Antibacterial and antifungal activities of aqueous leaves extract of some medicinal plants. *GSC Biological and Pharmaceutical Sciences*, **9(1)**: 062-069.
- Pambudi, A., Syaefudin, Noriko, N., Swandari, R., dan Azura, P.R., 2014, Identifikasi Bioaktif Golongan Flavonoid Tanaman Anting-Anting (*Acalypha indica L.*), *Jurnal Al-AZHAR Indonesia Seri SAINS dan Teknologi*, **2(3)** : 178-187.
- Panche, A. N., Diwan, A. D. and Chandra, S.R., 2016, Flavonoids: an overview. *Journal of nutritional science*, **5**.
- Parimin., 2005, Jambu Biji: Budidaya dan Ragam Pemanfaatannya, Penebar Swadaya, Jakarta.
- Paul, R.K., Dutta, D., Chakraborty, D., Nayak, A. Dutta, P.K. and Nag, M., 2019, Antimicrobial Agents from Natural Sources: An overview, *Advance Pharmaceutical Journal*, **4(2)**: 41-51.
- Phong, L. T., and Lum, N. T., 2021, *Psidium Guajava L.* Extract Against Minimum Inhibitory Concentration of *Staphylococcus Aureus*, *Journal of Asian Multicultural Research for Medical and Health Science Study*, **2(3)**: 22-26.
- Poeloengan, M., 2010, Uji aktivitas antibakteri ekstrak kulit buah manggis (*Garcinia mangostana* Linn). *Media Penelitian dan Pengembangan Kesehatan*, **20(2)**.
- Pramadita, A., 2020, Aktivitas antibakteri infusa daun jambu biji merah dalam hard candy terhadap bakteri *Staphylococcus aureus* dan *Pseudomonas aeruginosa*= *Antibacterial activity of red guava leaves infusion in hard candy on staphylococcus aureus and*

*pseudomonas aeruginosa* bacteria, Doctoral dissertation, Universitas Pelita Harapan.

- Purwaningsih, P., 2013, Pengaruh Pemberian Air Rebusan Daun Jambu Biji (*Psidium guajava*) terhadap Kadar Glukosa Darah Pada Penderita Diabetes Melitus Tipe II di Desa Leyangan Kecamatan Ungaran Timur Kabupaten Semarang, *Jurnal Keperawatan Medikal Bedah*,
- Qonita, N., Susilowati, S. S. dan Riyandini, D., 2019, Uji Aktivitas Antibakteri Ekstrak Daun Jambu Biji (*Psidium guajava* L.) Terhadap Bakteri *Escherichia coli* dan *Vibrio cholerae*, *Acta Pharmaciae Indonesia*, **7(2)**: 51-57.
- Ramluckan, K., Moodley, K. G., and Bux, F., 2014, An evaluation of the efficacy of using selected solvents for the extraction of lipids from algal biomass by the soxhlet extraction method, *Fuel*, **116**(): 103–108.
- Ranti, N. P., 2014, Aktivitas Antibakteri Kombinasi Susu Probiotik *Lactobacilli* dan Ekstrak Etanol Daun Jambu Biji (*Psidium guajava*) Terhadap Bakteri Penyebab Diare, Doctoral dissertation, Universitas Airlangga.
- Rasidah, R., Syahmani, S., dan Iriani, R., 2019, Identifikasi Senyawa Flavonoid dari Kulit Batang Tanaman Rambai Padi (*Sonneratia alba*) dan Uji Aktivitasnya sebagai Antibakteri *Staphylococcus aureus*, *Jurnal Jejaring Matematika dan Sains*, **1(2)**: 97-106.
- Romasi, E.F., Parahusip, A.J.N. dan Yuniarwaty., 2011, Study of Antimicrobial Activity From Guava (*Psidium guajava* L.) Leaf Extract Towards Pathogenic Microbes, Universitas Pelita harapan, Tanggerang.
- Sahidin, S., Salsabila, S., Wahyuni, W., Adryan, F., and Imran, I., 2019, Potensi Antibakteri Ekstrak Metanol dan Senyawa Aromatik dari Buah Wuale (Etlingera elatior). *Jurnal Kimia Valensi*, **5(1)**: 1-7.
- Saleh, B., and Al-Mariri, A., 2020, Antibacterial Activity Evaluation of Psidium guajava L.(Myrtaceae) Crude Extracts Against Selected Bacterial Pathogens, *Biological Sciences-PJSIR*, **63(2)**: 119-126.
- Sanda, K.A., Grema, H.A., Geidam, Y.A. and Bukar-Kolo, Y.M., 2011, Pharmacological aspects of *P. guajava*: An update, *International Journal of Pharmacology*, **7(3)**: 316-324.

- Saxena, M., Saxena, J., Nema, R., Singh, D. and Gupta, A., 2013, Phytochemistry of Medicinal Plants, *Journal of Pharmacognosy and Phytochemistry*, **1(6)**: 168-182.
- Sembiring, M. Y., 2021, Uji Daya Hambat Ekstrak Daun Jambu Biji Terhadap Bakteri *Escherichia coli* Systematic Review.
- Setiabudi, R., 2007, ‘Pengantar Antimikroba’, in Setiabudi, R., *Farmakologi dan Terapi*, 5<sup>th</sup> ed., Departemen Farmakologi Dan Terapeutik Fakultas Kedokteran Universitas Indonesia, Jakarta, pp. 585–98.
- Shah, D., Shah, S. S., Khan, I., Khan, J. M., Nabi, M., Zeb, J., Imad, J., Khan, I., Shah, I. and Khan, M. W., 2020, A Review of the Phytochemistry, Traditional Uses and Antibacterial Potential of *Psidium guajava*, **10(3)**: 2506 – 2514.
- Sharma, N., Jana, A. M., Pathak, N., Singh, C., and Singh, P., 2017, A preliminary study on the antibacterial effects of ethanolic extract of *Psidium guajava* leaves on Bacteria isolated from urinary tract infection with special reference to *Escherichia coli* and *Staphylococcus aureus*, *International journal of biotechnology and biochemistry*, **13(2)**: 183-189.
- Shetty, S., Shetty, R. M., Rahman, B., Vannala, V., Desai, V., and Shetty, S. R., 2020, Efficacy of *Psidium guajava* and *Allium sativum* extracts as antimicrobial agents against periodontal pathogens, *Journal of Pharmacy & Bioallied Sciences*, **12(1)**, S589.
- Shinde, M., Sawant, A., Dhekale, P., and Sharma, A., 2018, Effect of different extracts of *Psidium guajava* leaves on antibacterial and antifungal activity, *World J Pharmaceut Res*, **7(13)**: 523-528.
- Simbolon, R. A., Halimatussakkiah, H. dan Amna, U., 2021, Uji Kandungan Senyawa Metabolit Sekunder pada Ekstrak Daun Jambu Biji (*Psidium guajava* L var. Pomifera) dari Kota Langsa, Aceh, *QUIMICA: Jurnal Kimia Sains dan Terapan*, **3(1)**: 12-18.
- Sine, Y., dan Fallo, G, 2016, Uji Aktivitas Antibakteri Ekstrak Daun Ketapang (*Terminalia catappa* L.) dan Daun Jambu Biji (*Psidium guajava* L.) terhadap Pertumbuhan Bakteri *Aeromonas hydrophila*, *Bio-Edu: Jurnal Pendidikan Biologi*, **1(1)** : 9-11.
- Sivananthan, M., 2013, Antibacterial activity of 50 medicinal plants used in folk medicine. *Int J Biosci*, **3(4)**: 104-21.

- Soudawat, P., dan Verma, A., 2019, Phytochemical Analysis and Antibacterial Activity of *Psidium Guajava* against Some Clinical Pathogens, *Phytochemical Analysis*, **3(6)**.
- Sova, M., 2012, *Antioxidant and Antimicrobial Activities of Cinnamic Acid Derivatives. Mini-Reviews in Medicinal Chemistry*, **12(8)**: 749–767.
- Sudira, I. W., Merdana, I. M., dan Qurani, S. N., 2019, Preliminary phytochemical analysis of guava leaves (*Psidium guajava L.*) as antidiarrheal in calves. *Advances in Tropical Biodiversity and Environmental Sciences*, **3(2)**: 21-24.
- Supriyadi, S., 2017, Community of Practitioners: Solusi Alternatif Berbagi Pengetahuan antar Pustakawan. *Lentera Pustaka: Jurnal Kajian Ilmu Perpustakaan, Informasi Dan Kearsipan*, **2(2)** : 83-93.
- Suryana, S., Nuraeni, Y. Y. A., dan Rostinawati, T., 2017, Aktivitas antibakteri ekstrak etanol dari lima tanaman terhadap bakteri *Staphylococcus epidermidis* dengan metode mikrodilusi M7–A6CLSI, *Indonesian Journal of Pharmaceutical Science and Technology*, **4(1)**: 1-9.
- Tagousop., C.N., Tamokou, J.D., Ekom, S.E., Ngnokam, D. and Nazabadioko, L.V., 2018, Antimicrobial Activities of Flavonoid Glycosides from *Graptophyllum grandulosum* and Their Mechanism of Antibacterial Action, *BMC Complementary and Alternative Medicine*, **18**: 1-10.
- Triyansyah, I. M., Wirahmi N, Masrijal C.D.P., Amri Z., and Ikhsan., 2021, Formulation and Antibacterial Activity of Natural Disinfectant Combination of *Psidium guajava* and *Piper betle* Leaf Infusion Against *Staphylococcus aureus*. *Advances in Health Sciences Research*, **40** : 91-97
- Tsukaya, H., 2005, Leaf shape: Genetic Controls And Environmental Factors, *International Journal of Developmental Biology*, **49(5-6)** : 547-555.
- Tumpa, S. I., Hossain, M. I., and Ishika, T., 2015, Antimicrobial activities of *Psidium guajava*, *Carica papaya* and *Mangifera indica* against some gram positive and gram negative bacteria, *Journal of Pharmacognosy and Phytochemistry*, **3(6)**: 125-129.
- Ukwueze, S. E., Osadebe, P. O. and Okoye, F. B., 2015, A new antibacterial benzophenone glycoside from *Psidium guajava* (Linn.) leaves, *Natural product research*, **29(18)** : 1728-1734.

- Utari, S. S. N., dan Munawaroh, R., 2016, Skrining Aktivitas Antibakteri Ekstrak Etanol 70% Dari Beberapa Daun Tanaman Di Indonesia Terhadap Bakteri *Shigella sonnei* Serta Bioautografinya, Doctoral dissertation, Universitas Muhammadiyah Surakarta.
- Vaidya, M., 2013, Antimicrobial activity of aqueous & methanolic extract of young & mature leaves of *Psidium guajava* L.(Guava), *The Journal of Indian Botanical Society*, **92(1 and 2)**: 47-51.
- Vebliani, R., Muthmainah, N., dan Yasmina, A., 2020, Perbandingan Aktivitas Antibakteri Ekstrak Daun Tanjung dan Daun Jambu Biji terhadap Escherichia coli In Vitro. *Homeostasis*, **3(1)**: 141-146.
- Wang, S., Yao, J., Zhou, B., Yang, J., Chaudry, M. T., Wang, M., Xiao, F., Li, Y., and Yin, W., 2018, Bacteriostatic Effect of Quercetin as an Antibiotic Alternative In Vivo and Its Antibacterial Mechanism In Vitro, *Journal of Food Protection*, **81(1)**: 68–78.
- Welly, Z., 2020, Formulasi dan Uji Aktivitas Antibakteri Spray Hand Sanitizer dari Ekstrak Daun Jambu Biji (*Psidium guajava* L.) Terhadap Bakteri *Staphylococcus aureus*, Doctoral dissertation, Universitas perintis Indonesia.
- Western, U., 2020, diakses pada 14 November 2021, <https://www.lib.uwo.ca/tutorials/typesofliteraturereviews/index.html>
- WHO., 2015, World Health Statistics: World Health Statistics 2015, Genewa, pp. 55-86.
- Wibisono, W. G., 2011, Tanaman Obat Keluarga Berkhasiat, Vivo Publisher, Jawa Tengah.
- Widyawati, E., 2006, Penentuan Adanya Senyawa Triterpenoid dan Uji Aktivitas Biologis Pada Beberapa Spesies Tanaman Obat Tradisional Masyarakat Pedesaan Bengkulu, *Jurnal Gradien*, **2(1b)** : 116-122.
- Wiratna, S., 2014, Metodologi Penelitian, PT. Pustaka Baru, Yogyakarta
- Xie, Y., Yang, W., Tang, F., Chen, X. and Ren, L., 2015, Antibacterial Activities of Flavonoids: Structure-Activity Relationship and Mechanism, *Current Medicinal Chemistry*, **22(1)**: 132-149
- Yabo, S. A., Manga, S. B., Baki, A. S., Atata, R. F., Gambo, S., and Tahir, H., 2021, Antibacterial activity and toxicological evaluation of

- Anogeissusleiocarpus and Psidium guajava on Escherichia coli and *Staphylococcus aureus*, *Bayero Journal of Pure and Applied Sciences*, **14(1)**:214-220.
- Yadav, R., Sehgal, S. and Khanna, P., 2020, Phytochemical Constituents of *Hibiscus rosa-sinensis*, *Laurus nobilis* and *Psidium guajava* Leaves and their Antimicrobial Activity, *Indian Journal of Natural Sciences*, **11(63)**: 28549- 28557
- Yulianti, R., 2015, Formulasi krim anti jerawat kombinasi ekstrak daun sirsak (*Annona muricata L.*) dan daun jambu biji (*Psidium guajava L.*). *Jurnal Kesehatan Bakti Tunas Husada: Jurnal Ilmu-ilmu Keperawatan, Analisis Kesehatan dan Farmasi*, **14(1)**: 158-161.
- Yulisma, L., 2018, Uji Efek Antibakteri Ekstrak Daun Jambu Biji Lokal (*Psidium guajava L.*) terhadap Pertumbuhan *Staphylococcus aureus* dan *Bacillus subtilis* secara In Vitro, *Quagga: Jurnal Pendidikan dan Biologi*, **10(2)**: 1-5.
- Zhang, W., Wang, J., Chen, Y., Zheng, H., Xie, B. and Sun, Z., 2020, Flavonoid Compounds and Antibacterial Mechanisms of Different Parts of White Guava (*Psidium guajava L.* cv. Pearl), *Natural Product Research*, **34(11)**: 1621-1625.