

## BAB 7

### KESIMPULAN DAN SARAN

#### 7.1 Kesimpulan

Berdasarkan hasil penelitian yang diperoleh, maka dapat disimpulkan bahwa :

- Kadar Hambat Minimal ekstrak daun kersen (*Muntingia calabura L.*) terhadap *Pseudomonas aeruginosa* terletak pada rentang konsentrasi 400 – 800 mg/mL.
- Ekstrak daun kersen (*Muntingia calabura L.*) memiliki potensi bakterisidal terhadap *Pseudomonas aeruginosa*.
- Nilai KBM ekstrak daun kersen (*Muntingia calabura L.*) terhadap *Pseudomonas aeruginosa* terletak pada konsentrasi 800mg/mL.

#### 7.2 Saran

Berdasarkan hasil penelitian yg diperoleh, maka dapat disarankan bahwa :

- Rentang konsentrasi ekstrak daun kersen (*Muntingia calabura L.*) lebih dipersempit agar penentuan nilai KBM lebih spesifik.

- Menggunakan metode ekstraksi lain daun kersen (*Muntingia calabura* L.) untuk mengetahui metode ekstraksi yang menunjukkan hasil antibakteri paling baik.
- Melakukan uji fitokimia kadar flavonoid, saponin, dan tanin yang terkandung dalam ekstrak daun kersen (*Muntingia calabura* L.) untuk mengetahui kadar senyawa aktif yang dapat membunuh bakteri.

## **DAFTAR PUSTAKA**

1. Aditi S. Pengetahuan Dan Sikap Mahasiswa Akper Terhadap Pencegahan Infeksi Nosokomial Flebitis. Students E-Journals [Internet]. 2014;1–14. Available from: <http://journal.unpad.ac.id/index.php/ejournal/article/view/685>
2. Preface I. Nosocomial Infections Surveillance System. 2008;(Cdc):42–8.
3. Kurniawati AF, Satyabakti P, Arbianti N. Perbedaan Risiko Multidrug Resistance Organism (MDROS) Menurut Faktor Risiko dan Kepatuhan Hand Hygiene. J Berk Epidemiol. 2015;3(3):277–89.
4. Nugraheni R, Tono S, Winarni S. Infeksi Nosokomial di RSUD Setjonegoro Kabupaten Wonosobo. Media Kesehat Masy Indones [Internet]. 2012;11(1):94–100. Available from: <http://ejournal.undip.ac.id/index.php/mkmi/article/view/6169>
5. Andy Samuel ; Prof. DR. dr. Efriida Warganegara, M.Kes S. Pola Resistensi Antibiotik terhadap Isolat Bakteri Aerob Penyebab Infeksi Luka Operasi di Ruang Rawat Inap Bagian Bedah dan Kebidanan Rsud Dr. H. Abdul Moeloek Bandar Lampung. 2013;21–35.
6. Japoni A, Farshad S, Alborzi a. *Pseudomonas aeruginosa: Burn infection, treatment and antibacterial resistance*. Iran Red Crescent Med J. 2009;11(3):244–53.
7. Brooks, G. F., Jawetz, E., Melnick, J. L. & A. Jawetz, Melnick & Adelberg's medical microbiology (26th edition.). twenty-six. New York: London: McGraw-Hill Medical; 2013.
8. CDC. Antibiotic resistance threats in the United States, 2013. Current [Internet]. 2013;114. Available from: <http://www.cdc.gov/drugresistance/threat-report>

9. Dou Y, Huan J, Guo F, Zhou Z, Shi Y. *Pseudomonas aeruginosa* prevalence, antibiotic resistance and antimicrobial use in Chinese burn wards from 2007 to 2014. *J Int Med Res.* 2017;45(3):1124–37.
10. Dewi Anggraini, Utari Gusti Yulindra, Maya Savira, Fauzia Andini Djojosugito NH. Prevalensi dan Pola Sensitivitas Antimikrob Multidrug Resistant *Pseudomonas aeruginosa* di RSUD Arifin Achmad Prevalence and Antimicrobial Susceptibility Profile of Multidrug Resistant *Pseudomonas aeruginosa* in Arifin Achmad General Hospital. 2018;50(1):6–12.
11. Cecep Kusmana AH. The Biodiversity of Flora in Indonesia. 2017;vol.5 no.2(January). Available from: <http://journal.ipb.ac.id/index.php/jpsl/>
12. Ekor M. The growing use of herbal medicines: issues relating to adverse reactions and challenges in monitoring safety. 2014;4(January):1–10.
13. B Bustanussalam. Pemanfaatan obat tradisional (herbal) sebagai obat alternatif. 2016;7(1).
14. Wachtel-Galor S BI. *Herbal Medicine: An Introduction to Its History, Usage, Regulation, Current Trends, and Research Needs.* Herb Med Biomol Clin Asp [Internet]. 2011; Available from: <https://www.ncbi.nlm.nih.gov/books/NBK92773/>
15. K. LT. *Edible Medicinal And Non Medicinal Plants: Volume 3, Fruits* [Internet]. Springer Dordecht Heidelberg London New York; 2013. 487-491 p. Available from: <https://books.google.co.id/books?id=32rWbxUtjeMC&pg=P A492&dq=muntingia+calabura&hl=id&sa=X&ved=0ahUK Ewj4ysPXm->

7aAhVKRo8KHS0eAVAQ6AEIRjAF#v=onepage&q=muntingia calabura&f=false

16. Salleh MZ, Zakaria ZA, Nasir NLM, Rofiee MS, Tohid SFM, Ching SM. Muntingia calabura : A review of its traditional uses , chemical properties , and pharmacological observations Muntingia calabura : A review of its traditional uses , chemical properties , and pharmacological observations. 2014;0209.
17. ITIS. *Muntingia calabura L.* [Internet]. 2018. Available from:  
[https://www.itis.gov/servlet/SingleRpt/SingleRpt?search\\_top\\_ic=TSN&search\\_value=21503#null](https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_top_ic=TSN&search_value=21503#null)
18. Janick J& REP. *The Encyclopedia of Fruit and Nuts* [Internet]. Cambridge University Press; 2008. Available from:  
<https://books.google.co.id/books?id=cjHCoMQNkcgC&pg=PA348&dq=muntingia+calabura&hl=id&sa=X&ved=0ahUKEwjjiqnMpu7aAhUJOI8KHRMKAOcQ6AEIQDAE#v=onepage&q=muntingia calabura&f=false>
19. Made A& ALK. *Khasiat Warna-warni Makanan* [Internet]. Jakarta: PT Gramedia Pustaka Utama; 2008. Available from:  
<https://books.google.co.id/books?id=6y2eu0xw7s4C&printsec=frontcover&dq=khasiat+warna+warni+makanan&hl=id&sa=X&ved=0ahUKEwirm9PKqO7aAhXIsY8KHYbuDDYQ6AEIJzAA#v=onepage&q=khasiat warna warni makanan&f=false>
20. Krishnaveni M& RD. Qualitative and Quantitative Study of Phytochemicals in *Muntingia calabura L.* Leaf And Fruit World Journal of Pharmaceutical ReseaRch. World J Pharm Res World J Pharm. 2014;3(6).
21. Evans WC. *Trease and Evans Pharmacognosy*. Elsevier; 2009.

22. Kumar S, Pandey AK. Chemistry and Biological Activities of Flavonoids : An Overview. 2013;2013.
23. Waksmundzka M-JS& TK. Thin Layer Chromatography in Phytochemistry. Waksmundzka M-JS& TK, editor. CRC Press; 2008.
24. Tsao R. Chemistry and Biochemistry of Dietary Polyphenols. 2010;1231–46.
25. M.Yusofa ASSAZI. Isolation and identification of antibacterial and cytotoxic compounds from the leaves of Muntingia calabura L. ethnopharmacology [Internet]. 2013; Available from: <https://www.sciencedirect.com/science/article/pii/S0378874112008665?via%3Dhub>
26. Savage GP. Saponins. Encycl Food Sci Nutr (Second Ed [Internet]. 2004;5095–8. Available from: <https://www.sciencedirect.com/science/article/pii/B012227055X010506>
27. Mills S& KB. Principles and Practice of Phytotherapy. Churchill Livingstone; 2000.
28. Nn A. Medicinal & Aromatic Plants A Review on the Extraction Methods Use in Medicinal Plants , Principle , Strength and Limitation. 2015;4(3):3–8.
29. Tetti M. Ekstraksi, pemisahan senyawa, dan identifikasi senyawa aktif. 2014;
30. ITIS. Pseudomonas aeruginosa [Internet]. 2018. Available from: [https://www.itis.gov/servlet/SingleRpt/SingleRpt?search\\_top\\_ic=TSN&search\\_value=965278#null](https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_top_ic=TSN&search_value=965278#null)
31. Moselio Schaechter, N. Cary Engleberg, Victor J. DiRita TD. Schaechter's Mechanisms of Microbial Disease. fourth edi.

- Moselio Schaechter, N. Cary Engleberg, Victor J. DiRita TD, editor. Lippincott Williams & Wilkins; 2007. 762 p.
32. Vasanthakumari R. Textbook of Microbiology. New Delhi: BI Publication Pvt Ltd; 2007.
  33. Kumar S. Textbook of Microbiology. first edit. New Delhi: Jaypee Brothers Medical Publisher (P) Ltd; 2012.
  34. Steel KJ. Microbial Identification. 1965;
  35. W. L. Review of Medical Microbiology and Immunology. McGraw-Hill; 2014.
  36. Kango N. Textbook of Microbiology. New Delhi: I.K. International Publishing House Pvt. Ltd.; 2010.
  37. Alimsardjono, Lindawati, Priyo Budi Puwarno, Pepy Dwi Endraswari, Deby Kusumaningrum NMM. Pemeriksaan Mikrobiologi pada Penyakit Infeksi. Lindawati Alimsardjono, Priyo Budi Puwarno, Pepy Dwi Endraswari, Deby Kusumaningrum NMM, editor. Jakarta: CV. Sagung Seto; 2015.
  38. Shields P, Cathcart L. Oxidase Test Protocol. 2016;(May 2018):1–9.
  39. Vasanthakumari R. Practical Microbiology. New Delhi: BI Publication Pvt. Ltd.; 2009.
  40. Nagoba B& AP. Medical Microbiology and Parasitology. Edition T, editor. Elsevier; 2016.
  41. Hanson A. Oxidative-Fermentative Test Protocol. 2016;(September 2008):1–7.
  42. Harvey, Richard A. PCC& BDF. Microbiology. second edi. Lippincott Williams & Wilkins; 2007.
  43. Reiner K. Catalase Test Protocol. 2016;(May 2018):1–9.

44. Macwilliams MP. Citrate Test Protocol. 2016;(May 2018):1–7.
45. Parija SC. Textboook of Microbiology & Immunology. second edi. Elsevier2012; 2012.
46. I. K. Essentials of Microbiology for Nurses. Elsevier; 2016.
47. Mahon, R. Connie DCL& GM. Textbook of Diagnostic Microbiology. fourth edi. Saunders Elsevier; 2011.
48. Yanuhar DU. Mikroalga Laut Nannochloropsis Oculta. Tim UB Press, editor. UB Press;
49. Pratiwi ST. Mikrobiologi Farmasi. 2008. Erlangga; 2009. 256 p.
50. Christopher W. Antibiotics Action, Origins, Resistance. United States of America: ASM Press; 2003.
51. Donna L. Clinical Chemistry: Fundamentals and Laboratory Techniques. Joshua H, editor. Elsevier; 2017.
52. Lister PD, Wolter DJ, Hanson ND. Antibacterial-Resistant *Pseudomonas aeruginosa* : Clinical Impact and Complex Regulation of Chromosomally Encoded Resistance Mechanisms. 2009;22(4):582–610.
53. Chuah EL, Zakaria ZA, Suhaili Z, Bakar SA, Desa MNM. Antimicrobial Activities of Plant Extracts against Methicillin-Susceptible and Methicillin-Resistant *Staphylococcus aureus*. 2014;4(1):6–13.
54. Prasetyo AD, Sasongko H, Iii K, Soepomo JP. Aktivitas Antibakteri Ekstrak Etanol 70 % Daun Kersen ( *Muntingia Calabura L.* ) Terhadap Bakteri *Bacillus subtilis* dan *Shigella dysenteriae* Sebagai Materi Pembelajaran Biologi SMA Kelas X untuk Mencapai Kd 3 . 4 pada Kurikulum 2013. 2014;1(1):98–102.

55. Z.A.Zakaria, C.A. Fatimah, A.M. Mat Jais, H. Zaiton, E.F.P. Henie, M.R. Sulaiman, M.N Somchit MT and DK. The in vitro Antibacterial Activity of *Muntingia calabura* Extracts. *Int J Pharmacol.* 2006;
56. Fitri GD, Tistiana H, Radiati LE. Review study on antibacterial activity of cherry leaf ( *Muntingia calabura* ) against *Staphylococcus* spp . and *Salmonella* spp . the most causing disease in livestock. 2017;27(2):63–73.
57. Amyes Sebastian, Rex S Miles, Christopher J Thompson GT. *Antimicrobial Chemotherapy Pocketbook*. 1996.
58. Schwalbe Richard, Lynn Steele Moore ACG. *Antimicrobial Susceptibility Testing Protocols*. Schwalbe Richard, Lynn Steele Moore ACG, editor. CRC Press; 2007. 79 p.
59. Zamani NP, Muhaemin M. Penggunaan Spektrofotometer Sebagai Pendekripsi Kepadatan Sel Mikroalga Laut. *Maspari J.* 2016;8(1):39–48.
60. Buhian WPC, Rubio RO, Valle DL, Martin-Puzon JJ. Bioactive metabolite profiles and antimicrobial activity of ethanolic extracts from *Muntingia calabura* L. leaves and stems. *Asian Pac J Trop Biomed* [Internet]. 2016;6(8):682–5. Available from: <http://dx.doi.org/10.1016/j.apjtb.2016.06.006>
61. Ngajow M, Abidjulu J, Kamu V. Pengaruh Antibakteri Ekstrak Kulit Batang Matoa ( *Pometia pinnata* ) terhadap Bakteri *Staphylococcus aureus* secara In vitro. *J MIPA UNSRAT*. 2013;2(November 2013):128–32.
62. Xie Y, Yang W, Tang F, Chen X, Ren L. Antibacterial Activities of Flavonoids: Structure-Activity Relationship and Mechanism. *Curr Med Chem* [Internet]. 2014;22(1):132–49. Available from: <http://www.eurekaselect.com/openurl/content.php?genre=art>

icle&issn=0929-8673&volume=22&issue=1&spage=132

63. Balouiri M, Sadiki M, Ibnsouda SK. Methods for in vitro evaluating antimicrobial activity: A review. *J Pharm Anal.* 2016 Apr;6(2):71–9.
64. Triyati E. Spektrofotometri Ultra-Violet dan Sinar Tampak Serta Aplikasinya dalam Oseanologi. *Oseana*. 1985;X(1):39–47.
65. Sulaiman AY, Astuti P, Dewi A, Shita P. Uji Antibakteri Ekstrak Daun Kersen ( *Muntingia Calabura L.* ) Terhadap Koloni *Streptococcus viridians*. 2017;01(02):1–7.
66. Manik DF, T H, H A. Dengan Aktivitas Antibakteri Ekstrak Etanol Dan Fraksi-Fraksi Daun Kersen. 2014;1–11.
67. Ratnasari M. Uji Aktivitas Antibakteri Ekstrak Daun Kersen (*Muntingia calabura L.*) Dalam Bentuk Sediaan Gel Terhadap *Staphylococcus aureus* dan *Escherichia coli*. 2017; Available from: <http://e-journal.uajy.ac.id/id/eprint/12970>