

## **BAB 7**

### **SIMPULAN DAN SARAN**

#### **7.1 Simpulan**

Berdasarkan hasil penelitian yang telah dilakukan, dapat disimpulkan bahwa :

1. Terdapat efek pemberian ekstrak buah jujube merah kering dengan dosis 70mg/KgBB, 140mg/KgBB, dan 280mg/KgBB terhadap kadar bilirubin total tikus wistar yang diinduksi *Acetaminophen*.
2. Pemberian ekstrak buah jujube merah kering dengan dosis 280mg/KgBB menyebabkan perbaikan kadar bilirubin total paling baik pada tikus wistar yang diinduksi *Acetaminophen*.

#### **7.2 Saran**

Berdasarkan hasil penelitian yang telah dilakukan, saran yang dapat dipertimbangkan untuk penelitian selanjutnya yaitu melakukan penelitian pemberian ekstrak buah jujube merah kering dengan waktu yang lebih lama agar dapat mengetahui efek pemberian jangka panjang.

## DAFTAR PUSTAKA

1. Sherwood L. Fisiologi Manusia dari Sistem Ke Sel. Ed 8. Jakarta:EGC.2018. 701-706 p
2. Idrus Alwi, Sudoyo AW, Simadibrata M, Setyohadi B, Ari Fahrial Syam. Buku Ajar Ilmu Penyakit Dalam Jilid II edisi VI. Interna Publishing. 2014. 1929-2946 p
3. World Health Organization. Global hepatitis report, 2017. 2017. 1-19p. Available at: <https://www.who.int/publications/i/item/9789241565455>
4. Badan Penelitian dan Pengembangan Kesehatan. Laporan Kesehatan Dasar Nasional 2013. 2013. Available at: [http://labdata.litbang.kemkes.go.id/images/download/laporan/RKD/2018/Laporan\\_Nasional\\_RKD2018\\_FINAL.pdf](http://labdata.litbang.kemkes.go.id/images/download/laporan/RKD/2018/Laporan_Nasional_RKD2018_FINAL.pdf)
5. Shen T, Liu Y, Shang J, Xie Q, Li J, Yan M, et al. Incidence and Etiology of Drug-Induced Liver Injury in Mainland China. Gastroenterology. 2019. Available at: <https://doi.org/10.1053/j.gastro.2019.02.002>
6. Katzung B. Farmakologi Dasar & Klinik, Vol.2, Edisi 12. Annual Reports in Medicinal Chemistry;editor Bahasa Indonesia.2018. 732-833 p
7. Pandit A, Sachdeva T, Bafna P. Drug-induced hepatotoxicity: A review. Journal of Applied Pharmaceutical Science. 2012. Available at: <https://doi.org/10.7324/japs.2012.2541>
8. World Health Organization (WHO). WHO Traditional Medicine Strategy Plan 2014-2020. WHO Tradit Med Strateg. 2020. 15-54 p. Available at: <https://www.who.int/publications-detail-redirect/9789241506096>
9. Huang W, Wang Y, Jiang X, Sun Y, Zhao Z, Li S. Protective effect of flavonoids from *Ziziphus jujuba* cv. Jinsixiaozao against acetaminophen-induced liver injury by inhibiting oxidative stress and inflammation in mice. Molecules. 2017. Available at: <https://www.mdpi.com/1420-3049/22/10/1781>
10. Wang B, Huang Q, Venkitasamy C, Chai H, Gao H, Cheng N, et al. Changes in phenolic compounds and their antioxidant capacities in jujube (*Ziziphus jujuba* Miller) during three edible maturity stages. LWT. 2016. 56-62 p. Available at: <https://doi.org/10.1016/j.lwt.2015.10.005>
11. ITIS. Integrated Taxonomic Information System (ITIS). Encicla Vida: Taxonomy of *Ziziphus jujuba* Mill. 2020. Available at: [https://www.itis.gov/servlet/SingleRpt/SingleRpt?search\\_topic=TSN&search\\_value=196004#null](https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=196004#null)
12. C. Stubler, C. and J. Reimer. *Ziziphus jujuba* Tree Record. 2018. Available at: [selectree.calpoly.edu/tree-detail/ziziphus-jujuba](http://selectree.calpoly.edu/tree-detail/ziziphus-jujuba).
13. Xeing. *Pixabay*. *Ziziphus jujuba* Tree Record. 2018. Available at: [pixabay.com/en/jujube-food-green-dates-date-tree-931587/](http://pixabay.com/en/jujube-food-green-dates-date-tree-931587/).
14. Khadivi A, Mirheidari F, Moradi Y, Paryan S. Identification of superior jujube (*Ziziphus jujuba* Mill.) genotypes based on morphological and fruit characterizations. Food Science Nutrients. 2021. 3165-3176 p. Available at: <https://doi.org/10.1002/fsn3.2276>
15. Ivanišová E, Grygorieva O, Abrahamová V, Schubertova Z, Terentjeva M, Brindza J. Characterization of morphological parameters and biological

- activity of jujube fruit (*Ziziphus jujuba* Mill.). *J Berry Res.* 2017. 249-260p. Available at: <https://doi.org/10.3233/JBR-170162>
16. Ji X, Hou C, Yan Y, Shi M, Liu Y. Comparison of structural characterization and antioxidant activity of polysaccharides from jujube (*Ziziphus jujuba* Mill.) fruit. *Int J Biol Macromol.* 2020. 1008-1018 p. Available at : <https://doi.org/10.1016/j.ijbiomac.2020.02.018>  
Available at : <https://doi.org/10.3390/agronomy11010132>
  17. Guiné RPF. The Drying of Foods and Its Effect on the Physical-Chemical, Sensorial and Nutritional Properties. *ETP Int J Food Eng.* 2018. Available at: <https://doi.org/10.18178/ijfe.4.2.93-100>
  18. H. Al Mamari H. Phenolic Compounds: Classification, Chemistry, and Updated Techniques of Analysis and Synthesis. In 2022. 2-18 p. Available at : <https://doi.org/10.5772/intechopen.98958>
  19. Kumar S, Pandey AK. Chemistry and biological activities of flavonoids: An overview. *The Scientific World Journal.* 2013. Available at: <https://doi.org/10.1155/2013/162750>
  20. Feng W, Hao Z, Li M. Isolation and Structure Identification of Flavonoids. In: *Flavonoids - From Biosynthesis to Human Health.* 2017. 17-40 p. Available at : <https://doi.org/10.5772/67810>
  21. Yan M, Wang Y, Watharkar RB, Pu Y, Wu C, Lin M, et al. Physicochemical and antioxidant activity of fruit harvested from eight jujube (*Ziziphus jujuba* Mill.) cultivars at different development stages. *Sci Rep.* 2022. Available at : <https://doi.org/10.1038/s41598-022-06313-5>
  22. Tepe FB, Ekinci R, Ekinci A. The Physical and Chemical Properties of the Jujube Fruits at Different Maturation Stages. *J Microbiol Biotechnol Food Sci.* 2022. Available at : <https://doi.org/10.55251/jmbfs.4370>
  23. Wang C, Cao J, Jiang W. Effect of the drying method on browning of flesh, antioxidant compounds and antioxidant capacity of Chinese jujube (*Zizyphus jujuba* Mill.) fruit. *Curr Top Nutraceutical Res.* 2016. 151-170 p. Available at:  
[https://www.researchgate.net/publication/308452674\\_Effect\\_of\\_the\\_drying\\_method\\_on\\_browning\\_of\\_flesh\\_antioxidant\\_compounds\\_and\\_antioxidant\\_capacity\\_of\\_Chinese\\_jujube\\_Zizyphus\\_jujuba\\_Mill\\_fruit](https://www.researchgate.net/publication/308452674_Effect_of_the_drying_method_on_browning_of_flesh_antioxidant_compounds_and_antioxidant_capacity_of_Chinese_jujube_Zizyphus_jujuba_Mill_fruit)
  24. Reche J, Almansa MS, Hernández F, Amorós A, Legua P. Physicochemical and antioxidant capacity of jujube (*Ziziphus jujuba* mill.) at different maturation stages. *Agronomy.* 2021.
  25. Wojdyło A, Lech K, Nowicka P, Hernandez F, Figiel A, Carbonell-Barrachina AA. Influence of different drying techniques on phenolic compounds, antioxidant capacity and colour of *Ziziphus jujuba* mill. *Fruits. Molecules.* 2019. 2351 p. Available at : <https://doi.org/10.3390/molecules24132361>
  26. Hasan MU, Malik AU, Ali S, Imtiaz A, Munir A, Amjad W, et al. Modern drying techniques in fruits and vegetables to overcome postharvest losses: A review. *Journal of Food Processing and Preservation.* 2019. Available at: <https://doi.org/10.1111/jfpp.14280>
  27. Frank H. Netter M. *Atlas Anatomi Manusia.* Elsevier. 2019. 277p.
  28. Drake RL, Vogt AW, Mitchell AWM. *Gray Dasar-Dasar Anatomi Edisi ke-2;Elsevier.* 2019. 164-168 p

29. Guyton and Hall. Guyton and Hall Textbook of Medical Physiology 14th Ed. J Phys A Math Theor. 2019; 862-866 p
30. Mescher AL. Histologi Dasar Junqueira Teks dan Atlas Edisi 14. Journal of Chemical Information and Modeling, Jakarta;ECG. 2017. 281-291 p
31. Dacie, J.V., Lewis, S.M. Practical haematology;11thEd.,Chrchill Lovingsstone. 2012. 473-477 p
32. Kumar V, Abbas AK, Aster JC. Buku Ajar Patologi Dasar Robbins Edisi Ke-10. Elsevier Inc. 2018. 95-96 p
33. Perrone, S., Santacroce, A., Longini, M., Proietti, F., Bazzini, F., & Buonocore, G. (2018). *The Free Radical Diseases of Prematurity: From Cellular Mechanisms to Bedside. Oxidative Medicine and Cellular Longevity*. 2018 1–14 p.  
Available at: <https://doi.org/10.1155/2018/7483062>
34. Przybyła GW, Szychowski KA, Gmiński J. Paracetamol – An old drug with new mechanisms of action. Clinical and Experimental Pharmacology and Physiology. 2021. Available at: <https://doi.org/10.1111/1440-1681.13392>
35. Eric, Y. Et al. Acetaminophen-Induced Hepatotoxicity: a Comprehensive Update. (2016). *Journal of Clinical and Translational Hepatology*, 4(2). Available at: <https://doi.org/10.14218/jcth.2015.00052>
36. Myers P, R. Espinosa R, Parr C., Jones T, Hammond G., Dewey T. The animal diversity web(online). 2021. Diakses dari: <https://animaldiversity.org>. [Http://AnimaldiversityOrg/](http://AnimaldiversityOrg/).
37. Sharp P, Villano J. The laboratory rat, second edition. The Laboratory Rat, Second Edition. 2012.
38. Clause BT. The Wistar rat as a right choice: Establishing mammalian standards and the ideal of a standardized mammal. J Hist Biol. 1993; . Available at: <https://doi.org/10.1007/BF01061973>
39. Delgado-Montemayor C, Cordero-Pérez P, Salazar-Aranda R, Waksman-Minsky N. Models of hepatoprotective activity assessment. Med Univ. 2016. Available at: <https://doi.org/10.1016/j.rmu.2015.10.002>
40. Teschke R, Zhu Y. Paracetamol ( Acetaminophen ), Alcohol and Liver Injury: Biomarkers, Clinical Issues , and Experimental Aspects. 2018.1–20 p. Available at: <https://scientificliterature.org/Pharmacology/Pharmacology-18-113.pdf>
41. Sinaga E, Fitrayadi A, Asrori A, Rahayu SE, Suprihatin S, Prasasty VD. Hepatoprotective effect of Pandanus odoratissimus seed extracts on paracetamol-induced rats. Pharm Biol. 2021. Available at: <https://doi.org/10.1080/13880209.2020.1865408>
42. Raj V, Mishra AK, Mishra A, Khan NA. Hepatoprotective effect of Prunus armeniaca L. (Apricot) leaf extracts on Paracetamol induced liver damage in Wistar rats. Pharmacogn J. 2016. Available at: <https://doi.org/10.5530/pj.2016.2.9>
43. Sen S, De B, Devanna N, Chakraborty R. Hepatoprotective and antioxidant activity of Leea asiatica leaves against acetaminophen-induced hepatotoxicity in rats. TANG [HUMANITAS Med. 2014. Available at: <https://doi.org/10.5667/tang.2014.0005>
44. Sivakumar V, Dhana Rajan MS, Mohamed Sadiq A, Rajeshkumar S. Sivakumar et al, / Hepatoprotective effect of polyherbal formulations

- Hepatoprotective Effect of Polyherbal Formulations in Paracetamol Induced Hepatic Damaged Experimental Rats. *International Research Journal of Pharmaceutical and Biosciences (IRJPBS)*. 2014. Available at: [http://irjpbs.com/volumes/v\(2\)011/issue1/5.NOV1405-IRJPBS.pdf](http://irjpbs.com/volumes/v(2)011/issue1/5.NOV1405-IRJPBS.pdf)
45. Chaitanya D, Challa SR, Reddy A. Hepatoprotective effect of biherbal ethanolic extract against paracetamol-induced hepatic damage in albino rats. *J Ayurveda Integr Med*. 2012. Available at: <https://doi.org/10.4103/0975-9476.104436>
  46. Alam J, Mujahid M, Badruddeen, Jahan Y, Bagga P, Rahman MA. Hepatoprotective potential of ethanolic extract of *Aquilaria agallocha* leaves against paracetamol induced hepatotoxicity in SD rats. *J Tradit Complement Med*. 2017. Available at: <https://doi.org/10.1016/j.jtcme.2015.12.006>
  47. Abirami A, Nagarani G, Siddhuraju P. Hepatoprotective effect of leaf extracts from *Citrus hystrix* and *C. maxima* against paracetamol induced liver injury in rats. *Food Sci Hum Wellness*. 2015. Available at: <https://doi.org/10.1016/j.fshw.2015.02.002>
  48. Thrinitha B, R. M, P. M. Studies on Hepatoprotective Activity of Various Extracts of *Macaranga peltata* (Roxb.) on Paracetamol-Induced Hepatotoxicity Rats. *J Evol Med Dent Sci*. 2020. Available at: [https://jemds.com/data\\_pdf/bheemreddy%20thrinitha--june-1-.pdf](https://jemds.com/data_pdf/bheemreddy%20thrinitha--june-1-.pdf)