

## BAB VII

### KESIMPULAN DAN SARAN

#### 7.1 Kesimpulan

Berdasarkan hasil penelitian yang telah dilakukan dapat disimpulkan bahwa :

1. Terdapat perbedaan pengaruh pemberian balsam minyak atsiri *Vetiveria zizanioides* antara konsentrasi 10% dan 30% terhadap perubahan hormon kortisol pada hewan coba tikus jantan galur wistar putih (*Rattus norvegicus*), dengan konsentrasi 10% menurunkan kadar kortisol, sedangkan konsentrasi 30% tidak menurunkan kadar kortisol.
2. Tidak terdapat perbedaan efektivitas balsam minyak *Vetiveria zizanioides* dengan kadar 10% dan 30% pada hari ke 10, 20, dan 30 terhadap perubahan kadar hormon kortisol *Rattus norvegicus*.
3. Efektivitas terapi bergantung pada konsentrasi, namun tidak berdasarkan jangka waktu pemberian.

#### 7.2 Saran

Berdasarkan hasil penelitian, saran yang kedepan yang dapat dilakukan :

1. Pemberian stresor *forced swim test* dapat diberikan lebih lama agar tikus dapat dipastikan telah stres.
2. Melakukan penelitian mengenai uji toksisitas balsam minyak atsiri vetiver, khususnya untuk konsentrasi 30%.
3. Pengukuran stres pada hewan coba perlu ditambahkan parameter yang lain.
4. Pemberian balsam minyak atsiri dapat diberikan dengan konsentrasi kurang dari 30% untuk mengetahui dosis terapi yang efektif.

## DAFTAR PUSTAKA

1. World Health Organization. Depression and Other Common Mental Disorders. 2017;8–10.
2. Kementrian Kesehatan Indonesia. Hasil Utama Riskesdas 2018. Jakarta; 2018.
3. Maramis W, Maramis A. Catatan Ilmu Kedokteran Jiwa. 2nd ed. Surabaya: Airlangga University Press; 2010.
4. Hall JE. Hormon Adrenokortikoid. In: Guyton dan Hall : Buku Ajar Fisiologi Kedokteran. 12th ed. Philadelphia: Elsevier Inc.; 2011. p. 921–37.
5. Ulrich-Lai YM, Ryan KK. Neuroendocrine circuits governing energy balance and stress regulation: Functional overlap and therapeutic implications. Cell Metab Perspect [Internet]. 2014;19(6):910–25. Available from: <http://dx.doi.org/10.1016/j.cmet.2014.01.020>
6. Chamine I, Oken BS. Aroma Effects on Physiologic and Cognitive Function Following Acute Stress: A Mechanism Investigation. J Altern Complement Med. 2016;22(9):713–21.
7. Singh L, Bhushan B, Sharma SK, Arya H, Singh T. Vetiveria Zizanioides (Linn.) Nash: a Pharmacological Overview. Int Res J Pharm. 2013;4(7):18–20.
8. Chahal KK, Bhardwaj U, Kaushal S, Sandhu AK. Chemical composition and biological properties of Chrysopogon zizanioides (L.)Roberty syn. Vetiveria zizanioides (L.) Nash-a review. Indian J Nat Prod Resour. 2015;6(4):251–60.

9. Nirwane A, Gupta P, Shet J, Patil S. Anxiolytic and nootropic activity of *Vetiveria zizanioides* roots in mice. *J Ayurveda Integr Med.* 2014;6(3):158.
10. Kadarohman A, Ratnaningsih Eko S, Dwiyanti G, Lela Lailatul K, Kadarusman E, Ahmad Nur F. Quality and chemical composition of organic and non-organic Vetiver oil. *Indones J Chem.* 2014;14(1):43–50.
11. Indonesia Kementerian Pertanian Republik. Statistik Perkebunan Indonesia 2012-2014. Arianto Y, Zuraina W, editors. Jakarta: Direktorat Jendral Perkebunan; 2013. 6-13 p.
12. ITIS Report. No Title [Internet]. 2010. Available from: [https://www.itis.gov/servlet/SingleRpt/SingleRpt?search\\_topic=TSN&search\\_value=42309#null](https://www.itis.gov/servlet/SingleRpt/SingleRpt?search_topic=TSN&search_value=42309#null)
13. Manual TR, Truong P, Tan T, Pinnars VANE. *Vetiver System Application*. 2nd ed. Vol. 501. The Vetiver Network International; 2008. 1-83 p.
14. Terefe T. Farmers ' Perception on the Role of Vetiver Grass in Soil and Water Conservation in South Western Ethiopia. 2011;1:32–3.
15. Mallavarapu GR, Syamasudar K, Ramesh S, Rajeswara Rao B. Constituents of South Indian Vetiver. *Nat Prod Commun.* 2012;7(2):223–5.
16. H RC, N KB, Rakesh, B R. Potentiating effect of *Vetiveria zizanioides* root extract and essential oil on phenobarbital induced sedation-hypnosis in swiss albino mice. *Int J Exp Pharmacol.* 2014;4(2):89–93.

17. Fernandez X, Kempf M, Burger P, Janci L, Landreau A, Watson M, et al. Vetiver Essential Oil in Cosmetics: What Is New? *medicines*. 2017;4(41):1–13.
18. Can Baser H, Buchbauer G, editors. Effects of Essential Oils in the Central Nervous System. In: *Handbook of Essential Oils Science, Technology, and Applications*. Boca Raton: CRC Press; 2010. p. 297.
19. LANGE medical book A, Barrett KE, Barman SM, Boitano S, Brooks HL, York Chicago San Francisco Athens London Madrid Mexico City N. The Adrenal Medulla & Adrenal Cortex. In: *Ganong's Review of Medical Physiology* [Internet]. 24th ed. New York: Mc Graw Hill; 2016. p. 353–76. Available from: [www.mhprofessional.com](http://www.mhprofessional.com).
20. Tortora, Derrickson, J. G, Bryan. Nervous Tissue. In: *principles of anatomy and physiology*. 14th ed. New York: Willey; 2014. p. 399–437.
21. Issuriya A, Manor R, Kwangjai J, Cheaha D, Kumarnsit E, Rujiralai T. Modification of sleep-waking and electroencephalogram induced by vetiver essential oil inhalation. *J Intercult Ethnopharmacol*. 2016;5(1):72–8.
22. Tripathi R, Kaushik D, Tripathi A, Rasal VP, Khan SA. Acute and subacute toxicity studies on vetiver oil in rats. *Fabad J Pharm Sci*. 2006;31(2):71–7.
23. Tisserand R, Young R. *Essential Oil Safety*. 2nd ed. London: Elsevier Inc; 2014. 466-467 p.
24. Fink G. *Stress: Concepts, Cognition, Emotion, and Behavior*. San Diego:

Elsevier Inc.; 2016. 3-11 p.

25. Ulrich-Lai YM, Ryan KK. Neuroendocrine circuits governing energy balance and stress regulation: Functional overlap and therapeutic implications. *Cell Metab* [Internet]. 2014;19(6):910–25. Available from:  
<http://dx.doi.org/10.1016/j.cmet.2014.01.020>
26. Green MR, McCormick CM. Sex and stress steroids in adolescence: Gonadal regulation of the hypothalamic–pituitary–adrenal axis in the rat. *Gen Comp Endocrinol* [Internet]. 2016;234:110–6. Available from:  
<http://dx.doi.org/10.1016/j.ygcen.2016.02.004>
27. Cavigelli SA, Bao AD, Bourne RA, Caruso MJ, Caulfield JI, Chen M, et al. Timing matters: the interval between acute stressors within chronic mild stress modifies behavioral and physiologic stress responses in male rats. *Stress* [Internet]. 2018;21(5):453–63. Available from:  
<https://doi.org/10.1080/10253890.2018.1459557>
28. Willner P. Reliability of the chronic mild stress model of depression: A user survey. *Neurobiol Stress* [Internet]. 2017;6:68–77. Available from:  
<http://dx.doi.org/10.1016/j.ynstr.2016.08.001>
29. Rome R. The Teenage Brain: The stress Response and The Adolescent Brain. *Natl Inst Heal* [Internet]. 2013;22(2):4–5. Available from:  
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4274618/pdf/nihms627920.pdf>
30. Sheth C, McGlade E, Yurgelun-Todd D. Chronic Stress in Adolescents and Its

Neurobiological and Psychopathological Consequences: An RDoC

Perspective. *Chronic Stress*. 2017;1:1–22.

31. Ma K, Xu A, Cui S, Sun MR, Xue YC, Wang JH. Impaired GABA synthesis, uptake and release are associated with depression-like behaviors induced by chronic mild stress. *Transl Psychiatry*. 2016;6(10):1–10.
32. Sherwood L. *Fisiologi Manusia dari Sel ke Sistem*. Fisiologi Manusia dari Sel ke Sistem. 2013.
33. Drake R, Volg W, Mitchell A. *Gray's Anatomy for Student*. 4th ed. Amsterdam: Elsevier Inc; 2019. 386 p.
34. Mescher A. *Junqueras's Basic Histology Text and Atlas*. 14th ed. New York: Mc Graw Hill; 2016. 423-425 p.
35. Rodwell V, Bender D, Botham K, Kennelly P, Weil A. The Diversity of the Endocrine System. In: *Harper's Illustrated Biochemistry*. 31st ed. New York: Mc Graw Hill; 2018. p. 1187–91.
36. Eroschenko VP. *Atlas of Histology with Functional Correlations* [Internet]. 13th ed. Philadelphia: Wolters Kluwer; 2017. 776 p. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25246403><http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=PMC4249520><http://aac.asm.org/lookup/doi/10.1128/AAC.03728-14>
37. Hau J, Schapiro SJ, editors. *Handbook of laboratory animal science: Animal models*. CRC Press; 2013. 1-317 p.

38. Canadian Council on Animal Care. The Care and Use of Farms animals in Reasearch, teaching, and testing. Can Counc Anim Care. 2010;1–36.
39. Vinerean H. Rats Biology & Husbandry. Florida Int Univ. 2013;1–46.
40. Pallav S. Laboratory Rat Age Equal Human. Int J Prev Med. 2013;4(6):1–13.
41. Stepanichev M, Dygalo NN, Grigoryan G, Shishkina GT, Gulyaeva N. Rodent models of depression: Neurotrophic and neuroinflammatory biomarkers. Biomed Res Int. 2014;2014(1):1–20.
42. Khaleel Jameel M, Rajiv Joshi A, Dawane J, Padwal M, Joshi AR, Pandit VA, et al. Effect of various physical stress models on serum cortisol level in Wistar rats. J Clin Diagnostic Res. 2014;8(3):181–3.
43. Yankelevitch-Yahav R, Franko M, Huly A, Doron R. The Forced Swim Test as a Model of Depressive-like Behavior. J Vis Exp. 2015;(97):1–7.
44. Elabscience Biotechnology Inc. Cortisol ELISA Kit. USA. 2017.
45. Anderson T, Wideman L. Exercise and the Cortisol Awakening Response : A Systematic Review. Sport Med -Open. 2017;3(37).
46. Zhang W, Hetzel A, Shah B, Atchley D, Blume SR, Padival MA, et al. Greater Physiological and Behavioral Effects of Interrupted Stress Pattern Compared to Daily Restraint Stress in Rats. 2014;9(7):1–9.