

BAB V

KESIMPULAN DAN SARAN

5.1 Kesimpulan

Dari penelitian yang telah dilakukan, pada peningkatan stamina dan penurunan kadar hormon kortisol, maka dapat diambil kesimpulan sebagai berikut :

1. Pemberian balsam minyak atsiri cedarwood konsentrasi 10%, ada pengaruh terhadap peningkatan lamanya waktu berenang pada tikus putih jantan yang dibuat stres dibandingkan dengan kelompok kontrol negatif sedangkan pemberian balsam minyak atsiri cedarwood konsentrasi 20%, tidak ada pengaruh terhadap peningkatan lamanya waktu berenang pada tikus putih jantan yang dibuat stres dibandingkan dengan kelompok kontrol negatif.
2. Pemberian balsam minyak atsiri cedarwood konsentrasi 10% dan 20%, tidak ada pengaruh terhadap penurunan kadar hormon kortisol pada tikus putih jantan yang dibuat stres dibandingkan dengan kelompok kontrol negatif.

5.2 Saran

1. Penelitian selanjutnya dapat mencoba melakukan pemberian metode *stressor* yang lain yang dapat memberi pengaruh terhadap pengamatan stamina dan kadar hormon kortisol.
2. Penelitian selanjutnya untuk melihat balsam minyak atsiri cedarwood sebagai antistres dapat digunakan metode uji chimney, metode uji rotarod dan metode uji platform.

DAFTAR PUSTAKA

- Anonim, 2014, *Farmakope Indonesia V*, Jakarta: Departemen Kesehatan Republik Indonesia.
- Buckle, J. 2015, *Clinical Aromatherapy: Essential Oils in Healthcare*, 3rd Edition. Churchill Livingstone an imprint of Elsevier Inc, London.
- Bhatia, N., Maiti, P.P., Choudhary, A., Tuli, A., Masih, D., Khan, M.M.U., Ara, T. and Jaggi A.S. 2011, Animal Model of Stress, *International Journal of Pharmaceutical Sciences and Research*, **2(5)**: 1147-1155.
- Cahyono, J.B.S.B. (eds). 2008, *Gaya Hidup dan Penyakit Modern*, Kanisius, Yogyakarta, Indonesia.
- Canard, D., Perru, O., Tauzin, V., Devillard, C., and Bonhoure, J.-P. 1997, Terpene composition variations in diverse provenances of *Cedrus libani* (A.) Rich. and *Cedrus atlantica* Manet, *Trees Structure and Function*, **11(8)**: 504-510.
- Catalog No.E-EL-0030 96T. 2017, Cortisol Elisa Kit 7thed., USA: Elabscience Biotechnology Inc.
- Clarke, S. 2008, *Essential Chemistry for Aromatherapy*, 2nd Edition. Churchill Livingstone Elsevier, London.
- Dayanthi, N.P.K. 2016, ‘Uji Klinis Aktivitas Tonikum dari Ekstrak Rimpang Kencur (*Kaempferia galanga* L.) dengan Metoda Harvard Step Test’, *Skripsi*, Sarjana Farmasi, Universitas Andalas, Padang.
- Djilani, A. and Dicko, A, 2012, ‘The Therapeutic Benefits of Essential Oils’, in Bouayed, J., and Bohn, T., Nutrition, Well-Being and Health, InTech, Croatia, pp. 155-178.
- El-Fadel, T. 2012, ‘Compilation of toxicological data of major volatile essential oil components’, *Tesis*, Sarjana Farmasi, Universitas Wian, Austria.
- Eliza, W. 2015, ‘Formulasi Sediaan Mikroemulsi Minyak Atsiri Daun Jeruk Sambal (*Citrus microcarpa* Bunge) dengan Variasi Tween 20 dan Uji Efektivitas Terhadap *Propionibacterium acnes*’, *Skripsi*, Sarjana Farmasi, Universitas Tanjungpura, Pontianak.
- Federer, W. 1991, *Statistic and Society: Data Collection and Interpretation*, 2nd Ed., Maecel Dekker Inc, New York.

- Fidah, A., Salhi, N., Rahouti, M., Kabouchi, B., Ziani, M., Aberchane, M. and Famiri, A. 2016, Natural Durability of *Cedrus atlantica* Wood Related to The Bioactivity of Its Essential Oil Against Wood Decaying Fungi, *Maderas. Ciencia y Tecnología*, **18(4)**: 567-576.
- Girard, I. and T. Garland, Jr. 2002, Plasma Corticosterone Response to Acute and Chronic Voluntary Exercise in Female House Mice, *Journal Applied Physiology*, **92**: 1553-1561.
- Gitay, M. and Bano, S. 2013, Metabolic and Behavioral Effects of Serotonergic Antidepressants in Rats Exposed to Swim Endurance Stress, *Journal of Basic & Applied Sciences*, **9**: 269-275.
- Goel, N., Workman, J.L., Lee, T.T., Innala, L. and Viau, V. 2014, Sex Difference in the HPA Axis, *Comprehensive physiology*, **4(3)**: 1121-1155.
- Gong, S., Miao, Y-L., Jiao, G-Z., Sun, M-J., Li, H., Lin, J., Luo, M-J. and Tan J-H. 2015, Dynamics and Correlation of Serum Cortisol and Corticosterone under Different Physiological or Stressful Conditions in Mice, *Journal Pone*, **10(2)**: 1-14.
- Guleria, S., Kumar, A., and Tiku, A.K. 2008, Chemical Composition and Fungitoxic Activity of Essential Oil of *Thuja orientalis* L. Grown in the North-Western Himalaya, *Journal of Zeitschrift Naturforschung*, **63c**: 211-214.
- Hall, J.E and Guyton, A.C. 2006, *Guyton and Hall Textbook of Medical Physiology*, 13th Edition. Elsevier, Philadelphia.
- Inneke. 2015. ‘Karakterisasi Sifat Fisiko Kimia dan Analisis Profil Deskriptif Flavor Minyak Biji Adas (*Foeniculum vulgare* Mill)’, *Skripsi*, Sarjana Teknologi Pertanian, Institut Pertanian Bogor, Bogor.
- Jahromy, M.H., Mohajer, A.J., Adibi, L., and Khakpour, S. 2015, Effects of *Biebersteinia multifida* DC. Root Extract on Physical Stamina in Male Mice, *Journal of Food and Nutrition* **6**: 326-331.
- Kahle, W. 2003, *Color Atlas of Human Anatomy Volume 3: Nervous System and Sensory Organs*, 7th Edition, Diterjemahkan dari Bahasa Jerman oleh Vielkind U., Thieme Medical Publishers, New York.

- Katsu Y., and Iguchi, T. 2015, ‘Cortisol’, in Takei, Y., Ando, H., and Tsutsui, K., *Handbook of Hormones: Comparative Endocrinology for Basic and Clinical Research*, 1st ed., Academic Press, pp 533-534.
- Katzung and Trevor. 2015, *Basic & Clinical Pharmacology*, 13th ed. McGraw-Hill Education, New York.
- Khasanah, L.U., Utami, R., Ananditho, B.K., dan Nugraheni, A.E. 2014, Pengaruh Perlakuan Pendahuluan Fermentasi Padat dan Fermentasi Cair Terhadap Rendemen dan Karakteristik Mutu Minyak Atsiri Daun Kayu Manis, *Agritech*, Surakarta, pp. 36-42.
- Komori, T., Tamura, Y., Mitsui, M., Matsui, J., Uei, D. and Aoki, S. 2016, A Preliminary Study to Investigate Relaxation and Sleep-Inducing Effects of Cedrol, *The Open Access Journal of Science and Technology*, **4**: 1-6.
- Kothiyal, P. and Ratan, P. 2011, Antistress Effect of *Fagopyrum esculentum* in Rats Subjected to Forced Swimming Endurance Test, *Pharmacologyonline*, **3**: 290-296.
- Krishnaswamy, N.R. 2003, *Chemistry of Natural Products: A Laboratory Handbook*. University Press (India) Private Limited, Hyderabad, India.
- Kristian, J., Zain, S., Nurjanah, S., Widyasanti, A., dan Putri, S.H. 2016. Pengaruh Lama Ekstraksi Terhadap Rendemen Dan Mutu Minyak Bunga Melati Putih Menggunakan Metode Ekstraksi Pelarut Menguap (*Solvent Extraction*), *Jurnal Teknotan*, **10(2)**: 34-43.
- Kubeczka, K-H. 2016, ‘Analysis of Essential Oils’, in Baser, K.H.C. and Buchbauer, G., *Handbook of Essential Oil: Science, Technology, and Applications*, 2nd ed., CRC Press, Florida, pp. 5-33.
- Kumar, A., and Gandhi, A.J. 2016, Aroma Therapy in Major Depressive Disorders Assessment, *World Journal of Pharmacy and Pharmaceutical Sciences*, **5(3)**: 1224- 1241.
- Lamou B., Taiwe, G.S., Hamadou, A., Abene., Houlray, J., Atour, M.M. and Tan, P.V. 2016, Antioxidant and Antifatigue Properties of the Aqueous Extract of *Moringa oleifera* in Rats Subjected to Forced Swimming Endurance Test, *Oxidative Medicine and Cellular Longevity*, **(1)**: 1-9.
- Lee, D.Y., Kim, E. and Choi, M.H. 2015, Technical and clinical aspects of cortisol as a biochemical marker of chronic stress, *BMB Reports*, **48(4)**: 209-216.

- Li, Z., Wu, F., Shao., H., Zhang, Y., Fan, A. and Li, F. 2017, Does the Fragrance of Essential Oils Alleviate the Fatigue Induced by Exercise? A Biochemical Indicator Test in rats, *Evidence-Based Complementary and Alternative Medicine*, **7**: 1-7.
- Martin, I. 2007, *Aromatherapy for Massage Practitioners*, Lippincott Williams & Wilkins, Philadelphia.
- Mastorakos, G., Pavlatou, M., Kandarakis, E.D. and Chrousos, G.P. 2005, Exercise and The Stress System, *Hormones*, **4(2)**: 75-89.
- Matsubara, E., Tsunetsugu, Y., Ohira, Ti. and Sugiyama M. 2017, Essential Oil of Japanese Cedar (*Cryptomeria japonica*) Wood Increases Salivary Dehydroepiandrosterone Sulfate Levels after Monotonous Work, *International Journal of Environmental Research and Public Health*, **14(1)**: 97.
- Moghaddam, M. and Mehdizadeh L. 2017, *Handbook of Food Bioengineering* Vol. 3: Soft Chemistry and Food Fermentation, 1st ed. Academic Press, London.
- Musradinur. 2016, Stres dan Cara Mengatasinya dalam Perspektif Psikologi, *Jurnal Edukasi*, **2(2)**: 183-200.
- Narkhede, A.N., Jagtap, S.D., Nirmal, P.S., Giramkar, S.A., Nagarkar, B.E., Kulkarni O.P and Harsulkar A.M. 2016, Anti-Fatigue Effect of Amarkand on Endurance Exercise Capacity in Rats, *BMC Complementary and Alternative Medicine*, **16**: 23.
- Neil, M.J.O., Smith, A., Heekelman, P.E., Obenchain, J.R., Gallipeau, J.A.R., Arecea, M.A.D. and Budavari, S. (eds). 2001. *The Merck Index: An Encyclopedia of Chemicals Drugs and Biologicals*, 13th Edition, Merck & Co. Inc., New Jersey.
- Pavia, D.L., Lampman, G.M., Kriz, G.S. and Engel R.G. 2018, *A Microscale Approach to Organic Laboratory Techniques*, 6th Edition. Cengage Learning, Boston.
- Pusat Data dan Informasi Kementerian Kesehatan RI, 2015, *Pembinaan Kesehatan Olahraga di Indonesia*, Jakarta: Kementerian Kesehatan RI.
- Rabasa, C. and Dickson, S.L. 2016, Impact of Stress on Metabolism and Energy Balance, *Current Opinion in Behavioral Sciences*, **9**: 71-77.

- Rhafouri, R., Strani, B., Zair, T., Ghanmi, M., Aafi, A., Omari, M.E. and Bentayeb, A. 2014, Chemical Composition, Antibacterial and Antifungal Activities of The *Cedrus atlantica* (Endl.) Manettiex Carrière Seeds Essential Oil, *Mediterranean Journal of Chemistry*, **3(5)**, 1034-1043.
- Romeo, R.D. 2013, The Teenage Brain: The Stress Response and The Adolescent Brain, *Current Directions Psychological Science*, **22(2)**: 140-145.
- Sastrohamidjojo, H. 1991, *Kromatografi*, Edisi II, Liberty, Yogyakarta.
- Sastrohamidjojo, H. 2004, *Kimia Minyak Atsiri*, Gadjah Mada University Press, Yogyakarta.
- Saladin, 2003, *Anatomy & Physiology: The Unity of Form and Function 3rd Edition*. The McGraw-Hill Companies, New York.
- Saputri, D.E. 2010, 'Hubungan Stres dengan Hipertensi pada Penduduk di Indonesia Tahun 2007 (Analisis Data Riskesdas 2007)', *Tesis, Sarjana Kesehatan Masyarakat*, Universitas Indonesia, Jakarta.
- Sari, A. dan Maulidya, A. 2016, Formulasi Sediaan Salep Ekstrak Etanol Rimpang Kunyit (*Curcuma longa* Linn), *SEL Jurnal Penelitian Kesehatan*, **3(1)**: 16-23.
- Savill, P. and Wilson, S.M. 2015, Cedrus, True Cedars: Silviculture and Properties, *Quarterly Journal Of Forestry*, **109(3)**: 168-173.
- Sharp, P. and Villano, J. 2012, *A Volume in The Laboratory Animal Pocket Reference Series*. CRC Press, Boca Raton.
- Sherwood L. 2009, *Fisiologi Manusia: Dari Sel ke Sistem Edisi 6*, Diterjemahkan dari Bahasa Inggris oleh Pendidik, B.U., EGC, Jakarta.
- Silalahi, L.N. 2016, 'Aktivitas Gel Sitronelal dan Minyak Lavender Sebagai Penolak Nyamuk (*Aedes aegypti*)', *Skripsi*, Sarjana Sains, Universitas Negeri Semarang, Semarang.
- Siswandono dan Purwanto, B.T. 2008, 'Hubungan Struktur Aktivitas Senyawa Penekan Sistem Saraf Pusat', dalam Siswandono dan Soekardjo B., *Kimia Medisinal 2*, Airlangga University Press, Surabaya.
- Stahl, E. 1969. *Thin-Layer Chromatography: A Laboratory Handbook*, Diterjemahkan dari Bahasa Jerman oleh Ashworth M.R.F., Springer-Verlag Berlin Heidelberg, New York.

- Stevani, H., 2016, *Modul Bahan Ajar Cetak Farmasi: Praktikum Farmakologi*, Jakarta: Kementerian Kesehatan RI.
- Szabo, S., Tache, Y. and Somogyi, A. 2012, The legacy of Hans Selye and the origins of stress research: A retrospective 75 years after his landmark brief “Letter” to the Editor of Nature, *The International Journal on the Biology of Stress*, **15(5)**: 472–478.
- Thomas, P. 2013. *Cedrus atlantica*. The IUCN Red List of Threatened Species 2013. Diakses pada 23 September 2018, <https://www.iucnredlist.org/species/42303/2970716>.
- Tisserand, R. and Young, R. 2014, *Essential Oil Safety: A Guide for Health Care Professionals*, 2nd Edition. Churchill Livingstone Elsevier, China.
- Vinod, S. and Shivakumar, H. 2012, A Current Status of Adaptogens: Natural Remedy to Stress, *Asian Pacific Journal of Tropical Disease*, **2(1)**: 480-490.
- Widiantini, W. dan Tafal, Z. 2014, Aktivitas Fisik, Stres, dan Obesitas pada Pegawai Negeri Sipil, Kesmas: *Jurnal Kesehatan Masyarakat Nasional*, **8(7)**: 330-336.
- Zellner, B.D., Dugo, P., Dugo, G. and Mondello L. 2016, ‘Analysis of Essential Oils’, in Baser, K.H.C. and Buchbauer, G., *Handbook of Essential Oil: Science, Technology, and Applications*, 2nd ed., CRC Press, Florida, pp 195-228.
- Zoubi, Y.E., Akhal, F.E., Farah, A., Taghzouti, K. and Lalami, A.E.O. 2017, Chemical composition and larvicidal activity of Moroccan Atlas Cedar (*Cedrus atlantica* Manetti) against *Culex pipiens* (Diptera: Culicidae), *Journal of Applied Pharmaceutical Science*, **7(7)**: 30-34.
- Zulkarnain, I. dan Aminullah, 2012, Formulasi Minyak-Minyak Menguap Menjadi Sediaan Balsem Counterirritant, *As-Syifaa Jurnal Farmasi*, **4(1)**: 32-41.