

## BAB 5 KESIMPULAN DAN SARAN

### 5.1 Kesimpulan

Dari hasil penelitian dapat ditarik beberapa kesimpulan sebagai berikut:

1. Konsentrasi etanol mempengaruhi banyaknya perolehan fenolik yang didapatkan. Etanol 70% memberikan perolehan fenolik dan flavonoid yang paling tinggi yaitu sebesar 24,95 mg GAE dan 17,12 mg RE per gram rambut jagung kering.
2. Semakin lama waktu ekstraksi, maka semakin besar perolehan fenolik dan flavonoid yang didapatkan. Akan tetapi waktu ekstraksi yang terlalu lama dapat menurunkan perolehan fenolik dan flavonoid. Hal ini mungkin disebabkan karena terdegradasinya senyawa fenolik dan flavonoid oleh cahaya dan oksigen.
3. Aktivitas antioksidan, dinyatakan dalam *percentage inhibition*, semakin meningkat seiring bertambahnya konsentrasi antioksidan.

### 5.2 Saran

Perlunya penelitian lebih lanjut terkait pemanfaatan rambut jagung sebagai sumber antioksidan alami yaitu isolasi senyawa-senyawa aktif rambut jagung beserta uji aktivitas masing-masing senyawa aktif sehingga dapat dipelajari senyawa manakah yang lebih dominan sebagai antioksidan.

## DAFTAR PUSTAKA

1. Nawaly, H., A.B. Susanto, and J.L.A. Uktolseja, *Skripsi Senyawa Bioaktif dari Rumput Laut sebagai Antioksidan*, dalam *Perikanan dan Ilmu Kelautan*2013, Universitas Kristen Satya Wacana: p. 11-12.
2. Setiawan, Y., *Pencegahan Kencing Manis (Diabetes Mellitus) dengan Lari Pagi dan Konsumsi Pangan yang Kaya Antioksidan*., 2010, TPB IPB: p. 15-17.
3. Indriani, H., *Pengembangan Potensi Rambut Jagung (Zea mays) dan Kulit Jeruk Manis (Citrus sinensis) sebagai Alternatif Terapi Limbah Herbal Meluruhkan Batu Empedu (Gallstone) secara Alamiah*, dalam *Universitas Negeri Malang*2010, Malang: p. 4-5.
4. Lukacinova, A., et al., *Preventive Effects of Flavonoids on Alloxan-Induced Diabetes Mellitus in Rats*. ACTA VET. BRNO, 2008. **77**: p. 175-182.
5. Dungir, S.G., D.G. Katja, and V.S. Kamu, *Aktivitas Antioksidan Ekstrak Fenolik dari Kulit Buah Manggis (Garcinia mangostana L.)*. JURNAL MIPA UNSRAT ONLINE, 2012. **1**(1).
6. Winarsi, H., *Antioksidan Alami dan Radikal*. 2007, Yogyakarta: Kanisius: p. 22-28.
7. Panjaitan, T.D., B. Prasetyo, and L. Limantara, *Skripsi Peranan Karotenoid Alami dalam Menangkan Radikal Bebas di dalam Tubuh*, in *Magister Biologi*2010, Universitas Kristen Satya Wacana: p. 45-52.
8. Setiawan, B. and E. Suhartono, *Stres Oksidatif dan Peran Antioksidan pada Diabetes Mellitus*, in *Maj Kedokt Indon*2005, p. 86-91.
9. Lobo, V., et al., *Free radicals, antioxidants and functional foods: Impact on human health*. Pharmacogn Rev, 2010. **4**(8): p. 118-26.
10. Gordon, M.H., *The Mechanism of Antioxidant Action in Vitro*. Food Antioxidants Elsevier Applied Food Science 1990: p. 1-18.
11. Widyaningsih, W., *Uji Aktivitas Antioksidan Ekstrak Etanol Daun Dewa (Gynura procumbens) dengan Metode DPPH (1,1-difenil-2-pikrilhidrazil)*, 2010, Universitas Ahmad Dahlan: Yogyakarta: p. 12-22.
12. Hamilton, R.J. and J.C. Allen, *Rancidity in Foods*. 1983, London: Applied Science: p. 82-91.
13. Ji, L.L., *Antioxidants and Oxidative Stress in Excercise*, in *Society for Experimental Biology and Medicne*1999: Madison. p. 283-292.

14. Warsi and A. Guntarti, *Aktivitas Antioksidan Ekstrak Metanol Buah Paprika Hijau (Capsicum annum L.)*. Jurnal Ilmiah Kefarmasian, 2013. **3**(1): p. 9-19.
15. Soto-Vaca, A., et al., *Evolution of Phenolic Compounds from Color and Flavor Problems to Health Benefits*. J. Agric. Food Chem, 2012. **60**(27): p. 6658–6677.
16. Pratt, D.E., *Natural Antioxidants from Plant Material*, 1992, ACS Symposium Series.
17. Redha, A., *Struktur, Sifat Antioksidatif Dan Peranannya Dalam Sistem Biologis*, 2010: Pontianak: p. 56-67.
18. Ferreira, O. and S.P. Pinho, *Solubility of Flavonoids in Pure Solvents*. Ind. Eng. Chem. Res., 2012. **51**(18): p. 6586–6590.
19. Lenny, S., *Senyawa Flavonoida, Fenilpropanoida dan Alkaloida*, 2006, Universitas Sumatera Utara: Medan: p. 73-82.
20. Hertog, M.G.L., P.C.H. Hollman, and M.B. Katan., *Content of Potentially Anticarcinogenic Flavonoids of 28 Vegetables and 9 Fruits Commonly Consumed in The Netherlands*. J. Agric. Food Chem 1992 b. **40**: p. 2379-2383.
21. Fathiazada, F., et al., *Extraction of Flavonoids and Quantification of Rutin from waste Tobacco Leaves*. Iranian Journal of Pharmaceutical Research, 2006. **3**: p. 222-227.
22. Koirewoa, Y.A., Fatimawali, and W.I. Wiyono, *Isolasi dan Identifikasi Senyawa Flavonoid dalam Daun Beluntas (Pluchea indica L.)*, 2008, Universitas Sam Ratulangi: Manado: p. 83-96.
23. Miryanti, Y.I.P.A., et al., *Ekstraksi Antioksidan dari Kulit Buah Manggis (Garcinia mangostana L.)*, 2011, UNIVERSITAS KATOLIK PARAHYANGAN: Bandung: p. 101-122.
24. Rao, Y.K., et al., *Flavonoids and andrographolides from Andrographis paniculata*. Phytochemistry, 2004. **65**: p. 2317–2321.
25. Kaviarasan, S., et al., *In vitro studies on antiradical and antioxidant activities of fenugreek (Trigonella foenum graecum) seeds*. Food Chemistry, 2007. **103**: p. 31–37.
26. Miean, K.H. and S. Mohamed, *Flavonoid (Myricetin, Quercetin, Kaempferol, Luteolin, and Apigenin) Content of Edible Tropical Plants*, 2000.
27. Ebrahimzadeh, M.A., et al., *ATIDEPRESSAT ACTIVITY OF CORSILK*. Pharmacologyonline, 2009. **3**: p. 647-652.
28. Lumempouwa, L.I., E. Suryantoa, and J.J.E. Paendonga, *Aktivitas Anti UV-B Ekstrak Fenolik dari Tongkol Jagung (Zea mays L.)*. JURNAL MIPA UNSRAT ONLINE, 2012. **1**(1): p. 1-4.

29. Guo, J., et al., *The effects of corn silk on glycaemic metabolism*. Nutrition & Metabolism, 2009. **6**: p. 47.
30. El-Ghorab, A., K.F. El-Massry, and T. Shibamoto, *Chemical Composition of the Volatile Extract and Antioxidant Activities of the Volatile and Nonvolatile Extracts of Egyptian Corn Silk (Zea mays L.)*. J. Agric. Food Chem, 2007. **55**: p. 9124–9127.
31. Hu, Q.-L., et al., *Purification and anti-fatigue activity of flavonoids from corn silk*. International Journal of Physical Sciences, 2010. **5**(4): p. 321-326.
32. Sarepoua, E., et al., *Relationships between phytochemicals and antioxidant activity in corn silk*. International Food Research Journal, 2013. **20**(5): p. 2073-2079.
33. Milind, P. and D. Isha, *Zea Maise : A Modern Craze*. International Reasearch Journal of Pharmacy, 2013. **4**(6): p. 39-43.
34. BPS, *Perkembangan Beberapa Indikator Utama Sosial Ekonomi Indonesia*, 2013, Badan Pusat Statistik: Jakarta, Indonesia.
35. Nurhanan, A.R., W.I.W. Rosli, and S.S.J. Mohsin, *Total Polyphenol Content and Free Radical Scavenging Activity of Cornsilk (Zea mays hairs)*. Sains Malaysiana, 2012. **41**(10): p. 1217–1221.
36. Solihah, M.A., W.I.W. Rosli, and A.R. Nurhanan, *Phytochemicals screening and total phenolic content of Malaysian Zea mays hair extracts*. International Food Research Journal, 2012. **19**(4): p. 1533-1538.
37. Havsteen, B., *Flavonoids, a class of natural products of high pharmacological potency*. Biochem Pharmacol 1983. **32**: p. 1141-1148.
38. Nakamura, Y., S. Ishimitsu, and Y. Tonogai, *Effects of Quercetin and Rutin on Serum and Hepatic Lipid Concentrations, Fecal Steroid Excretion and Serum Antioxidant Properties*. Journal of Health Science, 2000. **46**(4): p. 229–240.
39. Kamalakkannan, N. and P.S.M. Prince, *Antihyperglycaemic and Antioxidant Effect of Rutin a Polyphenolic Flavonoid, in Streptozotocin-Induced Diabetic Wistar Rats*. Basic & Clinical Pharmacology & Toxicology, 2006. **98**: p. 97–103.
40. Lukačinová, A., et al., *Structure-activity relationships of preventive effects of flavonoids in alloxan-induced diabetes mellitus in rats*. Journal of Animal and Feed Sciences, 2008. **17**: p. 411–421.

41. Hussain, M.T., et al., *Rutin, a natural flavonoid, protects against gastric mucosal damage in experimental animals.* Asian Journal of Traditional Medicines, 2009. **4**(5): p. 188-197.
42. Azevedo, M.I., et al., *The antioxidant effects of the flavonoids rutin and quercetin inhibit oxaliplatin-induced chronic painful peripheral neuropathy.* Molecular Pain, 2013. **9**(1): p. 53.
43. Waji, R.A. and A. Sugrani, *Flavonoid (Quercetin)*, 2009, Universitas Hassanudin: p. 116-130.
44. Effendy, *Teori VSEPR, Kepolaran dan Gaya Antar Molekul*. 2006: Bayumedia Publishing: p. 122-140.
45. Gamse, T., *Extraction*, 2004, Graz University of Technology: Barcelona: p. 148-156.
46. Jensen, w.B., *The Origin of the Soxhlet Extractor*. Journal of Chemical Education, 2007. **84**(12): p. 1913.
47. Tam, M.T., *Distillation*, 2009, R.C. Costello and Associated. Inc.
48. Tatke, P. and Y. Jaiswal, *An Overview of Microwave Assisted Extraction and its Applications in Herbal Drug Research*. Research Journal of Medicinal Plant, 2011. **5**: p. 21-31.
49. Rahardjo, A. and F. Salim, *Ekstraksi Senyawa Fenolik dari Daun Sirih Untuk Antioksidan Antibakteri Alami dengan Metode Ultrasound-Assisted Extraction*, 2013, Universitas Katolik Widya Mandala: Surabaya: p. 17-21.
50. Rahmawati, A. and D.S. Pang, *Extraction of Phytochemicals from Mimosa pudica Linn using Supercritical CO<sub>2</sub>: Effect of Pressure, Temperature, and CO<sub>2</sub> Loading*, 2013, WIDYA MANDALA CATHOLIC UNIVERSITY: Surabaya: p. 28-36.
51. Pratiwi, E., *Perbandingan Metode Maserasi, Remaserasi, Perkolasi dan Reperkolasi dalam Ekstraksi Senyawa Aktif Andrographolide dari Tanaman Sambiloto (Andrographis paniculata (Burm.F.) Nees)*, 2010, Bogor Agricultural Univercity: Bogor: p. 93-111.
52. Jacques, S.L. and S.A. Prahl, *Biomedical Optics*. Vol. 5. 1998: Oregon Graduate Institute: p. 85-106.
53. Grafinita, *Kadar Kurkuminoid, Total Fenol dan Aktivitas Antioksidan Simplicia Temulawak pada Berbagai Teknik Pengeringan*, 2011, Institut Pertanian: Surakarta: p. 65-71.
54. Hart, H., L.E. Craine, and D.J. Hart, *Organic Chemistry*. 2003, Jakarta: Erlangga: p. 65-82.
55. Wang, J., et al., *Optimisation of Ultrasound-Assisted Extraction of Phenolic Compounds from Wheat Bran*. Food Chemistry, 2008. **106**: p. 804-810.

56. Zhang, Z.S., et al., *Optimization of Ethanol-Water Extraction of Lignans from Flaxseed*. Separation Purification Technology, 2007. **57**: p. 17-24.
57. Sultana, B., F. Anwar, and M. Ashaf, *Effect of Extraction Solvent/Technique on The Antioxidant Activity of Selected Medicinal Plant Extracts*. Molecules, 2009. **14**: p. 2167-2180.
58. Ismail, J., M.R.J. Runtuwene, and F. Fatimah, *Penentuan Total Febolik dan Uji Aktivitas Antioksidan pada Biji dan Kulit Buah Pinang Yaki (Areca vestiaria Giseke)*. Jurnal Ilmiah Sains, 2012. **12**(2).
59. Amic, D.D., D. Beslo, and Trinajstic, *Structure-radical scavenging activity relationship of flavonoids*. Croatia Chem.Acta, 2003. **76**(1): p. 55-61.