DAFTAR PUSTAKA

Alara, O.R., Abdurahman, N.H., Olalere, O.A., (2017). Optimization of microwave-assisted extraction of total flavonoids and antioxidants from *Vernonia amygdalina* leaf using response surface methodology. *Food Bioprod. Process*. 1 (1), 1–21. https://doi.org/10.1016/j.fbp.2017.10.007

Ali, S., Alemika, A., Taiwo, E., Rafat, A., (2012). A Study Review of Documented Phytochemistry of *Vernonia amygdalina* (Family Asteraceae) as the Basis for Pharmacologic Activity of Plant Extract. *Journal of Natural Sciences.* Res. 2 (7), 1–9. https://doi.org/2225-0921

Arhoghro, KE, E., Eo, A., GO, I., (2016). Effect of Aqueous Extract of Bitter Leaf (*Vernonia Amygdalina* Del) on Carbon Tetrachloride (CCl 4) Induced Liver Damage in Albino Wistar Rats. *Journal European*. 26 (1), 122–130.

Atangwho, I.J., Yin, K.B., Umar, M.I., Ahmad, M., (2014). Vernonia amygdalina simultaneously suppresses gluconeogenesis and potentiates glucose oxidation via the pentose phosphate pathway in streptozotocin-induced diabetic rats. *BMC Complementary and Alternative Medicine*. 14 (426), 1–13. https://doi.org//www.biomedcentral.com/1472-6882/14/426

Badan POM RI, (2010). Acuan Sediaan Herbal Volume Kelima Edisi Pertama 1, 1–74.

Camel, V., (2001). Recent Extraction Techniques for Solid Matrices-Supercritical Fluid Extraction, Pressurized Fluid Extraction and Microwave-assisted Extraction: Their Potential and Pitfalls. *The Royal Society of Chemistry*. 126, 1182–1193. https://doi.org/10.1039/b008243k

Chemat, F., Cravotto, G., (2013). Microwave-assisted Extraction for Bioactive Compounds. Springer, London.

Danladi, S., Hassan, M., Mas'ud, I., Ibrahim, U., (2018). Vernonia amygdalina Del : A Mini Review. *Research Journal Pharmacy and Technology*; 11(9) ; 4187-4190. DOI : 10.5958/0974-360X.2018.00768.0

Del, V., (2000). Pesticidal Plant Leaflet *Vernonia amygdalina* Del. R. Bot. Gard.

Departemen Kesehatan RI, (2017). Farmakope Herbal Indonesia Edisi V. Jakarta.

Departemen Kesehatan RI, (2000). Parameter Standar Umum Ekstrak Tumbuhan Obat. Departemen Kesehatan RI, Jakarta.

Departemen Kesehatan RI, (1995). Farmakope Edisi IV. Jakarta.

Departemen Kesehatan RI, (1986). Sediaan Gelenika. Departemen Kesehatan RI, Jakarta.

Departemen Kesehatan RI, (1983). Pemanfaatan Tanaman Obat. Direktoral Jenderal Pengawasan Obat dan Makanan, Jakarta.

Erasto, P , Grierson, D.S., (2006). Bioactive sesquiterpene lactones from the leaves of *Vernonia amygdalina* Bioactive sesquiterpene lactones from the leaves of *Vernonia amygdalina*. *Journal of Ethnopharmacology*. 106, 117–120. https://doi.org/10.1016/j.jep.2005.12.016

Erasto, P., Grierson, D.S., Afolayan, A.J., (2007). Food Chemistry Evaluation of antioxidant activity and the fatty acid profile of the leaves of Vernonia amygdalina growing in South Africa. *Elsevier Food Chemistry*. 104, 636–642. https://doi.org/10.1016/j.foodchem.2006.12.013

Fairuz, S., Haron, F.F., Tengku, M., Mohamed, M., Asib, N., Sakimin, S.Z., Kassim, F.A., Ismail, S.., (2020) Antifungal Activity and Phytochemical Screening of *Vernonia amygdalina* Extract against Botrytis cinerea Causing Gray Mold Disease on Tomato Fruits. *Biology (Basel)*. 9, 1–14. https://doi.org/10.3390/biology9090286

Georgewill, (2009). Evaluation of The Anti-Inflammatory Activity of Extract of *Vernonia amygdalina*. *Asian Pasific Journal of Tropical Medicine.* 1, 150–151. https://doi.org/10.1016/S1995-7645(10)60057-0

Ha, T.P., That, T., Dat, H., Canh, L., Cuong, V., (2018). Sterols and Flavone From The Leaves Of Vernonia Amygdalina Growing In Thua Thien Hue. Vietnam Journal of Sciences Technology 56, 681–687. https://doi.org/10.15625/2525-2518/56/6/12584

Igile, G., Oleszek W., Marian J(1994). Flavonoid from *Vernonia amygdalina* and Their Antioxidant Activities. *Journal of Agricurtural Food Chemistry* 42, 1–4. https://doi.org/0021-8561/94/1442-2445$04.50/0

Jaber, B.M., Jasim, S.F., (2014). Phytochemical Study of Stigmasterol and β -sitosterol in Viola odorata Plant Cultivated in Iraq ت β -sitosterol و Stigmasterol ا ارد ا آ ي ا ا ا ق ا آ ت. *Iraqi Journal of Biotechnology.* 13, 86–94.

Jain, C., Khatana, S. and Vijayvergia. (2019). Bioactivity of Secondary Metabolites of Various Plant : A Review. *International Journal of Pharmaceutical Sciences and Research*. 10(2) : 494-504.

https://dx.doi.org/10.13040/IJPSR.0975-8232.

Jisaka, M., Ohigashi, H., Takegawa, K., Huffman, M.A., Koshimizu, K., (1992). Antitumoral and Antimicrobial of Bitter Sesquiterpene lactonrs of *Vernonia amygdalina* a Possible Medicinal Plant Used by Wild Chimpanzes. *Biosciences Biotechnology Biochemistry.* 57, 833–834. https://doi.org/10.1271/bbb.57.833

Kiplimo, J.J., Koorbanally, N.A., Chenia, H., (2011). Triterpenoids from *Vernonia auriculifera* Hiern exhibit antimicrobial activity. *African Journal of Pharmacy and Pharmacology* 5, 1150–1156. https://doi.org/10.5897/AJPP11.183

Kwon, J., (2016). Optimization Of Microwave-Assisted Extraction Of Bioactive Compounds From Coriolus Versicolor Mushroom Using Response Surface Methodology. *Food Process Engineering.* 1, 1–8. https://doi.org/10.1111/jfpe.12421

Leba, M.A.U., (2017). Buku Ajar Ekstraksi dan Real Kromatografi. Yogyakarta. Montgomery, D.C., 2013. D esign and Analysis of Experiments Eighth Edition.

Bowen, B.,. 2020. Comrehensive Natural Product III (Third Edition) Che,istry and Biology Volume 6. United State.

Najib, A., (2018). Ekstraksi Senyawa Bahan Alam. Yogyakarta.

Nwanjo, H.U., (2005). Effeciacy Of Aqueous Leaf Extract Of *Vernonia amygdalina* On Plasma Lipoprotein And Oxidative Status In Diabetic Rat Models. *Nigeria Journal of Physiology Sciences*. 20, 39–42.

Owoeye, O., Yousuf, S., Akhtar, M.N., Qamar, K., Dar, A., Farombi, E.O., Onwuka, S.K., Choudhary, M.I., (2010). Another anticancer elemanolide from Vernonia amygdalina Del. *International Journal of Biology Chemical Sciences.* 4, 226–234. https://doi.org/4(1): 226-234,

Quasie, O., Zhang, Y., Zhang, H., Luo, J., Kong, L., (2016). Phytochemistry Letters Four new steroid saponins with highly oxidized side chains from the leaves of Vernonia amygdalina. *Phytochemistry Lett.* 15, 16–20. https://doi.org/10.1016/j.phytol.2015.11.002

Quiroz, J.Q., Maria, A., Duran, N., Garcia, M.S., Luz, G., Gomez, C., Jairo, J., Camargo, R., (2019). Ultrasound-Assisted Extraction of Bioactive Compounds from Annatto Seeds , Evaluation of Their Antimicrobial and Antioxidant Activity , and Identification of Main Compounds by LC / ESI-MS Analysis. *Hindawi International Journal Food Sciences*. 2019, 5–7.

https://doi.org/org/10.1155/2019/3721828

Saifudin, A., (2014). Senyawa Alam Metabolit Sekunder Teori, Konsep, dan Pemurnian, Deepublish. Yogyakarta.

Sanchez, S., (2011). Comprehensive Biotechnology (Second Edition) Volume 1. Mexico.

Stroka, J. Spangenberg, B, dan Anklam, E. (2007). New Approaches in TLC-Densitometry. *Journal of Liquid Chromatography and Related Technologies*. 25 (10&11) : 1497-1513. http:/dx.doi.org.1081/JLC-120005700.

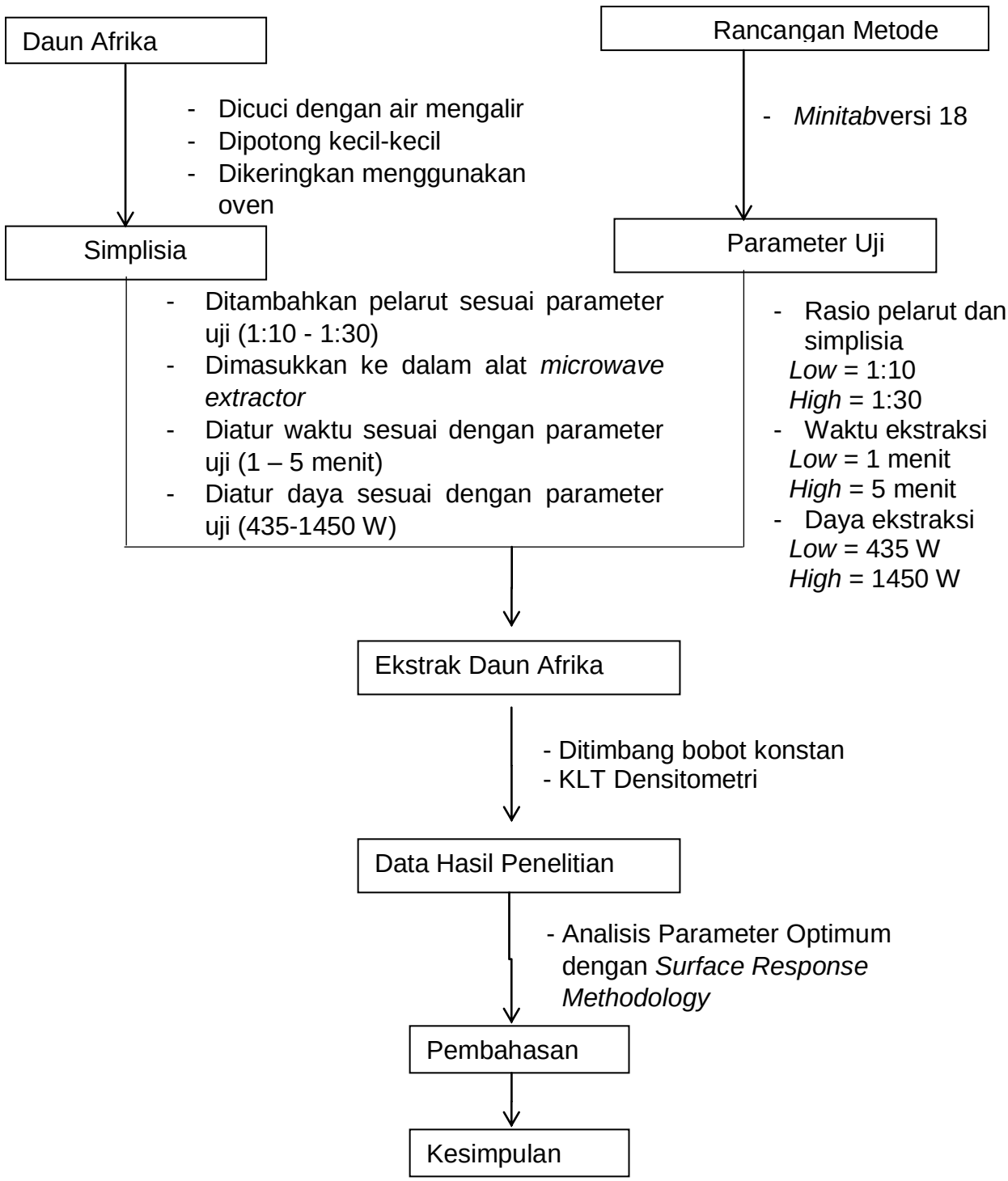
Zekovi, Z., Vladi, J., (2016). Optimization of microwave-assisted extraction (MAE) of coriander phenolic antioxidants – response surface methodology approach. *Society of Chemical Industry*. 1, 3–4. https://doi.org/10.1002/jsfa.7679

Zhang, Q.W., Lin, L.G., Ye, W.C., (2018). Techniques for extraction and isolation of natural products : a comprehensive review. Chin. Med. 13, 1–26. https://doi.org/10.1186/s13020-018-0177-x

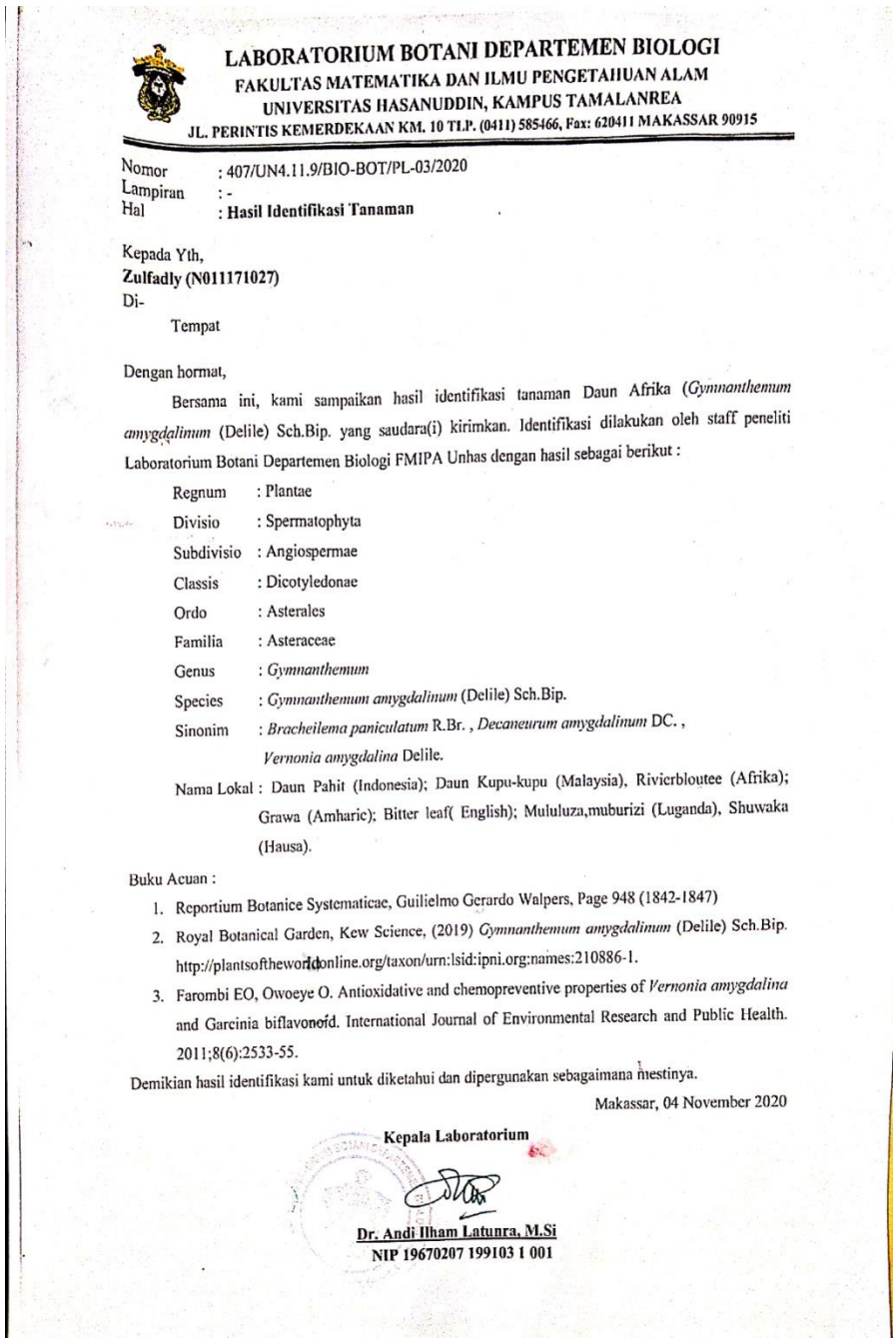
Zou, T., Xia, E., He, T., Huang, M., Jia, Q., Li, H., (2014). Ultrasound-Assisted Extraction of Mangiferin from Mango (Mangifera indica L.) Leaves Using Response Surface Methodology. *molecules* 19, 1411–1421. https://doi.org/10.3390/molecules19021411

LAMPIRAN

Lampiran 1. Skema kerja penelitian



Lampiran 2. Hasil kunci determinasi tanaman V. amygdalina



LABORATORIUM BOTANI DEPARTEMEN BIOLOGI
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
UNIVERSITAS HASANUDDIN, KAMPUS TAMALANREA
JL. PERINTIS KEMERDEKAAN KM. 10 TLP. (0411) 585466, Fax: 620411 MAKASSAR 90915

Nomor : 407/UN4.11.9/BIO-BOT/PL-03/2020
Lampiran : -
Hal : **Hasil Identifikasi Tanaman**

Kepada Yth,
Zulfadly (N011171027)
Di-
Tempat

Dengan hormat,

Bersama ini, kami sampaikan hasil identifikasi tanaman Daun Afrika (*Gymnanthemum amygdalinum* (Delile) Sch.Bip. yang saudara(i) kirimkan. Identifikasi dilakukan oleh staff peneliti Laboratorium Botani Departemen Biologi FMIPA Unhas dengan hasil sebagai berikut :

Regnum : Plantae
Divisio : Spermatophyta
Subdivisio : Angiospermae
Classis : Dicotyledonae
Ordo : Asterales
Familia : Asteraceae
Genus : *Gymnanthemum*
Species : *Gymnanthemum amygdalinum* (Delile) Sch.Bip.
Sinonim : *Bracheilema paniculatum* R.Br. , *Decaneurum amygdalinum* DC. , *Vernonia amygdalina* Delile.
Nama Lokal : Daun Pahit (Indonesia); Daun Kupu-kupu (Malaysia), Rivierbloutee (Afrika); Grawa (Amharic); Bitter leaf(English); Mululuza,muburizi (Luganda), Shuwaka (Hausa).

Buku Acuan :

1. Reportium Botanice Systematicae, Guilielmo Gerardo Walpers, Page 948 (1842-1847)
2. Royal Botanical Garden, Kew Science, (2019) *Gymnanthemum amygdalinum* (Delile) Sch.Bip. http://plantsoftheworldonline.org/taxon/urn:lsid:ipni.org:names:210886-1.
3. Farombi EO, Owoeye O. Antioxidative and chemopreventive properties of *Vernonia amygdalina* and Garcinia biflavonoid. International Journal of Environmental Research and Public Health. 2011;8(6):2533-55.

Demikian hasil identifikasi kami untuk diketahui dan dipergunakan sebagaimana mestinya.

Makassar, 04 November 2020

Kepala Laboratorium

Dr. Andi Ilham Latunra, M.Si
NIP 19670207 199103 1 001

Lampiran 3. Gambar dokumentasi kegiatan

Gambar 13. Pengambilan sampe

Gambar 14. Timbang simplisia basah

Gambar 15. Pencucian sampel

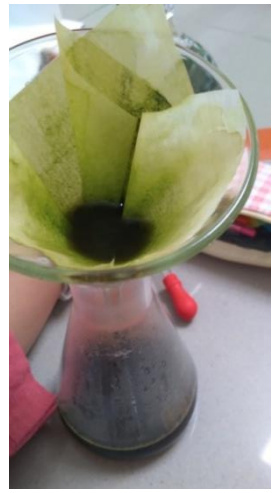
Gambar 16. Pengeringan sampel

Gambar 17. simplisia

Gambar 18. 10 gram simplisia

Gambar 19. Proses ekstraksi

Gambar 20. Hasil ekstraksi



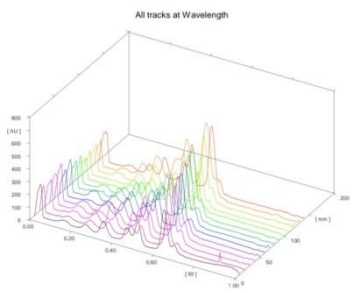
Gambar 21. Penyaringan hasil ekstraksi

Gambar 22. Timbang wadah kosong

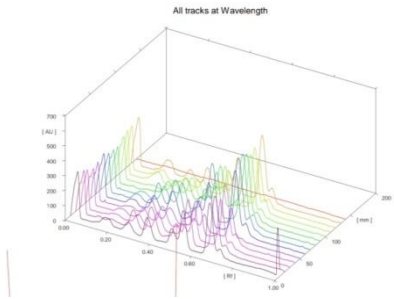
Gambar 23. Penguapan ekstrak

Gambar 24. Timbang bobot ekstrak

Lampiran 4. Data hasil *TLC Scanner*



1. Baku stigmasterol 200 ppm



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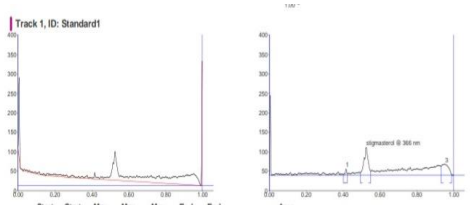

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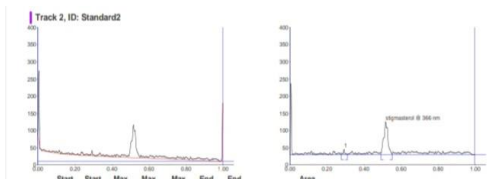

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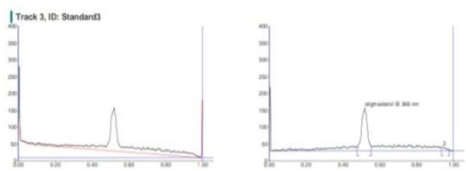

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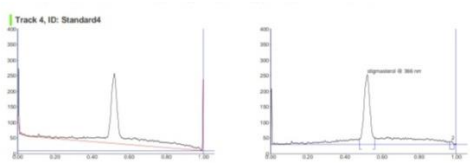

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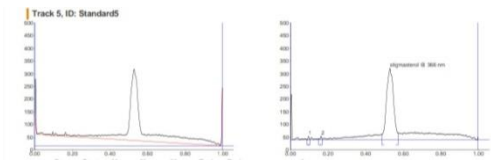

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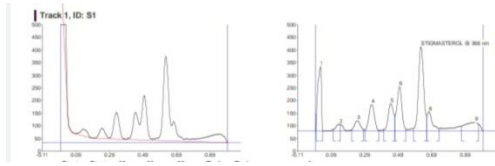

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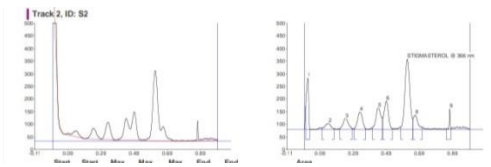

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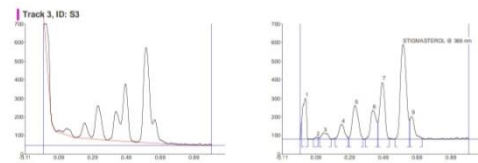

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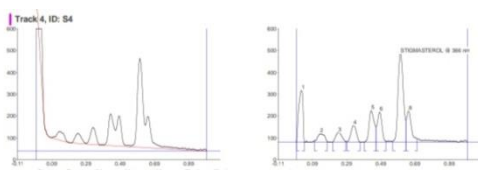

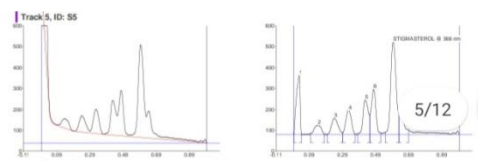

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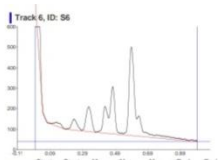

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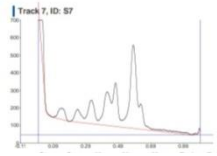

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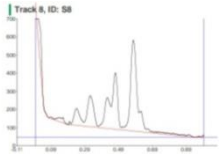

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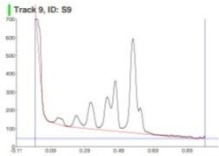

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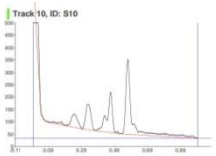

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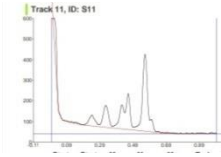

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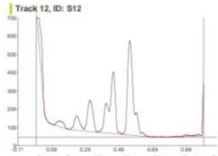

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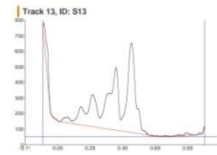

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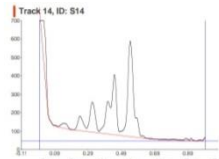

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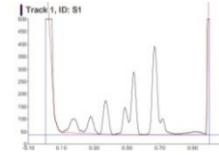

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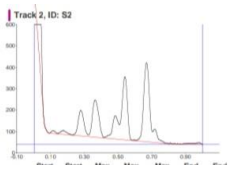

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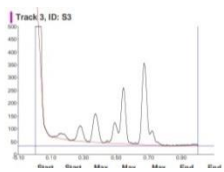

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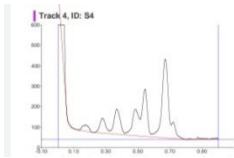

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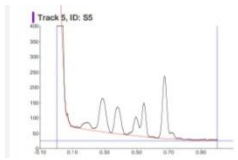

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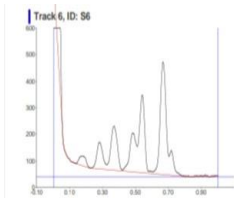
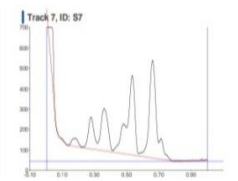
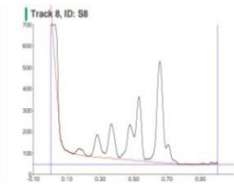


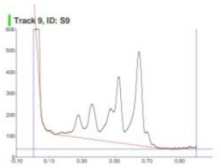
26. Rasio perbandingan pelarut 1: 30/ daya 435 W/ 5 menit



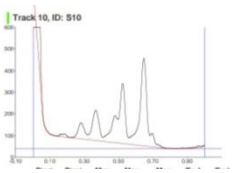
27. Rasio perbandingan pelarut 1: 30/ daya 1015 W/ 1 menit



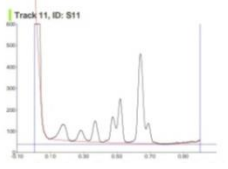
28. Rasio perbandingan pelarut 1: 30/ daya 1015 W/ 3 menit



29. Rasio perbandingan pelarut 1: 30/ daya 1015 W/ 5 menit

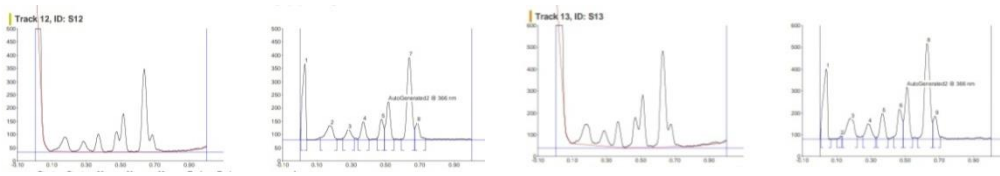


30. Rasio perbandingan pelarut 1: 30/ daya 1450 W/ 1 menit



31. Rasio perbandingan pelarut 1: 300/ daya 1450 W/ 1 menit 21 detik

32. Rasio perbandingan pelarut 1: 10/ daya 1450 W/ 1 menit 27 detik



Tabel 4. Data nilai Rf dan luas arean ekstak V.amygdalina menggunakan metode ekstraksi MAE

Parameter	Rf	Luas area
1:10 / 1 menit/ 435 W	1. 0,03	5361,9
	2. 0,14	608,8
	3. 0,25	1390,7
	4. 0,34	3379,8
	5. 0,45	3330,9
	6. 0,50	5190,6
	7. 0,63	10259,2
	8. 0,68	2337,0
	9. 0,95	2465,0
1:10/ 3 menit/ 30 (435 W)	1. 0,02	2884,9
	2. 0,15	811,4
	3. 0,25	1381,4
	4. 0,33	2010,8
	5. 0,45	2582,4
	6. 0,49	2911,9
	7. 0,62	8136,8
	8. 0,67	1474,9
	9. 0,88	454,0
1:10/ 5 menit/ 435 W	1. 0,03	5009,7
	2. 0,10	193,9
	3. 0,14	1287,9
	4. 0,25	2633,2
	5. 0,32	6302,6
	6. 0,43	5217,6
	7. 0,49	9029,6
	8. 0,61	17585,8
	9. 0,66	3472,2
1:10/ 1 menit/ 1015 W	1. 0,03	5793,5
	2. 0,14	1623,3
	3. 0,24	1646,6
	4. 0,33	2417,9
	5. 0,44	4392,0
	6. 0,49	3647,1
	7. 0,61	12395,1
	8. 0,66	4093,5

1:10/ 3 menit/ 1015 W	1. 0,03	6267,6
	2. 0,15	1854,4
	3. 0,24	3007,6
	4. 0,33	3798,7
	5. 0,43	5213,1
	6. 0,48	5962,9
	7. 0,60	14113,9
	8. 0,65	3613,4
1:10/ 5 menit/ 1015 W	1. 0,03	4314,2
	2. 0,14	465,4
	3. 0,15	382,8
	4. 0,24	1803,5
	5. 0,33	3925,8
	6. 0,43	3564,3
	7. 0,48	5985,7
	8. 0,59	12980,6
	9. 0,64	2661,1
1:10/ 1 menit/ 1450 W	1. 0,03	4997,3
	2. 0,15	2604,9
	3. 0,24	2803,0
	4. 0,33	5291,6
	5. 0,43	8079,8
	6. 0,48	7138,7
	7. 0,59	18091,2
	8. 0,63	3570,7
	9. 0,92	265,2
1:10/ 3 menit/ 1450 W	1. 0,03	4868,3
	2. 0,16	930,8
	3. 0,20	96,3
	4. 0,24	3166,4
	5. 0,33	6224,0
	6. 0,43	5619,0
	7. 0,48	8612,7
	8. 0,58	16615,6
	9. 0,63	2509,2
	10. 0,66	356,2
	11. 0,91	238,0
1:10/ 5 menit/ 1450 W	1. 0,03	4376,1
	2. 0,14	818,8
	3. 0,24	2139,8
	4. 0,33	5185,9
	5. 0,43	6246,0
	6. 0,47	7392,1
	7. 0,58	17319,3
	8. 0,62	2945,9
1:20/ 1 menit/ 435 W	1. 0,01	1702,0
	2. 0,03	2179,4
	3. 0,17	127,7
	4. 0,25	2022,9
	5. 0,34	3194,1

	6. 0,43	1624,0
	7. 0,47	3483,9
	8. 0,58	7229,3
	9. 0,61	826,7
1:20/ 3 menit/ 435 W	1. 0,03	2591,0
	2. 0,25	1909,8
	3. 0,33	3468,9
	4. 0,43	3443,3
	5. 0,47	4117,5
	6. 0,57	10533,3
	7. 0,60	1095,4
1:20/ 5 menit / 435 W	1. 0,03	4862,9
	2. 0,14	870,9
	3. 0,24	2591,9
	4. 0,32	5507,4
	5. 0,42	4391,3
	6. 0,46	8607,8
	7. 0,56	14931,5
	8. 0,60	2321,5
	9. 0,64	314,4
	10. 0,97	145,2
1:20/ 1 menit/ 1015 W	1. 0,03	4388,6
	2. 0,16	1405,8
	3. 0,24	4822,1
	4. 0,31	9885,1
	5. 0,41	9219,2
	6. 0,45	14052,0
	7. 0,55	28136,7
	8. 0,63	407,4
	9. 0,84	93,4
	10. 0,89	419,3
1:20/ 3 menit / 1015 W	1. 0,04	6434,9
	2. 0,16	993,3
	3. 0,24	2617,0
	4. 0,32	5139,0
	5. 0,41	5393,7
	6. 0,45	8252,2
	7. 0,55	17869,1
	8. 0,62	212,5
	9. 0,91	183,8
1:20/ 5 menit/ 1015 W	1. 0,03	7128,1
	2. 0,17	2423,2
	3. 0,28	2327,3
	4. 0,37	4069,3
	5. 0,48	2974,7
	6. 0,54	6770,0
	7. 0,66	10268,8
	8. 0,71	1642,0
1:20/ 1 menit/ 1450 W	1. 0,04	7192,4
	2. 0,11	287,9

	3. 0,17	581,9
	4. 0,27	3938,6
	5. 0,36	6288,2
	6. 0,48	3658,5
	7. 0,54	8850,3
	8. 0,67	12059,1
	9. 0,72	1668,0
1:20/ 3 menit/ 1450 W	1. 0,03	5724,2
	2. 0,16	558,6
	3. 0,17	417,6
	4. 0,28	2022,5
	5. 0,37	3568,9
	6. 0,49	2216,6
	7. 0,54	5953,2
	8. 0,67	9183,4
	9. 0,72	1508,6
1:20 / 5 menit/ 1450 W	1. 0,04	6030,2
	2. 0,17	1176,7
	3. 0,28	2614,7
	4. 0,37	4567,7
	5. 0,48	5226,2
	6. 0,54	7042,8
	7. 0,67	14179,3
	8. 0,72	2170,0
1:30/ 1 menit/ 435 W	1. 0,03	5667,3
	2. 0,07	75,9
	3. 0,19	1042,2
	4. 0,29	4264,7
	5. 0,38	3119,4
	6. 0,49	1796,2
	7. 0,54	2718,4
	8. 0,67	5382,5
	9. 0,72	474,4
1:30/ 3 menit/ 435 W	1. 0,04	7059
	2. 0,18	1455,8
	3. 0,28	3505,4
	4. 0,37	6274,6
	5. 0,48	5587,9
	6. 0,54	8915,4
	7. 0,67	14342,0
	8. 0,72	2344,9
1:30/ 5 menit/ 435 W	1. 0,04	5945,9
	2. 0,18	1565,4
	3. 0,28	5267,6
	4. 0,36	8709,0
	5. 0,48	5450,1
	6. 0,53	13245,5
	7. 0,66	18074,3
	8. 0,71	2952,5
1:30/ 1 menit/ 1015 W	1. 0,04	6020,1

	2. 0,18	1090,0
	3. 0,28	3705,5
	4. 0,36	5649,7
	5. 0,48	6076,7
	6. 0,53	8846,3
	7. 0,65	16326,9
	8. 0,70	2389,8
1:30/ 3 menit/ 1015 W	1. 0,03	4026,3
	2. 0,17	481,4
	3. 0,27	4328,8
	4. 0,36	7283,8
	5. 0,47	7126,7
	6. 0,52	10662,9
	7. 0,65	20270,0
	8. 0,70	1733,4
1:30/ 5 menit/ 1015 W	1. 0,04	6559,4
	2. 0,18	443,1
	3. 0,28	2683,3
	4. 0,36	5389,0
	5. 0,48	5039,1
	6. 0,52	8025,3
	7. 0,64	14981,6
	8. 0,69	1598,1
1:30/ 1 menit/ 1450 W	1. 0,03	5939,6
	2. 0,17	3123,7
	3. 0,28	1790,9
	4. 0,37	2716,6
	5. 0,47	3269,5
	6. 0,52	5007,0
	7. 0,64	12265,4
	8. 0,69	2233,0
1:30/ 3 menit/ 1450 W	1. 0,03	5465,7
	2. 0,18	2185,7
	3. 0,28	1236,9
	4. 0,37	1692,8
	5. 0,47	1728,0
	6. 0,51	3367,8
	7. 0,64	8208,6
	8. 0,68	1593,5
1:30/ 5 menit/ 1450 W	1. 0,04	7751,3
	2. 0,12	153,5
	3. 0,18	4142,8
	4. 0,28	2452,4
	5. 0,36	3123,1
	6. 0,46	3678,0
	7. 0,51	5713,0
	8. 0,63	12961,1
	9. 0,67	2465,8

Lampiran 5. Perhitungan

A. Perhitungan susut pengeringan simplisia

Susut pengeringan = $\frac{\text{bobot awal simplisia (g)} - \text{bobot akhir simplisia (g)}}{\text{bobot awal simplisia (g)}}$ x 100%

= $\frac{1\text{ g} - (76{,}6727\text{ g} - 75{,}7373\text{g})}{1\text{ g}}$ x 100%

= $\frac{1\text{ g} - 0{,}9354\text{ g}}{1\text{ g}}$ x 100%

= 6,46%

B. Perhitungan % rendemen ekstrak

% Rendemen = $\frac{Bobot\ akhir}{Bobot\ \ awal}$ x 100

1. Rasio perbandingan pelarut 1: 10/ daya 435 W/ 1 menit

% Rendemen = $\frac{1{,}27g}{10\ g}$ x 100

= 12,7%

2. Rasio perbandingan pelarut 1: 10/ daya 435 W/ 3 menit

% Rendemen = $\frac{1{,}16g}{10\ g}$ x 100

= 11,6%

3. Rasio perbandingan pelarut 1:10/ daya 435 W/ 5 menit

% Rendemen = $\frac{1{,}17\ g}{10\ g}$ x 100

= 11,7%

4. Rasio perbandingan pelarut 1:10/ daya 1015 W/ 1 menit

% Rendemen = $\frac{1{,}25g}{10\ g}$ x 100

= 12,5%

5. Rasio perbandingan pelarut 1:10/ daya 1015 W/ 3 menit

% Rendemen = $\frac{0{,}83\ g}{10\ g}$ x 100

= 8,3%

6. Rasio perbandingan pelarut 1:10/ daya 1015 W/ 5 menit

% Rendemen = $\frac{1{,}83\ g}{10\ g}$ x 100

= 8,3%

7. Rasio perbandingan pelarut 1:10/ daya 1450 W/ 1 menit

% Rendemen = $\frac{1{,}2\ g}{10\ g}$ x 100

= 12%

8. Rasio perbandingan pelarut 1:10/ daya 1450 W / 3 menit

% Rendemen = $\frac{1{,}36\ g}{10\ g}$ x 100

= 13,6%

9. Rasio perbandingan pelarut 1:10/ daya 1450 W/ 5 menit

% Rendemen = $\frac{0{,}99\ g}{10\ g}$ x 100

= 9,9%

10. Rasio perbandingan pelarut 1:20/ daya 435 W/ 1 menit

% Rendemen = $\frac{0{,}65\ g}{10\ g}$ x 100

= 6,5%

11. Rasio perbandingan pelarut 1:20/ daya 435 W/ 3 menit

% Rendemen = $\frac{1{,}41\ g}{10\ g}$ x 100

= 14,1%

12. Rasio perbandingan pelarut 1:20/ daya 435 W/ 5 menit

% Rendemen = $\frac{1{,}2\ g}{10\ g}$ x 100

= 12%

13. Rasio perbandingan pelarut 1:20/ daya 1015 W/ 1 menit

% Rendemen = $\frac{1{,}32\ g}{10\ g}$ x 100

= 13,2%

14. Rasio perbandingan pelarut 1:20/ daya 1015 W/ 3 menit

% Rendemen = $\frac{1{,}55\ g}{10\ g}$ x 100

= 15,5%

15. Rasio perbandingan pelarut 1:20/ daya 1015 W/ 5 menit

% Rendemen = $\frac{1{,}74\ g}{10\ g}$ x 100

= 17,4%

16. Rasio perbandingan pelarut 1:20/ daya 1450 W/ 1 menit

% Rendemen = $\frac{1{,}37g}{10\ g}$ x 100

= 13,7%

17. Rasio perbandingan pelarut 1:20/ daya 1450 W/ 3 menit

% Rendemen = $\frac{1{,}31\ g}{10\ g}$ x 100

= 13,1%

18. Rasio perbandingan pelarut 1:20/ daya 1450 W/ 5 menit

% Rendemen = $\frac{1{,}43\ g}{10\ g}$ x 100

= 14,3%

19. Rasio perbandingan pelarut 1:30/ daya 435 W/ 1 menit

% Rendemen = $\frac{0{,}51\ g}{8{,}33\ g}$ x 100

= 6,12%

20. Rasio perbandingan pelarut 1:30/ daya 435 W/ 3 menit

% Rendemen = $\frac{1{,}36\ g}{8{,}33\ g}$ x 100

= 16,35%

21. Rasio perbandingan pelarut 1:30/ daya 435 W/ 5 menit

% Rendemen = $\frac{1{,}21\ g}{8{,}33\ g}$ x 100

= 14,64%

22. Rasio perbandingan pelarut 1:30/ daya 1015 W/ 1 menit

% Rendemen = $\frac{0{,}61 g}{8{,}33\ g}$ x 100

= 7,41%

23. Rasio perbandingan pelarut 1:30/ daya 1015 W/ 3 menit

% Rendemen = $\frac{1{,}22\ g}{8{,}33\ g}$ x 100

= 14,7%

24. Rasio perbandingan pelarut 1:30/ daya 1015 W/ 5 menit

% Rendemen = $\frac{1{,}33\ g}{8{,}33\ g}$ x 100

= 15,98%

25. Rasio perbandingan pelarut 1:30/ daya 1450 W/ 1 menit

% Rendemen = $\frac{1{,}19 g}{8{,}33\ g}$ x 100

= 14,39%

26. Rasio perbandingan pelarut 1:30/ daya 1450 W/ 1 menit 21 detik

% Rendemen = $\frac{1,13g}{8,33\ g}$ x 100

= 13,63%

27. Rasio perbandingan pelarut 1:30/ daya 1450 W/ 1 menit 27 detik

% Rendemen = $\frac{1,22g}{8,33\ g}$ x 100

= 14,7%

C. Perhitungan kadar stigmasterol

Kurva baku y=11,252x-1494,4.

1. Rasio perbandingan pelarut 1: 10/ daya 435 W/ 1 menit

   y=11,252x-1494,4

   5190,6 = 11,252x-1494,4

   5190,6+1494,4=11,252x

   X= 594,11

2. Rasio perbandingan pelarut 1: 10/ daya 435 W/ 3 menit

   y=11,252x-1494,4

   2911,9 = 11,252x-1494,4

   2911,9+1494,4=11,252x

   X= 391,60

3. Rasio perbandingan pelarut 1: 10/ daya 435 W/ 5 menit

   y=11,252x-1494,4

   9029,6 = 11,252x-1494,4

   9029,6+1494,4=11,252x

   X= 935,30

4. Rasio perbandingan pelarut 1: 10/ daya 1015 W/ 1 menit

y=11,252x-1494,4

3647,1 = 11,252x-1494,4

3647,1+1494,4=11,252x

X= 456,94

5. Rasio perbandingan pelarut 1: 10/ daya 1015 W/ 3 menit

y=11,252x-1494,4

5962,9 = 11,252x-1494,4

5962,9+1494,4=11,252x

X= 662,75

6. Rasio perbandingan pelarut 1: 10/ daya 1015 W/ 5 menit

y=11,252x-1494,4

5985,7 = 11,252x-1494,4

5985,7+1494,4=11,252x

X= 664,77

7. Rasio perbandingan pelarut 1: 10/ daya 1450 W/ 1 menit

y=11,252x-1494,4

7138,7 = 11,252x-1494,4

7138,7+1494,4=11,252x

X= 767,25

8. Rasio perbandingan pelarut 1: 10/ daya 1450 W/ 3 menit

y=11,252x-1494,4

8612,7= 11,252x-1494,4

8612,7+1494,4=11,252x

X= 898,24

9. Rasio perbandingan pelarut 1: 10/ daya 1450 W/ 5 menit
   y=11,252x-1494,4

   7392,1= 11,252x-1494,4

   7392,1+1494,4=11,252x

   X= 789,77

10. Rasio perbandingan pelarut 1: 20/ daya 435 W/ 1 menit

    y=11,252x-1494,4

    3483,9= 11,252x-1494,4

    3483,9+1494,4=11,252x

    X= 442,43

11. Rasio perbandingan pelarut 1: 20/ daya 435 W/ 3 menit

    y=11,252x-1494,4

    4117,5 = 11,252x-1494,4

    4117,5+1494,4=11,252x

    X= 498,74

12. Rasio perbandingan pelarut 1: 20/ daya 435 W/ 5 menit

    y=11,252x-1494,4

    8607,8 = 11,252x-1494,4

    8607,8+1494,4=11,252x

    X= 897,81

13. Rasio perbandingan pelarut 1: 20/ daya 1015 W/ 1 menit

    y=11,252x-1494,4

    9219,2 = 11,252x-1494,4

    9219,2+1494,4=11,252x

    X= 952,15

14. Rasio perbandingan pelarut 1: 20/ daya 1015 W/ 3 menit

    y=11,252x-1494,4

    8252,2 = 11,252x-1494,4

    8252,2+1494,4=11,252x

    X= 866,21

15. Rasio perbandingan pelarut 1: 20/ daya 1015 W/ 5 menit

    y=11,252x-1494,4

    6770 = 11,252x-1494,4

    6770+1494,4=11,252x

    X= 734,48

16. Rasio perbandingan pelarut 1: 20/ daya 1450 W/ 1 menit

    y=11,252x-1494,4

    8850,3 = 11,252x-1494,4

    8850,3+1494,4=11,252x

    X= 919,36

17. Rasio perbandingan pelarut 1: 20/ daya 1450 W/ 3 menit

    y=11,252x-1494,4

    5953,2 = 11,252x-1494,4

5953,2+1494,4=11,252x

X= 661,89

18. Rasio perbandingan pelarut 1: 20/ daya 1450 W/ 5 menit
    y=11,252x-1494,4

    7042,8 = 11,252x-1494,4

    7042,8+1494,4=11,252x

    X= 758,72

19. Rasio perbandingan pelarut 1: 30/ daya 435 W/ 1 menit

    y=11,252x-1494,4

    2718,4 = 11,252x-1494,4

    2718,4+1494,4=11,252x

    X= 374,4

20. Rasio perbandingan pelarut 1: 30/ daya 435 W/ 3 menit

    y=11,252x-1494,4

    8915,4 = 11,252x-1494,4

    8915,4+1494,4=11,252x

    X= 925,15

21. Rasio perbandingan pelarut 1: 30/ daya 435 W/ 5 menit

    y=11,252x-1494,4

    13245,5 = 11,252x-1494,4

    13245,5+1494,4=11,252x

    X= 1309,98

22. Rasio perbandingan pelarut 1: 30/ daya 1015 W/ 1 menit

    y=11,252x-1494,4

8846,3 = 11,252x-1494,4

8846,3+1494,4=11,252x

X= 919,01

23. Rasio perbandingan pelarut 1: 30/ daya 1015 W/ 3 menit

y=11,252x-1494,4

10662,9 = 11,252x-1494,4

10662,9+1494,4=11,252x

X= 1080,45

24. Rasio perbandingan pelarut 1: 30/ daya 1015 W/ 5 menit

y=11,252x-1494,4

8025,3= 11,252x-1494,4

8025,3+1494,4=11,252x

X= 846,04

25. Rasio perbandingan pelarut 1: 30/ daya 1450 W/ 1 menit

y=11,252x-1494,4

5007,0 = 11,252x-1494,4

5007,0+1494,4=11,252x

X= 577,79

26. Rasio perbandingan pelarut 1: 30/ daya 1450 W/ 1 menit 21 detik

y=11,252x-1494,4

3367,8 = 11,252x-1494,4

3367,8+1494,4=11,252x

X= 432,11

27. Rasio perbandingan pelarut 1: 10/ daya 1450 W/ 1 menit 27 detik

    y=11,252x-1494,4

    5713,02 = 11,252x-1494,4

    5713,02+1494,4=11,252x

    X= 640,54