

LAMPIRAN

A. Perhitungan

1. Kadar Air

Perhitungan kadar air pada sampel enkapsulasi daun kelor dan daun pegagan sebagai berikut.

$$\text{Kadar air}(\%) = \frac{\text{berat awal} - \text{berat akhir}}{\text{berat awal}} \times 100\%$$

$$\begin{aligned}\text{Kadar air}(\%) &= \frac{1 - 0,85}{1} \times 100\% \\ &= 5,56\%\end{aligned}$$

2. Kadar Abu

Perhitungan kadar abu pada sampel enkapsulasi daun kelor dan daun pegagan sebagai berikut.

$$\text{Kadar abu}(\%) = \frac{w1 - w2}{w} \times 100\%$$

$$\begin{aligned}\text{Kadar abu}(\%) &= \frac{0,1848}{0,85} \times 100\% \\ &= 1,4\%\end{aligned}$$

3. Rendemen

Perhitungan rendemen yang didapatkan enkapsulasi daun kelor dan daun pegagan sebagai berikut.

$$\text{Rendemen}(\%) = \frac{\text{Massa sesudah pengeringan}}{\text{Massa sebelum pengeringan}} \times 100\%$$

$$\begin{aligned}\text{Rendemen}(\%) &= \frac{12,1}{22} \times 100\% \\ &= 55\%\end{aligned}$$

4. Uji Kelarutan dalam Air

Perhitungan kelarutan dalam air yang didapatkan enkapsulasi ekstrak daun kelor dan daun pegagan sebagai berikut.

$$\text{Kelarutan terhadap air} = 1 - \frac{(c - b)}{\frac{a \times (100 - ka)}{100}} \times 100\%$$

$$\begin{aligned} \text{Kelarutan terhadap air} &= 1 - \frac{(0.8 - 0.85)}{\frac{0.5 \times (100 - 5.88\%)}{100}} \times 100\% \\ &= 89.99\% \end{aligned}$$

5. Uji Higroskopis

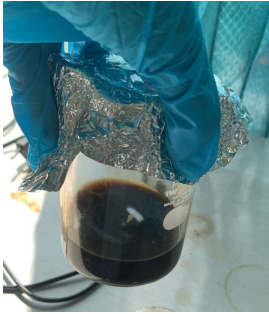
Perhitungan kelarutan dalam air yang didapatkan enkapsulasi ekstrak daun kelor dan daun pegagan sebagai berikut.

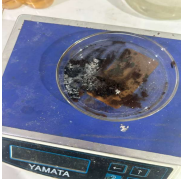
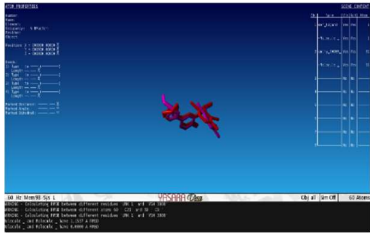
$$\text{Uji Higroskopis} = \frac{\text{berat setelah uji} - \text{berat sebelum uji}}{\text{berat sebelum uji}}$$

$$\text{Uji Higroskopis} = \frac{0.2 - 0.1}{0.1} = 100\%$$

B. Dokumentasi

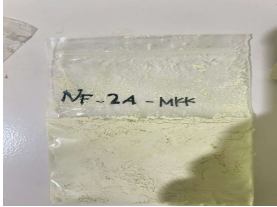
1. Pembuatan Ekstrak

Foto	Keterangan
	Penghalusan Daun Kelor dan Pegagan
	Pembuatan Ekstrak Daun Kelor dan Pegagan
	Analisis Fitokimia

	
	Analisis Proksimat
	<i>Molecular Docking</i>

2. Pembuatan Enkapsulasi Ekstrak Daun Kelor dan Pegagan

Foto	Keterangan
	Pembuatan enkapsulasi ekstrak daun kelor dan pegagan
	Enkapsulat dilakukan pengeringan

	menggunakan <i>spray dryer</i>
	Analisis Kadar dan Kadar Abu
	Analisis Higroskopis
	Analisis Kelarutan

C. Data Hasil

1. Jumlah Air yang Hilang Bubuk Enkapsulasi Ekstrak Daun Pegagan dan Kelor

Variasi	Massa Sebelum Pengeringan (g)	Massa Sesudah Pengeringan (g)	% Rendemen	Jumlah Air yang Hilang (g)	Massa Air yang Hilang (g)
Enkapsulasi Daun Kelor					
Maltodekstrin : Whey	22	12.1	55.00%	9.9	45%
Maltodekstrin : Karagenan	22	1.6	7.27%	20.4	93%
Maltodekstrin : Karagenan : Whey	22	5.5	25.00%	16.5	75%
Enkapsulasi Daun Pegagan					
Maltodekstrin : Whey	22	14.7	66.82%	7.3	33%
Maltodekstrin : Karagenan	22	7.25	32.95%	14.75	67%
Maltodekstrin : Karagenan : Whey	22	2.1	9.55%	19.9	90%

2. Kadar Air

Enkapsulasi Ekstrak Daun Kelor				
Komponen	Massa Cawan + Residu	Massa Cawan	Massa Residu	Kadar Air
MWP	49.75	48.95	0.8	5.88%
MKK	51.4	50.55	0.85	5.56%
MWPKK	45.15	44.4	0.75	6.25%
Enkapsulasi Ekstrak Daun Pegagan				
MWP	47.15	45.55	1.6	5.88%
MKK	44.15	42.5	1.65	2.94%

MWPKK	45.25	43.65	1.6	5.88%
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3. Kelarutan dalam Air

Komponen	Massa Kertas Saring	Massa Bubuk	Massa Kertas saring + Residu		Kelarutan (%)	
			Daun Kelor	Daun pegagan	Bubuk Enkapsulasi Daun kelor	Bubuk Enkapsulasi Daun Pegagan
Maltodekstrin : Whey	0.8	0.5	0.85	0.95	89.99%	69.98%
Maltodekstrin : Karagenan	0.8	0.5	1.05	1.05	49.97%	49.99%
Maltodekstrin : Whey : Karagenan	0.8	0.5	0.95	1	69.98%	59.98%

4. Uji Higroskopis

Enkapsulasi Daun Kelor						Enkapsulasi Daun Pegagan					
MWP		MKK		MWPKK		MWP		MKK		MWPKK	
Waktu	berat	Waktu	berat	Waktu	berat	Waktu	berat	Waktu	berat	Waktu	berat
0	0.2	0	0.2	0	0.2	0	0.1	0	0.1	0	0.1
1	0.25	1	0.2	1	0.2	1	0.1	1	0.1	1	0.1
2	0.25	2	0.2	2	0.2	2	0.1	2	0.1	2	0.1
3	0.25	3	0.2	3	0.2	3	0.15	3	0.1	3	0.1
4	0.3	4	0.2	4	0.2	4	0.2	4	0.1	4	0.1
24	0.3	24	0.2	24	0.2	24	0.2	24	0.1	24	0.1

5. Hasil Analisis LCMS-MS

A. Daun Pegagan

Nama	Molecular Formula	CA (%Rel. Abundance)
5-nitrothiophene-3-carbaldehyde 3-(2-pyridyl)hydrazone	C10 H8 N4 O2 S	0.749
Citric acid	C10 H8 N4 O2 S	0.784
Choline	C10 H8 N4 O2 S	0.796
ethyl 4-amino-2-(methylsulfanyl)-1,3-thiazole-5-carboxylate	C10 H8 N4 O2 S	0.802
L(-)-Carnitine	C10 H8 N4 O2 S	0.822
Betaine	C10 H8 N4 O2 S	0.835
D-(+)-Proline	C10 H8 N4 O2 S	0.851
1-[(3-Carboxypropyl)amino]-1-deoxy-beta-D-fructofuranose	C10 H8 N4 O2 S	0.861
1,2,3,4-Tetramethyl-1,3-cyclopentadiene	C9 H14	14.46
Propofol	C12 H18 O	14.462
α -Linolenic acid	C18 H30 O2	14.463
Jasmone	C11 H16 O	14.464
4-Vinylcyclohexene	C8 H12	14.465
Methyl 5-[(3aS,5R,6R,6aS)-5-hydroxy-6-[(1E,3R)-3-	C22 H36 O4	14.509

hydroxy-1-octen-1-yl]-1,3a,4,5,6,6a-hexahydro-2-pentalenyl} pentanoate		
GP1750000	C17 H20 O2	14.602
Biphenyl	C12 H10	14.608
α -Linolenic acid	C18 H30 O2	14.658
13-apo-beta-carotenone	C18 H26 O	14.673
3-(10,11-Dihydro-5H-dibenzo[a,d][7]annulen-5-yloxy)-8-methyl-8-azabicyclo[3.2.1]octane	C23 H27 N O	14.692
2-undecyl-4(1H)-quinolone	C20 H29 N O	14.694
Oleamide	C18 H35 N O	14.785
Palmitoleic acid	C16 H30 O2	14.903
Oleamide	C18 H35 N O	14.982
4-Octylphenol	C14 H22 O	14.99
EN0350000	C13 H20 O	14.991
Propofol	C12 H18 O	14.995
3-Methyl-1-phenyl-2-butene	C11 H14	15.001
Violaxanthin	C40 H56 O4	15.172
Linoleic acid	C18 H32 O2	15.185
(8E,10E,12S)-8,10-Heptadecadiene-4,6-diyne-1,12-diol	C17 H24 O2	9.842
1,1,6-Trimethyl-1,2-dihydronaphthalene	C13 H16	9.846
2-Amino-1,3,4-octadecanetriol	C18 H39 N O3	9.855
NP-003535	C30 H48 O6	9.856
beloxamide	C18 H21 N O2	13.059
2,4-Pentadiynylbenzen	C11 H8	13.061

e		
XT2570000	C9 H8	13.061
Naphthalene	C10 H8	13.061
5-Ethyl-3,8-dimethyl-1,7-dihydroazulene	C14 H18	13.062
1-Naphthol	C10 H8 O	13.063
GP1750000	C17 H20 O2	13.064
Biphenyl	C12 H10	13.072
DV5460000	C13 H12	13.073
Choline O-Sulfate	C5 H13 N O4 S	0.966
Uric acid	C5 H4 N4 O3	0.989
(2S)-3-Methyl-2-({[(3S,4S,5R)-2,3,4-trihydroxy-5-(hydroxymethyl)tetrahydro-2-furanyl]methyl}amino)butanoic acid (non-preferred name)	C11 H21 N O7	0.994
SL9650000	C29 H44 O2	9.899
Hydrolyzed fumonisins B1	C22 H47 N O5	9.998
(6Z)-6-Tetradecene-1,3-diyne-5,8-diol	C14 H20 O2	10.245
N,N-Diethyldodecanamide	C16 H33 N O	10.264
Artemotil	C17 H28 O5	10.316
6-Gingerol	C17 H26 O4	10.32
13-apo-beta-carotenone	C18 H26 O	12.012
13(S)-HOTrE	C18 H30 O3	12.089
Curcumene	C15 H22	12.166
(1S,4S,5R,10S,13S,17S,19S,20R)-10-hydroxy-4,5,9,9,13,19,20-heptamethyl-24-oxahexacyclo[15.5.2.0Ââ.0â.0â.0â.0â.0â]	C30 H46 O3	12.379

acos-15-en-23-one		
(Z)-?-amylcinnamyl alcohol	C14 H20 O	10.733
Asiatic acid	C30 H48 O5	10.751
Phytosphingosine	C18 H39 N O3	10.834
Safingol	C18 H39 N O2	10.857
4-(Trimethylammonio)-3-(undecanoyloxy)butanoate	C18 H35 N O4	10.873
RG5925700	C11 H18 O2	10.889
Gusperimus	C17 H37 N7 O3	10.934
Tetranor 12-HETE	C16 H26 O3	10.96
Estra-1,3,5(10)-trien-3-ol	C18 H24 O	10.963
9-Nitrooleate	C18 H33 N O4	11.016
8-{3-Oxo-2-[(2E)-2-penten-1-yl]-1-cyclopenten-1-yl}octanoic acid	C18 H28 O3	11.021
13(S)-HpOTrE	C18 H30 O4	11.031
Bis(4-ethylbenzylidene)sorbitol	C24 H30 O6	11.088
N-Heptadecanoylglycine	C19 H37 N O3	11.101
Heptanophenone	C13 H18 O	11.219
Ibuprofen	C13 H18 O2	7.918
Octyl (4xi)-2-deoxy-2-[(Z)-(1-hydroxyethylidene)amino]-alpha-D-xylo-hexopyranoside	C16 H31 N O6	8.056
Psoralen	C11 H6 O3	8.273
Kaempferol	C15 H10 O6	8.474

Corchorifatty acid F	C18 H32 O5	8.604
Phloionolic acid	C18 H36 O5	8.844
(1S,4S,5R,10S,13S,17S,19S,20R)-10-hydroxy-4,5,9,9,13,19,20-heptamethyl-24-oxahexacyclo	C30 H46 O3	8.894
Sedanolid	C12 H18 O2	8.963
(15Z)-9,12,13-Trihydroxy-15-octadecenoic acid	C18 H34 O5	8.968
4,5-Dicaffeoylquinic acid	C25 H24 O12	6.41
Neochlorogenic acid	C16 H18 O9	6.41
methyl 3,5-ditert-butyl-4-hydroxybenzoate	C16 H24 O3	11.232
XT2570000	C9 H8	11.267
Naphthalene	C10 H8	11.274
Biphenyl	C12 H10	11.275
DV5460000	C13 H12	11.276
2,4-Pentadiynylbenzene	C11 H8	11.278
NP-004038	C16 H24 O3	11.409
(±)9-HpODE	C18 H32 O4	11.503
12-Oxo phytodienoic acid	C18 H28 O3	10.601
Luteolin 7-O-malonylglucoside	C24 H22 O14	6.605
MFCD00801046	C18 H34 O	16.199
(2E,4Z)-N-Isobutyl-2,4-octadecadienamide	C22 H41 N O	16.204
Mandenol	C20 H36 O2	16.26
MFCD00083370	C22 H44 O3	16.781
Erucamide	C22 H43 N O	16.786
4-[(2E)-3,7-Dimethyl-2,6-octadien-1-yl]-2-	C37 H60 O5	16.798

formyl-3-hydroxy-5-methoxybenzyl stearate		
C16-Dihydroceramide	C34 H69 N O3	17.29
2-hydroxy Lignoceric Acid	C24 H48 O3	17.624
MFCD00135810	C10 H8 N4 O2 S	1.021
Nicotinic acid	C10 H8 N4 O2 S	1.027
Nicotinamide	C10 H8 N4 O2 S	1.041
L-Pyroglutamic acid	C10 H8 N4 O2 S	1.047
2-Methylpyrrolidine	C10 H8 N4 O2 S	1.072
L-Isoleucine	C10 H8 N4 O2 S	1.073
N-Acetyl-DL-glutamic acid	C10 H8 N4 O2 S	1.073
Glutaryl carnitine	C10 H8 N4 O2 S	1.082
(2S)-4-Methyl-2-({[(3S,4S,5R)-2,3,4-trihydroxy-5-(hydroxymethyl)tetrahydro-2-furanyl]methyl}amino)pentanoic acid (non-preferred name)	C10 H8 N4 O2 S	1.111
Aminohippuric acid	C10 H8 N4 O2 S	1.207
L-Phenylalanine	C10 H8 N4 O2 S	1.391
D-PANTOTHENIC ACID	C10 H8 N4 O2 S	1.574
g-Butyrobetaine	C10 H8 N4 O2 S	1.686
trans-3-Indoleacrylic acid	C10 H8 N4 O2 S	2.218
Caprolactam	C10 H8 N4 O2 S	2.817

(1r,3R,4s,5S)-4- {[(2E)-3-(3,4- dihydroxyphenyl)p rop-2-enoyl]oxy}- 1,3,5- trihydroxycyclohex ane-1-carboxylic acid	C10 H8 N4 O2 S	3.658
IN00458	C10 H8 N4 O2 S	3.721
Heptanophenone	C13 H18 O	11.219

B. Daun Kelor

Nama	Formula	RT (% Relative Abunda nce)
L-(+)-Arginine	C6 H14 N4 O2	0.996
Neochlorogenic acid	C16 H18 O9	2.109
Choline	C5 H13 N O	1.013
Lactamide	C3 H7 N O2	1.017
1-[(3-Carboxypropyl)amino]-1- deoxy-beta-D-fructofuranose	C10 H19 N O7	1.026
D-(-)-Fructose	C6 H12 O6	1.05
D-(-)-Quinic acid	C7 H12 O6	1.059
4-Guanidinobutyric acid	C5 H11 N3 O2	1.063
mycosporine	C11 H19 N O6	1.107
Hept-2-ulose	C7 H14 O7	1.109
α,α -Trehalose	C12 H22 O11	1.114
lactide	C6 H8 O4	1.165
Pipecolic acid	C6 H11 N O2	1.172
Stachydrine	C7 H13 N O2	1.203
Benzaldehyde	C7 H6 O	1.206

Adenine	C5 H5 N5	1.213
1-Naphthol	C10 H8 O	1.215
Uridine	C9 H12 N2 O6	1.241
MFCD00135810	C11 H17 N O8	1.242
Adenosine	C10 H13 N5 O4	1.26
Acetophenone	C8 H8 O	1.261
Nicotinamide	C6 H6 N2 O	1.266
Guanine	C5 H5 N5 O	1.266
Benzoic acid	C7 H6 O2	1.277
2-Methylpyrrolidine	C5 H11 N	1.3
L-Isoleucine	C6 H13 N O2	1.307
Glutaryl carnitine	C12 H21 N O6	1.32
Butenyl carnitine	C11 H19 N O4	1.322
(2S)-4-Methyl-2-({[(3S,4S,5R)- 2,3,4-trihydroxy-5- (hydroxymethyl)tetrahydro-2- furanyl]methyl}amino)pentanoic acid (non-preferred name)	C12 H23 N O7	1.323
oxisuran	C8 H9 N O2 S	1.393
Prolylleucine	C11 H20 N2 O3	1.43
6-Acetamido-2-oxohexanoic acid	C8 H13 N O4	1.451
2-Pyrrolidone	C4 H7 N O	1.454
TDIQ	C10 H11 N O2	1.463
6-Oxo-pipecolinic acid	C6 H9 N O3	1.512
Cinnamic acid	C9 H8 O2	1.615
(2S)-3-Phenyl-2-({[(3S,4S,5R)- 2,3,4-trihydroxy-5- (hydroxymethyl)tetrahydro-2- furanyl]methyl}amino)propanoic acid (non-preferred name)	C15 H21 N O7	1.638
4-Hydroxybenzaldehyde	C7 H6 O2	5.176

2-Hydroxy-N-{2-[2-(1H-imidazol-5-yl)ethyl]-5-methyl-3-oxo-1,2-oxazolidin-4-yl}benzamide	C16 H18 N4 O4	5.186
(2E)-5-methyl-2-phenylhex-2-enal	C13 H16 O	5.191
Damascenone	C13 H18 O	5.237
hymecromone	C10 H8 O3	5.247
(3R,5R)-1,3,5-Trihydroxy-4- {[(2E)-3-(4-hydroxy-3-methoxyphenyl)-2-propenoyl]oxy}cyclohexanecarboxylic acid	C17 H20 O9	5.258
(1ξ)-1,5-Anhydro-1-[2-(3,4-dihydroxyphenyl)-5,7-dihydroxy-4-oxo-4H-chromen-8-yl]-D-galactitol	C21 H20 O11	5.371
N-4-hydroxyphenylacetylglutamic acid	C13 H15 N O6	5.423
Ibuprofen	C13 H18 O2	5.66
2-(2,4-dihydroxyphenyl)-3,5,7-trihydroxy-4H-chromen-4-one	C15 H10 O7	5.784
Rutin	C27 H30 O16	5.79
Quercetin-3β-D-glucoside	C21 H20 O12	6.002
FENAMIC ACID	C13 H11 N O2	6.091
ZINGEROL	C11 H16 O3	6.318
α-Propylaminopentiophenone	C14 H21 N O	6.327
NP-019498	C28 H32 O16	6.338
p-cymene	C10 H14	6.34
5-Isopropyl-2-methyl-2-cyclohexen-1-one	C10 H16 O	6.373
(3E)-4-(4-Hydroxy-2,6,6-trimethyl-1-cyclohexen-1-yl)-3-buten-2-one	C13 H20 O2	6.404
Tetralin	C10 H12	6.415

1-[2-(3-Hydroxy-1-propen-2-yl)-2,3-dihydro-1-benzofuran-5-yl]ethanone	C13 H14 O3	6.428
3-{[(2R,3S,4S,5R,6S)-6-{[2-(3,4-dihydroxyphenyl)-5,7-dihydroxy-4-oxo-4H-chromen-3-yl]oxy}-3,4,5-trihydroxyoxan-2-yl]methoxy}-3-oxopropanoic acid	C24 H22 O15	6.457
Kaempferol	C15 H10 O6	6.467
Trifolin	C21 H20 O11	6.469
Valerophenone	C11 H14 O	6.549
Isorhamnetin	C16 H12 O7	6.569
5,7-dihydroxy-2-(4-hydroxy-3-methoxyphenyl)-3-{[3,4,5-trihydroxy-6-(hydroxymethyl)oxan-2-yl]oxy}-4H-chromen-4-one	C22 H22 O12	6.57