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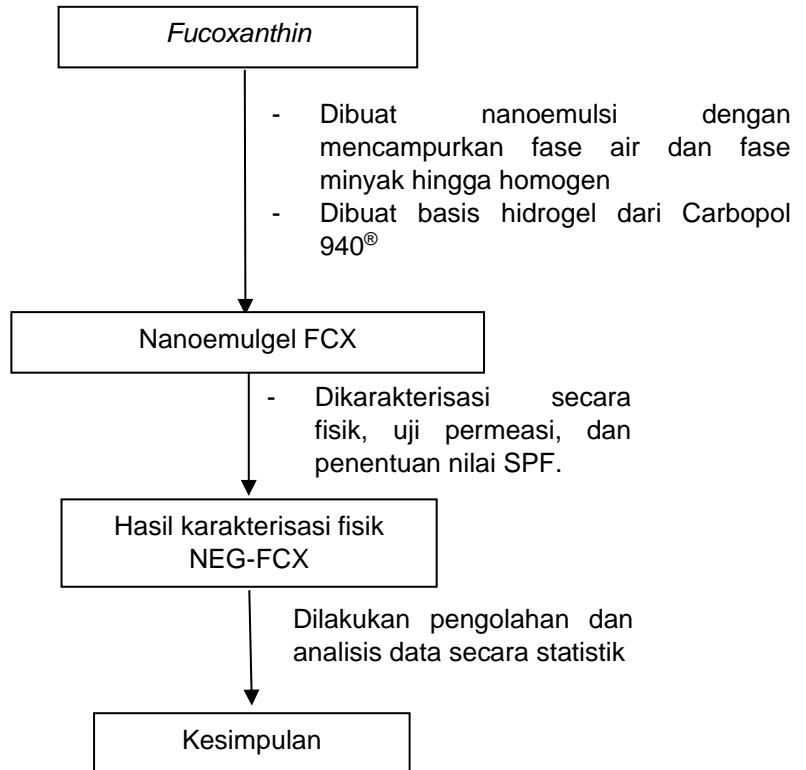
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LAMPIRAN

Lampiran 1. Skema kerja umum



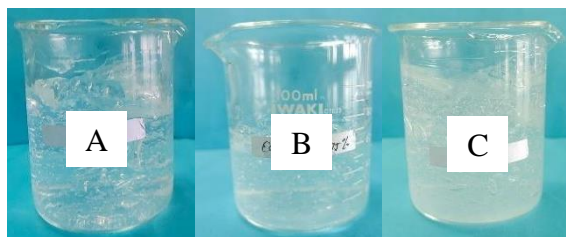
Lampiran 2. Data Formulasi dan Karakterisasi

Lampiran 2.1 Data orientasi basis hidrogel

Tabel 13. Data formula basis hidrogel

Formula	Komposisi Hidrogel (%b/b)	
	Carbopol 940®	Aquadest
F1	0,5	ad 100
F2	0,75	ad 100
F3	1	ad 100

Lampiran 2.2 Dokumentasi Formula Hidrogel



Gambar 12. Hasil formulasi hidrogel F1 (A); F2 (B); dan F3 (C)

Lampiran 2.3 Data hasil pengukuran jenis aliran (reologi)

Tabel 14. Hasil pengukuran jenis aliran

Formula	RPM	η (mPa.s)	Rate of Shear (s^{-1})	Shearing Stress (mPa)
F1	2,5	182400	4,2575	776568
		182000	4,2575	774865
		182670	4,2575	777717
	10	55500	17,03	945165
		56890	17,03	968837
		55850	17,03	951125
	20	30000	34,06	1021800
		30159	34,06	1027215
		30346	34,06	1033584
	50	14366,7	85,15	1223322
		13800	85,15	1175070
		14200	85,15	1208704
F2	2,5	158000	4,2575	672685
		158200	4,2575	673536
		158020	4,2575	672770
	10	48000	17,03	817440
		47500	17,03	808925
		48120	17,03	819483
	20	26000	34,06	885560
		26300	34,06	895778

		26570	34,06	904974
		12766,7	85,15	1087082
	50	12380	85,15	1054157
		12500,5	85,15	1064417
		150000	4,2575	638625
	2,5	150800	4,2575	642031
		157900	4,2575	672259
		47900	17,03	815737
	10	47120	17,03	802453
		47500	17,03	808925
F3		26750	34,06	911105
	20	26600	34,06	905996
		26820	34,06	913489
		12600	85,15	1072890
	50	12502	85,15	1064543
		12694	85,15	1080894

Lampiran 3. Hasil Pengujian Statistik

Lampiran 3.1 Hasil pengujian statistik uji ukuran partikel

Shapiro-Wilk test			
W	0.8697	0.9475	0.9527
P value	0.2946	0.5586	0.5811
Passed normality test (alpha=0.05)?	Yes	Yes	Yes
P value summary	ns	ns	ns

ANOVA summary	
F	12.01
P value	0.0080
P value summary	**
Significant diff. among means (P < 0.05)?	Yes
R squared	0.8001

Lampiran 3.2 Hasil pengujian statistik uji pH

Shapiro-Wilk test			
W	1.000	1.000	1.000
P value	>0.9999	>0.9999	>0.9999
Passed normality test (alpha=0.05)?	Yes	Yes	Yes
P value summary	ns	ns	ns

ANOVA summary	
F	121.0
P value	<0.0001
P value summary	****
Significant diff. among means (P < 0.05)?	Yes
R squared	0.9758

Lampiran 3.3 Hasil pengujian statistik uji viskositas dan reologi

Shapiro-Wilk test			
W	0.8480	0.8547	0.8710
P value	0.2351	0.2530	0.2983
Passed normality test (alpha=0.05)?	Yes	Yes	Yes
P value summary	ns	ns	ns

ANOVA summary	
F	29.59
P value	0.0008
P value summary	***
Significant diff. among means (P < 0.05)?	Yes
R squared	0.9079

Lampiran 3.4 Hasil pengujian statistik uji daya sebar

Shapiro-Wilk test			
W	0.9643	1.000	0.9868
P value	0.6369	>0.9999	0.7804
Passed normality test (alpha=0.05)?	Yes	Yes	Yes
P value summary	ns	ns	ns

ANOVA summary	
F	528.2
P value	<0.0001
P value summary	****
Significant diff. among means (P < 0.05)?	Yes
R squared	0.9944

Lampiran 3.5 Hasil pengujian statistik permeasi *ex vivo*

Test for normal distribution			
Shapiro-Wilk test			
W	0.8971	0.9960	0.9823
P value	0.3762	0.8794	0.7450
Passed normality test (alpha=0.05)?	Yes	Yes	Yes
P value summary	ns	ns	ns
Number of values			
	3	3	3
ANOVA summary			
F			1241
P value			<0.0001
P value summary			****
Significant diff. among means (P < 0.05)?			Yes
R squared			0.9976

Lampiran 4. Perhitungan

Lampiran 4.1 Perhitungan viskositas, *shearing stress* dan *rate of shear*

Lampiran 4.1.1 Perhitungan viskositas menggunakan viskometer Brookfield® (*Non - Newtonian*)

$$\begin{aligned}\eta &= \%T \times f \\ &= 62,5 \times 200 \\ &= 12500 \text{ mPa.s / cP}\end{aligned}$$

Lampiran 4.1.2 Perhitungan *shearing stress* dan *rate of shear*

$$\begin{aligned}\text{rate of shear (G)} &= 1,703 \times \text{RPM} \\ &= 1,703 \times 2,5 \\ &= 4,2575 \text{ S}^{-1}\end{aligned}$$

$$\begin{aligned}\text{shearing stress } (\tau) &= \eta \times G \\ &= 1500 \times 4,2575 \\ &= 6386,20 \text{ mPa}\end{aligned}$$

Lampiran 4.2 Perhitungan uji permease *ex vivo*

$$\begin{aligned}y &= 0,0089x + 0,0147 \\ 0,773 &= 0,0089x + 0,0147 \\ 0,0089x &= 0,773 - 0,0147 \\ X &= 85,20 \text{ } \mu\text{g/mL (konsentrasi dalam 1 mL)}\end{aligned}$$

Keterangan:

$$\begin{aligned}y &= \text{absorbansi pada jam ke-6 formula 1 replikasi 1} \\ x &= \text{konsentrasi}\end{aligned}$$

$$\begin{aligned}\text{Konsentrasi dalam 13 ml} &= 85,20 \text{ } \mu\text{g/mL} \times 4 \times 13 \text{ mL} \\ &= 4,4305 \text{ } \mu\text{g}\end{aligned}$$

$$\begin{aligned}\text{Faktor koreksi} &= \frac{\text{konsentrasi waktu sebelumnya}}{1000} + \text{faktor koreksi waktu sebelumnya} \\ &= \frac{93,40}{1000} + 0,1491 \\ &= 0,2425281\end{aligned}$$

$$\begin{aligned}\text{Jumlah terpermeasi jam ke-6} &= \text{Konsentrasi dalam 13 ml} + \text{Faktor koreksi} \\ &= 4,4305 \text{ } \mu\text{g} + 0,2425281 \\ &= 4,673044944\end{aligned}$$

Lampiran 4.3 Perhitungan nilai SPF

$$SPF = CF \times \sum_{290}^{320} EE \times I \times Abs$$

$$SPF = CF \times EE \times I \times Abs \text{ pada } \lambda 290 \text{ nm}$$

$$SPF = 10 \times 0,0150 \times 2,923$$

$$SPF = 0,4385$$

Keterangan :

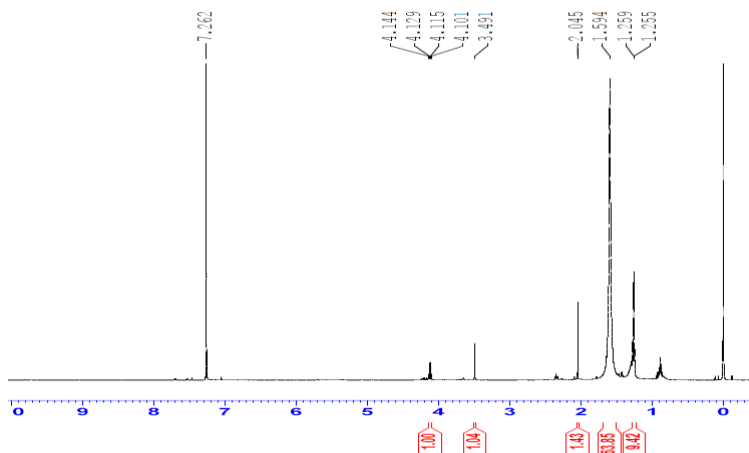
CF = Faktor korelasi (10)

EE = Efisiensi eritema

I = Spektrum simulasi sinar surya

Abs = Absorbansi

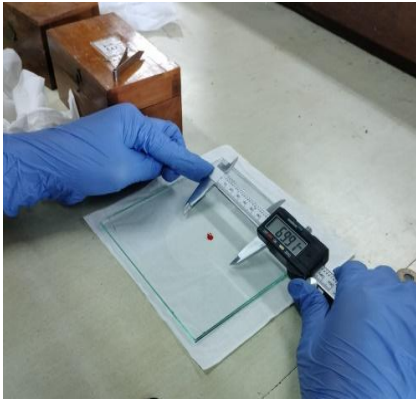
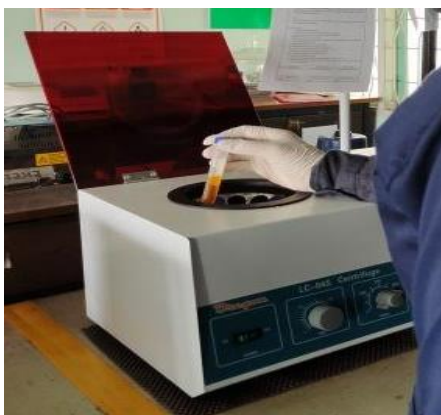
Lampiran 5. Hasil Karakterisasi Isolat Fucoxanthin dari Alga Cokelat (*Sargassum* sp.)



Gambar 13. Hasil karakterisasi menggunakan $^1\text{H-NMR}$

Keterangan:

$^1\text{H NMR}$: δ 0.92-1.02 (6H, 0.97 (s), 0.97 (s)), 1.15-1.25 (6H, 1.20 (s), 1.20 (s)), 1.32 (3H, s), 1.38-1.59 (7H, 1.46 (dd, $J = 14.2, 9.9$ Hz), 1.46 (dd, $J = 13.3, 10.2$ Hz), 1.48 (s), 1.51 (dd, $J = 13.3, 2.5$ Hz), 1.52 (dd, $J = 13.5, 2.5$ Hz)), 1.60-1.89 (7H, 1.67 (dd, $J = 14.2, 1.8$ Hz), 1.75 (dd, $J = 14.5, 10.1$ Hz), 1.72 (s), 1.80 (dd, $J = 14.5, 3.4$ Hz), 1.81 (dd, $J = 13.5, 10.2$ Hz)), 1.89-2.12 (12H, 1.94 (s), 1.97 (s), 2.03 (s), 2.07 (s)), 2.92-3.02 (2H, 2.97 (s), 2.97 (s)), 3.84 (1H, dddd, $J = 10.1, 9.9, 3.4, 1.8$ Hz), 4.95 (1H, tt, $J = 10.2, 2.5$ Hz), 6.30-6.92 (10H, 6.37 (d, $J = 10.2$ Hz), 6.43 (d, $J = 17.3$ Hz), 6.45 (dd, $J = 16.8, 10.3$ Hz), 6.43 (d, $J = 10.3$ Hz), 6.45 (d, $J = 10.2$ Hz), 6.55 (dd, $J = 15.8, 10.4$ Hz), 6.66 (d, $J = 15.8$ Hz), 6.70 (dd, $J = 16.8, 10.2$ Hz), 6.79 (dd, $J = 17.3, 10.2$ Hz), 6.87 (s)), 7.09 (1H, d, $J = 10.4$ Hz).

Lampiran 6. Dokumentasi penelitian**Gambar 14.** Proses formulasi NEG-FCX**Gambar 15.** Proses uji viskositas dan reologi**Gambar 16.** Proses uji daya sebar**Gambar 17.** Proses uji pH**Gambar 18.** Proses uji sentrifugasi**Gambar 19.** Proses uji permeasi

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