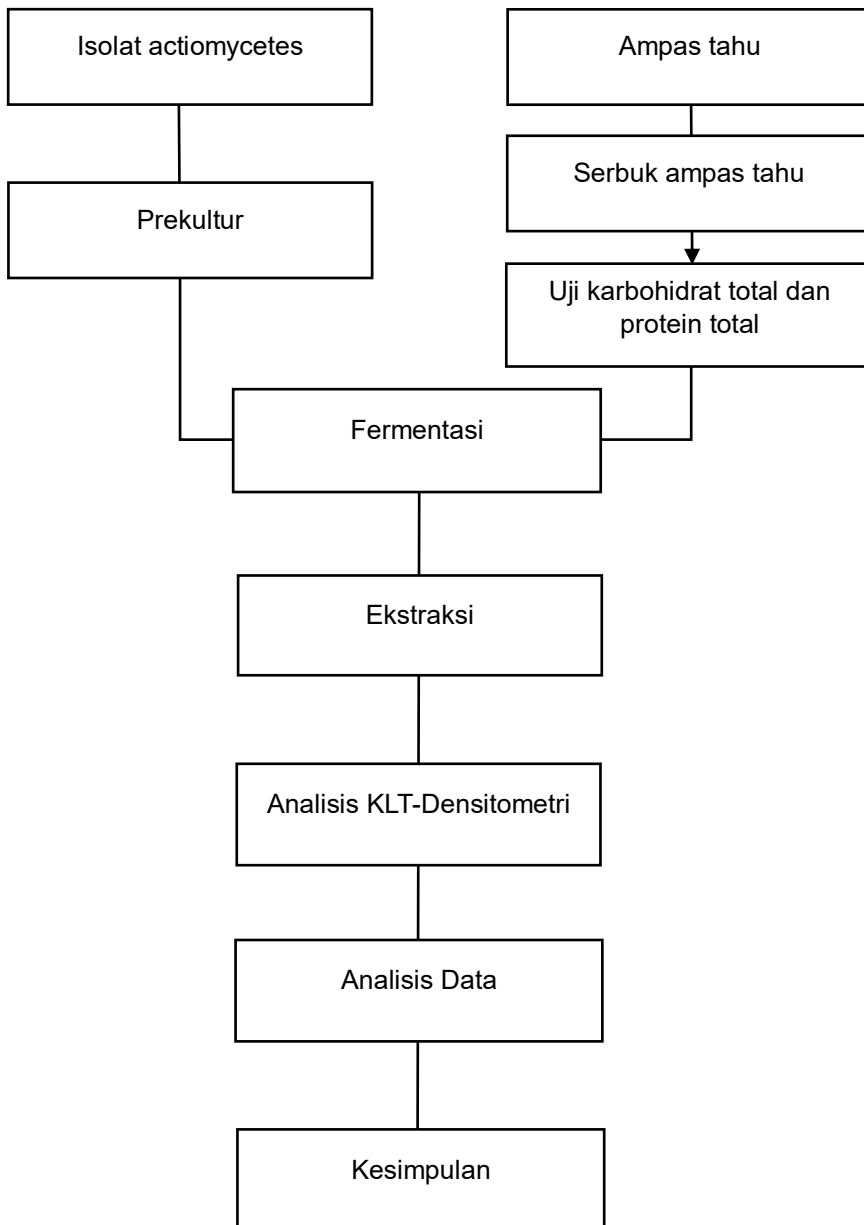


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LAMPIRAN**Lampiran 1. Skema**

Lampiran 2. Komposisi Media

Tabel 3. Komposisi Media *Starch Nitrate Agar* (SNA)

Nama Bahan	Jumlah
<i>Soluble starch</i>	20 gram
NaCl	0,5 gram
Agar	15 gram
KNO ₃	2 gram
K ₂ HPO ₄	1 gram
MgSO ₄ .7H ₂ O	0,05 gram
FeSO ₄ .H ₂ O	0,01 gram
<i>Distilled Water</i>	Ad 1 Liter

Tabel 4. Komposisi Media *Starch Nitrate Agar* (SNB)

Nama Bahan	Jumlah
<i>Soluble starch</i>	20 gram
NaCl	0,5 gram
CaCO ₃	0,02 gram
KNO ₃	2 gram
K ₂ HPO ₄	1 gram
MgSO ₄ .7H ₂ O	0,05 gram
FeSO ₄ .H ₂ O	0,01 gram
<i>Distilled Water</i>	Ad 1 Liter

Tabel 5. Komposisi Media *International Streptomyces Project 2* (ISP 2)

Nama Bahan	Jumlah
Malt extract	10 gram
Yeast extract	4 gram
Dextrose	4 gram
<i>Distilled Water</i>	Ad 1 Liter

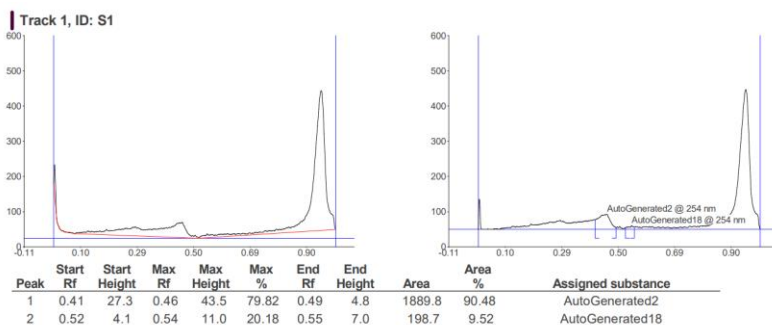
Tabel 6. Komposisi Media Produksi

Konsentrasi	Ampas Tahu	Malt Extract	Yeast Extract	Dextrose	Distilled Water
Tanpa perlakuan (ISP2)	-	1,5 gram	0,6 gram	0,6 gram	Ad 150 mL
0,25%	0,375 g	-	0,6 gram	0,6 gram	Ad 150 mL
0,5%	0,75 g	-	0,6 gram	0,6 gram	Ad 150 mL
1%	1,5 g	-	0,6 gram	0,6 gram	Ad 150 mL
2%	3 g	-	0,6 gram	0,6 gram	Ad 150 mL
4%	6 g	-	0,6 gram	0,6 gram	Ad 150 mL

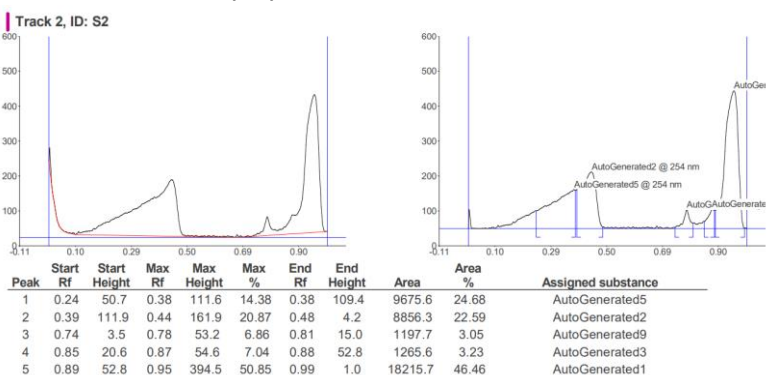
Lampiran 3. Profil KLT-Densitometri

Lampiran 3a. Gelombang 254 nm

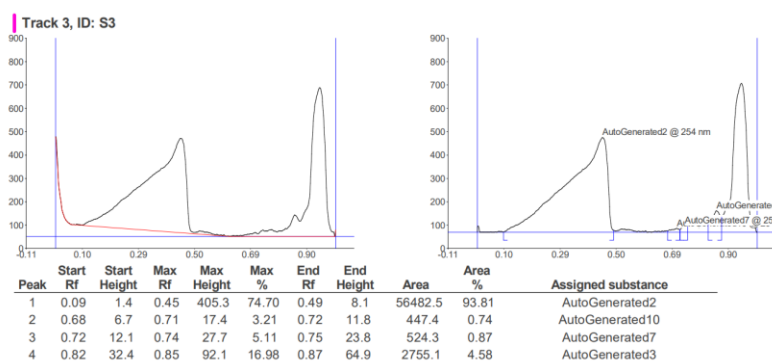
Track 1. Tanpa perlakuan media, Ekstrak etil asetat dari cairan fermentasi



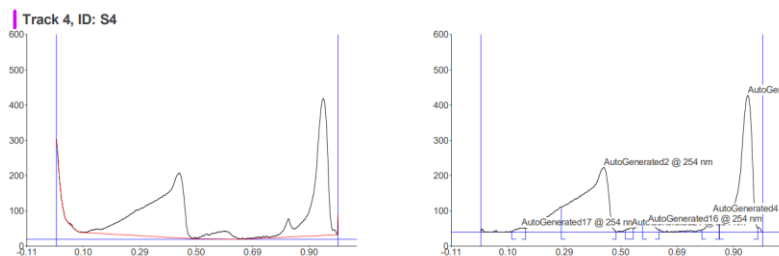
Track 2. Tanpa perlakuan media, Ekstrak etil asetat dari Biomassa



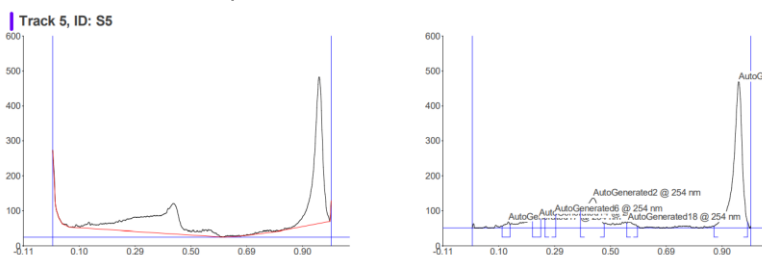
Track 3. Ampas tahu 0.25%, ekstrak etil asetat dari cairan fermentasi



Track 4. Ampas tahu 0.25%, ekstrak etil asetat dari biomassa

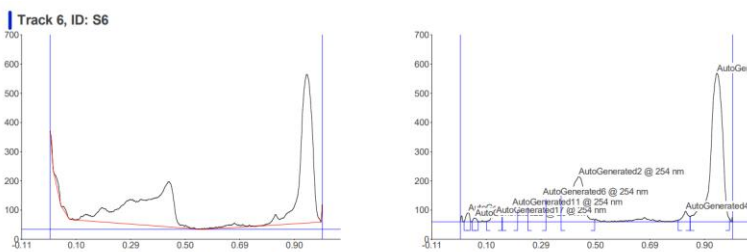


Track 5. Ampas tahu 0.5%, ekstrak etil asetat dari cairan fermentasi



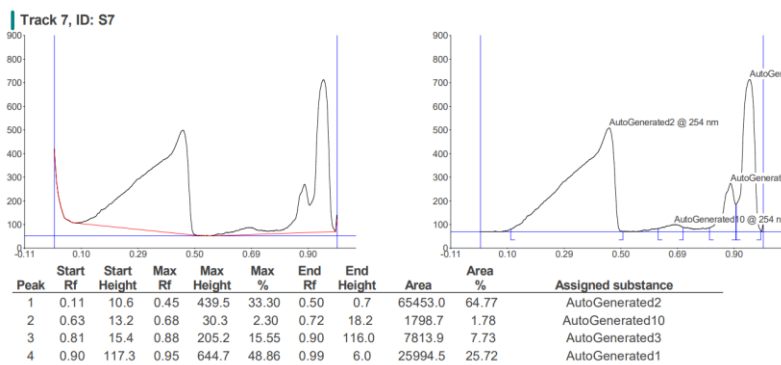
Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	0.11	5.4	0.13	17.8	2.92	0.14	9.6	280.1	1.42	AutoGenerated17
2	0.22	18.9	0.24	28.4	4.65	0.25	25.6	605.7	3.08	AutoGenerated14
3	0.26	29.0	0.30	40.4	6.62	0.30	40.0	1216.5	6.18	AutoGenerated6
4	0.39	49.4	0.43	86.4	14.16	0.47	12.7	4196.1	21.32	AutoGenerated2
5	0.55	14.7	0.56	17.4	2.86	0.59	5.3	437.8	2.22	AutoGenerated18
6	0.87	5.6	0.96	419.7	68.80	0.99	18.0	12941.3	65.77	AutoGenerated1

Track 6. Ampas tahu 0.5%, ekstrak etil asetat dari biomassa

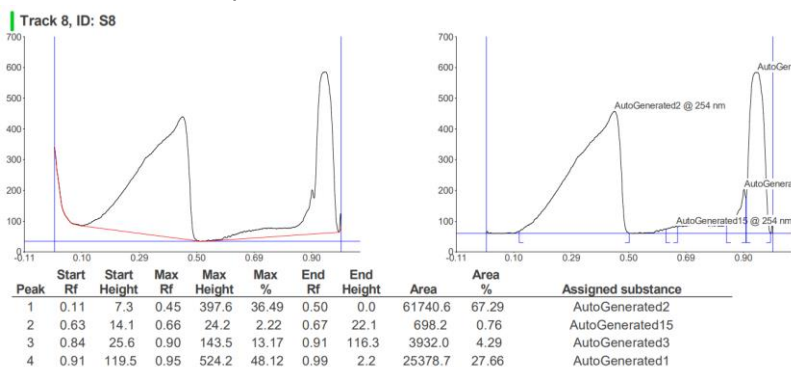


Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	0.01	1.0	0.03	31.0	3.44	0.04	1.9	393.2	1.01	AutoGenerated13
2	0.04	1.3	0.05	12.7	1.41	0.07	0.0	161.4	0.41	AutoGenerated22
3	0.10	0.7	0.13	22.7	2.51	0.15	15.5	713.0	1.82	AutoGenerated17
4	0.15	15.8	0.19	49.3	5.47	0.21	38.8	1767.2	4.52	AutoGenerated11
5	0.25	48.0	0.30	85.0	9.44	0.31	77.1	4150.0	10.61	AutoGenerated6
6	0.37	89.4	0.44	155.1	17.21	0.49	5.7	9323.0	23.83	AutoGenerated2
7	0.80	5.8	0.83	36.3	4.02	0.84	19.0	753.6	1.93	AutoGenerated4
8	0.84	19.0	0.94	509.0	56.49	0.99	11.9	21863.1	55.88	AutoGenerated1

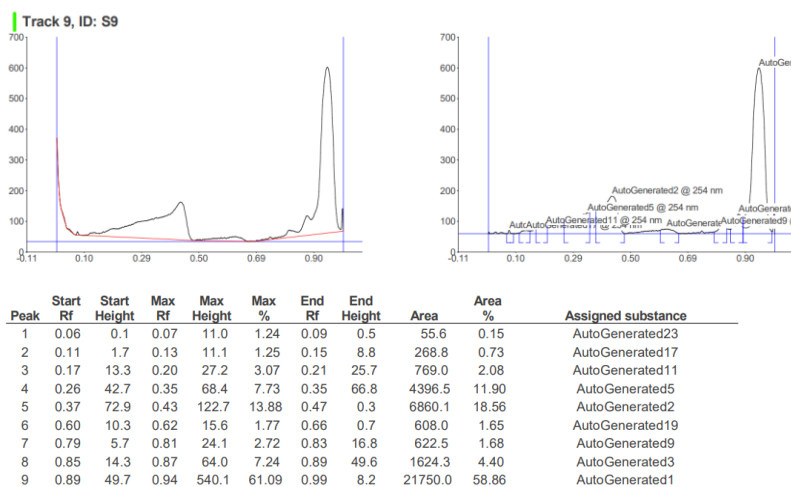
Track 7. Ampas tahu 1%, ekstrak etil asetat dari cairan fermentasi



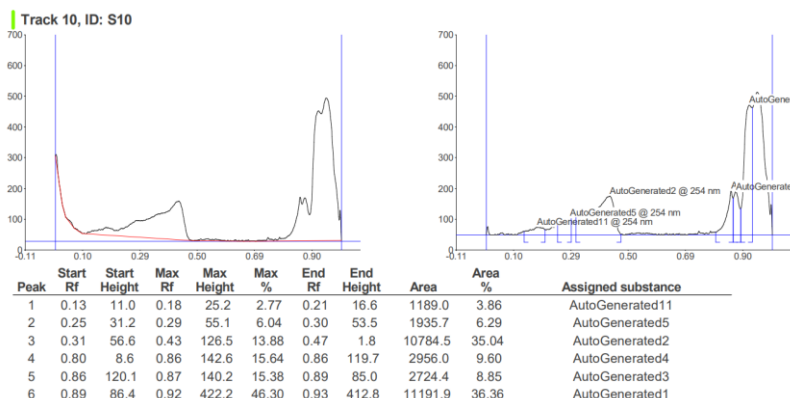
Track 8. Ampas tahu 1%, ekstrak etil asetat dari biomassa



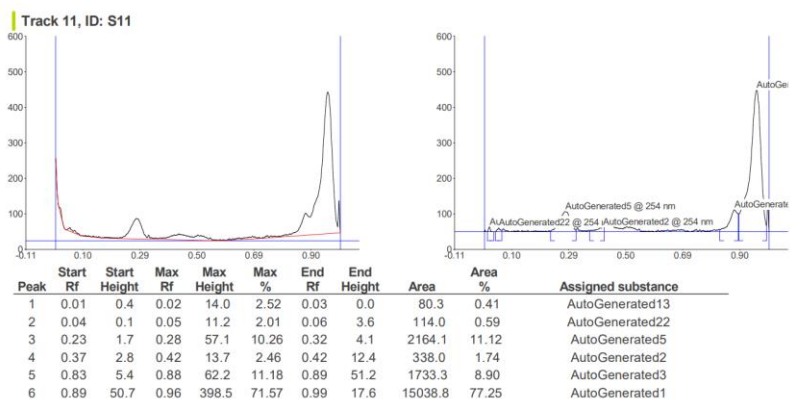
Track 9. Ampas tahu 2%, ekstrak etil asetat dari cairan fermentasi



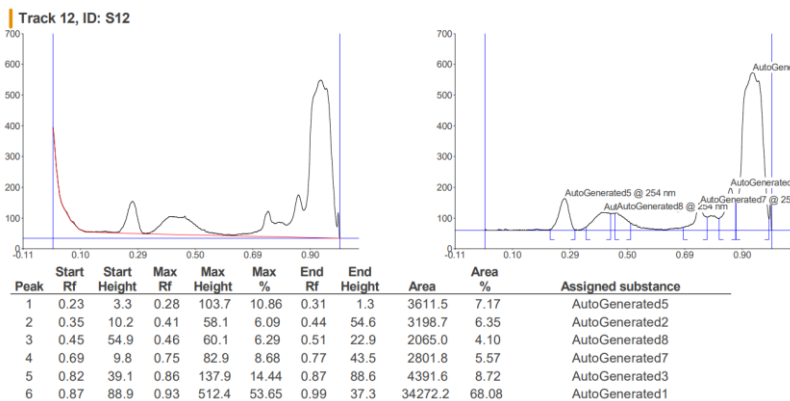
Track 10. Ampas tahu 2%, ekstrak etil asetat dari biomassa



Track 11. Ampas tahu 4%, ekstrak etil asetat dari cairan fermentasi

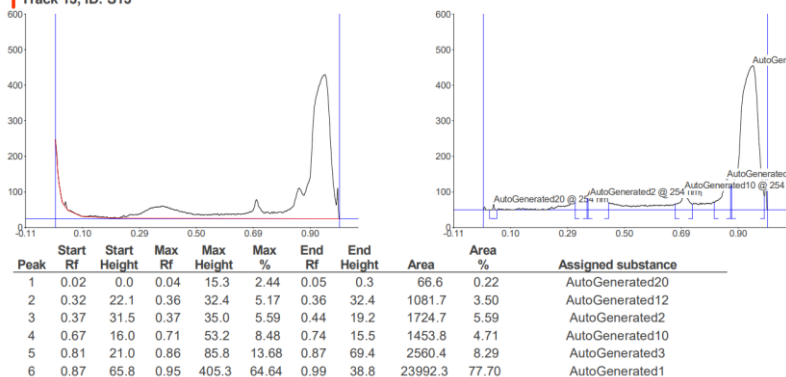


Track 12. Ampas tahu 4%, ekstrak etil asetat dari biomassa



Track 13. Ekstrak etil asetat ampas tahu

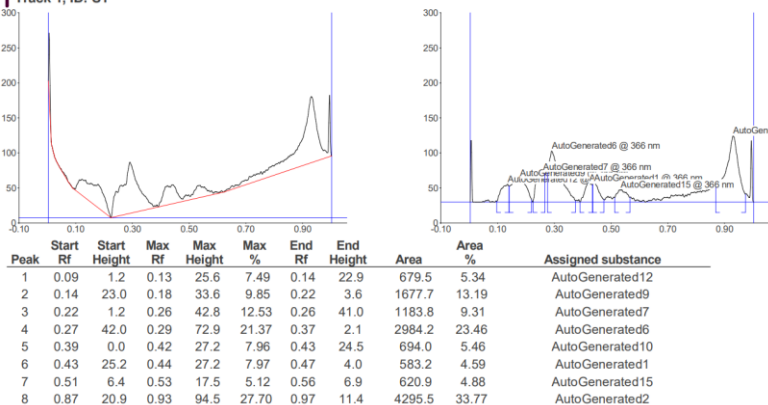
Track 13, ID: S13



Lampiran 3b. Gelombang 366 nm

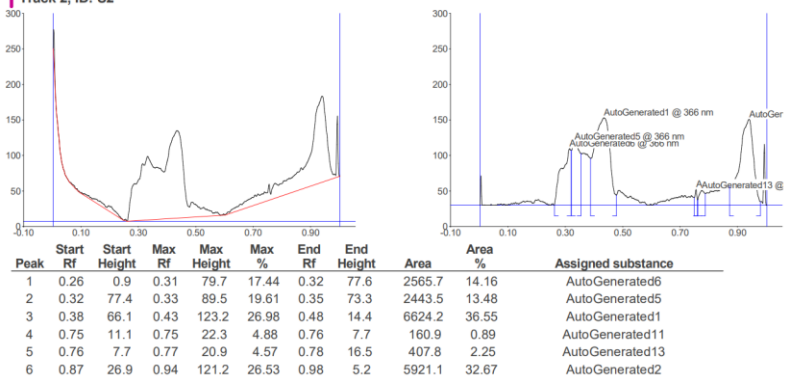
Track 1. Tanpa perlakuan media, Ekstrak etil asetat dari cairan fermentasi

Track 1, ID: S1



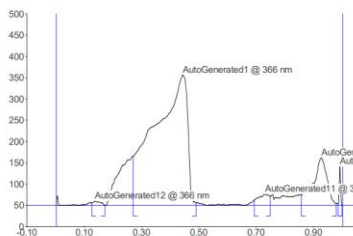
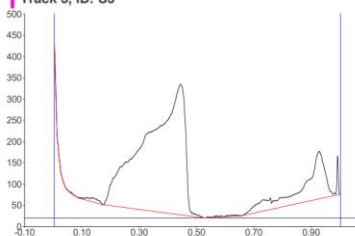
Track 2. Tanpa perlakuan media, Ekstrak etil asetat dari Biomassa

Track 2, ID: S2



Track 3. Ampas tahu 0.25%, ekstrak etil asetat dari cairan fermentasi

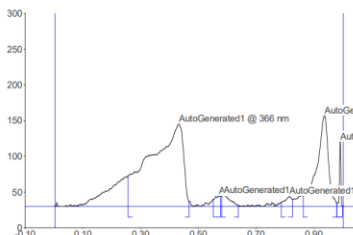
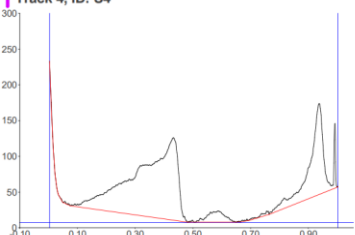
Track 3, ID: S3



Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	0.12	6.1	0.13	10.3	1.89	0.17	0.5	275.2	0.85	AutoGenerated12
2	0.27	115.6	0.44	306.6	56.05	0.49	5.9	34862.3	82.46	AutoGenerated1
3	0.69	13.3	0.73	26.5	4.84	0.75	21.6	1040.4	2.46	AutoGenerated11
4	0.86	24.8	0.92	112.0	20.47	0.98	4.8	5688.8	13.46	AutoGenerated2
5	0.98	3.9	0.99	91.7	16.75	1.00	0.6	412.4	0.98	AutoGenerated4

Track 4. Ampas tahu 0.25%, ekstrak etil asetat dari biomassa

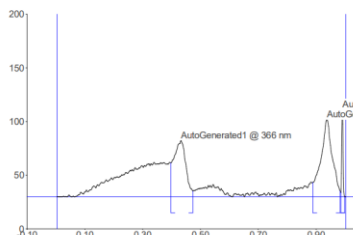
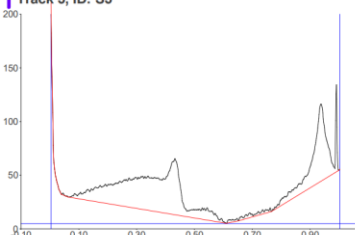
Track 4, ID: S4



Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	0.25	43.1	0.43	115.4	30.56	0.46	6.4	13005.9	66.15	AutoGenerated1
2	0.55	10.0	0.57	14.6	3.86	0.57	14.2	297.3	1.51	AutoGenerated18
3	0.58	14.0	0.58	15.9	4.22	0.64	1.2	469.5	2.39	AutoGenerated17
4	0.78	5.8	0.81	14.4	3.80	0.82	10.3	342.2	1.74	AutoGenerated19
5	0.86	14.2	0.93	127.0	33.62	0.98	5.1	5096.9	25.92	AutoGenerated2
6	0.98	5.2	0.99	90.4	23.94	1.00	0.8	449.4	2.29	AutoGenerated4

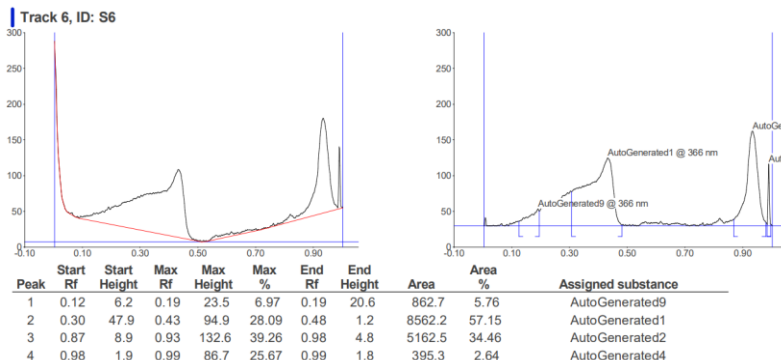
Track 5. Ampas tahu 0.5%, ekstrak etil asetat dari cairan fermentasi

Track 5, ID: S5

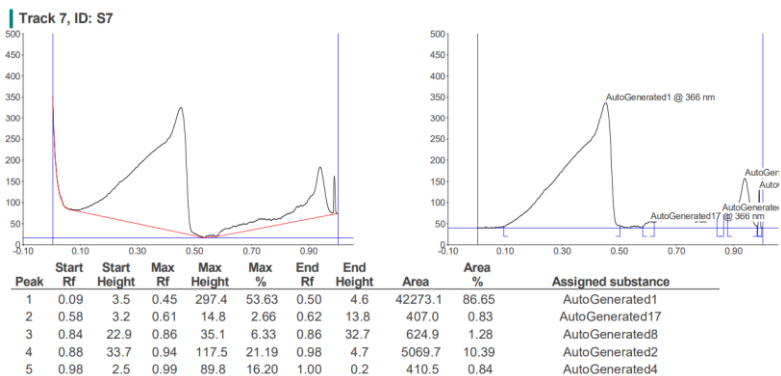


Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	0.39	31.5	0.43	52.3	25.47	0.47	5.3	2203.9	40.51	AutoGenerated1
2	0.89	13.4	0.93	71.8	34.97	0.98	5.6	2870.1	52.75	AutoGenerated2
3	0.98	3.9	0.99	81.2	39.56	1.00	0.2	367.1	6.75	AutoGenerated4

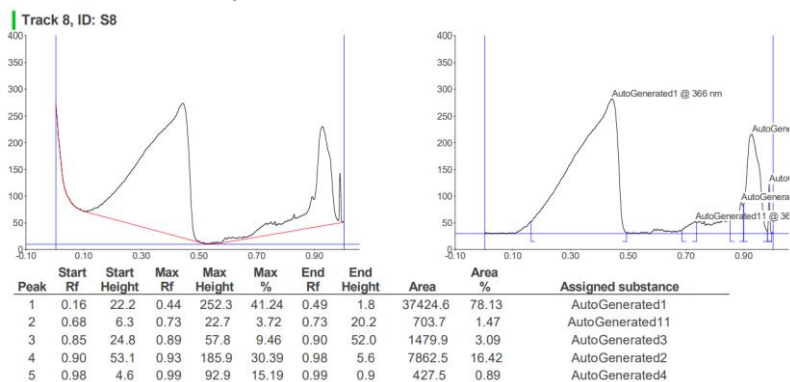
Track 6. Ampas tahu 0.5%, ekstrak etil asetat dari biomassa



Track 7. Ampas tahu 1%, ekstrak etil asetat dari cairan fermentasi

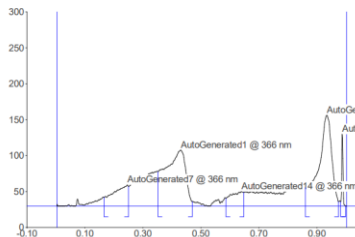
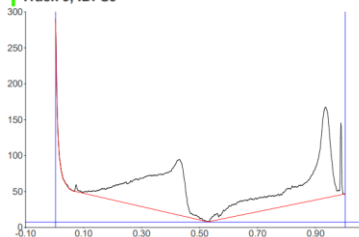


Track 8. Ampas tahu 1%, ekstrak etil asetat dari biomassa



Track 9. Ampas tahu 2%, ekstrak etil asetat dari cairan fermentasi

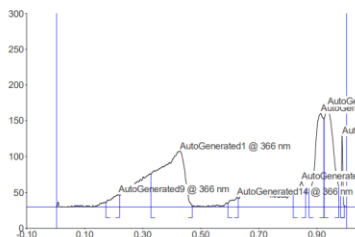
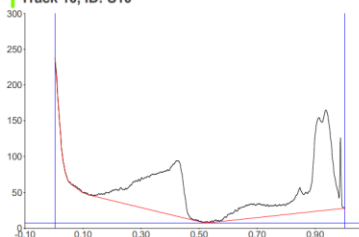
Track 9, ID: S9



Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	0.16	12.1	0.24	29.5	8.35	0.25	27.3	1520.4	10.75	AutoGenerated7
2	0.35	47.8	0.43	77.8	21.98	0.47	6.1	5487.9	38.82	AutoGenerated1
3	0.58	10.6	0.64	20.2	5.71	0.65	19.0	893.1	6.32	AutoGenerated14
4	0.86	25.7	0.93	126.3	35.70	0.97	6.2	5772.6	40.83	AutoGenerated2
5	0.98	5.9	0.98	100.0	28.26	1.00	0.3	464.2	3.28	AutoGenerated4

Track 10. Ampas tahu 2%, ekstrak etil asetat dari biomassa

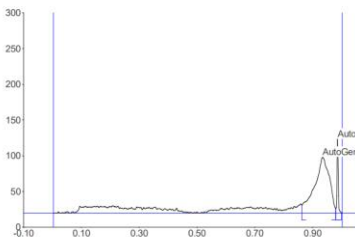
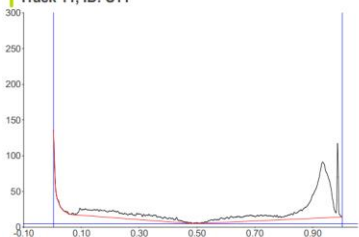
Track 10, ID: S10



Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	0.17	6.2	0.21	17.2	3.35	0.22	16.3	527.3	3.11	AutoGenerated9
2	0.32	45.5	0.42	77.6	15.16	0.47	1.6	6576.0	38.76	AutoGenerated1
3	0.59	4.9	0.62	13.7	2.68	0.63	12.3	314.0	1.85	AutoGenerated14
4	0.82	17.3	0.84	35.2	6.88	0.86	25.0	978.9	5.77	AutoGenerated8
5	0.87	26.0	0.91	130.0	25.39	0.92	123.0	3788.0	22.33	AutoGenerated3
6	0.92	123.4	0.93	139.5	27.25	0.97	28.2	4311.8	25.41	AutoGenerated2
7	0.98	15.0	0.98	98.7	19.28	0.99	1.8	470.2	2.77	AutoGenerated4

Track 11. Ampas tahu 4%, ekstrak etil asetat dari cairan fermentasi

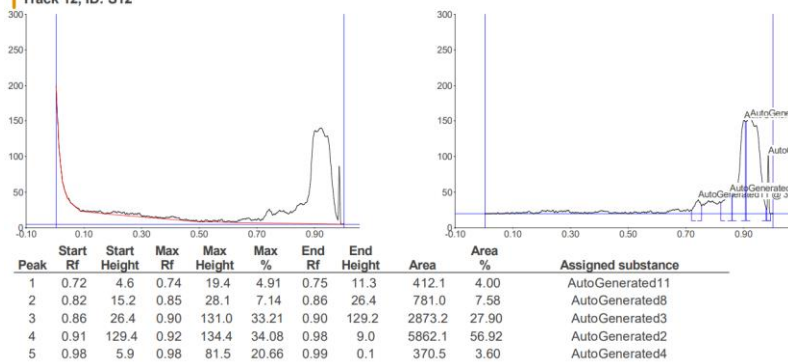
Track 11, ID: S11



Peak	Start Rf	Start Height	Max Rf	Max Height	Max %	End Rf	End Height	Area	Area %	Assigned substance
1	0.86	11.2	0.93	78.0	43.01	0.98	7.1	4020.4	89.28	AutoGenerated2
2	0.98	6.0	0.98	103.4	56.99	1.00	0.5	482.5	10.72	AutoGenerated4

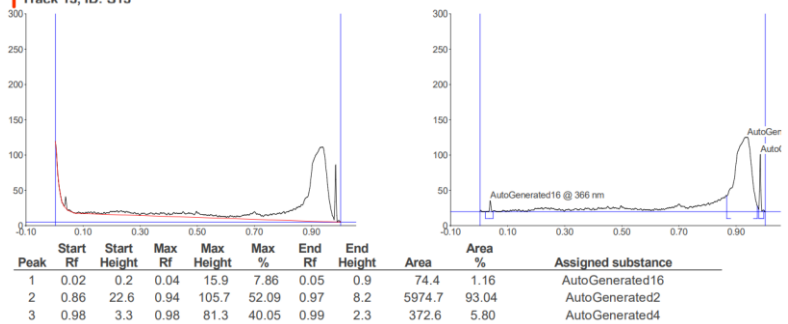
Track 12. Ampas tahu 4%, ekstrak etil asetat dari biomassa

Track 12, ID: S12



Track 13. Ekstrak etil asetat ampas tahu

Track 13, ID: S13



Lampiran 4. Perhitungan

Lampiran 4a. Perhitungan karbohidrat total

Bobot sampel = 1,0020 gram

FP1 = 25 mL larutan/10 mL sampel = 2,5

FP2 = 200 mL larutan/10 mL sampel = 20

***FP (Faktor pengenceran)**

$$\begin{aligned} \text{Volume titrasi} &= 24,0 \text{ mL} - 18,9 \text{ mL} = 5,1 \text{ mL} \\ &= \frac{5,1 \text{ mL} \times 0,1015646 \text{ N}}{0,1 \text{ N}} = 5,1797946 \text{ mL} \end{aligned}$$

$$\begin{aligned} \text{mg glukosa} &= \text{Volume titrasi dalam table luff} + \text{FP1} \times \text{decimal volume titrasi} \\ &= 12,2 + 2,5 \times 0,1797946 \\ &= 12,649487 \text{ mg} \end{aligned}$$

$$\begin{aligned} \% \text{ glukosa} &= \frac{\text{mg glukosa} \times \text{FP2}}{\text{Bobot sampel (mg)}} \times 100\% \\ &= \frac{12,649487 \text{ mg} \times 20}{1002 \text{ (mg)}} \times 100\% = 25,25\% \end{aligned}$$

Faktor konversi = 0,90 (jumlah karbon dari glukosa lebih banyak dari gula sederhana lain dan karbohidrat yang terdeteksi tidak semuanya glukosa)

$$\% \text{karbohidrat} = 25,25\% \times 0,90 = 22,72\%$$

Duplo

Bobot sampel = 1,0398 gram

$$\begin{aligned} \text{Volume titrasi} &= 24,0 \text{ mL} - 18,7 \text{ mL} = 5,3 \text{ mL} \\ &= \frac{5,1 \text{ mL} \times 0,1015646 \text{ N}}{0,1 \text{ N}} = 5,3829238 \text{ mL} \end{aligned}$$

$$\begin{aligned} \text{mg glukosa} &= \text{Volume titrasi dalam table luff} + \text{FP1} \times \text{desimal volume titrasi} \\ &= 12,2 + 2,5 \times 0,3829238 \\ &= 13,15731 \text{ mg} \end{aligned}$$

$$\begin{aligned} \% \text{ glukosa} &= \frac{\text{mg glukosa} \times \text{FP2}}{\text{Bobot sampel (mg)}} \times 100\% \\ &= \frac{13,15731 \text{ mg} \times 20}{1039,8 \text{ (mg)}} \times 100\% = 25,31\% \end{aligned}$$

$$\% \text{karbohidrat} = 25,25\% \times 0,90 = 22,78\%$$

$$\text{Rata-Rata} = \frac{22,72\% + 22,78\%}{2} = 22,75\%$$

Standar deviasi =

$$\sigma = \sqrt{\frac{\sum_{i=2}^n (x_i - \bar{x})^2}{n-1}} = \sqrt{\frac{(22,72 - 22,75)^2 + (22,78 - 22,75)^2}{2-1}} = \sqrt{\frac{0,0009 + 0,0009}{1}} = 0,0424264069$$

Lampiran 4b. Perhitungan protein total

Bobot sampel = 0,5264 gram

$$\begin{aligned} \text{N}\% &= \frac{(\text{Volume titrasi sampel} - \text{Volume titrasi blanko}) \times \text{N HCl} \times 14,007}{\text{bobot sampel (mg)}} \times 100\% \\ &= \frac{(11,4 \text{ mL} - 0,1 \text{ mL}) \times 0,093193 \times 14,007}{526,4 \text{ mg}} \times 100\% = 2,80\% \end{aligned}$$

Faktor konversi = Nitrogen sebanyak 16% dari protein total

$$= 100\% / 16\% = 6,25$$

$$\text{Protein \%} = 2,80\% \times 6,25 = 17,51\%$$

Duplo

Bobot sampel = 0,5268 gram

$$\begin{aligned} \text{N\%} &= \frac{(\text{Volume titrasi sampel} - \text{Volume titrasi blanko}) \times N \text{ HCl} \times 14,007}{\text{bobot sampel (mg)}} \times 100\% \\ &= \frac{(10,85 \text{ mL} - 0,1 \text{ mL}) \times 0,093193 \times 14,007}{526,8 \text{ mg}} \times 100\% = 2,66\% \end{aligned}$$

$$\text{Protein \%} = 2,66\% \times 6,25 = 16,65\%$$

$$\text{Rata-Rata N\%} = \frac{2,80\% + 2,66\%}{2} = 2,73\%$$

Standard deviasi =

$$\sigma = \sqrt{\frac{\sum_{i=2}^n (x_i - \bar{x})^2}{n-1}} = \sqrt{\frac{(2,80 - 2,73)^2 + (2,66 - 2,73)^2}{2-1}} = \sqrt{\frac{0,0049 + 0,0049}{1}} = 0,098994949$$

$$\text{Rata-Rata Protein} = \frac{17,51\% + 16,65\%}{2} = 17,08\%$$

Standard deviasi =

$$\sigma = \sqrt{\frac{\sum_{i=2}^n (x_i - \bar{x})^2}{n-1}} = \sqrt{\frac{(17,51 - 17,08)^2 + (16,65 - 17,08)^2}{2-1}} = \sqrt{\frac{0,1849 + 0,1849}{1}} = 0,60811183182$$

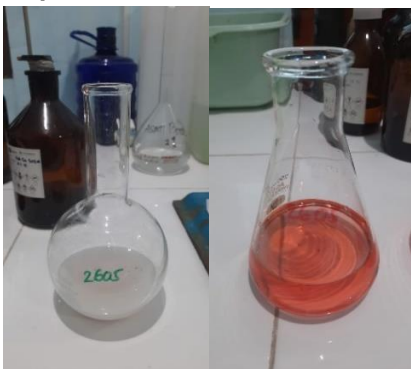
Lampiran 5c. Perhitungan volume totalan KLT

Jumlah ekstrak : 25 mg

Jumlah pelarut : 0,5 mL

$$\text{Konsentrasi larutan} = \frac{25 \text{ mg}}{0,5 \text{ mL}} \times 100\% = \frac{0,025 \text{ g}}{0,5 \text{ mL}} \times 100\% = 5\%$$

Volume yang ditotol 5 μL

Lampiran 5. Dokumentasi Penelitian

Gambar 10. Uji karbohidrat dan protein total ampas tahu



Gambar 11. Sentrifuge hasil fermentasi



Gambar 12. Inokulasi Isolat ke medium starter



Gambar 13. Ekstraksi cair-cair



Gambar 14. Inokulasi starter ke medium produksi



Gambar 15. Penguapan ekstrak



Gambar 16. Sonikasi media produksi



Gambar 17. Analisis KLT-Densitometri