

BAB V

KESIMPULAN DAN SARAN

A. Kesimpulan

Berdasarkan hasil dari penelitian yang telah dilakukan maka dapat disimpulkan bahwa :

Pertama, variasi konsentrasi karagenan dan glukomanan sebagai basis gel dapat mempengaruhi kekuatan serta stabilitas sediaan gel pengharum ruangan.

Kedua, konsentrasi sebesar 0,5% dan tanpa penambahan minyak atsiri nilam (kontrol negatif) dapat meningkatkan nilai kesukaan wangi sediaan gel pengharum ruang

Ketiga, variasi konsentrasi 0,75% (F2), 1% (F3) dan 1,25% (F4) minyak nilam sebagai *fiksatif* dapat meningkatkan ketahanan wangi sediaan gel pengharum ruangan selama satu bulan pemakaian.

B. Saran

Berdasarkan hasil dari penelitian yang telah dilakukan, penulis menyarankan perlu dilakukan penelitian lebih lanjut agar mendapatkan hasil yang lebih maksimal lagi, yaitu :

1. Perlu dilakukan uji ketahanan wangi sediaan gel pengharum ruangan pada kondisi penyimpanan.
2. Perlu dilakukan uji aktivitas sediaan gel pengharum ruangan kombinasi minyak atsiri jeruk nipis dan nilam sebagai anti repelant mau anti depressan.

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Lampiran 1. Hasil determinasi tanaman buah jeruk nipis



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HASIL DETERMINASI TUMBUHAN

Nama Sampel : *Citrus aurantifolia* (Christm.) Swingle
Familia : Rutaceae

Hasil Determinasi menurut C.A. Backer & R.C. Bakhuizen van den Brink, Jr. (1963,1965):
1b-2b-3b-4b-12b-13b-14b-17b-18b-19b-20b-21b-22b-23b-24b-25b-26b-27a-28b-29b-30b-31a-32a-33a-34a-35a-36d-37b-38b-39b-41b-42b-44b-45b-46c-50b-51b-53b-54b-56b-57b-58b-59d-72b-73b-74a-75b-76a-77a-78b-103c-104b-106b-107a-108b-109b-134a-135b-136b-137a-138c-139b-140a-141b-142b-143b-147b-156b-157a-158b-160a-161a **133. Rutaceae**
1b-18b-19b-20a-21a **23. Citrus**
1b-4b-5b-6b-7a-8b ***Citrus aurantifolia* (Christm.) Swingle**

Deskripsi Tumbuhan :

Habitus : pohon, menahun, tumbuh tegak, tinggi 0.5-3.5 m. Akar : tunggang, bercabang, putih kotor atau putih kekuningan. Batang : bentuk bulat, berkayu ulet, tumbuh tegak, bercabang banyak, warna abu-abu kusam, permukaan halus atau berduri, panjang duri 0.3-1.2 cm; ranting tidak berduri, permukaan gundul dan kusam. Daun : majemuk menjari beranak daun satu, tersebar, tangkai daun ke arah ujung kadang-kadang bersayap sedikit, panjang 0.5-2.5 cm, tepi sayap (alae) beringgit melekuk ke dalam; helaian daun bulat telur elliptis atau bulat telur memanjang, panjang 2.5-9 cm, lebar 1.5-5.5 cm, pangkal daun bulat, tepi daun beringgit, ujung daun tumpul dan melekuk ke dalam sedikit, permukaan daun mengkilat, daging daun seperti kertas, pertulangan daun menyirip, permukaan atas hijau tua, permukaan bawah hijau muda; panjang tangkai daun 0.5-2.5 cm, lebar 1.5-4.5 mm. Bunga : tunggal atau berkelompok hingga 7, di ketiak daun, diameter 1.5-2.5 cm; kelopak bunga berbentuk seperti mangkok, berbagi 4-5, berbentuk segitiga melebar, diameter 0.4-0.7 cm, berwarna putih kekuningan, permukaan sedikit berbulu; daun mahkota bunga berjumlah 4-5, berbentuk bulat telur atau memanjang atau lanset, panjang 7-12.5 mm, lebar 2.5-5 mm, ujungnya meruncing hingga tumpul, berwarna putih; benang sari 18-25, panjang tangkai sari 2-3 mm, kepala sari berbentuk memanjang; tangkai putik silindris putih kekuningan, panjang 3 mm, bakal buah berbentuk bulat. Buah : buah sejati tunggal berdaging jeruk (hesperidium), bentuk bola, permukaan licin, warna hijau muda hingga kuning, diameter 3.5-5 cm, tebal kulit buah 0.2-0.5 cm, daging buah kuning kehijauan. Biji : bulat telur sungsang, permukaan licin, putih kekuningan.

Surakarta, 1 Maret 2019

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Lampiran 2. Hasil determinasi tanaman daun nilam



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HASIL DETERMINASI TUMBUHAN

Nama Sampel : *Pogostemon cablin* (Blanco) Benth.
Synonym : *Mentha cablin* Blanco
Pogostemon comosus Miq.
Pogostemon tomentosus Hassk.
Familia : Lamiaceae

Hasil Determinasi menurut C.A. Backer & R.C. Bakhuizen van den Brink, Jr.(1963; 1965) :
1b-2b-3b-4b-12b-13b-14b-17b-18b-19b-20b-21b-22b-23b-24b-25b-26b-27a-28b-29b-30b-31b-403b-404b-405a-406b-409a-410b-411b **190. Lamiaceae**
1b-2b-3a-4c-5b-7b-8c-11a-12a-13b-15c-20b-21a-22b **24. Pogostemon**
1b-2b-3b-5b ***Pogostemon cablin* (Blanco) Benth.**

Deskripsi Tumbuhan :

Habitus : terna atau perdu kecil, menahun, tumbuh tegak atau menjalar, tinggi 0.3-0.75 m, aromatik.
Akar : tunggang, bercabang, putih kotor atau putih kekuningan hingga coklat keputihan. Batang : sedikit berkayu hingga berkayu, terutama pada bagian pangkal, berbentuk bulat, beruas dan bercabang, menebal pada bagian buku, permukaan batang muda berambut rapat dan lengket sedangkan batang dewasa sedikit berambut hingga gundul, hijau hingga hijau kecoklatan. Daun : tunggal, terletak berhadapan; bentuk helaian daun bulat telur hingga bulat memanjang, panjang hingga 12 cm, lebar 10 cm, pangkal tumpul hingga membulat, tepi bergerigi ganda, ujung runcing atau meruncing, permukaan berambut halus, banyak terdapat kelenjar yang lengket, pertulangan menyirip, hijau muda hingga hijau tua, sangat aromatik ketika diremas; tangkai daun bulat, hijau, panjang 8 cm, permukaan berambut hingga gundul. Bunga : majemuk berupa bulir, di ujung batang dan cabang, panjang 2.5-14 cm; tangkai bunga berambut hingga gundul, panjang 2-8 cm, diameter 1.5-2 cm; kelopak bunga berbentuk seperti lonceng, panjang kelopak bunga 5-6.5 mm, bercuping 5, berlekatan, hijau tua, rambut kelenjar sangat padat; mahkota bunga putih keunguan, permukaan ditutupi rambut berwarna ungu, panjang mahkota bunga 6-9 mm, panjang tabung mahkota lebih pendek atau sama dengan kelopak bunga, cuping mahkota berbibir 2, bagian atas bercuping 3; benangsari 4, muncul dari mulut tabung mahkota, tangkai sari ungu, kepala sari ungu; putik satu, kepala putik bercabang 2, putih, tangkai putik panjang, bakal buah beruang 4, gundul. Buah : bentuk bulat telur, pipih, permukaan gundul dan halus. Biji : kecil, ketika masak berwarna hitam.

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Lampiran 3. Gambar sampel buah jeruk nipis serta daun nilam

Buah jeruk nipis



Daun nilam



Pengeriang-anginan daun nilam (ruangan)



Penjemuran daun nilam (sinar matahari)

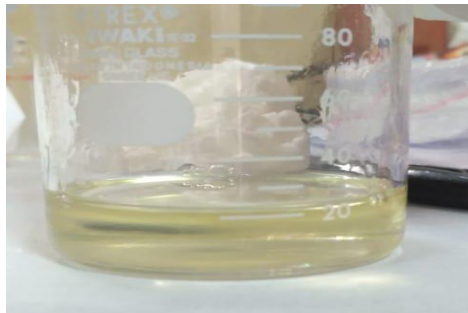
Lampiran 4. Hasil isolasi & perhitungan rendemen minyak atsiri buah jeruk nipis dan daun nilam



Buah jeruk nipis



Daun nilam



Minyak atsiri buah jeruk nipis



Minyak atsiri daun nilam

a. Perhitungan % rendemen minyak atsiri jeruk nipis

$$\begin{aligned} \text{Rendemen minyak atsiri buah jeruk nipis} &= \frac{\text{volume minyak} \times \text{BJ}}{\text{bobot sampel}} \times 100\% \\ &= \frac{22 \text{ ml} \times 0,87}{10000 \text{ g}} \times 100\% = 0,19 \text{ \% v/b} \end{aligned}$$

Jadi, kadar minyak atsiri kulit buah jeruk nipis adalah 0,19% v/b

b. Perhitungan % rendemen minyak atsiri daun nilam

$$\begin{aligned} \% \text{ Rendemen minyak atsiri daun nilam} &= \frac{\text{volume minyak} \times \text{BJ}}{\text{bobot sampel}} \times 100\% \\ &= \frac{14 \text{ ml} \times 0,95}{700 \text{ g}} \times 100\% = 1,9\% \text{ v/b} \end{aligned}$$

Jadi, kadar minyak atsiri daun nilam adalah 1,9% v/b

Lampiran 5. Rangkaian alat destilasi uap dan air



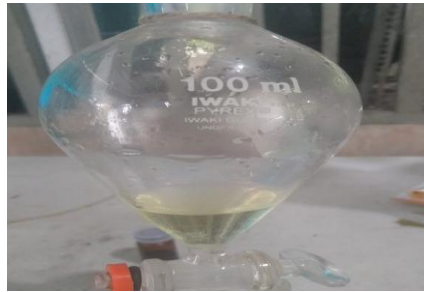
Rangkaian alat destilasi uap dan air



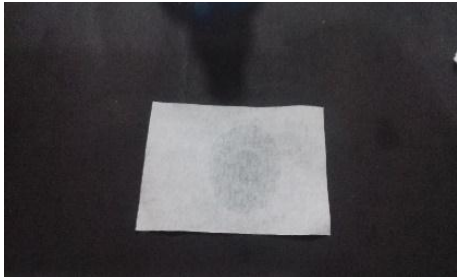
Tabung destilat



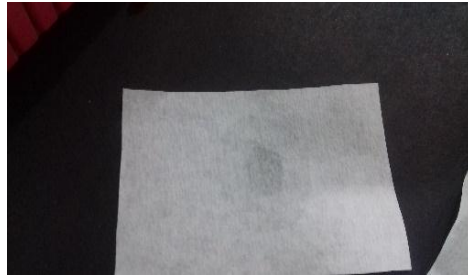
Dandang (wadah sampel)



Corong pisah

Lampiran 6. Hasil uji identifikasi minyak atsiri jeruk nipis dan nilam

Uji noda minyak atsiri jeruk nipis



Uji noda minyak atsiri nilam

Uji kelarutan minyak atsiri jeruk nipis
dalam airUji kelarutan minyak atsiri daun nilam
dalam air

Lampiran 7. Hasil & perhitungan uji indeks bias minyak atsiri jeruk nipis dan Nilam



Indeks bias minyak atsiri jeruk nipis



Indeks bias minyak atsiri nilam



Alat refraktometer



Termometer digital

a. Perhitungan indeks bias minyak atsiri jeruk nipis :

Konversi suhu tiap kenaikan $1^{\circ}\text{C} = 0,00045$

Suhu ruang praktek = $32,6^{\circ}\text{C}$

Indeks bias praktek = 1,481

Indeks bias teoritis minyak atsiri jeruk nipis $20^{\circ}\text{C} = 1,4750 - 14770$

Indeks bias = $[(32,6-20) \times 0,00045] = 0,005$

Indeks bias $32,6^{\circ}\text{C} = (1,4750 + 0,005) - (1,4770 + 0,005) = 1,48 - 1,482$

b. Perhitungan indeks bias minyak nilam

Konversi suhu tiap kenaikan $1^{\circ}\text{C} = 0,00042$

Suhu percobaan = $32,6^{\circ}\text{C}$

Indeks bias praktek = 1,519

Indeks bias teoritis minyak nilam $25^{\circ}\text{C} = 1,512-1,52$

Indeks bias = $[(32,6-20) \times 0,00042] = 0,005$

Indeks bias $32,6^{\circ}\text{C} = (1,507 + 0,005) - (1,515 + 0,005) = 1,51 - 1,52$

Lampiran 8. Hasil & perhitungan uji bobot jenis minyak atsiri

Bobot botol kosong (g)	Bobot botol + air (g)	Bobot botol + minyak (g)		Bobot minyak (g)	
		Nilam	Jeruk nipis	Nilam	Jeruk nipis
10877	16189	15897	15533	5020	4656
10877	16188	15890	15530	5020	4653
10877	16190	15888	15529	5021	4652

a. Perhitungan bobot jenis minyak atsiri buah jeruk nipis :

1. Bobot jenis

$$\text{Bobot botol + air} = 16189 \text{ gram}$$

$$\text{Bobot botol kosong} = \underline{10877 \text{ gram}}$$

$$\text{Bobot air} = 5313 \text{ gram}$$

$$\text{Bobot jenis minyak atsiri} = \frac{4656}{5312} = 0,87$$

2. Bobot jenis

$$\text{Bobot botol + air} = 16,188 \text{ gram}$$

$$\text{Bobot botol kosong} = \underline{10877 \text{ gram}}$$

$$\text{Bobot air} = 5313 \text{ gram}$$

$$\text{Bobot jenis minyak atsiri} = \frac{4655}{5312} = 0,87$$

3. Bobot jenis

$$\text{Bobot botol + air} = 16,190 \text{ gram}$$

$$\text{Bobot botol kosong} = \underline{10877 \text{ gram}}$$

$$\text{Bobot air} = 5313 \text{ gram}$$

$$\text{Bobot jenis minyak atsiri} = \frac{4652}{5313} = 0,87$$

$$\text{Rata-rata bobot jenis minyak atsiri buah jeruk nipis} = \frac{0,87+0,87+0,87}{3} = 0,87$$

Konversi suhu bobot jenis minyak jeruk nipis

Faktor konversi suhu setiap kenaikan $1^{\circ}\text{C} = 0,00070$

Suhu ruang praktek = 30°C

Bobot jenis teoritis minyak atsiri jeruk nipis $20^{\circ}\text{C} = 0,854-0,859 \text{ b/v}$

Bobot jenis = $(30^{\circ}\text{C} - 20^{\circ}\text{C}) \times 0,00070 = 0,007$

Bobot jenis $30^{\circ}\text{C} = (0,854 + 0,007) - (0,859 + 0,007) = 0,86 - 0,87 \text{ b/v}$

A. Perhitungan bobot jenis minyak atsiri daun nilam

1. Bobot jenis

$$\begin{aligned} \text{Bobot botol + air} &= 16189 \text{ gram} \\ \text{Bobot botol kosong} &= \underline{10877 \text{ gram}} - \\ \text{Bobot air} &= 5312 \text{ gram} \\ \text{Bobot jenis minyak atsiri} &= \frac{5020}{5312} = 0,95 \end{aligned}$$

2. Bobot jenis

$$\begin{aligned} \text{Bobot botol + air} &= 16188 \text{ gram} \\ \text{Bobot botol kosong} &= \underline{10877 \text{ gram}} - \\ \text{Bobot air} &= 5313 \text{ gram} \\ \text{Bobot jenis minyak atsiri} &= \frac{5021}{5312} = 0,95 \end{aligned}$$

3. Bobot jenis

$$\begin{aligned} \text{Bobot botol + air} &= 16190 \text{ gram} \\ \text{Bobot botol kosong} &= \underline{10877 \text{ gram}} - \\ \text{Bobot air} &= 5313 \text{ gram} \\ \text{Bobot jenis minyak atsiri} &= \frac{5017}{5313} = 0,94 \end{aligned}$$

$$\text{Rata-rata bobot jenis minyak atsiri daun nilam} = \frac{0,95+0,95+0,94}{3} = 0,95$$

Konversi suhu bobot jenis minyak nilam

Faktor konversi suhu setiap kenaikan $1^{\circ}\text{C} = 0,00073$

Suhu ruang praktek = 30°C

Bobot jenis teoritis minyak atsiri nilam $25^{\circ}\text{C} = 0,950 - 0,975 \text{ b/v}$

Bobot jenis = $(30^{\circ}\text{C} - 25^{\circ}\text{C}) \times 0,00073 = 0,00365$

Bobot jenis $30^{\circ}\text{C} = (0,950 + 0,003) - (0,975 + 0,003) = 0,95 - 0,98 \text{ b/v}$

Lampiran 9. Hasil uji kelarutan minyak atsiri jeruk nipis dan nilam

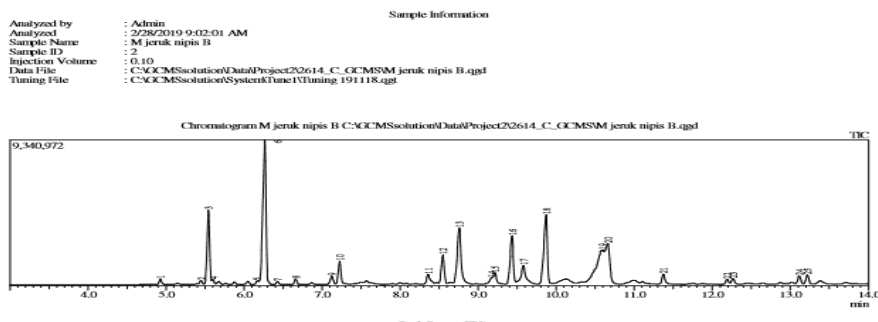
Minyak atsiri jeruk nipis



Minyak atsiri nilam

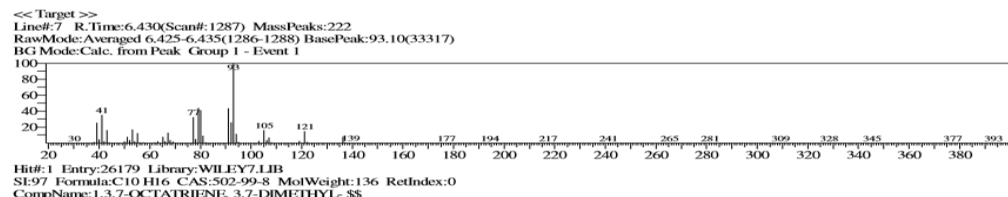
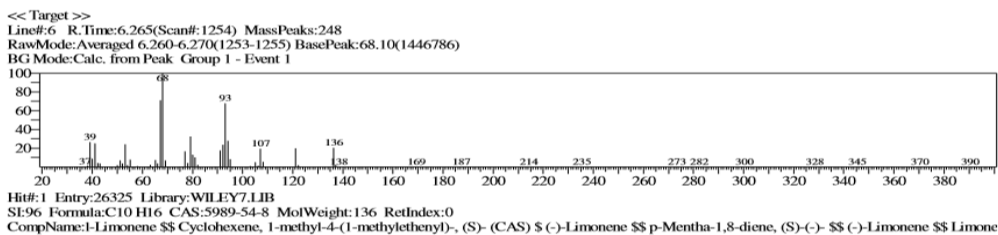
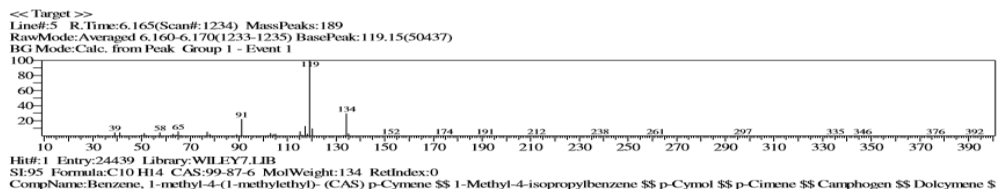
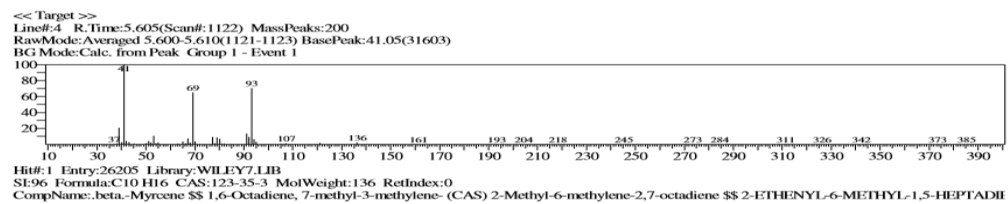
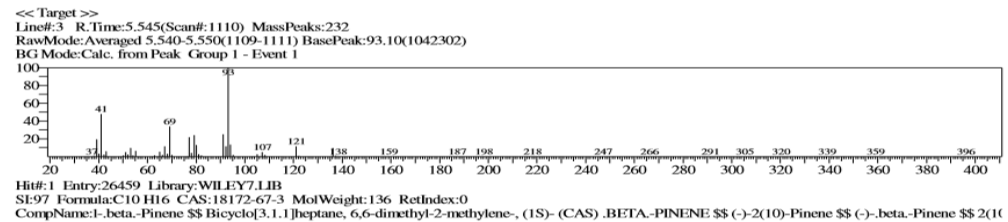
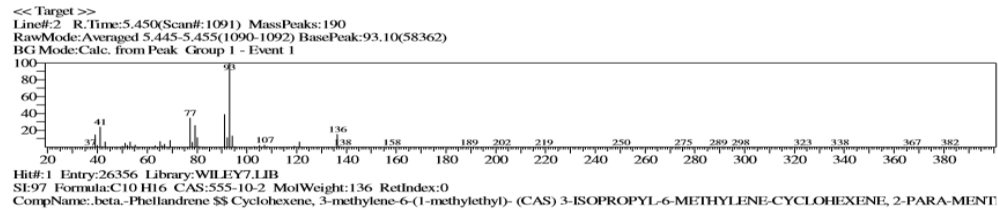
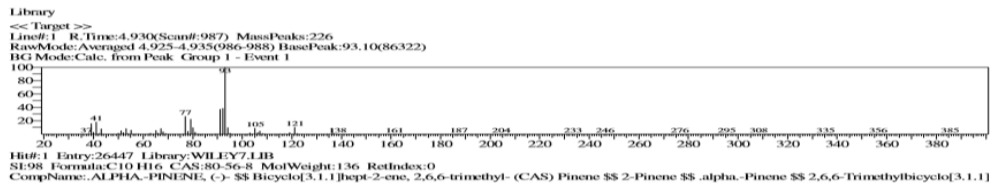
Lampiran 10. Hasil analisis senyawa minyak atsiri buah jeruk nipis menggunakan GC-MS

a. Hasil analisis GC (kromatografi gas) minyak atsiri buah jeruk nipis



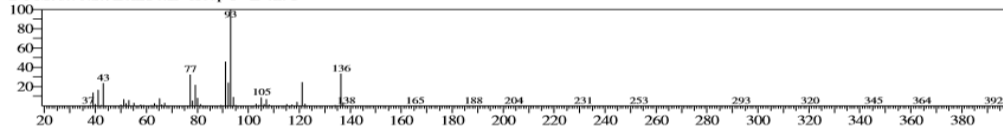
Peak	R.Time	Area %	BM	Senyawa yang diduga
1	4.929	0.59	136	Alpha – Pinene
2	5.448	0.37	136	Sabinene/ beta phellandrene
3	5.544	8.80	136	2-beta pinene
4	5.605	0.36	136	Beta-myrcene
5	6.165	0.45	134	Benzene,
6	6.267	21.57	136	1-limonene
7	6.428	0.32	136	1,3,7 – octatriene
8	6.661	0.63	136	Gamma-terpinene
9	7.124	1.04	136	Alpha-terpinolene
10	7.225	2.64	154	Linalool
11	8.360	1.60	152	p-mentha-1,5-dien-8-ol
12	8.548	4.03	154	3-cyclohexen
13	8.758	9.82	154	Alpha-terpineol
14	9.170	0.66	156	Alpha- citronellol
15	9.215	1.39	154	Nerol
16	9.433	7.21	152	Z-citral
17	9.579	4.03	154	Geraniol
18	9.871	11.49	152	E-citral
19	10.594	9.49	204	Delta,-guaiene
20	10.661	8.73	204	bicyclogermacrene
21	11.372	1.25	196	Neryl acetate
22	12.191	0.61	204	Trans- caryophyllene
23	12.265	0.71	204	Alpha-bergamotene
24	13.114	1.04	204	Farnesene
25	13.217	1.18	204	Beta- bisabolone

b. Hasil analisis MS (spektrofotometri massa) minyak atsiri jeruk nipis



<< Target >>

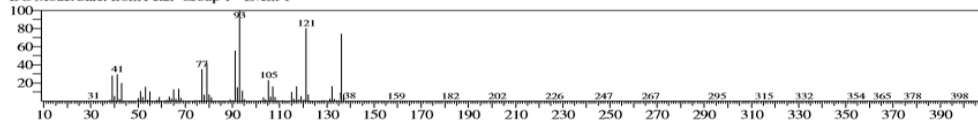
Line#:8 R.Time:6.660(Scan#:1333) MassPeaks:192
 RawMode:Averaged 6.655-6.665(1332-1334) BasePeak:93.10(75665)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:26280 Library:WILEY7.LIB
 SE:96 Formula:C10 H16 CAS:99-85-4 MolWeight:136 RetIndex:0
 CompName:.gamma.-Terpinene \$\$ 1,4-Cyclohexadiene, 1-methyl-4-(1-methylethyl)- (CAS) 1-ISOPROPYL-4-METHYL-1,4-CYCLOHEXADIENE \$\$ Mosten

<< Target >>

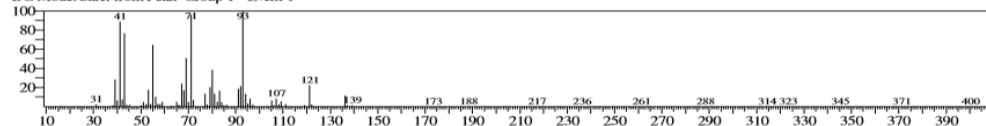
Line#:9 R.Time:7.125(Scan#:1426) MassPeaks:239
 RawMode:Averaged 7.120-7.130(1425-1427) BasePeak:93.10(63897)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:26340 Library:WILEY7.LIB
 SE:94 Formula:C10 H16 CAS:586-62-9 MolWeight:136 RetIndex:0
 CompName:.ALPHA.-TERPINOLENE \$\$ Cyclohexene, 1-methyl-4-(1-methylethylidene)- (CAS) 1,4(8)-P-MENTHADIENE \$\$ 1-METHYLENE-4-ISOPROP

<< Target >>

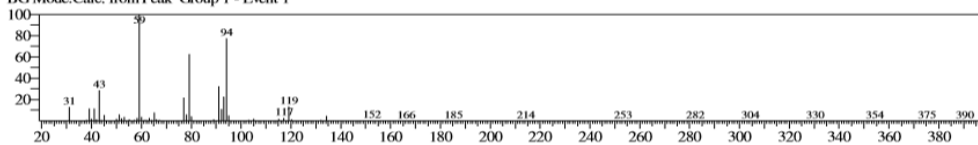
Line#:10 R.Time:7.225(Scan#:1446) MassPeaks:195
 RawMode:Averaged 7.220-7.230(1445-1447) BasePeak:93.10(156139)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:42931 Library:WILEY7.LIB
 SE:97 Formula:C10 H18 O CAS:78-70-6 MolWeight:154 RetIndex:0
 CompName:LINALLOL L \$\$

<< Target >>

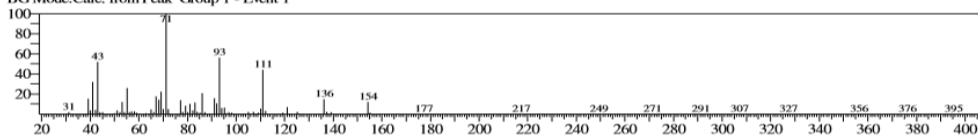
Line#:11 R.Time:8.360(Scan#:1673) MassPeaks:220
 RawMode:Averaged 8.355-8.365(1672-1674) BasePeak:59.05(117203)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:41021 Library:WILEY7.LIB
 SE:92 Formula:C10 H16 O CAS:1686-20-0 MolWeight:152 RetIndex:0
 CompName:p-Menta-1,5-dien-8-ol \$\$ 2,4-Cyclohexadiene-1-methanol, .alpha.,.alpha.,4-trimethyl- (CAS) .alpha.-Phellandren-8-ol \$\$ p-Menth-1,5-dien-8-ol \$

<< Target >>

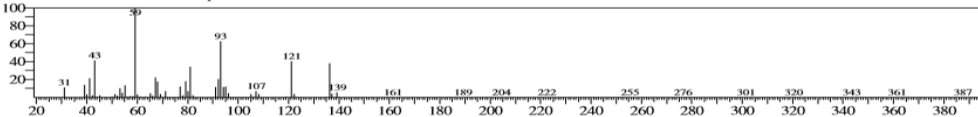
Line#:12 R.Time:8.550(Scan#:1711) MassPeaks:217
 RawMode:Averaged 8.545-8.555(1710-1712) BasePeak:71.10(284194)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:43760 Library:WILEY7.LIB
 SE:97 Formula:C10 H18 O CAS:562-74-3 MolWeight:154 RetIndex:0
 CompName:3-Cyclohexen-1-ol, 4-methyl-1-(1-methylethyl)- (CAS) 4-Terpineol \$\$ Terpinene-4-ol \$\$ 1-Terpinen-4-ol \$\$ 4-Carvomenthenol \$\$ p-Menth-1-en-4

<< Target >>

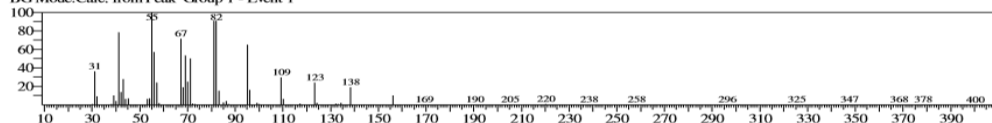
Line#:13 R.Time:8.760(Scan#:1753) MassPeaks:235
 RawMode:Averaged 8.755-8.765(1752-1754) BasePeak:59.10(564480)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:43785 Library:WILEY7.LIB
 SE:97 Formula:C10 H18 O CAS:10482-56-1 MolWeight:154 RetIndex:0
 CompName:3-Cyclohexene-1-methanol, .alpha.,.alpha.,4-trimethyl-, (S)- (CAS) p-Menth-1-en-8-ol, (S)-(-)- \$\$ ALPHA-TERPINEOL \$\$ (-)-.alpha.-Terpineol \$

<< Target >>

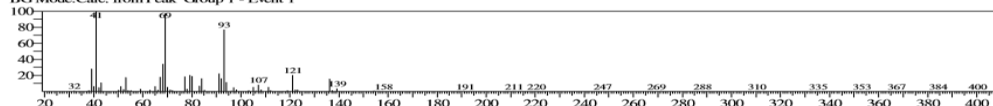
Line#:14 R.Time:9.170(Scan#:1835) MassPeaks:180
 RawMode:Averaged 9.165-9.175(1834-1836) BasePeak:55.10(9928)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:45476 Library:WILEY7.LIB
 SE:87 Formula:C10 H20 O CAS:6812-78-8 MolWeight:156 RetIndex:0
 CompName:ALPHA-CTIRONELLOL \$\$

<< Target >>

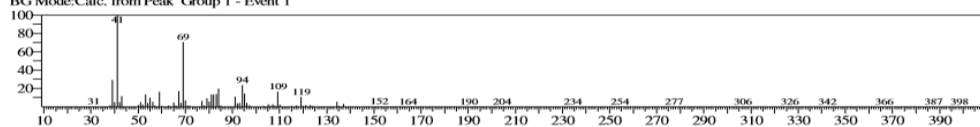
Line#:15 R.Time:9.215(Scan#:1844) MassPeaks:219
 RawMode:Averaged 9.210-9.220(1843-1845) BasePeak:41.05(65611)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:43647 Library:WILEY7.LIB
 SE:92 Formula:C10 H18 O CAS:106-25-2 MolWeight:154 RetIndex:0
 CompName:Nerol \$\$ 2,6-Octadien-1-ol, 3,7-dimethyl-, (Z)- (CAS) cis-Geraniol \$\$ Neryl alcohol \$\$ Geranyl Alcohol \$\$ cis-3,7-Dimethyl-2,6-octadien-1-ol \$\$:

<< Target >>

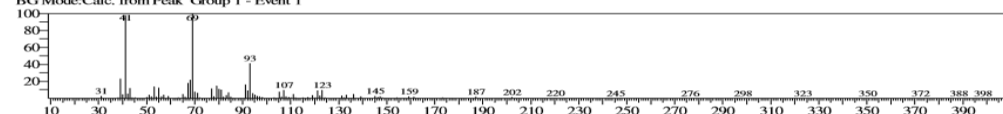
Line#:16 R.Time:9.435(Scan#:1888) MassPeaks:214
 RawMode:Averaged 9.430-9.440(1887-1889) BasePeak:41.05(544598)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:40960 Library:WILEY7.LIB
 SE:97 Formula:C10 H16 O CAS:106-26-3 MolWeight:152 RetIndex:0
 CompName:Z-Citral \$\$ 2,6-Octadienal, 3,7-dimethyl-, (Z)- (CAS) Nerol \$\$.beta.-Citral \$\$ cis-Citral \$\$ Citral b \$\$ cis-3,7-Dimethyl-2,6-octadienal \$\$ (Z)-3,7-

<< Target >>

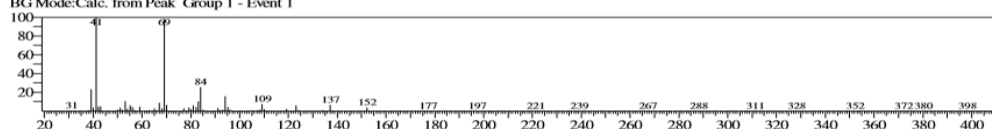
Line#:17 R.Time:9.580(Scan#:1917) MassPeaks:249
 RawMode:Averaged 9.575-9.585(1916-1918) BasePeak:69.10(171198)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:42946 Library:WILEY7.LIB
 SE:90 Formula:C10 H18 O CAS:106-24-1 MolWeight:154 RetIndex:0
 CompName:GERANIOL \$\$

<< Target >>

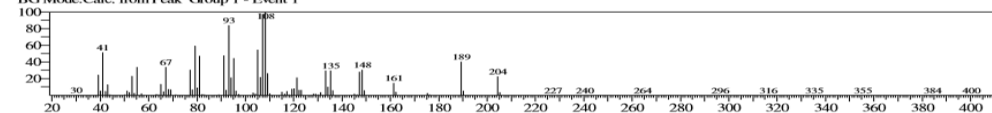
Line#:18 R.Time:9.870(Scan#:1975) MassPeaks:240
 RawMode:Averaged 9.865-9.875(1974-1976) BasePeak:41.10(1040738)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:40943 Library:WILEY7.LIB
 SE:97 Formula:C10 H16 O CAS:141-27-5 MolWeight:152 RetIndex:0
 CompName:E-Citral \$\$ 2,6-Octadienal, 3,7-dimethyl-, (E)- (CAS) Geraniol \$\$ trans-Citral \$\$ Citral a \$\$ Citral-a \$\$ (E)-Citral \$\$ Geranaldehyde \$\$.alpha.-Citral

<< Target >>

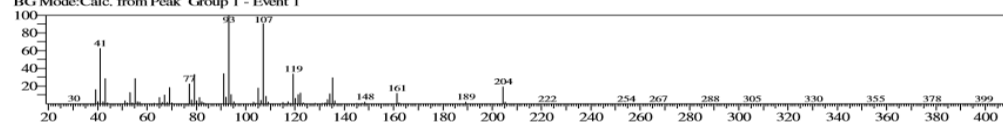
Line#:19 R.Time:13.330(Scan#:2667) MassPeaks:225
 RawMode:Averaged 13.325-13.335(2666-2668) BasePeak:108.15(123286)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:100823 Library:WILEY7.LIB
 SE:95 Formula:C15 H24 CAS:3691-11-0 MolWeight:204 RetIndex:0
 CompName:.delta.-Guaiene \$\$ Azulene, 1,2,3,5,6,7,8,8a-octahydro-1,4-dimethyl-7-(1-methylethenyl)-, [1S-(1.alpha.,7.alpha.,8a.beta.)]- (CAS) .alpha.-Bulnesene

<< Target >>

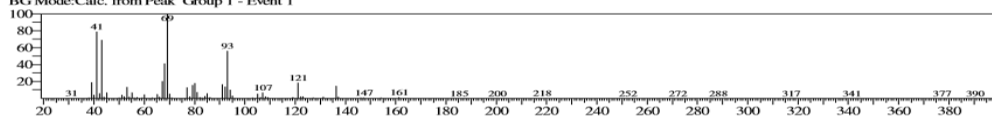
Line#:20 R.Time:13.545(Scan#:2710) MassPeaks:240
 RawMode:Averaged 13.540-13.550(2709-2711) BasePeak:93.10(32984)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:101113 Library:WILEY7.LIB
 SE:87 Formula:C15 H24 CAS:100762-46-7 MolWeight:204 RetIndex:0
 CompName:bicyclogermacrene \$\$ Bicyclo[8.1.0]undeca-2,6-diene, 3,7,11,11-tetramethyl-, (1R*,2Z,6E,10R*)-(+,-) (CAS) (+,-)-Lepidozene \$\$

<< Target >>

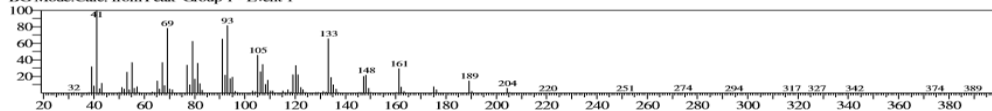
Line#:21 R.Time:11.370(Scan#:2275) MassPeaks:244
 RawMode:Averaged 11.365-11.375(2274-2276) BasePeak:69.10(90689)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:91125 Library:WILEY7.LIB
 SI:94 Formula:C12 H20 O2 CAS:141-12-8 MolWeight:196 RetIndex:0
 CompName:NERYL ACETATE \$\$ NERYLACETAT \$\$

<< Target >>

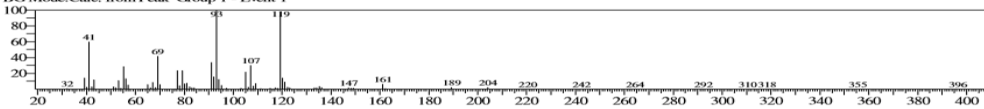
Line#:22 R.Time:12.190(Scan#:2439) MassPeaks:245
 RawMode:Averaged 12.185-12.195(2438-2440) BasePeak:41.05(19839)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:100774 Library:WILEY7.LIB
 SI:97 Formula:C15 H24 CAS:87-44-5 MolWeight:204 RetIndex:0
 CompName:trans-Caryophyllene \$\$ Bicyclo[7.2.0]undec-4-ene, 4,11,11-trimethyl-8-methylene-, [1R*(1R*,4E,9S*)]- (CAS) l-Caryophyllene \$\$ (-)-Caryophyll

<< Target >>

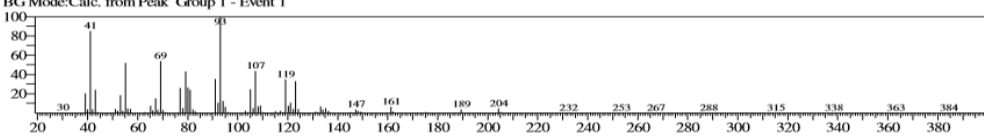
Line#:23 R.Time:12.265(Scan#:2454) MassPeaks:234
 RawMode:Averaged 12.260-12.270(2453-2455) BasePeak:93.10(41747)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:100220 Library:WILEY7.LIB
 SI:96 Formula:C15 H24 CAS:17699-05-7 MolWeight:204 RetIndex:0
 CompName:alpha-Bergamotene \$\$ Bicyclo[3.1.1]hept-2-ene, 2,6-dimethyl-6-(4-methyl-3-pentenyl)- (CAS) 2-Norpinene, 2,6-dimethyl-6-(4-methyl-3-pentenyl)

<< Target >>

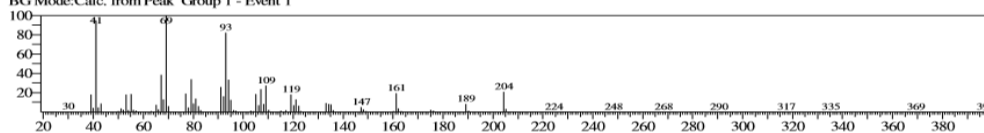
Line#:24 R.Time:13.115(Scan#:2624) MassPeaks:274
 RawMode:Averaged 13.110-13.120(2623-2625) BasePeak:93.10(56647)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:100668 Library:WILEY7.LIB
 SI:96 Formula:C15 H24 CAS:502-61-4 MolWeight:204 RetIndex:0
 CompName:Farnesene \$\$ 1,3,6,10-Dodecatetraene, 3,7,11-trimethyl- (CAS) .alpha.-Farnesene \$\$ 2,6,10-Trimethyl-2,6,9,11-dodecatetraene \$\$ 3,7,11-Trimethyl

<< Target >>

Line#:25 R.Time:13.215(Scan#:2644) MassPeaks:251
 RawMode:Averaged 13.210-13.220(2643-2645) BasePeak:69.10(63865)
 BG Mode:Calc. from Peak Group 1 - Event 1

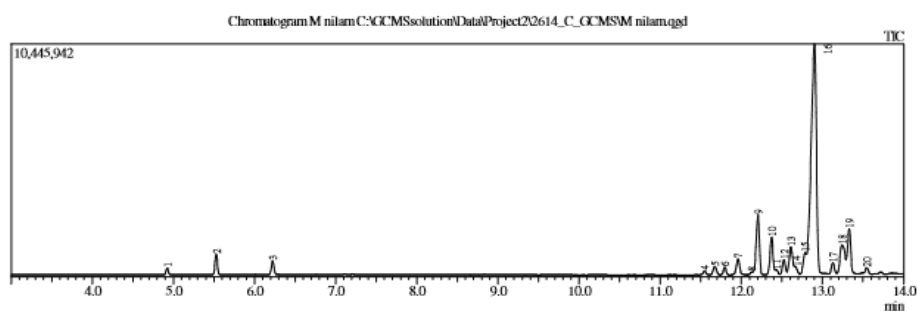


Hit#:1 Entry:100710 Library:WILEY7.LIB
 SI:96 Formula:C15 H24 CAS:495-61-4 MolWeight:204 RetIndex:0
 CompName:.beta.-Bisabolene \$\$ Cyclohexene, 1-methyl-4-(5-methyl-1-methylene-4-hexenyl)-, (S)- (CAS) l-.beta.-Bisabolene \$\$ 1,5-Heptadiene, 6-methyl-2-(

Lampiran 11. Hasil analisis senyawa minyak atsiri daun nilam menggunakan GC-MS

A. Hasil analisis GC (kromatografi gas) minyak atsiri daun nilam

Sample Information
 Analyzed by : Admin
 Analyzed : 2/28/2019 8:44:29 AM
 Sample Name : M nilam
 Sample ID : 1
 Injection Volume : 0.10
 Data File : C:\GCMSsolution\Data\Project2\2614_C_GCMSM nilam.qgd
 Tuning File : C:\GCMSsolution\System1\Tuning 191118.qgt

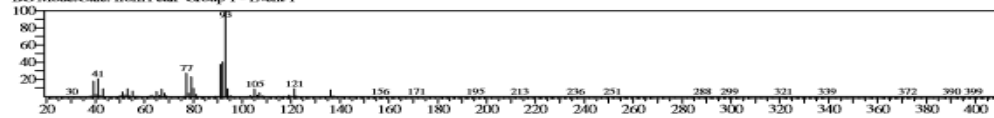


Peak	R.Time	Area %	BM	Senyawa yang diduga
1	4.924	0.66	136	Alpha-pinen
2	5.528	2.17	136	1-beta-Pinene
3	6.224	1.52	136	1-Limonene
4	11.547	0.43	204	Beta-Himachalene
5	11.673	1.23	204	Beta-Patchoulene
6	11.797	0.92	204	Zingiberene
7	11.958	2.35	204	Beta-himachalene
8	12.125	0.33	188	Silan, dimethyl di (2,4 cyclopentadien-1-TL)
9	12.205	8.37	204	Trans-caryophyllene
10	12.373	5.00	204	Alpha-guaiene
11	12.435	0.48	204	Beta-farnesene
12	12.525	1.85	204	Beta-sesquiphellandrene
13	12.611	4.24	204	Seychellene
14	12.670	0.78	204	Alpha-humulene
15	12.785	2.76	204	Alpha-patchoulene
16	12.902	52.29	204	Beta-himachelene
17	13.128	1.40	204	Farnesene
18	13.240	6.21	204	Beta-bisabolone
19	13.330	6.32	222	Patchouli alcohol
20	13.546	0.68	223	Patchouli alcohol

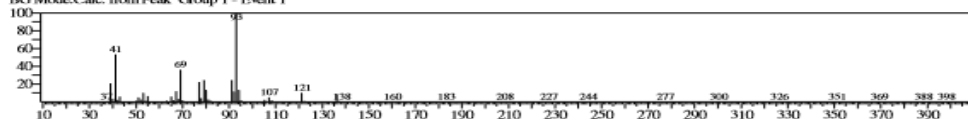
b. Hasil analisis MS (spektrofotometri massa) minyak atsiri daun nilam

Library

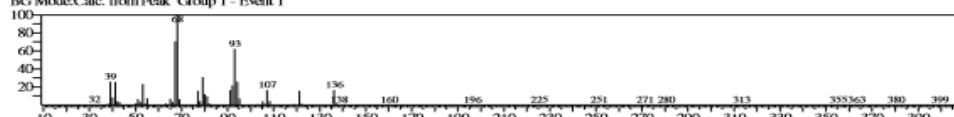
<< Target >>

Line#1 R.Time:4.925(Scan#:986) MassPeaks:219
RawMode:Averaged 4.920-4.930(985-987) BasePeak:93.10(70063)
BG Mode:Calc. from Peak Group 1 - Event 1Hit#1 Entry:26447 Library:WILEY7.LIB
SE98 Formula:C10 H16 CAS:80-56-8 MolWeight:136 RetIndex:0
CompName:ALPHA-PINENE, (-)- β -Bicyclo[3.1.1]hept-2-ene, 2,6,6-trimethyl- (CAS) Pinene β -Pinene α -Pinene β -2,6,6-Trimethylbicyclo[3.1.1]

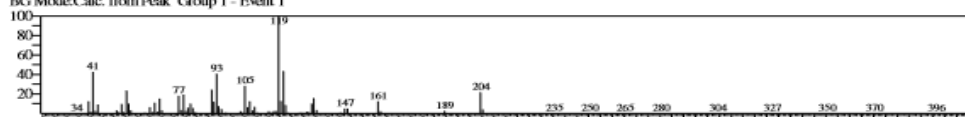
<< Target >>

Line#2 R.Time:5.530(Scan#:1107) MassPeaks:254
RawMode:Averaged 5.525-5.535(1106-1108) BasePeak:93.10(198678)
BG Mode:Calc. from Peak Group 1 - Event 1Hit#1 Entry:26459 Library:WILEY7.LIB
SE98 Formula:C10 H16 CAS:18172-67-3 MolWeight:136 RetIndex:0
CompName:-beta-Pinene β -Bicyclo[3.1.1]heptane, 6,6-dimethyl-2-methylene-, (1S)- (CAS) .BETA-PINENE β -(-)-2(10)-Pinene β -beta-Pinene β 2(10)

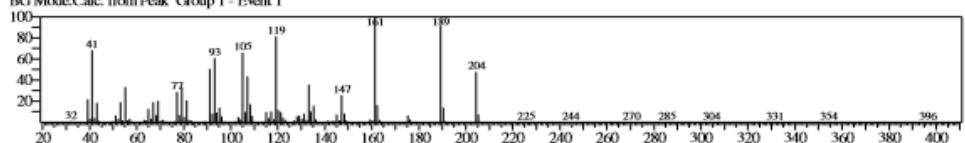
<< Target >>

Line#3 R.Time:6.225(Scan#:1246) MassPeaks:238
RawMode:Averaged 6.220-6.230(1245-1247) BasePeak:68.10(101434)
BG Mode:Calc. from Peak Group 1 - Event 1Hit#1 Entry:26325 Library:WILEY7.LIB
SE96 Formula:C10 H16 CAS:5989-54-8 MolWeight:136 RetIndex:0
CompName:1-Limonene β -Cyclohexene, 1-methyl-4-(1-methylethenyl)-, (S)- (CAS) β -Limonene β -p-Mentha-1,8-diene, (S)-(-)- β -Limonene β Limone

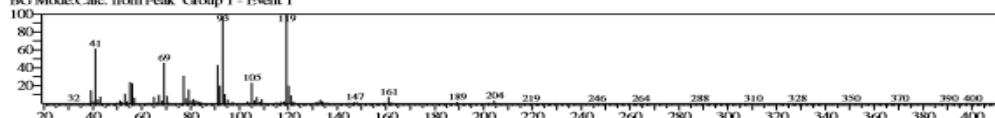
<< Target >>

Line#4 R.Time:11.545(Scan#:2310) MassPeaks:215
RawMode:Averaged 11.540-11.550(2309-2311) BasePeak:119.15(23387)
BG Mode:Calc. from Peak Group 1 - Event 1Hit#1 Entry:100971 Library:WILEY7.LIB
SE92 Formula:C15 H24 CAS:1461-03-6 MolWeight:204 RetIndex:0
CompName:beta-Fimachalene β 1H-Benzocycloheptene, 2,4a,5,6,7,8-hexahydro-3,5,5,9-tetramethyl-, (R)- (CAS) 1H-Benzocycloheptene, 2,4a,5,6,7,8-t

<< Target >>

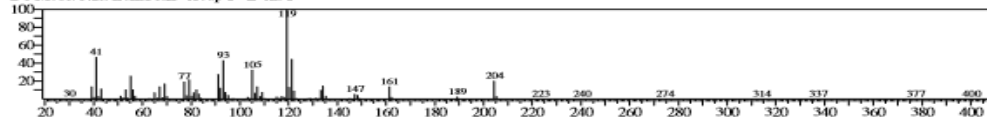
Line#5 R.Time:11.675(Scan#:2336) MassPeaks:258
RawMode:Averaged 11.670-11.680(2335-2337) BasePeak:161.25(20576)
BG Mode:Calc. from Peak Group 1 - Event 1Hit#1 Entry:100863 Library:WILEY7.LIB
SE95 Formula:C15 H24 CAS:514-51-2 MolWeight:204 RetIndex:0
CompName:beta-Patchoulene β 4,7-Methanoazulene, 1,2,3,4,5,6,7,8-octahydro-1,4,9,9-tetramethyl- (CAS) 4,7-Methanoazulene, 1,2,3,4,5,6,7,8-octahydro-1,

<< Target >>

Line#6 R.Time:11.795(Scan#:2360) MassPeaks:265
RawMode:Averaged 11.790-11.800(2359-2361) BasePeak:119.15(44746)
BG Mode:Calc. from Peak Group 1 - Event 1Hit#1 Entry:100700 Library:WILEY7.LIB
SE94 Formula:C15 H24 CAS:495-60-3 MolWeight:204 RetIndex:0
CompName:Zingiberene β 1,3-Cyclohexadiene, 5-(1,5-dimethyl-4-hexenyl)-2-methyl-, [S-(R*,S*)]- (CAS) 1-Zingiberene β (-)-Zingiberene β .alpha.-Zingibe

<< Target >>

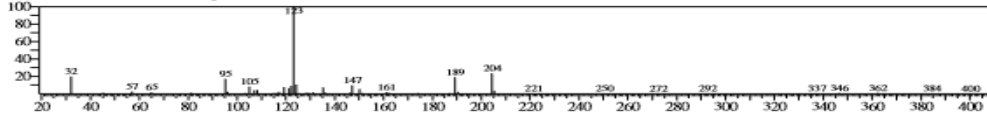
Line#7 R.Time:11.960(Scan#:2393) MassPeaks:258
 RawMode:Averaged 11.955-11.965(2392-2394) BasePeak:119.20(99234)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:100971 Library:WILEY7.LIB
 SE:93 Formula:C15 H24 CAS:1461-03-6 MolWeight:204 RetIndex:0
 CompName:.beta.-Himachalene \$\$ 1H-Benzocycloheptene, 2,4a,5,6,7,8-hexahydro-3,5,5,9-tetramethyl-, (R)- (CAS) 1H-Benzocycloheptene, 2,4a,beta-,5,6,7,8-t

<< Target >>

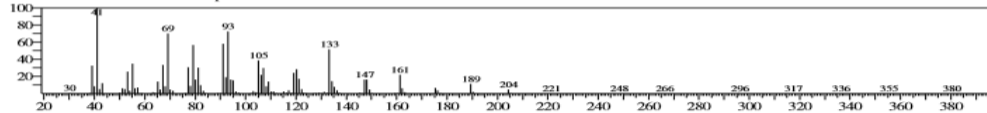
Line#8 R.Time:12.125(Scan#:2426) MassPeaks:189
 RawMode:Averaged 12.120-12.130(2425-2427) BasePeak:123.20(6836)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:80733 Library:WILEY7.LIB
 SE:67 Formula:C12 H16 SI CAS:18053-74-2 MolWeight:188 RetIndex:0
 CompName:SILAN, DIMETHYLDI(2,4-CYCLOPENTADIEN-1-YL)- \$\$

<< Target >>

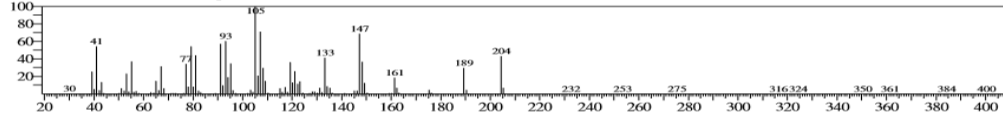
Line#9 R.Time:12.205(Scan#:2442) MassPeaks:261
 RawMode:Averaged 12.200-12.210(2441-2443) BasePeak:41.05(225975)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:100788 Library:WILEY7.LIB
 SE:97 Formula:C15 H24 CAS:87-44-5 MolWeight:204 RetIndex:0
 CompName:trans-Caryophyllene \$\$ Bicyclo[7.2.0]undec-4-ene, 4,11,11-trimethyl-8-methylene-, [1R-(1R*,4E,9S*)]- (CAS) 1-Caryophyllene \$\$ (-)-Caryophyll

<< Target >>

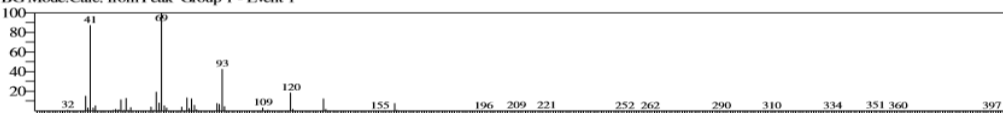
Line#10 R.Time:12.375(Scan#:2476) MassPeaks:249
 RawMode:Averaged 12.370-12.380(2475-2477) BasePeak:105.15(113355)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:100816 Library:WILEY7.LIB
 SE:95 Formula:C15 H24 CAS:3691-12-1 MolWeight:204 RetIndex:0
 CompName:.alpha.-Guaiane \$\$ Azulene, 1,2,3,4,5,6,7,8-octahydro-1,4-dimethyl-7-(1-methylethyl)-, [1S-(1.alpha.,4.alpha.,7.alpha.)]- (CAS) .ALPHA.-GUAI

<< Target >>

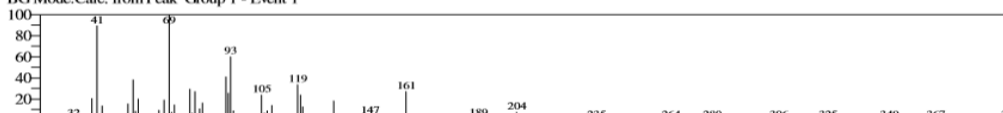
Line#11 R.Time:12.435(Scan#:2488) MassPeaks:184
 RawMode:Averaged 12.430-12.440(2487-2489) BasePeak:69.10(17243)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:100678 Library:WILEY7.LIB
 SE:93 Formula:C15 H24 CAS:18794-84-8 MolWeight:204 RetIndex:0
 CompName:.beta.-Farnesene \$\$ 1,6,10-Dodecatriene, 7,11-dimethyl-3-methylene-, (E)- (CAS) 7,11-DIMETHYL-3-METHYLEN-1,6,10-DODECATRIENE \$\$

<< Target >>

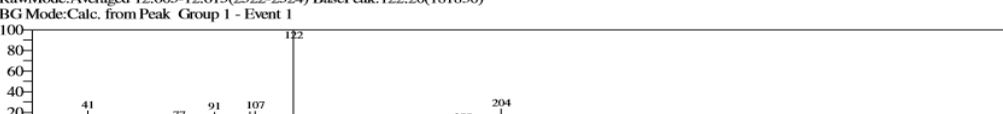
Line#12 R.Time:12.525(Scan#:2506) MassPeaks:227
 RawMode:Averaged 12.520-12.530(2505-2507) BasePeak:69.10(65793)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:100703 Library:WILEY7.LIB
 SE:91 Formula:C15 H24 CAS:20307-83-9 MolWeight:204 RetIndex:0
 CompName:.beta.-Sesquiphellandrene (CAS) 2-METHYL-6-(4-METHYLENOCYCLOHEX-2-ENYL)-2-HEPTENE \$\$ BETA-SESQUIPHELLANDRENE \$\$

<< Target >>

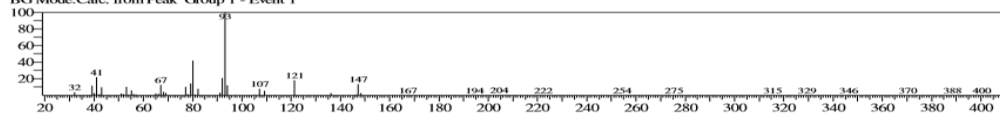
Line#13 R.Time:12.610(Scan#:2523) MassPeaks:240
 RawMode:Averaged 12.605-12.615(2522-2524) BasePeak:122.20(181830)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:101091 Library:WILEY7.LIB
 SE:91 Formula:C15 H24 CAS:20085-93-2 MolWeight:204 RetIndex:0
 CompName:Seychellene (CAS) 1,6-Methanonaphthalene, decahydro-1,4,8a-trimethyl-9-methylene-, [1S-(1.alpha.,4.alpha.,4a.beta.,6a)S] 1,6-Methanonaphthal

<< Target >>

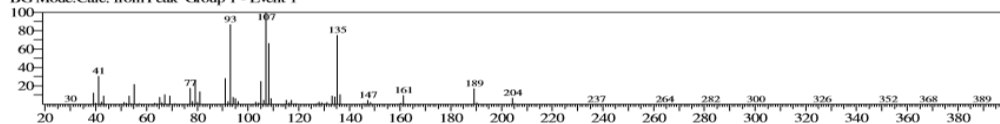
Line#:14 R.Time:12.670(Scan#:2535) MassPeaks:185
 RawMode:Averaged 12.665-12.675(2534-2536) BasePeak:93.10(23465)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:100733 Library:WILEY7.LIB
 SE:88 Formula:C15 H24 CAS:6753-98-6 MolWeight:204 RetIndex:0
 CompName:.alpha.-Humulene \$\$ 1,4,8-Cycloundecatriene, 2,6,6,9-tetramethyl-, (E,E,E)- (CAS) 4,7,10-CYCLOUNDECATRIENE, 1,1,4,8-TETRAMETHYL-,

<< Target >>

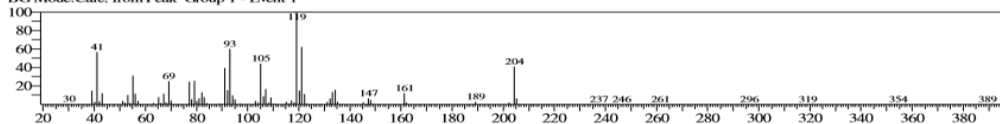
Line#:15 R.Time:12.785(Scan#:2558) MassPeaks:207
 RawMode:Averaged 12.780-12.790(2557-2559) BasePeak:107.15(33349)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:100858 Library:WILEY7.LIB
 SE:88 Formula:C15 H24 CAS:560-32-7 MolWeight:204 RetIndex:0
 CompName:.alpha.-Patchoulene \$\$ 1H-3a,7-Methanoazulene, 2,3,6,7,8,8a-hexahydro-1,4,9,9-tetramethyl-, (1.alpha.,3a.alpha.,7.alpha.,8a.beta.)- (CAS) 1H-3a,7-

<< Target >>

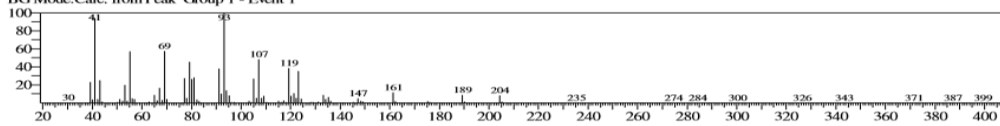
Line#:16 R.Time:12.900(Scan#:2581) MassPeaks:272
 RawMode:Averaged 12.895-12.905(2580-2582) BasePeak:119.15(1150572)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:100971 Library:WILEY7.LIB
 SE:92 Formula:C15 H24 CAS:1461-03-6 MolWeight:204 RetIndex:0
 CompName:.beta.-Himachalene \$\$ 1H-Benzocycloheptene, 2,4a,5,6,7,8-hexahydro-3,5,5,9-tetramethyl-, (R)- (CAS) 1H-Benzocycloheptene, 2,4a.beta.,5,6,7,8-1

<< Target >>

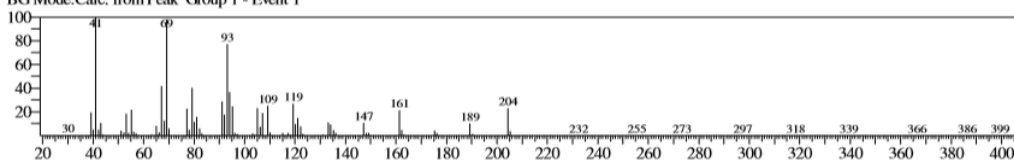
Line#:17 R.Time:13.130(Scan#:2627) MassPeaks:240
 RawMode:Averaged 13.125-13.135(2626-2628) BasePeak:93.10(48504)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:100668 Library:WILEY7.LIB
 SE:96 Formula:C15 H24 CAS:502-61-4 MolWeight:204 RetIndex:0
 CompName:Farnesene \$\$ 1,3,6,10-Dodecatetraene, 3,7,11-trimethyl- (CAS) .alpha.-Farnesene \$\$ 2,6,10-Trimethyl-2,6,9,11-dodecatetraene \$\$ 3,7,11-Trimethyl

<< Target >>

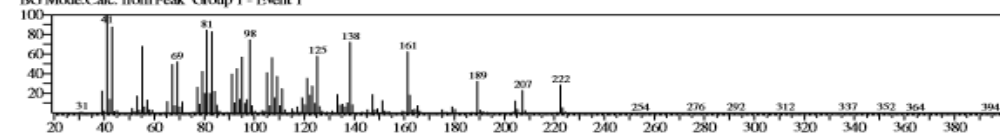
Line#:18 R.Time:13.240(Scan#:2649) MassPeaks:226
 RawMode:Averaged 13.235-13.245(2648-2650) BasePeak:41.05(98437)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:100710 Library:WILEY7.LIB
 SE:94 Formula:C15 H24 CAS:495-61-4 MolWeight:204 RetIndex:0
 CompName:.beta.-Bisabolene \$\$ Cyclohexene, 1-methyl-4-(5-methyl-1-methylene-4-hexenyl)-, (S)- (CAS) 1-.beta.-Bisabolene \$\$ 1,5-Heptadiene, 6-methyl-2-(

<< Target >>

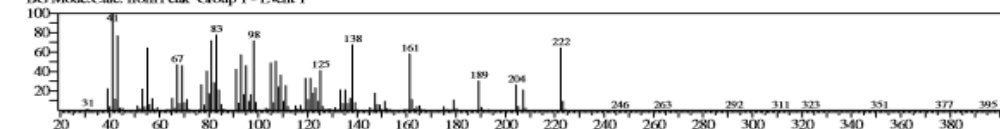
Line#:19 R.Time:10.595(Scan#:2120) MassPeaks:257
 RawMode:Averaged 10.590-10.600(2119-2121) BasePeak:41.05(12882)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:124014 Library:WILEY7.LIB
 SE:90 Formula:C15 H26 O CAS:5986-55-0 MolWeight:222 RetIndex:0
 CompName:Patchouli alcohol \$\$ 1,6-Methanonaphthalen-1(2H)-ol, octahydro-4,8a,9,9-tetramethyl-, [1R-(1.alpha.,4.beta.,4a.alpha.,6.beta.,8a.alpha.)]- (CAS) 1

<< Target >>

Line#:20 R.Time:10.660(Scan#:2133) MassPeaks:269
 RawMode:Averaged 10.655-10.665(2132-2134) BasePeak:41.05(59397)
 BG Mode:Calc. from Peak Group 1 - Event 1



Hit#:1 Entry:124011 Library:WILEY7.LIB
 SE:91 Formula:C15 H26 O CAS:5986-55-0 MolWeight:222 RetIndex:0
 CompName:Patchouli alcohol \$\$ 1,6-Methanonaphthalen-1(2H)-ol, octahydro-4,8a,9,9-tetramethyl-, [1R-(1.alpha.,4.beta.,4a.alpha.,6.beta.,8a.alpha.)]- (CAS) 1

Lampiran 12. Gambar basis gel dan sediaan gel pengharum ruangan**a. Basis gel dengan variasi konsentrasi karagenan dan glukomanan**

Formula 1
(1,5%)

Formula 2
(2%)

Formula 3
(2,5%)

Formula 4
(3%)

Formula 5
(3,5%)

b. Sediaan gel dengan variasi konsentrasi minyak atsiri nilam

Lampiran 13. Hasil perhitungan kestabilan basis gel

$$\text{Formula F1} = \frac{16158-15535}{16158} \times 100 \% = 3,85\%$$

$$\text{Formula F2} = \frac{14542-14179}{14542} \times 100 \% = 2,33\%$$

$$\text{Formula F3} = \frac{14829-14587}{14829} \times 100 \% = 1,63\%$$

$$\text{Formula F4} = \frac{13812-13605}{13812} \times 100 \% = 1,49\%$$

$$\text{Formula F5} = \frac{13346-13156}{13346} \times 100 \% = 1,42\%$$

Lampiran 14. Lembar penilaian Kuisisioner uji kesukaan wangi

Lembar Penilaian Uji Kesukaan

Nama :

Usia :

Judul : FORMULASI GEL PENGHARUM RUANGAN BERBASIS KARAGENAN DAN GLUKOMANAN DENGAN MINYAK ATSIRI JERUK NIPIS SEBAGAI BAHAN PEWANGI DAN MINYAK ATSIRI NILAM SEBAGAI *FIKSATIF*

Instruksi :

1. Ambil satu sediaan gel pengharum ruangan
2. Sampel diposisikan 45⁰ dengan jarak 20 cm dari hidung lalu dicium aromanya dengan mengibaskan-ngibaskan tangan kearah hidung sebanyak 2-3x.
3. Berikan pendapat anda tentang wangi sediaan gel pengharum ruangan yang diuji dengan memberikan tanda centang (✓) pada salah satu kolom) penilaian
4. Lakukan hal yang sama (poin No.2) terhadap serbuk kopi yang telah disediakan sebagai penetral bau sebelum menguji formula selanjutnya.

Formula	Penilaian				
	Sangat suka	Suka	Cukup suka	Kurang suka	Tidak suka
FI					
F2					
F3					
F4					
K-					
K+					

Keterangan :

Nilai 5 = Sangat Suka

Nilai 4 = Suka

Nilai 3 = Cukup Suka

Nilai 2 = Kurang Suka

Nilai 1 = Tidak Suka

Surakarta, 2019

Peneliti

Panelis

.....

.....

Lampiran 15. Hasil analisis frekuensi uji kesukaan wangi

F1

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid cukup suka	4	16.0	16.0	16.0
Suka	12	48.0	48.0	64.0
sangat suka	9	36.0	36.0	100.0
Total	25	100.0	100.0	

F2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid kurang suka	2	8.0	8.0	8.0
cukup suka	5	20.0	20.0	28.0
Suka	14	56.0	56.0	84.0
sangat suka	4	16.0	16.0	100.0
Total	25	100.0	100.0	

F3

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid kurang suka	1	4.0	4.0	4.0
cukup suka	11	44.0	44.0	48.0
Suka	12	48.0	48.0	96.0
sangat suka	1	4.0	4.0	100.0
Total	25	100.0	100.0	

F4

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid kurang suka	2	8.0	8.0	8.0
cukup suka	11	44.0	44.0	52.0
Suka	9	36.0	36.0	88.0
sangat suka	3	12.0	12.0	100.0
Total	25	100.0	100.0	

Kontrolnegatif

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	kurang suka	3	12.0	12.0	12.0
	cukup suka	6	24.0	24.0	36.0
	Suka	12	48.0	48.0	84.0
	sangat suka	4	16.0	16.0	100.0
	Total	25	100.0	100.0	

Kontrolpositif

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	kurang suka	3	12.0	12.0	12.0
	cukup suka	7	28.0	28.0	40.0
	Suka	5	20.0	20.0	60.0
	sangat suka	10	40.0	40.0	100.0
	Total	25	100.0	100.0	

Lampiran 16. Hasil perhitungan uji kesukaan wangi gel pengharum ruangan

Panelis	Formula					
	F1	F2	F3	F4	K-	K+
1	5	4	3	3	5	5
2	4	4	4	3	4	5
3	3	2	3	5	4	2
4	4	4	4	3	5	3
5	5	4	3	4	2	2
6	4	4	4	3	3	5
7	4	4	5	5	4	5
8	5	5	4	3	3	4
9	4	4	3	4	5	3
10	5	4	3	4	3	4
11	5	5	3	4	2	4
12	5	4	4	3	3	5
13	3	3	4	4	3	5
14	5	4	3	3	5	5
15	3	4	4	3	4	4
16	4	3	3	2	4	5
17	4	2	3	4	4	3
18	4	3	3	4	4	5
19	4	5	4	3	3	5
20	4	4	3	4	4	4
21	4	3	4	5	2	3
22	3	3	2	4	4	2
23	5	5	4	3	4	3
24	4	4	4	2	4	3
25	5	4	4	3	4	3
Total	105	95	88	88	92	97

Formula 1

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{105}{25} = 4,2$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n} = \frac{9(5-4,2)^2 + 12(4-4,2)^2 + 4(3-4,2)^2 + 5,76 + 0,48 + 5,76}{25} = \frac{12}{25} = 0,48$$

$$S = \sqrt{S^2} = \sqrt{0,48} = 0,69$$

$$P(4,2 - (1,96 \cdot 0,69 / \sqrt{25})) \leq \mu \leq (4,2 + (1,96 \cdot 0,69 / \sqrt{25}))$$

$$P(4,2 - 0,27) \leq \mu \leq (4,2 + 0,27)$$

$$P(3,93 \leq \mu \leq 4,47)$$

Formula 2

$$\bar{X} = \frac{\sum_{i=1}^n x_i^2}{n} = \frac{95}{25} = 3,8$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n} = \frac{4(5-3,8)^2 + 14(4-3,8)^2 + 5(3-3,8)^2 + 2(2-3,8)^2}{25} = \frac{5,76 + 0,56 + 3,2 + 6,48}{25} = 0,64$$

$$S = \sqrt{S^2} = \sqrt{0,64} = 0,8$$

$$P(\bar{X} - (1,96 \cdot S/\sqrt{n})) \leq \mu \leq P(\bar{X} + (1,96 \cdot S/\sqrt{n}))$$

$$P(3,8 - (1,96 \cdot 0,8 / \sqrt{25})) \leq \mu \leq (3,8 + (1,96 \cdot 0,8 / \sqrt{25}))$$

$$P(3,8 - 0,31) \leq \mu \leq (3,8 + 0,31)$$

$$P(3,49 \leq \mu \leq 4,11)$$

Formula 3

$$\bar{X} = \frac{\sum_{i=1}^n x_i^2}{n} = \frac{88}{25} = 3,52$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n} = \frac{1(5-3,52)^2 + 12(4-3,52)^2 + 11(3-3,52)^2 + 1(2-3,52)^2}{25} = \frac{2,19 + 2,76 + 2,97 + 2,31}{25} = 0,41$$

$$S = \sqrt{S^2} = \sqrt{0,41} = 0,64$$

$$P(\bar{X} - (1,96 \cdot S/\sqrt{n})) \leq \mu \leq P(\bar{X} + (1,96 \cdot S/\sqrt{n}))$$

$$P(3,52 - (1,96 \cdot 0,64 / \sqrt{25})) \leq \mu \leq (3,52 + (1,96 \cdot 0,64 / \sqrt{25}))$$

$$P(3,52 - 0,25) \leq \mu \leq (3,52 + 0,25)$$

$$P(3,27 \leq \mu \leq 3,77)$$

Formula 4

$$\bar{X} = \frac{\sum_{i=1}^n x_i^2}{n} = \frac{88}{25} = 3,52$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n} = \frac{3(5-3,52)^2 + 9(4-3,52)^2 + 11(3-3,52)^2 + 2(2-3,52)^2}{25} = \frac{6,57 + 2,07 + 2,97 + 4,62}{25} = 0,65$$

$$S = \sqrt{S^2} = \sqrt{0,65} = 0,81$$

$$P(\bar{X} - (1,96 \cdot S/\sqrt{n})) \leq \mu \leq (\bar{X} + (1,96 \cdot S/\sqrt{n}))$$

$$P(3,52 - (1,96 \cdot 0,80 / \sqrt{25})) \leq \mu \leq (3,52 + (1,96 \cdot 0,80 / \sqrt{25}))$$

$$P(3,52 - 0,32) \leq \mu \leq (3,52 + 0,32)$$

$$P(3,2 \leq \mu \leq 3,84)$$

Kontrol (-)

$$\bar{X} = \frac{\sum_i^n x_i^2}{n} = \frac{92}{25} = 3,68$$

$$S^2 = \frac{\sum_i^n (x_i + \bar{x})^2}{n} = \frac{4(5-3,68)^2 + 12(4-3,68)^2 + 6(3-3,68)^2 + 3(2-3,68)^2}{25} = \frac{6,70 + 1,23 + 2,77 + 8,47}{25} = 0,77$$

$$S = \sqrt{S^2} = \sqrt{0,77} = 0,88$$

$$P(\bar{X} - (1,96 \cdot S/\sqrt{n})) \leq \mu \leq (\bar{X} + (1,96 \cdot S/\sqrt{n}))$$

$$P(3,68 - (1,96 \cdot 0,88 / \sqrt{25})) \leq \mu \leq (3,68 + (1,96 \cdot 0,88 / \sqrt{25}))$$

$$P(3,68 - 0,06) \leq \mu \leq (3,68 + 0,06)$$

$$P(3,62 \leq \mu \leq 3,74)$$

Kontrol (+)

$$\bar{X} = \frac{\sum_i^n x_i^2}{n} = \frac{97}{25} = 3,88$$

$$S^2 = \frac{\sum_i^n (x_i + \bar{x})^2}{n} = \frac{10(5-3,88)^2 + 5(4-3,88)^2 + 7(3-3,88)^2 + 3(2-3,88)^2}{25} = \frac{12,54 + 0,07 + 5,42 + 10,60}{25} = 1,14$$

$$S = \sqrt{S^2} = \sqrt{1,14} = 1,07$$

$$P(\bar{X} - (1,96 \cdot S/\sqrt{n})) \leq \mu \leq (\bar{X} + (1,96 \cdot S/\sqrt{n}))$$

$$P(3,88 - (1,96 \cdot 1,07 / \sqrt{25})) \leq \mu \leq (3,88 + (1,96 \cdot 1,07 / \sqrt{25}))$$

$$P(3,88 - 0,42) \leq \mu \leq (3,88 + 0,42)$$

$$P(3,46 \leq \mu \leq 4,3)$$

Lampiran 17. Hasil penguapan zat cair gel pengharum ruangan selama satu bulan

Suhu	Samp el	Bobot sisa gel (g)					Penguapan zat cair (g)				Total pengu - pan (g)
		H0	H7	H14	H21	H28	H7	H14	H21	H28	
Kipas angin	F1	14833	14008	12466	9830	8915	825	1542	2636	915	5918
	F2	14291	13415	12432	9964	8839	876	983	2468	1125	5447
	F3	15344	14599	13712	10108	9225	745	887	2627	883	5142
	F4	15912	15046	14141	10853	9927	866	905	3288	926	5985
	K-	15967	14669	12798	9740	8413	1298	1871	3053	1325	7347
	K+	41847	26622	21610	19224	16830	15225	5012	2386	2394	25017
AC	F1	15612	14827	13841	11281	10177	785	986	2560	1104	5435
	F2	14688	14009	13371	11720	10793	679	728	1657	927	3991
	F3	14924	14057	13899	10872	9958	867	1158	2022	919	4966
	F4	15458	14734	13695	11660	10690	724	1039	2035	970	4768
	K-	15632	14459	13233	10691	9262	1173	1226	2542	2029	6370
	K+	41923	27114	22700	20553	18675	14809	4414	2247	1878	23248
kamar	F1	14133	13465	12654	11512	10584	668	811	1142	928	3549
	F2	15869	15195	14612	13686	12688	674	583	926	998	3181
	F3	14027	13306	12646	11643	10790	721	660	1003	1153	3537
	F4	15564	14945	14276	13019	11896	618	669	1257	1123	3667
	K-	15739	14831	13978	12859	11751	908	853	1119	1108	3988
	K+	41901	29597	25,756	22760	20928	12304	3841	2096	1832	20973

Lampiran 18. Lembar kuisioner penilaian uji ketahanan wangi

Lembar Penilaian Uji Ketahanan Wangi

Minggu I

Ruangan Biasa/ Ruangan Kipas/ Ruangan AC

Nama :

Usia :

Judul: **FORMULASI GEL PENGHARUM RUANGAN BERBASIS KARAGENAN DAN GLUKOMANAN DENGAN MINYAK ATSIRI JERUK NIPIS SEBAGAI BAHAN PEWANGI DAN MINYAK ATSIRI NILAM SEBAGAI FIKSATIF**

Instruksi :

1. Ambil satu sediaan gel pengharum ruangan
2. Sampel diposisikan 450 dengan jarak 20 cm dari hidung lalu dicium aromanya dengan mengibaskan-ngibaskan tangan kearah hidung sebanyak 2-3x.
3. Berikan pendapat anda tentang wangi sediaan gel pengharum ruangan yang diuji dengan memberikan tanda centang (✓) pada salah satu kolom penilaian
4. Lakukan hal yang sama (poin No.2) terhadap serbuk kopi yang telah disediakan sebagai penetral bau sebelum menguji formula selanjutnya

Formula

Penilaian

	Sangat wangi	Wangi	Agak wangi	Agak kurang wangi	Sangat tidak wangi
F1					
F2					
F3					
F4					
K-					
K+					

Keterangan :

Nilai 5 = Sangat wangi

Nilai 4 = Wangi

Nilai 3 = Agak wangi

Nilai 2 = Agak kurang wangi

Nilai 1 = Sangat tidak wangi

Surakarta, 2019

Peneliti

Panelis

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Lampiran 19. Hasil analisis frekuensi uji ketahanan wangi ruang suhu kipas angin minggu ke 1- 4

a. Minggu ke-1

F1

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	4	16.0	16.0	16.0
Wangi	18	72.0	72.0	88.0
sangat wangi	3	12.0	12.0	100.0
Total	25	100.0	100.0	

F2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	5	20.0	20.0	20.0
Wangi	15	60.0	60.0	80.0
sangat wangi	5	20.0	20.0	100.0
Total	25	100.0	100.0	

F3

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Wangi	16	64.0	64.0	64.0
sangat wangi	9	36.0	36.0	100.0
Total	25	100.0	100.0	

F4

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	2	8.0	8.0	8.0
Wangi	11	44.0	44.0	52.0
sangat wangi	12	48.0	48.0	100.0
Total	25	100.0	100.0	

Knegatif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	1	4.0	4.0	4.0
agak wangi	9	36.0	36.0	40.0
Wangi	13	52.0	52.0	92.0
sangat wangi	2	8.0	8.0	100.0
Total	25	100.0	100.0	

Kpositif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Wangi	1	4.0	4.0	4.0
sangat wangi	24	96.0	96.0	100.0
Total	25	100.0	100.0	

b. Minggu ke-2

F1

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	13	52.0	52.0	52.0
Wangi	12	48.0	48.0	100.0
Total	25	100.0	100.0	

F2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	8	32.0	32.0	32.0
Wangi	17	68.0	68.0	100.0
Total	25	100.0	100.0	

F3

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	4	16.0	16.0	16.0
Wangi	20	80.0	80.0	96.0
sangat wangi	1	4.0	4.0	100.0
Total	25	100.0	100.0	

F4

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	2	8.0	8.0	8.0
Wangi	18	72.0	72.0	80.0
sangat wangi	5	20.0	20.0	100.0
Total	25	100.0	100.0	

Knegatif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	5	20.0	20.0	20.0
agak wangi	15	60.0	60.0	80.0
Wangi	5	20.0	20.0	100.0
Total	25	100.0	100.0	

Kpositif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Wangi	1	4.0	4.0	4.0
sangat wangi	24	96.0	96.0	100.0
Total	25	100.0	100.0	

c. Minggu ke-3

F1

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	19	76.0	76.0	76.0
wangi	6	24.0	24.0	100.0
Total	25	100.0	100.0	

F2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	15	60.0	60.0	60.0
wangi	10	40.0	40.0	100.0
Total	25	100.0	100.0	

F3

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	4	16.0	16.0	16.0
wangi	21	84.0	84.0	100.0
Total	25	100.0	100.0	

F4

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	6	24.0	24.0	24.0
wangi	19	76.0	76.0	100.0
Total	25	100.0	100.0	

Knegatif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	9	36.0	36.0	36.0
agak wangi	13	52.0	52.0	88.0
Wangi	3	12.0	12.0	100.0
Total	25	100.0	100.0	

Kpositif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid wangi	1	4.0	4.0	4.0
sangat wangi	24	96.0	96.0	100.0
Total	25	100.0	100.0	

d. Minggu ke-4

F1

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	10	40.0	40.0	40.0
agak wangi	15	60.0	60.0	100.0
Total	25	100.0	100.0	

F2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	3	12.0	12.0	12.0
agak wangi	20	80.0	80.0	92.0
Wangi	2	8.0	8.0	100.0
Total	25	100.0	100.0	

F3

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agak wangi	18	72.0	72.0
	wangi	7	28.0	100.0
	Total	25	100.0	100.0

F4

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agak wangi	13	52.0	52.0
	wangi	12	48.0	100.0
	Total	25	100.0	100.0

Knegatif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agak kurang wangi	12	48.0	48.0
	agak wangi	13	52.0	100.0
	Total	25	100.0	100.0

Kpositif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	wangi	1	4.0	4.0
	sangat wangi	24	96.0	100.0
	Total	25	100.0	100.0

Lampiran 20. Hasil analisis frekuensi uji ketahanan wangi ruang suhu AC minggu ke 1- 4

a. Minggu ke-1

F1

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
agak wangi	3	12.0	12.0	12.0
wangi	21	84.0	84.0	96.0
sangat wangi	1	4.0	4.0	100.0
Total	25	100.0	100.0	

F2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
agak wangi	2	8.0	8.0	8.0
wangi	17	68.0	68.0	76.0
sangat wangi	6	24.0	24.0	100.0
Total	25	100.0	100.0	

F3

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
agak wangi	1	4.0	4.0	4.0
wangi	12	48.0	48.0	52.0
sangat wangi	12	48.0	48.0	100.0
Total	25	100.0	100.0	

F4

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
agak wangi	1	4.0	4.0	4.0
wangi	9	36.0	36.0	40.0
sangat wangi	15	60.0	60.0	100.0
Total	25	100.0	100.0	

Knegatif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid				
agak kurang wangi	3	12.0	12.0	12.0
agak wangi	10	40.0	40.0	52.0
Wangi	11	44.0	44.0	96.0
sangat wangi	1	4.0	4.0	100.0
Total	25	100.0	100.0	

Kpositif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid wangi	1	4.0	4.0	4.0
sangat wangi	24	96.0	96.0	100.0
Total	25	100.0	100.0	

b. Minggu Ke-2

F1

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	16	64.0	64.0	64.0
wangi	9	36.0	36.0	100.0
Total	25	100.0	100.0	

F2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	8	32.0	32.0	32.0
wangi	17	68.0	68.0	100.0
Total	25	100.0	100.0	

F3

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	2	8.0	8.0	8.0
wangi	22	88.0	88.0	96.0
sangat wangi	1	4.0	4.0	100.0
Total	25	100.0	100.0	

F4

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid wangi	20	80.0	80.0	80.0
sangat wangi	5	20.0	20.0	100.0
Total	25	100.0	100.0	

Knegatif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	5	20.0	20.0	20.0
agak wangi	12	48.0	48.0	68.0
Wangi	8	32.0	32.0	100.0
Total	25	100.0	100.0	

Kpositif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid wangi	1	4.0	4.0	4.0
sangat wangi	24	96.0	96.0	100.0
Total	25	100.0	100.0	

c. Minggu ke-3

F1

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	21	84.0	84.0	84.0
wangi	4	16.0	16.0	100.0
Total	25	100.0	100.0	

F2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	15	60.0	60.0	60.0
wangi	10	40.0	40.0	100.0
Total	25	100.0	100.0	

F3

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	6	24.0	24.0	24.0
wangi	19	76.0	76.0	100.0
Total	25	100.0	100.0	

F4

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	3	12.0	12.0	12.0
wangi	22	88.0	88.0	100.0
Total	25	100.0	100.0	

Knegatif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	1	4.0	4.0	4.0
agak wangi	23	92.0	92.0	96.0
Wangi	1	4.0	4.0	100.0
Total	25	100.0	100.0	

Kpositif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid wangi	1	4.0	4.0	4.0
sangat wangi	24	96.0	96.0	100.0
Total	25	100.0	100.0	

d. Minggu ke -4

F1

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	8	32.0	32.0	32.0
agak wangi	17	68.0	68.0	100.0
Total	25	100.0	100.0	

F2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	2	8.0	8.0	8.0
agak wangi	20	80.0	80.0	88.0
Wangi	3	12.0	12.0	100.0
Total	25	100.0	100.0	

F3

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	11	44.0	44.0	44.0
wangi	14	56.0	56.0	100.0
Total	25	100.0	100.0	

F4

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	9	36.0	36.0	36.0
wangi	16	64.0	64.0	100.0
Total	25	100.0	100.0	

Knegatif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	15	60.0	60.0	60.0
agak wangi	10	40.0	40.0	100.0
Total	25	100.0	100.0	

Kpositif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid wangi	1	4.0	4.0	4.0
sangat wangi	24	96.0	96.0	100.0
Total	25	100.0	100.0	

Lampiran 21. Hasil analisis frekuensi uji ketahanan wangi ruang suhu kamar minggu ke 1-4

a. Minggu ke-1

F1

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	1	4.0	4.0	4.0
agak wangi	4	16.0	16.0	20.0
Wangi	16	64.0	64.0	84.0
sangat wangi	4	16.0	16.0	100.0
Total	25	100.0	100.0	

F2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	2	8.0	8.0	8.0
Wangi	18	72.0	72.0	80.0
sangat wangi	5	20.0	20.0	100.0
Total	25	100.0	100.0	

F3

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	2	8.0	8.0	8.0
Wangi	13	52.0	52.0	60.0
sangat wangi	10	40.0	40.0	100.0
Total	25	100.0	100.0	

F4

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	1	4.0	4.0	4.0
agak wangi	1	4.0	4.0	8.0
wangi	11	44.0	44.0	52.0
sangat wangi	12	48.0	48.0	100.0
Total	25	100.0	100.0	

Knegatif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	2	8.0	8.0	8.0
agak wangi	13	52.0	52.0	60.0
wangi	10	40.0	40.0	100.0
Total	25	100.0	100.0	

Kpositif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid wangi	1	4.0	4.0	4.0
sangat wangi	24	96.0	96.0	100.0
Total	25	100.0	100.0	

b. Minggu ke-2

F1

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	17	68.0	68.0	68.0
wangi	8	32.0	32.0	100.0
Total	25	100.0	100.0	

F2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	9	36.0	36.0	36.0
wangi	16	64.0	64.0	100.0
Total	25	100.0	100.0	

F3

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	4	16.0	16.0	16.0
wangi	20	80.0	80.0	96.0
sangat wangi	1	4.0	4.0	100.0
Total	25	100.0	100.0	

F4

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	1	4.0	4.0	4.0
wangi	20	80.0	80.0	84.0
sangat wangi	4	16.0	16.0	100.0
Total	25	100.0	100.0	

Knegatif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	5	20.0	20.0	20.0
agak wangi	13	52.0	52.0	72.0
wangi	7	28.0	28.0	100.0
Total	25	100.0	100.0	

Kpositif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid wangi	1	4.0	4.0	4.0
sangat wangi	24	96.0	96.0	100.0
Total	25	100.0	100.0	

c. Minggu ke-3

F1

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid sangat tidak wangi	12	48.0	48.0	48.0
agak kurang wangi	13	52.0	52.0	100.0
Total	25	100.0	100.0	

F2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	3	12.0	12.0	12.0
agak wangi	12	48.0	48.0	60.0
wangi	10	40.0	40.0	100.0
Total	25	100.0	100.0	

F3

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	10	40.0	40.0	40.0
wangi	15	60.0	60.0	100.0
Total	25	100.0	100.0	

F4

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	5	20.0	20.0	20.0
wangi	20	80.0	80.0	100.0
Total	25	100.0	100.0	

Knegatif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid sangat tidak wangi	25	100.0	100.0	100.0

Kpositif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid wangi	1	4.0	4.0	4.0
sangat wangi	24	96.0	96.0	100.0
Total	25	100.0	100.0	

d. Minggu ke-4

F1

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid sangat tidak wangi	25	100.0	100.0	100.0

F2

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak kurang wangi	8	32.0	32.0	32.0
agak wangi	17	68.0	68.0	100.0
Total	25	100.0	100.0	

F3

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	11	44.0	44.0	44.0
wangi	14	56.0	56.0	100.0
Total	25	100.0	100.0	

F4

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid agak wangi	9	36.0	36.0	36.0
wangi	16	64.0	64.0	100.0
Total	25	100.0	100.0	

Knegatif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid sangat tidak wangi	25	100.0	100.0	100.0

Kpositif

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid wangi	1	4.0	4.0	4.0
sangat wangi	24	96.0	96.0	100.0
Total	25	100.0	100.0	

Lampiran 22. Hasil uji ketahanan wangi pada suhu ruang kipas angin minggu ke-1

Panelis	Formula					
	F1	F2	F3	F4	K-	K+
1	4	5	5	5	4	5
2	4	4	4	4	4	5
3	5	5	4	3	3	5
4	3	4	4	4	3	5
5	4	4	4	5	4	5
6	3	3	4	4	4	5
7	5	4	5	5	4	5
8	4	5	4	4	2	4
9	4	4	4	5	3	5
10	4	4	4	4	4	5
11	4	4	4	4	3	5
12	4	3	4	5	4	5
13	4	4	5	5	4	5
14	4	5	4	4	4	5
15	3	4	5	4	3	5
16	3	3	4	3	3	5
17	4	4	4	5	4	5
18	4	3	5	4	3	5
19	4	4	5	5	4	5
20	5	4	5	4	5	5
21	4	3	5	5	3	5
22	4	4	4	4	4	5
23	4	4	4	5	4	5
24	4	4	4	5	3	5
25	4	5	5	5	5	5
Total	99	100	109	110	91	124

a. Formula 1

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{99}{25} = 3,96$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n} = \frac{3(5-3,96)^2 + 18(4-3,96)^2 + 4(3-3,96)^2}{25} = \frac{9,73+0,52+14,75}{25} = \frac{25}{25} = 1$$

$$S = \sqrt{S^2} = \sqrt{1} = 1$$

$$P(3,96 - (1,96 \cdot 1 / \sqrt{25})) \leq \mu \leq (3,96 + (1,96 \cdot 1 / \sqrt{25})) = P(3,57 \leq \mu \leq 4,35)$$

b. Formula 2

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{100}{25} = 4$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{x})^2}{n} = \frac{5(5-4)^2 + 15(4-4)^2 + 5(3-4)^2}{25} = \frac{25+0+25}{25} = \frac{50}{25} = 2$$

$$S = \sqrt{S^2} = \sqrt{2} = 1,41$$

$$P(4 - (1,96 \cdot 1,41 / \sqrt{25})) \leq \mu \leq (4 + (1,96 \cdot 1,41 / \sqrt{25})) = P(3,45 \leq \mu \leq 4,55)$$

c. Formula 3

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{109}{25} = 4,36$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{x})^2}{n} = \frac{9(5-4,36)^2 + 16(4-4,36)^2}{25} = \frac{33,18+33,18}{25} = \frac{66,36}{25} = 2,65$$

$$S = \sqrt{S^2} = \sqrt{2,65} = 1,63$$

$$P(4,36 - (1,96 \cdot 1,63 / \sqrt{25})) \leq \mu \leq (4,36 + (1,96 \cdot 1,63 / \sqrt{25})) = P(3,72 \leq \mu \leq 5)$$

d. Formula 4

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{110}{25} = 4,4$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{x})^2}{n} = \frac{12(5-4,4)^2 + 11(4-4,4)^2 + 2(3-4,4)^2}{25} = \frac{51,84+19,36+3,92}{25} = \frac{75,12}{25} = 3,00$$

$$S = \sqrt{S^2} = \sqrt{3,00} = 1,73$$

$$P(4,4 - (1,96 \cdot 1,73 / \sqrt{25})) \leq \mu \leq (4,4 + (1,96 \cdot 1,73 / \sqrt{25})) = P(3,72 \leq \mu \leq 5,08)$$

e. Kontrol (-)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{91}{25} = 3,64$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{x})^2}{n} = \frac{2(5-3,64)^2 + 13(4-3,64)^2 + 9(3-3,64)^2 + 1(2-3,64)^2}{25} = \frac{3,70+1,68+3,69+2,69}{25} = \frac{11,76}{25} = 0,47$$

$$S = \sqrt{S^2} = \sqrt{0,47} = 0,69$$

$$P(3,64 - (1,96 \cdot 0,69 / \sqrt{25})) \leq \mu \leq (3,64 + (1,96 \cdot 0,69 / \sqrt{25})) = P(3,37 \leq \mu \leq 3,91)$$

f. Kontrol (+)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{124}{25} = 4,96$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{x})^2}{n} = \frac{24(5-4,96)^2 + 1(4-4,96)^2}{25} = \frac{0,04+0,92}{25} = \frac{0,96}{25} = 0,03$$

$$S = \sqrt{S^2} = \sqrt{0,03} = 0,17$$

$$P(4,96 - (1,96 \cdot 0,17 / \sqrt{25})) \leq \mu \leq (4,96 + (1,96 \cdot 0,17 / \sqrt{25})) = P(4,95 \leq \mu \leq 4,97)$$

Lampiran 23. Uji ketahanan wangi suhu ruang kipas angin minggu ke-2

Panelis	Formula					
	F1	F2	F3	F4	K-	K+
1	4	4	4	4	3	5
2	3	3	4	4	4	5
3	4	4	3	4	3	5
4	3	4	4	4	3	5
5	4	4	4	4	3	5
6	3	4	4	4	2	5
7	4	4	4	5	3	5
8	4	4	5	5	2	4
9	4	4	4	4	3	5
10	3	3	4	4	3	5
11	4	4	4	4	2	5
12	4	4	4	4	2	5
13	4	4	4	5	3	5
14	4	4	4	5	3	5
15	3	4	4	4	3	5
16	3	4	3	3	4	5
17	3	3	4	5	3	5
18	4	3	3	4	2	5
19	3	4	4	4	3	5
20	3	4	3	3	4	5
21	3	3	4	4	4	5
22	3	3	4	4	3	5
23	3	3	4	4	3	5
24	4	4	4	4	3	5
25	3	3	4	4	4	5
Total	87	92	98	103	75	124

a. Formula 1

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{87}{25} = 3,48$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n} = \frac{12(4-3,48)^2 + 13(3-3,48)^2}{25} = \frac{38,93+3,00}{25} = \frac{41,93}{25} = 1,68$$

$$S = \sqrt{S^2} = \sqrt{1,68} = 1,30$$

$$P(3,48 - (1,96 \cdot 1,30 / \sqrt{25})) \leq \mu \leq (3,48 + (1,96 \cdot 1,30 / \sqrt{25})) = P(2,97 \leq \mu \leq 3,99)$$

b. Formula 2

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{92}{25} = 3,68$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{x})^2}{n} = \frac{17(4-3,68)^2 + 8(3-3,68)^2}{25} = \frac{1,74+3,70}{25} = \frac{5,44}{25} = 0,22$$

$$S = \sqrt{S^2} = \sqrt{0,22} = 0,47$$

$$P(3,68 - (1,96 \cdot 0,47 / \sqrt{25})) \leq \mu \leq (3,68 + (1,96 \cdot 0,47 / \sqrt{25})) = P(3,52 \leq \mu \leq 3,84)$$

c. Formula 3

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{98}{25} = 3,92$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{x})^2}{n} = \frac{1(5-3,92)^2 + 21(4-3,92)^2 + 3(3-3,92)^2}{25} = \frac{1,17+0,13+2,54}{25} = \frac{3,84}{25} = 0,15$$

$$S = \sqrt{S^2} = \sqrt{0,15} = 0,39$$

$$P(3,92 - (1,96 \cdot 0,39 / \sqrt{25})) \leq \mu \leq (3,92 + (1,96 \cdot 0,39 / \sqrt{25})) = P(3,77 \leq \mu \leq 4,07)$$

d. Formula 4

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{103}{25} = 4,12$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{x})^2}{n} = \frac{5(5-4,12)^2 + 18(4-4,12)^2 + 2(3-4,12)^2}{25} = \frac{3,87+0,26+2,51}{25} = \frac{6,64}{25} = 0,27$$

$$S = \sqrt{S^2} = \sqrt{0,27} = 0,52$$

$$P(4,12 - (1,96 \cdot 0,52 / \sqrt{25})) \leq \mu \leq (4,12 + (1,96 \cdot 0,52 / \sqrt{25})) = P(3,92 \leq \mu \leq 4,32)$$

e. Kontrol (-)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{75}{25} = 3$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{x})^2}{n} = \frac{5(4-3)^2 + 15(3-3)^2 + 5(2-3)^2}{25} = \frac{5+0+5}{25} = \frac{10}{25} = 0,4$$

$$S = \sqrt{S^2} = \sqrt{0,4} = 0,63$$

$$P(3 - (1,96 \cdot 0,63 / \sqrt{25})) \leq \mu \leq (3 + (1,96 \cdot 0,63 / \sqrt{25})) = P(2,75 \leq \mu \leq 3,25)$$

f. Kontrol (+)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{124}{25} = 4,96$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{x})^2}{n} = \frac{24(5-4,96)^2 + 1(4-4,96)^2}{25} = \frac{0,04+0,92}{25} = \frac{0,96}{25} = 0,03$$

$$S = \sqrt{S^2} = \sqrt{0,03} = 0,17$$

$$P(4,96 - (1,96 \cdot 0,17 / \sqrt{25})) \leq \mu \leq (4,96 + (1,96 \cdot 0,17 / \sqrt{25})) = P(4,95 \leq \mu \leq 4,97)$$

Lampiran 24. Uji ketahanan wangi suhu ruang kipas angin minggu ke-3

Panelis	Formula					
	F1	F2	F3	F4	K-	K+
1	3	4	4	4	3	5
2	3	4	4	4	4	5
3	3	3	3	4	2	5
4	3	3	4	4	3	5
5	3	4	4	4	3	5
6	3	3	4	3	3	5
7	4	4	4	4	4	5
8	4	3	4	4	3	4
9	3	4	4	4	4	5
10	3	3	4	4	3	5
11	4	4	4	4	3	5
12	3	4	4	4	2	5
13	3	4	4	4	3	5
14	3	3	4	4	2	5
15	4	3	4	3	3	5
16	3	3	3	4	2	5
17	3	3	4	3	3	5
18	3	4	3	4	2	5
19	4	4	4	4	2	5
20	3	3	3	3	3	5
21	3	3	4	3	3	5
22	3	3	4	4	3	5
23	3	3	4	3	2	5
24	4	3	4	4	2	5
25	3	3	4	4	2	5
Total	81	85	96	94	69	124

a. Formula 1

$$\bar{X} = \frac{\sum_{i=1}^n X_i}{n} = \frac{81}{25} = 3,24$$

$$S^2 = \frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n} = \frac{6(4-3,24)^2 + 19(3-3,24)^2}{25} = \frac{3,47+1,09}{25} = \frac{4,56}{25} = 0,18$$

$$S = \sqrt{S^2} = \sqrt{0,18} = 0,42$$

$$P(3,24 - (1,96 \cdot 0,42 / \sqrt{25})) \leq \mu \leq (3,24 + (1,96 \cdot 0,42 / \sqrt{25})) = P(3,08 \leq \mu \leq 3,4)$$

b. Formula 2

$$\bar{X} = \frac{\sum_{i=1}^n X_i}{n} = \frac{85}{25} = 3,4$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{x})^2}{n} = \frac{10(4-3,4)^2 + 15(3-3,4)^2}{25} = \frac{3,6+2,4}{25} = \frac{6}{25} = 0,24$$

$$S = \sqrt{S^2} = \sqrt{0,24} = 0,49$$

$$P(3,4 - (1,96 \cdot 0,49 / \sqrt{25})) \leq \mu \leq (3,4 + (1,96 \cdot 0,49 / \sqrt{25})) = P(3,21 \leq \mu \leq 3,59)$$

c. Formula 3

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{96}{25} = 3,84$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{x})^2}{n} = \frac{21(4-3,84)^2 + 4(3-3,84)^2}{25} = \frac{0,54+2,82}{25} = \frac{3,36}{25} = 0,13$$

$$S = \sqrt{S^2} = \sqrt{0,13} = 0,36$$

$$P(3,84 - (1,96 \cdot 0,36 / \sqrt{25})) \leq \mu \leq (3,84 + (1,96 \cdot 0,36 / \sqrt{25})) = P(3,7 \leq \mu \leq 3,98)$$

d. Formula 4

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{94}{25} = 3,76$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{x})^2}{n} = \frac{19(4-3,76)^2 + 6(3-3,76)^2}{25} = \frac{1,09+3,47}{25} = \frac{4,56}{25} = 0,18$$

$$S = \sqrt{S^2} = \sqrt{0,18} = 0,42$$

$$P(3,76 - (1,96 \cdot 0,42 / \sqrt{25})) \leq \mu \leq (3,76 + (1,96 \cdot 0,42 / \sqrt{25})) = P(3,6 \leq \mu \leq 3,92)$$

e. Kontrol (-)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{69}{25} = 2,76$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{x})^2}{n} = \frac{3(4-2,76)^2 + 13(3-2,76)^2 + 9(2-2,76)^2}{25} = \frac{4,61+0,75+5,20}{25} = \frac{10,56}{25} = 0,42$$

$$S = \sqrt{S^2} = \sqrt{0,42} = 0,65$$

$$P(2,76 - (1,96 \cdot 0,65 / \sqrt{25})) \leq \mu \leq (2,76 + (1,96 \cdot 0,65 / \sqrt{25})) = P(2,51 \leq \mu \leq 3,01)$$

f. Kontrol (+)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{124}{25} = 4,96$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{x})^2}{n} = \frac{24(5-4,96)^2 + 1(4-4,96)^2}{25} = \frac{0,04+0,92}{25} = \frac{0,96}{25} = 0,03$$

$$S = \sqrt{S^2} = \sqrt{0,03} = 0,17$$

$$P(4,96 - (1,96 \cdot 0,17 / \sqrt{25})) \leq \mu \leq (4,96 + (1,96 \cdot 0,17 / \sqrt{25})) = P(4,95 \leq \mu \leq 4,97)$$

Lampiran 25. Uji ketahanan wangi suhu ruang kipas angin minggu ke-4

Panelis	Formula					
	F1	F2	F3	F4	K-	K+
1	3	3	3	3	3	5
2	3	3	4	4	3	5
3	3	3	3	4	3	5
4	3	3	3	3	3	5
5	3	4	3	3	2	5
6	3	3	3	3	3	5
7	3	3	4	4	2	5
8	2	3	3	4	3	4
9	2	3	3	4	2	5
10	2	3	3	3	3	5
11	2	3	3	3	2	5
12	2	3	3	3	2	5
13	3	4	4	4	3	5
14	3	3	3	3	2	5
15	3	3	4	4	3	5
16	2	2	3	4	2	5
17	3	3	3	3	3	5
18	3	3	4	4	2	5
19	2	3	4	4	2	5
20	3	3	3	3	3	5
21	3	3	4	4	2	5
22	2	3	3	4	3	5
23	2	2	3	3	2	5
24	3	3	3	3	2	5
25	2	2	3	3	3	5
Total	65	74	92	97	63	124

a. Formula 1

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{65}{25} = 2,6$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n} = \frac{15(3-2,6)^2 + 10(2-2,6)^2}{25} = \frac{7,35+3,6}{25} = \frac{10,95}{25} = 0,44$$

$$S = \sqrt{S^2} = \sqrt{0,44} = 0,66$$

$$P(2,6 - (1,96 \cdot 0,66 / \sqrt{25})) \leq \mu \leq (2,6 + (1,96 \cdot 0,66 / \sqrt{25})) = P(2,34 \leq \mu \leq 2,86)$$

b. Formula 2

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{74}{25} = 2,96$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{2(4-2,96)^2 + 20(3-2,96)^2 + 3(2-2,96)^2}{25} = \frac{2,16+0,03+2,76}{25} = \frac{4,95}{25} = 0,20$$

$$S = \sqrt{S^2} = \sqrt{0,20} = 0,45$$

$$P(2,96 - (1,96 \cdot 0,45 / \sqrt{25})) \leq \mu \leq (2,96 + (1,96 \cdot 0,45 / \sqrt{25})) = P(2,78 \leq \mu \leq 3,14)$$

c. Formula 3

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{82}{25} = 3,28$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{7(4-3,28)^2 + 18(3-3,28)^2}{25} = \frac{3,63+1,41}{25} = \frac{5,04}{25} = 0,20$$

$$S = \sqrt{S^2} = \sqrt{0,20} = 0,45$$

$$P(3,28 - (1,96 \cdot 0,45 / \sqrt{25})) \leq \mu \leq (3,28 + (1,96 \cdot 0,45 / \sqrt{25})) = P(3,1 \leq \mu \leq 3,46)$$

d. Formula 4

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{87}{25} = 3,48$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{12(4-3,48)^2 + 13(3-3,48)^2}{25} = \frac{3,24+3,00}{25} = \frac{6,24}{25} = 0,25$$

$$S = \sqrt{S^2} = \sqrt{0,25} = 0,5$$

$$P(3,48 - (1,96 \cdot 0,5 / \sqrt{25})) \leq \mu \leq (3,48 + (1,96 \cdot 0,5 / \sqrt{25})) = P(3,28 \leq \mu \leq 3,68)$$

e. Kontrol (-)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{63}{25} = 2,52$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{13(3-2,52)^2 + 12(2-2,52)^2}{25} = \frac{3,00+3,24}{25} = \frac{6,24}{25} = 0,25$$

$$S = \sqrt{S^2} = \sqrt{0,25} = 0,5$$

$$P(2,52 - (1,96 \cdot 0,5 / \sqrt{25})) \leq \mu \leq (2,52 + (1,96 \cdot 0,5 / \sqrt{25})) = P(2,32 \leq \mu \leq 2,72)$$

f. Kontrol (+)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{124}{25} = 4,96$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{24(5-4,96)^2 + 1(4-4,96)^2}{25} = \frac{0,04+0,92}{25} = \frac{0,96}{25} = 0,03$$

$$S = \sqrt{S^2} = \sqrt{0,03} = 0,17$$

$$P(4,96 - (1,96 \cdot 0,17 / \sqrt{25})) \leq \mu \leq (4,96 + (1,96 \cdot 0,17 / \sqrt{25})) = P(4,95 \leq \mu \leq 4,9)$$

Lampiran 26. Uji ketahanan wangi suhu AC minggu ke-1

Panelis	Formula					
	F1	F2	F3	F4	K-	K+
1	4	4	5	5	4	5
2	4	5	5	5	4	5
3	4	4	4	3	3	5
4	3	3	4	4	3	5
5	4	4	5	5	3	5
6	4	4	4	4	4	5
7	4	4	4	5	3	5
8	4	4	4	4	2	4
9	3	4	4	4	3	5
10	5	4	4	4	4	5
11	4	4	4	4	3	5
12	4	5	3	4	2	5
13	4	4	5	5	3	5
14	4	4	5	5	4	5
15	4	3	5	5	3	5
16	4	5	5	4	2	5
17	4	4	4	5	4	5
18	3	5	4	5	3	5
19	4	4	5	4	4	5
20	4	5	5	5	5	5
21	4	4	5	5	3	5
22	4	4	4	5	4	5
23	4	4	4	5	4	5
24	4	5	5	5	4	5
25	4	4	5	5	4	5
Total	98	104	108	114	85	124

a. Formula 1

$$\bar{X} = \frac{\sum_{i=1}^n x_i^2}{n} = \frac{98}{25} = 3,92$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n} = \frac{1(5-3,92)^2 + 21(4-3,92)^2 + 3(3-3,92)^2}{25} = \frac{1,16+0,13+2,54}{25} = \frac{3,82}{25} = 0,15$$

$$S = \sqrt{S^2} = \sqrt{0,15} = 0,39$$

$$P(3,92 - (1,96 \cdot 0,39 / \sqrt{25})) \leq \mu \leq (3,92 + (1,96 \cdot 0,39 / \sqrt{25})) = P(3,77 \leq \mu \leq 4,07)$$

b. Formula 2

$$\bar{X} = \frac{\sum_{i=1}^n x_i^2}{n} = \frac{104}{25} = 4,16$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n} = \frac{6(5-4,16)^2 + 17(4-4,16)^2 + 2(3-4,16)^2}{25} = \frac{4,23+0,44+2,69}{25} = \frac{7,36}{25} = 0,29$$

$$S = \sqrt{S^2} = \sqrt{0,29} = 0,54$$

$$P(4,16 - (1,96 \cdot 0,54 / \sqrt{25})) \leq \mu \leq (4,16 + (1,96 \cdot 0,54 / \sqrt{25})) = P(3,98 \leq \mu \leq 4,34)$$

c. Formula 3

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{108}{25} = 4,32$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n} = \frac{12(5-4,32)^2 + 12(4-4,32)^2 + 1(3-4,32)^2}{25} = \frac{5,55 + 1,23 + 1,74}{25} = \frac{8,52}{25} = 0,34$$

$$S = \sqrt{S^2} = \sqrt{0,34} = 0,58$$

$$P(4,32 - (1,96 \cdot 0,58 / \sqrt{25})) \leq \mu \leq (4,32 + (1,96 \cdot 0,58 / \sqrt{25})) = P(4,09 \leq \mu \leq 4,55)$$

d. Formula 4

$$\bar{X} = \frac{\sum_{i=1}^n x_i^2}{n} = \frac{114}{25} = 4,56$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n} = \frac{15(5-4,56)^2 + 9(4-4,56)^2 + 1(3-4,56)^2}{25} = \frac{2,90 + 2,82 + 2,43}{25} = \frac{8,15}{25} = 0,33$$

$$S = \sqrt{S^2} = \sqrt{0,33} = 0,57$$

$$P(4,56 - (1,96 \cdot 0,57 / \sqrt{25})) \leq \mu \leq (4,56 + (1,96 \cdot 0,57 / \sqrt{25})) = P(4,34 \leq \mu \leq 4,78)$$

e. Kontrol (-)

$$\bar{X} = \frac{\sum_{i=1}^n x_i^2}{n} = \frac{85}{25} = 3,4$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n} = \frac{1(5-3,4)^2 + 11(4-3,4)^2 + 10(3-3,4)^2 + 1(2-3,4)^2}{25} = \frac{2,56 + 3,96 + 1,6 + 1,96}{25} = \frac{10,08}{25} = 0,40$$

$$S = \sqrt{S^2} = \sqrt{0,40} = 0,63$$

$$P(3,4 - (1,96 \cdot 0,63 / \sqrt{25})) \leq \mu \leq (3,4 + (1,96 \cdot 0,63 / \sqrt{25})) = P(3,15 \leq \mu \leq 3,65)$$

Kontrol (+)

$$\bar{X} = \frac{\sum_{i=1}^n x_i^2}{n} = \frac{124}{25} = 4,96$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n} = \frac{24(5-4,96)^2 + 1(4-4,96)^2}{25} = \frac{0,04 + 0,92}{25} = \frac{0,96}{25} = 0,03$$

$$S = \sqrt{S^2} = \sqrt{0,03} = 0,17$$

$$P(4,96 - (1,96 \cdot 0,17 / \sqrt{25})) \leq \mu \leq (4,96 + (1,96 \cdot 0,17 / \sqrt{25})) = P(4,95 \leq \mu \leq 4,97)$$

Lampiran 27. Uji ketahanan wangi suhu AC minggu ke-2

Panelis	Formula					
	F1	F2	F3	F4	K-	K+
1	4	4	4	4	4	5
2	4	4	4	5	4	5
3	3	4	4	4	3	5
4	3	4	4	4	3	5
5	4	4	4	5	3	5
6	3	3	4	4	3	5
7	3	4	4	4	3	5
8	4	4	4	4	2	4
9	3	3	4	4	3	5
10	4	4	4	4	2	5
11	3	4	4	4	3	5
12	4	3	4	4	2	5
13	4	4	5	5	4	5
14	3	4	4	4	4	5
15	3	3	4	4	3	5
16	3	4	3	4	2	5
17	3	4	4	4	4	5
18	3	4	4	4	3	5
19	4	4	4	5	3	5
20	3	4	3	4	2	5
21	3	3	4	4	4	5
22	3	3	4	4	3	5
23	3	3	4	4	3	5
24	4	4	4	5	4	5
25	3	3	4	4	4	5
Total	84	92	99	100	78	124

a. Formula 1

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{84}{25} = 3,36$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n} = \frac{9(4-3,36)^2 + 16(3-3,36)^2}{25} = \frac{3,69+6,15}{25} = \frac{9,84}{25} = 0,39$$

$$S = \sqrt{S^2} = \sqrt{0,39} = 0,62$$

$$P(3,36 - (1,96 \cdot 0,62 / \sqrt{25})) \leq \mu \leq (3,36 + (1,96 \cdot 0,62 / \sqrt{25})) = P(3,12 \leq \mu \leq 3,6)$$

b. Formula 2

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{92}{25} = 3,68$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{17(4-3,68)^2 + 8(3-3,68)^2}{25} = \frac{1,74+3,70}{25} = \frac{5,44}{25} = 0,22$$

$$S = \sqrt{S^2} = \sqrt{0,22} = 0,47$$

$$P(3,68 - (1,96 \cdot 0,47 / \sqrt{25})) \leq \mu \leq (3,68 + (1,96 \cdot 0,47 / \sqrt{25})) = P(3,5 \leq \mu \leq 3,86)$$

c. Formula 3

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{99}{25} = 3,96$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{1(5-3,96)^2 + 22(4-3,96)^2 + 2(3-3,96)^2}{25} = \frac{1,08+0,04+1,84}{25} = \frac{2,96}{25} = 0,12$$

$$S = \sqrt{S^2} = \sqrt{0,12} = 0,35$$

$$P(3,96 - (1,96 \cdot 0,35 / \sqrt{25})) \leq \mu \leq (3,96 + (1,96 \cdot 0,35 / \sqrt{25})) = P(3,82 \leq \mu \leq 4,11)$$

d. Formula 4

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{100}{25} = 4$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{5(5-4)^2 + 20(4-4)^2}{25} = \frac{5+0}{25} = \frac{5,44}{25} = 0,2$$

$$S = \sqrt{S^2} = \sqrt{0,2} = 0,45$$

$$P(4 - (1,96 \cdot 0,45 / \sqrt{25})) \leq \mu \leq (4 + (1,96 \cdot 0,45 / \sqrt{25})) = P(3,82 \leq \mu \leq 4,18)$$

e. Kontrol (-)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{78}{25} = 3,12$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{8(4-3,12)^2 + 12(3-3,12)^2 + 5(2-3,12)^2}{25} = \frac{6,20+0,17+6,27}{25} = \frac{12,64}{25} = 0,51$$

$$S = \sqrt{S^2} = \sqrt{0,51} = 0,71$$

$$P(3,12 - (1,96 \cdot 0,71 / \sqrt{25})) \leq \mu \leq (3,12 + (1,96 \cdot 0,71 / \sqrt{25})) = P(2,84 \leq \mu \leq 3,4)$$

f. Kontrol (+)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{124}{25} = 4,96$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{24(5-4,96)^2 + 1(4-4,96)^2}{25} = \frac{0,04+0,92}{25} = \frac{0,96}{25} = 0,03$$

$$S = \sqrt{S^2} = \sqrt{0,03} = 0,17$$

$$P(4,96 - (1,96 \cdot 0,17 / \sqrt{25})) \leq \mu \leq (4,96 + (1,96 \cdot 0,17 / \sqrt{25})) = P(4,95 \leq \mu \leq 4,97)$$

Lampiran 28. Uji ketahanan wangi suhu AC minggu ke-3

Panelis	Formula					
	F1	F2	F3	F4	K-	K+
1	3	4	4	4	3	5
2	3	3	3	4	3	5
3	3	3	3	4	3	5
4	3	3	3	4	3	5
5	3	3	4	4	3	5
6	3	4	4	4	3	5
7	3	4	4	4	3	5
8	3	3	3	3	3	4
9	3	3	3	4	3	5
10	3	3	4	4	3	5
11	3	4	4	4	3	5
12	4	4	4	4	3	5
13	3	4	4	4	3	5
14	3	4	4	3	3	5
15	4	4	4	3	3	5
16	3	3	4	4	3	5
17	4	4	4	4	3	5
18	3	3	3	4	2	5
19	3	3	4	4	3	5
20	3	3	4	4	4	5
21	3	3	4	4	3	5
22	3	3	4	4	3	5
23	3	3	4	4	3	5
24	4	4	4	4	3	5
25	3	3	4	4	3	5
Total	79	85	94	97	75	124

a. Formula 1

$$\bar{X} = \frac{\sum_{i=1}^n X_i}{n} = \frac{79}{25} = 3,16$$

$$S^2 = \frac{\sum_{i=1}^n (X_i - \bar{X})^2}{n} = \frac{4(4-3,16)^2 + 21(3-3,16)^2}{25} = \frac{2,82+0,54}{25} = \frac{3,36}{25} = 0,13$$

$$S = \sqrt{S^2} = \sqrt{0,13} = 0,36$$

$$P(3,16 - (1,96 \cdot 0,36 / \sqrt{25})) \leq \mu \leq (3,16 + (1,96 \cdot 0,36 / \sqrt{25})) = P(3,02 \leq \mu \leq 3,3)$$

b. Formula 2

$$\bar{X} = \frac{\sum_{i=1}^n X_i}{n} = \frac{85}{25} = 3,4$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{10(4-3,4)^2 + 15(3-3,4)^2}{25} = \frac{3,6+2,4}{25} = \frac{6}{25} = 0,24$$

$$S = \sqrt{S^2} = \sqrt{0,24} = 0,49$$

$$P(3,4 - (1,96 \cdot 0,49 / \sqrt{25})) \leq \mu \leq (3,4 + (1,96 \cdot 0,49 / \sqrt{25})) = P(3,21 \leq \mu \leq 3,59)$$

c. Formula 3

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{94}{25} = 3,76$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{19(4-3,76)^2 + 6(3-3,76)^2}{25} = \frac{1,09+3,47}{25} = \frac{4,56}{25} = 0,18$$

$$S = \sqrt{S^2} = \sqrt{0,18} = 0,42$$

$$P(3,76 - (1,96 \cdot 0,42 / \sqrt{25})) \leq \mu \leq (3,76 + (1,96 \cdot 0,42 / \sqrt{25})) = P(3,6 \leq \mu \leq 3,92)$$

d. Formula 4

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{97}{25} = 3,88$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{22(4-3,88)^2 + 3(3-3,88)^2}{25} = \frac{0,32+2,32}{25} = \frac{2,64}{25} = 0,11$$

$$S = \sqrt{S^2} = \sqrt{0,11} = 0,33$$

$$P(3,88 - (1,96 \cdot 0,33 / \sqrt{25})) \leq \mu \leq (3,88 + (1,96 \cdot 0,33 / \sqrt{25})) = P(3,75 \leq \mu \leq 4,01)$$

e. Kontrol (-)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{75}{25} = 3$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{1(4-3)^2 + 23(3-3)^2 + 1(2-3)^2}{25} = \frac{1+0+1}{25} = \frac{2}{25} = 0,08$$

$$S = \sqrt{S^2} = \sqrt{0,08} = 0,28$$

$$P(3 - (1,96 \cdot 0,28 / \sqrt{25})) \leq \mu \leq (3 + (1,96 \cdot 0,28 / \sqrt{25})) = P(2,89 \leq \mu \leq 3,11)$$

f. Kontrol (+)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{124}{25} = 4,96$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{24(5-4,96)^2 + 1(4-4,96)^2}{25} = \frac{0,04+0,92}{25} = \frac{0,96}{25} = 0,03$$

$$S = \sqrt{S^2} = \sqrt{0,03} = 0,17$$

$$P(4,96 - (1,96 \cdot 0,17 / \sqrt{25})) \leq \mu \leq (4,96 + (1,96 \cdot 0,17 / \sqrt{25})) = P(4,95 \leq \mu \leq 4,97)$$

Lampiran 29. Uji ketahanan wangi suhu AC minggu ke-4

Panelis	Formula					
	F1	F2	F3	F4	K-	K+
1	3	3	4	3	3	5
2	3	3	4	4	2	5
3	2	3	3	3	2	5
4	3	3	3	4	3	5
5	3	3	4	4	3	5
6	2	3	4	3	3	5
7	2	3	3	3	3	5
8	3	3	4	4	2	4
9	3	4	4	4	2	5
10	3	3	4	4	2	5
11	3	3	4	4	3	5
12	2	3	3	4	3	5
13	2	2	3	3	2	5
14	3	4	4	4	2	5
15	3	4	4	4	3	5
16	3	3	4	4	2	5
17	3	3	3	4	2	5
18	3	3	3	3	2	5
19	3	3	4	4	3	5
20	2	3	3	3	2	5
21	2	2	3	3	2	5
22	2	3	3	4	2	5
23	2	3	4	4	3	5
24	3	3	4	4	2	5
25	2	3	3	3	2	5
Total	65	76	89	91	60	124

a. Formula 1

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{65}{25} = 2,6$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n} = \frac{15(3-2,6)^2 + 10(2-2,6)^2}{25} = \frac{2,4 + 3,6}{25} = \frac{6}{25} = 0,24$$

$$S = \sqrt{S^2} = \sqrt{0,24} = 0,48$$

$$P(2,6 - (1,96 \cdot 0,48 / \sqrt{25})) \leq \mu \leq (2,6 + (1,96 \cdot 0,48 / \sqrt{25})) = P(2,42 \leq \mu \leq 2,78)$$

b. Formula 2

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{76}{25} = 3,04$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{3(4-3,04)^2 + 20(3-3,04)^2 + 2(2-3,04)^2}{25} = \frac{2,77+0,03+2,16}{25} = \frac{4,96}{25} = 0,20$$

$$S = \sqrt{S^2} = \sqrt{0,20} = 0,45$$

$$P(3,04 - (1,96 \cdot 0,45 / \sqrt{25})) \leq \mu \leq (3,04 + (1,96 \cdot 0,45 / \sqrt{25})) = P(2,86 \leq \mu \leq 3,22)$$

c. Formula 3

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{89}{25} = 3,56$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{14(4-3,56)^2 + 11(3-3,56)^2}{25} = \frac{2,71+3,45}{25} = \frac{6,16}{25} = 0,25$$

$$S = \sqrt{S^2} = \sqrt{0,25} = 0,5$$

$$P(3,56 - (1,96 \cdot 0,5 / \sqrt{25})) \leq \mu \leq (3,56 + (1,96 \cdot 0,5 / \sqrt{25})) = P(3,36 \leq \mu \leq 3,76)$$

d. Formula 4

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{91}{25} = 3,64$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{16(4-3,64)^2 + 9(3-3,64)^2}{25} = \frac{2,07+3,69}{25} = \frac{5,76}{25} = 0,23$$

$$S = \sqrt{S^2} = \sqrt{0,23} = 0,48$$

$$P(3,64 - (1,96 \cdot 0,48 / \sqrt{25})) \leq \mu \leq (3,64 + (1,96 \cdot 0,48 / \sqrt{25})) = P(3,46 \leq \mu \leq 3,82)$$

e. Kontrol (-)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{60}{25} = 2,4$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{10(3-2,4)^2 + 15(2-2,4)^2}{25} = \frac{3,6+2,4}{25} = \frac{6}{25} = 0,24$$

$$S = \sqrt{S^2} = \sqrt{0,24} = 0,49$$

$$P(2,4 - (1,96 \cdot 0,49 / \sqrt{25})) \leq \mu \leq (2,4 + (1,96 \cdot 0,49 / \sqrt{25})) = P(2,21 \leq \mu \leq 2,59)$$

f. Kontrol (+)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{124}{25} = 4,96$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{24(5-4,96)^2 + 1(4-4,96)^2}{25} = \frac{0,04+0,92}{25} = \frac{0,96}{25} = 0,03$$

$$S = \sqrt{S^2} = \sqrt{0,03} = 0,17$$

$$P(4,96 - (1,96 \cdot 0,17 / \sqrt{25})) \leq \mu \leq (4,96 + (1,96 \cdot 0,17 / \sqrt{25})) = P(4,95 \leq \mu \leq 4,97)$$

Lampiran 30. Hasil uji ketahanan wangi suhu kamar minggu ke-1

panelis	Formula					
	F1	F2	F3	F4	K-	K+
1	4	4	4	5	4	5
2	4	5	4	5	4	5
3	2	3	4	4	3	5
4	3	4	4	4	3	5
5	4	4	5	5	3	5
6	3	3	3	3	4	5
7	4	4	4	4	3	5
8	4	5	5	5	3	4
9	4	4	4	4	3	5
10	5	4	3	4	3	5
11	3	4	4	2	3	5
12	5	5	5	4	2	5
13	4	4	5	5	3	5
14	4	4	5	5	3	5
15	4	4	5	5	4	5
16	4	4	5	5	3	5
17	4	4	4	5	4	5
18	3	5	4	4	3	5
19	4	4	5	4	4	5
20	5	4	5	5	4	5
21	5	5	4	4	2	5
22	4	4	4	4	4	5
23	4	4	4	5	4	5
24	4	4	5	5	4	5
25	4	4	4	4	3	5
Total	96	103	108	109	96	124

a. Formula 1

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{96}{25} = 3,92$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n} = \frac{4(5-3,92)^2 + 16(4-3,92)^2 + 4(3-3,92)^2 + 1(2-3,92)^2}{25} = \frac{4,67+0,10+3,39+3,69}{25} = \frac{11,85}{25} = 0,47$$

$$S = \sqrt{S^2} = \sqrt{0,47} = 0,69$$

$$P(3,92 - (1,96 \cdot 0,69 / \sqrt{25})) \leq \mu \leq (3,92 + (1,96 \cdot 0,69 / \sqrt{25})) = P(3,65 \leq \mu \leq 4,19)$$

b. Formula 2

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{103}{25} = 4,12$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{5(5-4,12)^2 + 18(4-4,12)^2 + 2(3-4,12)^2}{25} = \frac{3,87+0,26+2,51}{25} = \frac{6,64}{25} = 0,27$$

$$S = \sqrt{S^2} = \sqrt{0,27} = 0,52$$

$$P(4,12 - (1,96 \cdot 0,52 / \sqrt{25})) \leq \mu \leq (4,12 + (1,96 \cdot 0,52 / \sqrt{25})) = P(3,92 \leq \mu \leq 4,32)$$

c. Formula 3

$$\bar{X} = \frac{\sum_i^n X_i}{n} = \frac{108}{25} = 4,32$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{10(5-4,32)^2 + 13(4-4,32)^2 + 2(3-4,32)^2}{25} = \frac{4,62+1,33+3,48}{25} = \frac{9,43}{25} = 0,38$$

$$S = \sqrt{S^2} = \sqrt{0,38} = 0,62$$

$$P(4,32 - (1,96 \cdot 0,62 / \sqrt{25})) \leq \mu \leq (4,32 + (1,96 \cdot 0,62 / \sqrt{25})) = P(4,08 \leq \mu \leq 4,56)$$

d. Formula 4

$$\bar{X} = \frac{\sum_i^n X_i}{n} = \frac{109}{25} = 4,36$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{12(5-4,36)^2 + 11(4-4,36)^2 + 1(3-4,36)^2 + 1(2-4,36)^2}{25} = \frac{4,92+1,43+1,85+5,57}{25} = \frac{13,77}{25} = 0,55$$

$$S = \sqrt{S^2} = \sqrt{0,55} = 0,74$$

$$P(4,36 - (1,96 \cdot 0,74 / \sqrt{25})) \leq \mu \leq (4,36 + (1,96 \cdot 0,74 / \sqrt{25})) = P(4,07 \leq \mu \leq 4,65)$$

e. Kontrol (-)

$$\bar{X} = \frac{\sum_i^n X_i}{n} = \frac{96}{25} = 3,84$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{10(4-3,84)^2 + 13(3-3,84)^2 + 1(2-3,84)^2}{25} = \frac{0,26+9,17+3,39}{25} = \frac{12,82}{25} = 0,51$$

$$S = \sqrt{S^2} = \sqrt{0,51} = 0,71$$

$$P(3,84 - (1,96 \cdot 0,71 / \sqrt{25})) \leq \mu \leq (3,84 + (1,96 \cdot 0,71 / \sqrt{25})) = P(3,56 \leq \mu \leq 4,12)$$

f. Kontrol (+)

$$\bar{X} = \frac{\sum_i^n X_i}{n} = \frac{124}{25} = 4,96$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{24(5-4,96)^2 + 1(4-4,96)^2}{25} = \frac{0,04+0,92}{25} = \frac{0,96}{25} = 0,03$$

$$S = \sqrt{S^2} = \sqrt{0,03} = 0,17$$

$$P(4,96 - (1,96 \cdot 0,17 / \sqrt{25})) \leq \mu \leq (4,96 + (1,96 \cdot 0,17 / \sqrt{25})) = P(4,95 \leq \mu \leq 4,97)$$

Lampiran 31. Hasil uji ketahanan wangi suhu kamar minggu ke-2

Panelis	Formula					
	F1	F2	F3	F4	K-	K+
1	4	4	4	5	4	5
2	3	4	3	4	4	5
3	3	3	3	4	3	5
4	4	4	4	4	2	5
5	3	4	4	5	3	5
6	3	3	4	4	3	5
7	3	4	4	4	3	5
8	4	4	4	4	2	4
9	3	4	4	4	3	5
10	3	3	4	4	3	5
11	4	4	4	4	2	5
12	3	4	4	4	2	5
13	4	4	5	5	3	5
14	4	4	4	5	3	5
15	4	4	4	4	3	5
16	3	4	3	4	4	5
17	3	3	4	4	3	5
18	3	3	4	4	4	5
19	4	4	4	4	2	5
20	3	4	3	4	4	5
21	3	3	4	4	4	5
22	3	3	4	4	3	5
23	3	3	4	4	3	5
24	3	4	4	3	3	5
25	3	3	4	4	4	5
Total	83	91	97	103	77	124

a. Formula 1

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{83}{25} = 3,32$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n} = \frac{8(4-3,32)^2 + 17(3-3,32)^2}{25} = \frac{3,70+1,74}{25} = \frac{5,44}{25} = 0,22$$

$$S = \sqrt{S^2} = \sqrt{0,22} = 0,47$$

$$P(3,32 - (1,96 \cdot 0,47 / \sqrt{25})) \leq \mu \leq (3,32 + (1,96 \cdot 0,47 / \sqrt{25})) = P(3,14 \leq \mu \leq 3,5)$$

b. Formula 2

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{91}{25} = 3,64$$

$$S^2 = \frac{\sum_i^n (X_i - \bar{X})^2}{n} = \frac{16(4-3,64)^2 + 9(3-3,64)^2}{25} = \frac{2,07+3,67}{25} = \frac{5,74}{25} = 0,23$$

$$S = \sqrt{S^2} = \sqrt{0,23} = 0,48$$

$$P(3,64 - (1,96 \cdot 0,48 / \sqrt{25})) \leq \mu \leq (3,64 + (1,96 \cdot 0,48 / \sqrt{25})) = P(3,46 \leq \mu \leq 3,82)$$

c. Formula 3

$$\bar{X} = \frac{\sum_i^n X_i}{n} = \frac{97}{25} = 3,88$$

$$S^2 = \frac{\sum_i^n (X_i - \bar{X})^2}{n} = \frac{1(5-3,88)^2 + 20(4-3,88)^2 + 4(3-3,88)^2}{25} = \frac{1,25+0,29+3,10}{25} = \frac{4,64}{25} = 0,19$$

$$S = \sqrt{S^2} = \sqrt{0,19} = 0,44$$

$$P(3,88 - (1,96 \cdot 0,44 / \sqrt{25})) \leq \mu \leq (3,88 + (1,96 \cdot 0,44 / \sqrt{25})) = P(3,71 \leq \mu \leq 4,05)$$

d. Formula 4

$$\bar{X} = \frac{\sum_i^n X_i}{n} = \frac{103}{25} = 4,12$$

$$S^2 = \frac{\sum_i^n (X_i - \bar{X})^2}{n} = \frac{4(5-4,12)^2 + 20(4-4,12)^2 + 1(3-4,12)^2}{25} = \frac{3,10+0,29+1,25}{25} = \frac{4,64}{25} = 0,19$$

$$S = \sqrt{S^2} = \sqrt{0,19} = 0,44$$

$$P(4,12 - (1,96 \cdot 0,44 / \sqrt{25})) \leq \mu \leq (4,12 + (1,96 \cdot 0,44 / \sqrt{25})) = P(3,95 \leq \mu \leq 4,29)$$

e. Kontrol (-)

$$\bar{X} = \frac{\sum_i^n X_i}{n} = \frac{77}{25} = 3,08$$

$$S^2 = \frac{\sum_i^n (X_i - \bar{X})^2}{n} = \frac{7(4-3,08)^2 + 13(3-3,08)^2 + 5(2-3,08)^2}{25} = \frac{5,92+0,08+3,39}{25} = \frac{12,82}{25} = 0,51$$

$$S = \sqrt{S^2} = \sqrt{0,51} = 0,71$$

$$P(3,08 - (1,96 \cdot 0,71 / \sqrt{25})) \leq \mu \leq (3,08 + (1,96 \cdot 0,71 / \sqrt{25})) = P(2,8 \leq \mu \leq 3,36)$$

f. Kontrol (+)

$$\bar{X} = \frac{\sum_i^n X_i}{n} = \frac{124}{25} = 4,96$$

$$S^2 = \frac{\sum_i^n (X_i - \bar{X})^2}{n} = \frac{24(5-4,96)^2 + 1(4-4,96)^2}{25} = \frac{0,04+0,92}{25} = \frac{0,96}{25} = 0,03$$

$$S = \sqrt{S^2} = \sqrt{0,03} = 0,17$$

$$P(4,96 - (1,96 \cdot 0,17 / \sqrt{25})) \leq \mu \leq (4,96 + (1,96 \cdot 0,17 / \sqrt{25})) = P(4,95 \leq \mu \leq 4,97)$$

Lampiran 30. Hasil uji ketahanan wangi suhu kamar minggu ke-3

Panelis	Formula					
	F1	F2	F3	F4	K-	K+
1	2	4	4	4	1	5
2	2	3	3	4	1	5
3	1	2	3	4	1	5
4	2	3	4	4	1	5
5	2	3	3	3	1	5
6	2	4	4	4	1	5
7	2	3	4	4	1	5
8	2	3	4	4	1	4
9	2	4	4	4	1	5
10	2	3	3	4	1	5
11	1	3	3	4	1	5
12	2	4	4	4	1	5
13	1	3	4	3	1	5
14	2	4	4	4	1	5
15	1	3	4	4	1	5
16	1	2	4	4	1	5
17	1	3	3	3	1	5
18	1	3	3	3	1	5
19	2	4	4	4	1	5
20	2	4	4	4	1	5
21	1	2	3	3	1	5
22	1	3	3	4	1	5
23	1	4	3	4	1	5
24	1	4	4	4	1	5
25	1	4	4	4	1	5
Total	38	82	90	95	25	124

a. Formula 1

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{38}{25} = 1,51$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n} = \frac{13(2-1,52)^2 + 12(1-1,52)^2}{25} = \frac{3,00+3,24}{25} = \frac{6,24}{25} = 0,25$$

$$S = \sqrt{S^2} = \sqrt{0,25} = 0,5$$

$$P(1,52 - (1,96 \cdot 0,5 / \sqrt{25})) \leq \mu \leq (1,52 + (1,96 \cdot 0,5 / \sqrt{25})) = P(1,32 \leq \mu \leq 1,72)$$

b. Formula 2

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{82}{25} = 3,28$$

$$S^2 = \frac{\sum_i^n (X_i - \bar{X})^2}{n} = \frac{10(4-3,28)^2 + 12(3-3,28)^2 + 3(2-3,28)^2}{25} = \frac{5,18 + 0,94 + 4,92}{25} = \frac{11,04}{25} = 0,44$$

$$S = \sqrt{S^2} = \sqrt{0,44} = 0,66$$

$$P(3,28 - (1,96 \cdot 0,66 / \sqrt{25})) \leq \mu \leq (3,28 + (1,96 \cdot 0,66 / \sqrt{25})) = P(3,02 \leq \mu \leq 3,54)$$

c. Formula 3

$$\bar{X} = \frac{\sum_i^n X_i}{n} = \frac{90}{25} = 3,6$$

$$S^2 = \frac{\sum_i^n (X_i - \bar{X})^2}{n} = \frac{20(4-3,6)^2 + 5(3-3,6)^2}{25} = \frac{3,2 + 1,8}{25} = \frac{5}{25} = 0,2$$

$$S = \sqrt{S^2} = \sqrt{0,2} = 0,45$$

$$P(3,6 - (1,96 \cdot 0,45 / \sqrt{25})) \leq \mu \leq (3,6 + (1,96 \cdot 0,45 / \sqrt{25})) = P(3,42 \leq \mu \leq 3,78)$$

d. Formula 4

$$\bar{X} = \frac{\sum_i^n X_i}{n} = \frac{95}{25} = 3,8$$

$$S^2 = \frac{\sum_i^n (X_i - \bar{X})^2}{n} = \frac{20(4-3,8)^2 + 5(3-3,8)^2}{25} = \frac{0,8 + 3,2}{25} = \frac{4}{25} = 0,16$$

$$S = \sqrt{S^2} = \sqrt{0,16} = 0,4$$

$$P(3,8 - (1,96 \cdot 0,4 / \sqrt{25})) \leq \mu \leq (3,8 + (1,96 \cdot 0,4 / \sqrt{25})) = P(3,64 \leq \mu \leq 3,96)$$

e. Kontrol (-)

$$\bar{X} = \frac{\sum_i^n X_i}{n} = \frac{25}{25} = 1$$

$$S^2 = \frac{\sum_i^n (X_i - \bar{X})^2}{n} = \frac{25(1-1)^2}{25} = \frac{0}{25} = 0$$

$$S = \sqrt{S^2} = \sqrt{0} = 0$$

$$P(1 - (1,96 \cdot 0 / \sqrt{25})) \leq \mu \leq (1 + (1,96 \cdot 0 / \sqrt{25})) = P(1 \leq \mu \leq 1)$$

f. Kontrol (+)

$$\bar{X} = \frac{\sum_i^n X_i}{n} = \frac{124}{25} = 4,96$$

$$S^2 = \frac{\sum_i^n (X_i - \bar{X})^2}{n} = \frac{24(5-4,96)^2 + 1(4-4,96)^2}{25} = \frac{0,04 + 0,92}{25} = \frac{0,96}{25} = 0,03$$

$$S = \sqrt{S^2} = \sqrt{0,03} = 0,17$$

$$P(4,96 - (1,96 \cdot 0,17 / \sqrt{25})) \leq \mu \leq (4,96 + (1,96 \cdot 0,17 / \sqrt{25})) = P(4,95 \leq \mu \leq 4,97)$$

Lampiran 31. Hasil uji ketahanan wangi suhu kamar minggu ke-4

Panelis	Formula					
	F1	F2	F3	F4	K-	K+
1	1	3	4	3	1	5
2	1	3	4	4	1	5
3	1	3	3	3	1	5
4	1	3	3	4	1	5
5	1	2	4	4	1	5
6	1	3	4	3	1	5
7	1	3	3	3	1	5
8	1	3	4	4	1	4
9	1	2	4	4	1	5
10	1	3	4	4	1	5
11	1	3	4	4	1	5
12	1	2	3	4	1	5
13	1	2	3	3	1	5
14	1	3	4	4	1	5
15	1	3	4	4	1	5
16	1	3	4	4	1	5
17	1	3	3	4	1	5
18	1	2	3	3	1	5
19	1	3	4	4	1	5
20	1	2	3	3	1	5
21	1	2	3	3	1	5
22	1	2	3	4	1	5
23	1	3	4	4	1	5
24	1	3	4	4	1	5
25	1	3	3	3	1	5
Total	25	67	89	91	25	124

a. Formula 1

$$\bar{X} = \frac{\sum_{i=1}^n x_i}{n} = \frac{25}{25} = 1$$

$$S^2 = \frac{\sum_{i=1}^n (x_i - \bar{X})^2}{n} = \frac{25(1-1)^2}{25} = \frac{0}{25} = 0$$

$$S = \sqrt{S^2} = \sqrt{0} = 0$$

$$P(1 - (1,96 \cdot 0 / \sqrt{25})) \leq \mu \leq (1 + (1,96 \cdot 0 / \sqrt{25})) = P(1 \leq \mu \leq 1)$$

b. Formula 2

$$\bar{X} = \frac{\sum_{i=1}^n x_i^2}{n} = \frac{67}{25} = 2,68$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{17(3-2,68)^2 + 8(2-2,68)^2}{25} = \frac{1,74+3,70}{25} = \frac{5,44}{25} = 0,22$$

$$S = \sqrt{S^2} = \sqrt{0,22} = 0,47$$

$$P(2,68 - (1,96 \cdot 0,47 / \sqrt{25})) \leq \mu \leq (2,68 + (1,96 \cdot 0,47 / \sqrt{25})) = P(2,5 \leq \mu \leq 2,86)$$

c. Formula 3

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{89}{25} = 3,56$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{14(4-3,56)^2 + 11(3-3,56)^2}{25} = \frac{2,71+3,45}{25} = \frac{6,16}{25} = 0,25$$

$$S = \sqrt{S^2} = \sqrt{0,25} = 0,5$$

$$P(3,56 - (1,96 \cdot 0,5 / \sqrt{25})) \leq \mu \leq (3,56 + (1,96 \cdot 0,5 / \sqrt{25})) = P(3,36 \leq \mu \leq 3,74)$$

d. Formula 4

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{91}{25} = 3,64$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{16(4-3,64)^2 + 9(3-3,64)^2}{25} = \frac{2,07+2,82}{25} = \frac{4,89}{25} = 0,20$$

$$S = \sqrt{S^2} = \sqrt{0,20} = 0,45$$

$$P(3,64 - (1,96 \cdot 0,45 / \sqrt{25})) \leq \mu \leq (3,64 + (1,96 \cdot 0,45 / \sqrt{25})) = P(3,46 \leq \mu \leq 3,82)$$

e. Kontrol (-)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{25}{25} = 1$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{25(1-1)^2}{25} = \frac{0}{25} = 0$$

$$S = \sqrt{S^2} = \sqrt{0} = 0$$

$$P(1 - (1,96 \cdot 0 / \sqrt{25})) \leq \mu \leq (1 + (1,96 \cdot 0 / \sqrt{25})) = P(1 \leq \mu \leq 1)$$

f. Kontrol (+)

$$\bar{X} = \frac{\sum_i^n X_i^2}{n} = \frac{124}{25} = 4,96$$

$$S^2 = \frac{\sum_i^n (X_i + \bar{X})^2}{n} = \frac{24(5-4,96)^2 + 1(4-4,96)^2}{25} = \frac{0,04+0,92}{25} = \frac{0,96}{25} = 0,03$$

$$S = \sqrt{S^2} = \sqrt{0,03} = 0,17$$

$$P(4,96 - (1,96 \cdot 0,17 / \sqrt{25})) \leq \mu \leq (4,96 + (1,96 \cdot 0,17 / \sqrt{25})) = P(4,95 \leq \mu \leq 4,97)$$