

## DAFTAR PUSTAKA

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## DAFTAR LAMPIRAN

### Lampiran 1. Hasil Determinasi Tanaman *R. Tomentosa*



**KEMENTERIAN RISET, TEKNOLOGI DAN PENDIDIKAN TINGGI  
UNIVERSITAS NEGERI MAKASSAR  
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM  
LABORATORIUM BIOLOGI**

Alamat : Kampus UNM Perum Tumbang Jl. Dr. Taib Raye Telp (0411) 848618 Makassar

No : 094/SKAP/LAB.BIOLOGI/VIII/2018  
Lamp : -  
Hal : Hasil Identifikasi Tanaman

31 Agustus 2018

Kepada Yth.  
**Rizky Dharmayanti**  
Program Studi S1 Farmasi  
STIFA Makassar

Dengan Hormat,

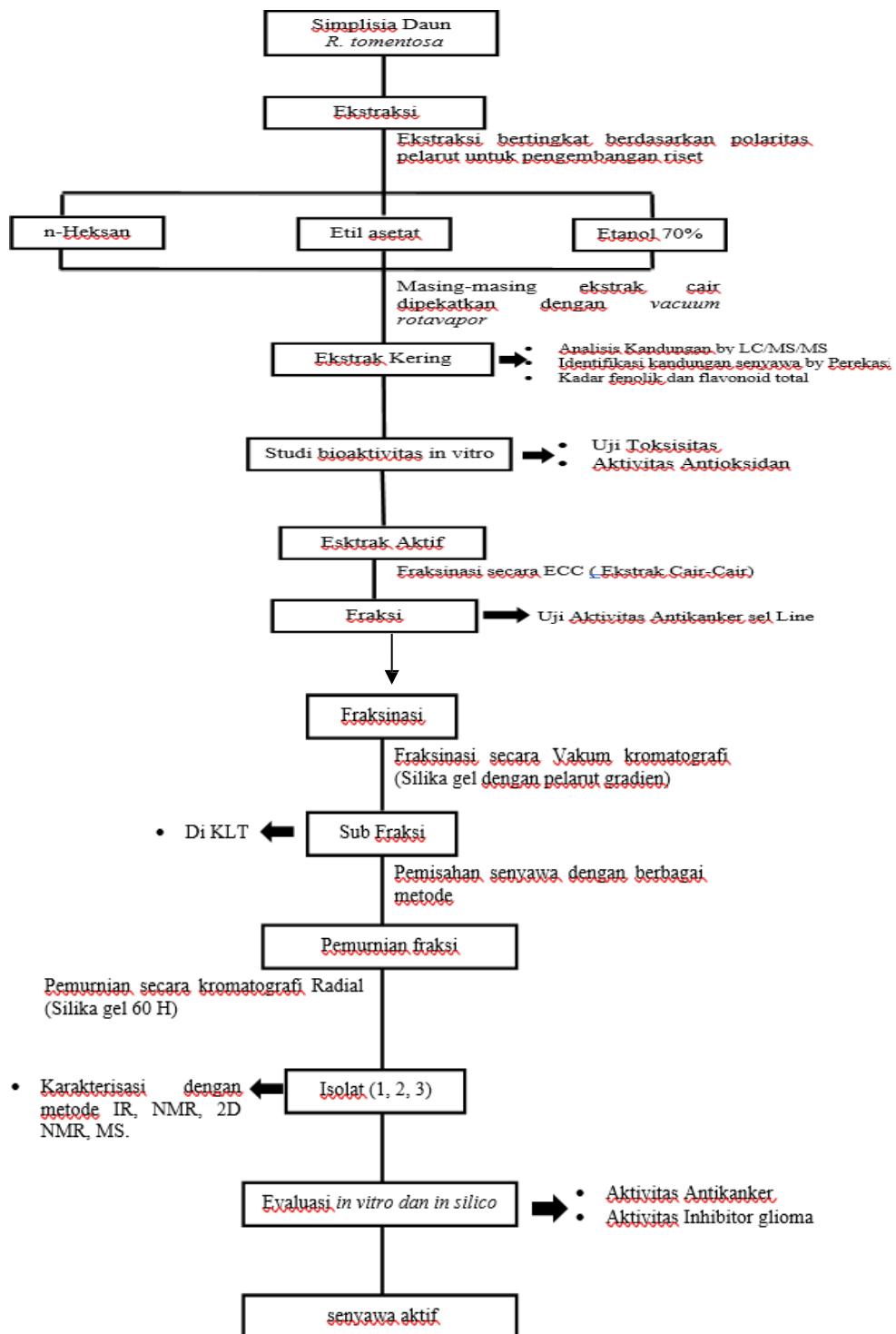
Bersama ini, kami sampaikan hasil identifikasi Tanaman Karumunting (*Rhodomyrtus tomentosa* (Aitton) Hassk.) yang saudara kirimkan. Identifikasi dilakukan oleh staf peneliti laboratorium Botani Jurusan Biologi FMIPA UNM dengan hasil sebagai berikut:

Kingdom	:	Plantae
Divisi	:	Magnoliophyta
Kelas	:	Magnoliopsida
Ordo	:	Myrales
Famili	:	Myrtaceae
Genus	:	<i>Rhodomyrtus</i>
Species	:	<i>Rhodomyrtus tomentosa</i> (Aitton) Hassk.

Demikian untuk diketahui dan dipergunakan sebagaimana mestinya.

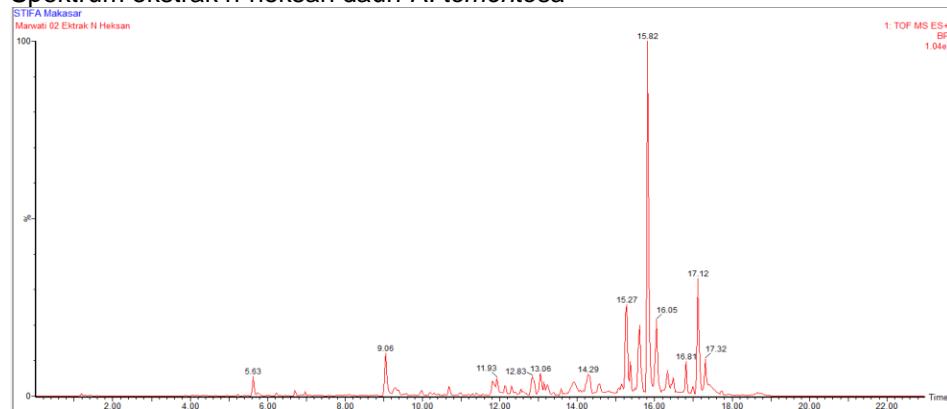


## Lampiran 2. Skema Kerja Penelitian

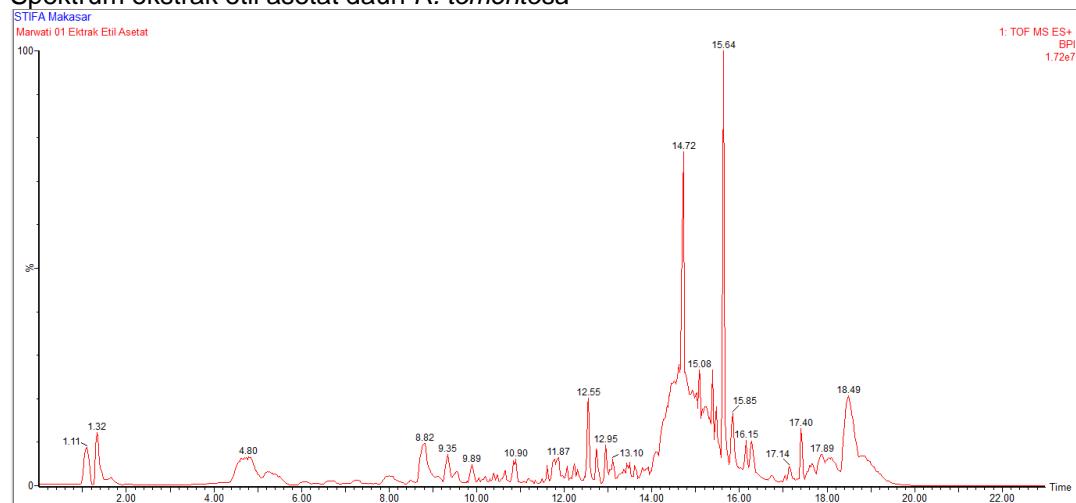


### Lampiran 3. Hasil Spektrum LC-MS dari masing-masing Ekstrak *R. Tomentosa*

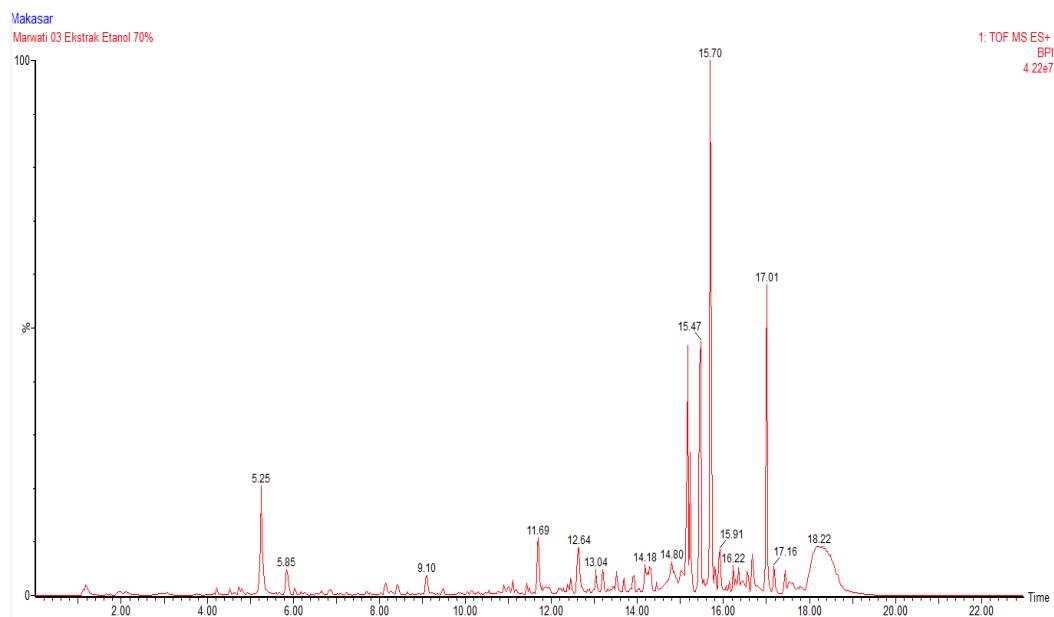
#### a. Spektrum ekstrak n-heksan daun *R. tomentosa*

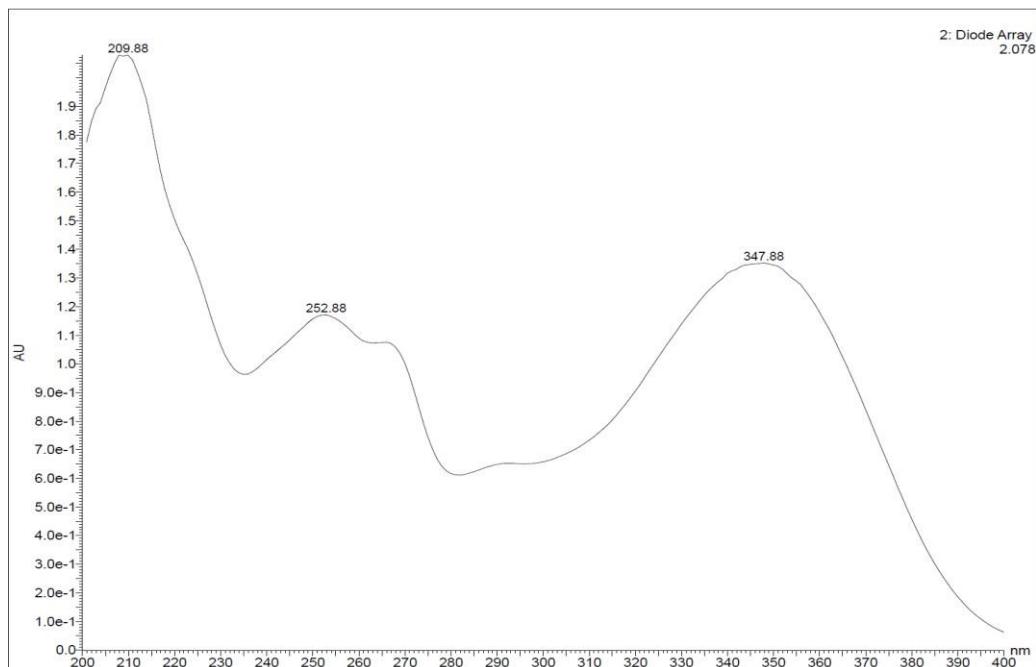
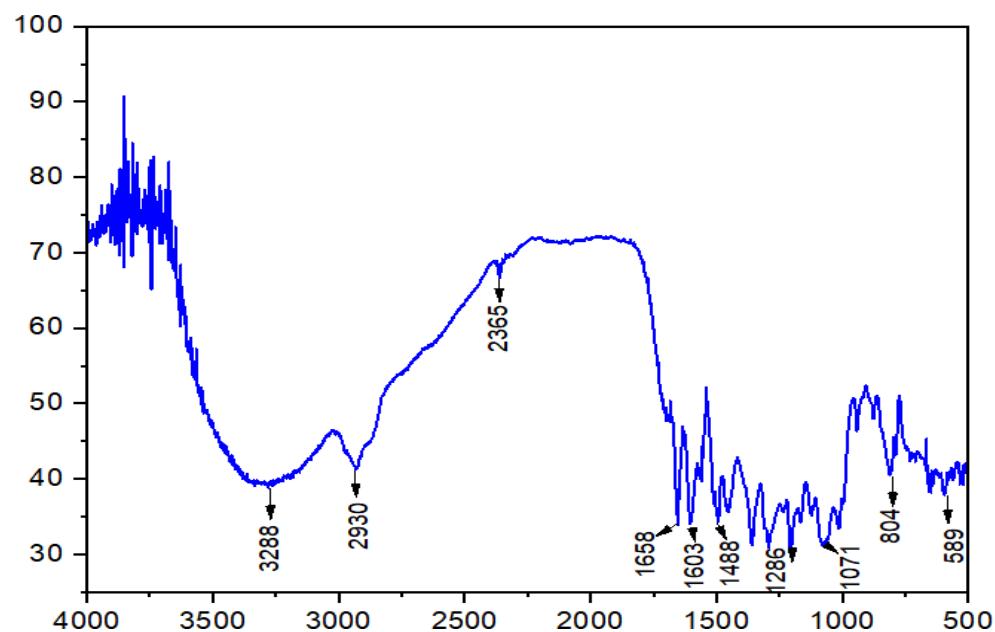


#### b. Spektrum ekstrak etil asetat daun *R. tomentosa*

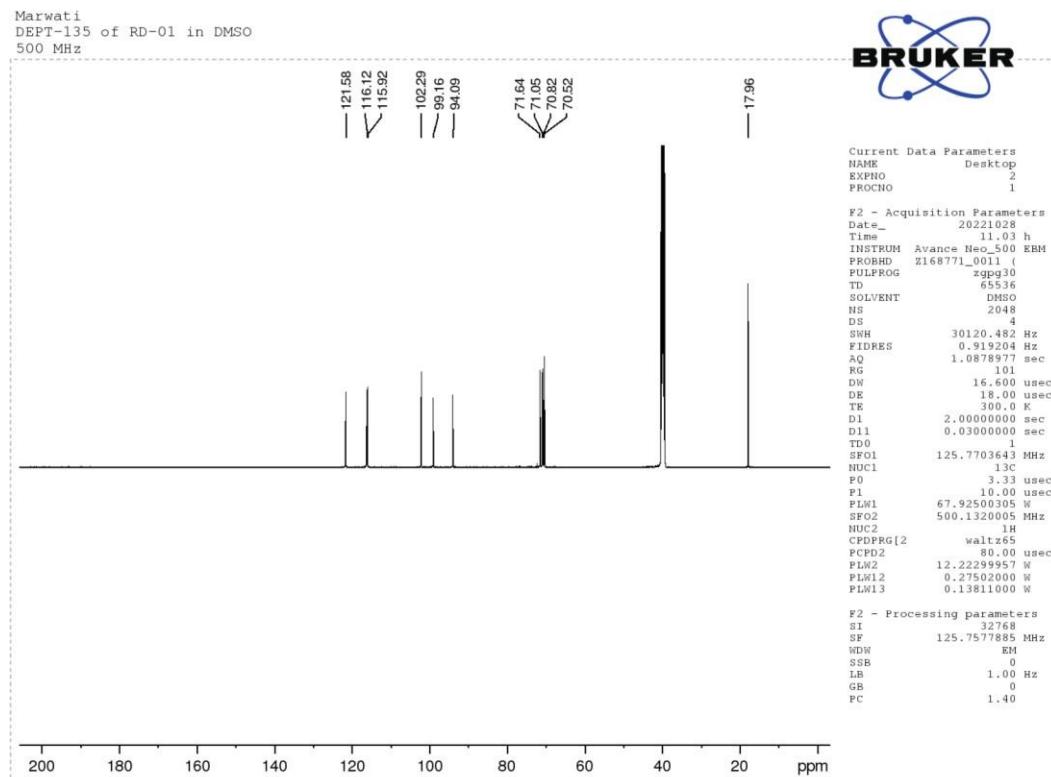


#### c. Spektrum ekstrak pelarut etanol 70% daun *R. tomentosa*

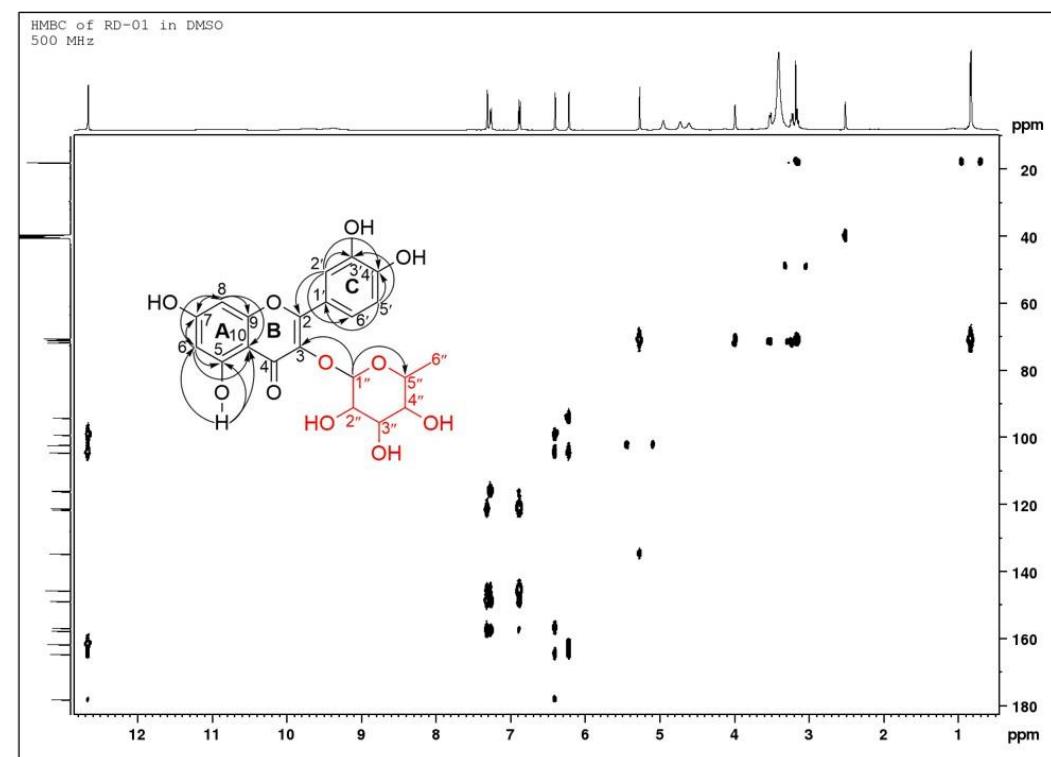


**Lampiran 4.** Hasil Spektrum UV dari senyawa Quercitrin**Lampiran 5.** Hasil Spektrum FT-IR dari senyawa Quercitrin

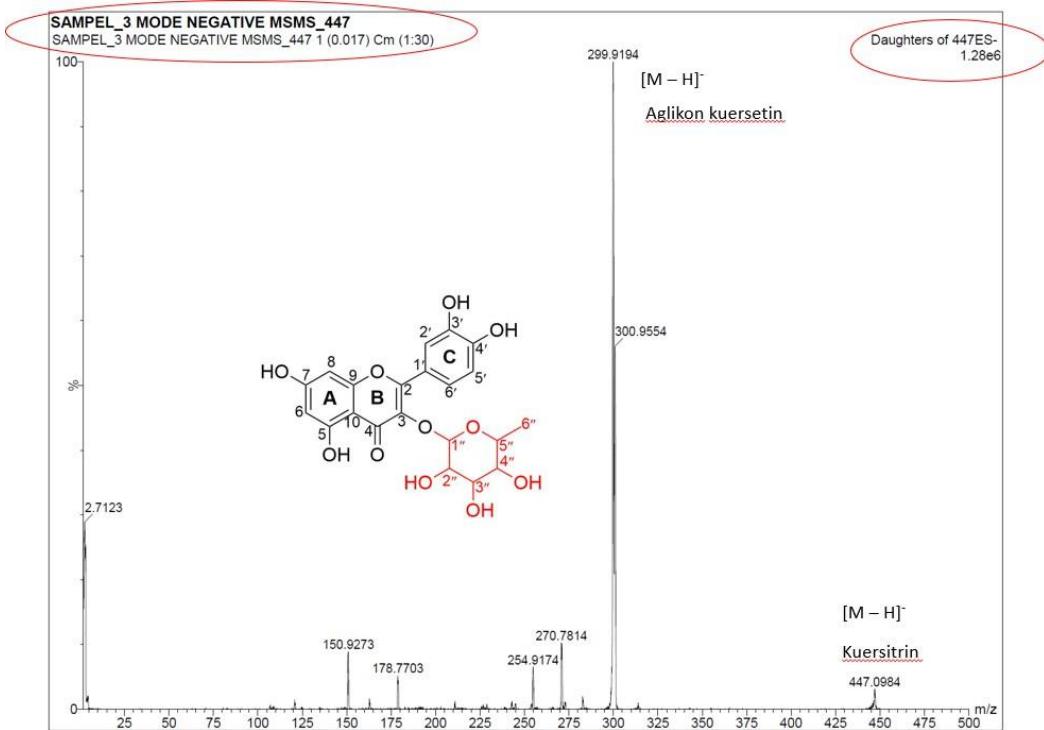
### Lampiran 6. Hasil DEPT dari senyawa Quercitrin



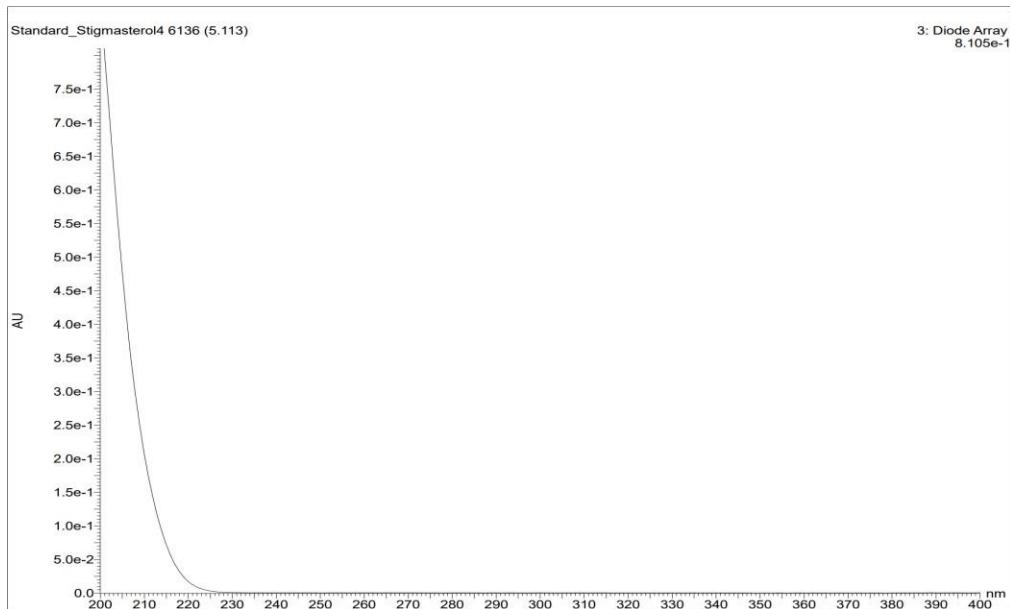
### Lampiran 7. Hasil HMBC dari senyawa Quercitrin



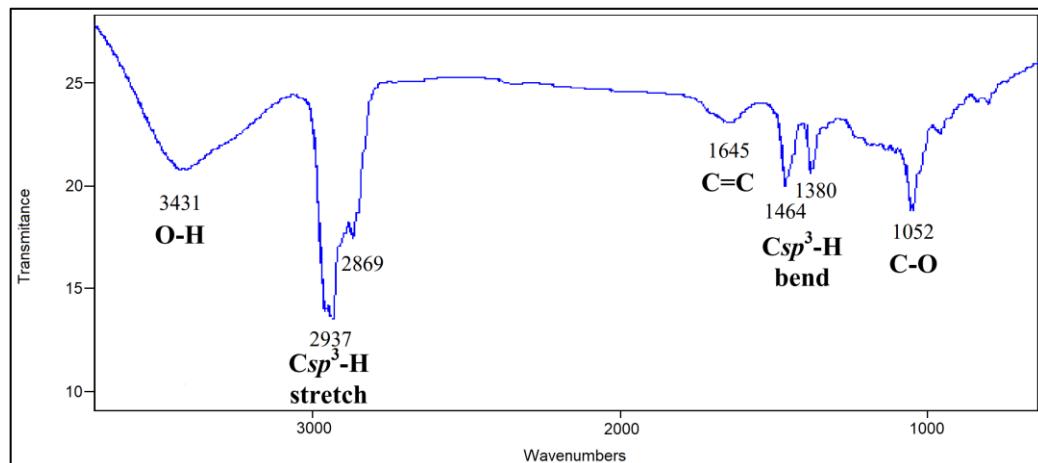
**Lampiran 8.** Hasil MS dari senyawa Quercitrin



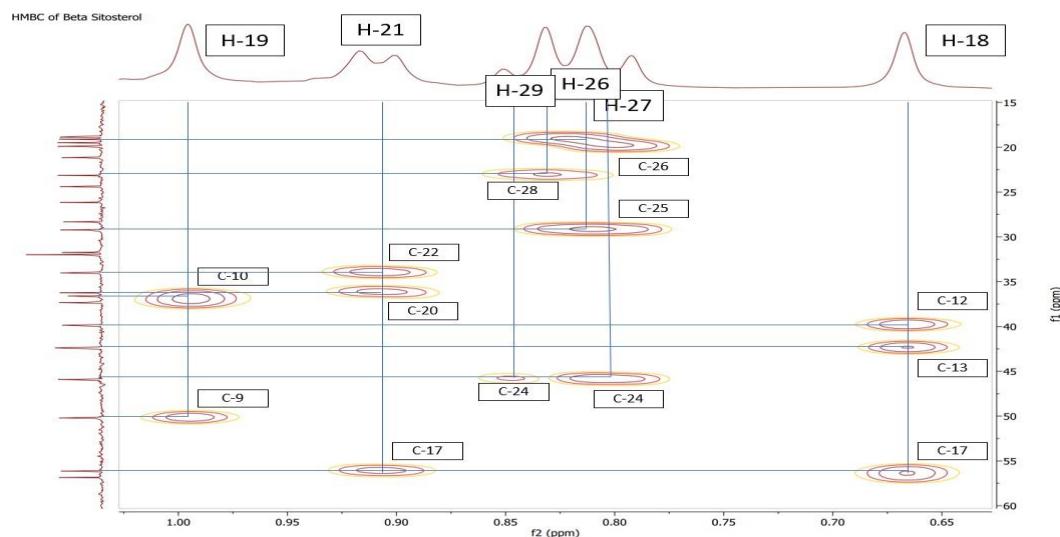
**Lampiran 9.** Hasil Spektrum UV dari senyawa  $\beta$ -sitostero



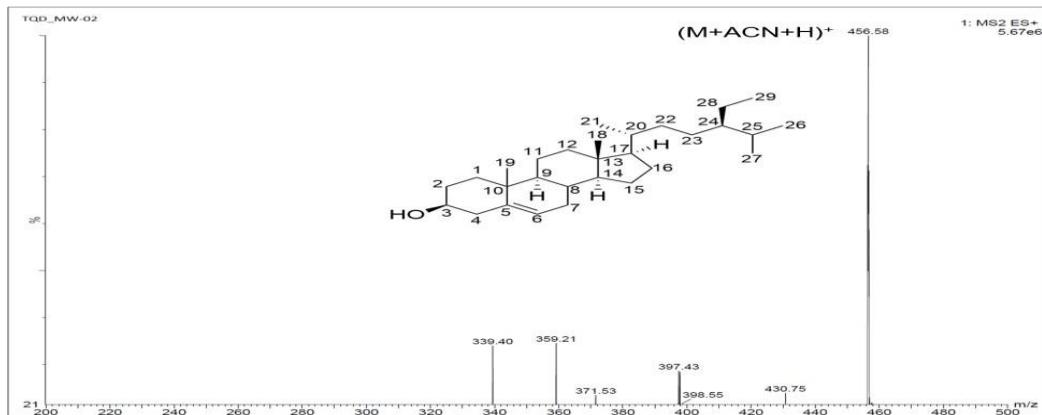
Lampiran 10. Hasil FT-IR dari senyawa  $\beta$ -sitosterol



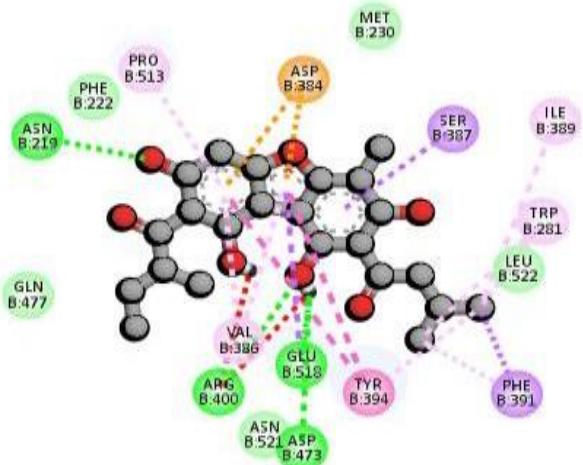
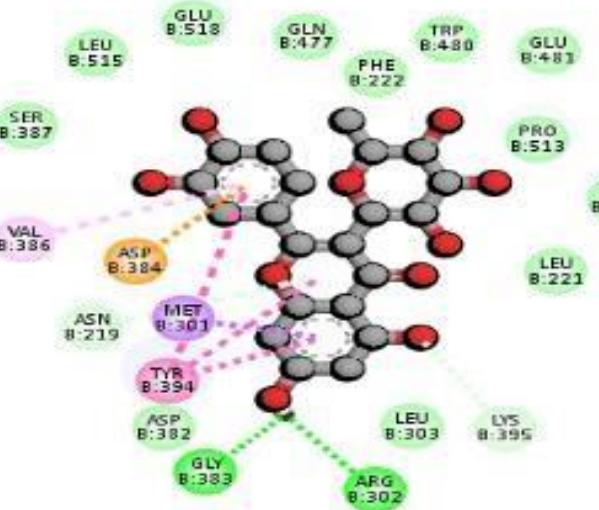
Lampiran 11. Hasil HMBC dari senyawa  $\beta$ -sitosterol



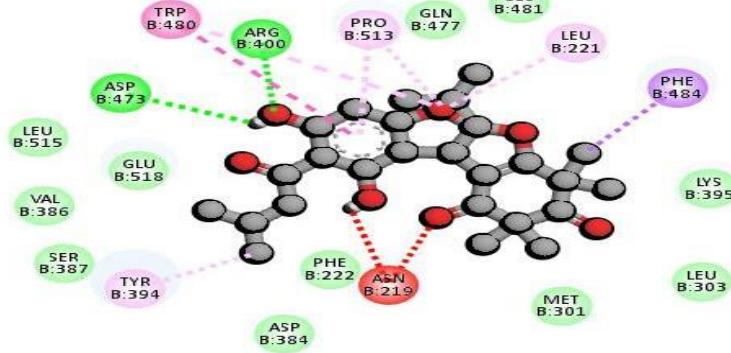
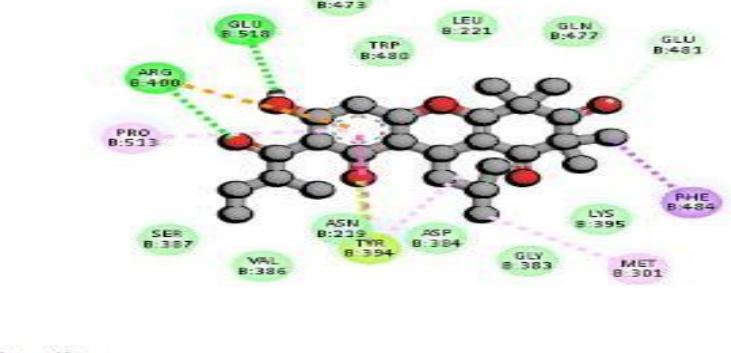
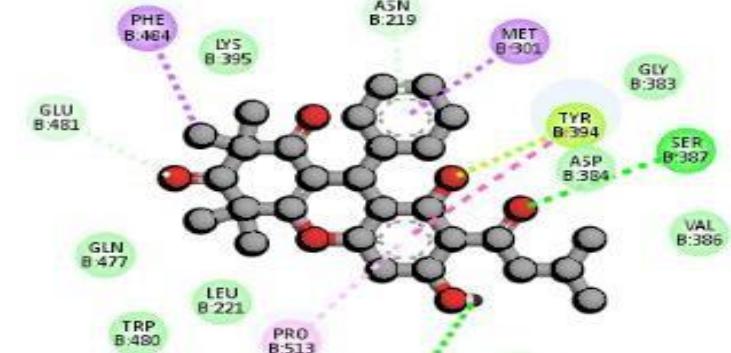
Lampiran 12. Hasil MS dari senyawa  $\beta$ -sitosterol



**Lampiran 13.** Hasil Visualisasi Ligan Asli Dan Ligan *R. tomentosa*

NO	Senyawa	Visualisasi 2D
1	Quercetin	 <p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>[Green square] van der Waals</li> <li>[Green square] Conventional Hydrogen Bond</li> <li>[Red square] Unfavorable Donor-Donor</li> <li>[Orange square] Pi-Anion</li> <li>[Purple square] Pi-Sigma</li> <li>[Pink square] Pi-Pi T-shaped</li> <li>[Light purple square] Alkyl</li> <li>[Light pink square] Pi-Alkyl</li> </ul>
2	$\beta$ -sitosterol	 <p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>[Green square] van der Waals</li> <li>[Green square] Conventional Hydrogen Bond</li> <li>[Light green square] Carbon Hydrogen Bond</li> <li>[Red square] Unfavorable Donor-Donor</li> <li>[Orange square] Pi-Anion</li> <li>[Purple square] Pi-Sigma</li> <li>[Pink square] Pi-Pi Stacked</li> <li>[Light pink square] Pi-Pi T-shaped</li> <li>[Yellow square] Amide-Pi Stacked</li> <li>[Light blue square] Pi-Alkyl</li> </ul>

3	Asam 2-(3-aminofenil) asetat	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>[Green Box] van der Waals</li> <li>[Red Box] Unfavorable Bump</li> <li>[Green Box] Conventional Hydrogen Bond</li> <li>[Light Green Box] Carbon Hydrogen Bond</li> <li>[Orange Box] Pi-Anion</li> <li>[Purple Box] Pi-Sigma</li> <li>[Pink Box] Amide-Pi Stacked</li> <li>[Yellow Box] Pi-Alkyl</li> </ul>
4	Rhodomyrtoson C	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>[Green Box] van der Waals</li> <li>[Green Box] Conventional Hydrogen Bond</li> </ul>
5	Rhodomyrtoson D	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>[Green Box] van der Waals</li> </ul>

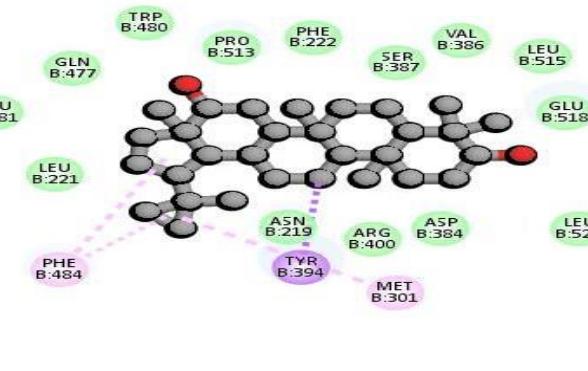
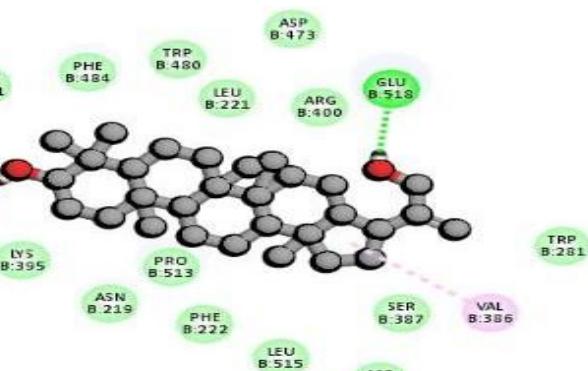
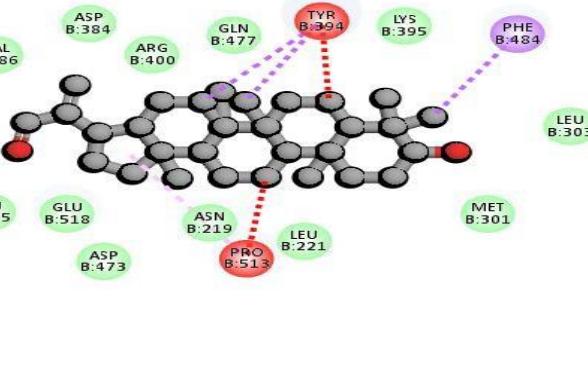
6	Rhodomyrtoson G	 <p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>[Green square] van der Waals</li> <li>[Red square] Unfavorable Bump</li> <li>[Green square] Conventional Hydrogen Bond</li> <li>[Red square] Unfavorable Donor-Donor</li> <li>[Purple square] Pi-Sigma</li> <li>[Pink square] Pi-Pi T-shaped</li> <li>[Light pink square] Alkyl</li> <li>[Light purple square] Pi-Alkyl</li> </ul>
7	Rhodomyrtoson H	 <p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>[Green square] van der Waals</li> <li>[Green square] Conventional Hydrogen Bond</li> <li>[Light green square] Carbon Hydrogen Bond</li> <li>[Orange square] Pi-Cation</li> <li>[Purple square] Pi-Sigma</li> <li>[Yellow square] Pi-Lone Pair</li> <li>[Pink square] Pi-Pi Stacked</li> <li>[Light pink square] Alkyl</li> <li>[Light purple square] Pi-Alkyl</li> </ul>
8	Rhodomyrtoson I	 <p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>[Green square] van der Waals</li> <li>[Green square] Conventional Hydrogen Bond</li> <li>[Light green square] Carbon Hydrogen Bond</li> <li>[Light green square] Pi-Donor Hydrogen Bond</li> <li>[Purple square] Pi-Sigma</li> <li>[Yellow square] Pi-Lone Pair</li> <li>[Pink square] Pi-Pi Stacked</li> <li>[Light pink square] Pi-Alkyl</li> </ul>

9	Rhodomenton A	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Unfavorable Bump</li> <li>Conventional Hydrogen Bond</li> </ul>
10	Rhodomenton B	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Unfavorable Bump</li> <li>Conventional Hydrogen Bond</li> </ul>
11	Rhodomyrt toxin	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Conventional Hydrogen Bond</li> <li>Carbon Hydrogen Bond</li> <li>PI-Anion</li> <li>PI-Donor Hydrogen Bond</li> <li>PI-Sigma</li> <li>PI-PI T-shaped</li> <li>PI-Alkyl</li> </ul>
12	Rhodomyrt toxin B	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Conventional Hydrogen Bond</li> <li>Unfavorable Donor-Donor</li> <li>PI-Anion</li> <li>PI-Donor Hydrogen Bond</li> <li>PI-Sigma</li> <li>Amide-PI Stacked</li> <li>PI-Alkyl</li> </ul>
13	Rhodomyrt toxin C	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Conventional Hydrogen Bond</li> <li>Unfavorable Donor-Donor</li> <li>PI-Anion</li> <li>PI-Sigma</li> <li>PI-PI T-shaped</li> <li>Alkyl</li> <li>PI-Alkyl</li> </ul>

14	$\psi$ -Rhodomyrt toxin	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Conventional Hydrogen Bond</li> <li>Pi-Anion</li> <li>Pi-Donor Hydrogen Bond</li> <li>Pi-Sigma</li> <li>Pi-Pi T-shaped</li> <li>Pi-Alkyl</li> </ul>
15	Tomentodion A	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Unfavorable Bump</li> <li>Conventional Hydrogen Bond</li> <li>Pi-Sigma</li> <li>Alkyl</li> <li>Pi-Alkyl</li> </ul>
16	Tomentodion B	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Conventional Hydrogen Bond</li> <li>Pi-Sigma</li> <li>Alkyl</li> <li>Pi-Alkyl</li> </ul>
17	Tomentodion E	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Alkyl</li> <li>Pi-Alkyl</li> </ul>
18	Tomentosanol D	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Conventional Hydrogen Bond</li> <li>Pi-Anion</li> <li>Pi-Donor Hydrogen Bond</li> <li>Pi-Pi Stacked</li> <li>Pi-Alkyl</li> </ul>

19	Tomentoson A	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Unfavorable Bump</li> <li>Conventional Hydrogen Bond</li> <li>Carbon Hydrogen Bond</li> <li>Alkyl</li> <li>Pi-Alkyl</li> </ul>
20	Tomentoson B	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Conventional Hydrogen Bond</li> <li>Pi-Anion</li> <li>Pi-Donor Hydrogen Bond</li> <li>Amide-Pi Stacked</li> <li>Pi-Alkyl</li> </ul>
21	Myricetin 3-O- $\alpha$ -furanoarabinoside	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Conventional Hydrogen Bond</li> <li>Pi-Anion</li> <li>Pi-Sigma</li> <li>Pi-Sulfur</li> </ul>

22	Myricetin 3-O- $\beta$ -D-glucoside	<p><b>Interactions:</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Conventional Hydrogen Bond</li> <li>Carbon Hydrogen Bond</li> <li>Pi-Anion</li> <li>Pi-Donor Hydrogen Bond</li> <li>Pi-Sigma</li> <li>Pi-Pi Stacked</li> <li>Pi-Pi T-shaped</li> <li>Pi-Alkyl</li> </ul>
23	Myricitrin	<p><b>Interactions:</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Conventional Hydrogen Bond</li> <li>Carbon Hydrogen Bond</li> <li>Pi-Cation</li> <li>Pi-Anion</li> <li>Pi-Donor Hydrogen Bond</li> <li>Pi-Pi Stacked</li> <li>Alkyl</li> <li>Pi-Alkyl</li> </ul>
24	Combreitol	<p><b>Interactions:</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Conventional Hydrogen Bond</li> <li>Carbon Hydrogen Bond</li> <li>Unfavorable Acceptor-Acceptor</li> <li>Pi-Cation</li> <li>Pi-Anion</li> <li>Pi-Donor Hydrogen Bond</li> <li>Alkyl</li> <li>Pi-Alkyl</li> </ul>
25	Quercetin	<p><b>Interactions:</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Pi-Sigma</li> <li>Alkyl</li> </ul>

26	Lupeol	 <p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals (green)</li> <li>Pi-Sigma (purple)</li> <li>Alkyl (pink)</li> <li>Pi-Alkyl (light pink)</li> </ul>
27	Betulin	 <p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals (green)</li> <li>Conventional Hydrogen Bond (green)</li> <li>Unfavorable Donor-Donor (red)</li> <li>Alkyl (pink)</li> </ul>
28	Betulin-3-acetate	 <p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals (green)</li> <li>Unfavorable Bump (red)</li> <li>Pi-Sigma (purple)</li> <li>Alkyl (pink)</li> </ul>

29	21 $\alpha$ -H-hop-22(29)-en-3 $\beta$ , 30-diol	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>green square: van der Waals</li> <li>magenta square: Alkyl</li> </ul> <p>Labeled residues include: VAL B:386, LEU B:515, PHE B:222, PRO B:513, GLN B:477, LYS B:395, SER B:387, GLU B:518, ASP B:384, TYR B:394, PHE B:484, MET B:301, ASP B:473, ARG B:400, GLY B:383.</p>
30	3 $\beta$ hydroxy-21 $\alpha$ -H-22(29)-en-30-al	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>green square: van der Waals</li> <li>magenta square: Conventional Hydrogen Bond</li> </ul> <p>Labeled residues include: LEU B:515, VAL B:386, PHE B:222, GIN B:477, PRO B:513, TRP B:480, SER B:387, GLU B:518, ASP B:384, TYR B:394, ASN B:219, PHE B:484, LEU B:522, TRP B:281, ARG B:400.</p>
31	$\alpha$ -amyrin	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>green square: van der Waals</li> </ul> <p>Labeled residues include: LEU B:515, VAL B:386, PHE B:222, ASN B:219, LEU B:221, GLU B:518, SER B:387, PRO B:513, MET B:301, ASP B:384, TYR B:394, ARG B:400, PHE B:484, TRP B:281.</p>

32	$\beta$ -amyrenonol	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>■ van der Waals</li> <li>■ Pi-Sigma</li> </ul>
33	Taraxerol	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>■ van der Waals</li> <li>■ Carbon Hydrogen Bond</li> <li>■ Pi-Sigma</li> </ul>
34	Friedelin	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>■ van der Waals</li> <li>■ Unfavorable Bump</li> <li>■ Conventional Hydrogen Bond</li> <li>■ Carbon Hydrogen Bond</li> <li>■ Pi-Sigma</li> </ul>

35	3 $\beta$ -acetoxy-12-oxo-oleanan-28, 13 $\beta$ -olid	<p>This figure displays a 3D surface plot of the 3<math>\beta</math>-acetoxy-12-oxo-oleanan-28, 13<math>\beta</math>-olid molecule in its binding pose. The ligand is shown as a grey surface with its atoms represented by spheres. The plot highlights various interactions between the ligand and a protein, indicated by dashed lines of different colors. A legend at the bottom defines these interactions:</p> <ul style="list-style-type: none"> <li>Green: van der Waals</li> <li>Red: Unfavorable Bump</li> <li>Yellow: Pi-Cation</li> <li>Orange: Pi-Anion</li> <li>Light Green: Conventional Hydrogen Bond</li> <li>Pink: Pi-Pi Stacked</li> <li>Dark Green: Carbon Hydrogen Bond</li> <li>Magenta: Pi-Alkyl</li> <li>Light Blue: Pi-Lone Pair</li> <li>Light Orange: Pi-Pi T-shaped</li> <li>Light Yellow: Pi-Sulfur</li> </ul> <p>The ligand features a complex steroid-like core with multiple hydroxyl groups and a ketone group at C-12. It is surrounded by numerous amino acid residues from the protein, including ILE, MET, SER, GLU, ASN, GLN, HIS, ARG, THR, VAL, ASP, PRO, LEU, PHE, and TYR.</p>
36	3 $\beta$ -acetoxy-11 $\alpha$ ,12 $\alpha$ -epoxyoleanan-28, 13 $\beta$ -olid	<p>This figure displays a 3D surface plot of the 3<math>\beta</math>-acetoxy-11<math>\alpha</math>,12<math>\alpha</math>-epoxyoleanan-28, 13<math>\beta</math>-olid molecule in its binding pose. The ligand is shown as a grey surface with its atoms represented by spheres. The plot highlights various interactions between the ligand and a protein, indicated by dashed lines of different colors. A legend at the bottom defines these interactions:</p> <ul style="list-style-type: none"> <li>Green: van der Waals</li> <li>Red: Unfavorable Bump</li> <li>Yellow: Pi-Cation</li> <li>Orange: Pi-Anion</li> <li>Light Green: Conventional Hydrogen Bond</li> <li>Pink: Pi-Pi Stacked</li> <li>Dark Green: Carbon Hydrogen Bond</li> <li>Magenta: Pi-Alkyl</li> </ul> <p>The ligand features a complex steroid-like core with multiple hydroxyl groups and a ketone group at C-12. It is surrounded by numerous amino acid residues from the protein, including ILE, MET, SER, GLU, ASN, GLN, HIS, ARG, THR, VAL, ASP, PRO, LEU, PHE, and TYR.</p>
37	2,3-hexahydroxy diphenyl-D-glucose	<p>This figure displays a 3D surface plot of the 2,3-hexahydroxy diphenyl-D-glucose molecule in its binding pose. The ligand is shown as a grey surface with its atoms represented by spheres. The plot highlights various interactions between the ligand and a protein, indicated by dashed lines of different colors. A legend at the bottom defines these interactions:</p> <ul style="list-style-type: none"> <li>Green: van der Waals</li> <li>Red: Unfavorable Bump</li> <li>Yellow: Pi-Cation</li> <li>Orange: Pi-Anion</li> <li>Light Green: Conventional Hydrogen Bond</li> <li>Pink: Pi-Pi Stacked</li> <li>Dark Green: Carbon Hydrogen Bond</li> <li>Magenta: Pi-Alkyl</li> </ul> <p>The ligand features a glucose molecule substituted with two hydroxyl groups at the 2 and 3 positions. It is surrounded by numerous amino acid residues from the protein, including ILE, MET, SER, GLU, ASN, GLN, HIS, ARG, THR, VAL, ASP, PRO, LEU, PHE, and TYR.</p>
38	Tomentosin O <sup>C</sup>	<p>This figure displays a 3D surface plot of the Tomentosin O<sup>C</sup> molecule in its binding pose. The ligand is shown as a grey surface with its atoms represented by spheres. The plot highlights various interactions between the ligand and a protein, indicated by dashed lines of different colors. A legend at the bottom defines these interactions:</p> <ul style="list-style-type: none"> <li>Green: van der Waals</li> <li>Red: Unfavorable Bump</li> <li>Yellow: Pi-Cation</li> <li>Orange: Pi-Anion</li> <li>Light Green: Conventional Hydrogen Bond</li> <li>Pink: Pi-Pi Stacked</li> <li>Dark Green: Carbon Hydrogen Bond</li> <li>Magenta: Pi-Alkyl</li> </ul> <p>The ligand features a complex molecule with a central ring system substituted with various side chains, including a phenyl ring and a guanine-like moiety. It is surrounded by numerous amino acid residues from the protein, including ILE, MET, SER, GLU, ASN, GLN, HIS, ARG, THR, VAL, ASP, PRO, LEU, PHE, and TYR.</p>

39	Casuarinin	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Unfavorable Bump</li> <li>Conventional Hydrogen Bond</li> <li>Unfavorable Donor-Donor</li> <li>Pi-Anion</li> <li>Pi-Sigma</li> <li>Pi-Sulfur</li> <li>Pi-Pi Stacked</li> <li>Pi-Alkyl</li> </ul>
40	Castalagin	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Conventional Hydrogen Bond</li> <li>Carbon Hydrogen Bond</li> <li>Unfavorable Donor-Donor</li> <li>Pi-Alkyl</li> </ul>
41	Pedunculagin	<p><b>Interactions</b></p> <ul style="list-style-type: none"> <li>van der Waals</li> <li>Conventional Hydrogen Bond</li> <li>Carbon Hydrogen Bond</li> <li>Unfavorable Donor-Donor</li> <li>Pi-Anion</li> <li>Pi-Donor Hydrogen Bond</li> <li>Pi-Pi T-shaped</li> <li>Pi-Alkyl</li> </ul>

42	<i>Piceatannol 4-O-β-D-glucoside</i>	<p><b>Interactions:</b></p> <ul style="list-style-type: none"> <li>van der Waals (green)</li> <li>Conventional Hydrogen Bond (red)</li> <li>π-Alkyl (purple)</li> <li>Carbon-Hydrogen Bond (light green)</li> </ul>
43	Rhodomyrtone	<p><b>Interactions:</b></p> <ul style="list-style-type: none"> <li>van der Waals (green)</li> <li>Conventional Hydrogen Bond (red)</li> <li>π-Alkyl (purple)</li> <li>π-Alkyl (pink)</li> </ul>
44	Rhodomyrtoson A	<p><b>Interactions:</b></p> <ul style="list-style-type: none"> <li>van der Waals (green)</li> <li>Conventional Hydrogen Bond (red)</li> <li>π-Donor Hydrogen Bond (light green)</li> <li>π-Lone Pair (yellow)</li> <li>Alkyl (purple)</li> <li>π-Alkyl (pink)</li> </ul>

## CURRICULUM VITAE

### **A. Data Pribadi**

- 1 Nama : Marwati
- 2 Tempat, Tanggal Lahir : Latawe 04-06-1990
- 3 Alamat : Perumahan Depag Blok C1.No 6 Pondok DiVas
- 4 Kewarganegaraan : Indonesia

### **B. Riwayat Pendidikan**

1. Tamat SMA tahun 2009 di SMAN 1 Raha
2. Sarjana Farmasi tahun 2013 di Universitas Almarisah Madani
3. Magister Farmasi tahun 2018 di Universitas Hasanuddin

### **C. Pekerjaan dan Riwayat Pekerjaan**

- 1 Jenis Pekerjaan : Dosen
- 2 NIDN : 0904069002
- 3 Pangkat/Jabatan : Kepala Bagian Biologi Farmasi

### **D. Karya Ilmiah yang telah dipublikasikan**

Marwati Marwati; Yusnita Rifai; Gemini alam, Risfah Yulianty (2024) The Isolation, Characterisation, And Evaluation Of Bioactivities Of Secondary Metabolites From Leaf Extracts Of Karamunting (*Rhodomyrtus Tomentosa* (Aiton) Hassk)"

### **E. Makalah pada Seminar/Konferensi Ilmiah Nasional dan Internasional**

- 1 Marwati, M., Rifai, Y., Alam, G., Yulianty, R., & Samsiar, N. (2022, December). Toxicity Test of Karamunitng Leaf (*Rhodomyrtus tomentosa* (Aiton) Hassk.) Ekstratc with Finder Liquid Variation Using the Brine Shrimp Lethality Test (BSLT) Method. In *Tapanuli International Health Conference 2022 (TIHC 2022)* (pp. 103-109). Atlantis Press.