

Article

# Biochemical analyses of bioactive extracts from plants native to Lampedusa, Sicily minor island

Roberta Di Lecce<sup>1</sup>, Natacha Mérindol<sup>2</sup>, Mayra Galarza Pérez<sup>3</sup>, Vahid Karimzadegan<sup>2</sup>, Lionel Berthoux<sup>4</sup>, Angela Boari<sup>5</sup>, Christian Zidorn<sup>3</sup>, Maurizio Vurro<sup>5</sup>, Giuseppe Surico<sup>6</sup>, I. Desgagné-Penix<sup>2</sup> and Antonio Evidente<sup>1,5\*</sup>

<sup>1</sup> Department of Chemical Sciences, University of Naples Federico II, Complesso Universitario Monte Sant'Angelo, Napoli, Italy

<sup>2</sup> Département de Chimie, Biochimie et Physique, Université du Québec à Trois-Rivières, Trois-Rivières, QC, Canada

<sup>3</sup> Pharmazeutisches Institut, Abteilung Pharmazeutische Biologie, Christian-Albrechts-Universität zu Kiel, Gutenbergstraße 76, 24118, Kiel, Germany

<sup>4</sup> Département de Biologie Médicale, Université du Québec à Trois-Rivières, Trois-Rivières, QC, Canada

<sup>5</sup> Institute of Sciences of Food Production, National Research Council, Via Amendola 122/O, 70125 Bari, Italy

<sup>6</sup> Department of Agriculture, Food, Environment, and Forestry (DAGRI), Section of Agricultural Microbiology, Plant Pathology and Entomology, University of Florence, Italy

\* Correspondence: e-evidente@unina.it

## Supplementary Materials

## PLANTS



*Atriplex halimus* L. (Ap)



*Daucus lopadusanus* Tineo (Dl)



*Echinops spinosus* Fiori (Es)



*Glaucium flavum* Crantz (Gf)





*Hypericum aegypticum* L. (Ha)



*Periploca angustifolia* Labill (Pa)



*Prasium majus* L. (Pm)

#### References

1. Sommier S. *Le isole Pelagie – Lampedusa, Linosa e Lampione - e la loro flora*; Stabilimento Pellas, Luigi Chiti Successore: Firenze, Italia, 1908.
  2. Di Martino, A. Flora e vegetazione. In: Zavattari e Coll. *Biogeografia delle isole Pelagie*, Zavattari e Coll. Eds.; Rendiconti Accademia Nazionale dei XL: Roma, Italia, 1958; serie IV, vol. XI, pp. 163-261
- Corti, C.; Lo Cascio, P.; Massetti, M.; Corti C.; Pasta S. *Storia naturale delle isole Pelagie*; Società Editrice L'Epos: Palermo, Italia, 2002; pp. 151-192.

## *Daucus lopadusanus*

### List of Figures

#### H<sub>2</sub>O phase

Figure S1a. Base Peak Chromatogram (BPC) in the positive ionization mode of water extract of *Daucus lopadusanus*

Figure S1b. Base Peak Chromatogram (BPC) in the negative ionization mode of water extract of *Daucus lopadusanus*.

Figure S1c. PDA chromatogram of water extracts of *Daucus lopadusanus* at 245 nm.

Figure S1d. PDA chromatogram of water extracts of *Daucus lopadusanus* at 360 nm.

#### Hexane extract

Figure S2a. Base Peak Chromatogram (BPC) in positive mode of *n*-hexane extract of *Daucus lopadusanus*

Figure S2b. Base Peak Chromatogram (BPC) in negative mode of *n*-hexane extract of *Daucus lopadusanus*.

Figure S2c. PDA chromatogram of *n*-hexane extracts of *Daucus lopadusanus* at 245 nm.

Figure S2d. PDA chromatogram of *n*-hexane extracts of *Daucus lopadusanus* at 360 nm.

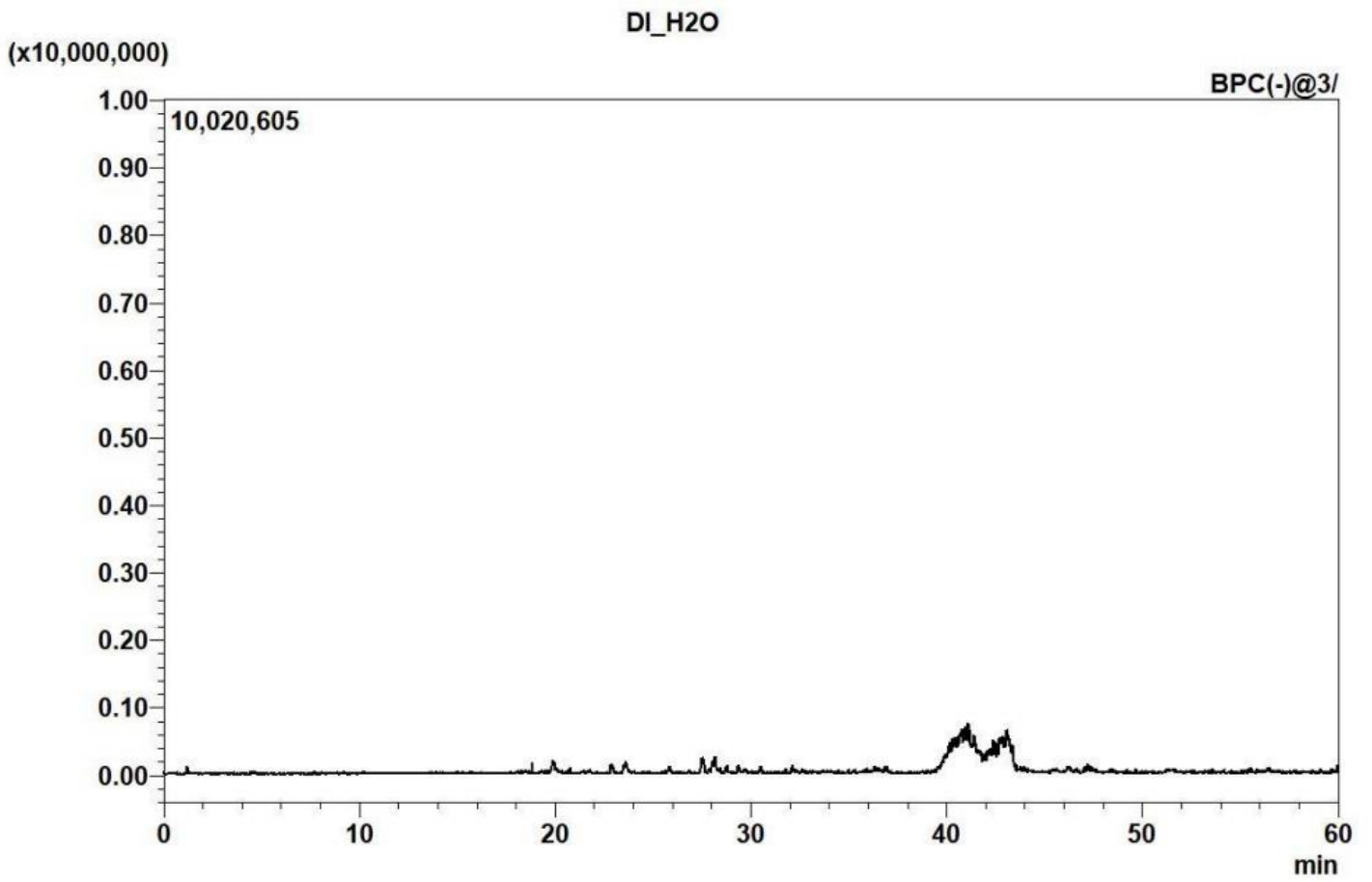
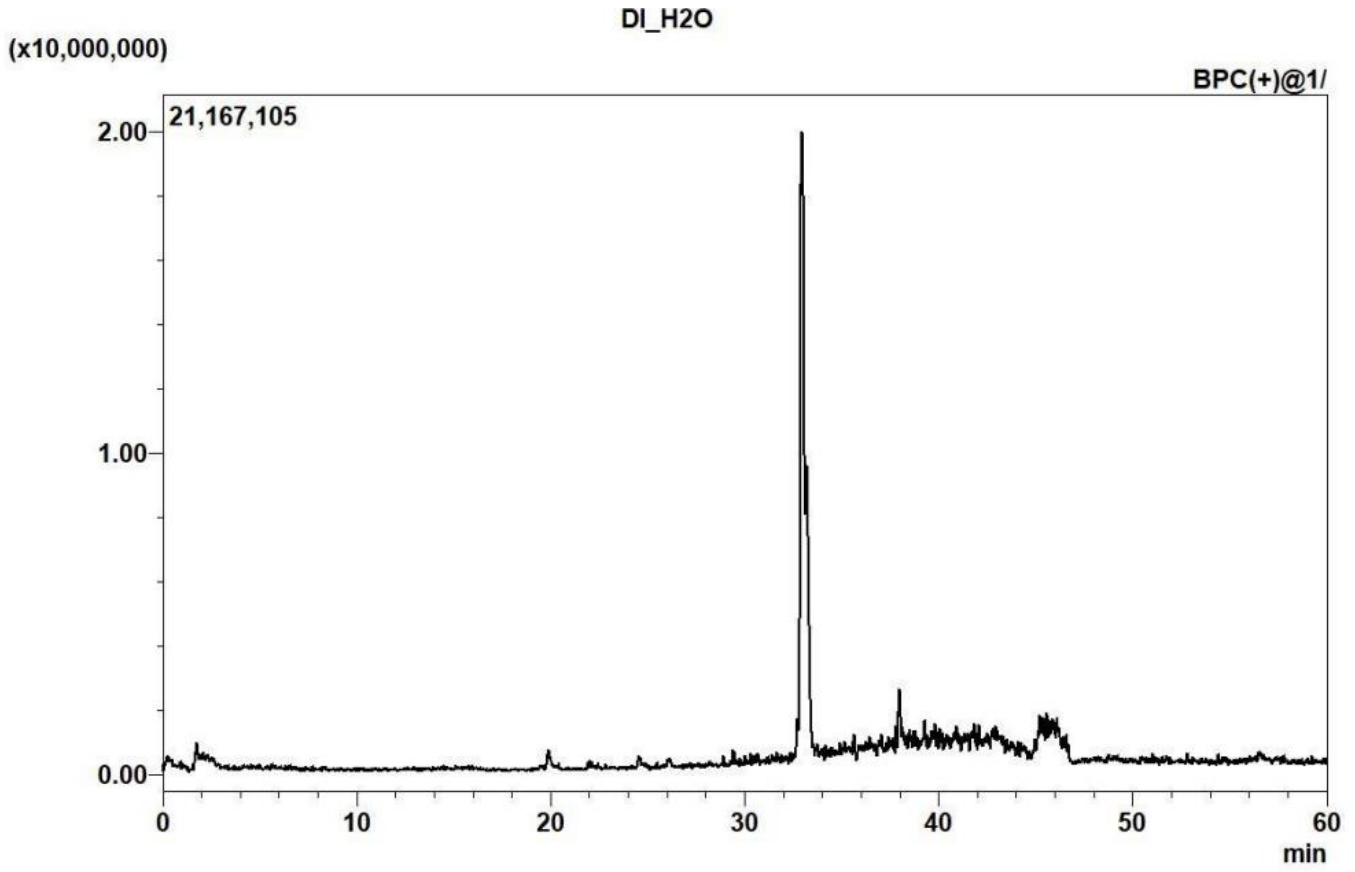
#### CH<sub>2</sub>Cl<sub>2</sub> extract

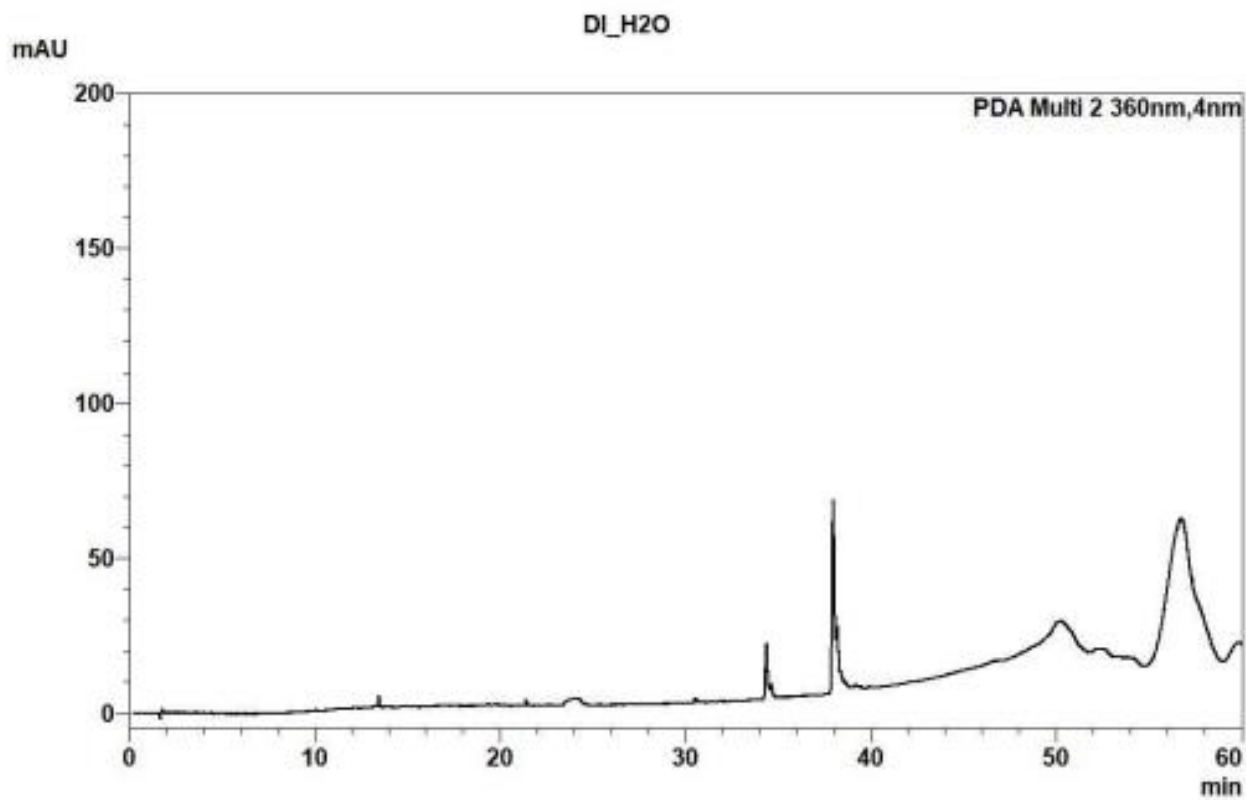
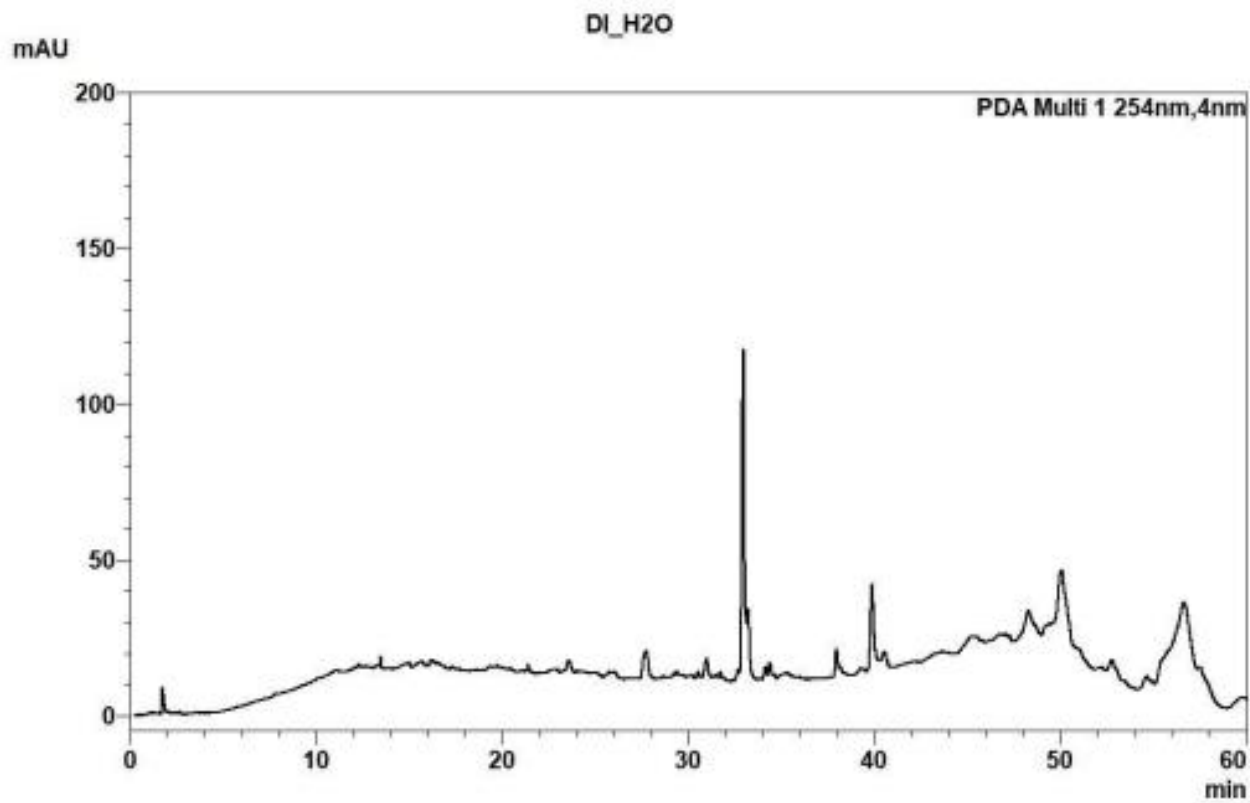
Figure S3a. Base Peak Chromatogram (BPC) in positive mode of dichloromethane extract of *Daucus lopadusanus*

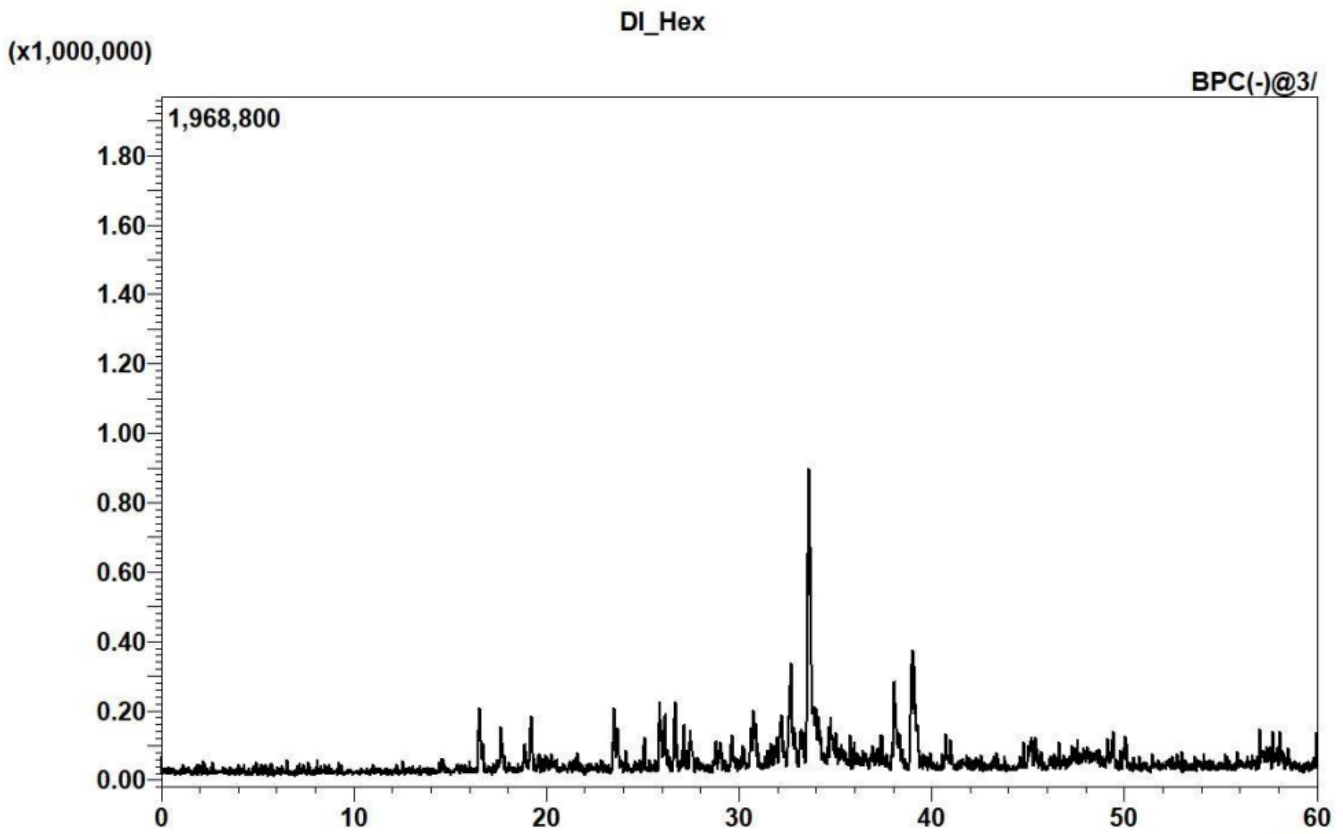
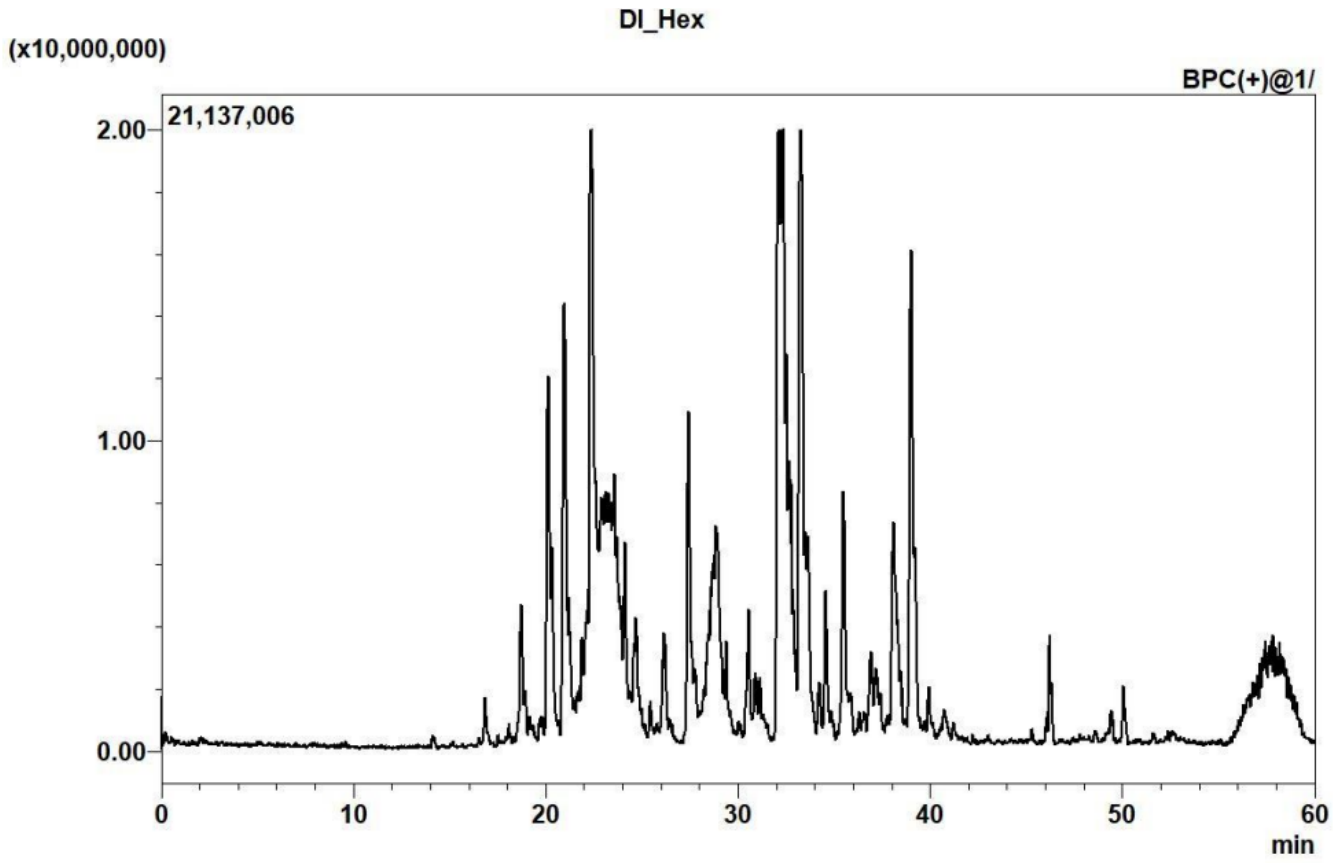
Figure S3b. Base Peak Chromatogram (BPC) in negative mode of dichloromethane extract of *Daucus lopadusanus*.

Figure S3c. PDA chromatogram of dichloromethane extracts of *Daucus lopadusanus* at 245 nm.

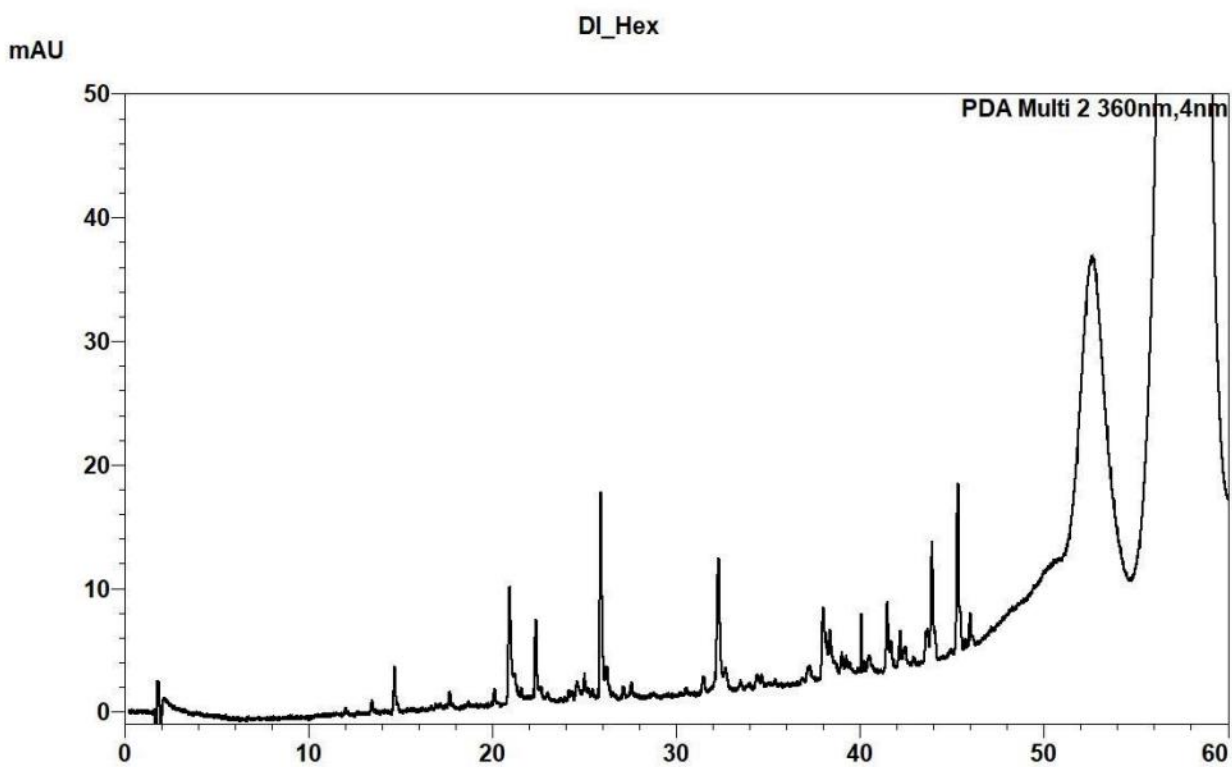
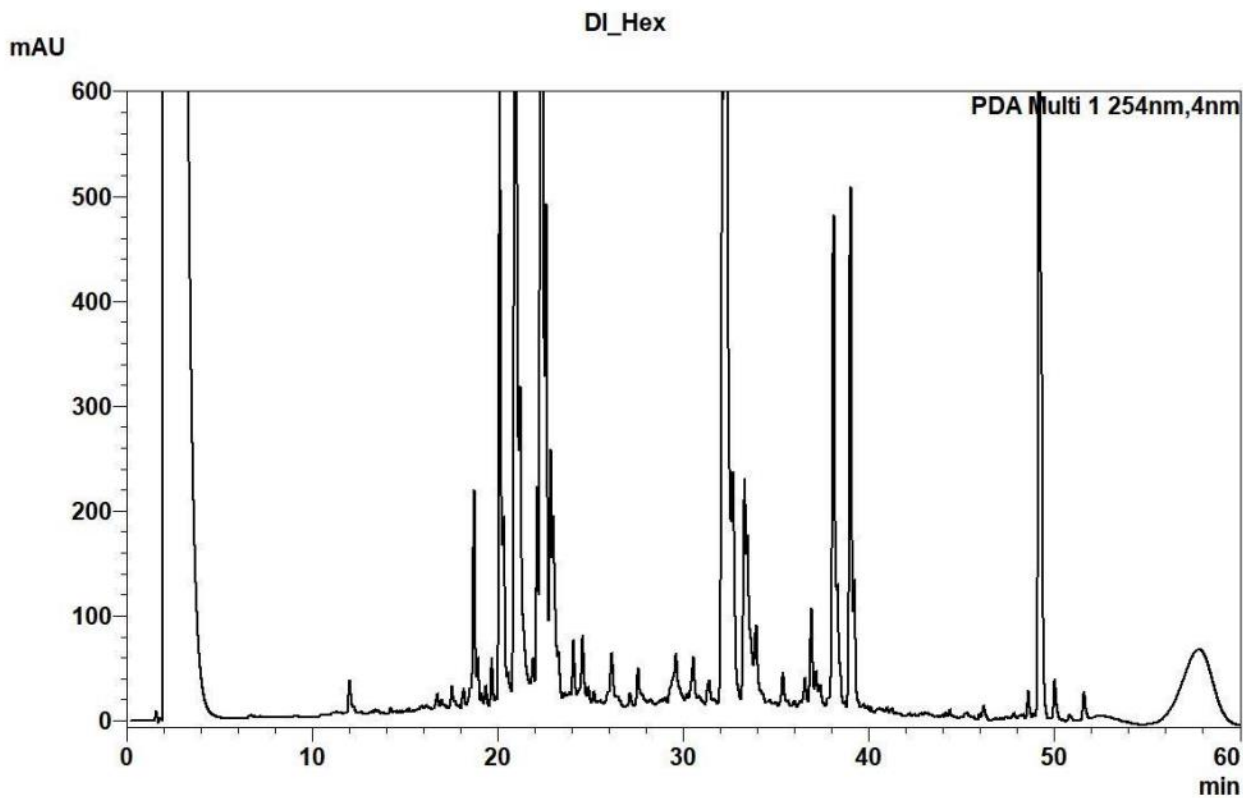
Figure S3d. PDA chromatogram of dichloromethane of *Daucus lopadusanus* at 360 nm.







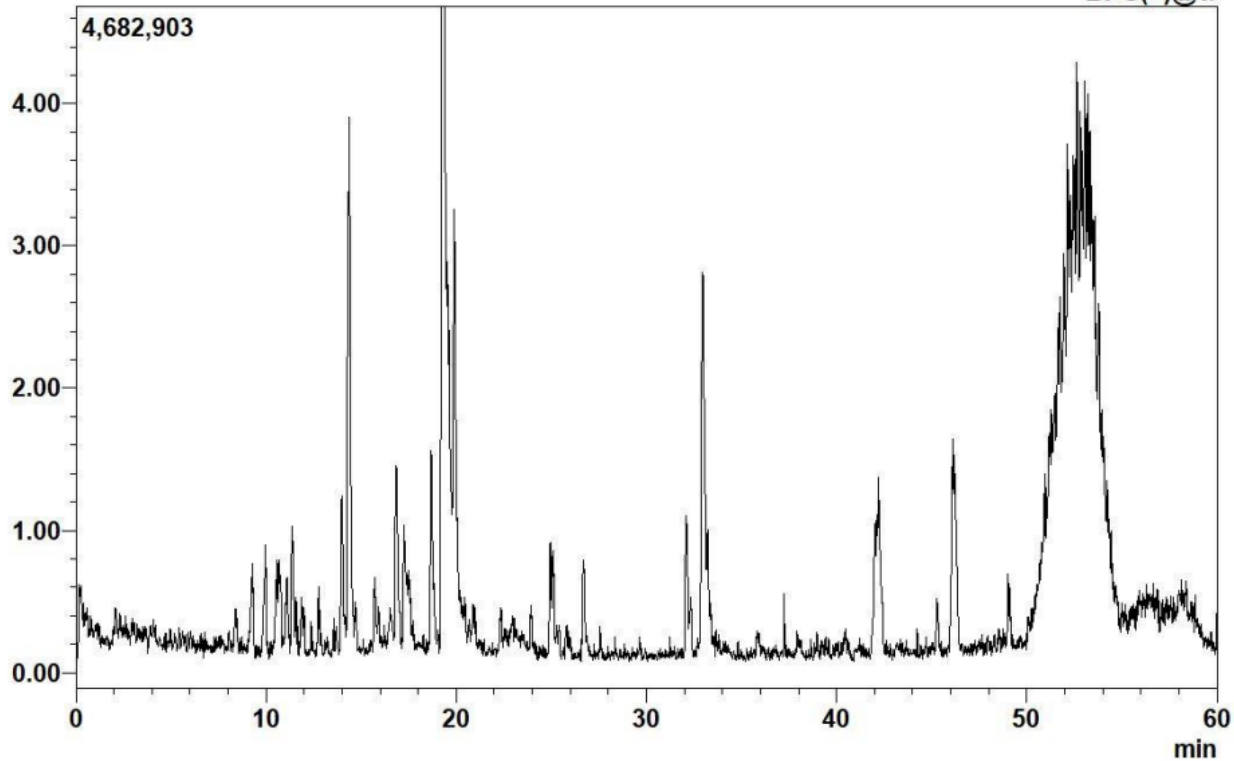




DI\_CH2Cl2

(x1,000,000)

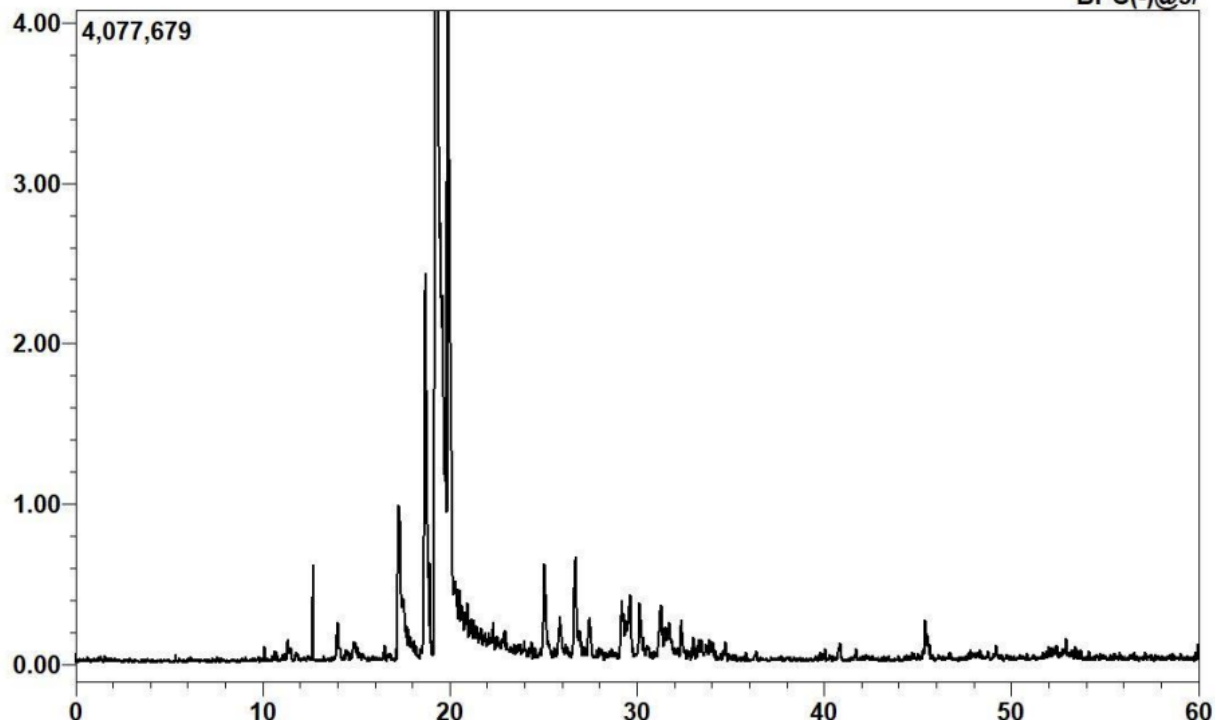
BPC(+@1/

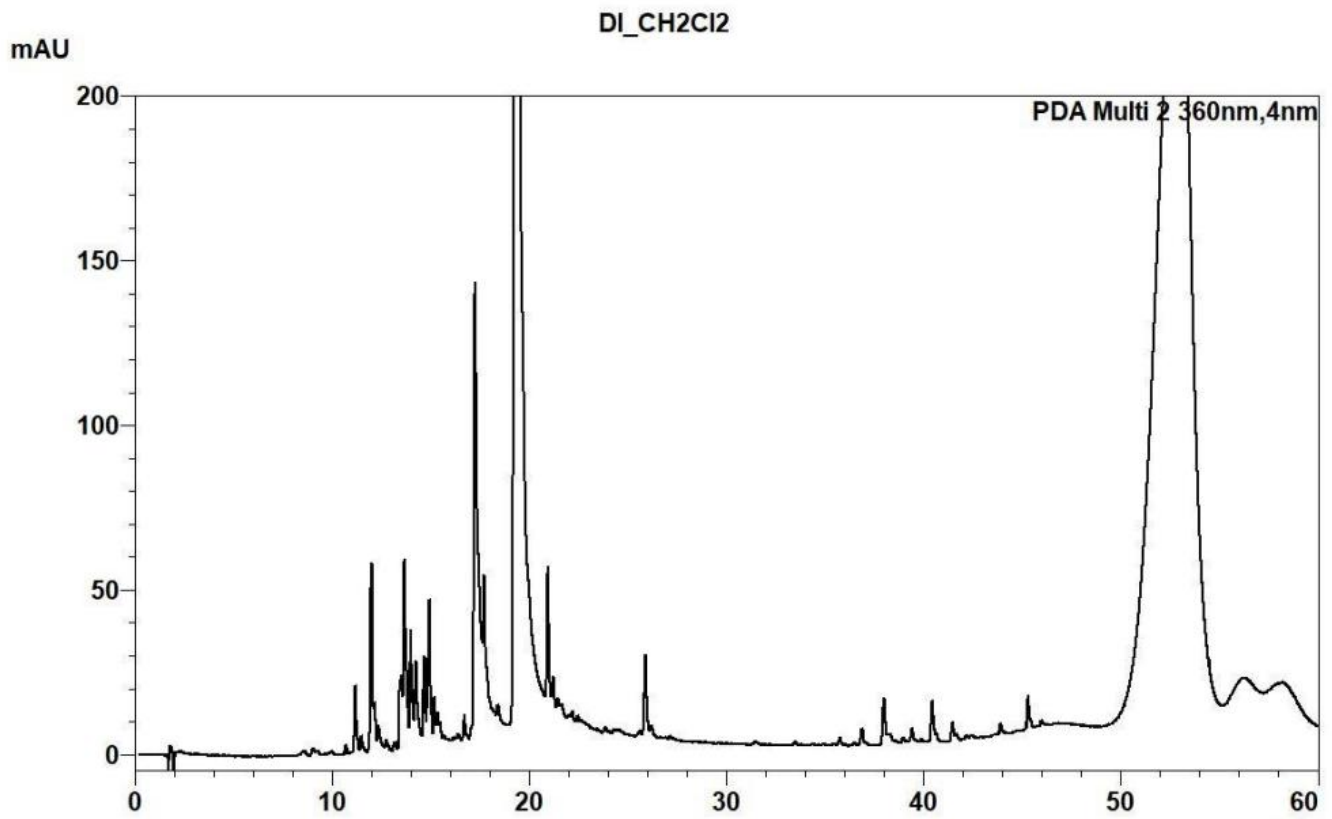
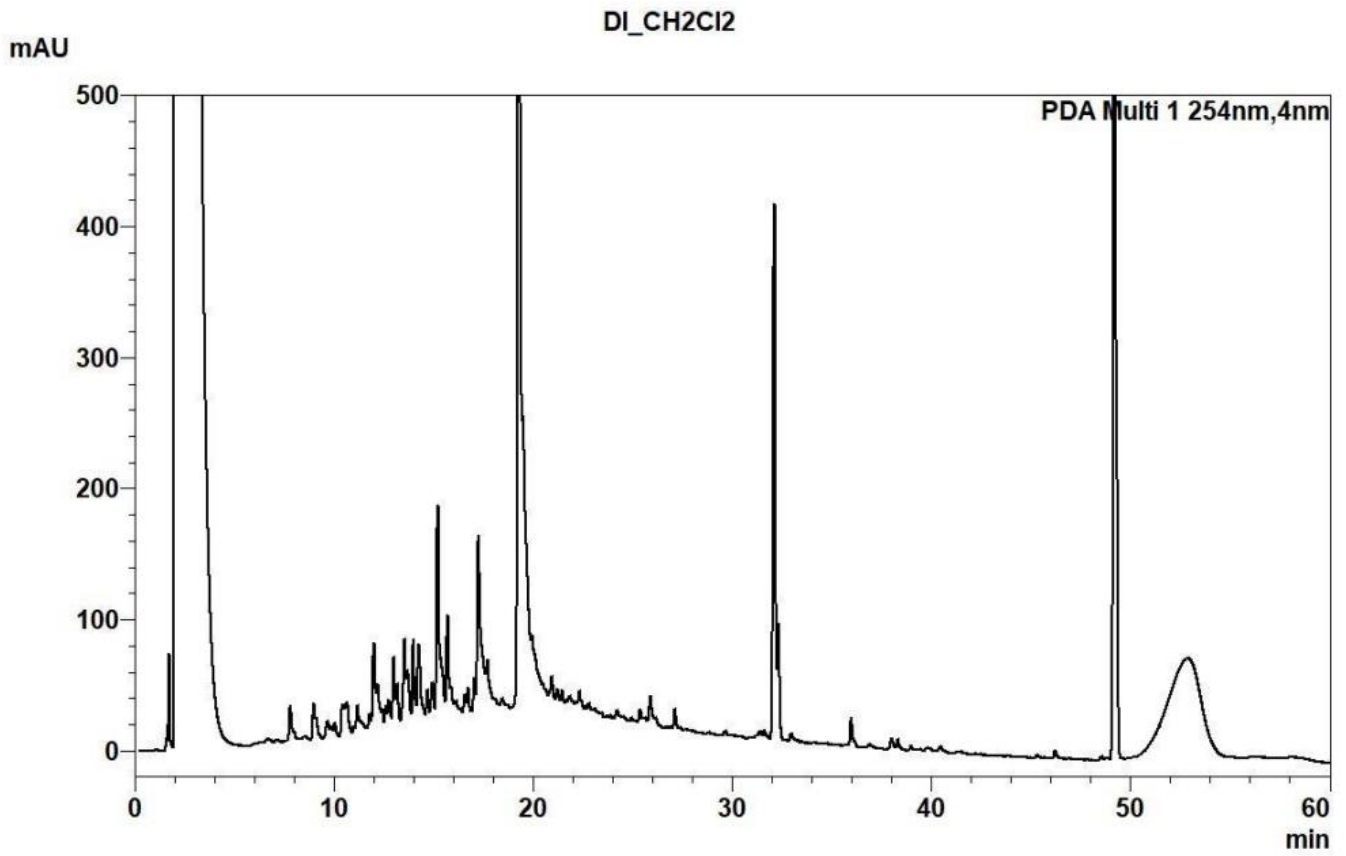


DI\_CH2Cl2

(x1,000,000)

BPC(-@3/





## *Glacium flavum*

### List of Figures

#### H<sub>2</sub>O phase

Figure S4a. Base Peak Chromatogram (BPC) in the positive ionization mode of water extract of *Glacium flavum*.

Figure S4b. Base Peak Chromatogram (BPC) in the negative ionization mode of water extract of *Glacium flavum*.

Figure S4c. PDA chromatogram of water extracts of *Glacium flavum* at 245 nm.

Figure S4d. PDA chromatogram of water extracts of *Glacium flavum* at 360 nm.

#### Hexane extract

Figure S5a. Base Peak Chromatogram (BPC) in positive mode of *n*-hexane extract of *Glacium flavum*.

Figure S5b. Base Peak Chromatogram (BPC) in negative mode of *n*-hexane extract of *Glacium flavum*.

Figure S5c. PDA chromatogram of *n*-hexane extracts of *Glacium flavum* at 245 nm.

Figure S5d. PDA chromatogram of *n*-hexane extracts of *Glacium flavum* at 360 nm.

#### CH<sub>2</sub>Cl<sub>2</sub> extract

Figure S6a. Base Peak Chromatogram (BPC) in positive mode of dichloromethane extract of *Glacium flavum*.

Figure S6b. Base Peak Chromatogram (BPC) in negative mode of dichloromethane extract of *Glacium flavum*.

Figure S6c. PDA chromatogram of dichloromethane extracts of *Glacium flavum* at 245 nm.

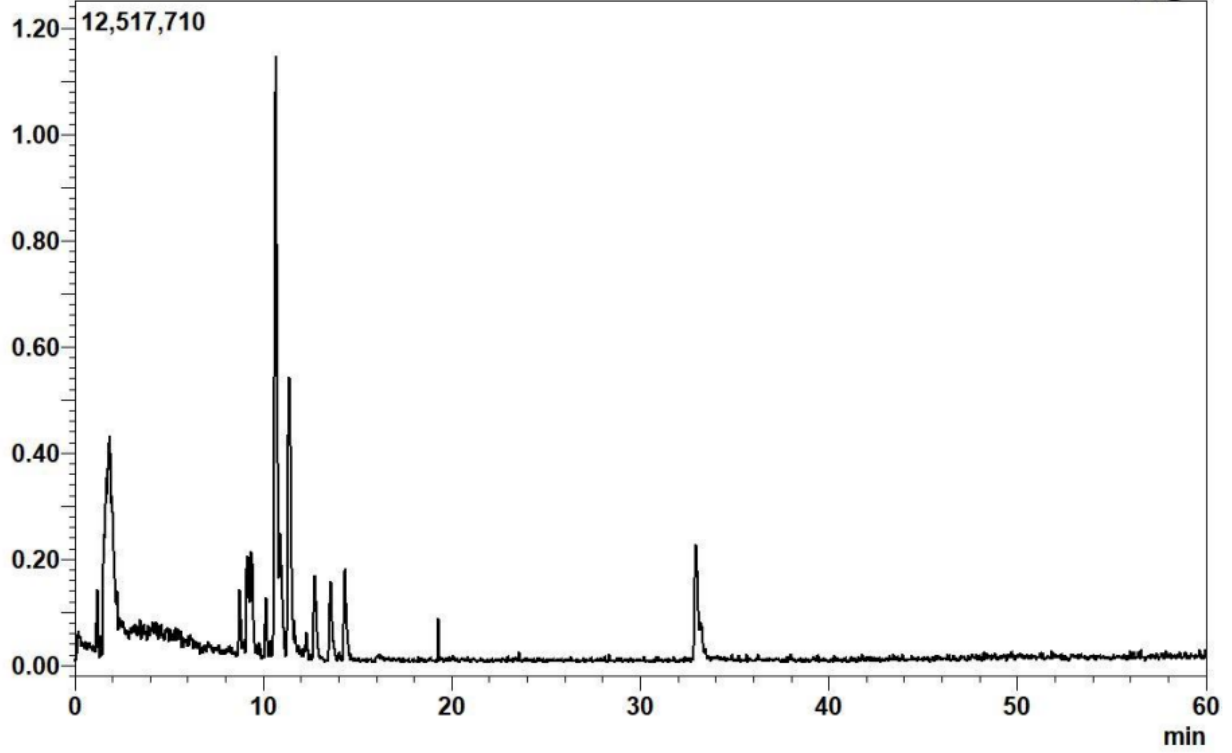
Figure S6d. PDA chromatogram of dichloromethane of *Glacium flavum* at 360 nm.



Gf\_H2O

(x10,000,000)

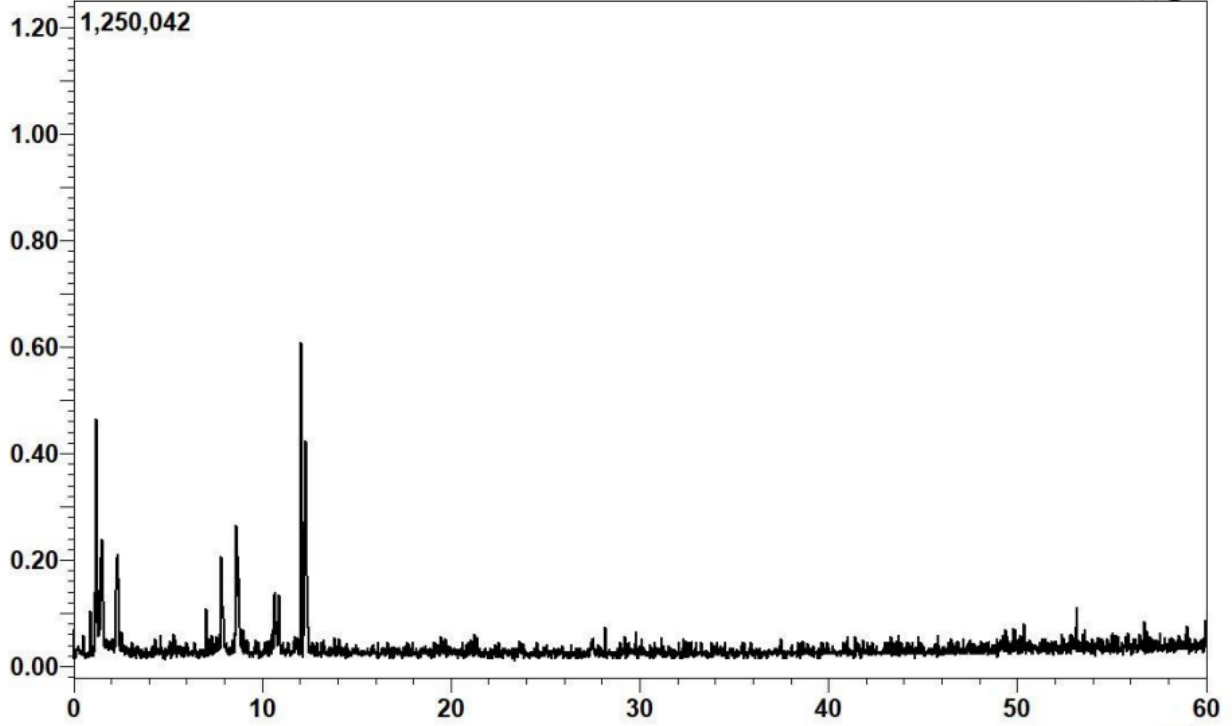
BPC(+@1/



Gf\_H2O

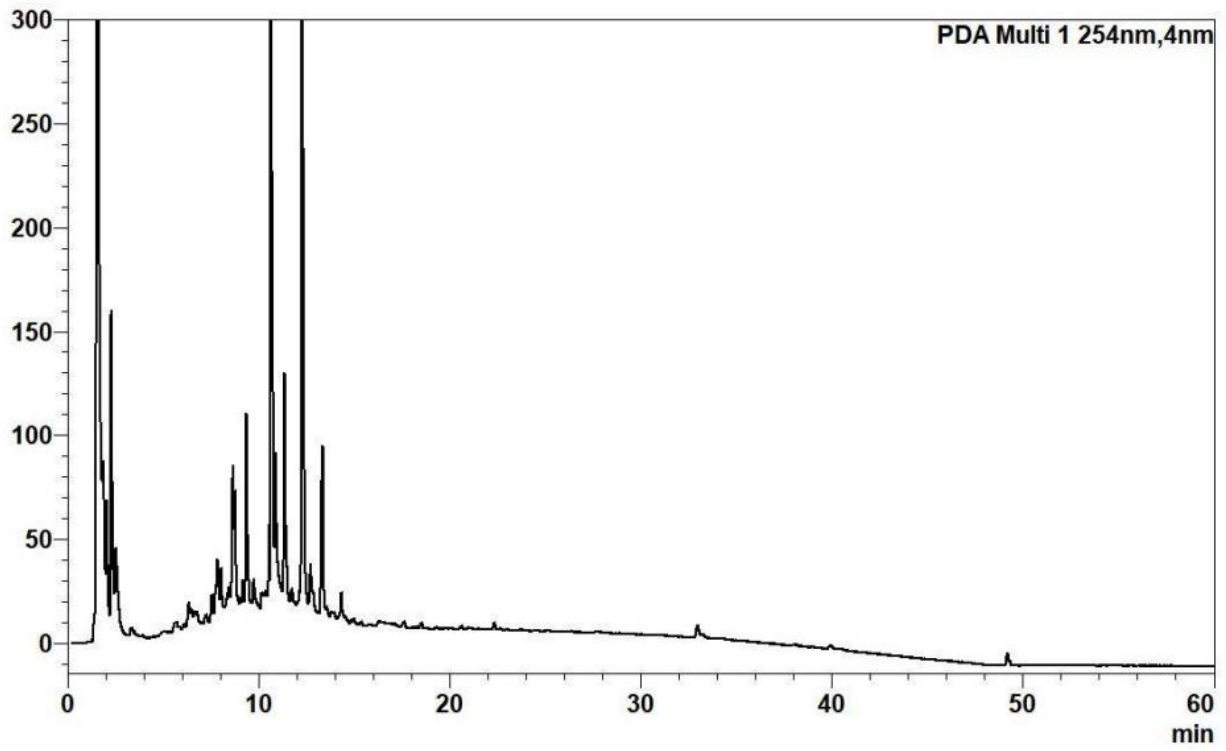
(x1,000,000)

BPC(-@3/



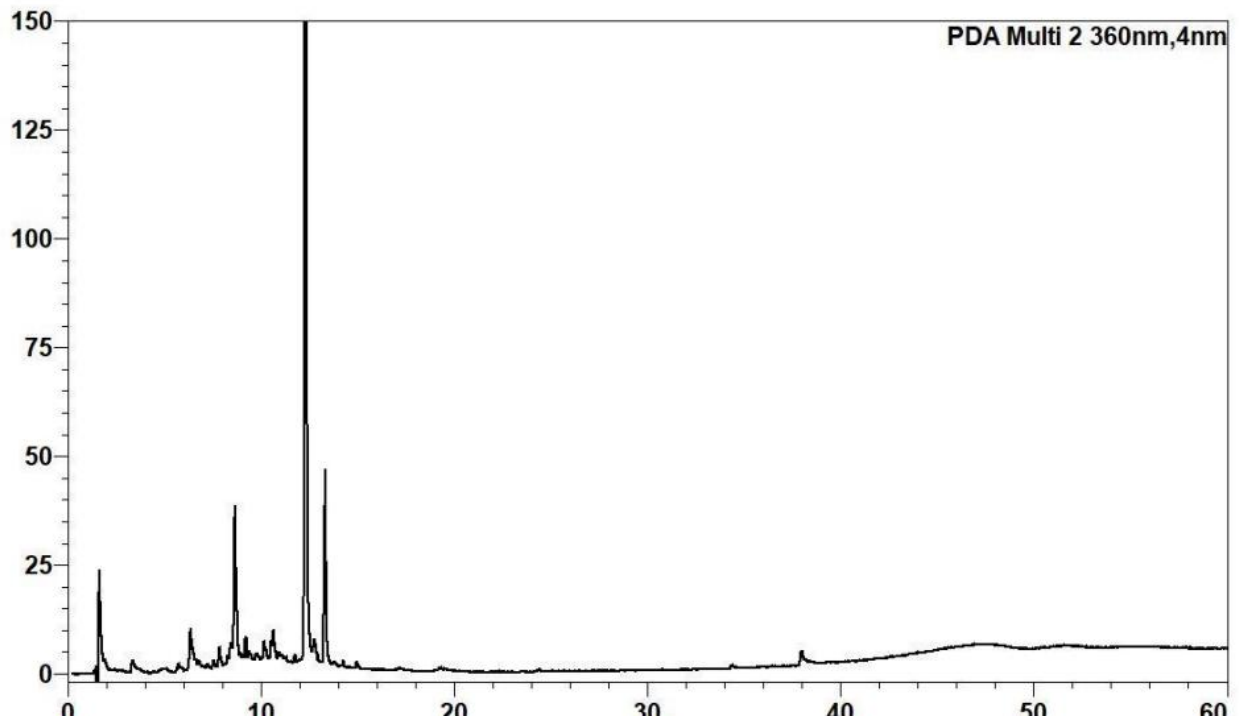
Gf\_H2O

mAU



Gf\_H2O

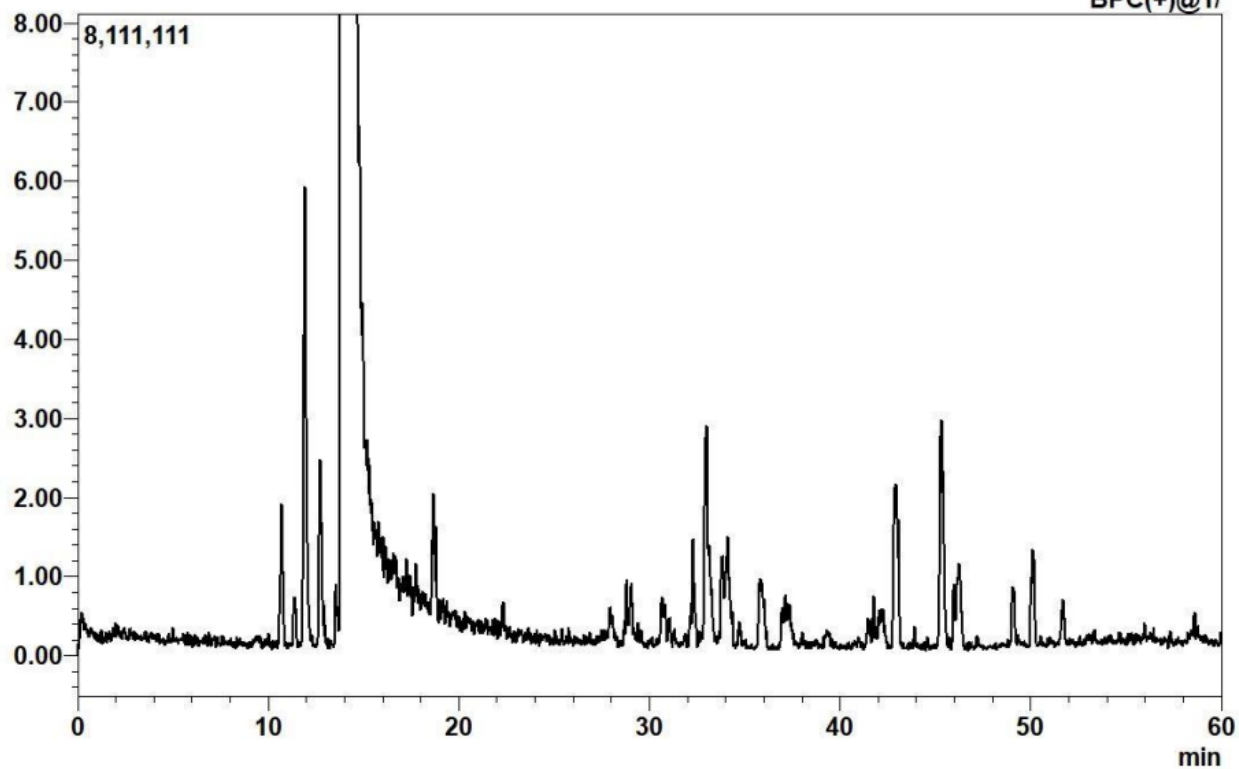
mAU



Gf\_Hex

(x1,000,000)

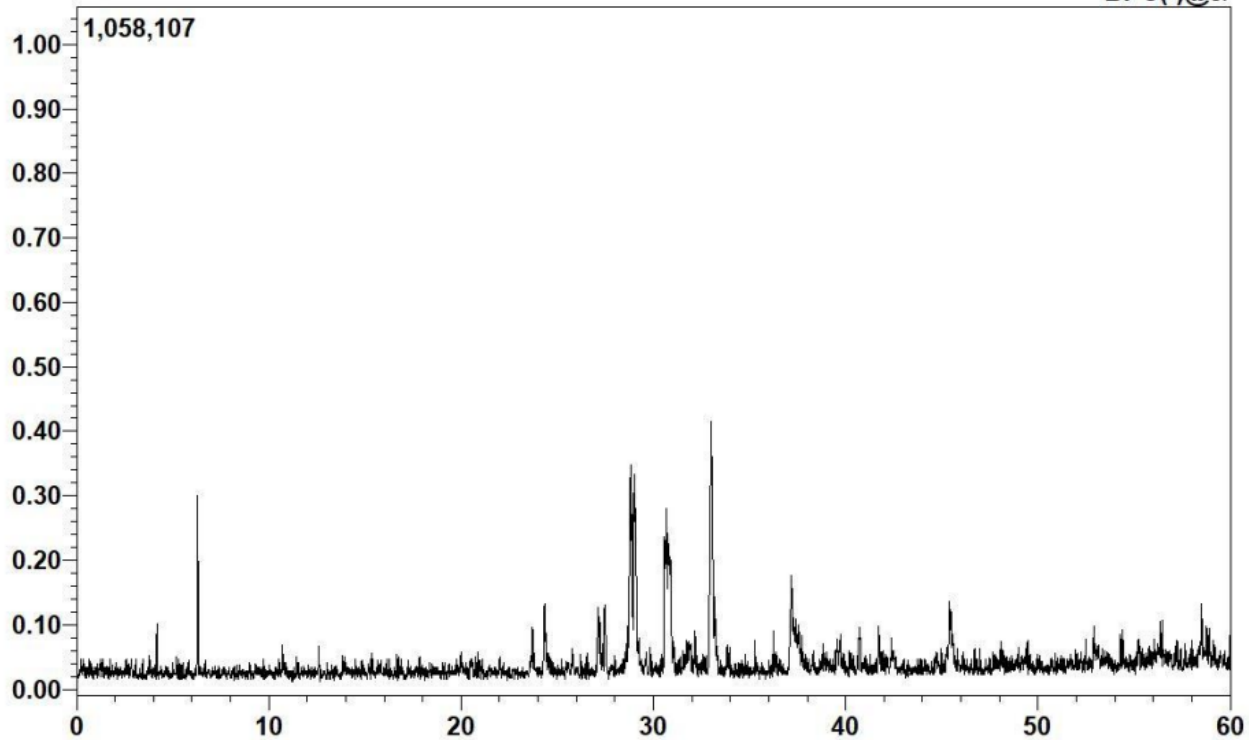
BPC(+@1/

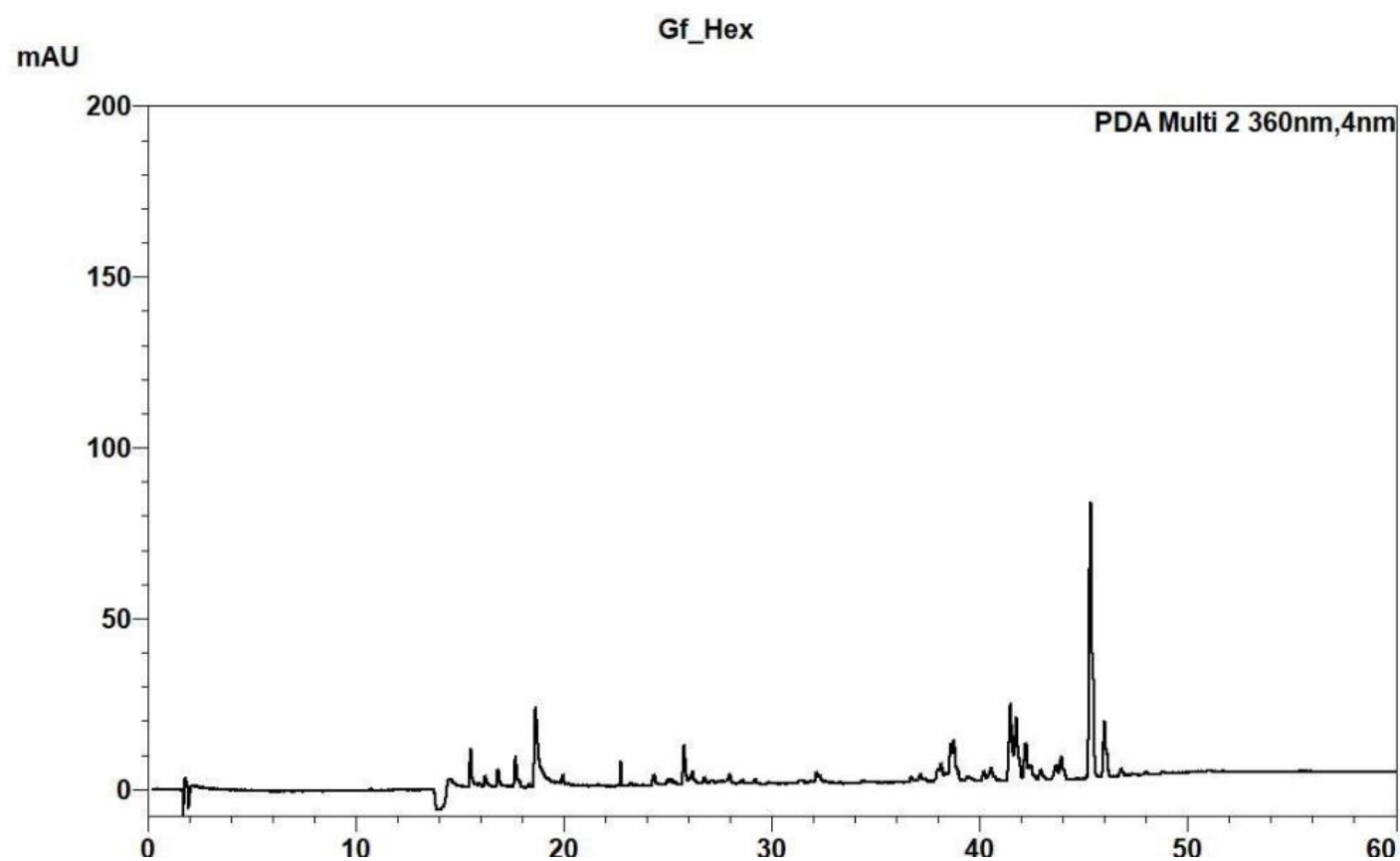
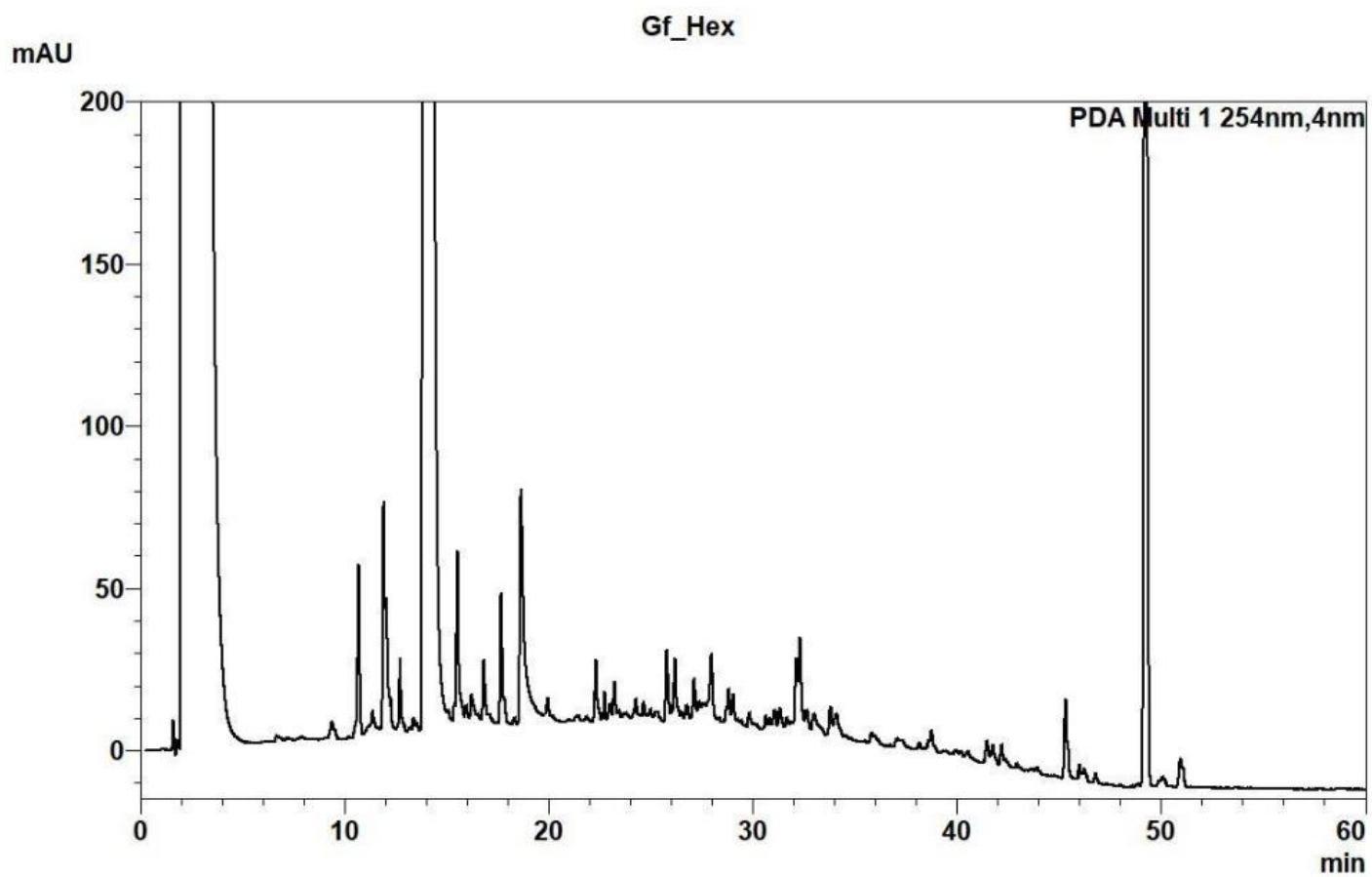


Gf\_Hex

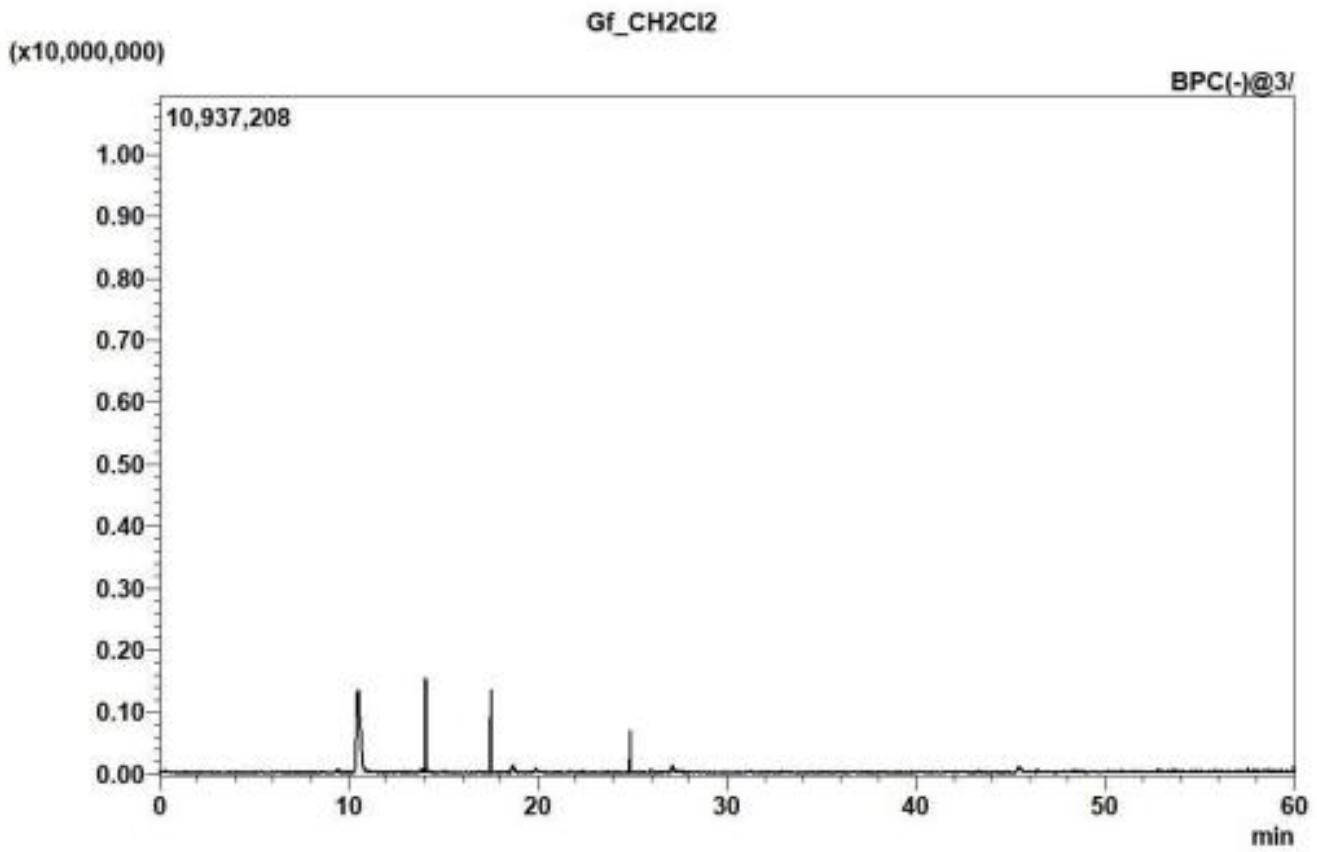
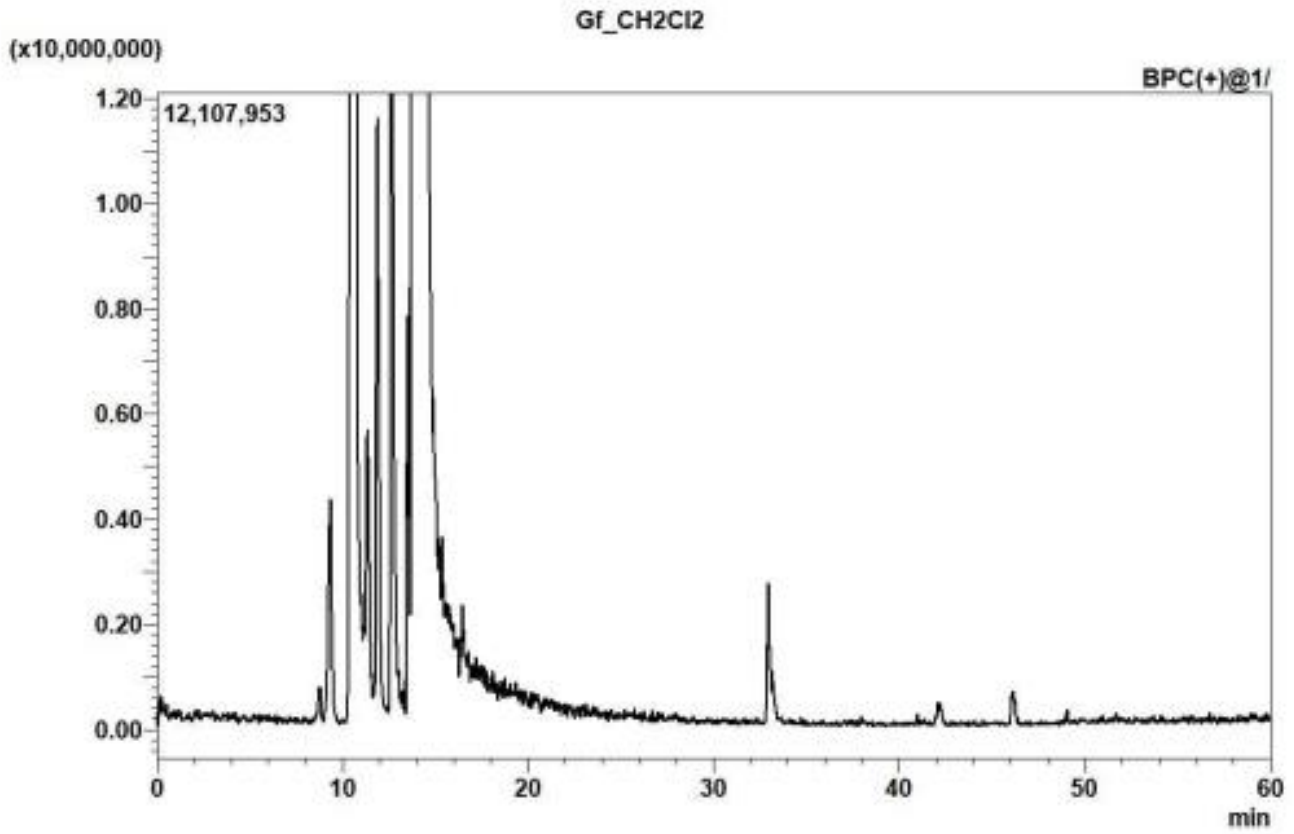
(x1,000,000)

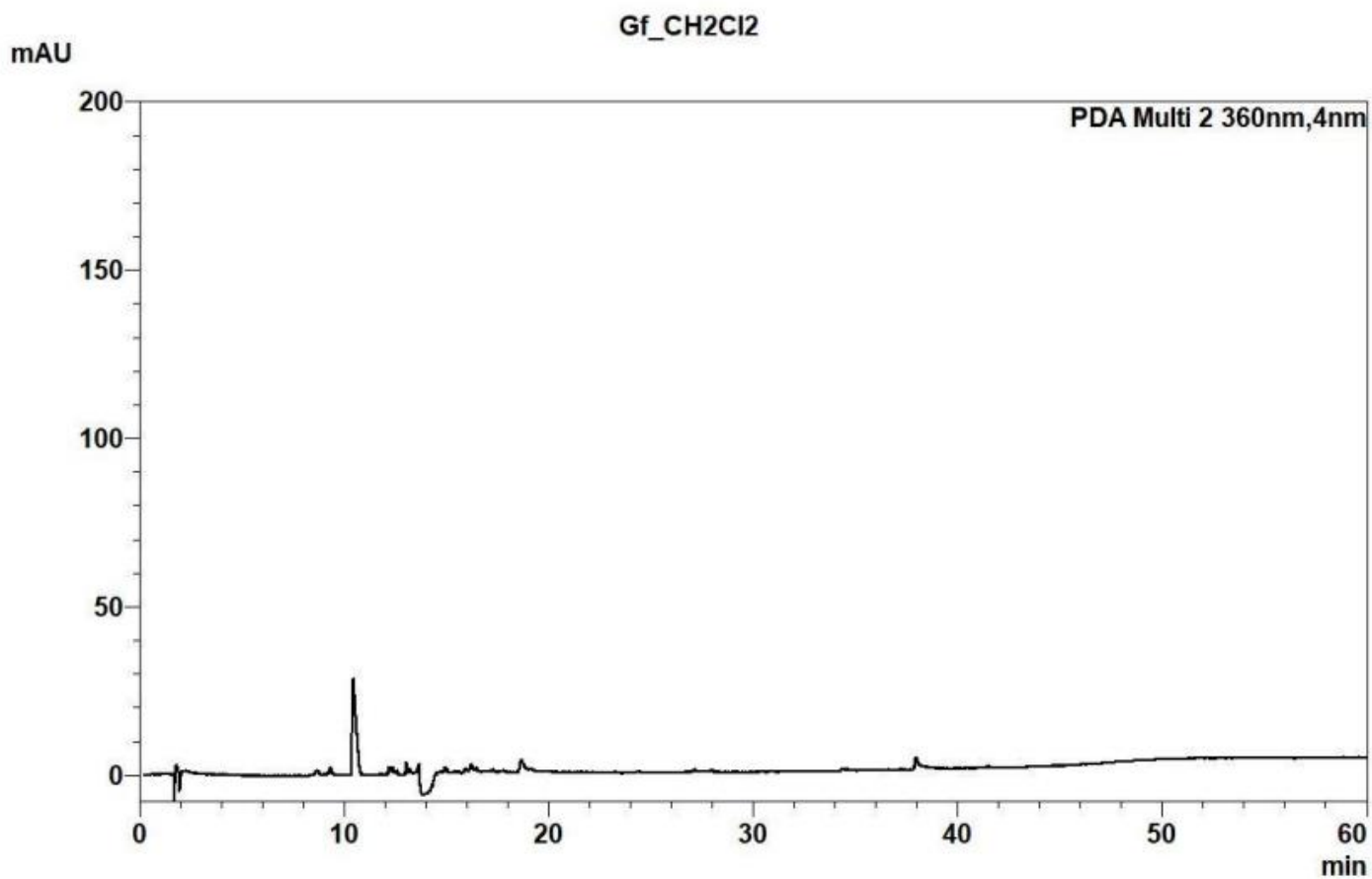
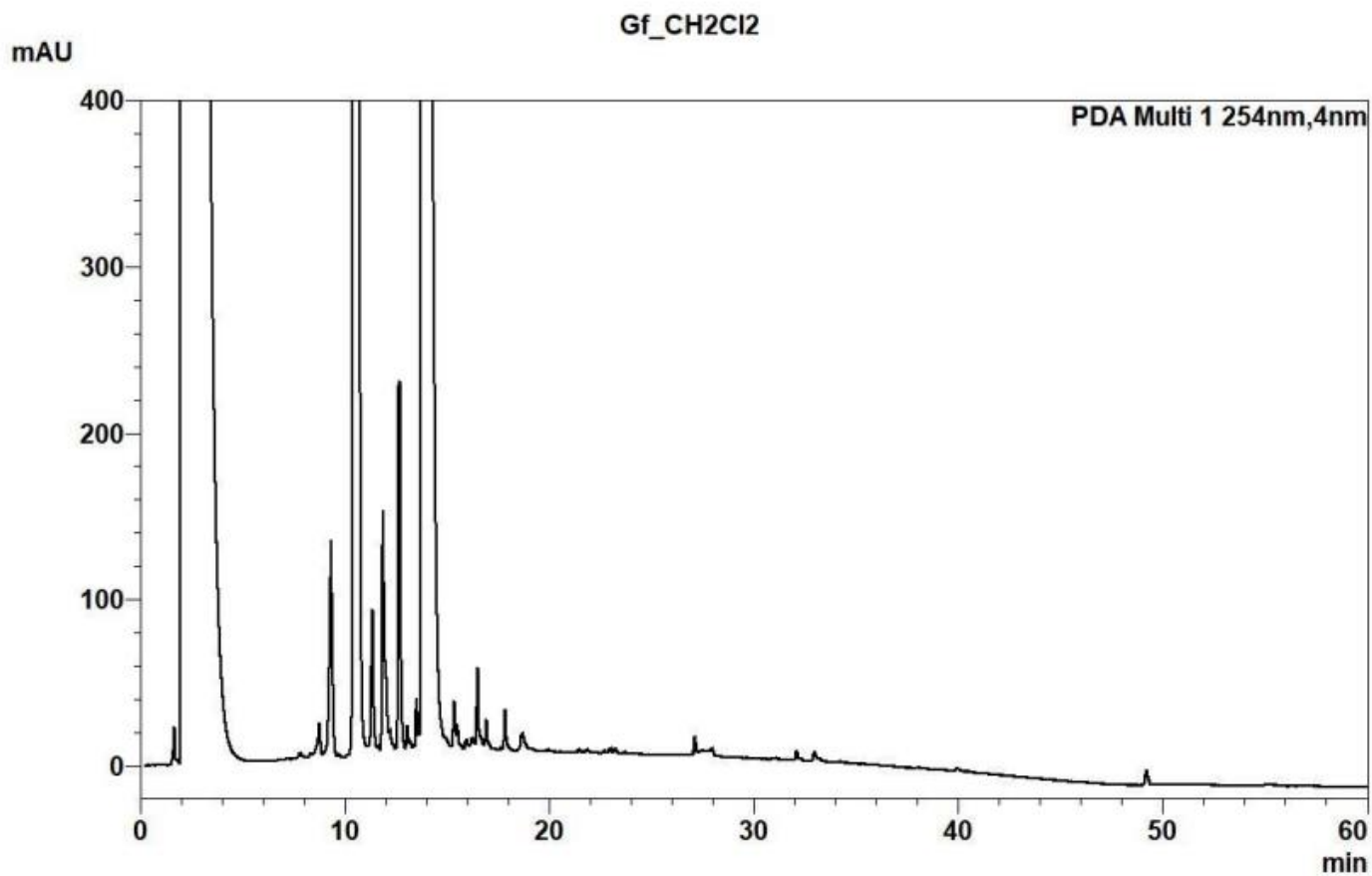
BPC(-@3/











## *Hypericum egyptum*

### List of Figures

#### H<sub>2</sub>O phase

Figure S7a. Base Peak Chromatogram (BPC) in the positive ionization mode of water extract of *Hypericum egyptum*.

Figure S7b. Base Peak Chromatogram (BPC) in the negative ionization mode of water extract of *Hypericum egyptum*.

Figure S7c. PDA chromatogram of water extracts of *Hypericum egyptum* at 245 nm.

Figure S7d. PDA chromatogram of water extracts of *Hypericum egyptum* at 360 nm.

#### Hexane extract

Figure S8a. Base Peak Chromatogram (BPC) in positive mode of *n*-hexane extract of *Hypericum egyptum*.

Figure S8b. Base Peak Chromatogram (BPC) in negative mode of *n*-hexane extract of *Hypericum egyptum*.

Figure S8c. PDA chromatogram of *n*-hexane extracts of *Hypericum egyptum* at 245 nm.

Figure S8d. PDA chromatogram of *n*-hexane extracts of *Hypericum egyptum* at 360 nm.

#### CH<sub>2</sub>Cl<sub>2</sub> extract

Figure S9a. Base Peak Chromatogram (BPC) in positive mode of dichloromethane extract of *Hypericum egyptum*.

Figure S9b. Base Peak Chromatogram (BPC) in negative mode of dichloromethane extract of *Hypericum egyptum*.

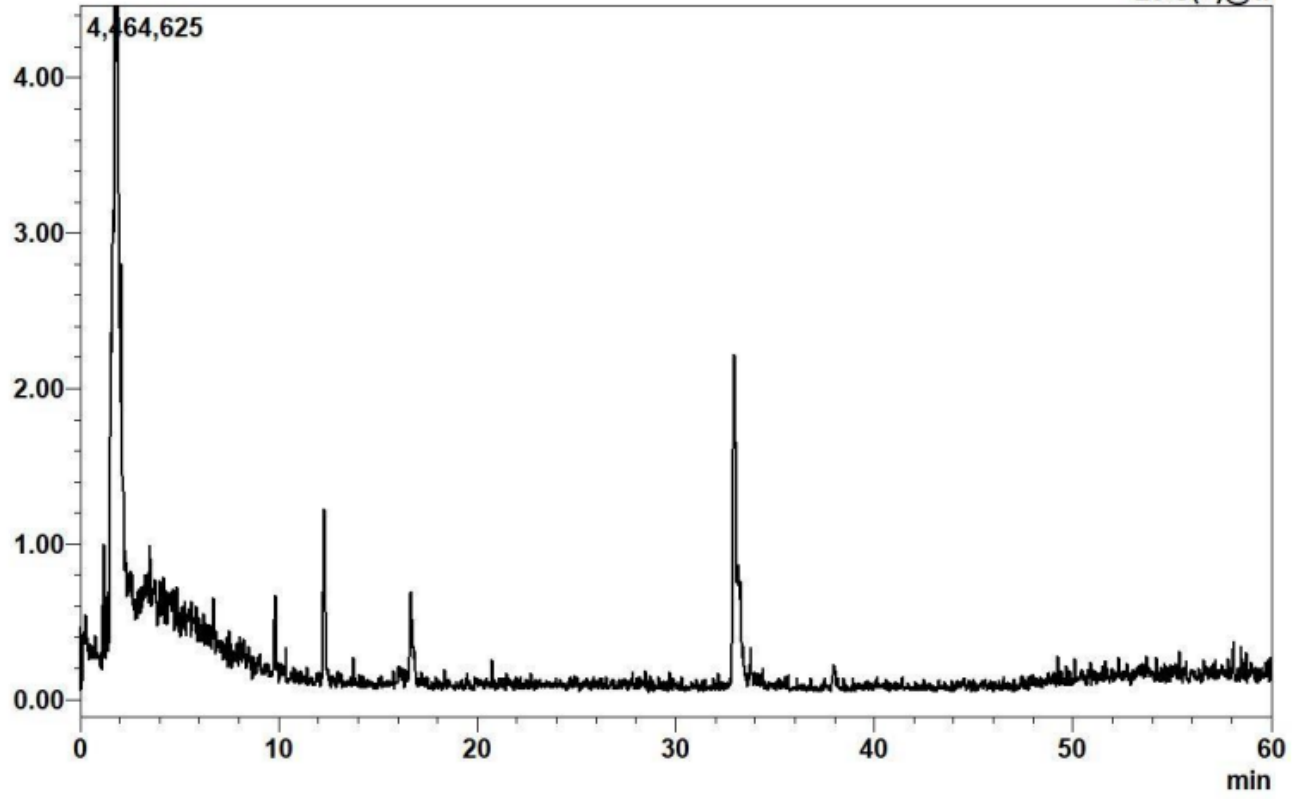
Figure S9c. PDA chromatogram of dichloromethane extracts of *Hypericum egyptum* at 245 nm.

Figure S9d. PDA chromatogram of dichloromethane of *Hypericum egyptum* at 360 nm.

He\_H2O

(x1,000,000)

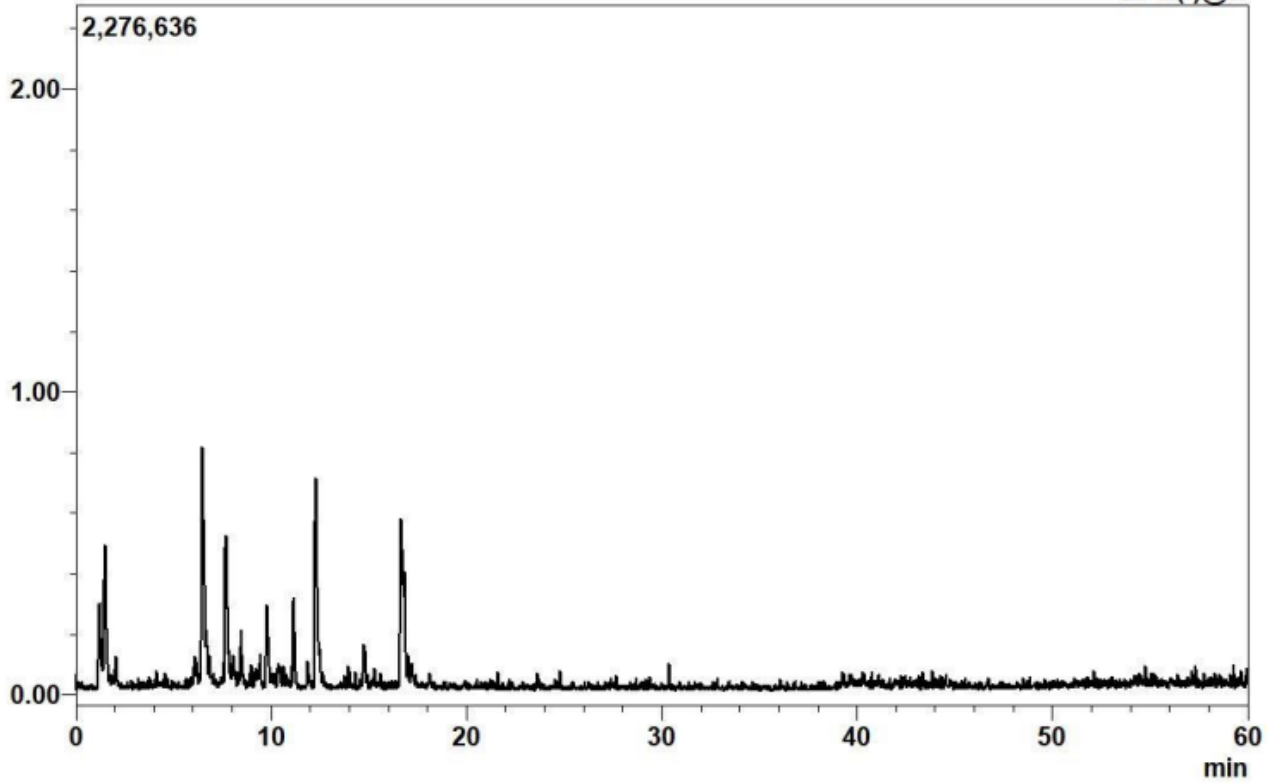
BPC(+@1/



He\_H2O

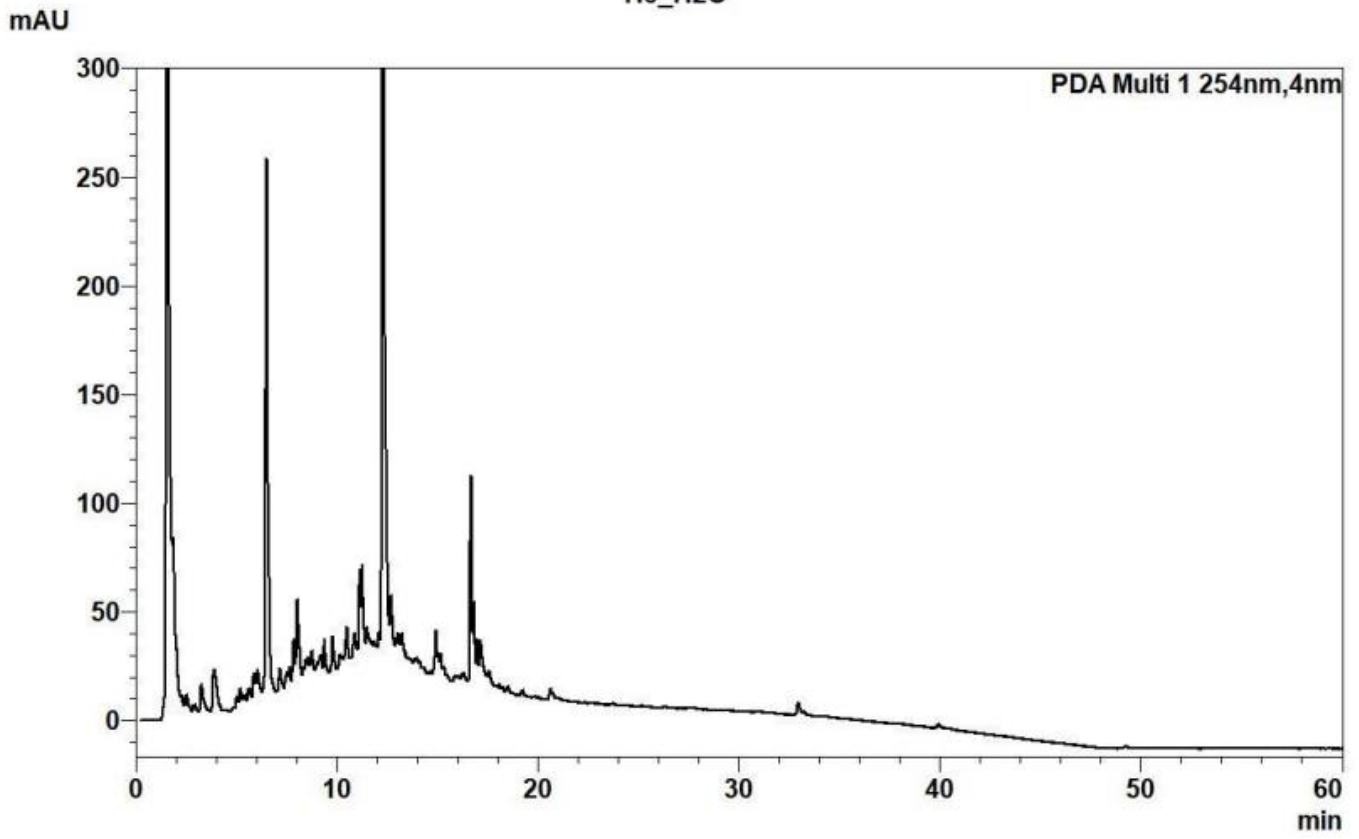
(x1,000,000)

BPC(-@3/

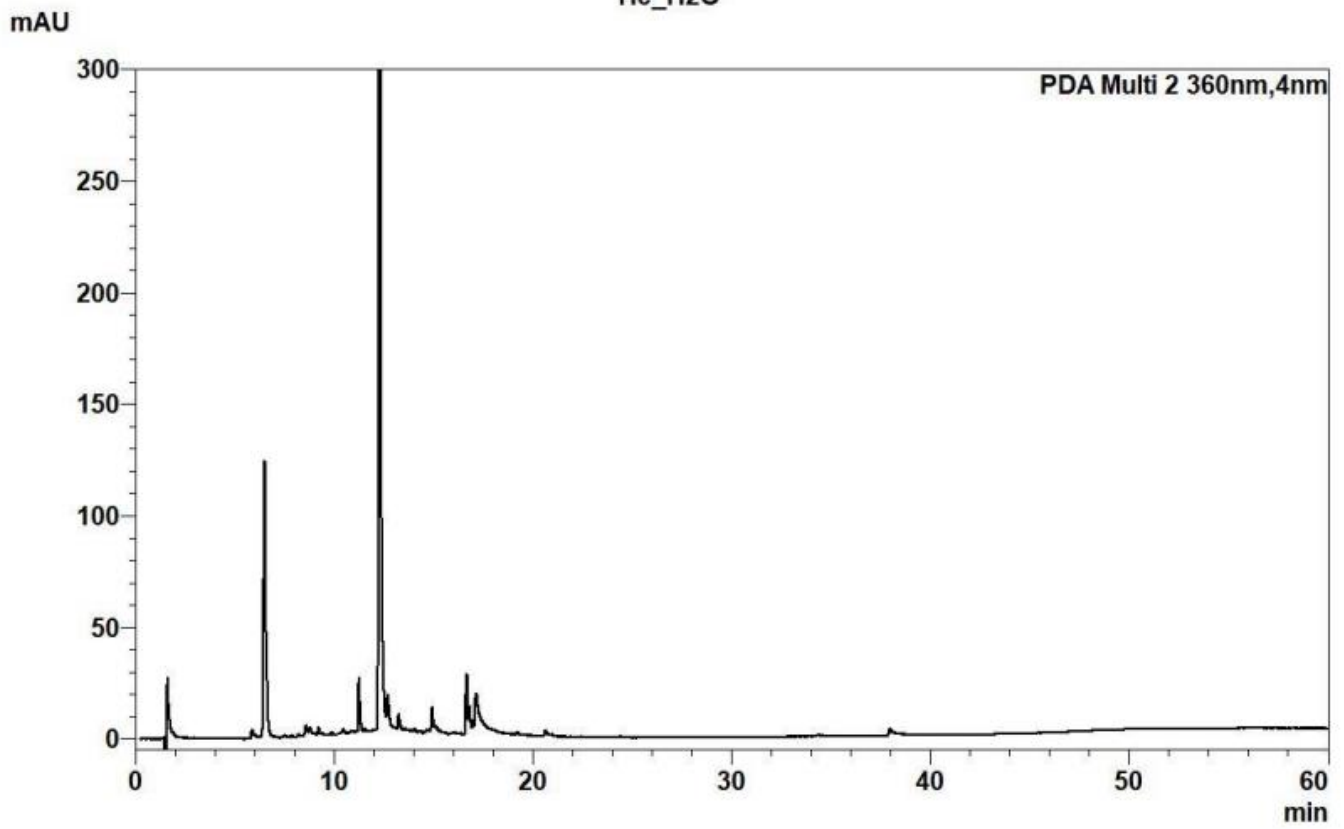


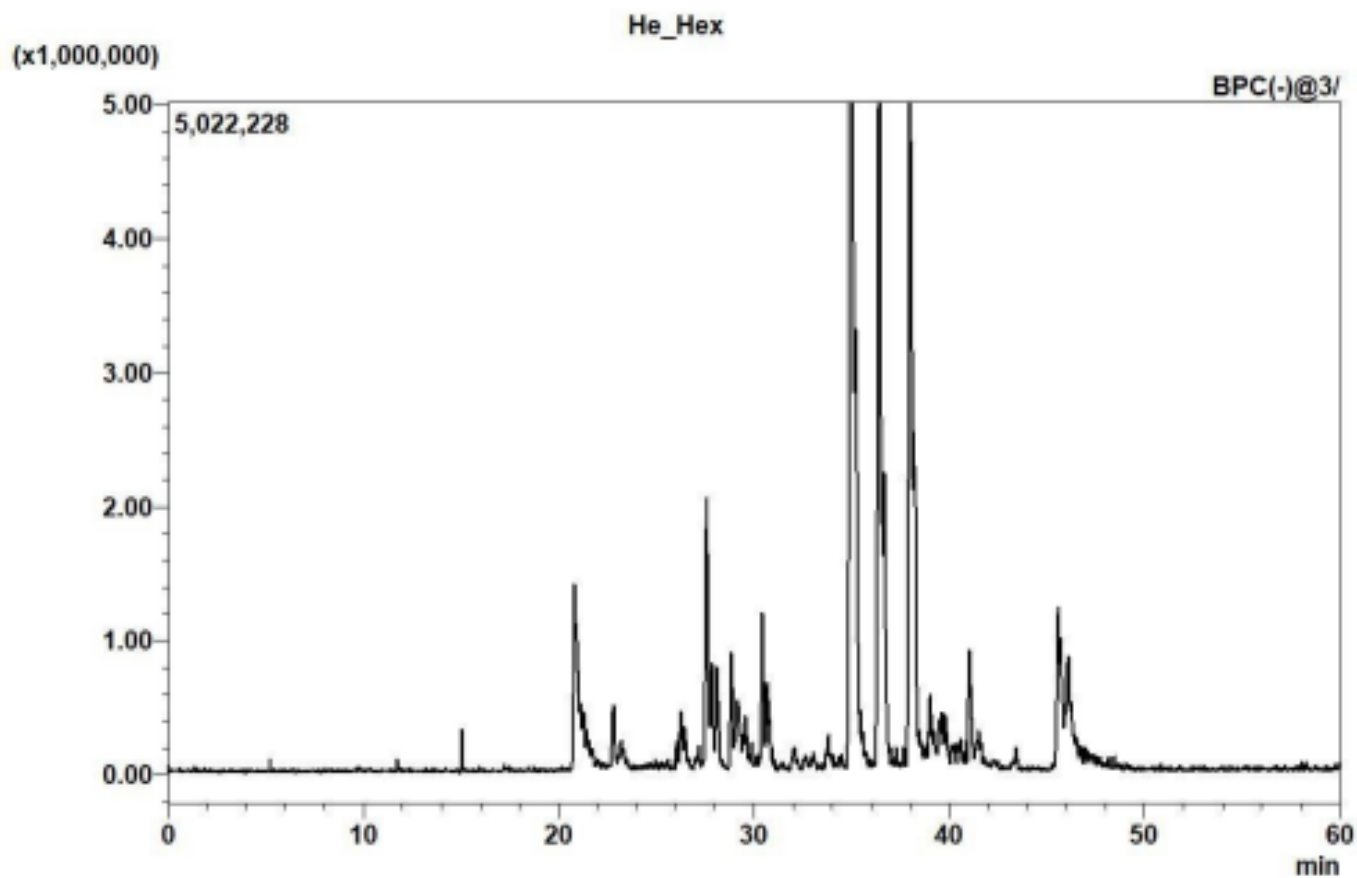
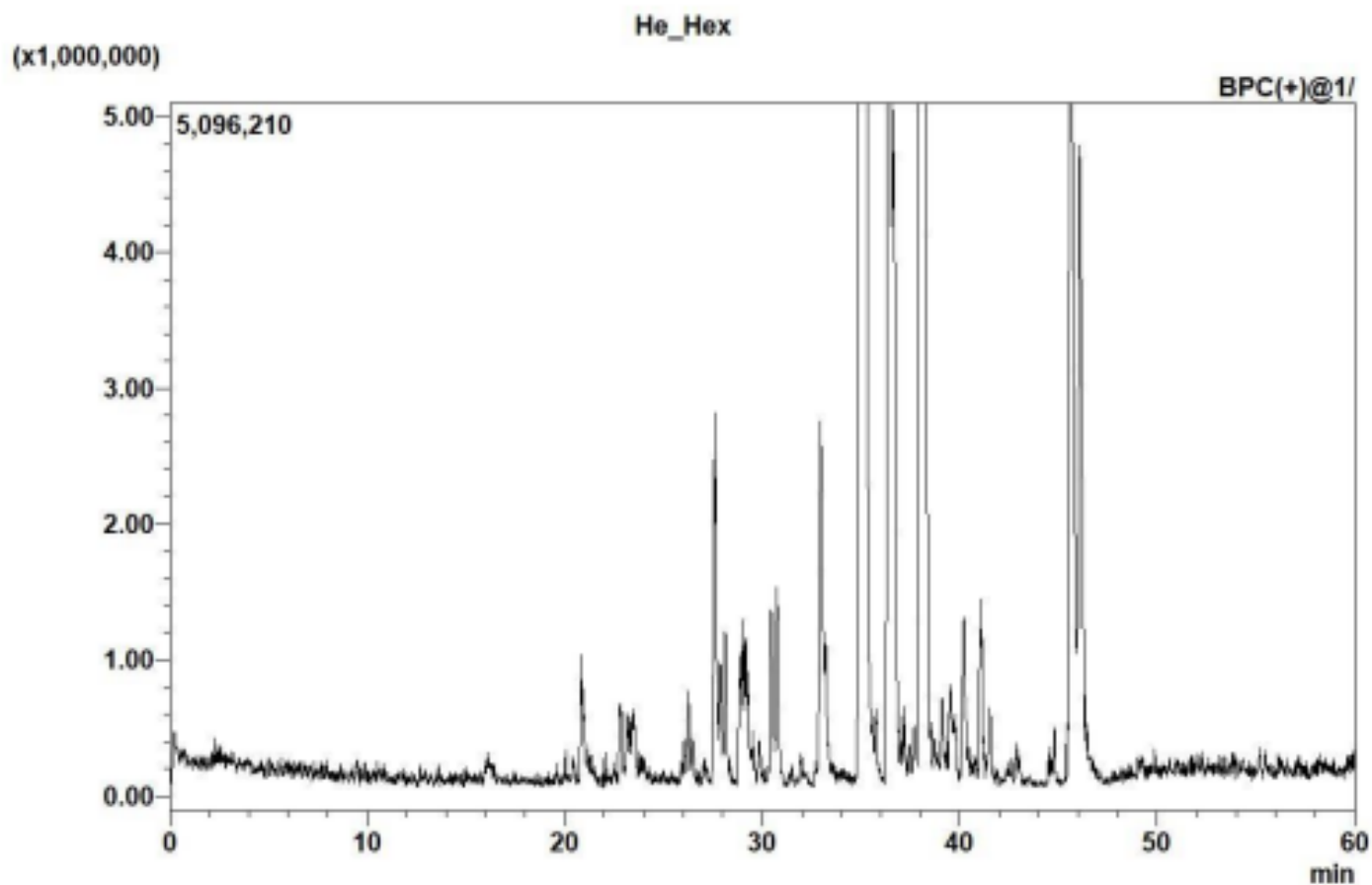


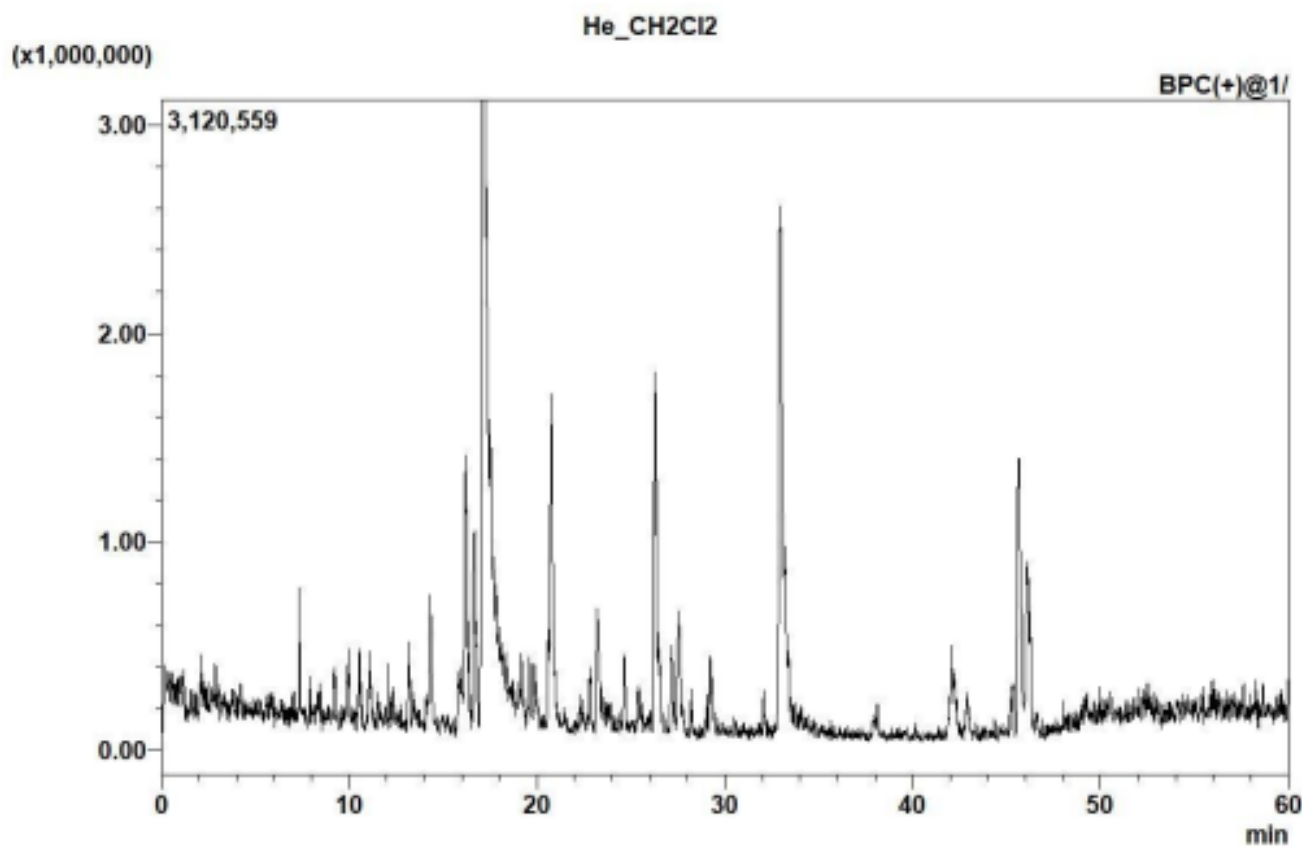
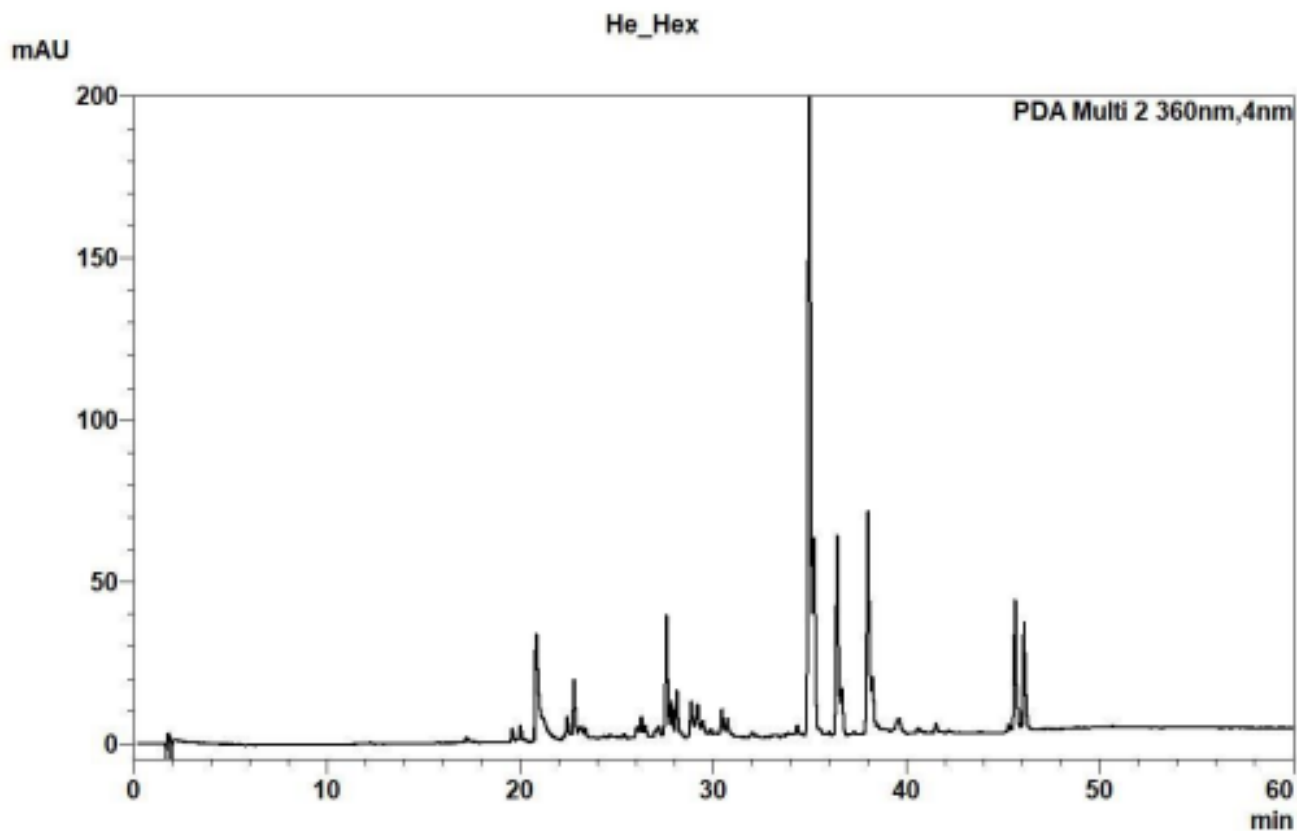
He\_H2O

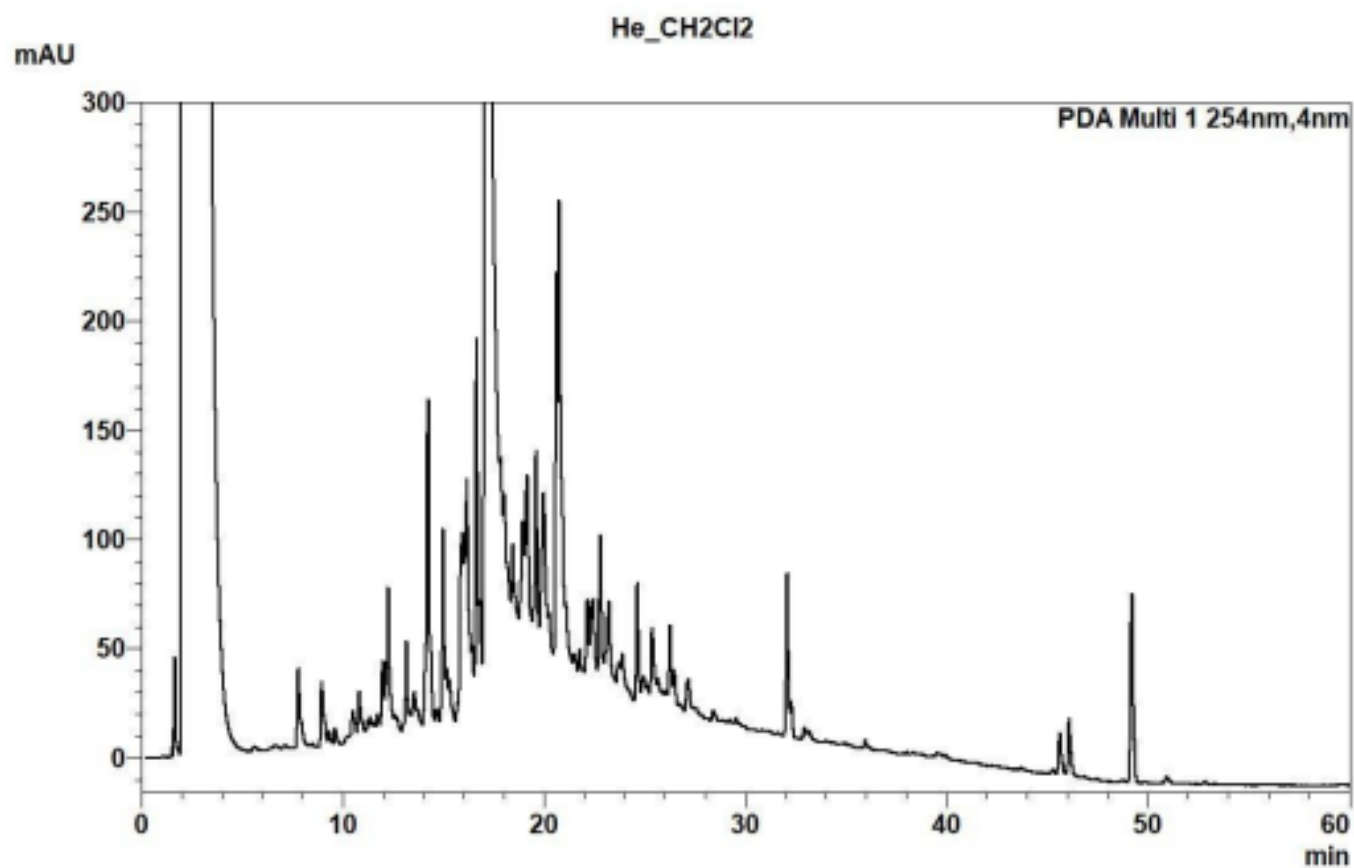
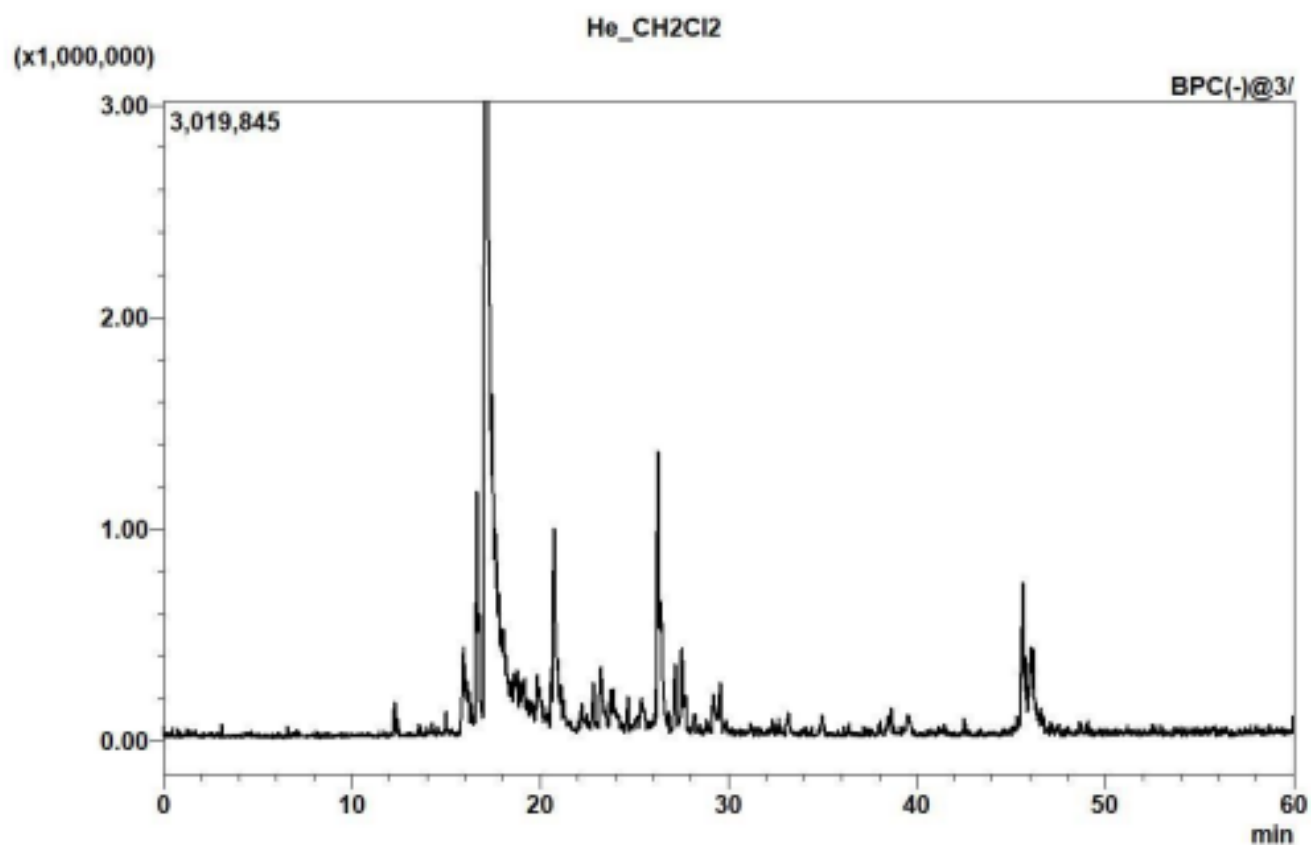


He\_H2O





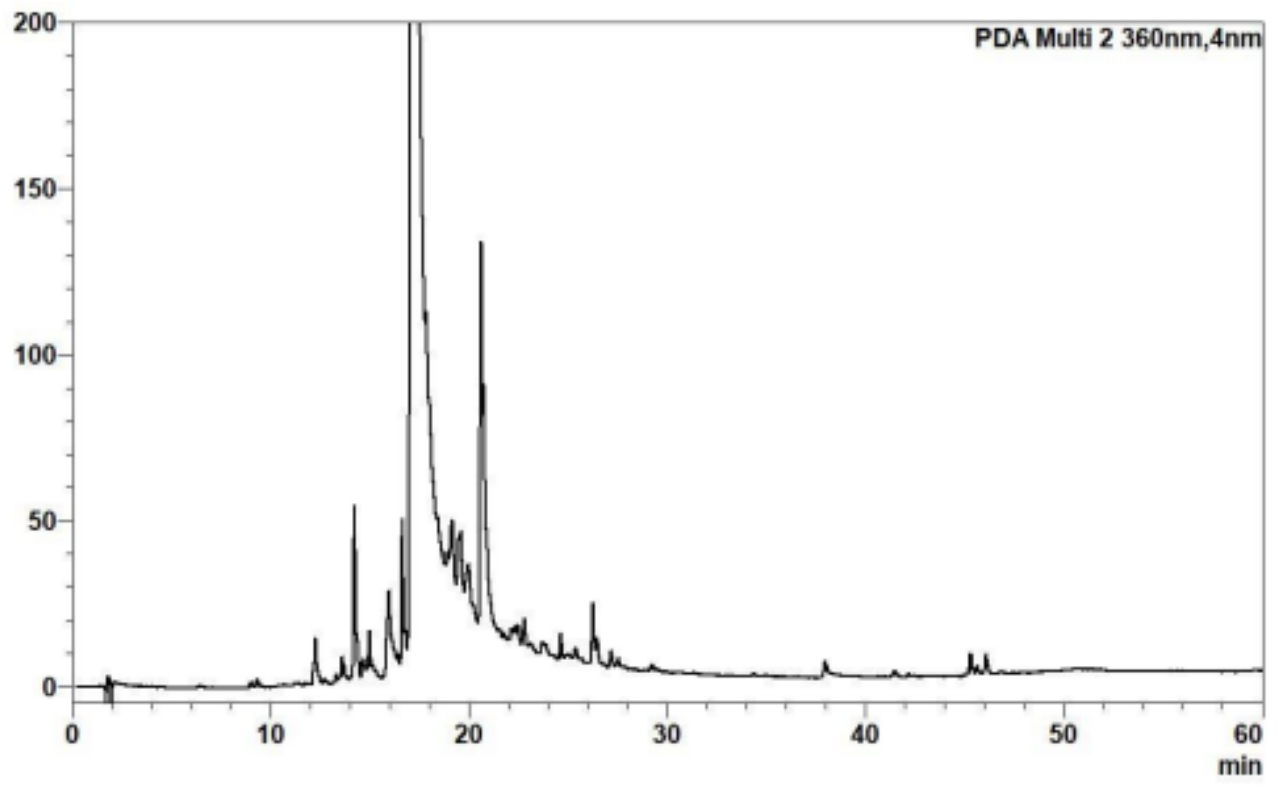






He\_CH2Cl2

mAU



# *Periploca angustifolia*

## List of Figures

### H<sub>2</sub>O phase

Figure S10a. Base Peak Chromatogram (BPC) in the positive ionization mode of water extract of *Periploca angustifolia*.

Figure S10b. Base Peak Chromatogram (BPC) in the negative ionization mode of water extract of *Periploca angustifolia*.

Figure S10c. PDA chromatogram of water extracts of *Periploca angustifolia* at 245 nm.

Figure S10d. PDA chromatogram of water extracts of *Periploca angustifolia* at 360 nm. Hexane extract

Figure S11a. Base Peak Chromatogram (BPC) in positive mode of *n*-hexane extract of *Periploca angustifolia*.

Figure S11b. Base Peak Chromatogram (BPC) in negative mode of *n*-hexane extract of *Periploca angustifolia*.

Figure S11c. PDA chromatogram of *n*-hexane extracts of *Periploca angustifolia* at 245 nm.

Figure S11d. PDA chromatogram of *n*-hexane extracts of *Periploca angustifolia* at 360 nm.

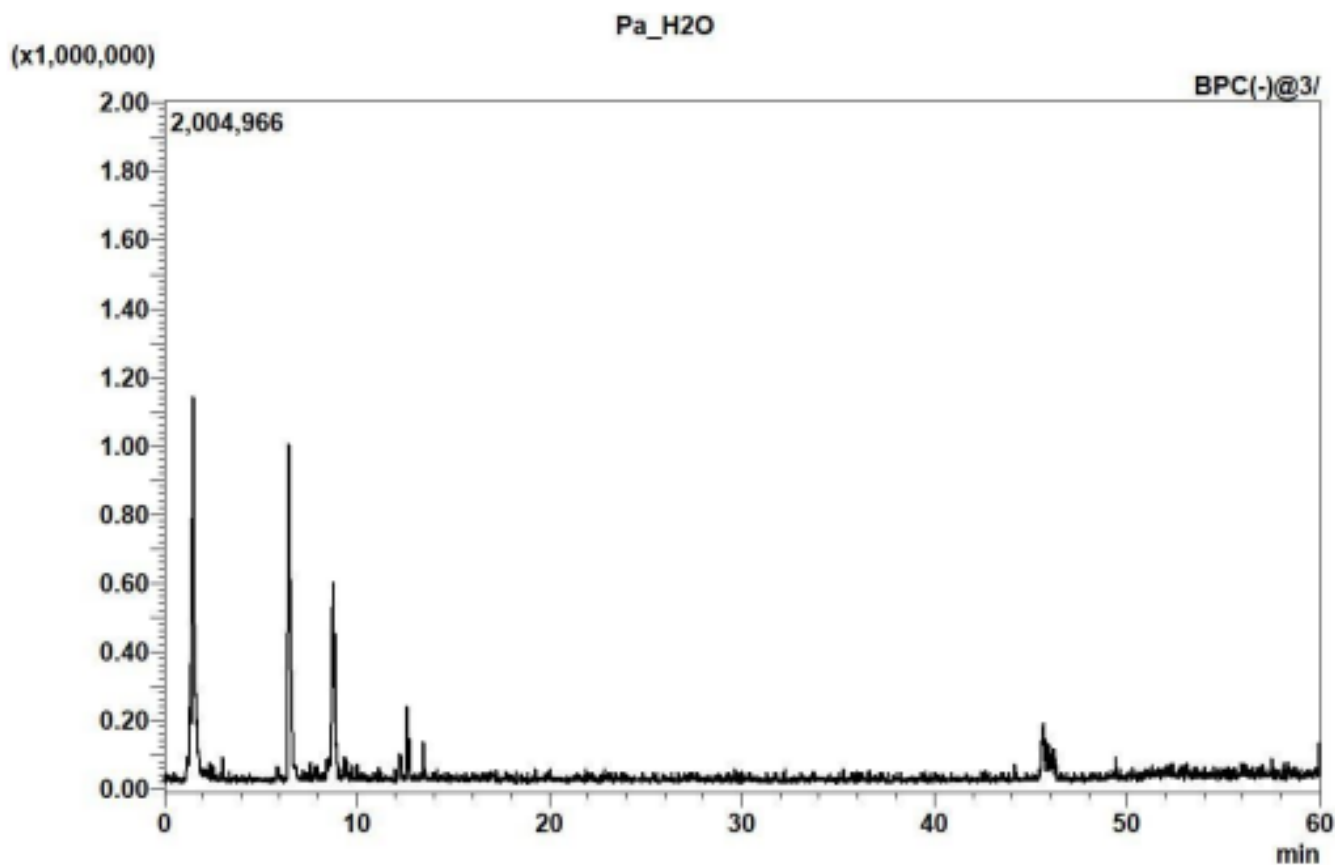
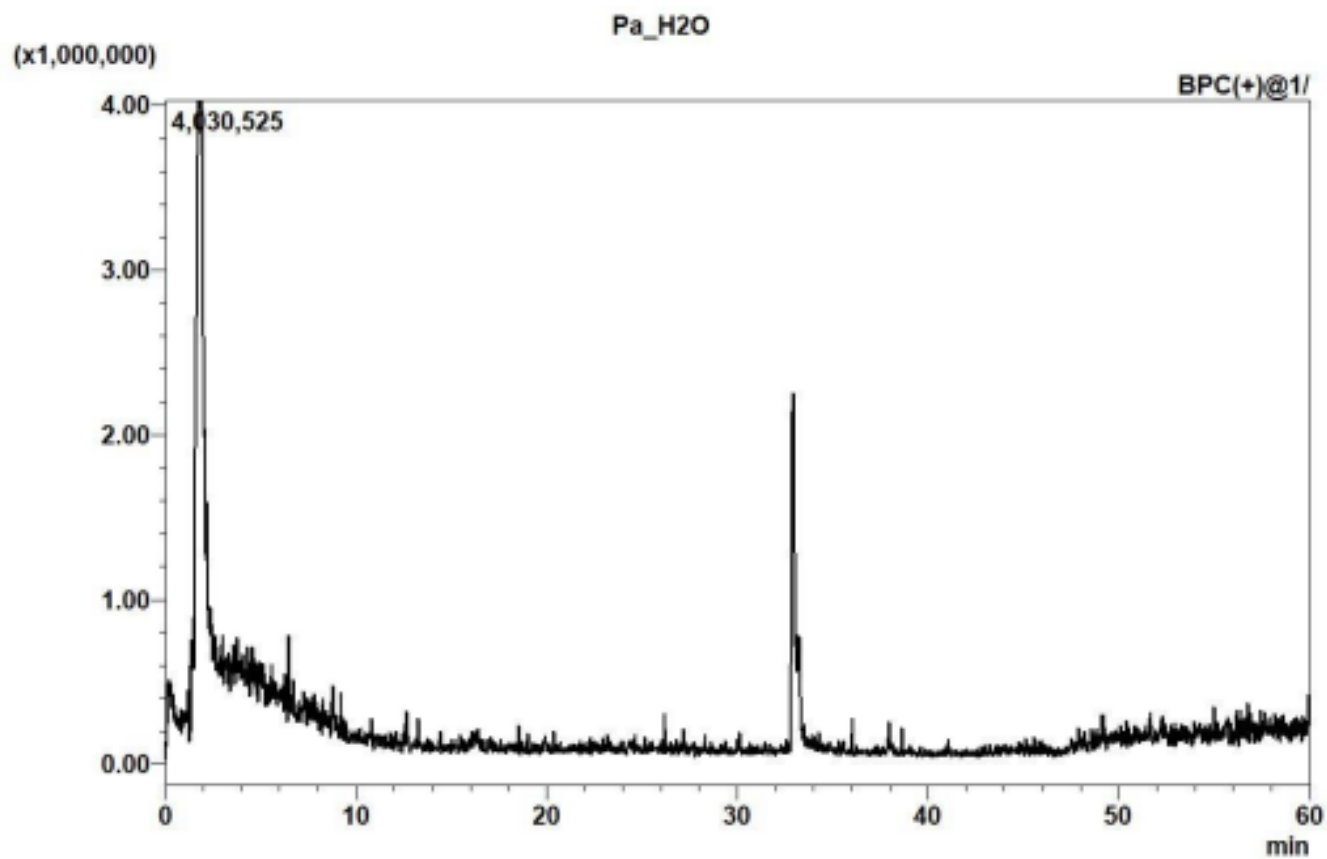
### CH<sub>2</sub>Cl<sub>2</sub> extract

Figure S12a. Base Peak Chromatogram (BPC) in positive mode of dichloromethane extract of *Periploca angustifolia*.

Figure S12b. Base Peak Chromatogram (BPC) in negative mode of dichloromethane extract of *Periploca angustifolia*.

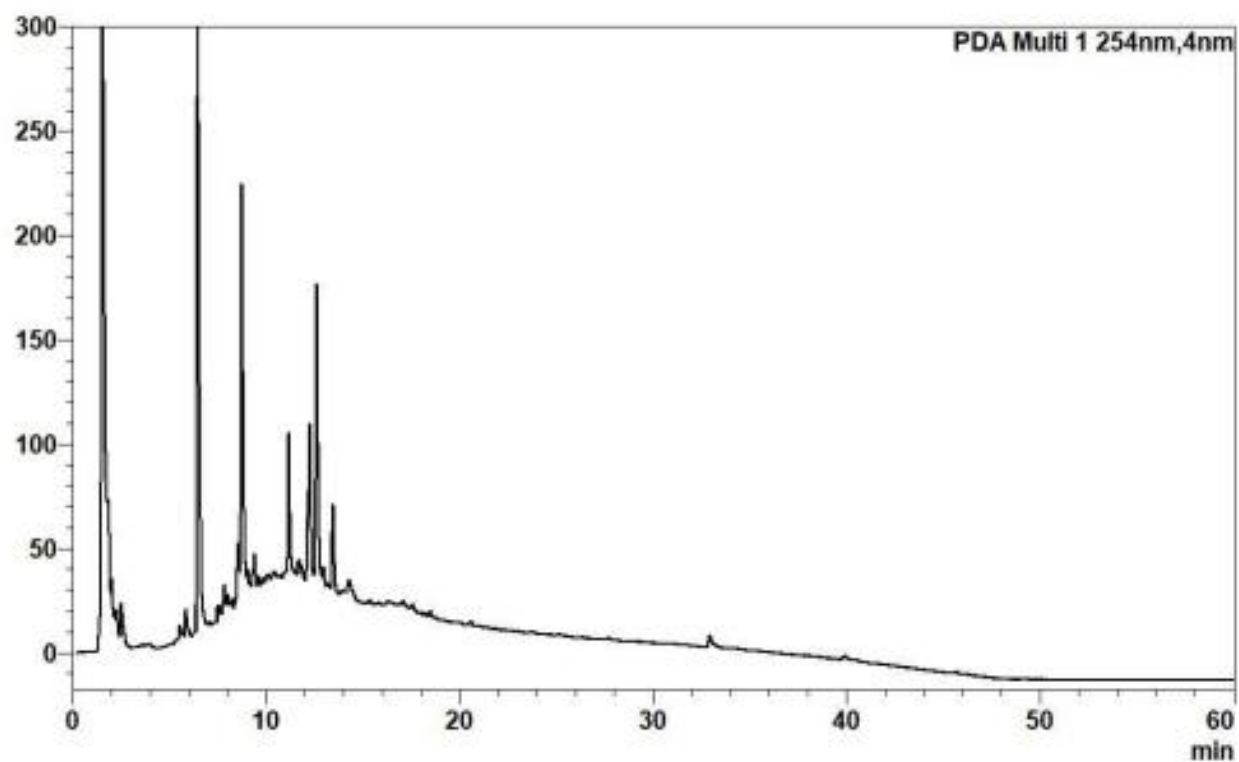
Figure S12c. PDA chromatogram of dichloromethane extracts of *Periploca angustifolia* at 245 nm.

Figure S12d. PDA chromatogram of dichloromethane of *Periploca angustifolia* at 360 nm



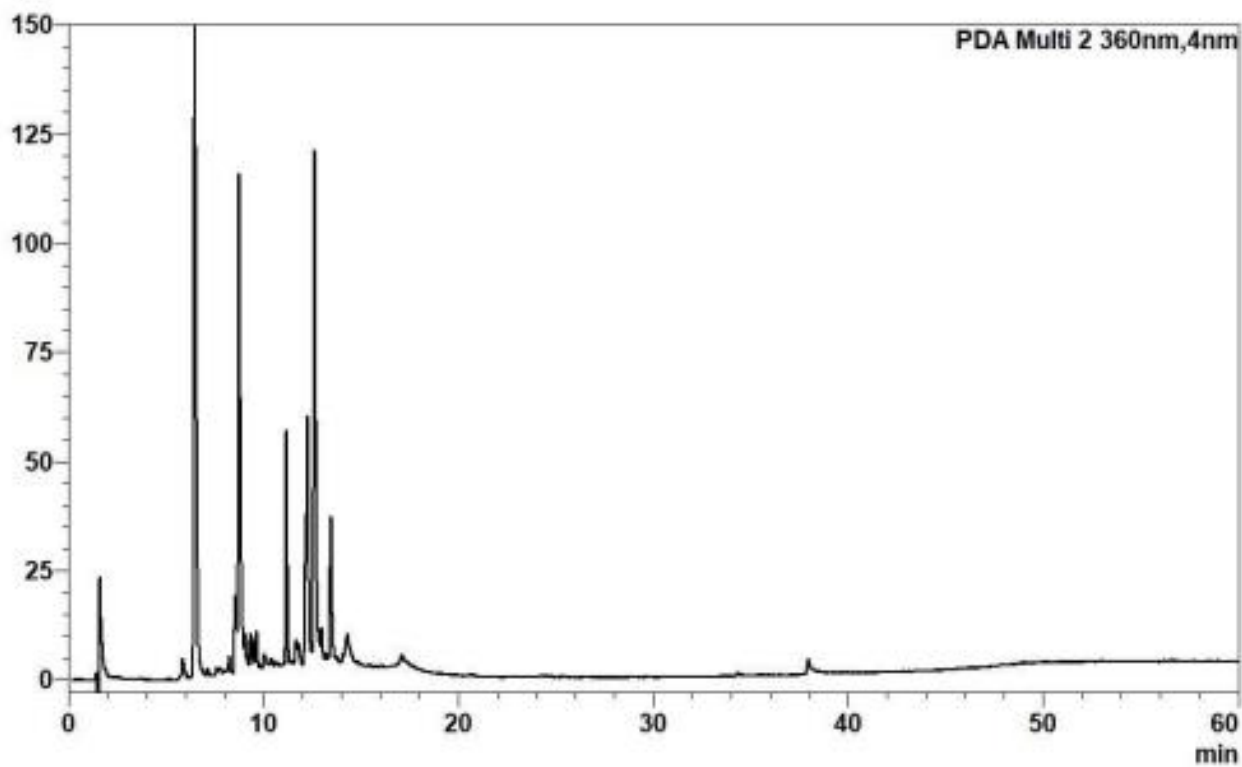
Pa\_H2O

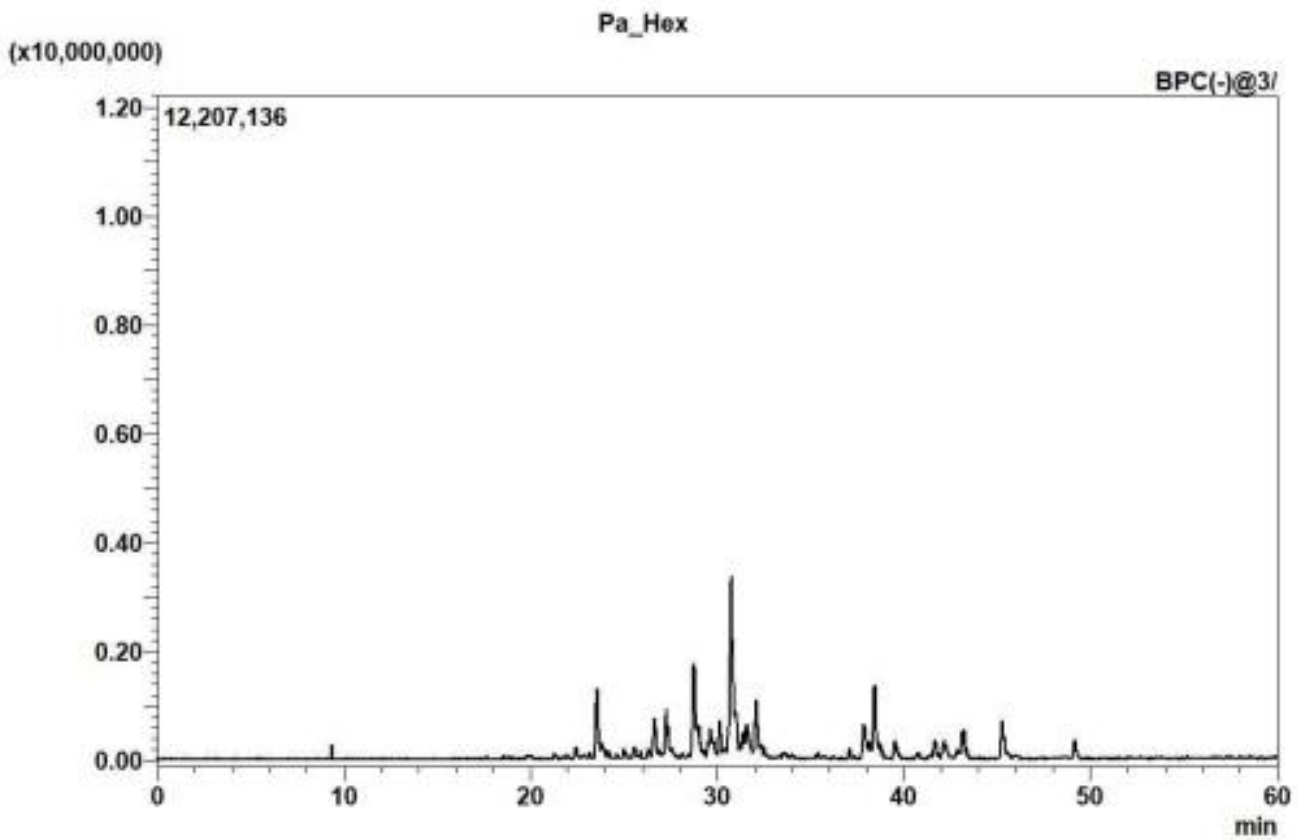
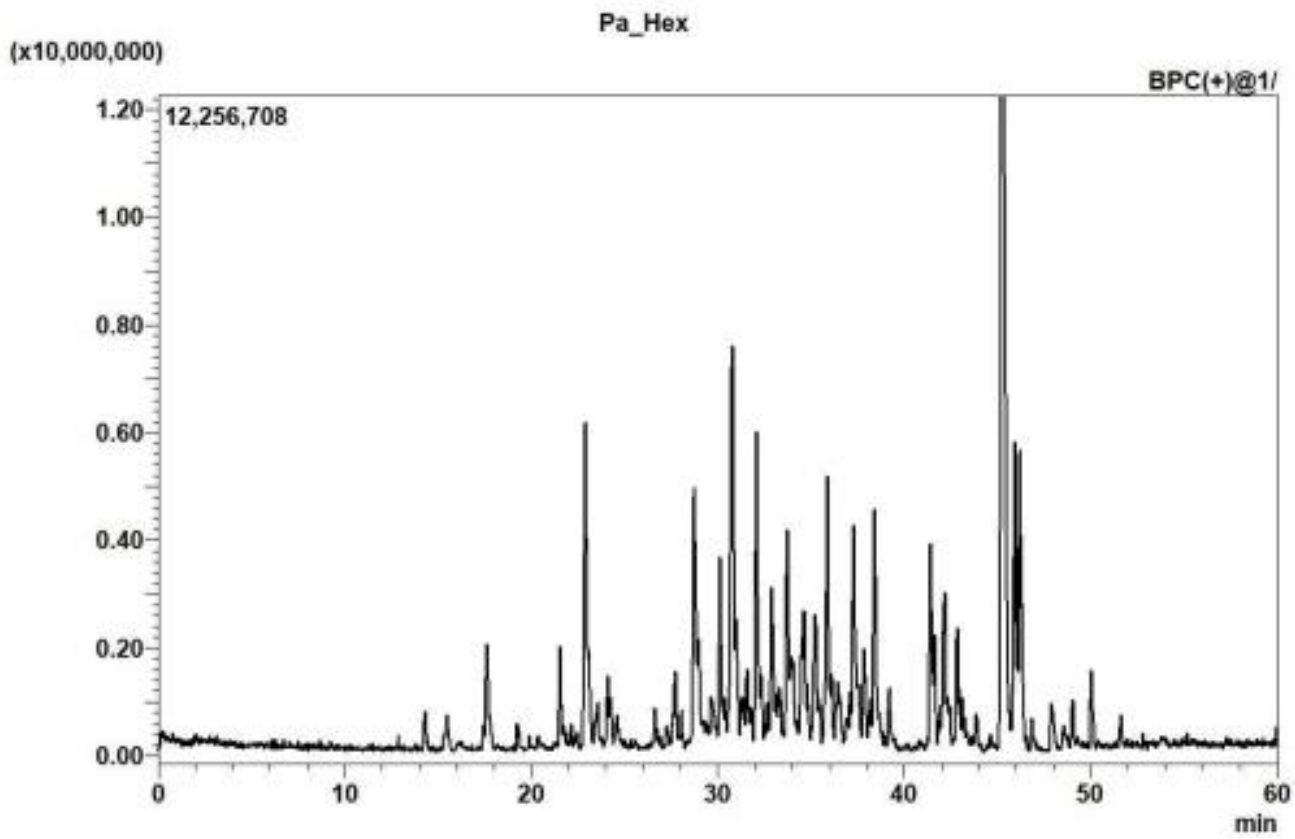
mAU

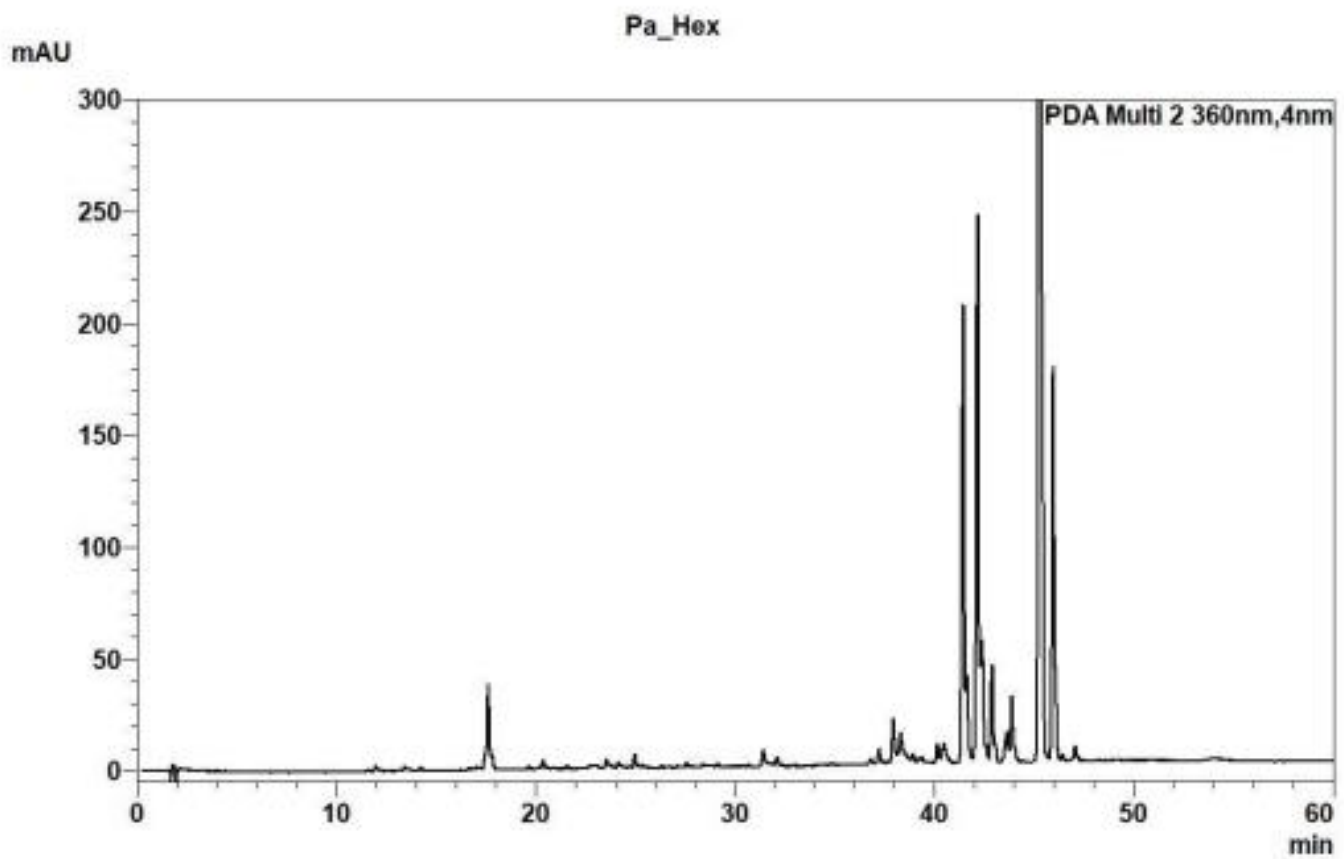
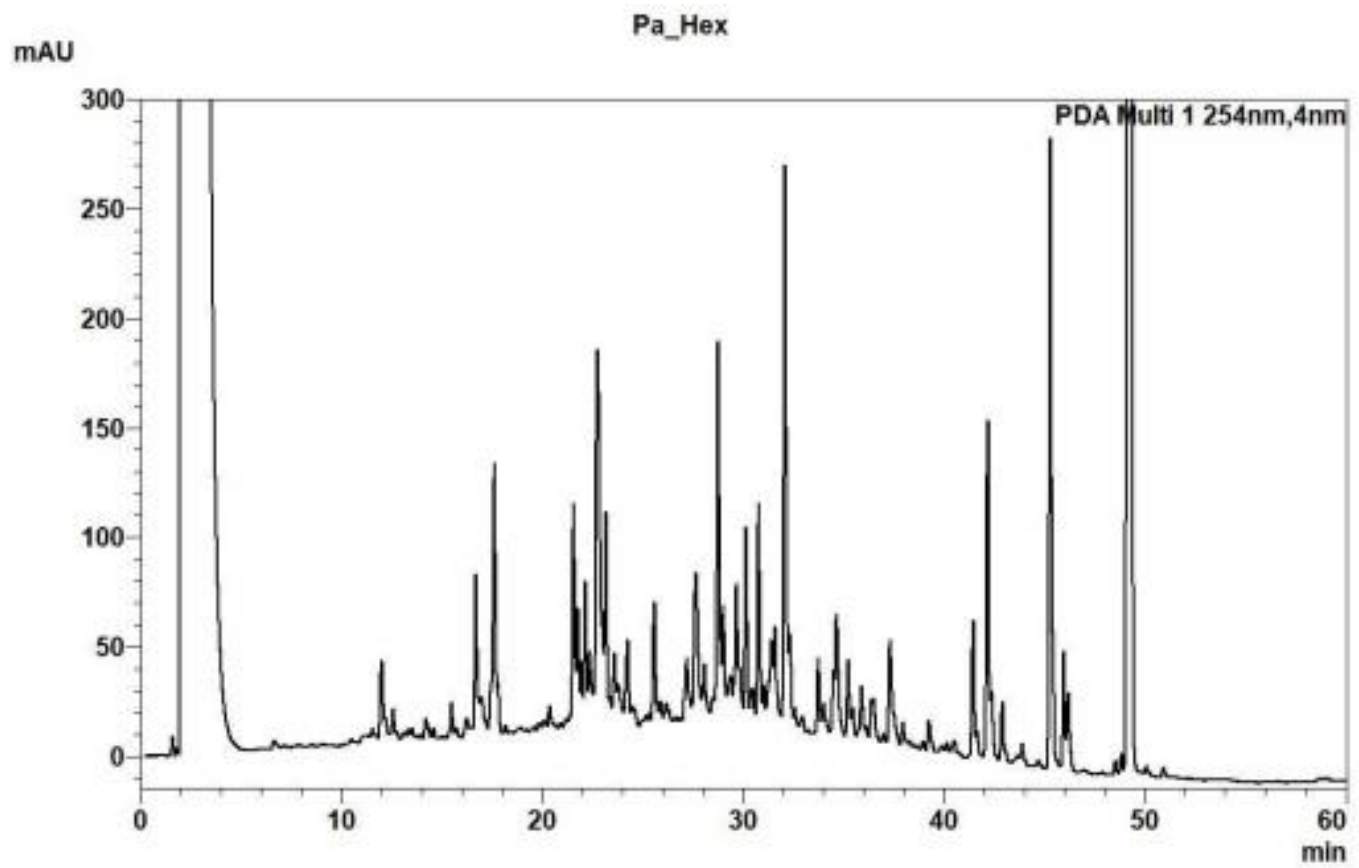


Pa\_H2O

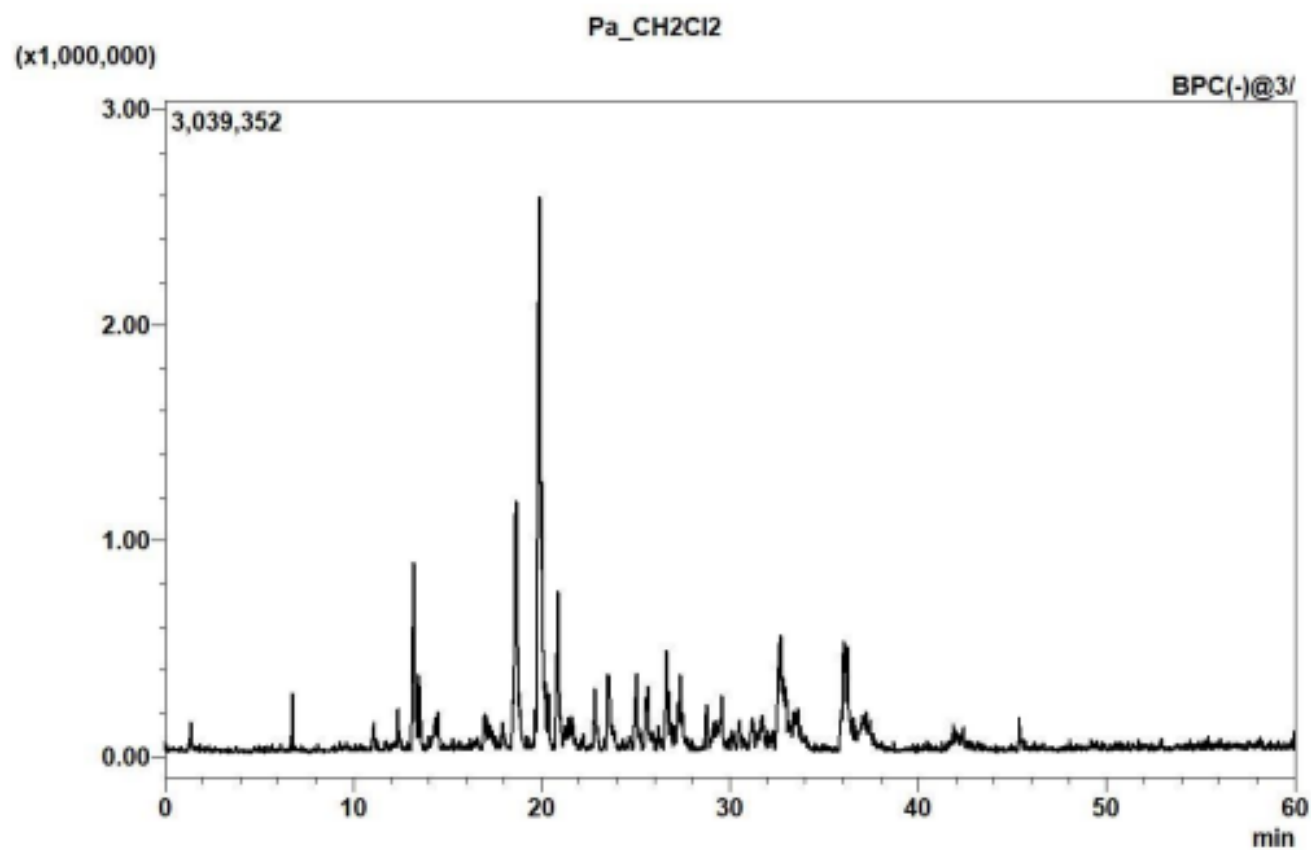
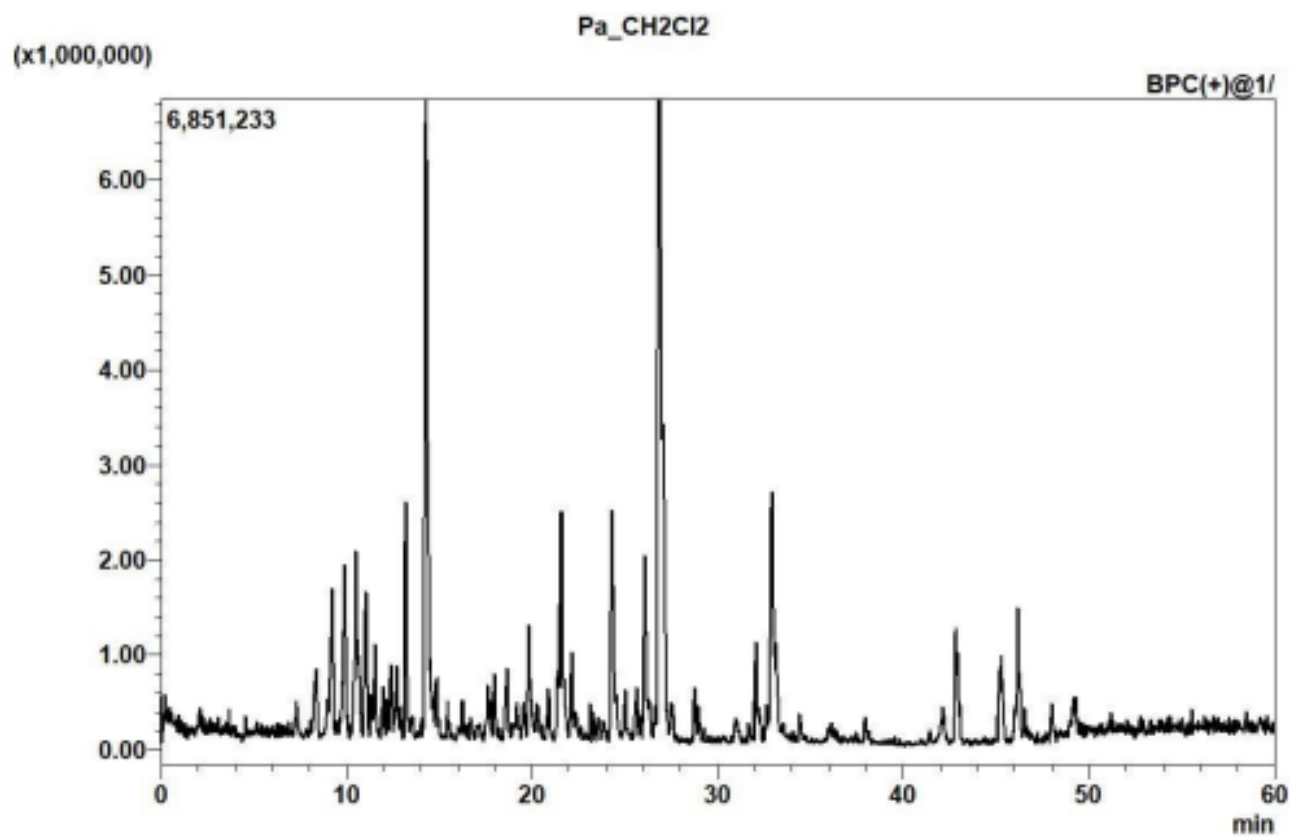
mAU





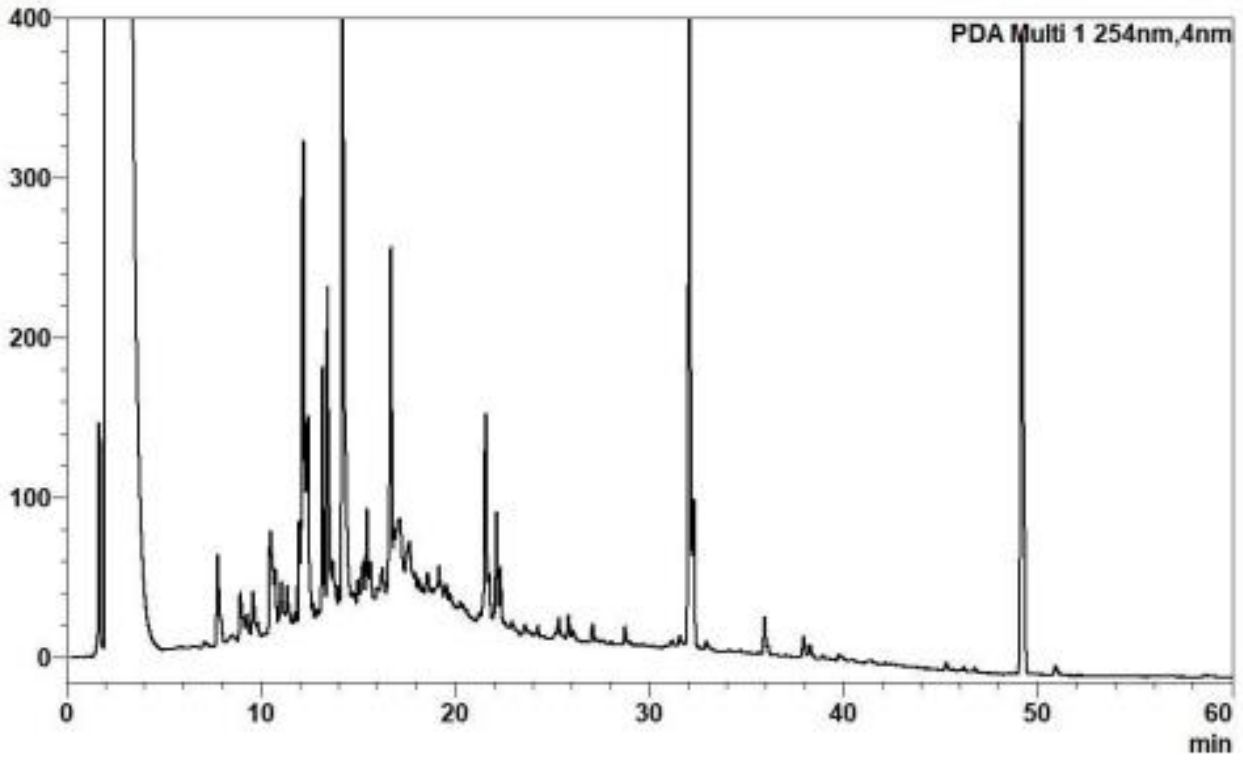






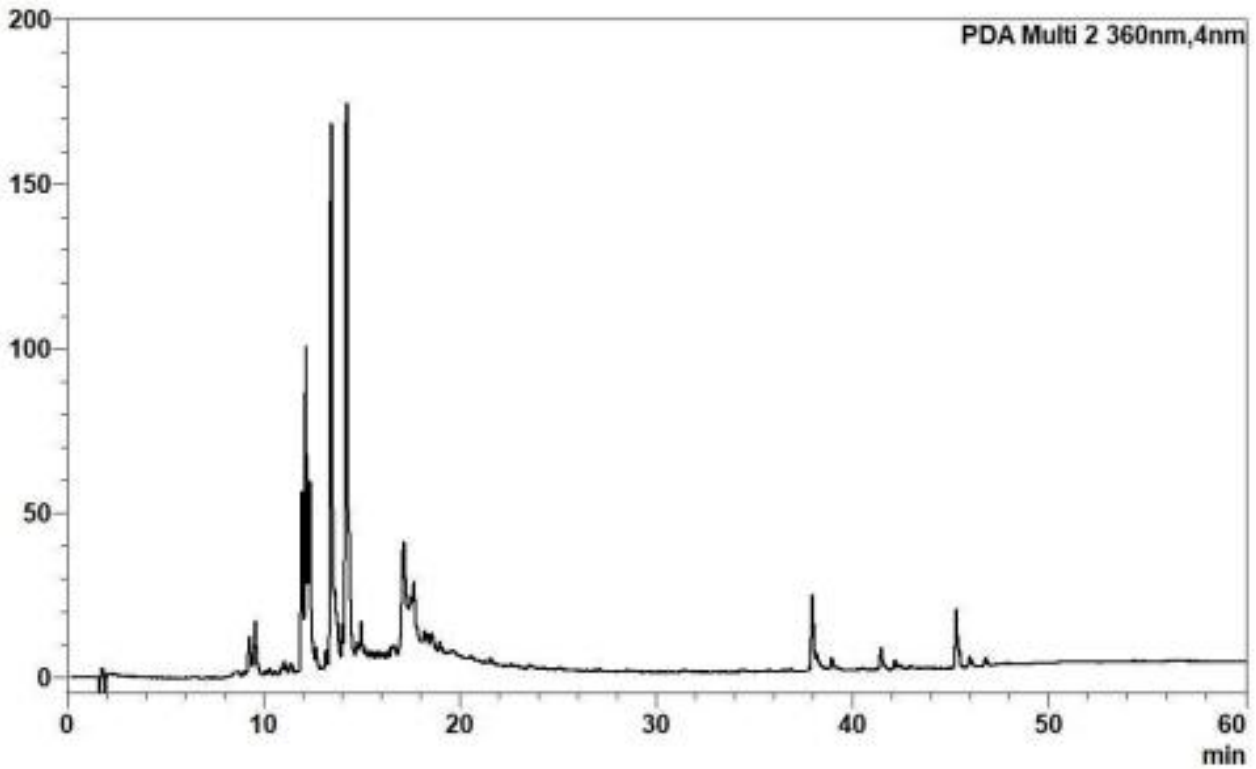
Pa\_CH2Cl2

mAU



Pa\_CH2Cl2

mAU



## *Echinops ritro*

### List of Figures

#### H<sub>2</sub>O phase

Figure S13a. Base Peak Chromatogram (BPC) in the positive ionization mode of water extract of *Echinops ritro*.

Figure S13b. Base Peak Chromatogram (BPC) in the negative ionization mode of water extract of *Echinops ritro*.

Figure S13c. PDA chromatogram of water extracts of *Echinops ritro* at 245 nm.

Figure S13d. PDA chromatogram of water extracts of *Echinops ritro* at 360 nm.

#### Hexane extract

Figure S14a. Base Peak Chromatogram (BPC) in positive mode of *n*-hexane extract of *Echinops ritro*.

Figure S14b. Base Peak Chromatogram (BPC) in negative mode of *n*-hexane extract of *Echinops ritro*.

Figure S14c. PDA chromatogram of *n*-hexane extracts of *Echinops ritro* at 245 nm.

Figure S14d. PDA chromatogram of *n*-hexane extracts of *Echinops ritro* at 360 nm.

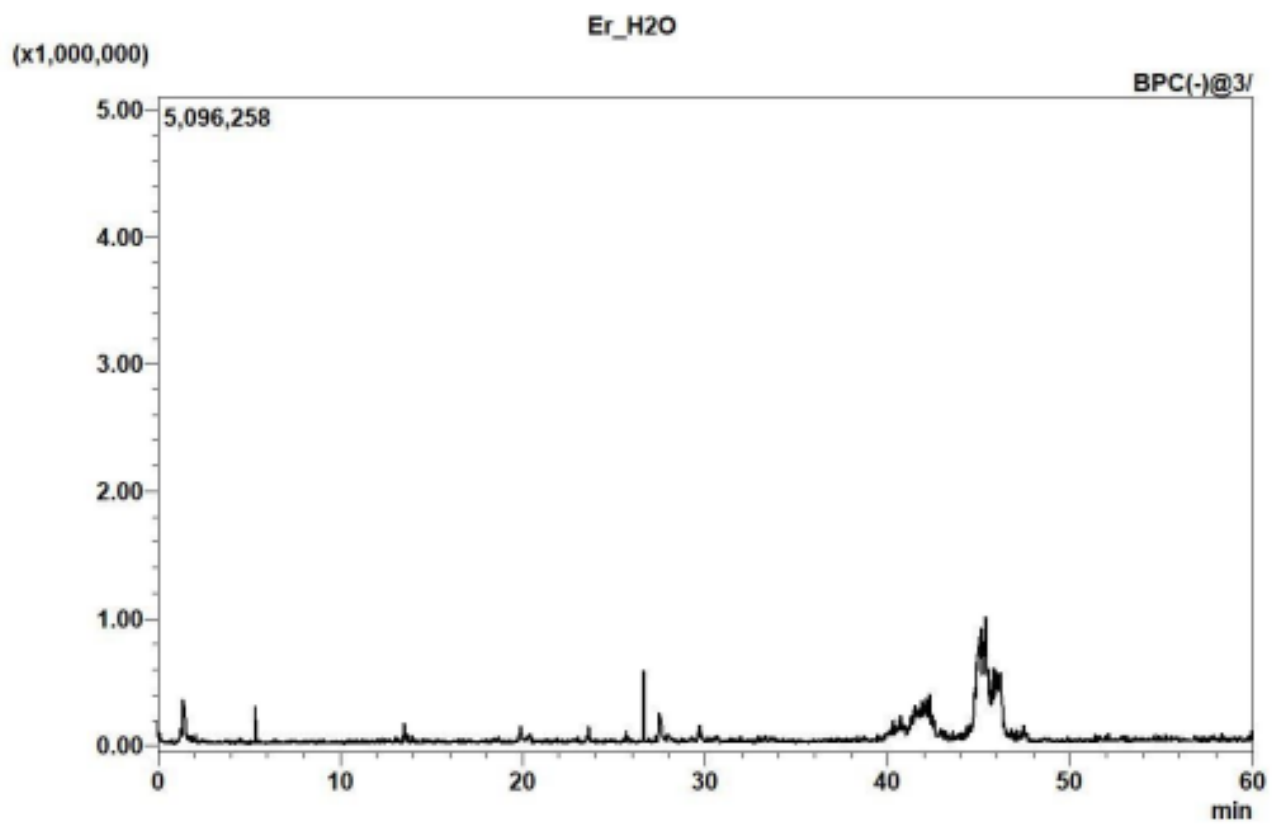
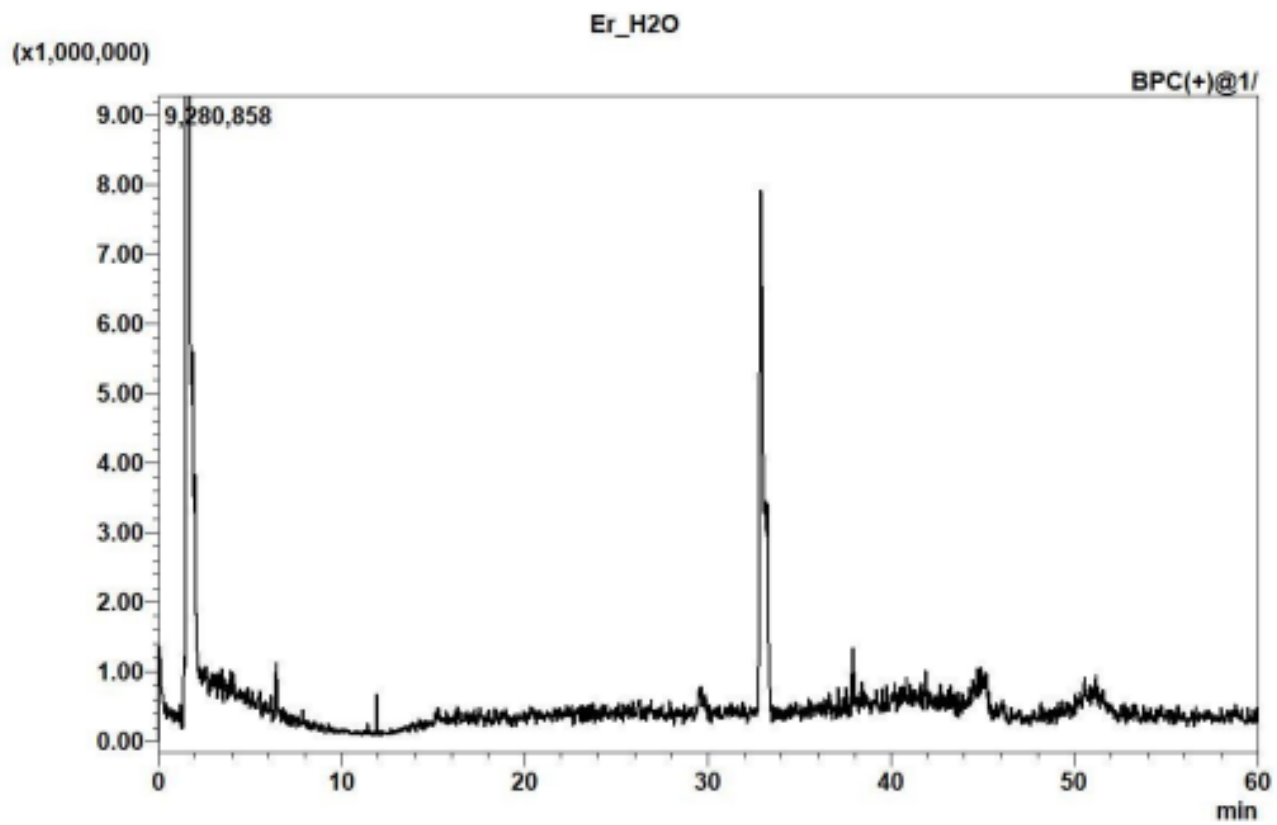
#### CH<sub>2</sub>Cl<sub>2</sub> extract

Figure S15a. Base Peak Chromatogram (BPC) in positive mode of dichloromethane extract of *Echinops ritro*.

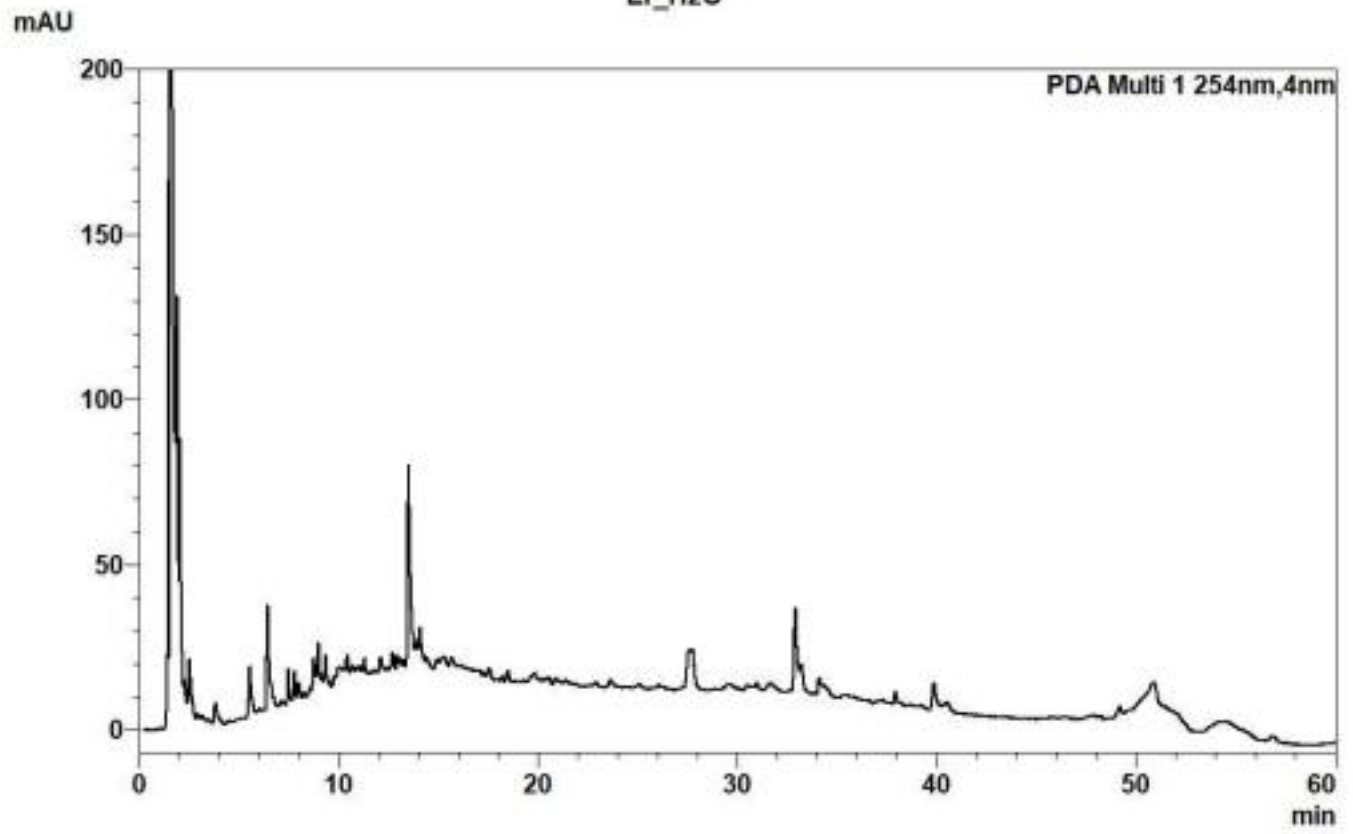
Figure S15b. Base Peak Chromatogram (BPC) in negative mode of dichloromethane extract of *Echinops ritro*.

Figure S15c. PDA chromatogram of dichloromethane extracts of *Echinops ritro* at 245 nm.

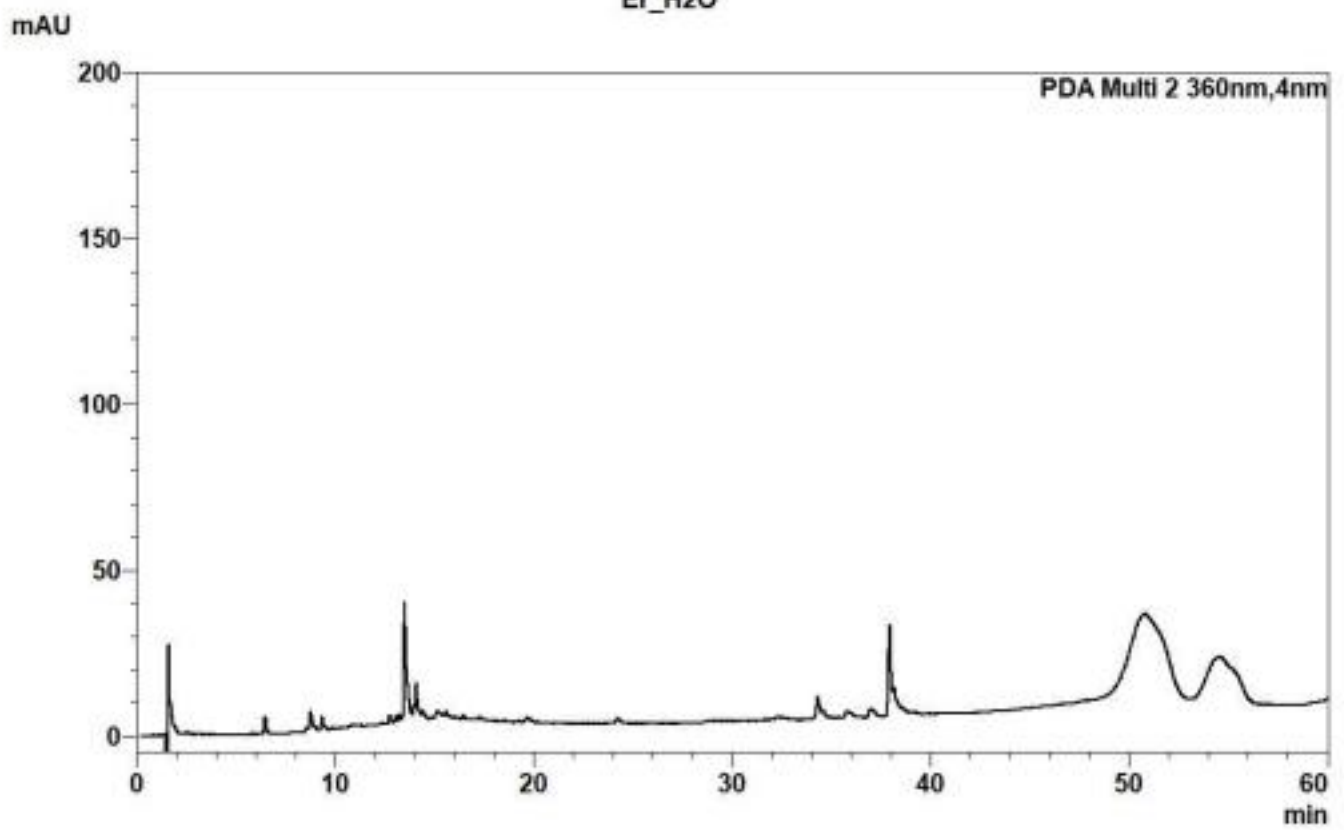
Figure S15d. PDA chromatogram of dichloromethane of *Echinops ritro* at 360 nm.

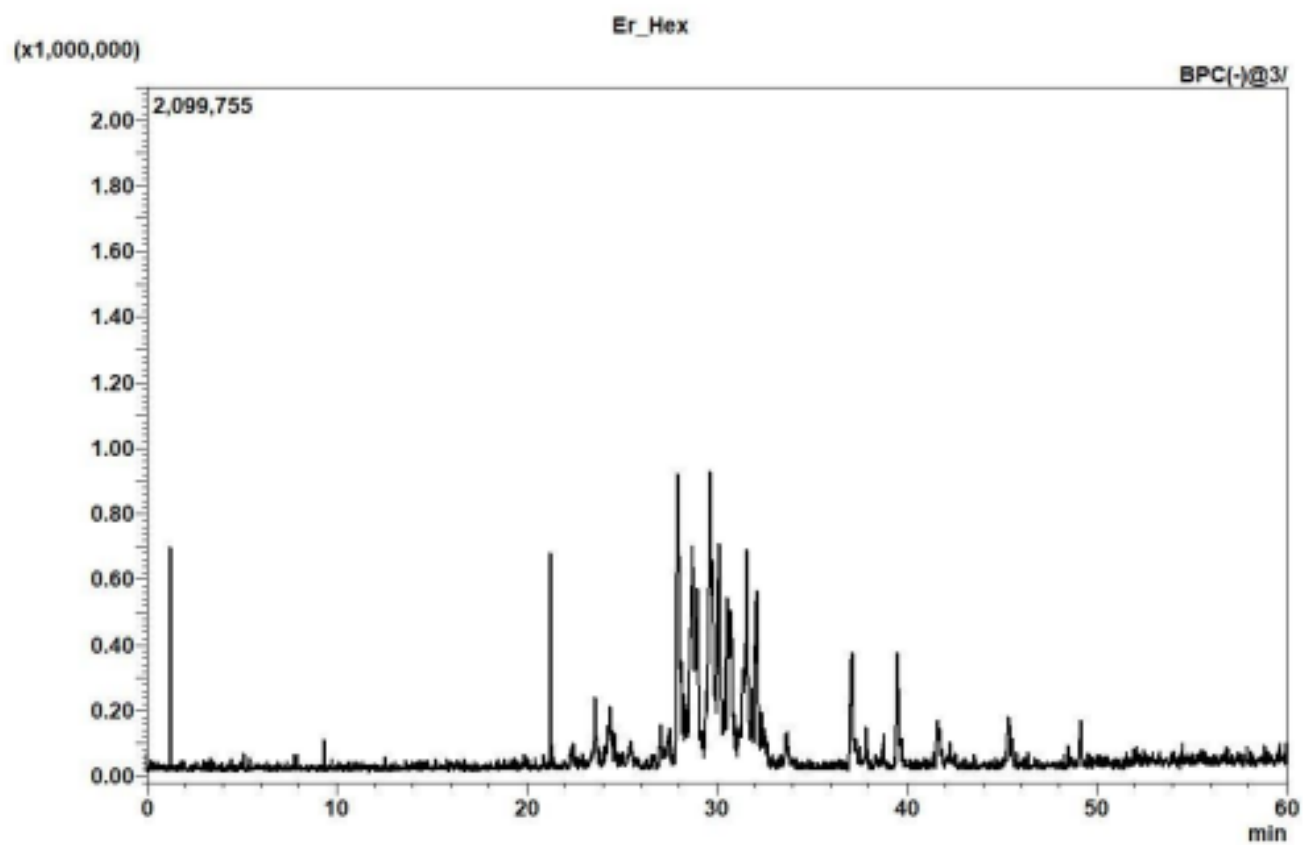
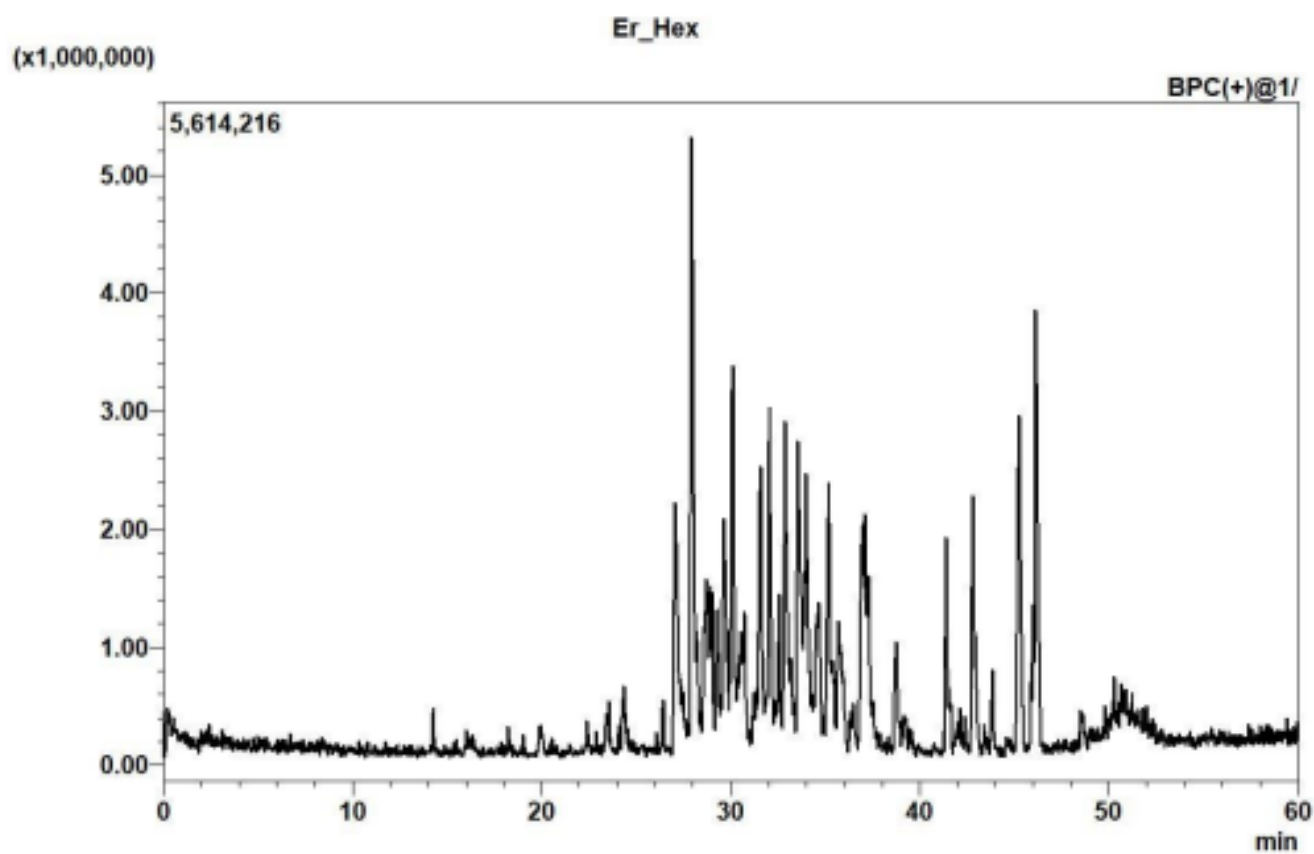


Er\_H2O

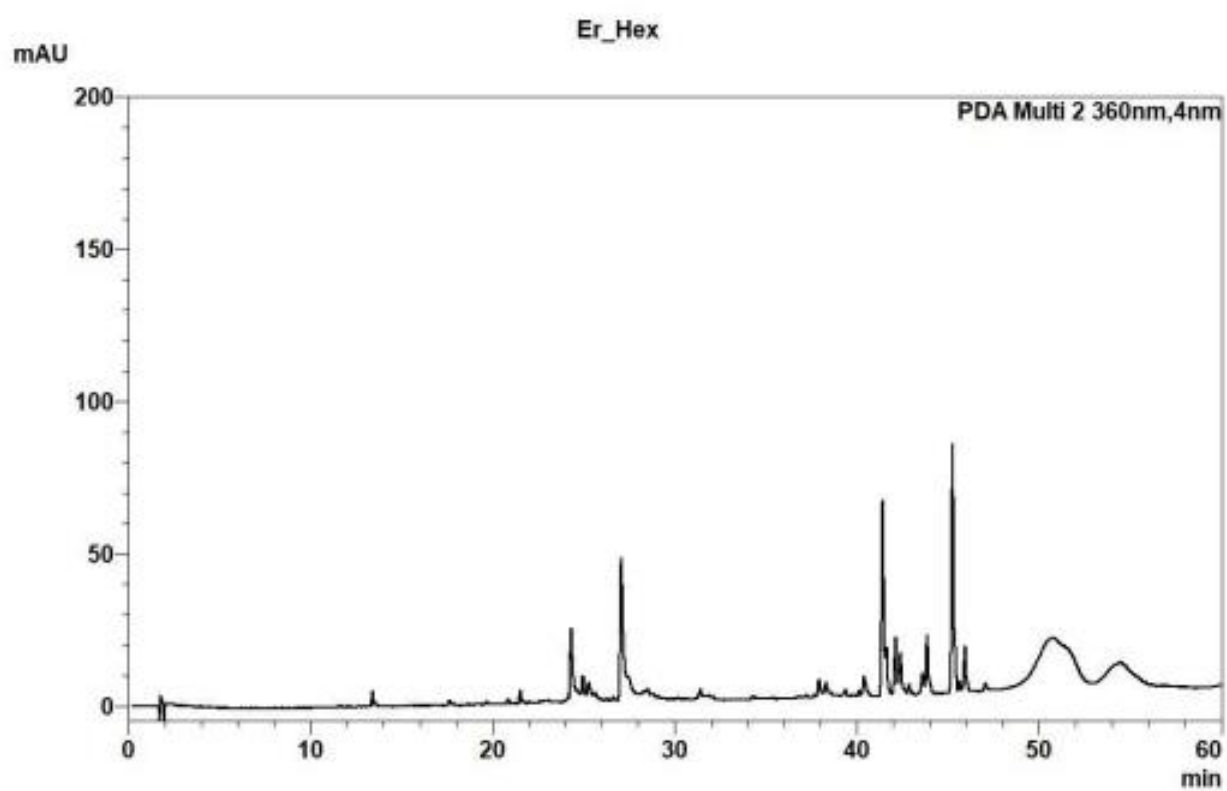
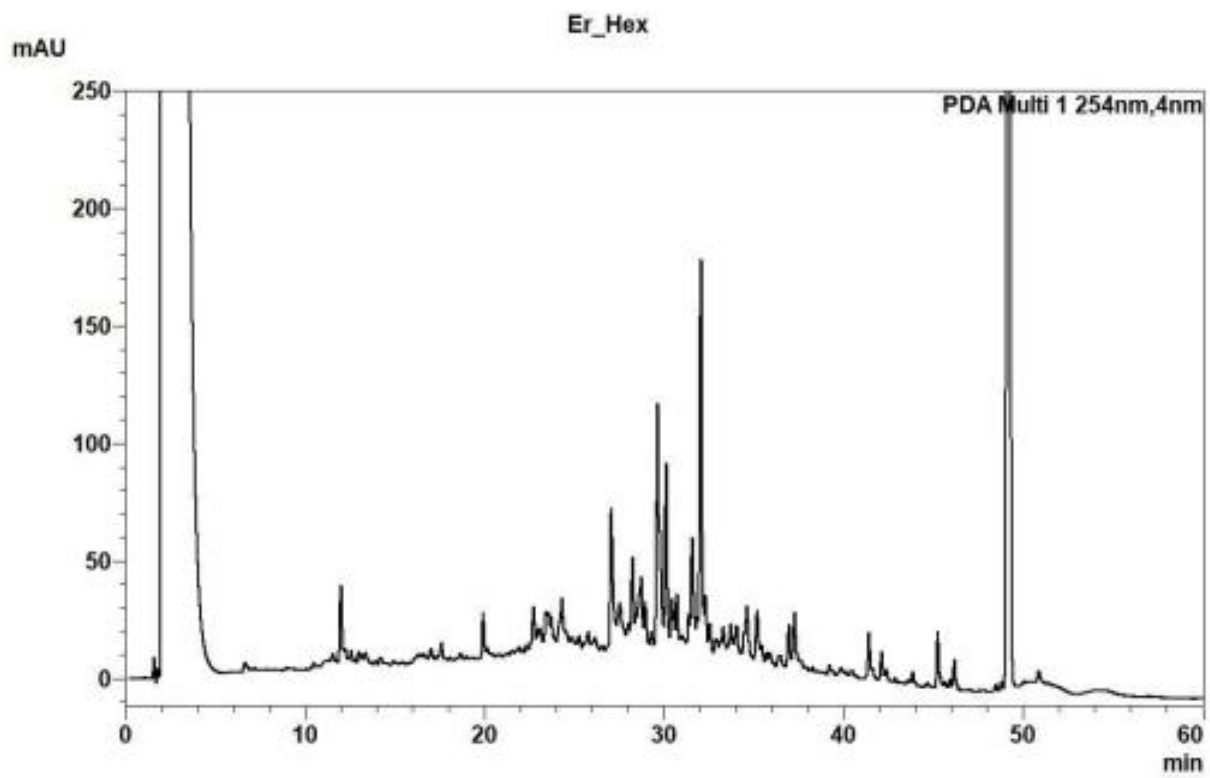


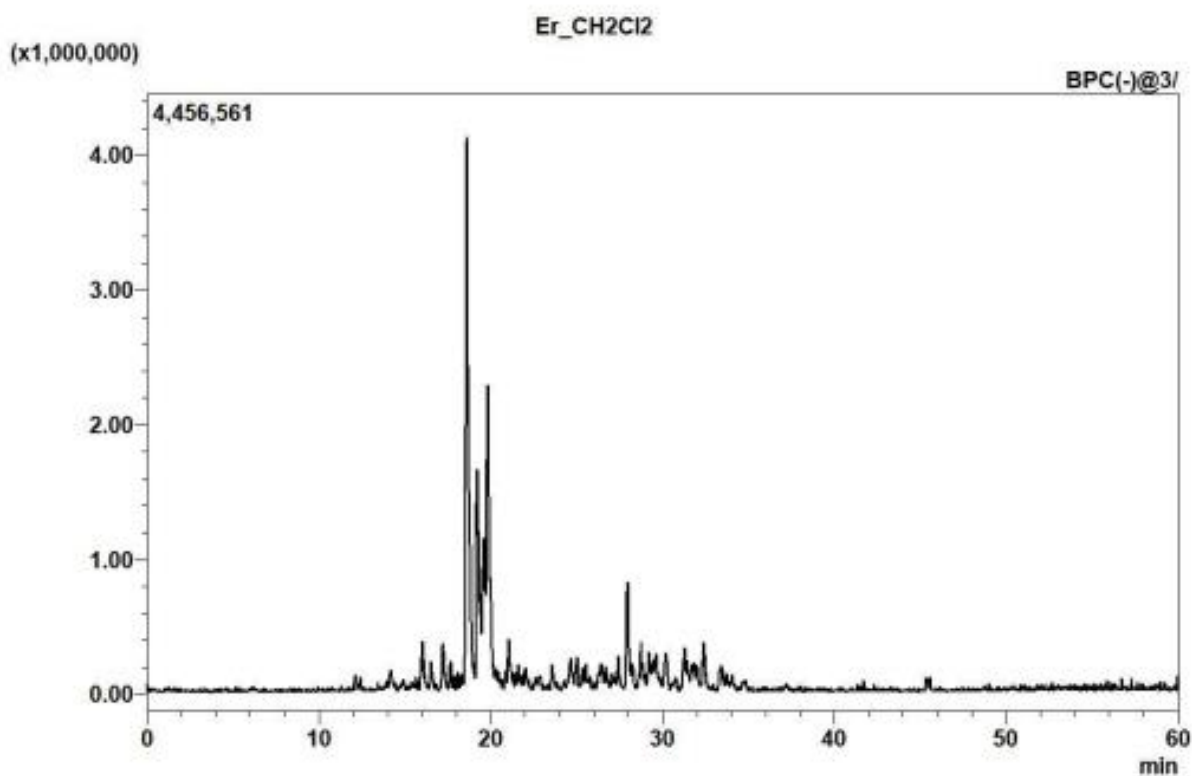
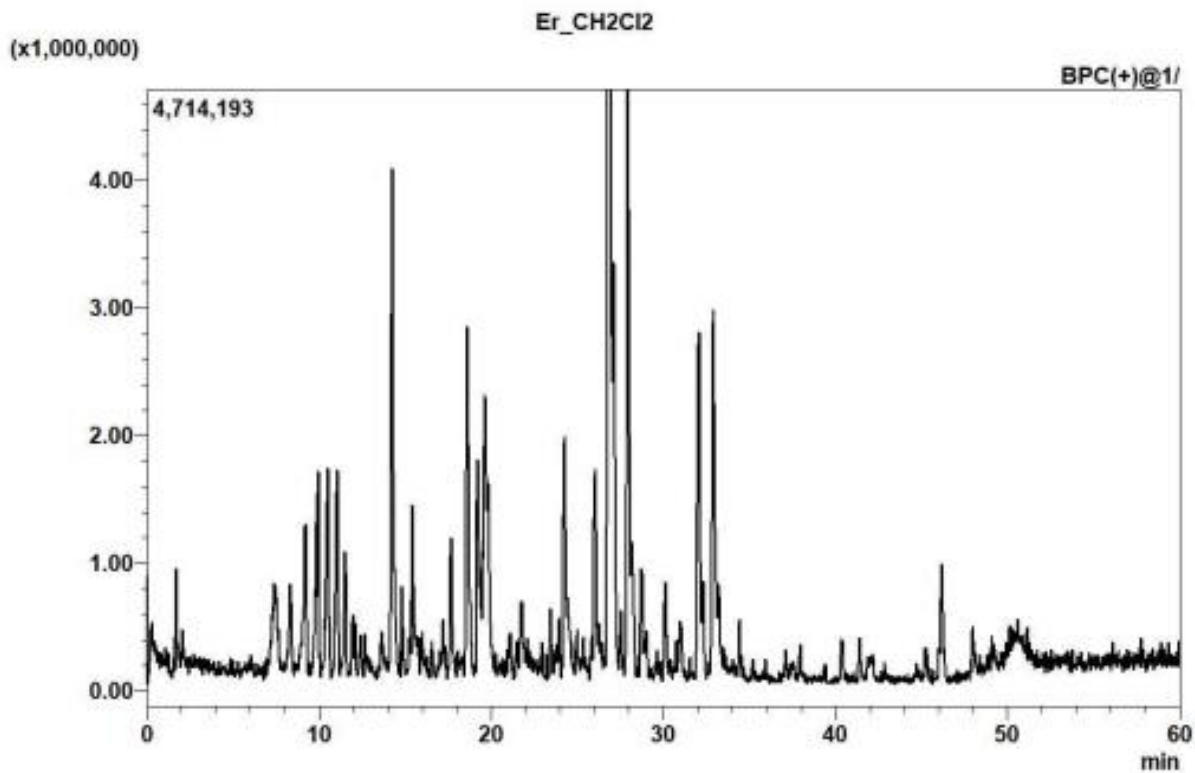
Er\_H2O

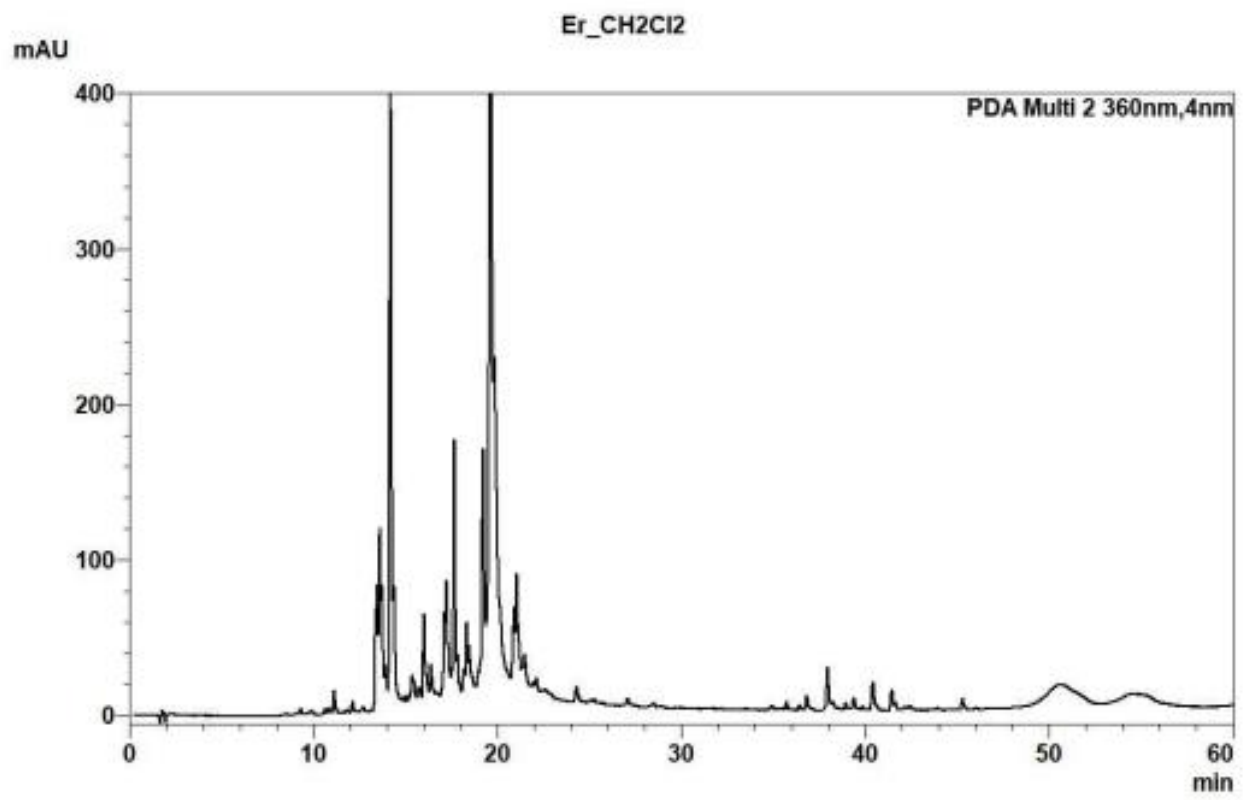
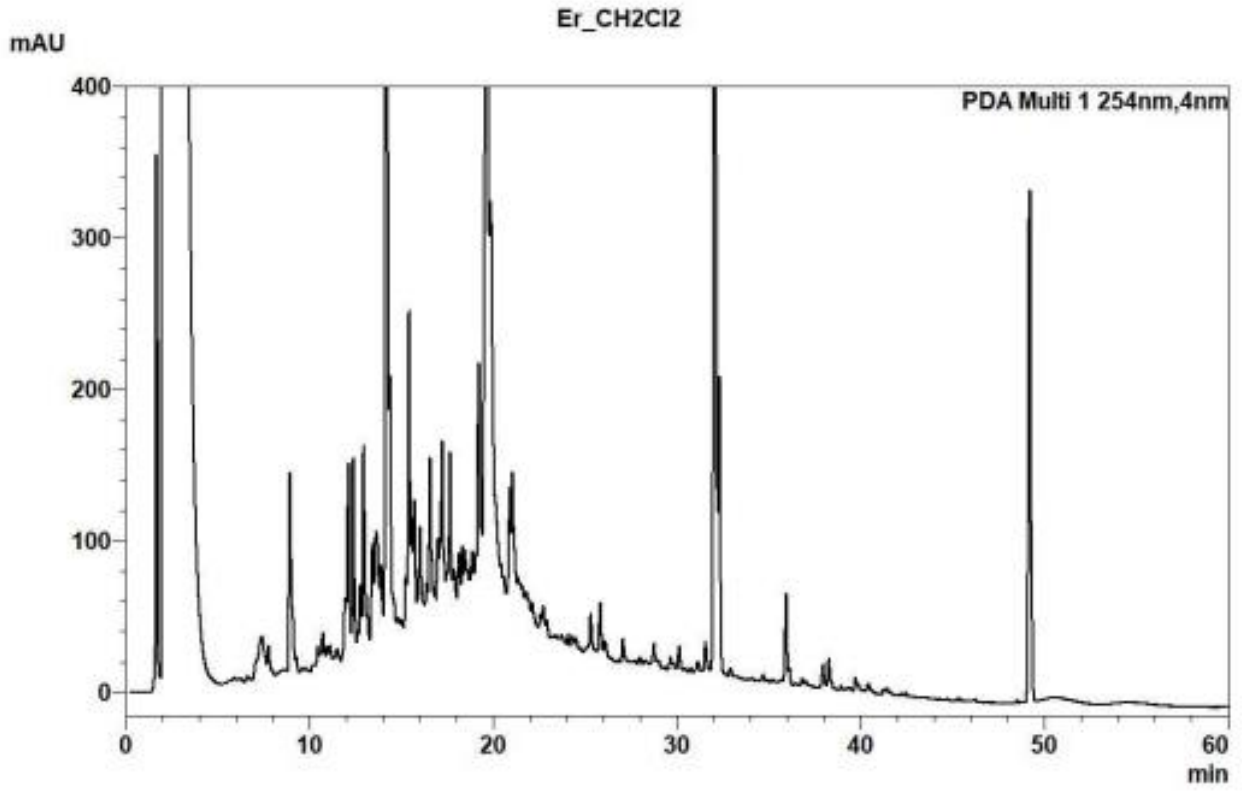












## *Prasium majus*

### List of Figures

#### H<sub>2</sub>O phase

Figure S16a. Base Peak Chromatogram (BPC) in the positive ionization mode of water extract of *Prasium majus*.

Figure S16b. Base Peak Chromatogram (BPC) in the negative ionization mode of water extract of *Prasium majus*.

Figure S16c. PDA chromatogram of water extracts of *Prasium majus* at 245 nm.

Figure S16d. PDA chromatogram of water extracts of *Prasium majus* at 360 nm.

#### Hexane extract

Figure S17a. Base Peak Chromatogram (BPC) in positive mode of *n*-hexane extract of *Prasium majus*.

Figure S17b. Base Peak Chromatogram (BPC) in negative mode of *n*-hexane extract of *Prasium majus*.

Figure S17c. PDA chromatogram of *n*-hexane extracts of *Prasium majus* at 245 nm.

Figure S17d. PDA chromatogram of *n*-hexane extracts of *Prasium majus* at 360 nm.

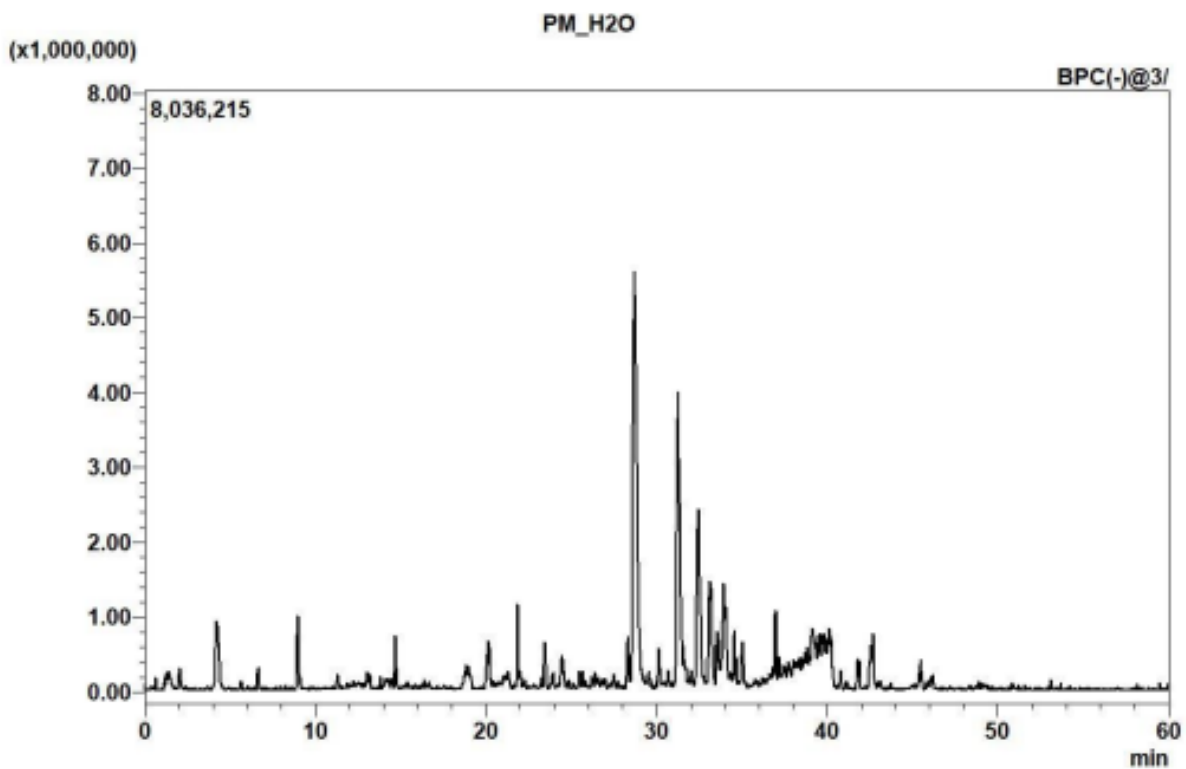
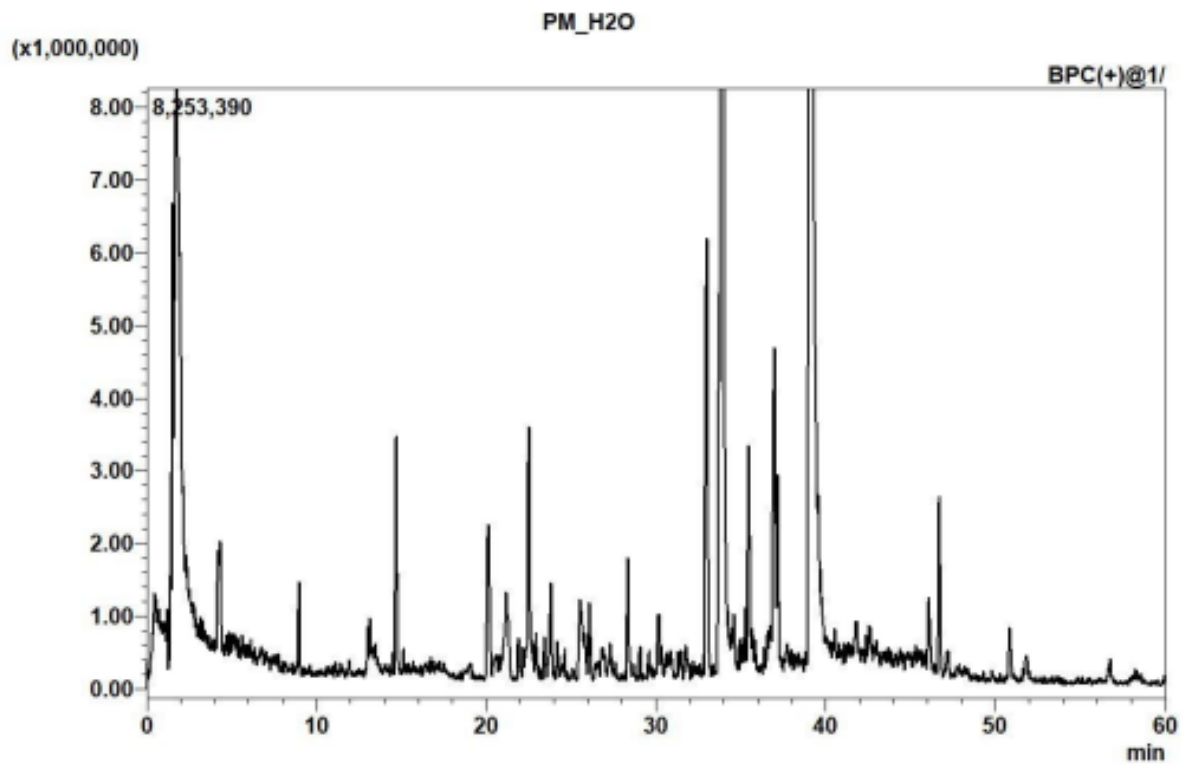
#### CH<sub>2</sub>Cl<sub>2</sub> extract

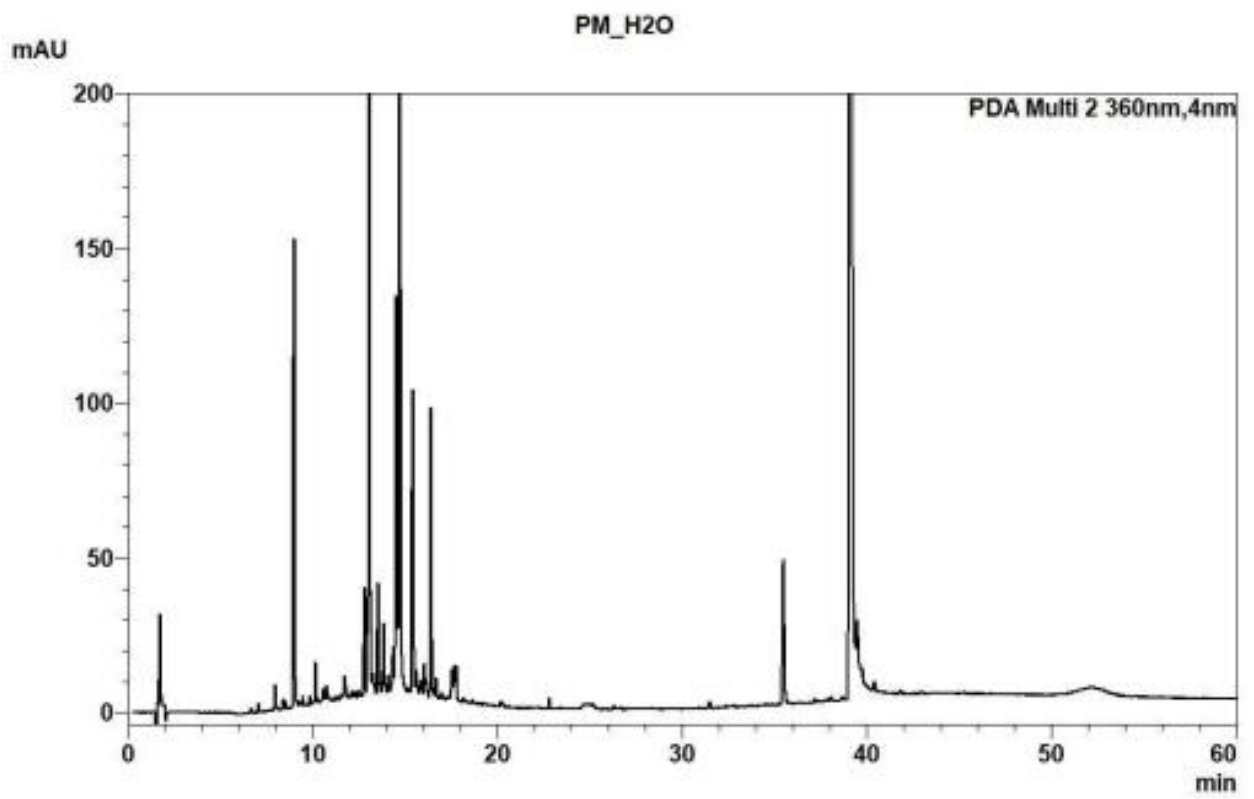
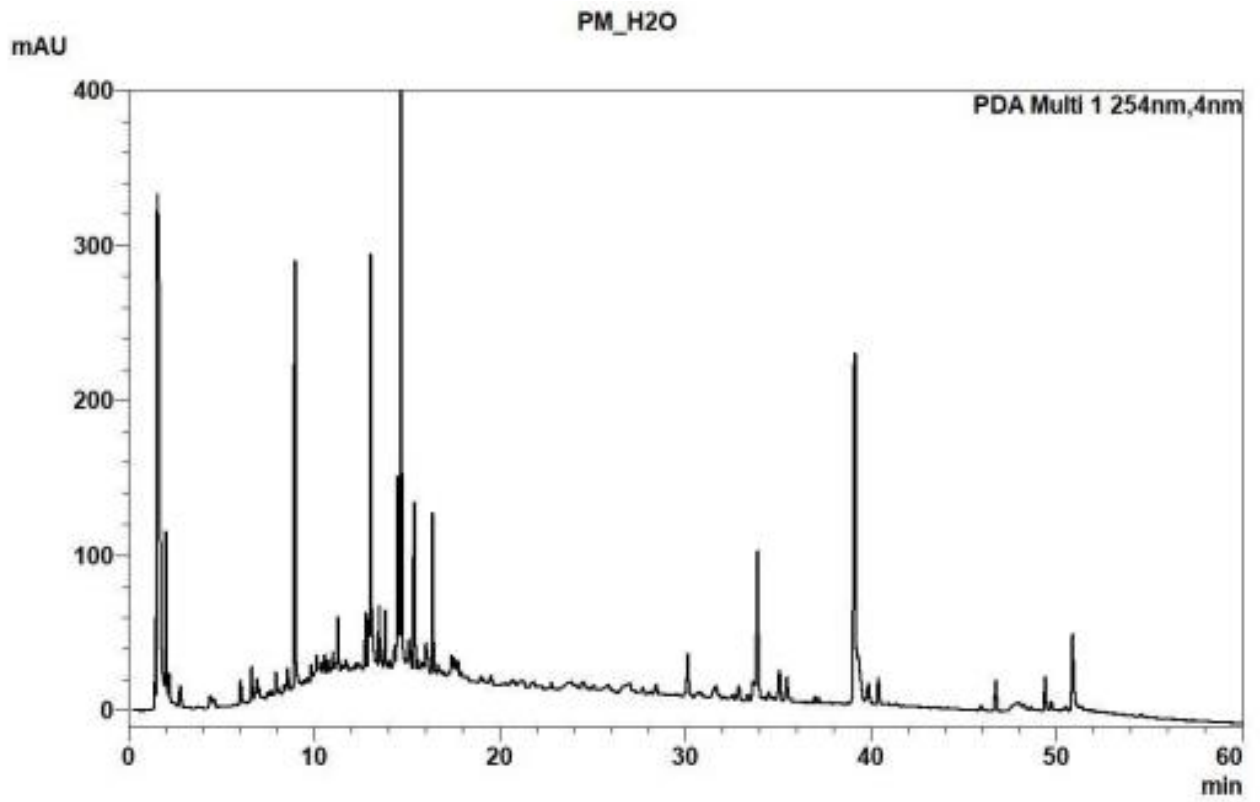
Figure S18a. Base Peak Chromatogram (BPC) in positive mode of dichloromethane extract of *Prasium majus*.

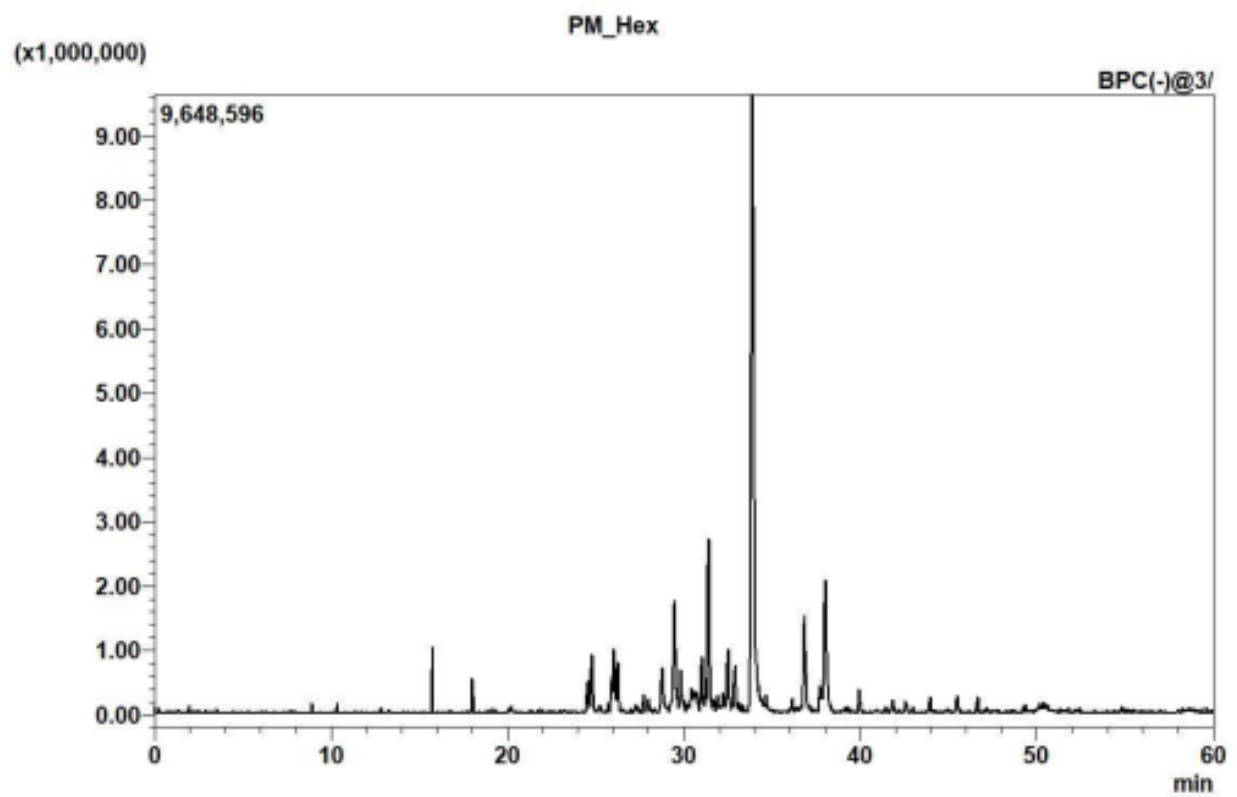
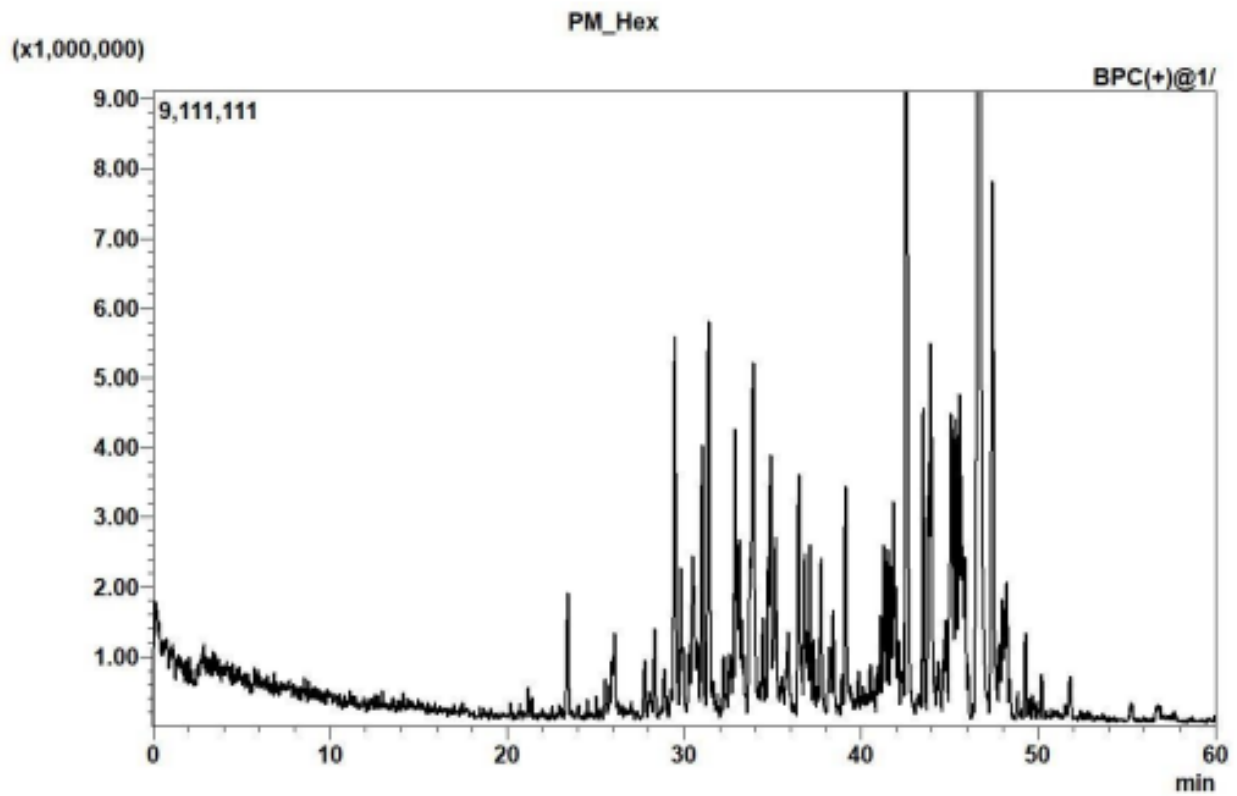
Figure S18b. Base Peak Chromatogram (BPC) in negative mode of dichloromethane extract of *Prasium majus*.

Figure S18c. PDA chromatogram of dichloromethane extracts of *Prasium majus* at 245 nm.

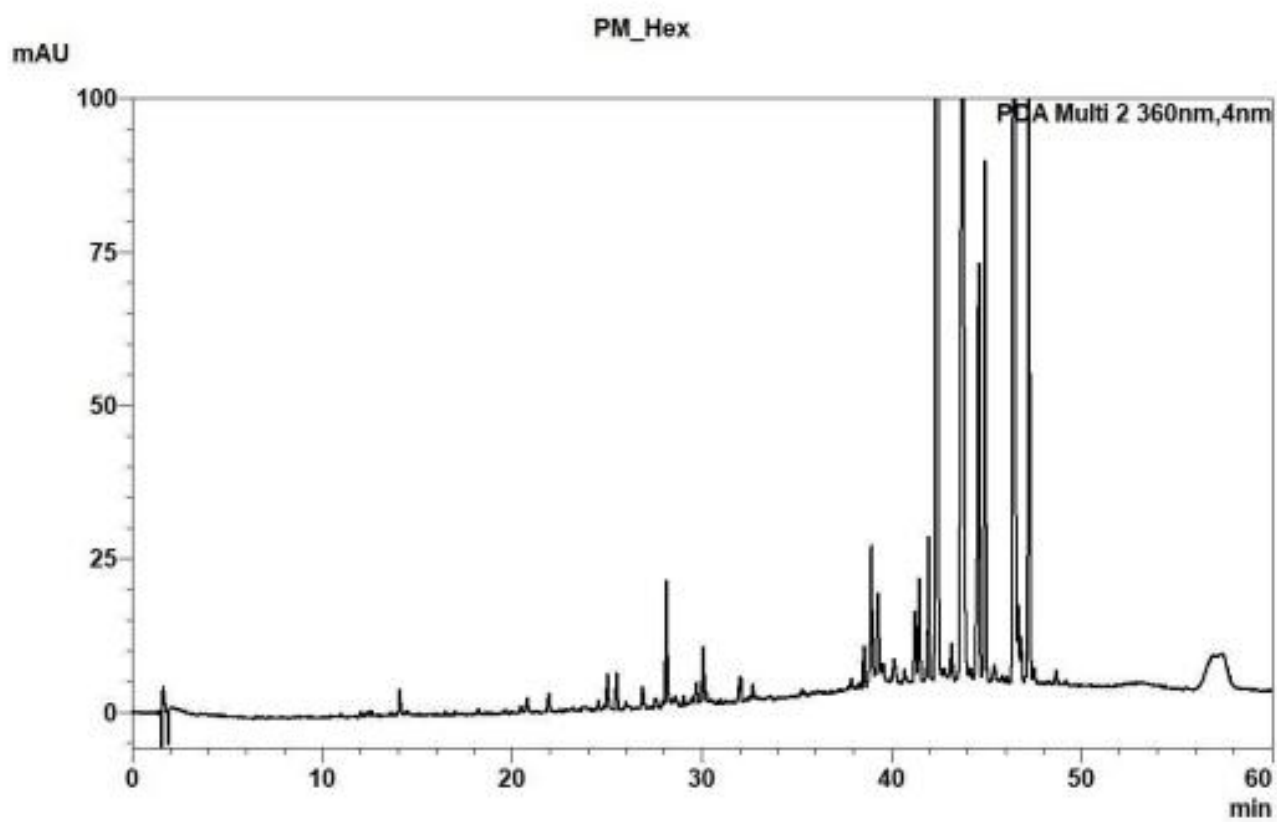
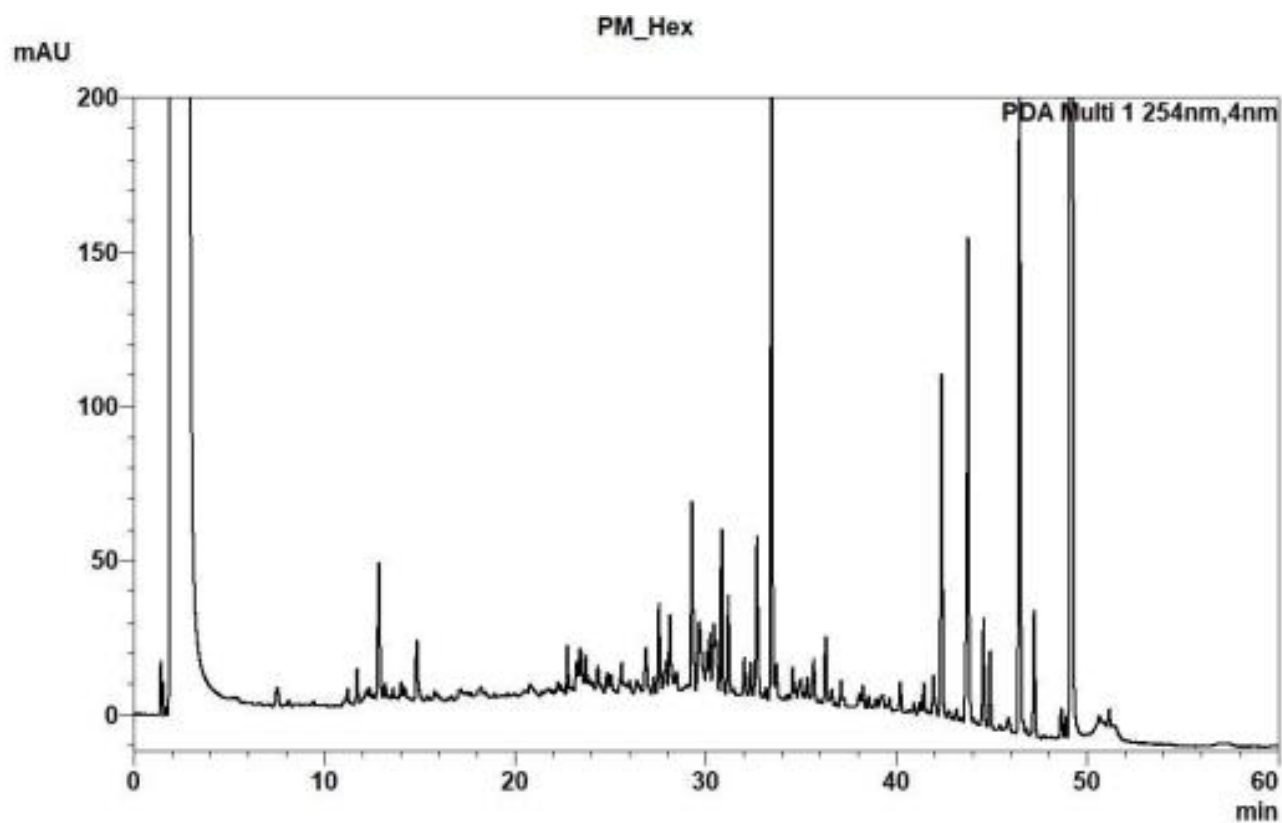
Figure S18d. PDA chromatogram of dichloromethane of *Prasium majus* at 360 nm.

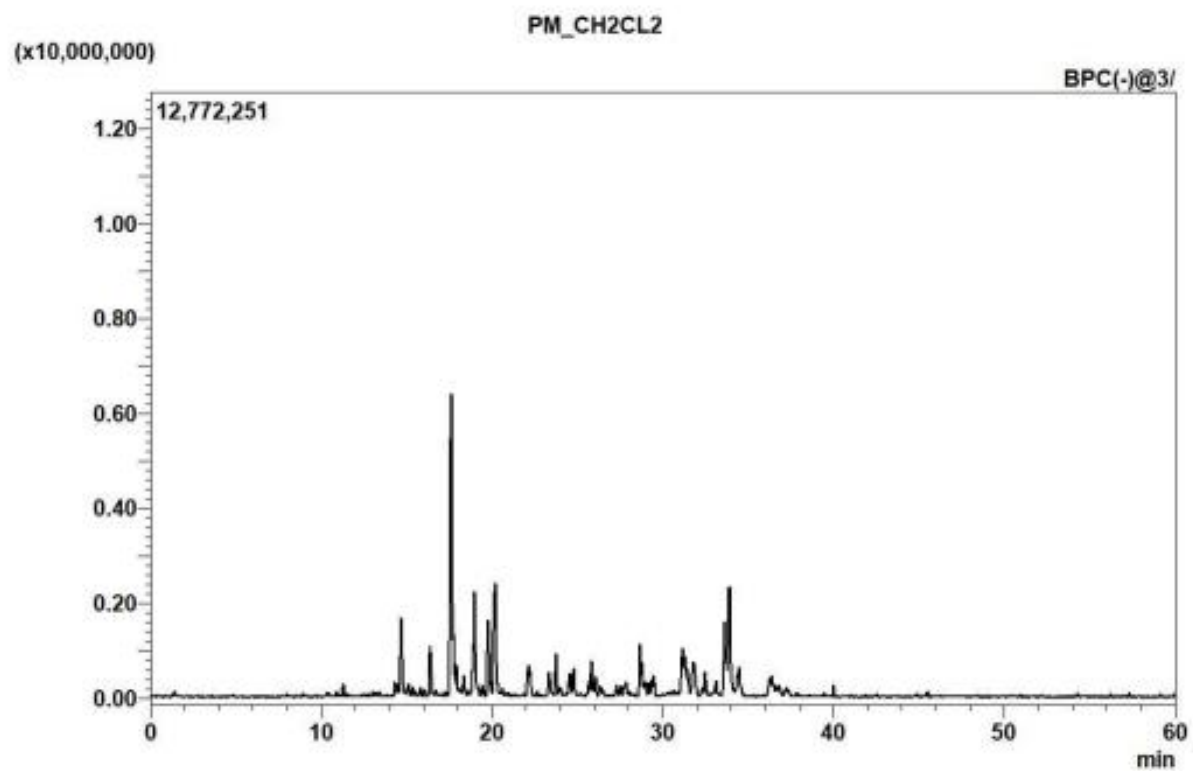
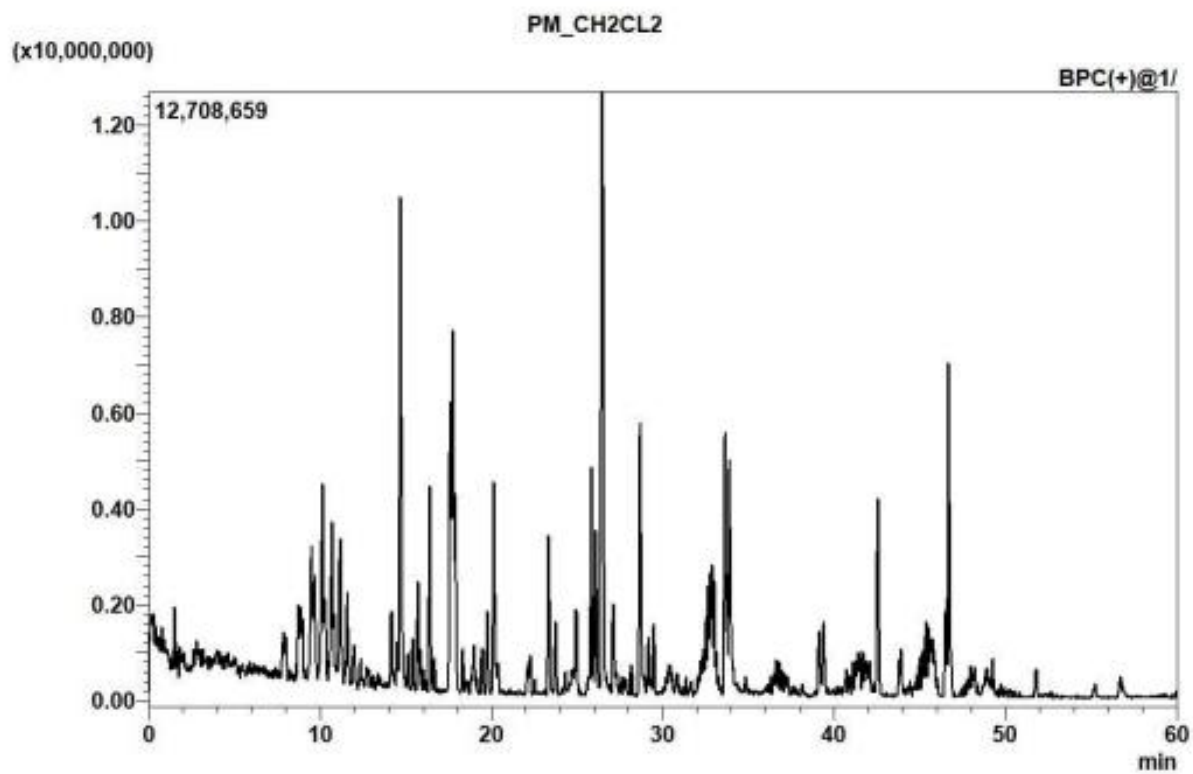


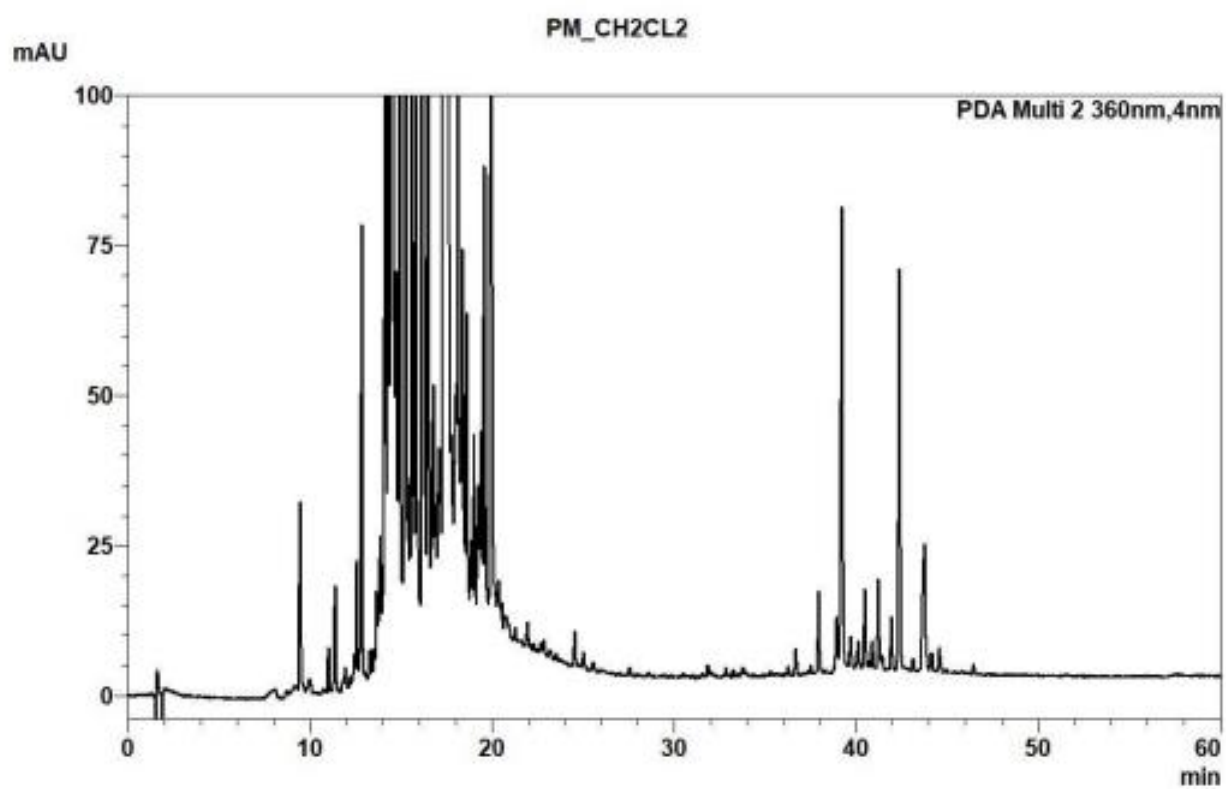
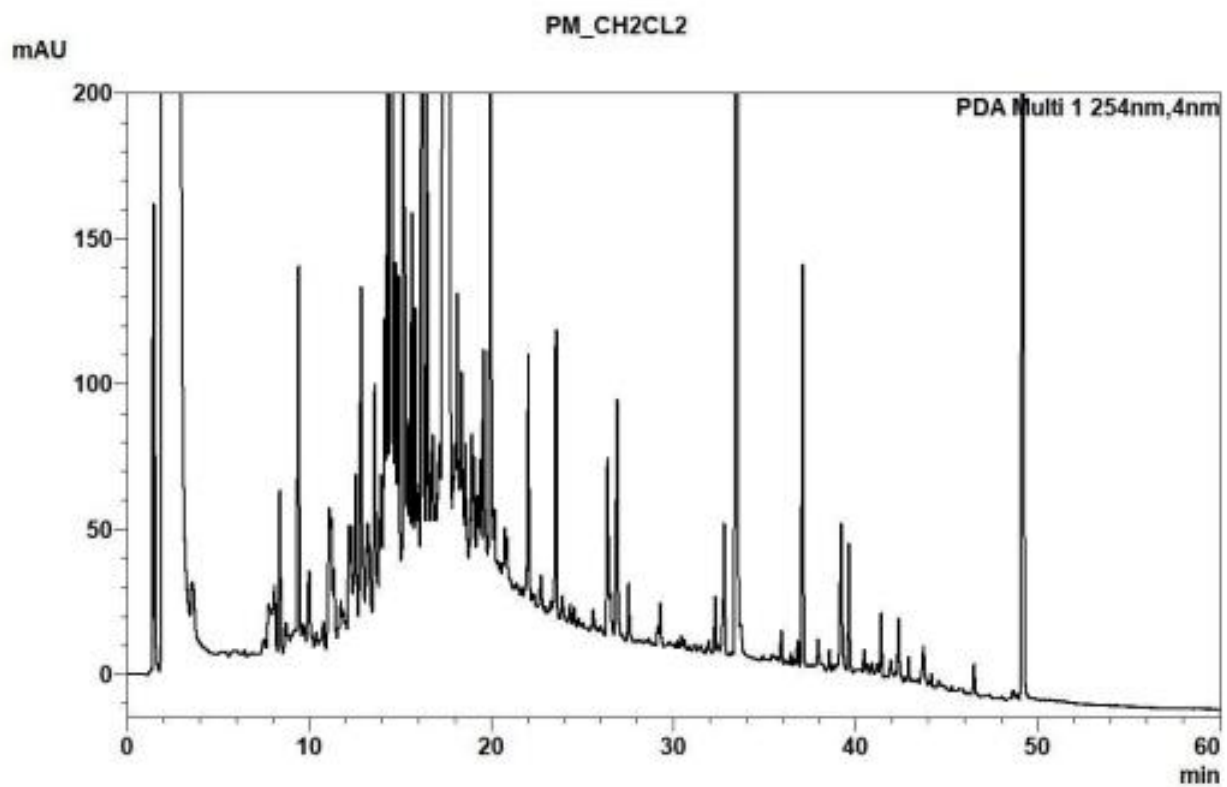












## *Atriplex portulacoides*

### List of Figures

#### H<sub>2</sub>O phase

Figure S19a. Base Peak Chromatogram (BPC) in the positive ionization mode of water extract of *Atriplex portulacoides*.

Figure S19b. Base Peak Chromatogram (BPC) in the negative ionization mode of water extract of *Atriplex portulacoides*.

Figure S19c. PDA chromatogram of water extracts of *Atriplex portulacoides* at 245 nm.

Figure S19d. PDA chromatogram of water extracts of *Atriplex portulacoides* at 360 nm.

#### Hexane extract

Figure S20a. Base Peak Chromatogram (BPC) in positive mode of *n*-hexane extract of *Atriplex portulacoides*.

Figure S20b. Base Peak Chromatogram (BPC) in negative mode of *n*-hexane extract of *Atriplex portulacoides*.

Figure S20c. PDA chromatogram of *n*-hexane extracts of *Atriplex portulacoides* at 245 nm.

Figure S20d. PDA chromatogram of *n*-hexane extracts of *Atriplex portulacoides* at 360 nm.

#### CH<sub>2</sub>Cl<sub>2</sub> extract

Figure S21a. Base Peak Chromatogram (BPC) in positive mode of dichloromethane extract of *Atriplex portulacoides*.

Figure S21b. Base Peak Chromatogram (BPC) in negative mode of dichloromethane extract of *Atriplex portulacoides*.

Figure S21c. PDA chromatogram of dichloromethane extracts of *Atriplex portulacoides* at 245 nm.

Figure S21d. PDA chromatogram of dichloromethane of *Atriplex portulacoides* at 360 nm

