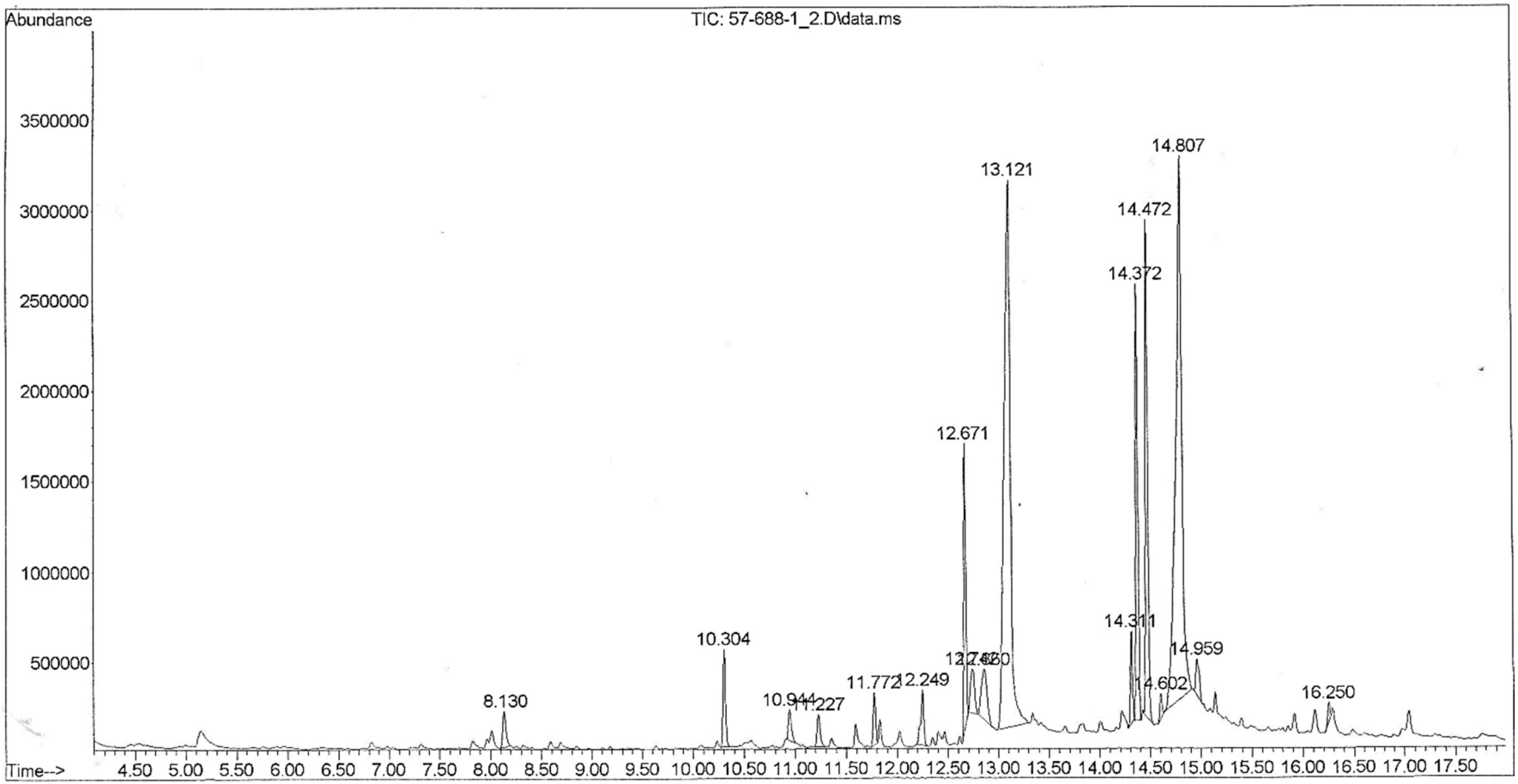
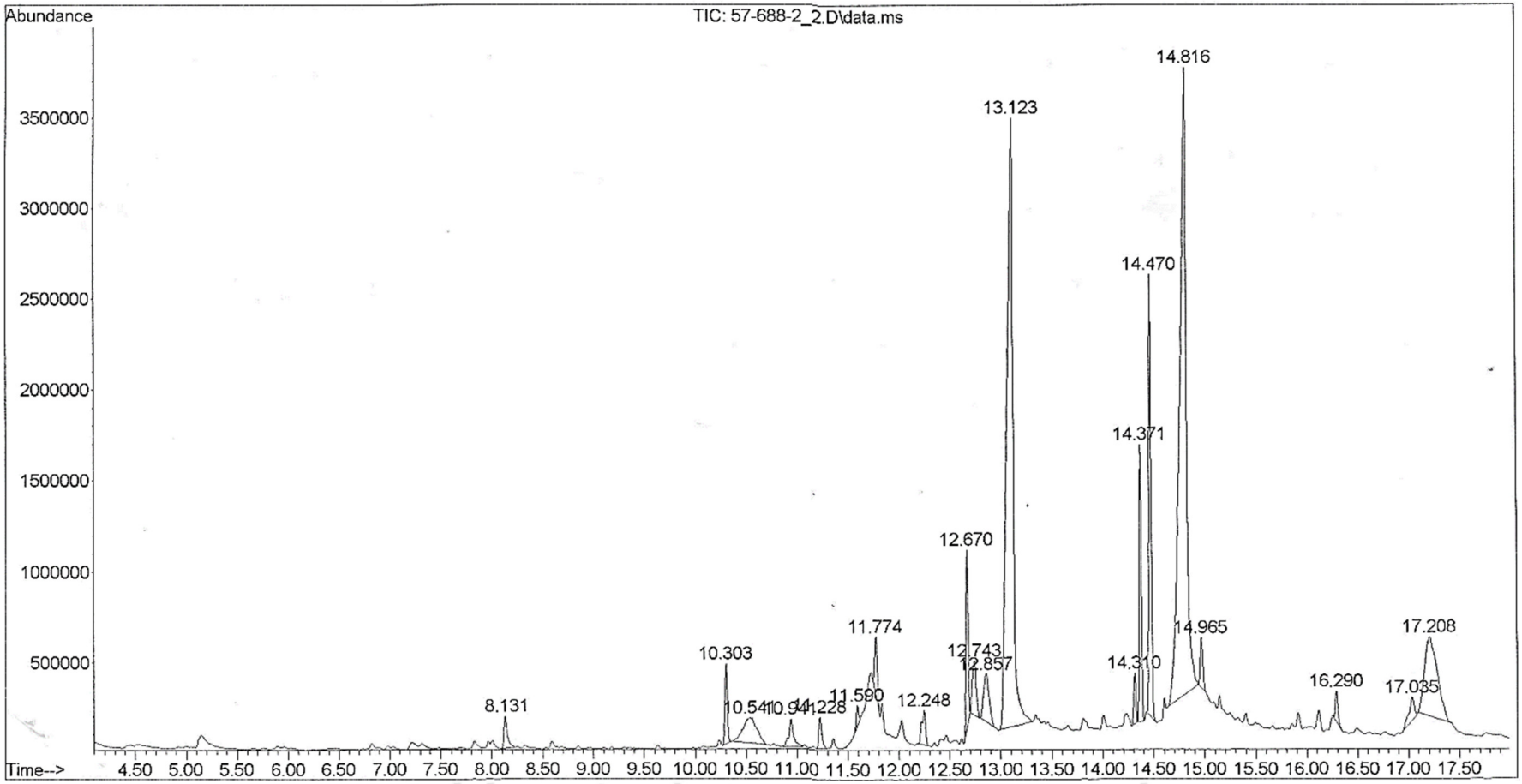
APPENDIX A

GC-MS chromatogram of lipid from microalgae

Appendix A.1 GC-MS chromatogram of lipid compositions from MC cultivated with CO_2 supplementation



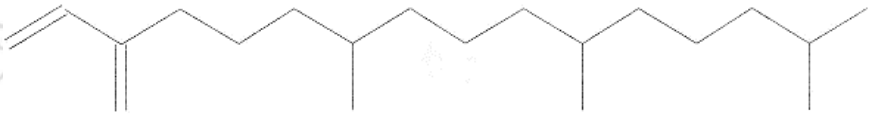
Appendix A.2 GC-MS chromatogram of lipid compositions from MC cultivated without CO_2 supplementation



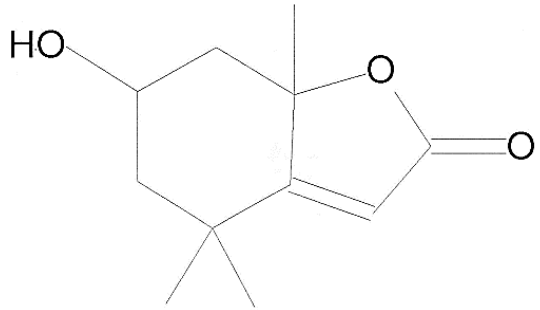
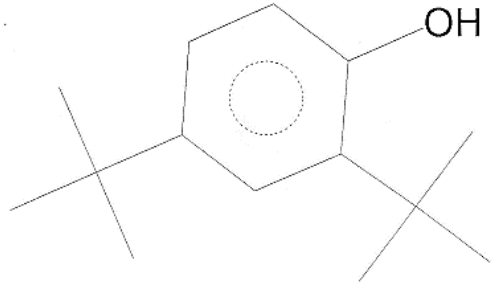
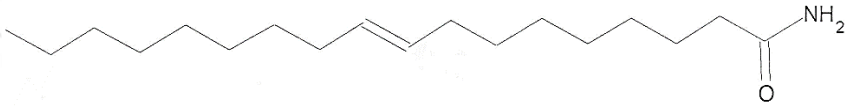
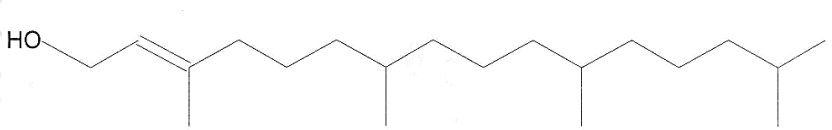
APPENDIX B

Chemical formula and chemical structure of lipid compounds in microalgae

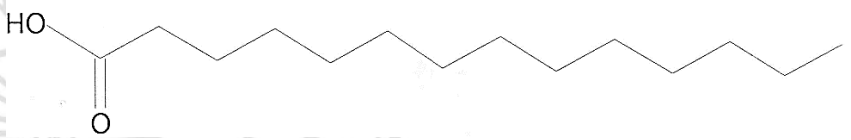
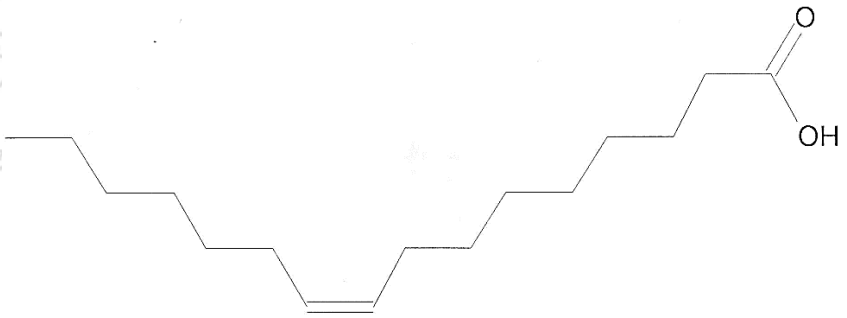
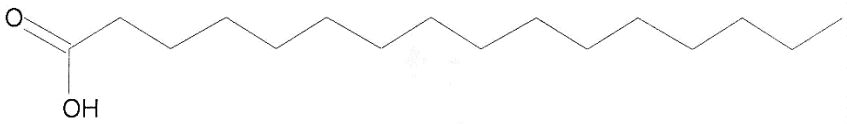
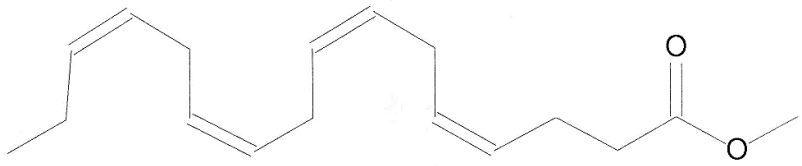
Chemical formula and chemical structure of lipid compounds in MC cultured with and without CO_2 supplementations

Compounds	Chemical formula	Chemical structure
n-Heptadecane	$C_{17}H_{36}$	
2, 6, 10-trimethyl, 14-ethylene-14-pentadecane	$C_{20}H_{38}$	
cis-9-Tricosene	$C_{23}H_{46}$	

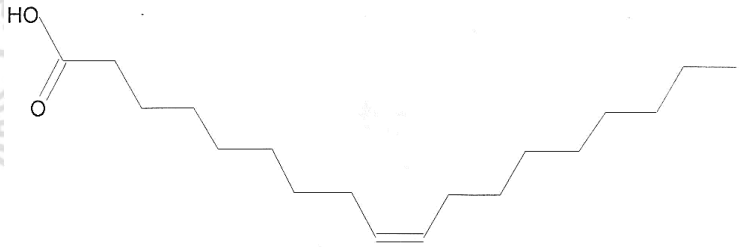
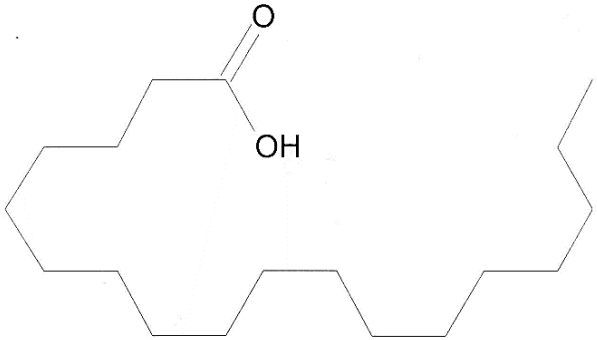
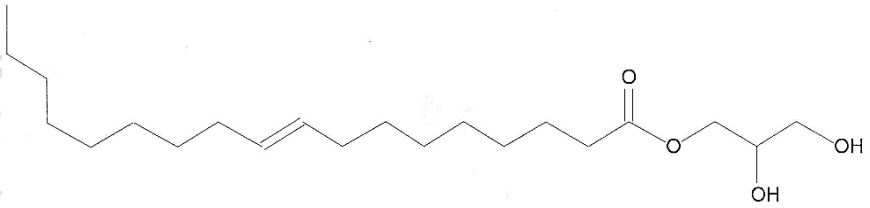
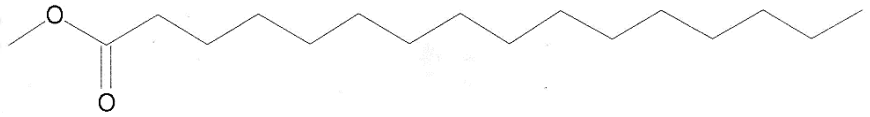
Appendix B (continued)

Compounds	Chemical formula	Chemical structure
2(4H)-Benzofuranone, 5, 6, 7, 7a-tetrahydro-6-hydroxy-4, 4, 7a-trimethyl (Loliolide)	$C_{11}H_{16}O_3$	
2, 4-bis(1, 1-Dimethylethyl)-phenol	$C_{14}H_{22}O$	
9-Octadecanamide	$C_{18}H_{37}NO$	
3, 7, 11, 15-Tetramethylhexadec-2-en-1-ol	$C_{20}H_{40}O$	

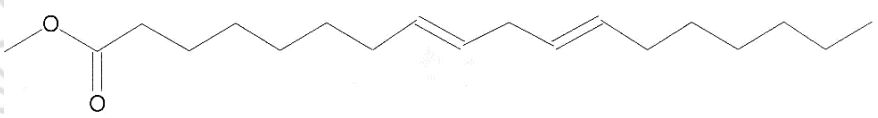
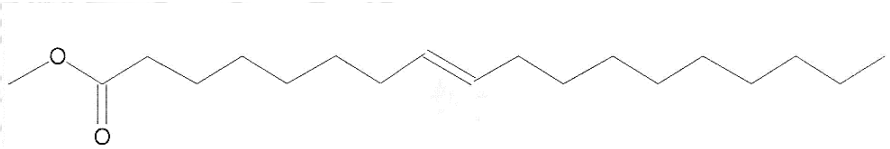
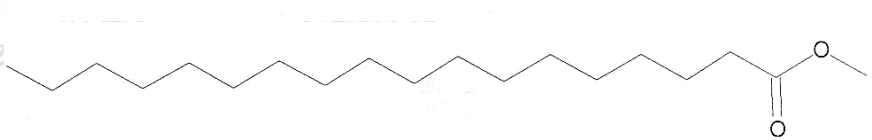
Appendix B (continued)

Compounds	Chemical formula	Chemical structure
Myristic acid	$C_{14}H_{28}O_2$	
cis-9-Hexadecanoic acid	$C_{16}H_{28}O_2$	
Palmitic acid	$C_{16}H_{32}O_2$	
Methyl 4,7,10,13-hexadecatetraenoate	$C_{17}H_{26}O_2$	

Appendix B (continued)

Compounds	Chemical formula	Chemical structure
Oleic acid	$C_{18}H_{34}O_2$	
Stearic acid	$C_{18}H_{36}O_2$	
2, 3-Dihydroxylpropyl (9E)-9-octadecenoate	$C_{21}H_{40}O_4$	
Palmitic acid mthyl ester	$C_{17}H_{34}O_2$	

Appendix B (continued)

Compounds	Chemical formula	Chemical structure
8, 11-Octadecadienoic acid, methyl ester	$C_{19}H_{34}O_2$	
Oleic acid methyl ester	$C_{19}H_{36}O_2$	
Stearic acid methyl ester	$C_{19}H_{38}O_2$	

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Publications

Boonma, S., Chaiklangmuang, S., Chaiwongsar, S., Pekkoh, J., Pumas, C., Ungsethaphand, T., Tongsiri, S. and Peerapornpisal, Y. 2015. Enhanced carbon dioxide fixation and bio-oil production of a microalgal consortium. Journal of Clean-Soil, Air, Water, 43(6): 761-766.

Boonma, S., Vacharapiyasophon, P., Peerapornpisal, Y., Pekkoh, J. and Pumas, C. 2014. Isolation and cultivation of *Botryococcus*

braunii Kützing northern Thailand. Chiang Mai Journal of Science, 41(2): 298- 306.

Oral presentation Boonma, S., Chaiklangmuang, S., Chaiwongsar, S., Pekkoh, J., Pamas, C. and Peerapornpisal, Y. Cultivation of mixed microalgal consortia for carbon dioxide reduction and bio-oil production. The 6th National Conference on Algae and Plankton, Chiang Mai, Thailand. March 28-30, 2013.

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Poster presentation Boonma, S., Takarada, T., Peerapornpisal, Y., Pekkoh, J., Pumas, C. and Chaiklangmuang, S. Some characteristics of microalgal consortium biomass of biofuel production. The 7th National Conference on Algae and Plankton, Bangkok, Thailand. May 25-27, 2015.

Boonma, S., Chaiklangmuang, S., Chaiwongsar, S., Pekkoh, J., Pumas, C. and Peerapornpisal, Y. Cultivation of mixed culture microalgae by using CO_2 for bio-oil production. The 2nd Asia Oceania Algae Innovation: Submit Algae for Sustaintable Development, Bangkok, Thailand. September 3-5, 2012.