# Microalgae as sustainable bio-factories of healthy lipids: evaluating fatty acid content and antioxidant activity

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***Table S1.*** Lipid content of *Chlorella vulgaris, Chlorococcum amblystomatis, Scenedesmus obliquus, Tetraselmis chui, Phaeodactylum tricornutum, Spirulina* sp. and *Nannochloropsis oceanica.* Kruskal–Wallis test followed by Dunn's post-hoc comparisons)**.**

| **Microalgae** | ***Chlorophyta*** | | | | ***Bacillariophyta*** | ***Cyanobacteria*** | ***Ochrophyta*** |
|---|---|---|---|---|---|---|---|
| | ***Chlorella vulgaris*** | ***Chlorococcum amblystomatis*** | ***Scenedesmus obliquus*** | ***Tetraselmis chui*** | ***Phaeodactylum tricornutum*** | ***Spirulina* sp.** | ***Nannochloropsis oceanica*** |
| **Lipid content (%)** | 8.8 ±0.7 $^{a,b}$ | 16.6 ±0.9 $^{a,c}$ | 11.1 ±1.1 | 6.5 ±0.4 $^{c,d,e}$ | 12.6 ±1.2 $^{e}$ | 10.7 ±1.0 $^{f}$ | **20.9 ±3.4 $^{b,d,f}$** |

***Table S2.*** – Evaluation of the antioxidant activity for the extracts of different microalgae. Concentration of lipid extract (μg.mL$^{-1}$) providing 50% inhibition of the ABTS$^{\bullet+}$ radical and 20% inhibition of the DPPH$^{\bullet}$ radical, and their respective Trolox equivalents (TE; μmol.g$^{-1}$). The values are displayed as the mean (n = 3) ± standard deviation. Matching letters (a-f) indicate statistically significant differences between microalgae species, i.e. the same letter represents significant differences ($q < 0.05$, Kruskal–Wallis test followed by Dunn's post-hoc comparisons).

| | | ***Chlor.ophyta*** | | | | ***Bacillariophyta*** | ***Cyanobacteria*** | ***Ochrophyta*** |
|---|---|---|---|---|---|---|---|---|
| | | ***C. vulgaris*** | ***C. amblystomatis*** | ***S. obliquus*** | ***T. chuui*** | ***P. tricornutum*** | ***Spirulina* sp.** | ***N. oceanica*** |
| **ABTS$^{\bullet+}$** | IC50 (μg.mL$^{-1}$) | 51.1 ±3.7 | 52.6 ±4.6 | 29.4 ±1.2 $^{a,b}$ | 40.9 ±4.7 | 57.3 ±4.5$^{b}$ | 38.7 ±1.6$^{c}$ | 101.9 ±1.7$^{a,c}$ |
| | TE (μmol.g$^{-1}$) | 368.4 ±27.0 | 358.8 ±32.4 | 637.5 ±27.4$^{a}$ | 432.9 ±51.3 | 306.6 ±23.5 | 452.2 ±9.6 | 184.0 ±3.2$^{a}$ |
| **DPPH$^{+}$** | IC20 (μg.mL$^{-1}$) | 50.5 ±12.3$^{d,e}$ | 58.4 ±10.7$^{f}$ | 89.1 ±6.6 | 225.7 ±6.9$^{d,f}$ | 75.4 ±4.6 | 96.9 ±9.7 | 175.6 ±8.7$^{e}$ |
| | TE (μmol.g$^{-1}$) | 191.8 ±40.0$^{d,e}$ | 143.0 ±25.1$^{f}$ | 114.5 ±8.9 | 45.0 ±1.4$^{d,f}$ | 122.3 ±7.2 | 84.3 ±9.1 | 52.5 ±2.7 $^{e}$ |

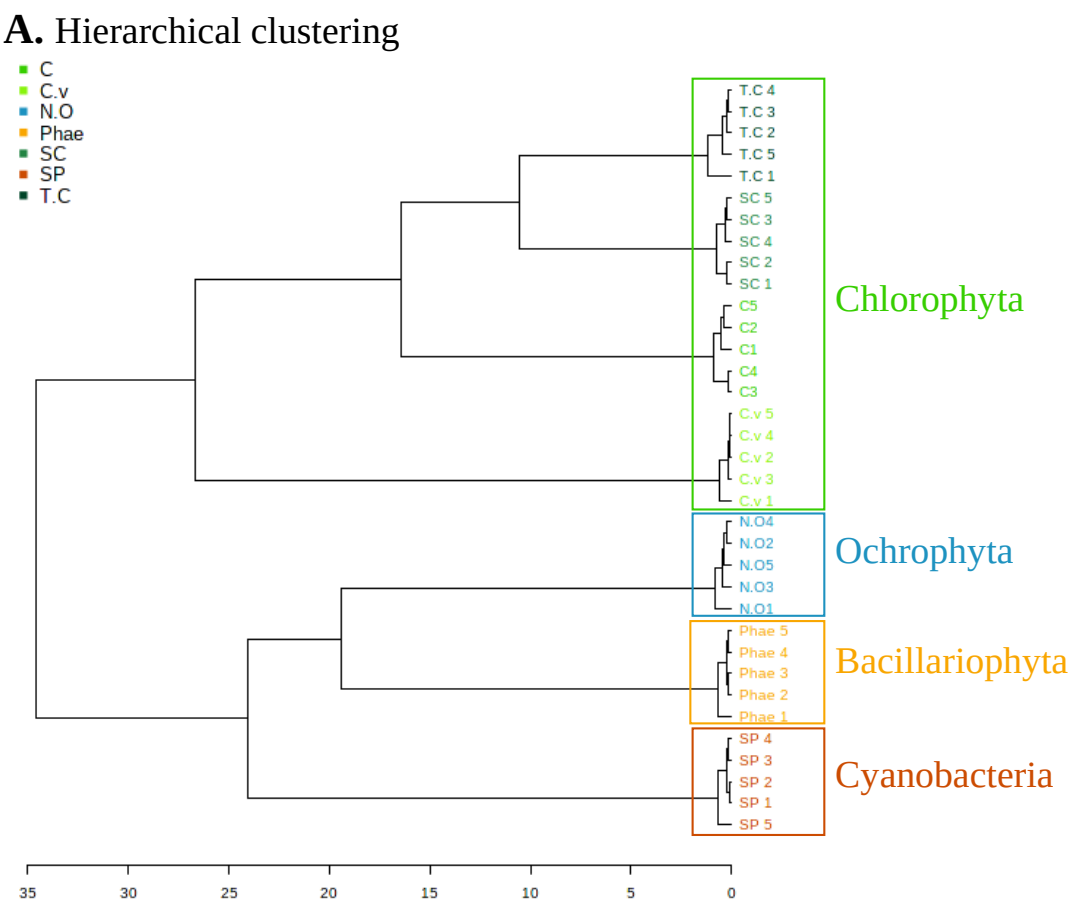


***Figure S1.*** (**A**) Hierarchical cluster analysis using relative abundance after Glog normalization of all fatty acids identified in *Chlorella vulgaris, Chlorococcum amblystomatis, Scenedesmus obliquus, Tetraselmis chui, Phaeodactylum tricornutum., Spirulina* sp. and *Nannochloropsis oceanica*. The green, blue, yellow, and orange boxes show microalgae from the phylum Chlorophyta, Ochrophyta, Bacillariophyta and Cyanobacteria, respectively. Abbreviations: C, *Chlorococcum amblystomatis;* C.v, *Chlorella vulgaris;* SC, *Scenedesmus obliquus;* T.C, *Tetraselmis chui;* Phae, *Phaeodactylum tricornutum;* SP, *Spirulina* sp.; and N.O, *Nannochloropsis oceanica.*

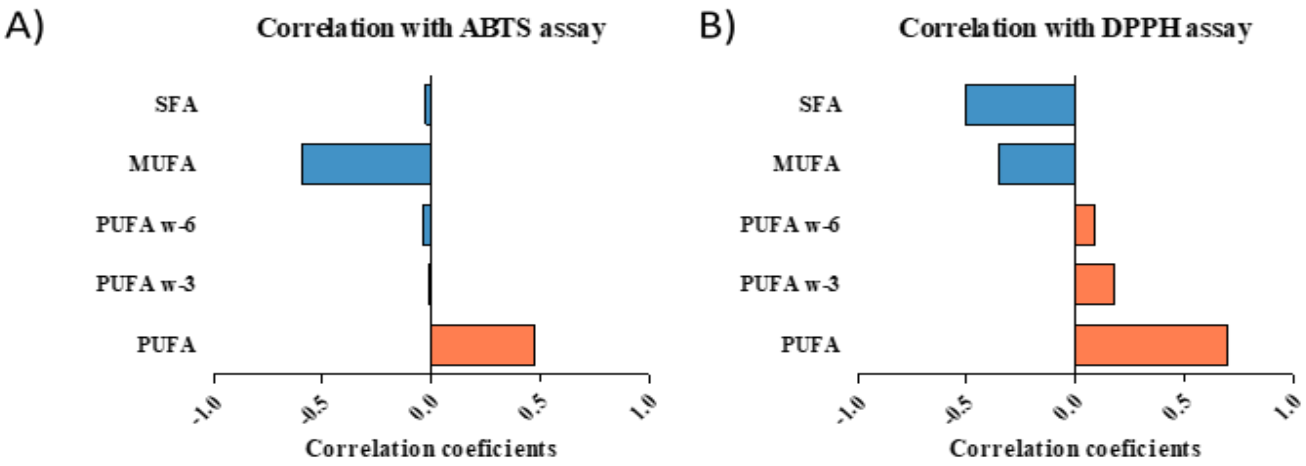


***Figure S2.*** Correlation coefficients analysis using the sum of relative abundances from saturated fatty acids (SFA), mono-unsaturated FA (MUFA), polyunsaturated FA (PUFA), omega-3 PUFA and omega-6 PUFA, and antioxidant activity. (**A**) Correlation coefficients with ABTS assay. (**B**) Correlation coefficients with DPPH assay.