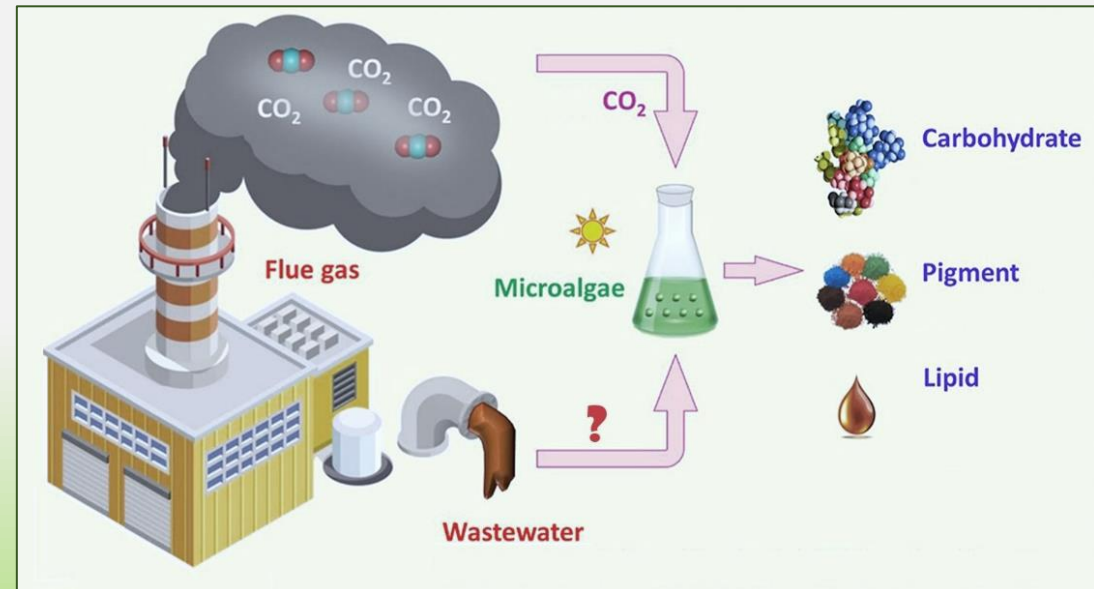


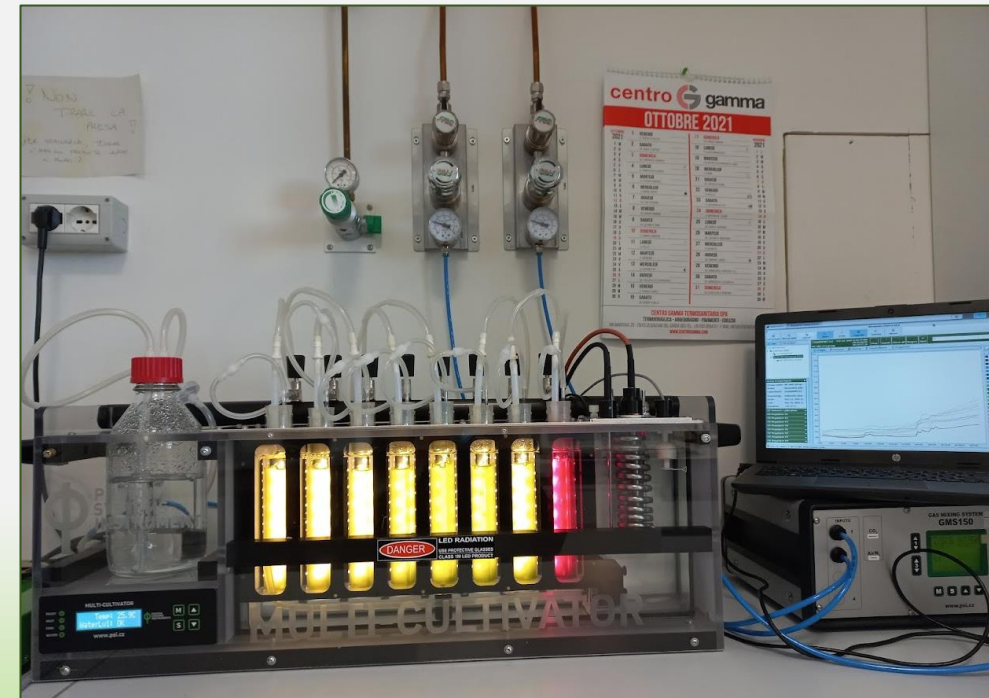
MICROALGAE FOR WATER RESOURCES MANAGEMENT COMBINED WITH ENERGY PRODUCTION SYSTEMS FROM RENEWABLE SOURCES

- The research activity is funded by the Emilia Romagna region in implementation of the 'Alte Competenze' program for research and technology transfer - POR FSE 2014/2020 Thematic objective 10;
- Culture and maintenance of 5 microalgal strains: *Spirulina sp.*, *Chlorella vulgaris* Beij ACUF 863, *Chlamydomonas pitschmannii* Ettl ACUF 292, *Scenedesmus sp.* ACUF 145 (A), and *Scenedesmus sp.* ACUF 329 (B).



RESEARCH PROGRESSES

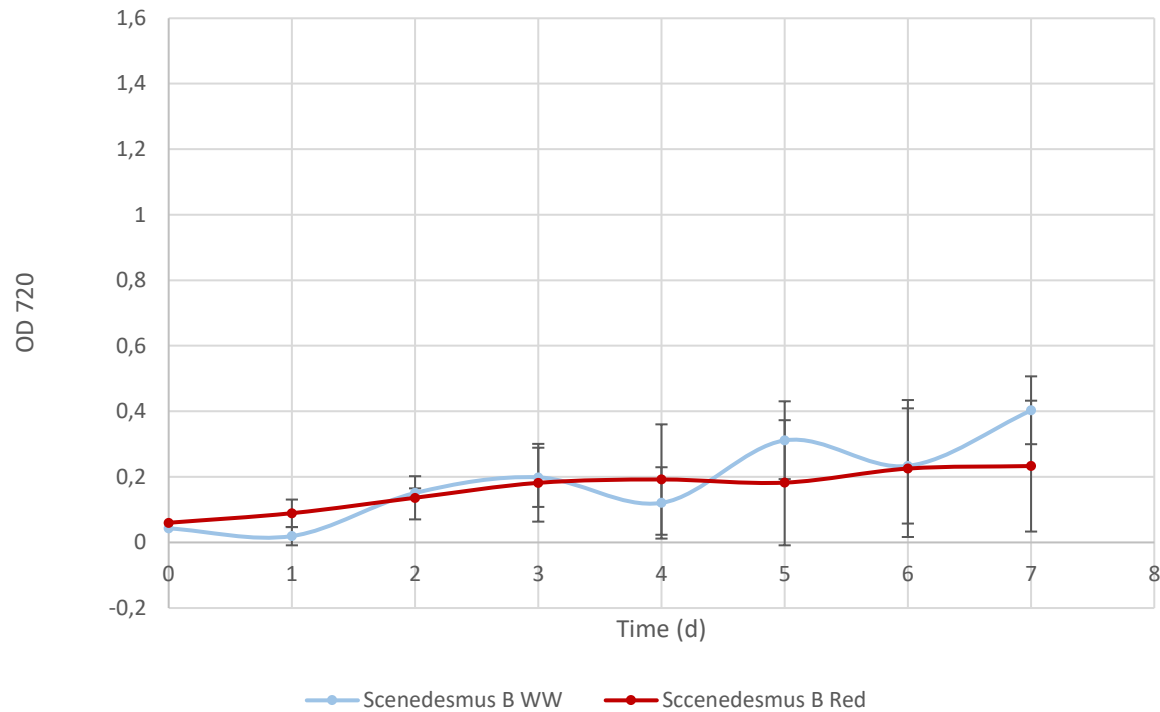
- Construction of growth curves to relate the OD with the cellular concentration of each alga;
- Lipid production in the presence of waste by-products from the agri-food industry;
- Effect of different wavelengths on algae growth;
- Combining the management of water resources and agro-industrial wastewater with the use of CO₂.



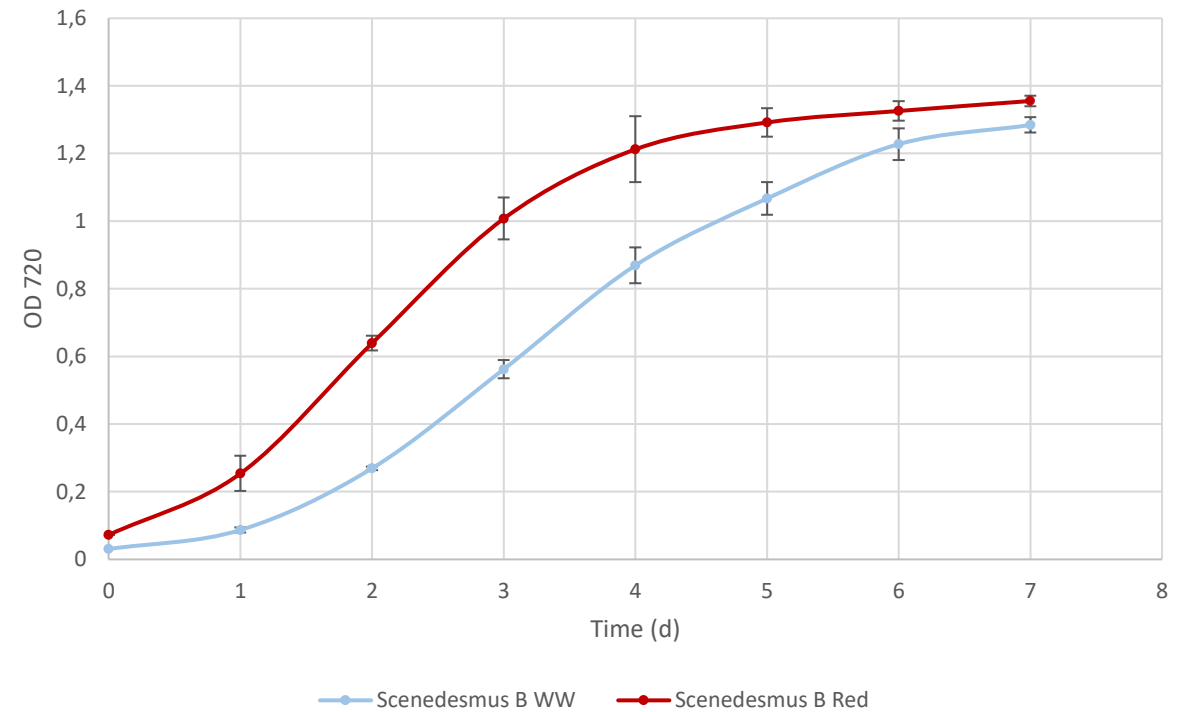
MULTI CULTIVATOR MC-1000 OD

CO₂ REDUCTION-BASED EXPERIMENTS: *Scenedesmus sp. 329*

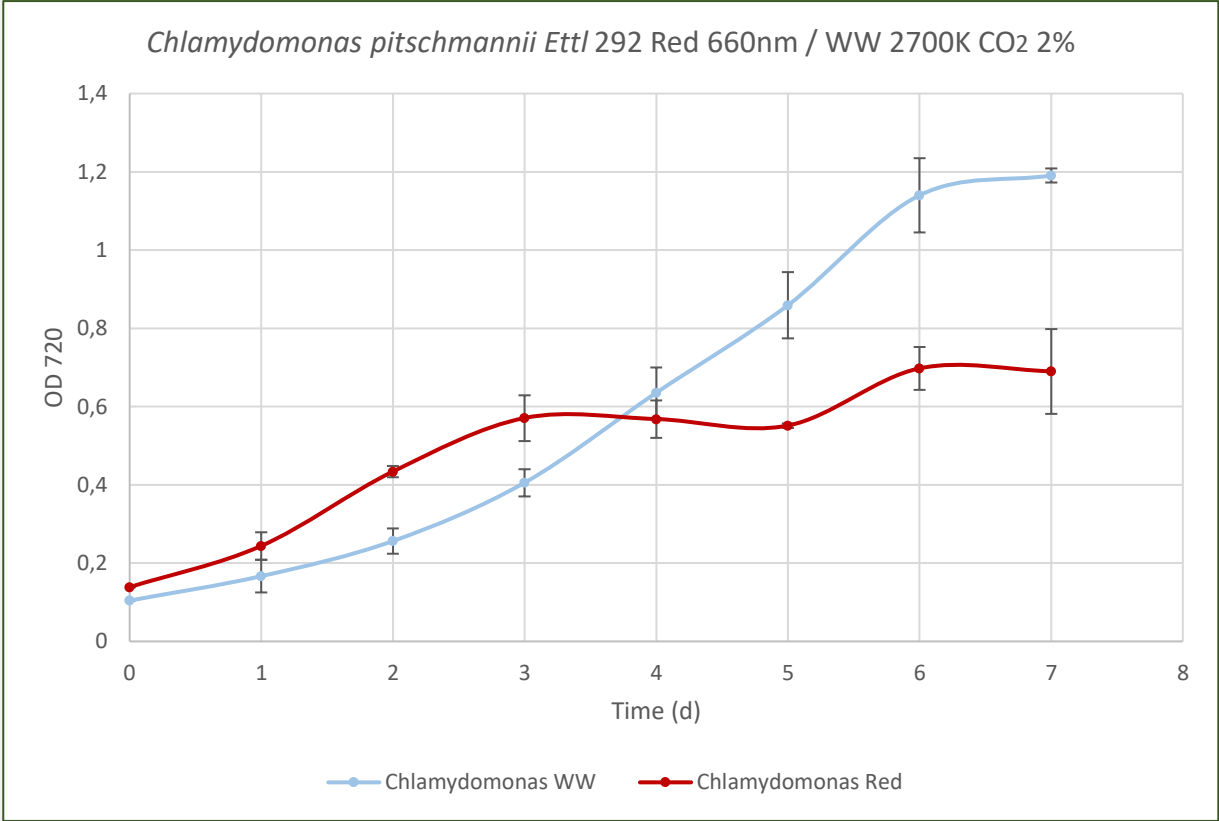
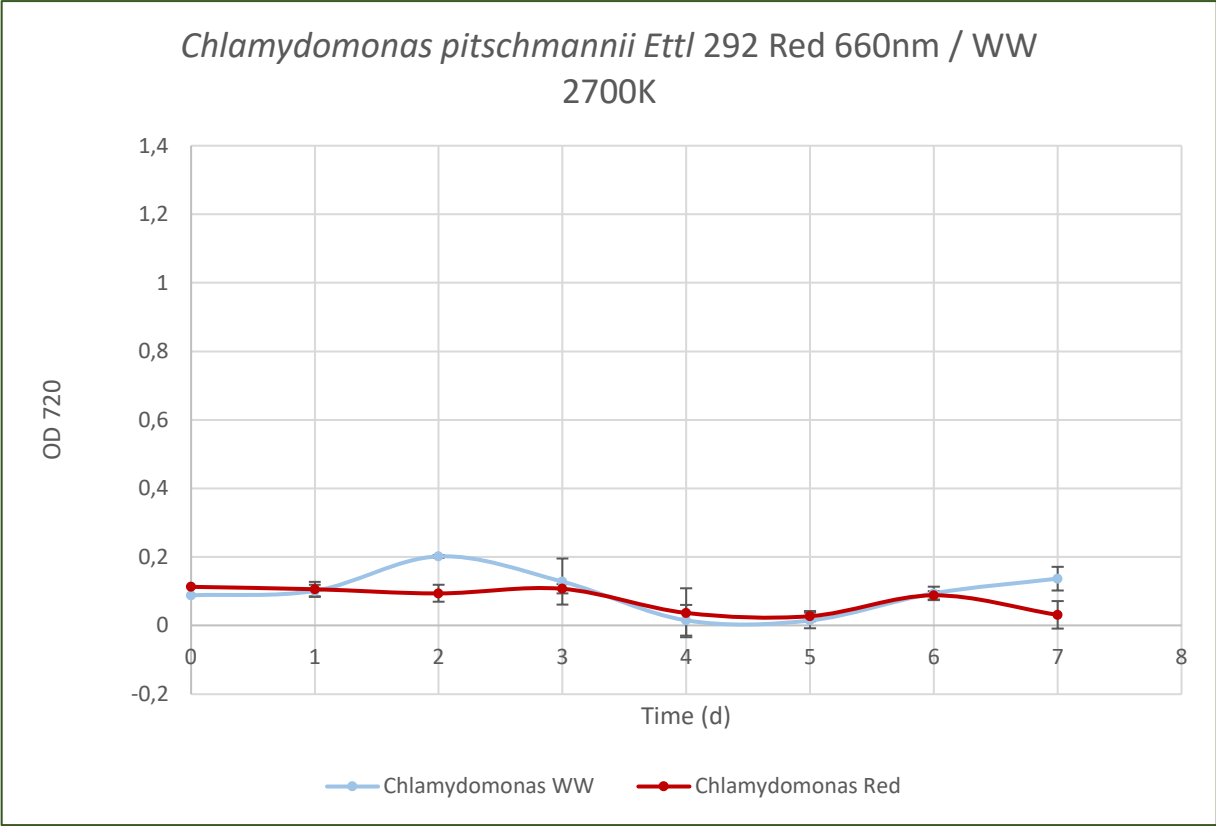
Scenedesmus sp. 329 Red 660nm / WW 2700K



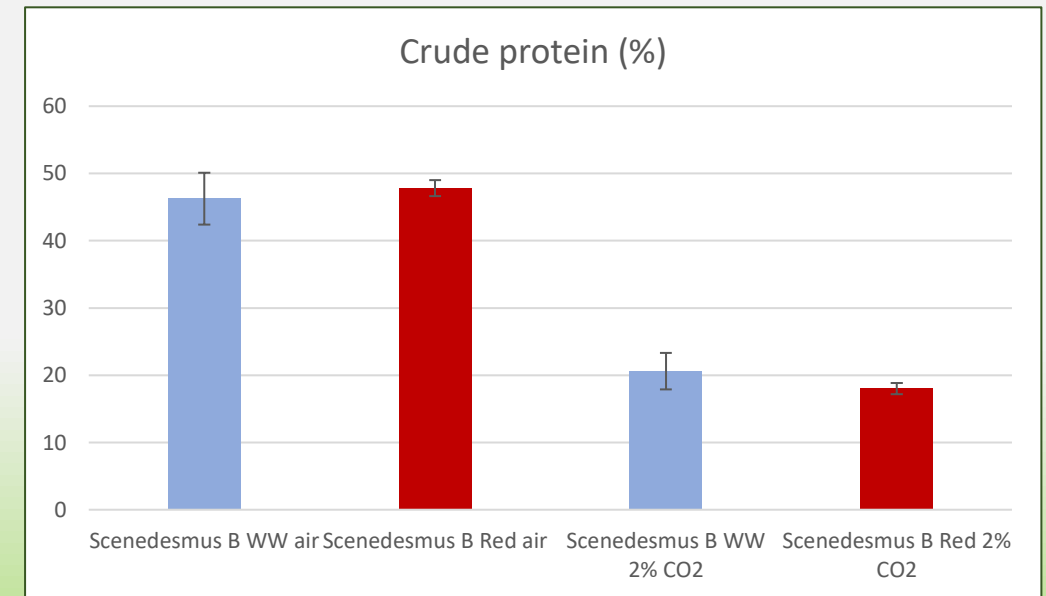
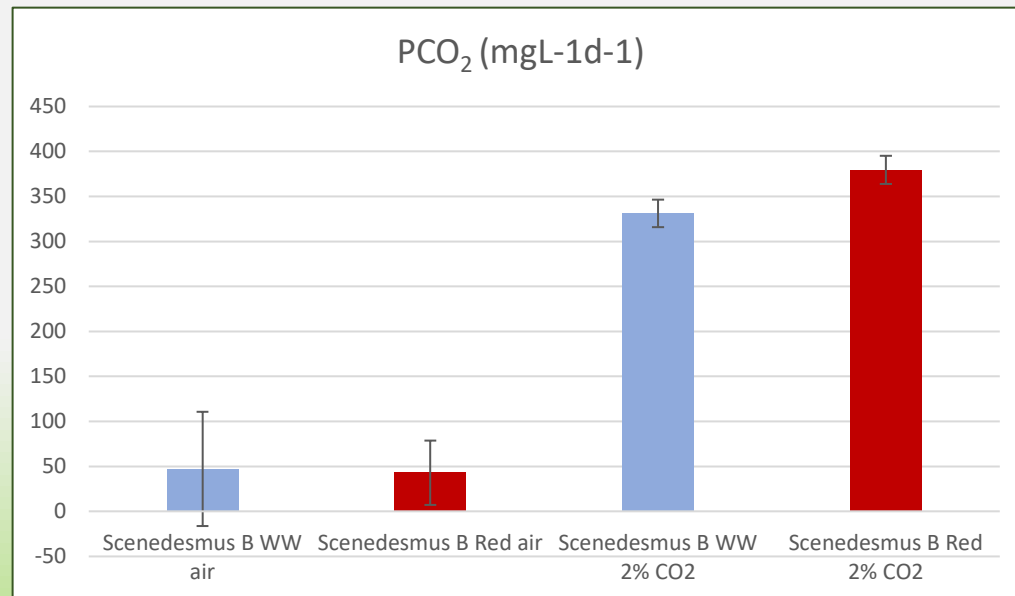
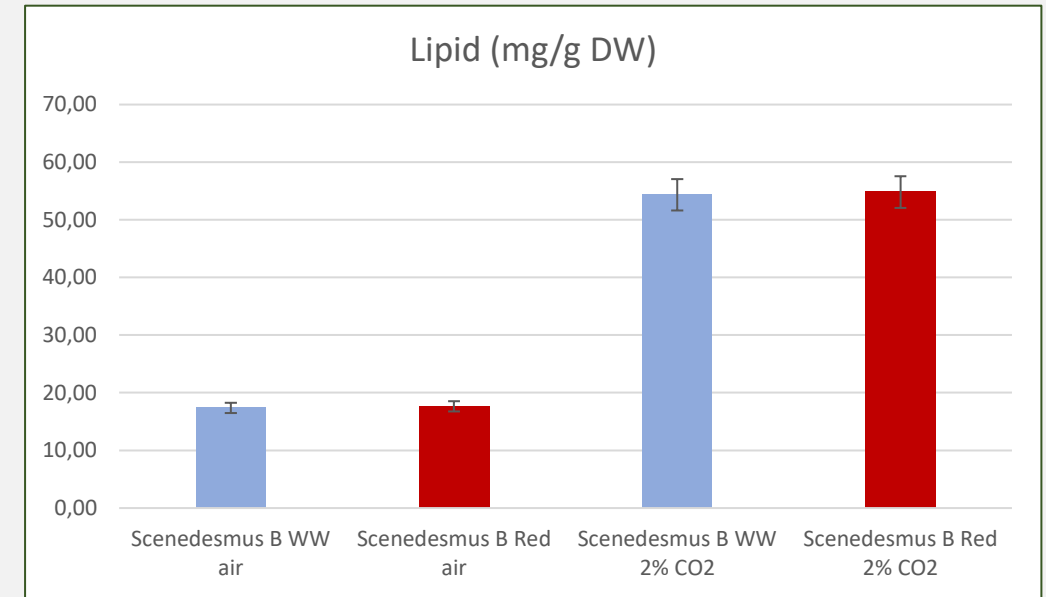
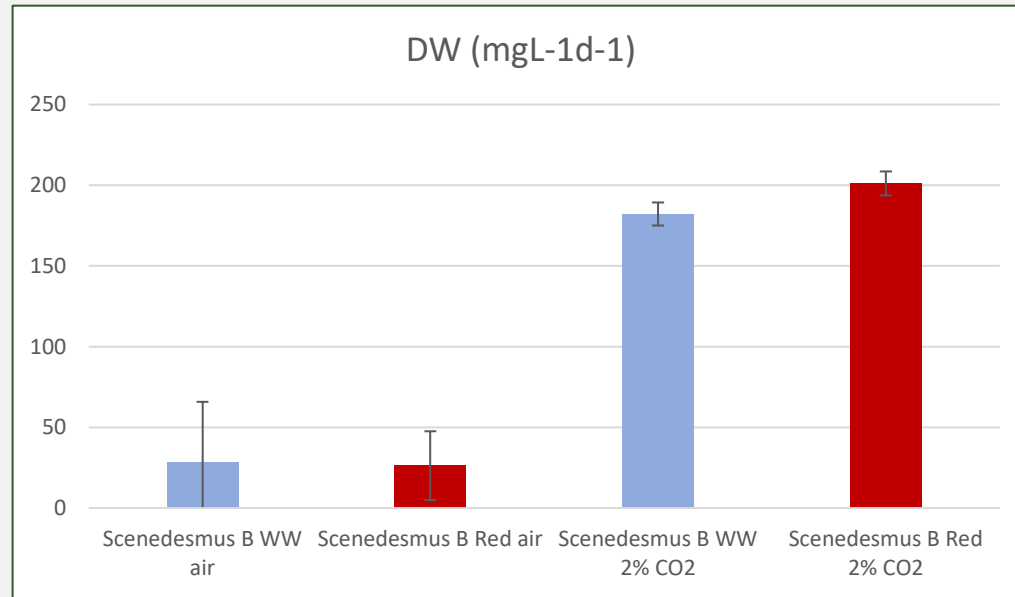
Scenedesmus sp. 329 Red 660nm / WW 2700K CO₂ 2%



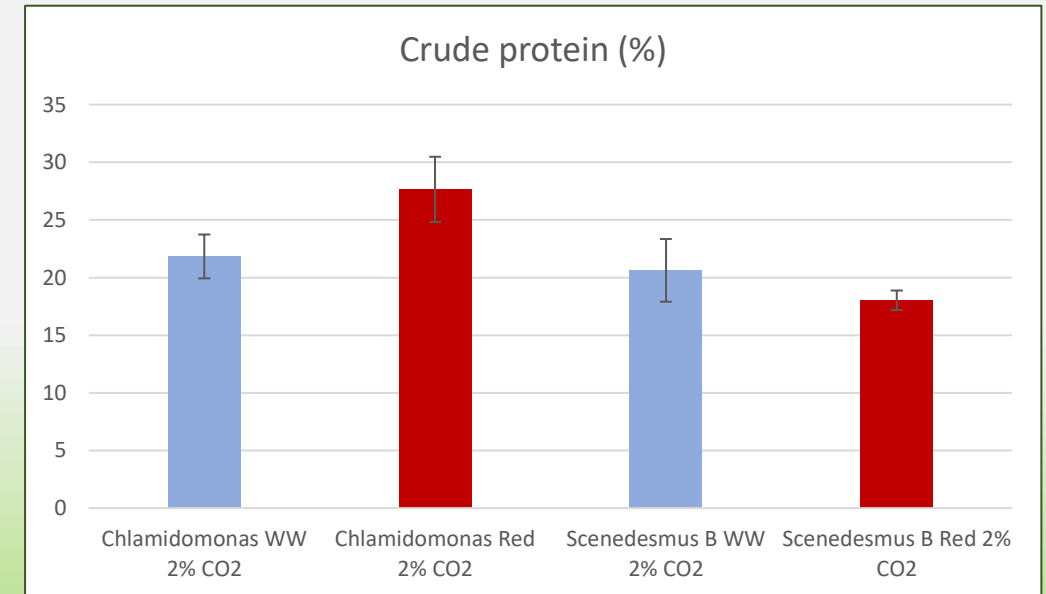
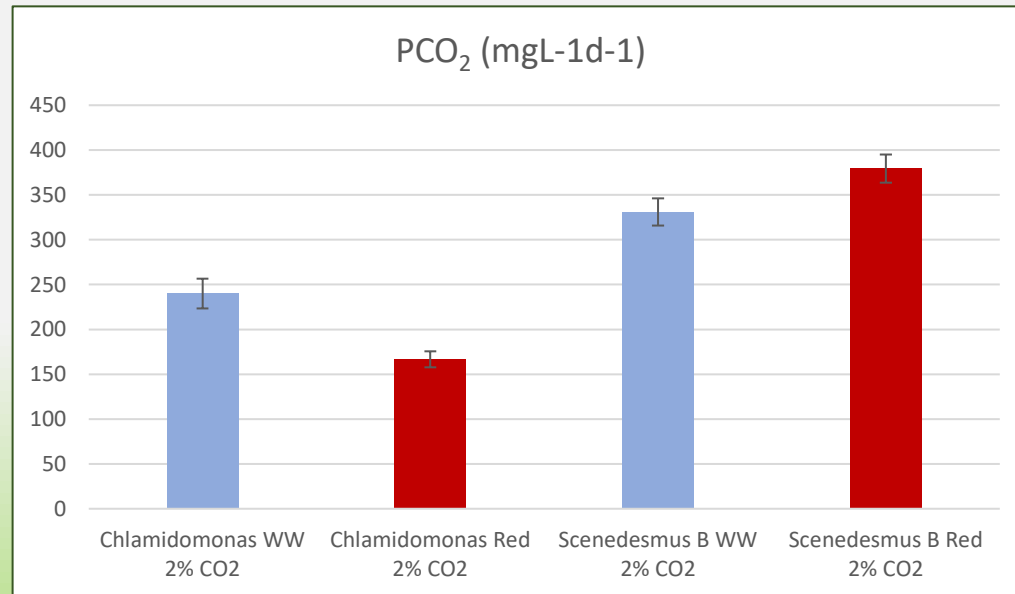
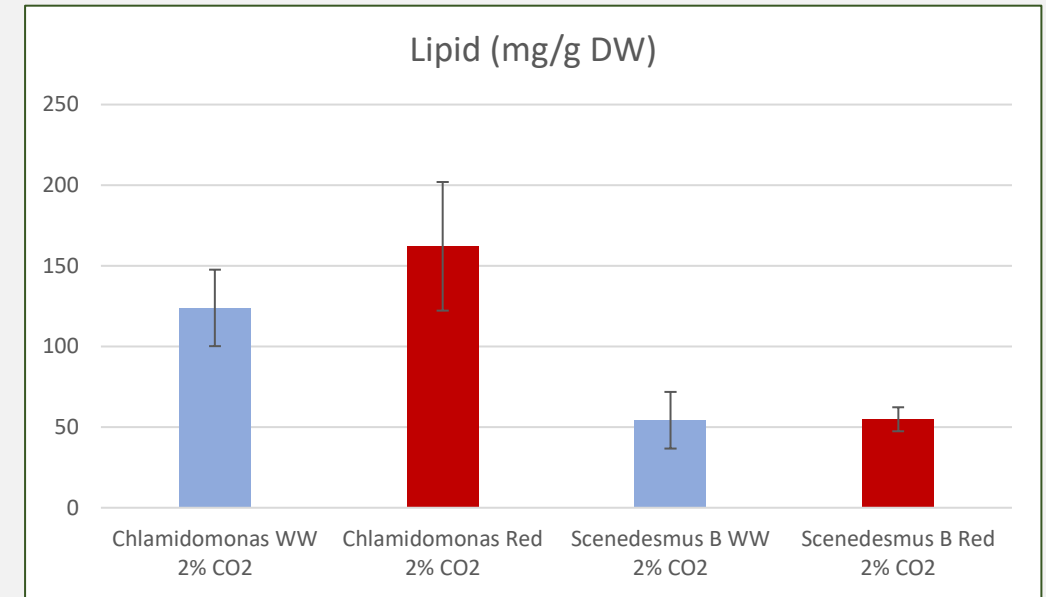
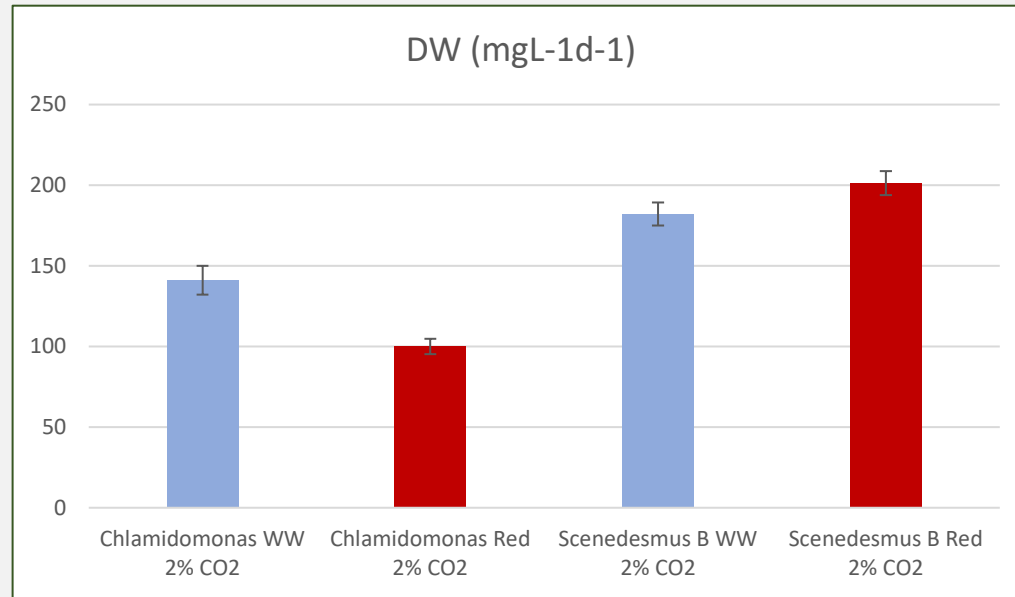
CO₂ REDUCTION-BASED EXPERIMENTS: *Chlamydomonas pitschmannii* Ettl 292



Scenedesmus sp. 329



Chlamydomonas pitschmannii Ettl 292 vs *Scenedesmus* sp. 329



CONCLUSIONS

Microalgae	CO ₂ input (%)	λ (nm)	DW (mgL ⁻¹ d ⁻¹)	k (d ⁻¹)	PCO ₂ (mgL ⁻¹ d ⁻¹)	RE (%)	Crude protein (%)	Lipid (mg/g DW)	Divisions per day	Generation time (d)	Generation time (h)
<i>Scenedesmus sp. 329</i>	0,04	WW 2700K	28 ± 38	0.21 ± 0.09	47 ± 63	4 ± 5.3	46.3 ± 3.8	17.4 ± 30	nd	nd	nd
	0,04	Deep Red 660	26 ± 21	0.2 ± 0.1	43 ± 35	3.7 ± 3	47.8 ± 1.2	17.6 ± 30.6	nd	nd	nd
	2	WW 2700K	182 ± 7	1.0 ± 0.1	331 ± 15	28.4 ± 1.3	20.6 ± 2.7	54 ± 17	1.43 ± 0.15	0.70 ± 0.07	16.8 ± 1.7
	2	Deep Red 660	201 ± 7	1.17 ± 0.31	379 ± 16	32.6 ± 1.3	18.0 ± 0.9	54.8 ± 7.4	1.69 ± 0.44	0.59 ± 0.15	14.2 ± 3.6
<i>Chlamidomonas p. E. 292</i>	0,04	WW 2700K	14.9 ± 5.7	0.73 ± 0.08	nd	nd	nd	nd	nd	nd	nd
	0,04	Deep Red 660	9.5 ± 6.3	nd	nd	nd	nd	nd	nd	nd	nd
	2	WW 2700K	141 ± 9	0.46 ± 0.01	239 ± 17	20.5 ± 1.4	21.8 ± 1.9	124 ± 24	0.66 ± 0.02	1.52 ± 0.05	36.5 ± 1.2
	2	Deep Red 660	100 ± 5	0.42 ± 0.08	167 ± 9	14.3 ± 0.8	27.6 ± 2.8	162 ± 40	0.98 ± 0.11	1.02 ± 0.11	24.5 ± 2.6

- Frongia et al. (2020) Sound perception and its effects in plants and algae, PSB 15:12 DOI: 10.1080/15592324.2020.1828674;
- Frongia et al. (2021) Microalgae potential in the capture of CO₂ emission, Acta Innovations 41(20): 19-7 DOI: 10.32933/ActaInnovations.41.2.
- Participation in the International Online Conference on Algal Biomass, Biofuels & Bioproducts (14-16 Jun 2021);

francesca.frongia@unimore.it

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