Microalgae as a source of natural ingredients for application in cosmetic industry

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INTRODUCTION

Table 1: Skin aging causes.

Skin aging		
Intrinsic aging	**Extrinsic aging**	
Excessive ROS production	UV radiation	Smoking
Decrease of the skin antioxidant capacity	Pollution	Stress

Antioxidant extracts for skin aging

- ⬇ Skin ROS production
- ⬇ Skin damage caused by ROS

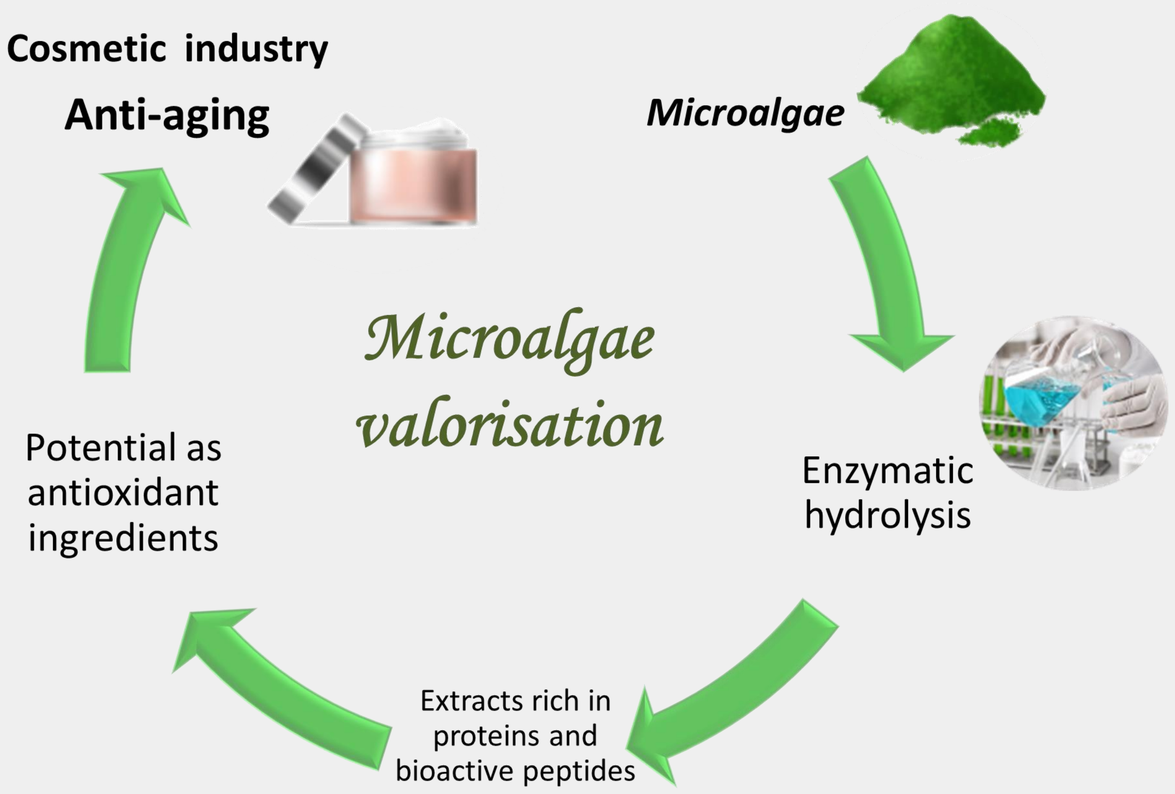

Figure 1: Scheme of the microalgae extracts potential.

METHODOLOGY

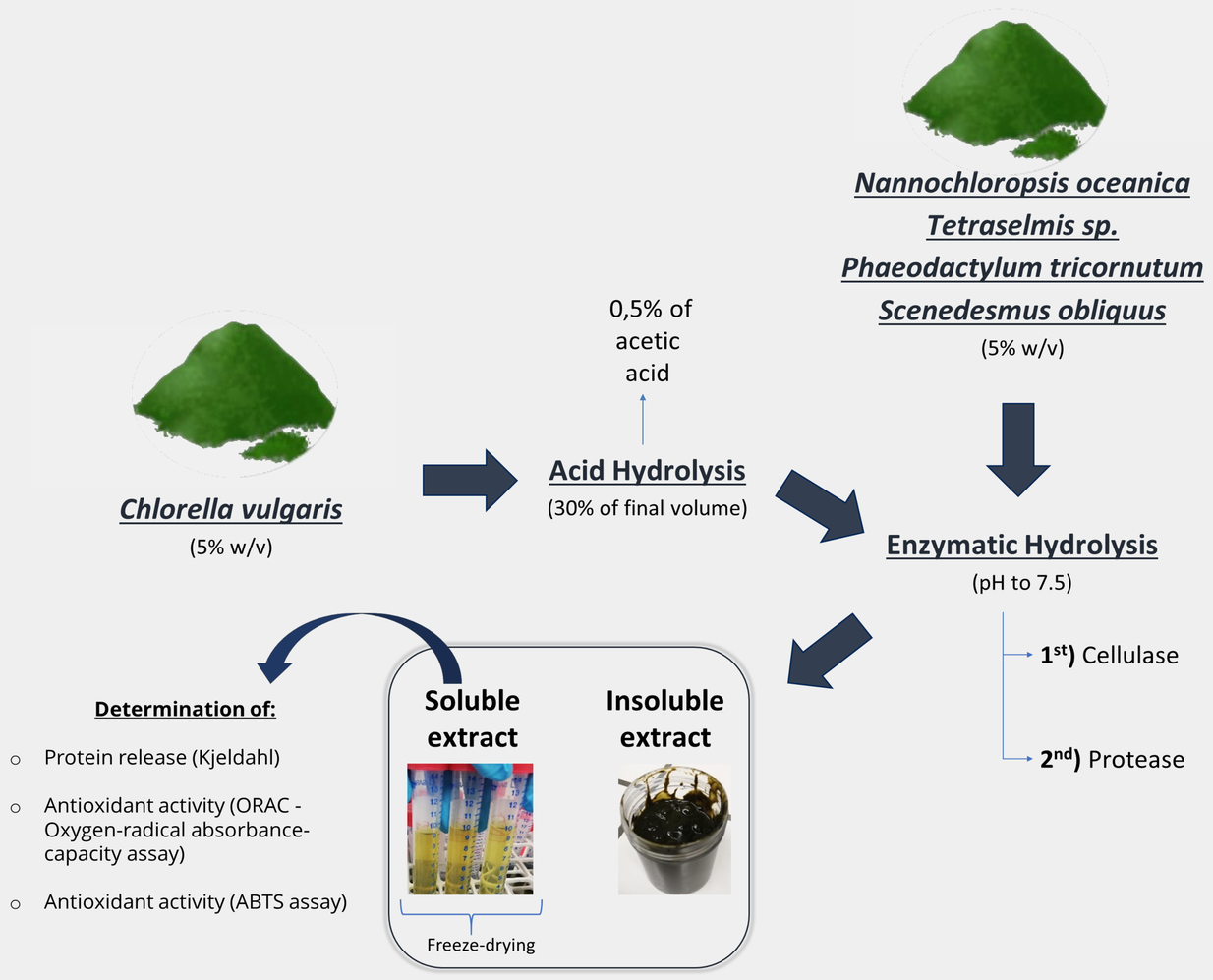

Figure 2: Scheme of the extraction method of proteins and bioactive peptides from the microalgae.

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RESULTS

Table 2: Results obtained for each extract regarding their protein content and antioxidant potential, tested by ORAC and ABTS assays.

Microalgae extract	Protein (%)	ORAC (µmol TE/g of extract)	ABTS (µmol TE/g of extract)
Chlorella vulgaris	44.71 ± 1.75	462.83 ± 39.97	76.12 ± 7.53
Nannochloropsis oceanica	31.01 ± 0.27	361.32 ± 49.29	68.07 ± 6.97
Scenedesmus obliquus	53.68 ± 1.10	572.82 ± 24.28	80.31 ± 3.15
Tetraselmis sp.	16.49 ± 0.48	156.18 ± 9.51	64.99 ± 3.92
Phaeodactylum tricornutum	36.84 ± 0.17	359.81 ± 54.64	83.07 ± 1.13

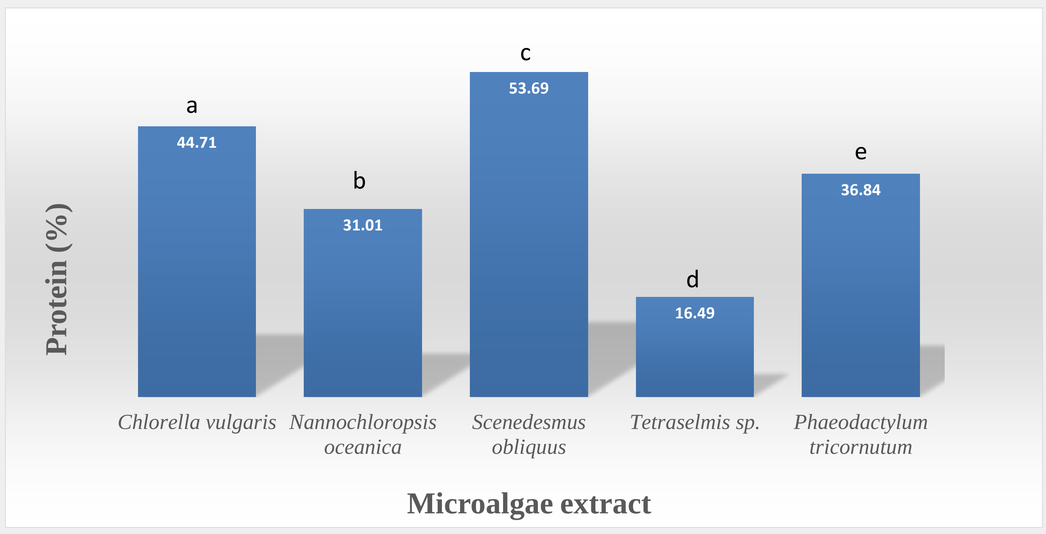

Figure 3: Protein content (A) and antioxidant activity by ORAC (B) and ABTS assays (C) for each microalgae extract. As the data proved to follow a normal distribution, one-way ANOVA, coupled with Tukey's post hoc test, was used to determine the differences of the mean values between the extracts. Significative diferences ($p<0.05$) between the extracts are indicated by different letters.

CONCLUSION

The enzymatic hydrolysis allowed to produce extracts rich in proteins, with interesting antioxidant activity. The higher protein yield (statistically significant) was obtained for the microalgae *Chlorella* (44%) and *Scenedesmus* (52%), which coincides with the higher values of antioxidant activity.

Therefore, the high protein content and the antioxidant activity of the enzymatic extracts from the microalgae *Chlorella vulgaris* and *Scenedesmus obliquus* may be an interesting approach for the development of anti-aging ingredients.

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