

PROTEIN EXTRACTION FROM FOUR INDUSTRIALLY-RELEVANT MICROALGAE AND *IN VITRO* EVALUATION OF BIOACTIVITIES

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1. INTRODUCTION

WHY MICROALGAE?

- Potential for use in foods as a source of protein and bioactive compounds.
 - Easily cultivated
- Favourable amino acid & nutrient profiles

DEVELOPMENT OF ALTERNATIVE, SAFE AND SCALABLE TECHNOLOGIES TO ACCESS THESE PROTEINS

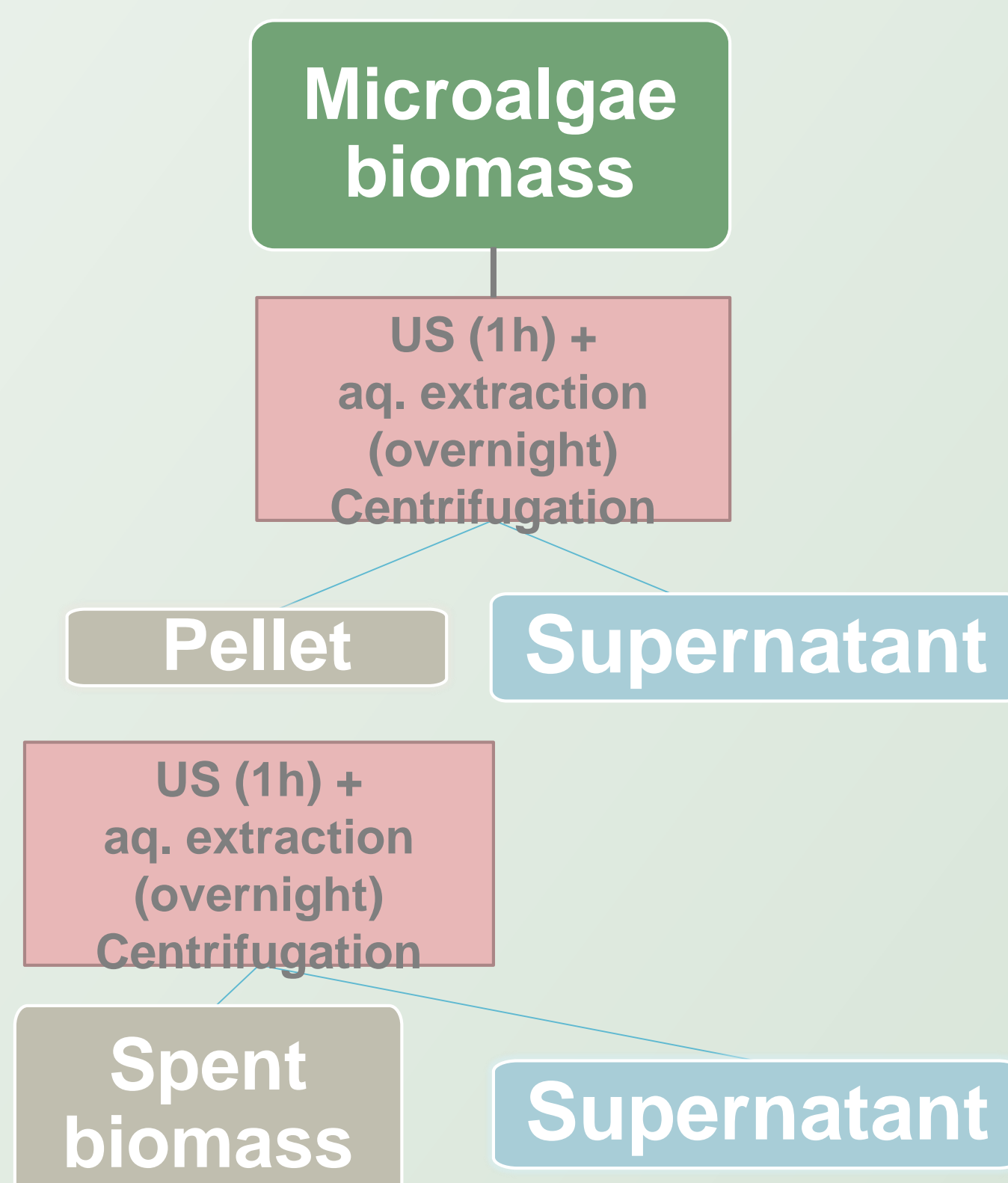
Continuous growth of population means increasing demand for food, particularly protein: “protein gap”
Increasing interest in alternative and algal proteins

2. AIM & MATERIALS AND METHODS

The aim of this work was to compare protein extraction methods including a traditional extraction using salts, High pressure processing (HPP) and pulse electric field (PEF) to isolate proteins from four microalgal strains; *Arthrospira (Spirulina)* sp., *Isochrysis* T-iso, *Nannochloropsis* sp. and *Scenedesmus* sp. Total protein, lipid and ash were measured along with *in vitro* bioactivities including Angiotensin-I-converting enzyme (ACE-I) inhibitory and renin inhibitory activities.

a. Pre-treatments

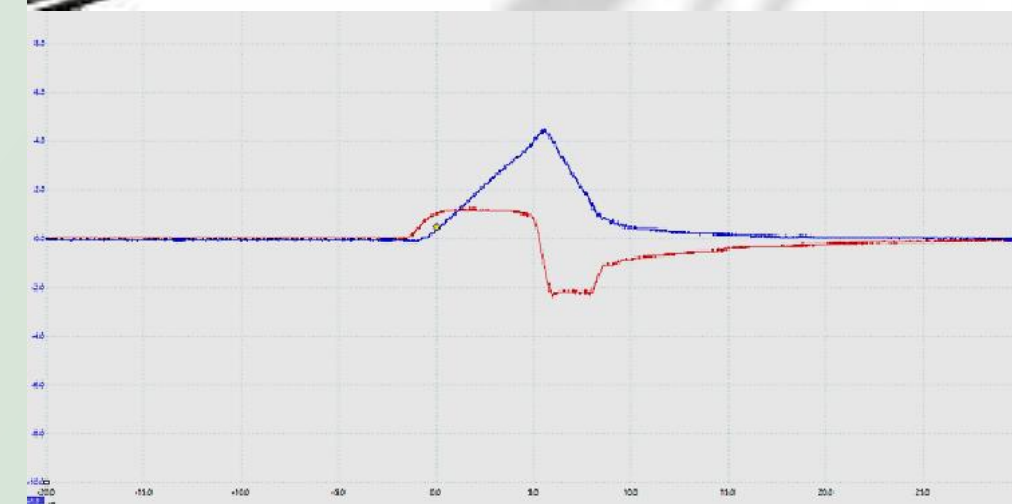
a.1. Traditional extraction



a.2. HPP

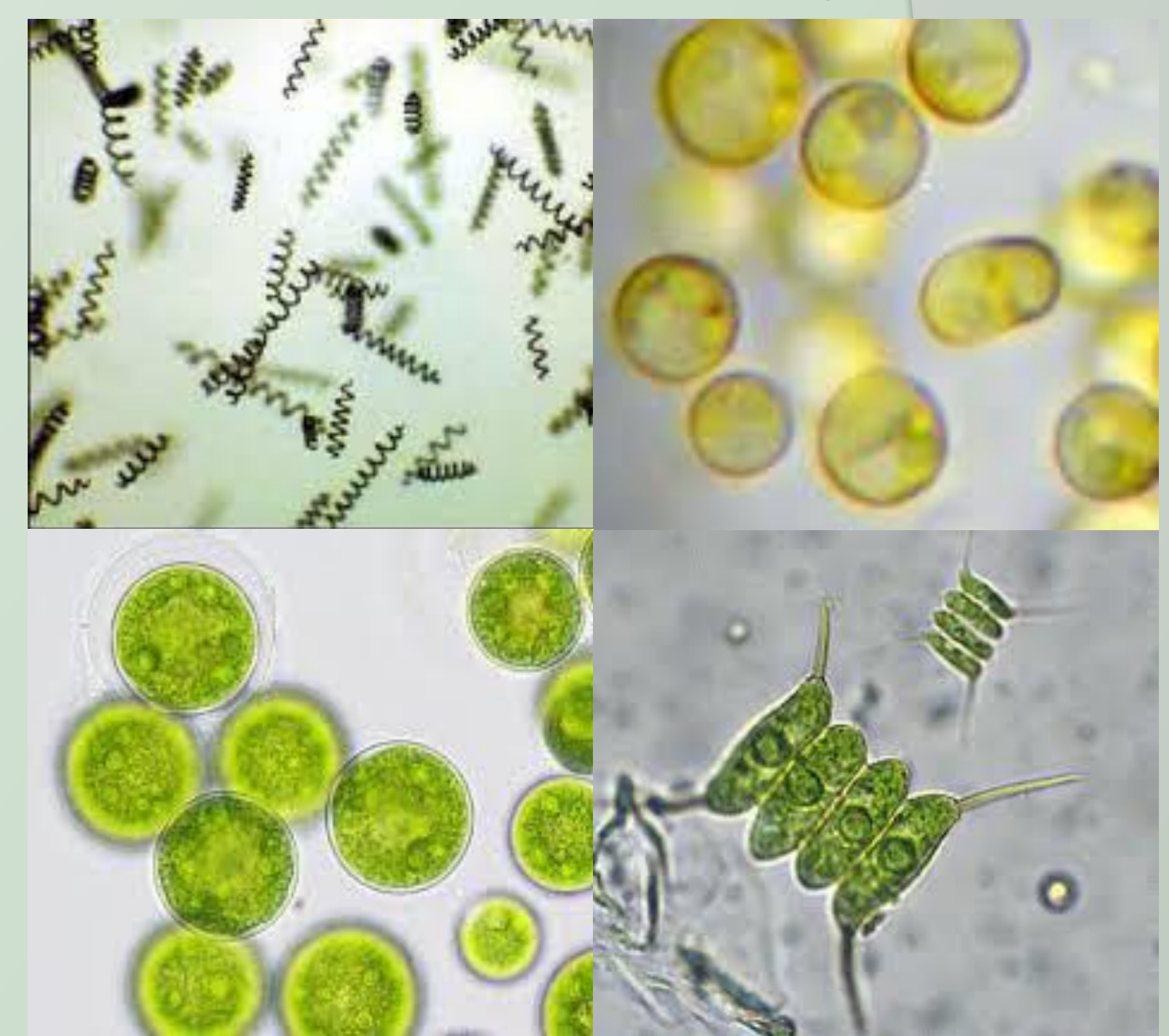


a.3. PEF



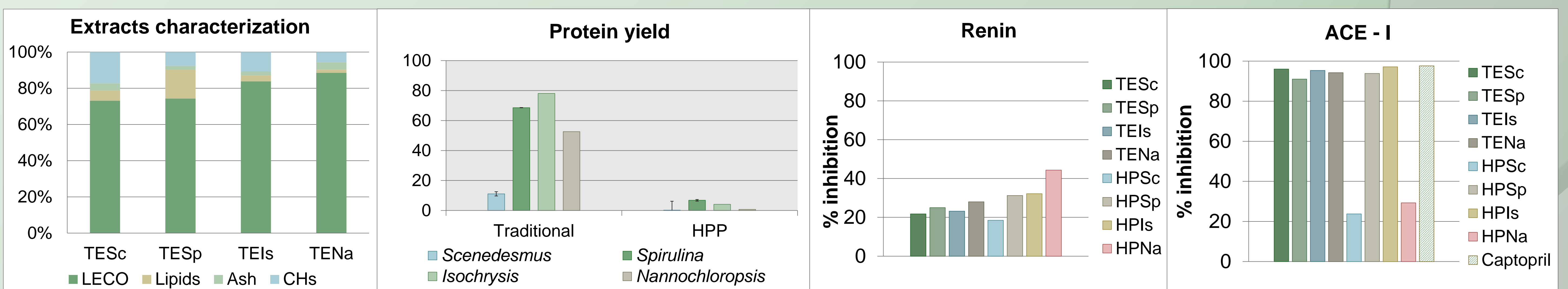
b. Microalgae biomass

Spirulina sp. *Isochrysis* T-iso



Nannochloropsis sp. *Scenedesmus* sp.

3. RESULTS



4. CONCLUSIONS

- Traditional extraction was useful for protein extraction from *Isochrysis* Iso-T (78.1±8.3%) and *Arthrospira (Spirulina)* sp. (68.6±6.0%) and resulted in the greatest yields.
- HPP did not enhance protein extraction.
- ACE-I inhibitory activities assayed *in vitro* were greater than 90% for all the algal proteins obtained using the traditional extraction method. A protein extracted using HPP from *Nannochloropsis* inhibited renin by 44.3±3.28% at 1 mg/ml compared to the control.

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