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Microalgae have been used in food and cosmetic industries due to their richness in compounds with high biological value, such as proteins, essential amino acids, vitamins and minerals [1]. Several microalgae contain high protein content, similar to other common protein sources such as meat and soybean [1], making them a promising source of bioactive peptides. Bioactive peptides are inert inside proteins but can show several interesting properties when isolated [2]. Antioxidant, antihypertensive, antidiabetic, anticancer, anti-inflammatory and anti-aging are some properties that can be found described in bioactive peptides. Bioactive peptides may be more easily absorbed by the gastrointestinal tract than the intact protein, which allied with their potential bioactivities make them interesting for the development of functional foods, with health benefits for the consumer. Hypertension is one of the main causes of cardiovascular diseases, which can lead to heart attack or stroke. Angiotensin-converting enzyme (ACE) is involved in blood pressure regulation, thus inhibiting it can help to control high blood pressure. Thus, this research aimed to produce water soluble hydrolysates rich in proteins and bioactive peptides, with antioxidant and anti-hypertensive potential, from the five microalgae species Chlorella vulgaris, Nannochloropsis oceanica, Tetraselmis sp., Scenedesmus obliquus and Phaeodactylum tricornutum. The five microalgae species were submitted to an enzymatic hydrolysis (one of the most described methods for producing bioactive peptides) with a cellulase and a subtilisin protease, using previously optimized methods. Prior to the enzymatic hydrolysis, C. vulgaris was submitted to an acid hydrolysis, using a weak and food-grade acid. The anti-hypertensive potential was evaluated by the hydrolysate's ability of inhibiting ACE. Previous studies [3] showed that C. vulgaris and S. obliquus hydrolysates stood out with the higher antioxidant potential. All the hydrolysates demonstrated anti-hypertensive potential by showing an IC50 lower than 500 μg protein/mL for ACE inhibition (Table 1). Thus, production of peptide hydrolysates from microalgae may represent an interesting approach for the development of sustainable, natural functional ingredients to be used to prevent hypertension on the consumers by incorporating it in food matrices.

In conclusion, the enzymatic hydrolysis of microalgae allowed to produce hydrolysates with antioxidant and anti-hypertensive potential. Further studies should be done to confirm the anti-hypertensive ability after the gastrointestinal digestion of the hydrolysates. If the bioactivity is maintained, these hydrolysates may be incorporated in food matrices as functional ingredients, contributing to the development of functional foods with antioxidant and anti-hypertensive benefits for the consumers.