Valorisation of *Lycium chinense* Mill. (Goji) pruning waste for the development of added-value food products

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INTRODUTION

***Lycium chinense* Mill. (LC)**, known for its goji berries, is widely used in Chinese cuisine and traditional medicine due to its rich bioactive compounds, such as polysaccharides, phenolic compounds and carotenoids, which offer several health benefits [1]. Global cultivation includes organic practices by Portuguese producers, focusing on fresh fruit sales to differentiate from conventional Chinese products [2]. However, pruning LC shrubs to stimulate fruit production produces significant biowaste annually, demanding research into its composition and potential uses for novel product development [3].

Objective: This work aimed to evaluate the potential of LC pruning biowaste for use as a food ingredient. This study is divided into two tasks: screening of bioactive compounds of LC pruning biowaste through sequential extraction (**Task 1**) and analyzing the use of an aqueous extract of LC pruning biowaste as a new ingredient in gum formulations (**Task 2**).

TASK 1

Screening of bioactive compounds

Sequencial extraction

Less polar → **More polar**

Hexane → Ethyl acetate → Methanol → Water

↓ 4 extracts

Phytochemical analysis

- Pigments content and profile (UV-Vis, HPLC)
- Phenolic content and profile (Folin-Ciocalteu, HPLC-MS)
- Antioxidant activity (ABTS)

Final remarks

↑ **amount of pigments** in ethyl acetate extract, with presence of chlorophyl derivative and violaxanthin

↑ **amount of phenolic compounds** in aqueous extract, with presence of flavonoids and tannins

↑ **antioxidant activity** in aqueous extract, highlighting its potential as a valuable food ingredient rich in antioxidants

TASK 2

Gum formulations

LC pruning biowaste aqueous extraction conditions:
100 ºC; ratio 1:20; 10 min

Ingredients:

- Gelatin solution;
- Citric acid solution;
- Syrup: control gum (sucrose) and low sugar gum (sucrose + xylitol 50:50)

All ingredients were prepared using the aqueous extract.

Quality analysis

% Dry matter, % humidity, pH, colour, phenolic compound content and antioxidant activity

Final remarks

- pH and moisture/dry matter values are similar to those typically obtained in gummy formulations
- Browning index of the control gum was higher compared to the low sugar gum, due to the presence of xylitol, since it does not undergo browning reactions

This work aimed at contributing to the minimization of food losses and waste along the production and supply chain (Goal 12), as also to foster the commercialization of food products that ensure the health and well-being of the population (Goal 3).

References
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