

Olive pomace: a sustainable source of health ingredients

Beatriz Oliveira
(beatoliv@ff.up.pt)

Olive pomace: a sustainable source of health ingredients



University of Porto -
a public university founded in 1911



Faculty of Pharmacy (FFUP) - The first school of pharmacy of Portugal.

Olive pomace

≈60 – 70% water
 ≈2 – 3% fat
 Olive pulp and skin
 Without pits



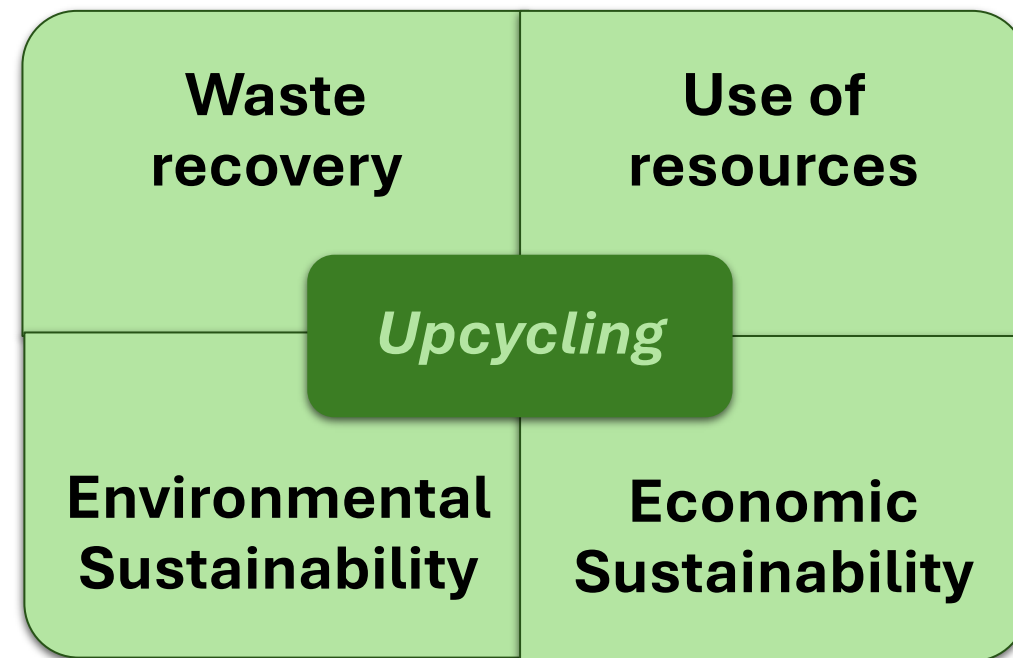
Fresh olive pomace without pits
 (crushed olive paste "without" olive oil)

↑ 15 - 20% Olive oil
 ↓ 80 - 85% Olive pomace
 (600 000 t)

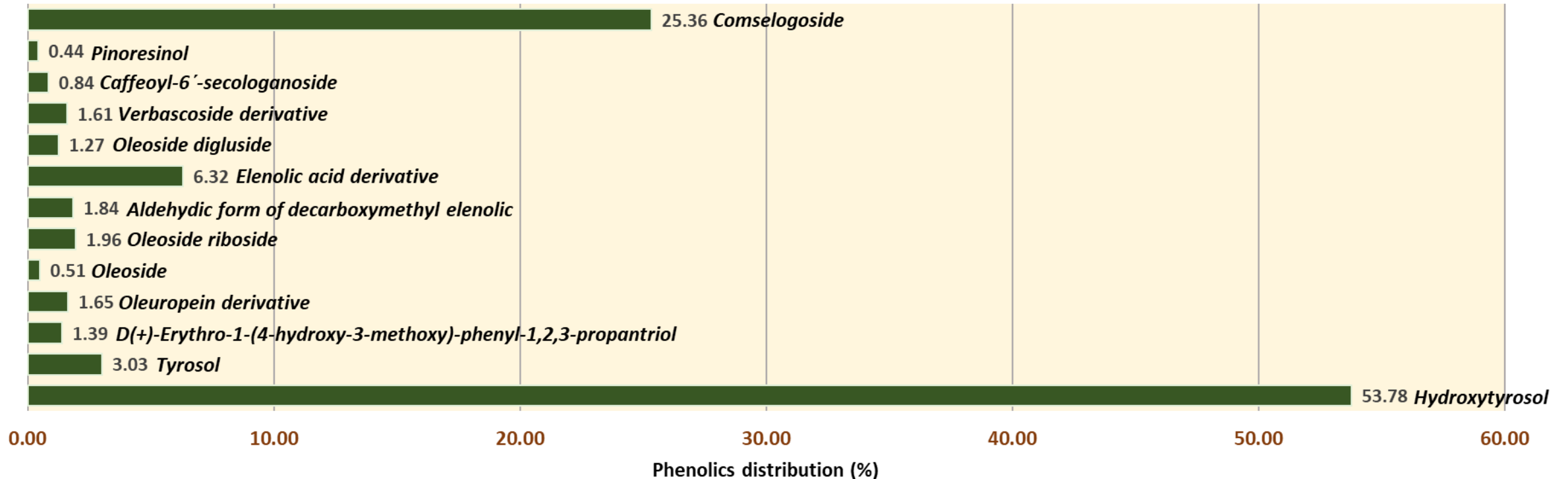
**Phytotoxic
 environmental burden**



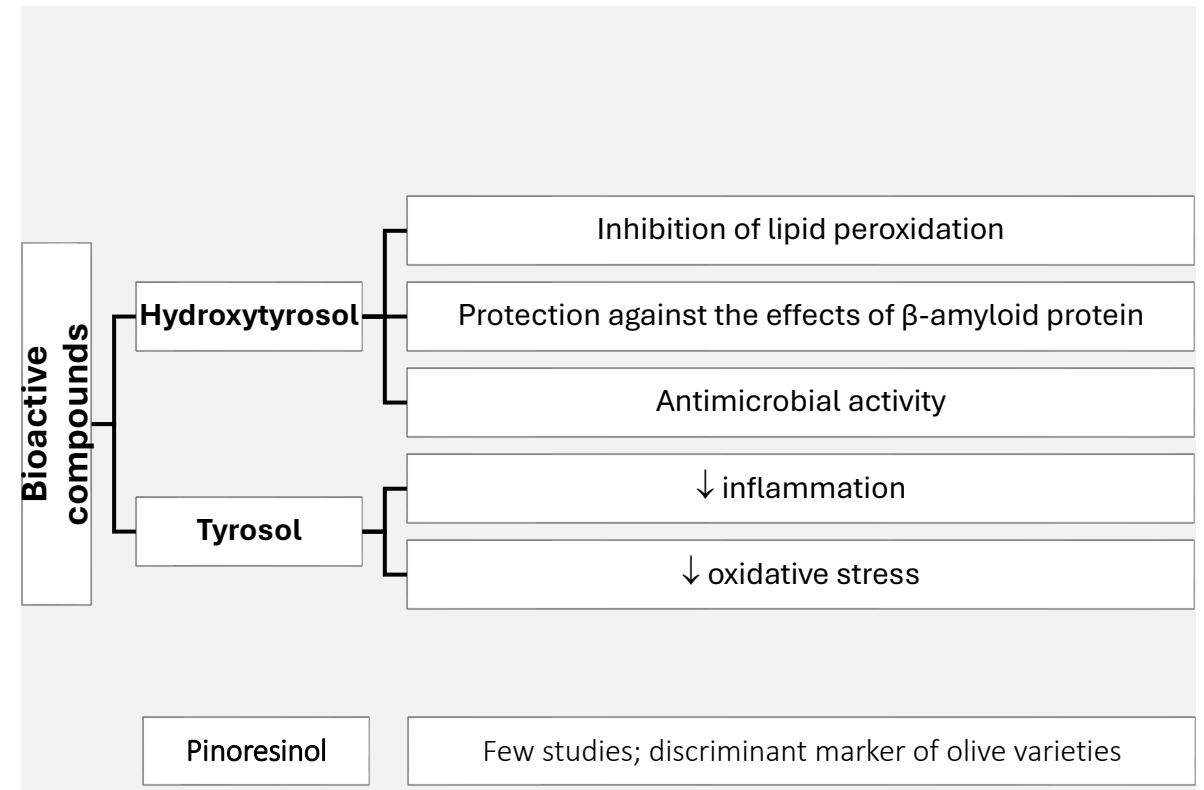
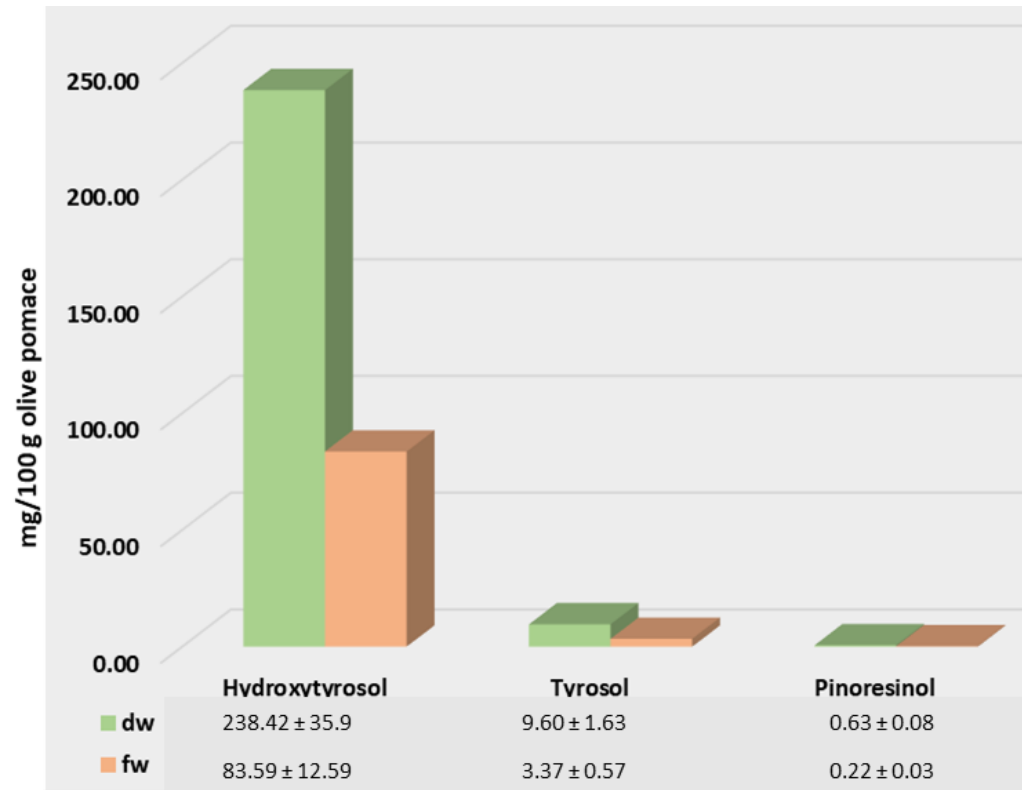
Beneficial effects on human health
 Bioactive compounds



Olive pomace: a sustainable source of health ingredients



- Hydroxytyrosol > comselogoside > tyrosol > oleoside riboside
- **Hydroxytyrosol**, the major phenolic compound present in OP (>50%), is a well-known powerful antioxidant
- Food natural **preservative/nutritional** profile enhancer



- Food chemical, nutritional, and sensory properties
- Health claim (hydroxytyrosol)
- Cosmetic applications (antiaging, photo protection,...)

Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.

Food waste prevention is a top priority

The unavoidable waste should always be managed via circular systems rather than landfilled

Synchronize harvesting with the processing

Food upcycling is one of the most environmentally friendly way to mitigate food waste.

Waste-to-feed pathways should be further considered to help develop a more circular and lower-impact food system



Environmental issues



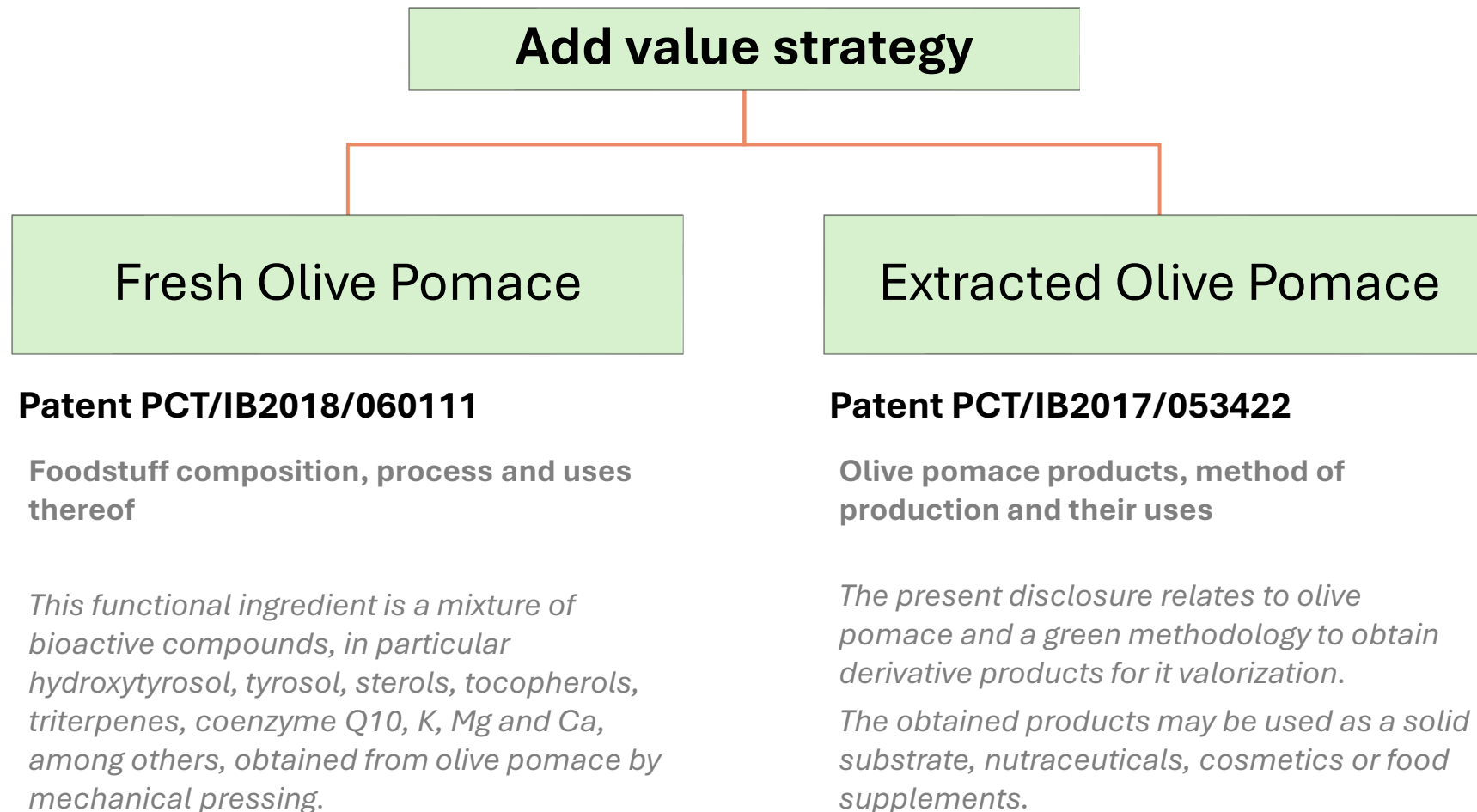
Increase in the world population



Climate changes impact on animal, ecosystems and human health

Olive pomace: a sustainable source of health ingredients





Nunes, M.A., Costa, A.S.G., & Oliveira, M.B.P.P. (2017).

Foodstuff composition comprising a derivate of olive pomace.

European Patent Application No 18847273.2 filed 08/07/2020; Priority date: 14/12/17 (PT 110455).

International Patent Classification: A23D 7/005, A23L 33/10, A23L 33/105, A23D 7/01.

Date of publication and mention of the grant: 03.01.2024 Bulletin 2024/01.

European Patent N° EP3723491 granted on January 3, **2024**.

Unitary Patent with legal effect in the following 17 territories: Austria, Belgium, Bulgaria, Denmark, Estonia, Finland, France, Germany, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Slovenia and Sweden.

United States:

US Patent Application Number 16/954,060 filed 15/06/2020; Priority date: 14/12/17 (PT 110455). U.S. Patent and Trademark Office.

N° US11,918,007 B2 granted on 5 March **2024**.



Fresh olive pomace

Olive pomace: a sustainable source of health ingredients



- Nunes, M.A., Costa, A.S.G., Pimentel, F. & Oliveira, M.B.P.P. (2016). ***Olive pomace products, method of production and their uses***. European Patent Application No 17735631.8 filed 09/01/2019; Priority date 09/06/16 (PT 109443). European Patent Office.

European patent 3468941 granted at **22.05.2024**

US Patent 10479958, Grant date: 19/11/19.
U.S. Patent and Trademark Office.

Patent No US10,479,958 B2



Topping (salty) - functional (?)

The formula developed with the lupine-based flour presented the best properties:

- ✓ Homogeneous
- ✓ Fluidity
- ✓ Brightness
- ✓ Phases separation not observed after 24 hours of processing and can be used to develop a food product with the technological characteristics of a topping



Olive pomace paste can be used as a natural ingredient in the development of new sustainable and innovative products, due to its fat content and profile, where the monounsaturated fatty acids, ashes and carbohydrates stand out.

- ✓ New product
- ✓ Sustainable
- ✓ Consumer trends (health, convenience, sustainability)



Incorporation into biscuits



Pasta incorporation
with improved nutritional value (protein, fiber and minerals)



Moisturizing mask

Olive pâtés prototypes

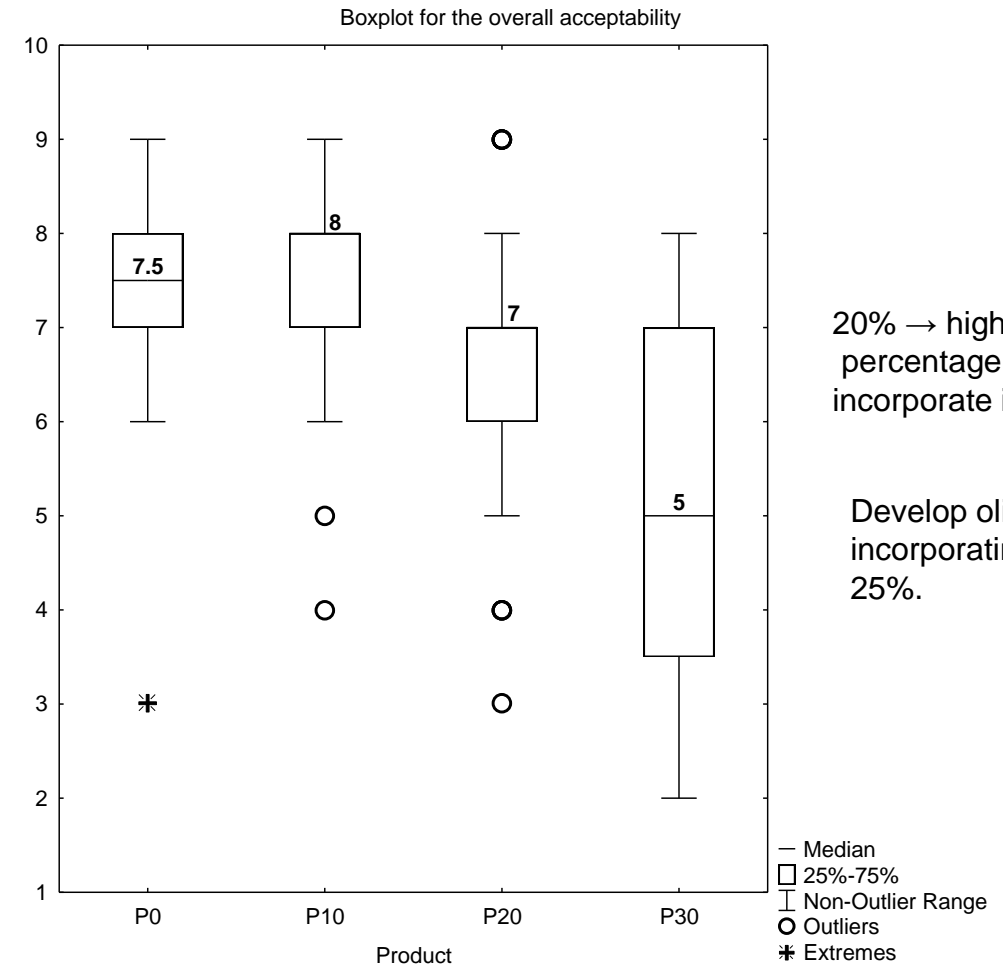


Acceptance test table with the developed olive pâtés.

- Gosto extremamente
- Gosto muito
- Gosto moderadamente
- Gosto ligeiramente
- Nem gosto/nem desgosto
- Não gosto ligeiramente
- Não gosto moderadamente
- Não gosto muito
- Não gosto extremamente

56 consumers

9 point-hedonic
 scale



20% → highest acceptable
 percentage of HT-OPP to
 incorporate in the olive pâtés.

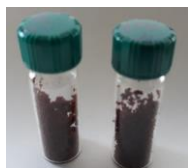
Develop olive pâtés
 incorporating 20% and
 25%.

Boxplots for the overall acceptability: Evaluation on a nine-point hedonic scale from 1 (“dislike extremely”) to 9 (“like extremely”).

Olive pomace: a multidimensional approach without residues



Fresh olive pomace



The olive oil-based-formulations with the functional ingredient showed a nutritionally interesting lipid profile due to its richness in a healthy fat (olive oil)



Olive oil is rich in oleic acid, associated to the cardiovascular health



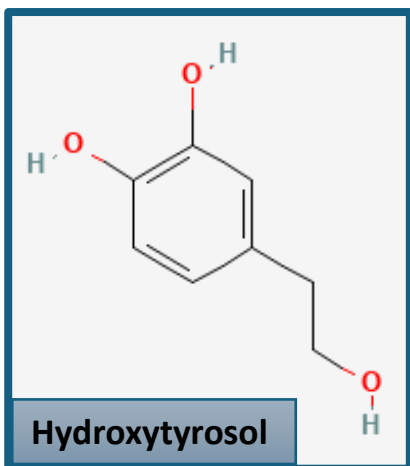
Vegetable creams developed with olive oil and olive pomace are different from those available on the market:

- the bioactive compounds (hydroxytyrosol) with health benefits
- the main ingredients are obtained without the use of solvents
- environmental impact from increased olive oil production can be reduced

Sprelive



Vegetable cream
- functional (?)



Fermented olive pomace– a novel foodstuff nutritionally balanced and microbiologically safe

- Phenolics reduction seems beneficial since it can reduce olive pomace's astringent/bitter flavour, improving consumers' acceptability of this foodstuff.
- The aroma is very pleasant, probably new aromatic compounds are being produced.
- Has fermented olive pomace a prebiotic effect? The total microorganisms increased during fermentation.
- A novel product very promising since it presents a nutritionally balanced composition and is microbiologically safe.

Method of obtaining a fermented olive pomace paste, *saccharomyces cerevisiae* and uses thereof PAT505 - FERMOPSY

Date of Deposit: 11/08/2023

Application No PCT/IB2023/058480

Holders: UP and REQUIMTE

Palmeira, J.D., Alves, R.C., Oliveira, M.B.P.P. & Sousa, H. (2023). *Method of obtaining a fermented olive pomace paste, fermented olive pomace paste, Saccharomyces cerevisiae and uses thereof*. International application number PCT/IB2023/058480 filed 28/08/23; Priority dates: 06/07/23 (PT 118803), 08/08/23 (PT 118861), 11/08/23 (PT 118880).



Semisolid composition for scalp and hair, method for obtaining and use thereof

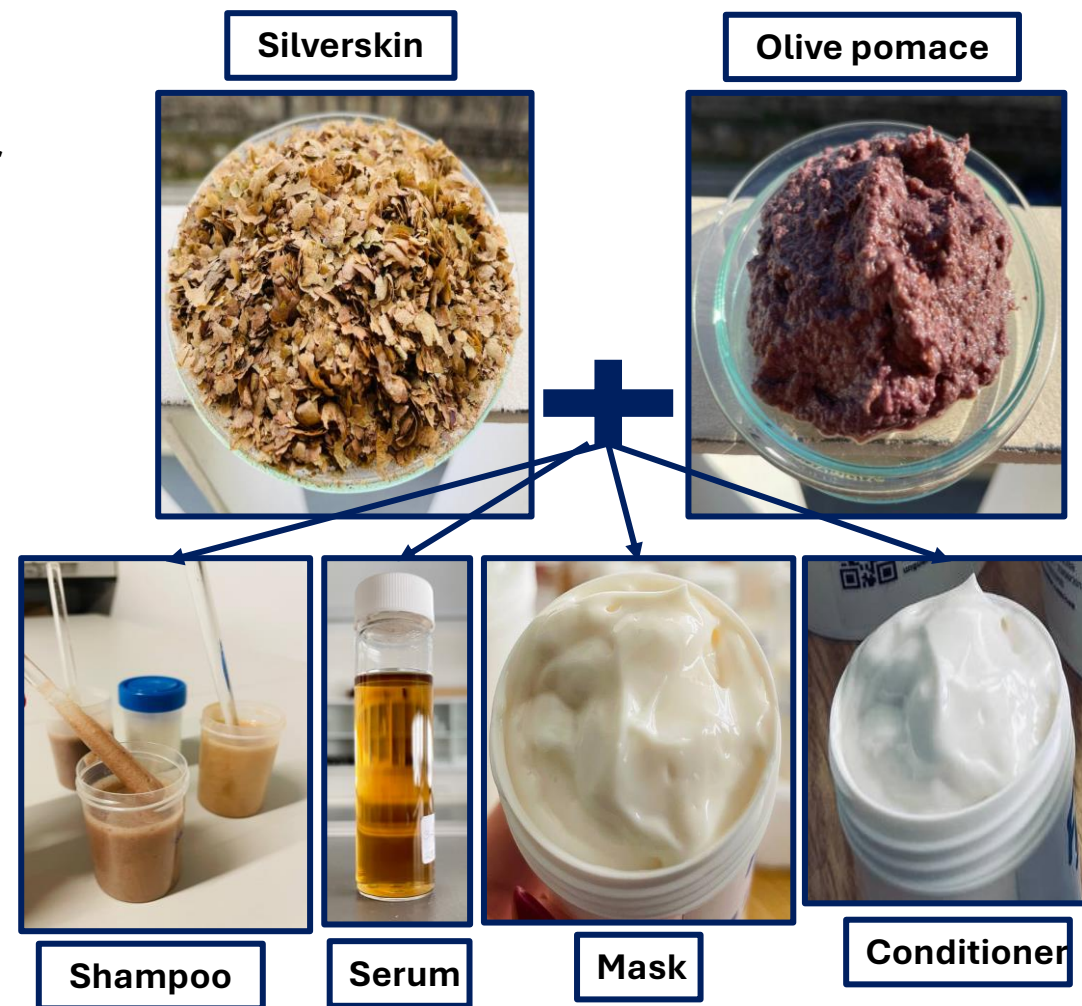
NanoNourishH

Date of Deposit: 31/08/2023

Application No PCT/IB2023/058621

Holders: UP and REQUIMTE

Fathi, F., Alves, R.C., Souto, E.M.B. & Oliveira, M.B.P.P. (2023). *Semisolid composition for scalp and hair, method for obtaining and use thereof*. International application number PCT/IB2023/058621 filed 31/08/23; Priority date: 31/08/23 (PT 118899).



Olive pomace: a sustainable source of health ingredients



ERRADICAR A FOME, ALCANÇAR A SEGURANÇA ALIMENTAR, MELHORAR A NUTRIÇÃO E PROMOVER A AGRICULTURA SUSTENTÁVEL



GARANTIR O ACESSO À SAÚDE DE QUALIDADE E PROMOVER O BEM-ESTAR PARA TODOS, EM TODAS AS IDADES



GARANTIR PADRÕES DE CONSUMO E DE PRODUÇÃO SUSTENTÁVEIS

