IN VITRO BIOACTIVITY OF OLIVE-OIL BY PRODUCTS

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Introduction

- Olive tree, Olea europea L., is one of the most important fruit trees in the Mediterranean area mainly due to its products, olive oil and table olives.
- The olive oil industry produces large amounts of by-products such as olive leaves, olive pomace and olive mill waste waters. These by-products are rich in phenolic compounds, being, therefore, considered a major ecological issue for their high toxicity.
- The recovery and reuse of olive oil industry by-products can be considered a major benefit, due to its numerous potential health properties.[1]

Aim

The aim of this work is the in vitro bioactivity of different olive oil by-products extracts.

Methods: In vitro assays

Cell viability studies

Immortalized human keratinocyte cells (HaCaT) as well as fibroblasts (L929) were used to study the cell viability by a MTT reduction method.

Antioxidant Capacity

The capacity to reduce the percentage of reactive oxygen species (ROS) was studied using a hydrogen peroxide solution and UVB light to induce the ROS production.

Enzymatic activity

The inhibitory effect on enzymatic activity of human neutrophil elastase (HNE), tyrosinase, collagenase and hyaluronidase was studied.

Results and Discussion

Cell viability Studies

All extracts demonstrated to be safe with moderate to high cell viability in both HaCaT cells and in fibroblasts.

Antioxidant Capacity

The ROS reduction values varied between 75%-97%, with exception of extract 21

Enzymatic activity

4 extracts showed a HNE inhibition values between 25%-75%.

7 extracts showed a HNE inhibition values between 75%-95%.

8 extracts showed a HNE inhibition values between 95%- 100%.

<table>
<thead>
<tr>
<th>Olive-by product extract</th>
<th>Enzymatic inhibition HNE (%) ± SD</th>
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<tbody>
<tr>
<td>5</td>
<td>100 ± 0</td>
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<tr>
<td>9</td>
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<tr>
<td>17</td>
<td>100 ± 0</td>
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<tr>
<td>20</td>
<td>100 ± 0</td>
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The olive by-products evaluated did not show high in vitro tyrosinase, collagenase and hyaluronidase inhibition.

Conclusion

Olive oil by-products extracts present strong antioxidant and anti-aging properties, inhibiting the human neutrophil elastase enzyme as well reducing the reactive oxygen species. Thus, they have potential to be used in cosmetics promoting circular economy of olive oil industry.

References:

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