Sweet cherry extracts as natural potential anticancer agents

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Graphical Abstract

Prunus avium L.

Lapins
Van
Ambrunes

3 sweet cherry extracts (80:19:1 v/v/p)

Total phenolics content
Total anthocyanins activity
Total antioxidant activity

Cytotoxic effect

MDA-MB-231 cell line
Abstract:

The extraction of bioactive compounds from by-products of the agri-food industry allows the obtaining of active biomolecules, low-cost raw materials that, after reuse, provide an economic yield as well as ecological and pharmacological benefits. The aim of this study was to evaluate the antitumoral potential of natural sweet cherry extracts, based on their functional composition. Three non-commercial sweet cherries (Lapins, Van, Ambrunes; Prunus avium L.) cultivars from Jerte Valley (Spain) were used as raw material for the elaboration of the different cherry extracts. These extracts were obtained by a hydro-alcoholic solution with citric acid (80:19:1 v/v/p) in agitation for 15 min at room temperature (avoiding light). Total phenolics content, total anthocyanins content, as well as total antioxidant activity were determined. Likewise, in vitro anticancer activity was assayed in triple negative breast cancer cell line (MDA-MB-231). All the extracts assayed possess high total phenolics and anthocyanins content, as well as elevated total antioxidant activity. Moreover, a remarkable cytotoxic effect was reported in all the three cherry extracts assayed. Sweet cherry extracts, derived from non-commercial cherry fruit, could be therefore considered as natural anticancer agents.

Keywords: Sweet cherry; by-product; sustainability; antioxidant; cancer
Introduction

Green and circular economy

- Antioxidant and anti-inflammatory capacity
- Sleep-wake cycle regulation
- Mood regulation (serotonin and cortisol)

Results and discussion

- Functional composition

<table>
<thead>
<tr>
<th></th>
<th>Total phenolics content</th>
<th>Total anthocyanins content</th>
<th>Total antioxidant activity</th>
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</thead>
<tbody>
<tr>
<td><strong>Lapins</strong></td>
<td>5112.29±1511.72</td>
<td>1892.44±575.92</td>
<td>20974.64±5268.64</td>
</tr>
<tr>
<td><strong>Van</strong></td>
<td>4986.35±637.31</td>
<td>2220.28±543.68</td>
<td>32707.85±4844.44</td>
</tr>
<tr>
<td><strong>Ambrunes</strong></td>
<td>3277.05±285.66</td>
<td>1118.49±187.58</td>
<td>20804.60±1202.49</td>
</tr>
</tbody>
</table>

Values are expressed as mean ± SD (mg/100 g of lyophilized cherry)
Results and discussion

- **In vitro cytotoxicity assay**

Dose-response curve of each extract on cell viability of MDA-MB-231 cell line after 24 h of treatment with different concentration of anthocyanins.

Values are presented as means ± SD of 5 separate experiments and expressed as percentage of control values (untreated samples). *P < 0.05 compared to control values.
Conclusions

Sweet cherry extracts possess a high phenolics and anthocyanins content and a potent total antioxidant activity.

A remarkable cytotoxic effect was observed in each extract in breast cancer cell line (MDA-MB-231).

Sweet cherry extracts could be a good natural anticancer agents.
Acknowledgments

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