Polyphenols characterization and toxicological evaluation of *Pterospartum tridentatum* leaf water extracts

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d

**Background:**

*Pterospartum tridentatum* Willk. (prickled broom) is an autochthonous plant, common in Portuguese territory. The leaves and stems are used in used to flavour rice, roast meat or hunting animals; leaves are also used as a condiment in salads; Despite its widespread use, no toxicological assessment of this plant has been performed, as far as we know.

**Goals:**

- polyphenols characterization of *P. tridentatum* leaf extract
- evaluation of antioxidant activity of *P. tridentatum* extract
- assessment of potential toxicological effects of *P. tridentatum* flowers water extracts.

**Chemical characterization:**

<table>
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<tr>
<th>Main Fragments</th>
<th>Compound</th>
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<tr>
<td>ESI “m/z”</td>
<td></td>
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<tr>
<td>MS2[447]: 285; MS3[285]: 267, 257, 243, 241, 217, 199, 175, 151</td>
<td>Isorhamnetin-O-diglucoside</td>
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<tr>
<td>MS2[653]: 477; MS3[477]: 315, 300</td>
<td>Isorhamnetin-O-(glucuronyl-glucoside)</td>
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**Polyphenols content:**

<table>
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<tr>
<th>Flavonoids</th>
<th>Phenols</th>
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<tr>
<td>(catechin equivalents: (GAE; mg Eq. g⁻¹)</td>
<td>mg Eq. g⁻¹)</td>
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<tr>
<td><em>R. officinalis</em></td>
<td>35.03 ± 0.20</td>
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<tr>
<td><em>P. tridentatum</em></td>
<td>62.64 ± 0.42</td>
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> *P. tridentatum* leaf extract showed a higher polyphenols content, than the *R. officinalis* extract (**p<0.001).*

**Toxicological evaluation:**

The results suggest that in the range of concentrations used the mitochondrial phosphorylative system is not directly inhibited by *P. tridentatum* leaves aqueous extract, although a partial dissociation between oxidative and phosphorylative systems must occur.

The results account for a partial energetic uncoupling induced by *P. tridentatum* leaf extract, decreasing membrane potential that induce a decrease in ROS production. Hence, the mild mitochondrial stress induced by the polyphenols present in *P. tridentatum* extract, that act as hormetic stimuli, can account for the antioxidant properties of *P. tridentatum* observed in vivo and contribute also to a higher mitochondrial flexibility. These hormetic stimuli can also be important in the prevention of other chronic pathologies, related with oxidative stress and the human modern nutritional milieu.

**References:**