Alternanthera brasiliana (Amaranthaceae): establishment of cellular culture, chemical profile and evaluation of antioxidant and antimicrobial activity.

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Abstract
Species from Alternanthera genus (Amaranthaceae Family), produces many compounds of pharmacological interest, however few chemical and pharmacological studies have been conducted with species from this genus. Alternanthera brasiliana, a herbaceous, perennial plant, is frequently found in Brazil, is popularly known as penicillin, terramicina, doril, and perpetua, and in traditional folk medicine is used to treat inflammation, pain, infection, diarrhea and cough. No biotechnological, antimicrobial and antioxidant activity investigation has previously been reported or prospection of bioactive compounds in this specie.

Key words:
Plant callus culture, Antioxidant, Antimicrobial.

Introduction
This study aimed the establishment of callus culture\(^1\) of Alternanthera brasiliana and evaluation their antioxidant capacity and antimicrobial activity. Once the callus culture was established (Figure 1), it was submitted to different cultivation conditions in order to evaluate alterations on the bioactives compounds production.

Results and Discussion
Using ORAC methodology, the callus of the ethanolic extract (at 25 µg/mL) presented an activity of 1183.22 µmol TE/g, a higher value than the one presented by Trolox and the plants extracts, indicating a high antioxidant activity (Table 1). On the antimicrobial\(^2,3\) activity experiment it was possible to observe that the extract of callus culture (at 0.5 mg/mL) showed inhibition of growth(26.54%) of the bacteria S. aureus compared to the positive control (bacteria without any extract applied). It was not observed any activity of growing inhibition to the yeast.

Table 1. Values of the antioxidant activity of different extracts from the samples of callus and plant at µmol TE/g.

<table>
<thead>
<tr>
<th>Solvents</th>
<th>Distilled water</th>
<th>Ethyl acetate</th>
<th>Ethanol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample of callus</td>
<td>902</td>
<td>110</td>
<td>1183</td>
</tr>
<tr>
<td>Sample of plant</td>
<td>717</td>
<td>495</td>
<td>535</td>
</tr>
</tbody>
</table>

Conclusions
It can be concluded that the callus extraction presented relevant values of antioxidant and antimicrobial activity. This fact justifies, last in part, the popular therapeutic use of this plant. It can be also concluded that the plant presents a satisfactory growth performance on callus culture.

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