Limonium brasiliense (Boiss) Kuntze, AN ALTERNATIVE TO ITS MEDICINAL PROPERTIES

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INTRODUCTION
Continuing our research of bioactive natural products on medicinal plants from southern Argentina and its potential applications, in particular its insecticidal activity against Rhizopertha dominica, we present the results obtained with the extract, sub-extracts and metabolites isolated from the polar extract from roots of Limonium brasiliense (Boiss.) Kuntze (Plumbaginaceae).

Limonium brasiliense is a perennial herb, known as “guaycurú”, distributed in Argentina, Uruguay and South of Brasil. Infusions from the roots are use in the treatment of hemorrhage, menstrual disorders, rheumatism and it is believed to have cardioprotective properties [1].

Rhizopertha dominica is one of the most widespread and destructive primary insect pests of stored products. Control of these insects is primarily dependent upon continued applications of synthetic insecticides. Although effective, their repeated use has resulted in the development of resistance; it has had undesirable effects on non-target organisms, environment and human beings. Because of this, interest has been put in plant products for fumigant action.

MATERIALS AND METHODS
Dried roots from L. brasiliense were milled and extracted with refluxing methanol. This extract was partitioned with different solvents of increasing polarity to obtain sub-extracts that were fractionated by silica gel column chromatography, for isolation and purification of the active compounds. Gallic acid and catechin derivates were identified. The elucidation of the isolated compounds were determined by 1H and 13C NMR spectra and confirmed by comparison with literature data. [2-3]

Rhizopertha dominica had been reared on wheat in the laboratory at 30ºC, 65- 75% r.h., under a photoperiod of 12 h light/ 12 h dark. A bioassay to evaluate the effect on the survival of beetles was conducted with the ethyl acetate and chloroform sub-extracts and with gallic acid, the major component isolated from the ethyl acetate sub-extract. To determine the fumigant toxicity the protocol was followed as previously described by Pascual Villalobos. [4]. Mortality was evaluated daily during 5 days. Probit analysis was used to estimate LT50 (lethal time) at 30% (W/W) by Micro Probit 3.0 software.

RESULTS
Table 1 shows the results of LT50 of the two sub- extracts and gallic acid.

DISCUSSION AND CONCLUSION
Both ethyl acetate and chloroform sub-extracts demonstrated to be toxic against R. dominica and there were no significant differences between them based on LT50. In particular, gallic acid was more effective than the ethyl acetate sub-extract from which it was isolated, which may be attributed to the fact that this is one of its major constituents. Similar results were founded by Regnault Roger et al [5] with gallic acid isolated from five Lamiaceae against Acanthoscelides obtectus.

Further research is in progress to isolate other active compounds from L. brasiliense to explain the results obtained with theses sub- extracts.

These results suggest that Limonium brasiliense is an important resource of biological relevance.

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REFERENCES

Table 1

<table>
<thead>
<tr>
<th>Sub- extract/compound</th>
<th>LT$_{50}$</th>
<th>95% CI</th>
<th>Slope± SE</th>
<th>X$^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>96.90</td>
<td>(79.20-143.96)</td>
<td>2.67±0.83</td>
<td>0.51</td>
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<tr>
<td>Ethyl acetate</td>
<td>96.38</td>
<td>(79.66-137.02)</td>
<td>2.83±0.85</td>
<td>0.84</td>
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<tr>
<td>Gallic acid</td>
<td>75.49</td>
<td>(50.37-171.53)</td>
<td>1.58±0.55</td>
<td>1.59</td>
</tr>
</tbody>
</table>

LT$_{50}$: Lethal Time 50 (hours); CI 95%: Confidence Interval of 95%; SE: Standard error.