Investigation of Presence of Bioactive Natural Products from *Lupinus Sericatus* and *Aesculus Sapindaceae*

Ben Wu, Roy K. Okuda
Department of Chemistry, College of Science

**Abstract**

The goal of the Okuda lab is to investigate whether bioactive natural products are found in plants that are native to the California ecosystem. Two of those plants, *L. Sericatus* (left) and *A. Sapindaceae* (right), were investigated.

Although neither of the plants investigated were active against brine shrimp, we will continue to work up these samples via an antimicrobial assay.

**Evaporation/Preparation of Crude Sample**

1. Breakdown of plant leaves into fine pieces (about 3 mm x 3mm)
2. Addition of sufficient methanol to cover all leaves
3. After 24 hours, decant solution
4. Repeat steps 1-3, end result: about 80-100 mL total dissolved plant material in methanol

**Brine Shrimp Toxility Assay**

*Artemia sp.* ("brine shrimp") are utilized as an indicator of biological activity. In a typical assay, 8-10 *Artemia* are placed in a well with 2.0mL brine water with 15 mL of sample in DMSO to be tested. After 24 hours, the number of dead *Artemia* are counted. Controls are brine alone, DMSO, and chomic acid (positive control).

**Brine Shrimp Assay Results**

<table>
<thead>
<tr>
<th>Genus/Species</th>
<th>ID #</th>
<th><em>1 ppm (avg)</em></th>
<th><em>10 ppm (avg)</em></th>
<th>50</th>
<th>Avg % Death (10 ppm)</th>
<th>Avg % Death (100 ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>L. Sericatus</em></td>
<td>CNP - 10DA</td>
<td>0</td>
<td>1.67</td>
<td>12.21</td>
<td>0</td>
<td>20.68</td>
</tr>
<tr>
<td><em>A. Sapindaceae</em></td>
<td>CNP - 10DA</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Control - DMSO</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>≤ 0</td>
<td>-</td>
<td>0.66</td>
</tr>
<tr>
<td>Control - Chropic Acid</td>
<td>-</td>
<td>-</td>
<td>8</td>
<td>≤ 0</td>
<td>-</td>
<td>100.00</td>
</tr>
</tbody>
</table>

**Conclusion**

Both *L. Sericatus* and *A. Sapindaceae* were found to be inactive against brine shrimp. Further workup includes an antimicrobial assay (Okuda lab) and structure analysis if bioactivity is identified.

**Acknowledgements & References**

- Los Gatos California Native Plant Society (CNPS)
- SJSU Undergraduate Research Program

**Image Credits**

- Image of *L. Sericatus*: CalFlora Nursery
- William Tran, Okuda lab