1. Introduction

- Forensic entomology: the use of insects to aid legal investigations by estimating postmortem interval, PMI (Agrawal et al., 2021).
- To accurately calculate PMI, precise and accurate identification of samples is vital (Harvey et al., 2003a, Harvey et al., 2003b).
- Entomological data from Arizona is limited, however.
- Therefore, this project aimed to determine biodiversity in the Southwestern United States.
- This was done by using DNA to identify forensically important blow flies.

2. Methods

- Flies were collected from January 3 - February 11, 2022 from Glendale, AZ, and Chandler, AZ.
- A leg was taken from each randomly selected fly and underwent Qiagen extraction using the DNeasy Blood and Tissue Kit.
- DNA was quantified using Qubit.
- An approx. 650bp region of the COI gene was amplified.
- DNA sequences were identified using BLASTN (NCBI) and sequenced using Sanger sequencing procedures and performed so that samples could be successfully amplified.
- Amplicons were run and visualized using gel electrophoresis (Figure 1).
- Successfully amplified products underwent Sanger sequencing (Figure 2).
- Successfully amplified products underwent Sanger sequencing and performed so that samples could be sequenced using Sanger sequencing.
- Sequences were identified using BLASTN (NCBI) and phylogenetic analysis performed in MEGA.

3. Results

- 28 samples were identified as *Lucilia sericata*, 13 were identified as *Calliphora coloradensis*, and 5 were identified as *Calliphora latifrons* (Table 1). Phylogenetic analysis showed distinct populations (Figure 3).

<table>
<thead>
<tr>
<th>Species</th>
<th>Number of samples</th>
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</thead>
<tbody>
<tr>
<td><em>L. sericata</em></td>
<td>13</td>
</tr>
<tr>
<td><em>C. coloradensis</em></td>
<td>28</td>
</tr>
<tr>
<td><em>C. latifrons</em></td>
<td>5</td>
</tr>
</tbody>
</table>

4. Discussion

- Three forensically important blow flies identified in the Phoenix Area.
- Species specific to climate (*C. coloradensis* and *C. latifrons*):
  - Cold-adapted species
- Similar genetic findings in Harvey et al., 2003a — *L. sericata* are dominant
- Hot-adapted species
- Phylogenetic analysis showed distinct populations of species.
- Possible migration into temporal climates to adapt to weather changes
- Limited research on *C. coloradensis* and *C. latifrons*

5. Future Work

- More research on *C. coloradensis* and *C. latifrons*.
- Examine flies from other areas of the southwestern United States, such as California and New Mexico.
- Examine flies from southern Louisiana and compare the species to the ones found in Arizona.
- Examine distinct populations collected from surrounding states.

References