Analysis of C. elegans on Drugs Lab Report

Philip Kim

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#	Drug A	Control A	Drug A - Control A
1	40.20	22.40	17.80
2	7.60	9.90	-2.30
3	0.00	6.20	-6.20
4	15.10	18.10	-3.00
5	10.50	20.50	-10.00
6	5.50	2.00	3.50
7	22.50	25.00	-2.50
8	12.60	23.30	-10.70
9	3.00	15.00	-12.00
10	0.00	11.00	-11.00

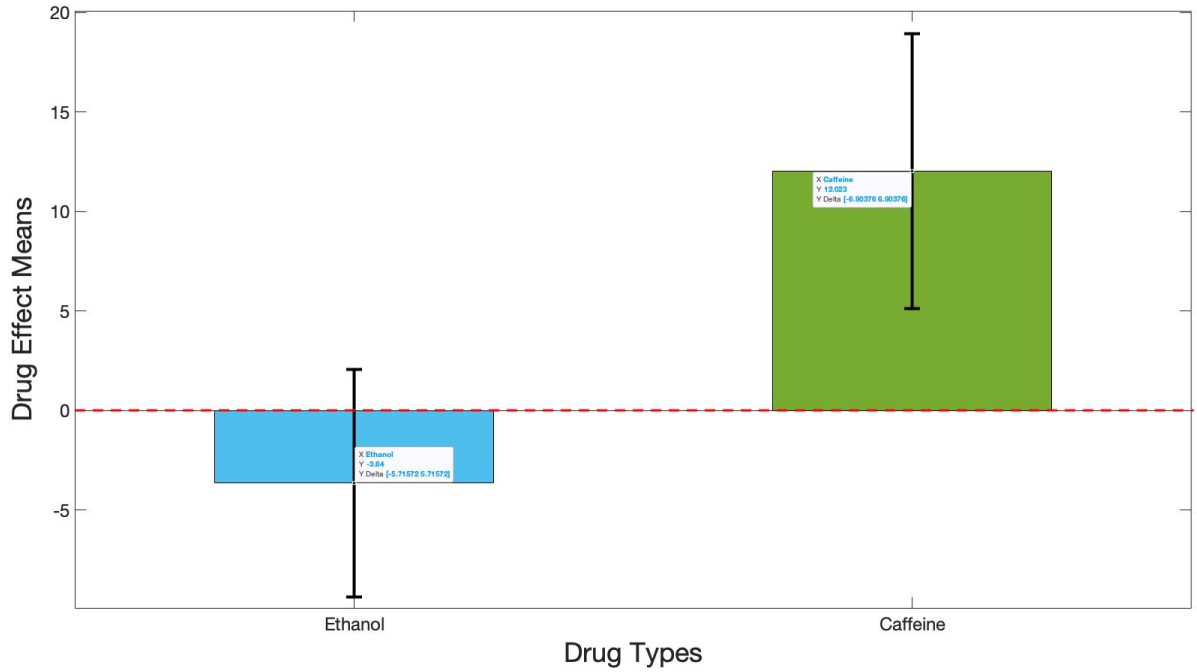
Drug A Effect:

$$
\begin{aligned}
N &= 10 \\
\overline{\mathbf{A}} &= \frac{\mathbf{A}_1+\mathbf{A}_2+\cdots+\mathbf{A}_N}{N} \\
&= \boxed{-3.64} \\
\sigma_{\mathbf{A}} &= \sqrt{\frac{|\mathbf{A}_1-\overline{\mathbf{A}}|^2+\cdots+|\mathbf{A}_N-\overline{\mathbf{A}}|^2}{N-1}} \\
&= \boxed{9.04} \\
\epsilon_{\mathbf{A}} &= \frac{\sigma_{\mathbf{A}}}{\sqrt{N}} \\
&= \boxed{2.86} \\
\mathcal{CI}_{\mathbf{A}} &= 2 \cdot \epsilon_{\mathbf{A}} \\
&= \boxed{5.72 \ (95\% \ \mathcal{CI}_{\mathbf{A}})} \\
\textit{Upper } \mathcal{CL}_{\mathbf{A}} &= \overline{\mathbf{A}} + (2 \cdot \epsilon_{\mathbf{A}}) \\
&= \boxed{2.08} \\
\textit{Lower } \mathcal{CL}_{\mathbf{A}} &= \overline{\mathbf{A}} - (2 \cdot \epsilon_{\mathbf{A}}) \\
&= \boxed{-9.36}
\end{aligned}
$$

#	Drug B	Control B	Drug B - Control B
1	33.70	26.30	7.40
2	18.90	8.00	10.90
3	15.00	9.00	6.00
4	19.40	20.60	-1.20
5	41.20	13.57	27.63
6	49.80	18.50	31.30
7	36.10	21.90	14.20
8	28.50	24.90	3.60
9	23.90	22.10	1.80
10	35.50	16.90	18.60

Drug B Effect:

$$
\begin{aligned}
N &= 10 \\
\overline{\mathrm{B}} &= \frac{\mathrm{B}_1+\mathrm{B}_2+\cdots+\mathrm{B}_N}{N} \\
&= \boxed{12.04} \\
\sigma_{\mathrm{B}} &= \sqrt{\frac{\left|\mathrm{B}_1-\overline{\mathrm{B}}\right|^2+\cdots+\left|\mathrm{B}_N-\overline{\mathrm{B}}\right|^2}{N-1}} \\
&= \boxed{10.92} \\
\epsilon_{\mathrm{B}} &= \frac{\sigma_{\mathrm{B}}}{\sqrt{N}} \\
&= \boxed{3.45} \\
\mathcal{CI}_{\mathrm{B}} &= 2 \cdot \epsilon_{\mathrm{B}} \\
&= \boxed{6.90\ (95\%\ \mathcal{CI}_{\mathrm{B}})} \\
\textit{Upper}\ \mathcal{CL}_{\mathrm{B}} &= \overline{\mathrm{B}} + (2 \cdot \epsilon_{\mathrm{B}}) \\
&= \boxed{18.83} \\
\textit{Lower}\ \mathcal{CL}_{\mathrm{B}} &= \overline{\mathrm{B}} - (2 \cdot \epsilon_{\mathrm{B}}) \\
&= \boxed{5.12}
\end{aligned}
$$



1. What was your hypothesis?

- My hypothesis on C. elegans on ethanol and caffeine would have a similar effect as humans would since we share a common ancestor. For humans, ethanol is a downer while caffeine is a upper. I would expect drug **A** to be on the negative side of the graph and drug **B** to be on the positive side of the graph with both drugs to have significant differences.

2. Does the data support your hypothesis? In other words, what were the results of the experiment? Did Drug **A** have a significant positive or negative effect? Did Drug **B** have a significant positive or negative effect?

- Drug **A**'s confidence interval overlaps with zero, therefore ethanol has no significant difference on C. elegans.

- Drug **B**'s confidence interval do not overlap with zero, therefor caffeine has a significant difference on C. elegans.

3. If the data does not show significance, why might this be?

- Drug **A** has no significant difference on C. elegans because

4. Do you think it's an issue that Robyn knew which side of the slide was the control and which side contained the drug? Could this influence results?

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