Comparing Two Mosses Lab Report

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Table 1: Scleropodium obtusifolium

Length	Width	W:L
2.36	1.62	0.6864
2.67	1.65	0.6180
2.95	1.87	0.6339
2.16	1.29	0.5972
1.96	1.29	0.6582
2.82	1.76	0.6241
2.64	1.67	0.6326
2.97	1.9	0.6397
2.57	1.53	0.5953
2.67	1.8	0.6742
2.21	1.47	0.6652
2.91	1.91	0.6564
2.08	1.31	0.6298
2.54	1.62	0.6378
2.35	1.44	0.6128

$$
\begin{aligned}
n &= 15 \\
\overline{x} &= \frac{x_1 + x_2 + \cdots + x_n}{n} \\
\sigma_x &= \sqrt{\frac{|x_1 - \overline{x}|^2 + |x_2 - \overline{x}|^2 + \cdots + |x_n - \overline{x}|^2}{n-1}} \\
\epsilon_x &= \frac{\sigma_x}{\sqrt{n}} \\
\overline{W:L} &= 0.6374 \\
\sigma_{W:L} &= 0.0267 \\
\epsilon_{W:L} &= 0.0069
\end{aligned}
\tag{1}
$$

Table 2: Scleropodium possible new-sp

Length	Width	W:L
1.82	1.65	0.9066
2.41	2.21	0.9170
2.03	1.77	0.8719
2.16	2	0.9259
2.18	1.96	0.8991
1.95	1.86	0.9538
2.61	2.25	0.8621
2.41	2.11	0.8755
2.46	2.1	0.8537
1.86	1.75	0.9409
2.15	1.78	0.8279
2.13	1.9	0.8920
1.89	1.59	0.8413
2.78	2.44	0.8777
2.49	2.47	0.9920

$$
\begin{aligned}
n &= 15 \\
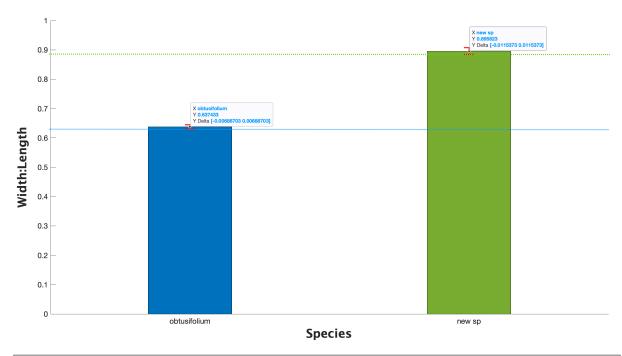\overline{x} &= \frac{x_1 + x_2 + \cdots + x_n}{n} \\
\sigma_x &= \sqrt{\frac{|x_1 - \overline{x}|^2 + |x_2 - \overline{x}|^2 + \cdots + |x_n - \overline{x}|^2}{n - 1}} \\
\epsilon_x &= \frac{\sigma_x}{\sqrt{n}} \\
\overline{W:L} &= 0.8958 \\
\sigma_{W:L} &= 0.0447 \\
\epsilon_{W:L} &= 0.0115
\end{aligned}
\tag{2}
$$

The chart shows a bar labeled "obtusifolium" (blue) with annotations:
X **obtusifolium**
Y **0.637433**
Y Delta **[-0.00688703 0.00688703]**

and a bar labeled "new sp" (green) with annotations:
X **new sp**
Y **0.895823**
Y Delta **[-0.0115373 0.0115373]**

Axis labels: **Width:Length** (y-axis), **Species** (x-axis)

In the bar chart above, are the length-to-width ratios for Scleropodium obtusifolium and Scleropodium possible new-sp. As you can see from both error bars and the dashed lines across with no overlaps, we can conclude that there is a statistical significant difference meaning the populations represent different species.