

# Comparing Two Mosses Lab Report

Philip Kim

February 22, 2021

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

$$n = 15$$

$$\bar{x} = \frac{x_1 + x_2 + \cdots + x_n}{n}$$

$$\sigma_x = \sqrt{\frac{|x_1 - \bar{x}|^2 + |x_2 - \bar{x}|^2 + \cdots + |x_n - \bar{x}|^2}{n - 1}}$$

$$\epsilon_x = \frac{\sigma_x}{\sqrt{n}}$$

$$\overline{W:L} = 0.6374$$

$$\sigma_{W:L} = 0.0267$$

$$\epsilon_{W:L} = 0.0069$$

(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

$$n = 15$$

$$\bar{x} = \frac{x_1 + x_2 + \cdots + x_n}{n}$$

$$\sigma_x = \sqrt{\frac{|x_1 - \bar{x}|^2 + |x_2 - \bar{x}|^2 + \cdots + |x_n - \bar{x}|^2}{n - 1}}$$

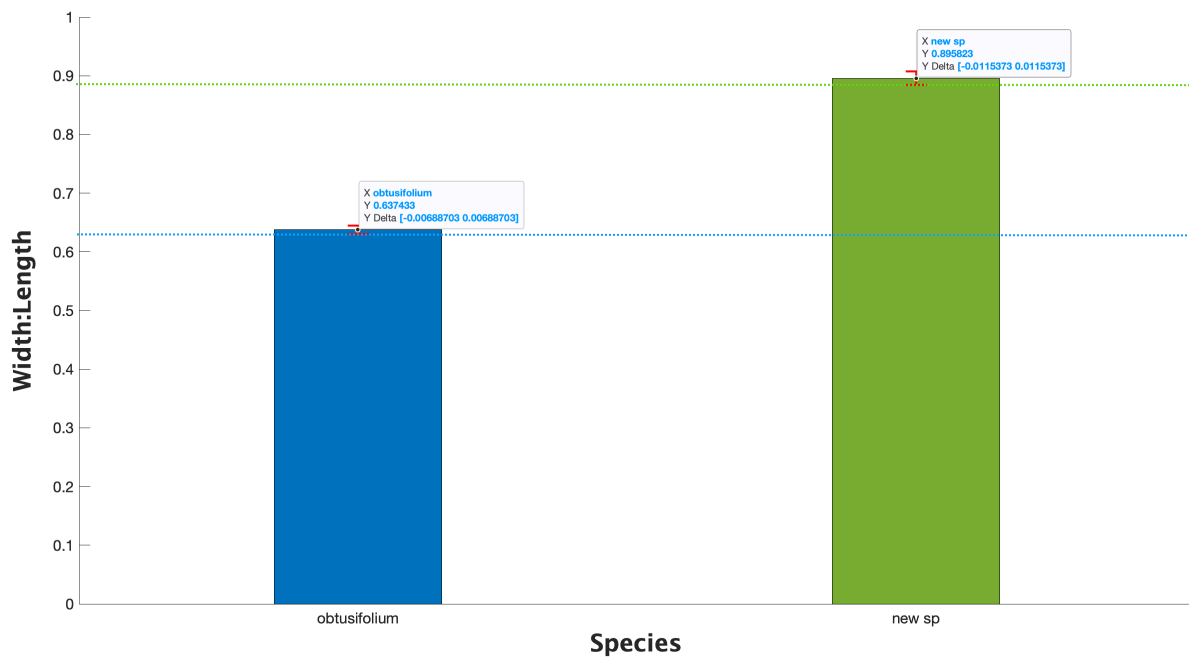
$$\epsilon_x = \frac{\sigma_x}{\sqrt{n}}$$

$$\overline{W:L} = 0.8958$$

$$\sigma_{W:L} = 0.0447$$

$$\epsilon_{W:L} = 0.0115$$

(2)



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.