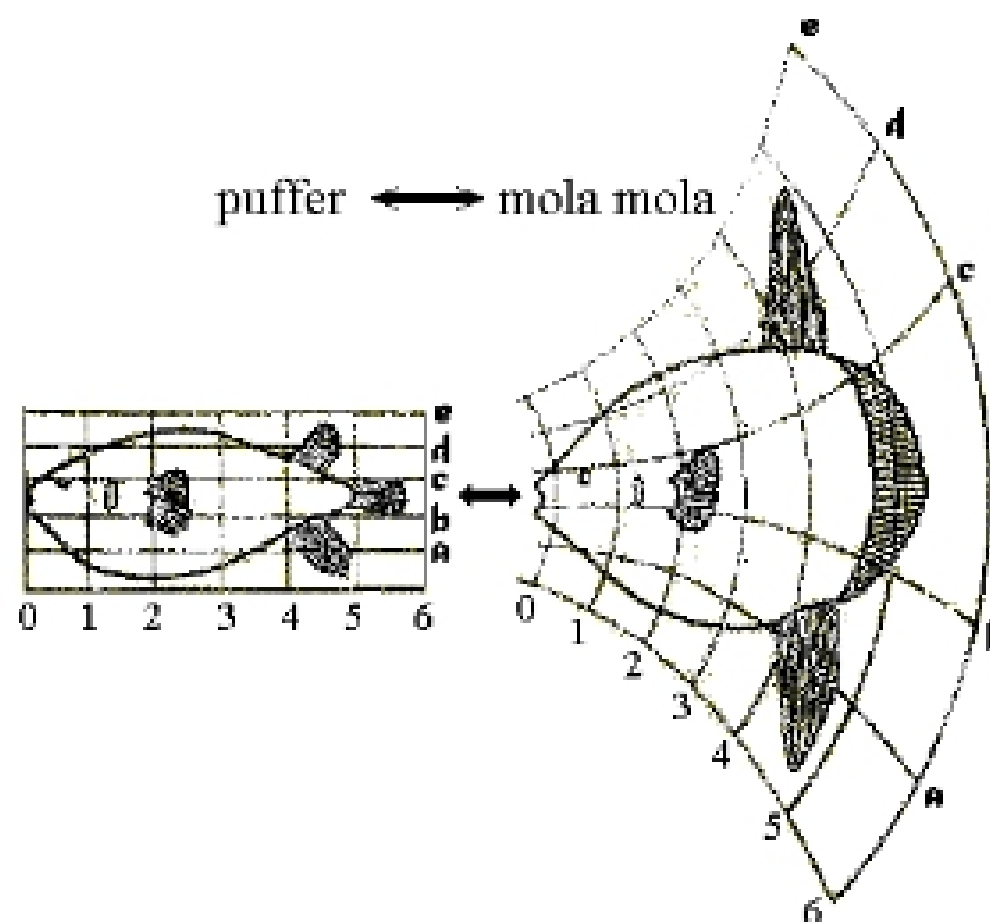


Morphometrics

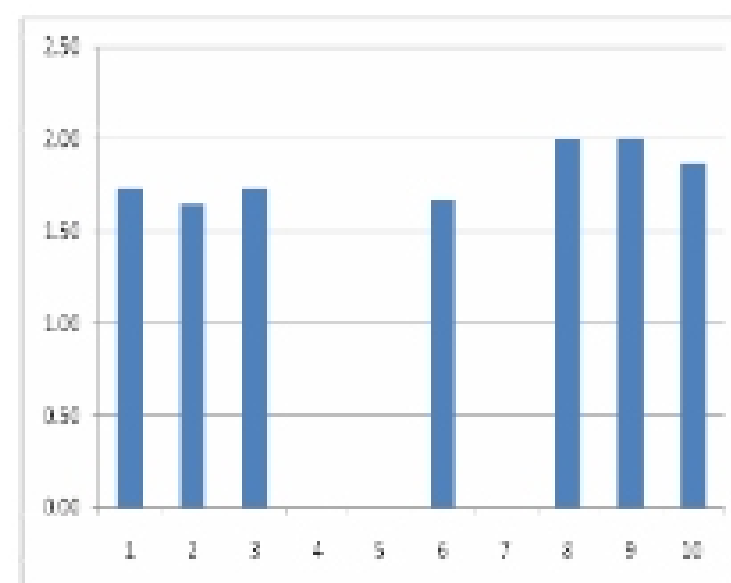
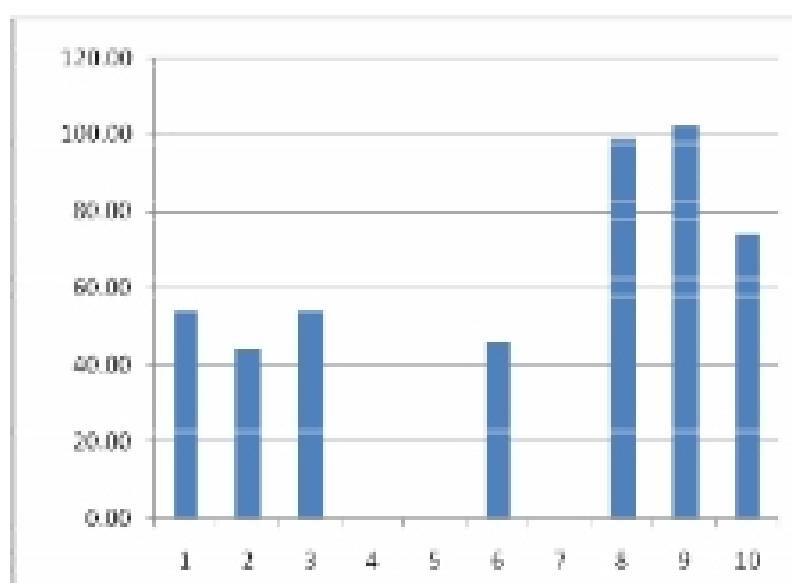
Morphometrics is the branch of mathematics studying the metrical and statistical properties of shapes and shape changes of geometric objects like molecules, fossils, brains, bird wings, ancient handcraft, modern cars, etc.

On Growth and Form Sir D'Arcy W. Thompson, 1917 - The mathematization of natural history. Thompson comes out punching with an array of arguments and stresses the importance of understanding the natural world quantitatively, but is limited philosophically to descriptive and classificatory methods (although embryology had already embarked on experimental manipulation).

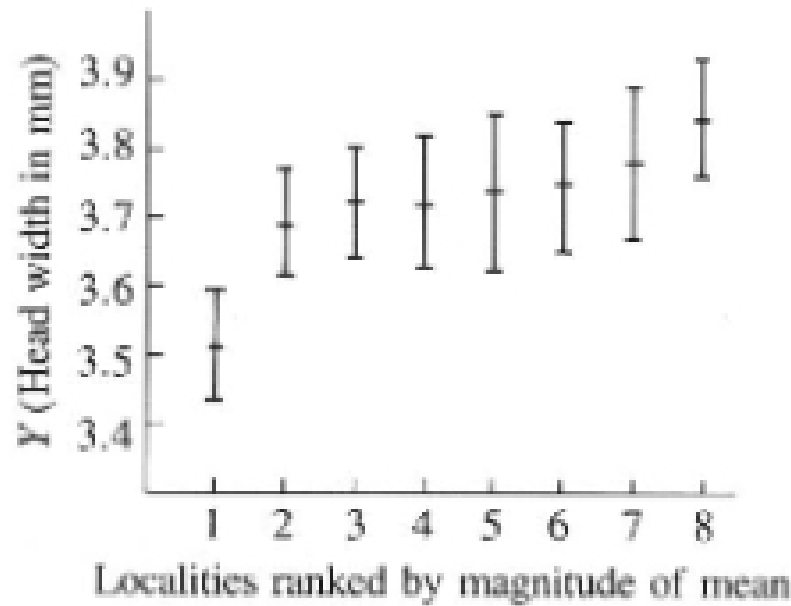


Traditional Approaches:

Univariate data plots (X) -- The distribution of the variance in character measurements should always be normally distributed, Data transformations -- why alter your data?



Raw Data



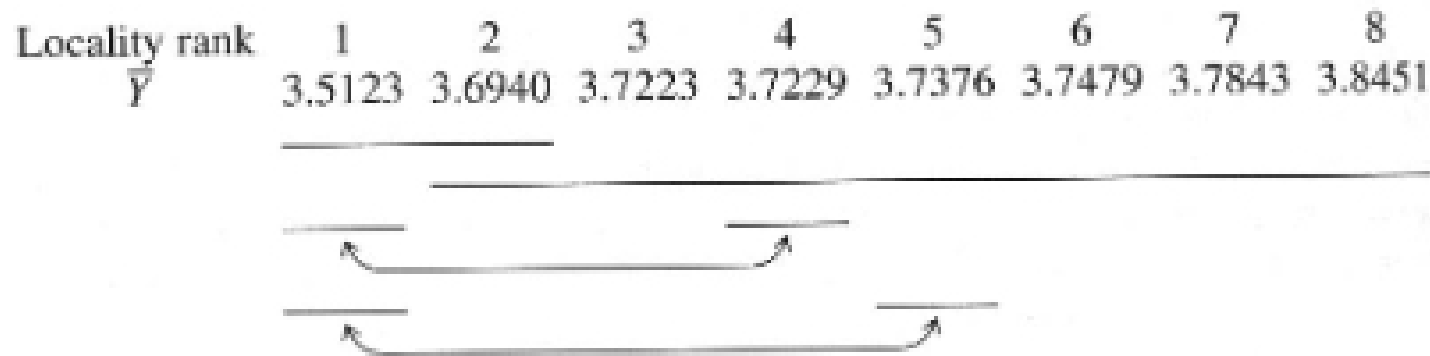
Log Transformed

Multiple Comparison Tests

Student-Newman Kuels (SNK)
 Tukey-Kramer
 SS-STP

	Ranked localities							
	1	2	3	4	5	6	7	8
1	—	.1586	.1586	.1748	.1943	.1713	.1883	.1586
2	.1817*	—	.1586	.1748	.1943	.1713	.1883	.1586
3	.2100*	.0283	—	.1748	.1943	.1713	.1883	.1586
4	.2106*	.0289	.0006	—	.2077	.1864	.2021	.1748
5	.2253*	.0436	.0153	.0147	—	.2048	.2192	.1943
6	.2356*	.0539	.0256	.0250	.0103	—	.1991	.1713
7	.2720*	.0903	.0620	.0614	.0467	.0364	—	.1883
8	.3328*	.1511	.1228	.1222	.1075	.0972	.0608	—

Tukey-Kramer



SS-STP

Bivariant data plots (X,Y) -- Correlations between morphological characters. Data exploration -- should I plot everything? Two morphological values can be combined into a single variable or ratio, Ratios are excellent for removing size, weight, etc. from a term, but what happens to the variance? Is it still normally distributed in the new term?

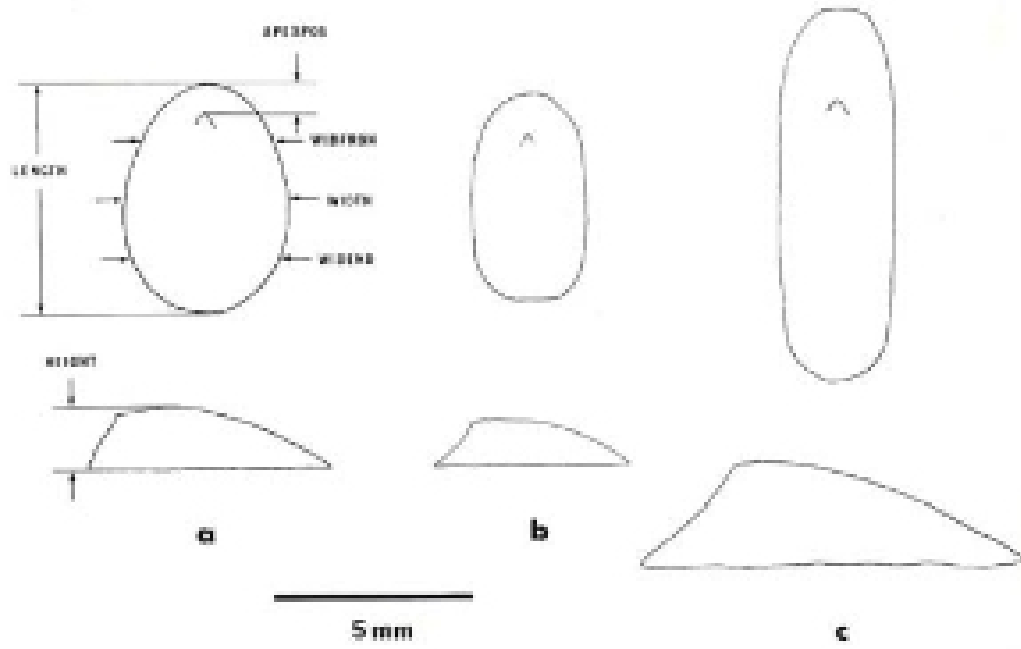


Fig. 1. Dorsal and lateral views of (a) the oval form of *Notosacma depicta*, (b) *N. leptoma*, and (c) the compressed form of *N. depicta*.

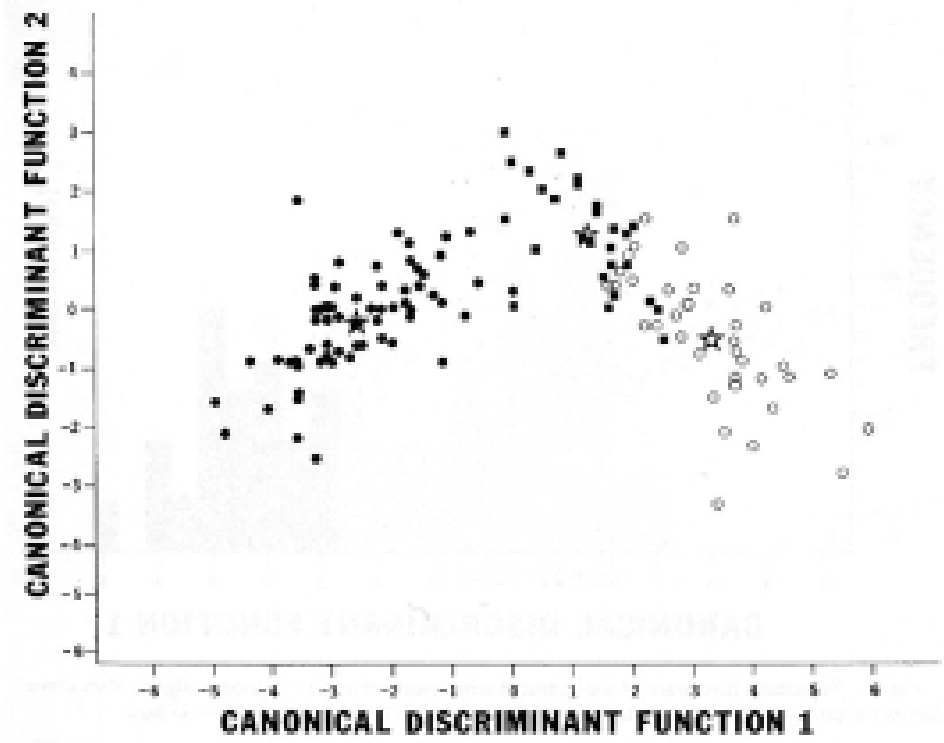


Fig. 2. Scatter diagram of individual discriminant function scores for 3 group analysis. ● = compressed forms, ■ = *Notosacma leptoma*, ○ = oval form, □ = group centroids.

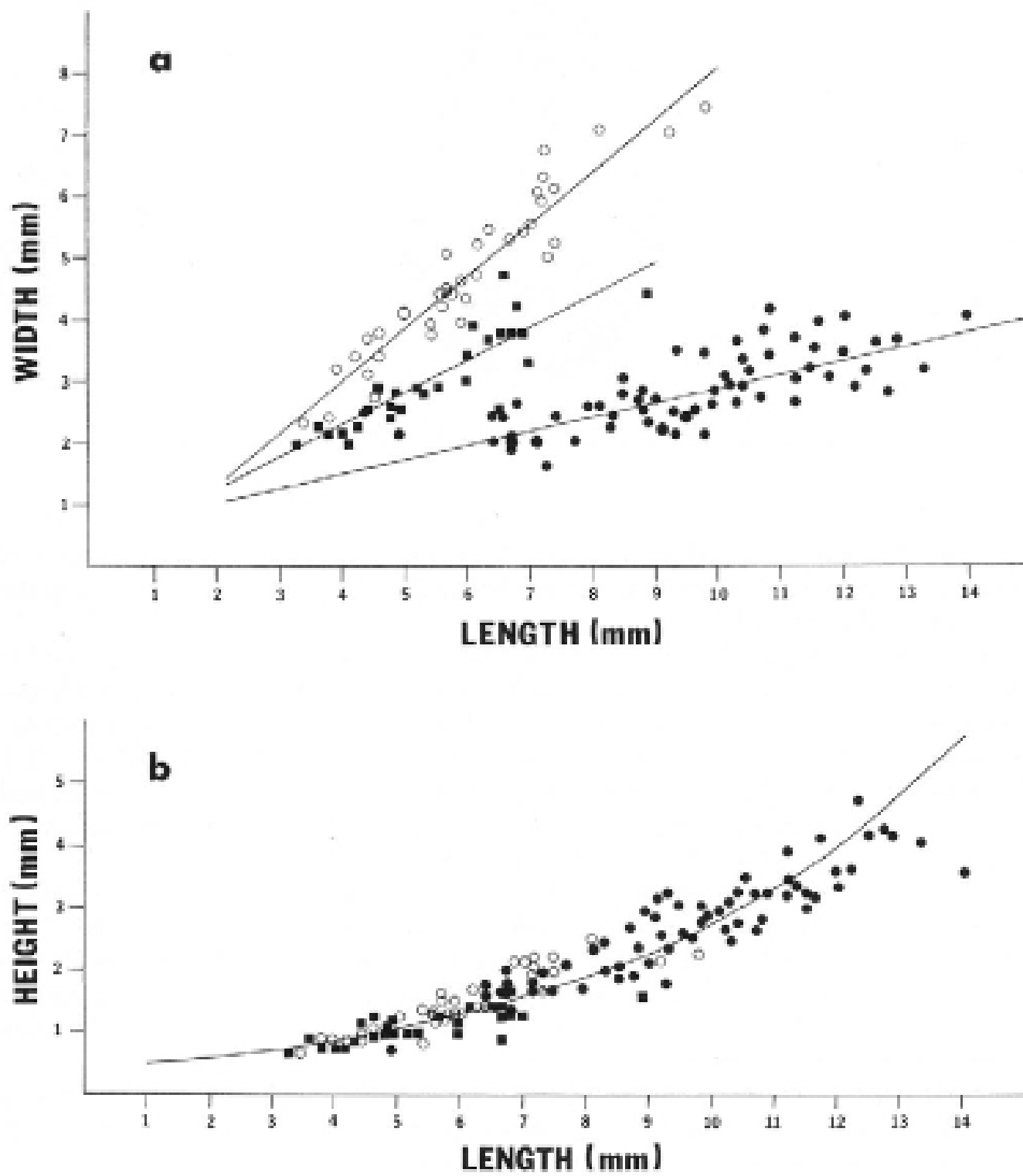


Fig. 4. Scatter diagram and fitted regression lines of length on (a) width and (b) height. ● = compressed form, ■ = *Notosacma leptoma*, ○ = oval form. Correlation coefficients (a) ● = .7717, ■ = .9007, ○ = .9266; (b) .9307.