GL21A Palaeontology Morphometrics II

I. Multivariate Analysis

A. Based on Correlations

B. Dimension Reduction

II. Factor Analysis – Principal Component Analysis

-usually based on Correlations between characters

- **Reduces variation into a few more easily visualized combinations (principal components).**
- **Describes which of your original variables contribute most to variation between samples.**
- **Each sample is given a score on each of the newly created principal components.**
- **Allows you to plot samples on these Prin. Comp. so that you can see variation in many characters or variables on 2 or 3 axes.**
- **Discrete groupings on these plots may indicate distinct morphospecies.**

III. Cluster Analysis (grouping similar specimens)

A. Based on Similarity or Dissimilarity

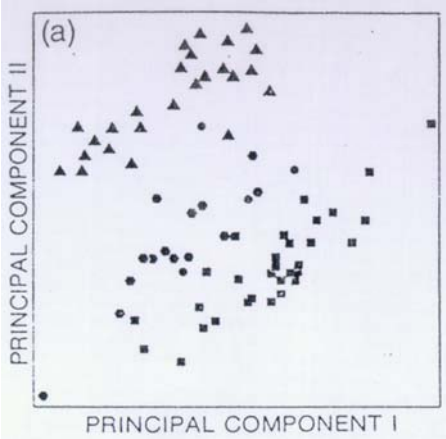
B. The Dendrogram – shows groupings of similar specimens

C. Clusters of similar specimens are potentially morphospecies

IV. Typical outline of analysis of fossil morphospecies

- **Character analysis and measurement of fossil population**
- **Univariate analysis**
- **Principal Component Analysis to examine and summarize variation in all characters**
- **Cluster Analysis to examine if there are any discrete clusters**
- **Further analysis to determine what distinguishes the clusters**

Three possible species based on Principal Component Analysis



Dendrogram from Cluster Analysis showing 2 possible morphospecies