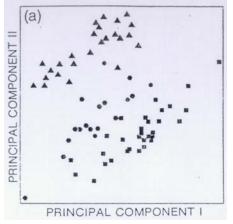
- GL21A Palaeontology Morphometrics II
- I. Multivariate Analysis
  - A. Based on Correlations
  - B. Dimension Reduction
- II. Factor Analysis Principal Component Analysis

-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

Dendrogram	usin	g Averag	go Linkag	e (Betwee	n Groups)		
			Rescale	d Distanc	e Cluster Co	ombine	
CASE		0	5	10	15	20	25
Label	Num	******	*****	+	+		+
PV5B	27	-+					
PV1	28	-+					
PV5A	26	-+-+					
PV3	25	-+ +	· · · ·				
PV2A	23	-+ I	I				
PV2B	24	-+-+	+				
PV4	22	-+	I				I
UC306a	32	-+-+	I				
UC306b	33	-+ +					T
PG9	30	-+ I					Ť
PV5	31	-+-+					Ť
PG8	29	-+		÷ .			
PG7B	13	-+					7
PG3A	14	-+					111111111111111111111111111111111111111
PG7A	12	-++					÷
PC2A	15	-+ I					Ť
PC2B	16	-+ +					
PC4A	19	-+-+ I		I			-
PC3	21	-+ +-+		Î			I
PC6	17	-+ I		Î			i
PC5	18	-+-+		÷			
PC1	20	-+		I			
PG1A	1	-+		ĩ			
PG1B	2	-+	I	Î			
PG6A	10	-+-+	-	+			
PG6B	11						
PG4A	6	-+-+					
PG4A PG4B	7	-+-+	I				
PG4B PG5A	8	-++	-				
PG5B	9		+				
PG3B PG2A	3	-+ + -+ I					
PG2A PG2B	4						
	5	-++					
PG3B	2	-+					