Supplementary Online Material (SOM)

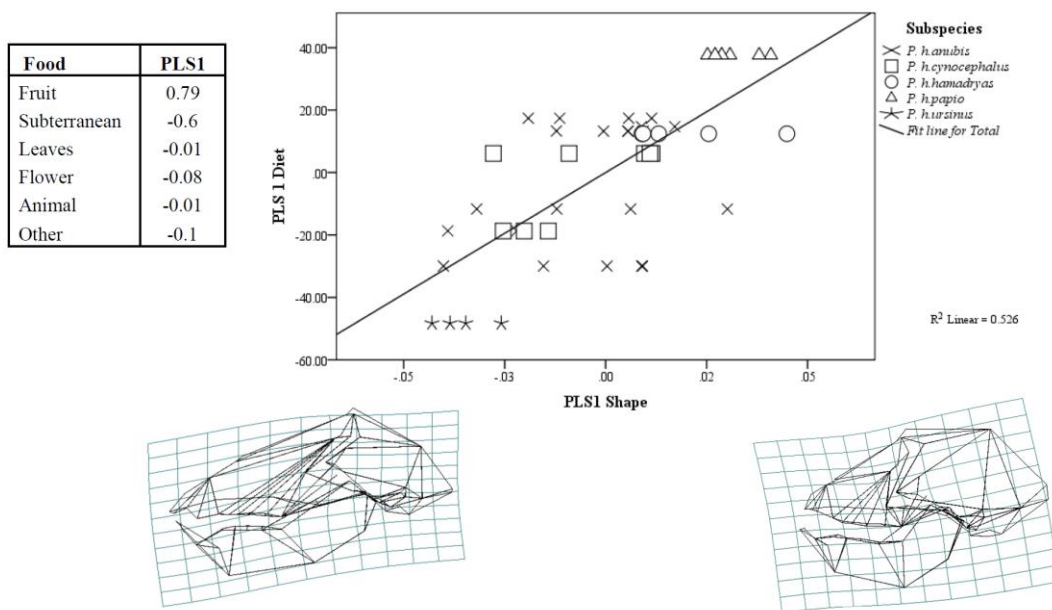| Food	PLS1
Fruit	0.79
Subterranean	-0.6
Leaves	-0.01
Flower	-0.08
Animal	-0.01
Other	-0.1

Figure S1: Scatter plot of scores for the first PLS between diet and shape for full baboon sample. Loadings for interpretation of the dietary axis are given in the table beside the axis and wireframes show the morphological extremes of the axis of covariation (exaggerated by a factor of 3).

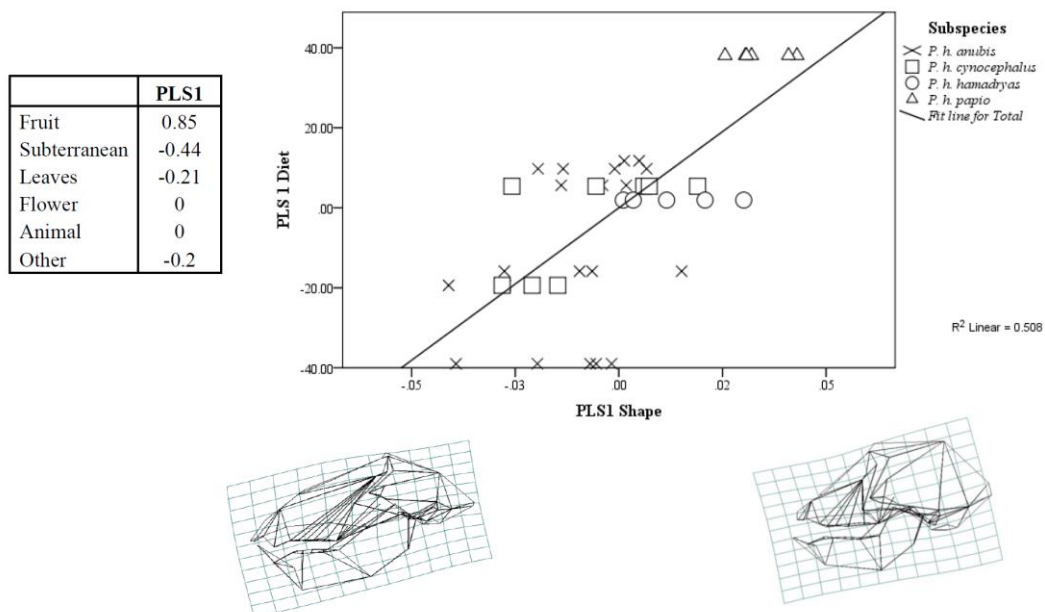|	PLS1
Fruit	0.85
Subterranean	-0.44
Leaves	-0.21
Flower	0
Animal	0
Other	-0.2

Figure S2: Scatter plot of scores for the first PLS between diet and shape without *Papio ursinus*. Loadings for interpretation of the dietary axis are given in the table beside the axis and wireframes show the morphological extremes of the axis of covariation (exaggerated by a factor of 3).

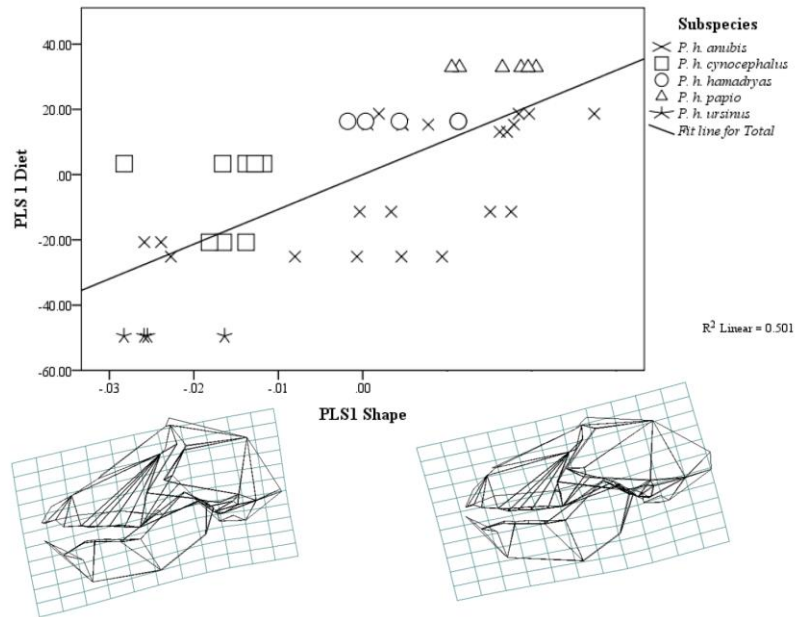|	PLS1
Fruit	0.72
Subterranean	-0.67
Leaves	0.13
Flower	-0.13
Animal	0.01
Other	-0.07

Figure S3: Scatter plot of scores for the first PLS between diet and size-controlled shape for full baboon sample. Loadings for interpretation of the dietary axis are given in the table beside the axis and wireframes show the morphological extremes of the axis of covariation (exaggerated by a factor of 3).

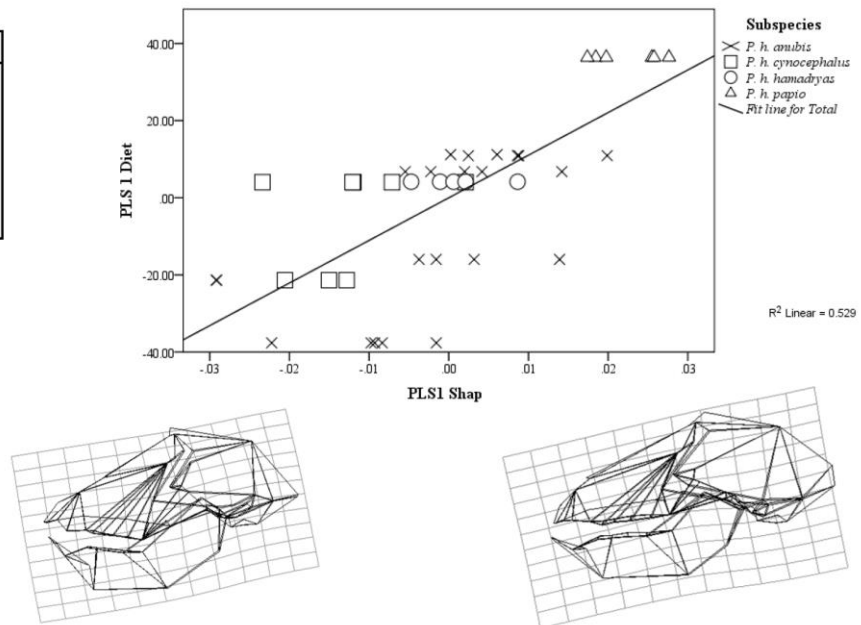|	PLS1
Fruit	0.83
Subterranean	-0.51
Leaves	-0.13
Flower	-0.01
Animal	0.01
Other	-0.17

Figure S4: Scatter plot of scores for the first PLS between diet and size-controlled shape without *P. ursinus*. Loadings for interpretation of the dietary axis are given in the table beside the axis and wireframes show the morphological extremes of the axis of covariation (exaggerated by a factor of 3).

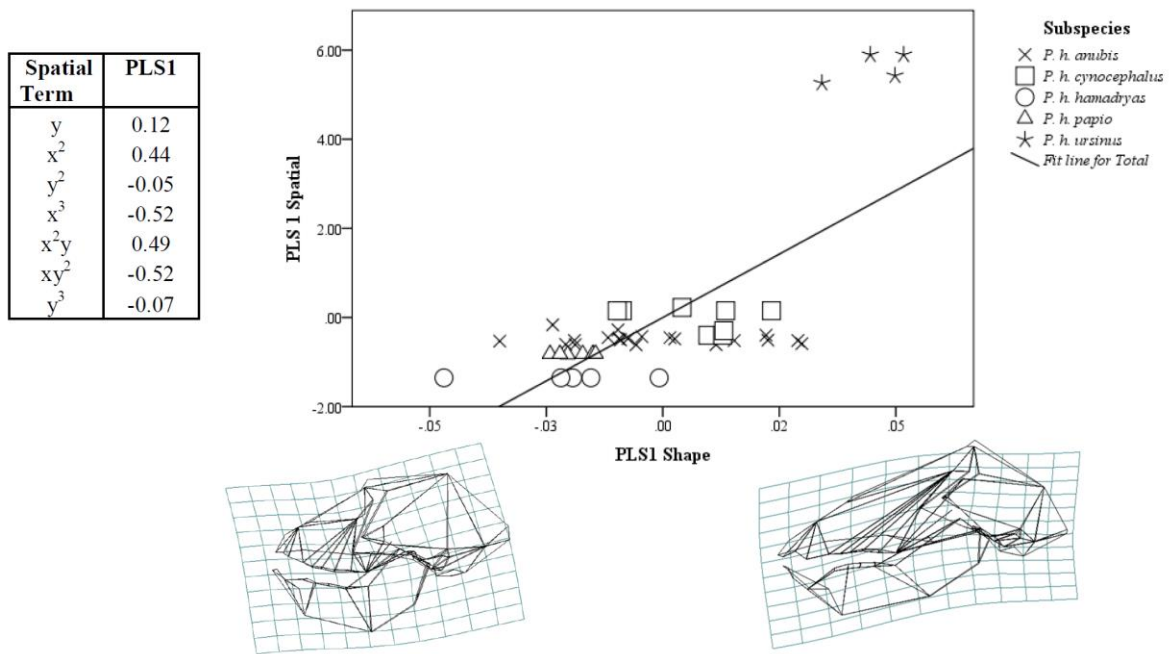| Spatial Term	PLS1
y	0.12
x^2	0.44
y^2	-0.05
x^3	-0.52
x^2y	0.49
xy^2	-0.52
y^3	-0.07

Figure S5: Scatter plot of PLS scores for the first PLS axis between geography and baboon shape. Wireframes show the morphological extremes of the axis of covariation (exaggerated by a factor of 3). Loadings are given in the table adjacent to the spatial axis.

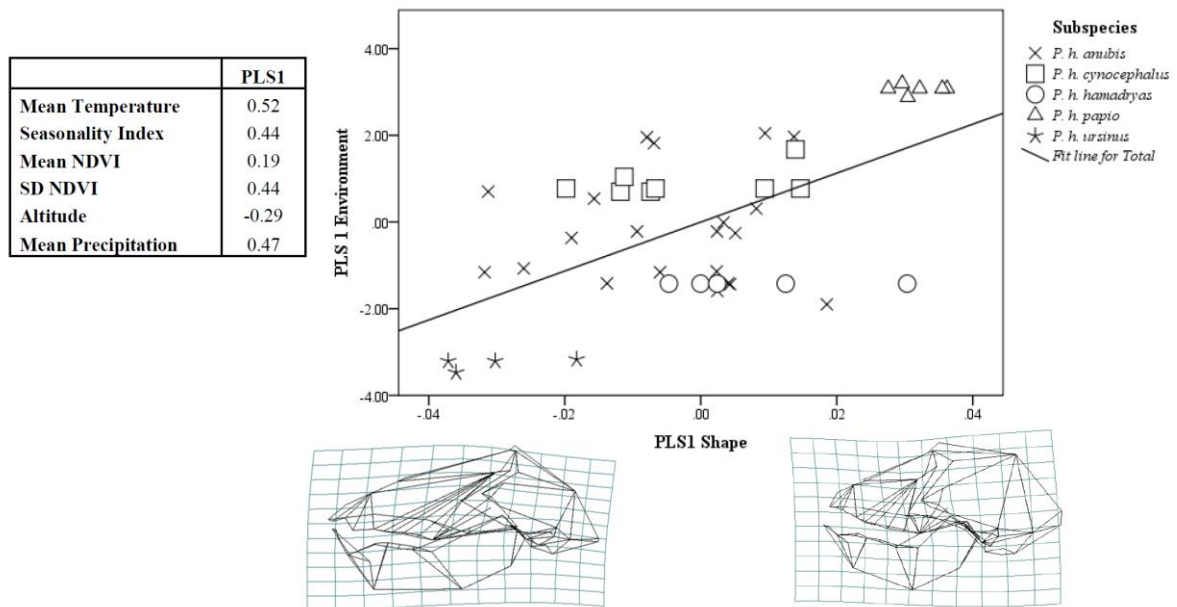|	PLS1
Mean Temperature	0.52
Seasonality Index	0.44
Mean NDVI	0.19
SD NDVI	0.44
Altitude	-0.29
Mean Precipitation	0.47

Figure S6: Scatter plot of scores for the first PLS between baboon environment and shape. Wireframes show the morphological extremes of the axis of covariation (exaggerated by a factor of 3). Loadings are given in the table adjacent to the environmental axis.
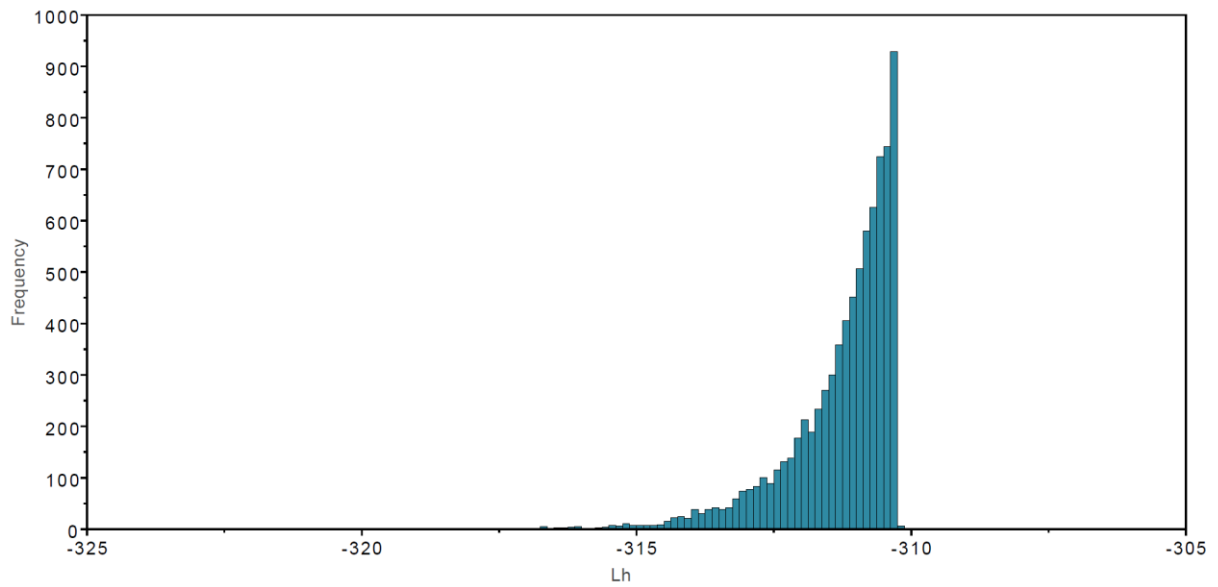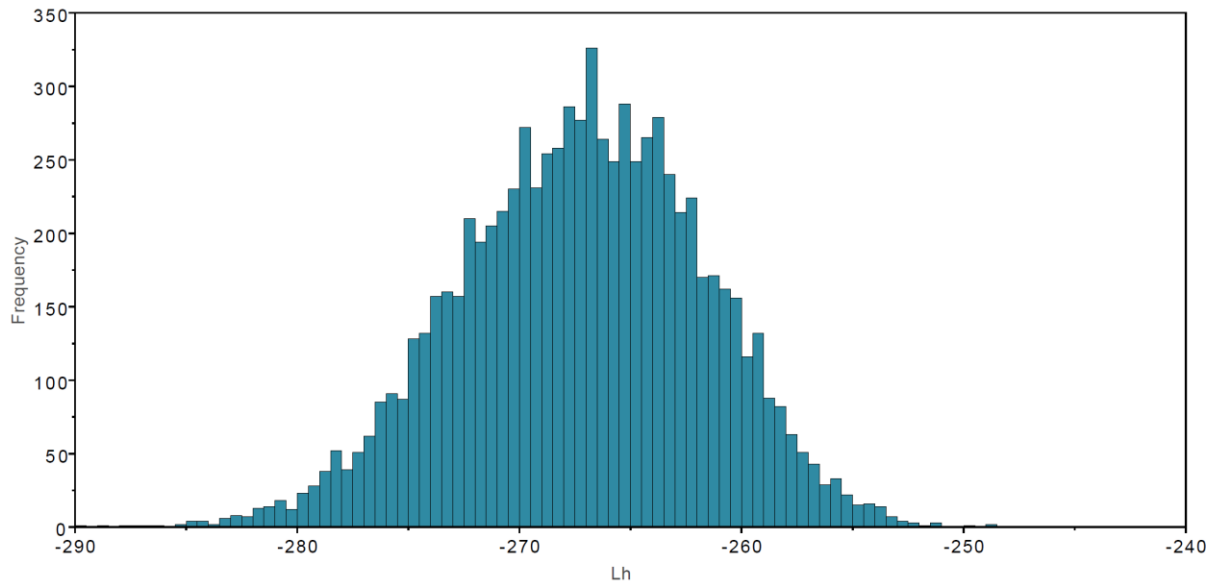
Figure S7: Distribution of log marginal likelihoods for (top) the variable rates model and (bottom) the null model in the male body mass analysis.
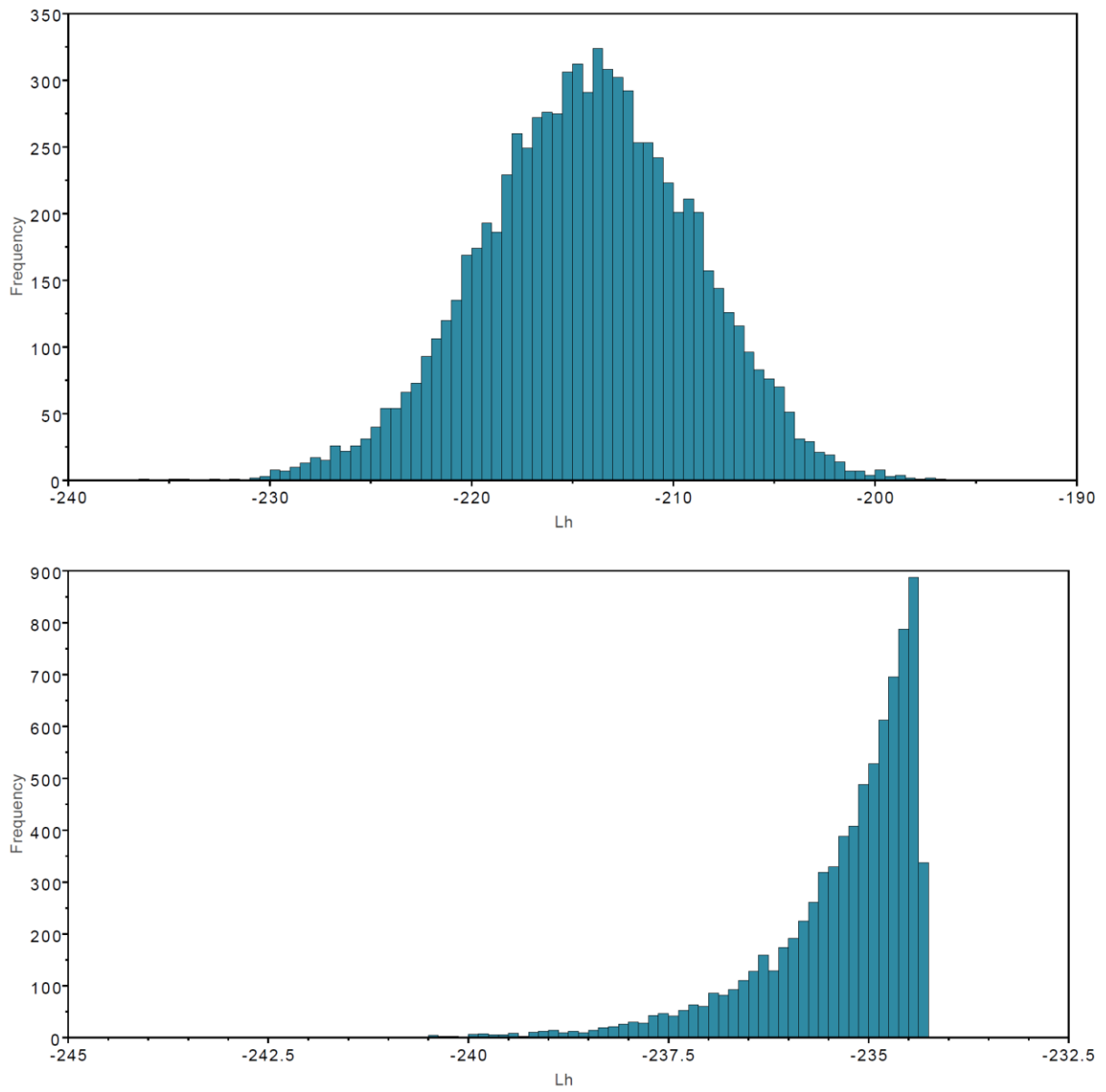
Figure S8: Distribution of log marginal likelihoods for (top) the variable rates model and (bottom) the null model in the female body mass analysis.