SUPPLEMENTARY FIGURES

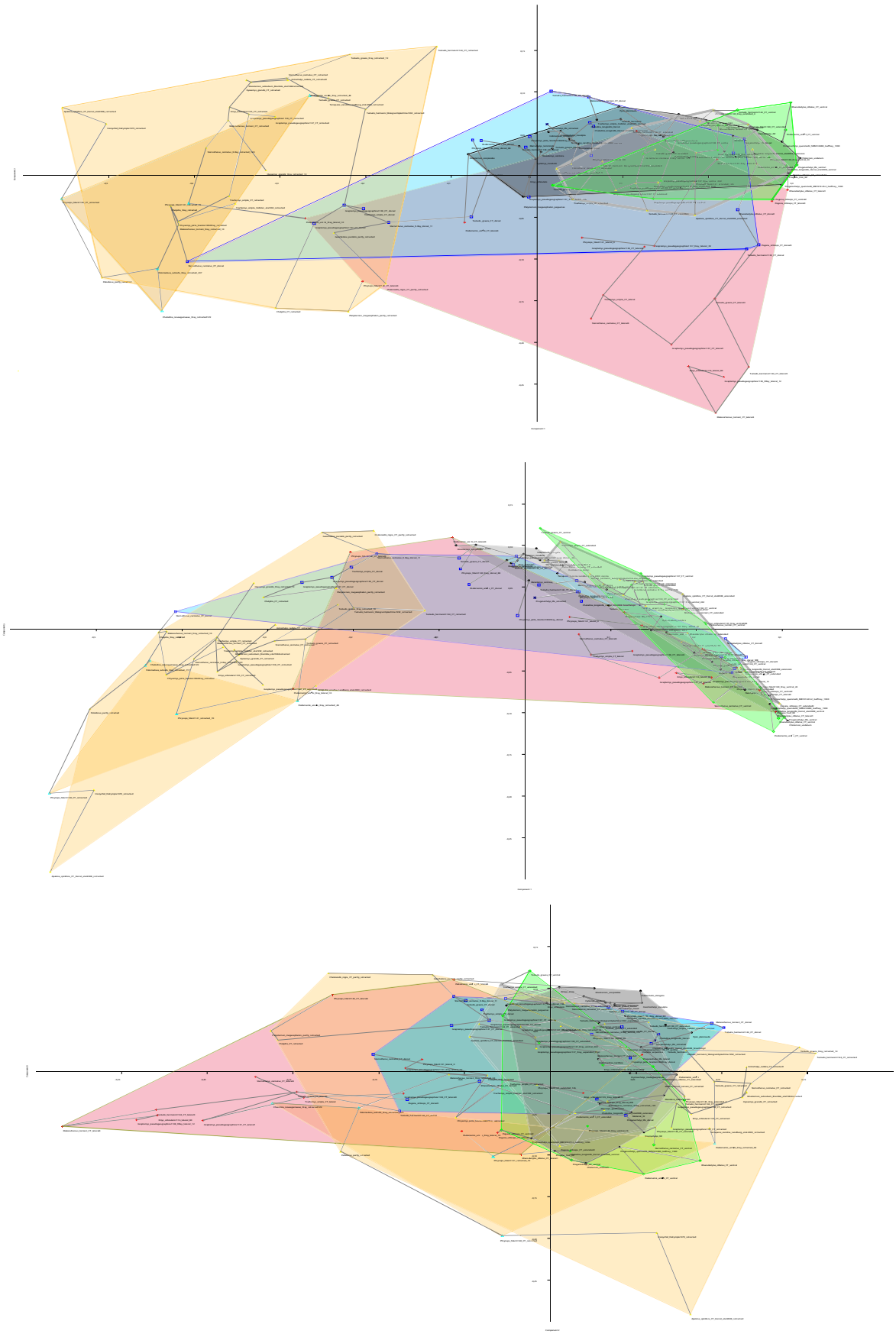

Figure S1. PC1/3, PC2/3, and PC1/3 of Figure 3.

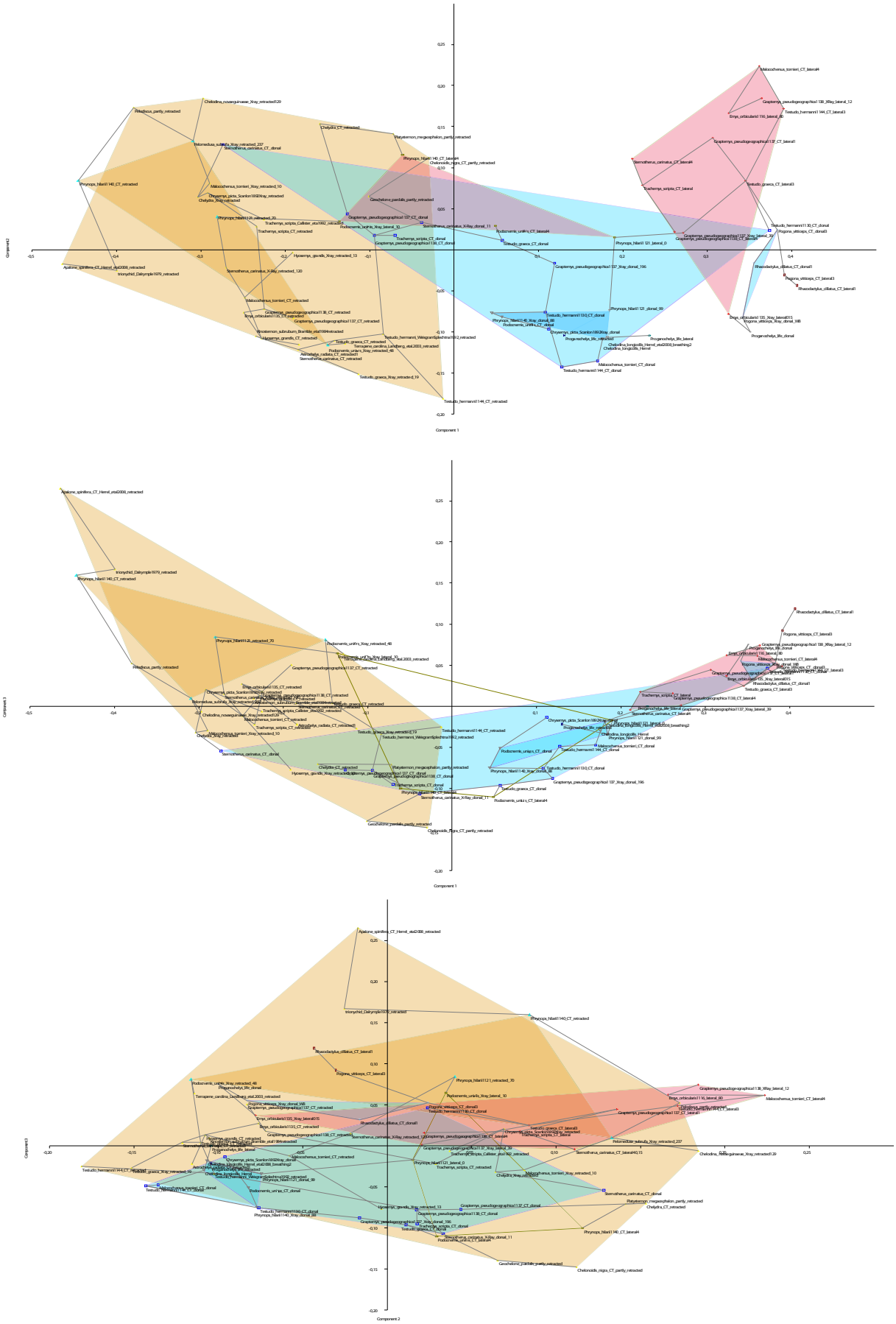

Figure S2. PC1/3, PC2/3, and PC1/3 of Figure 4.

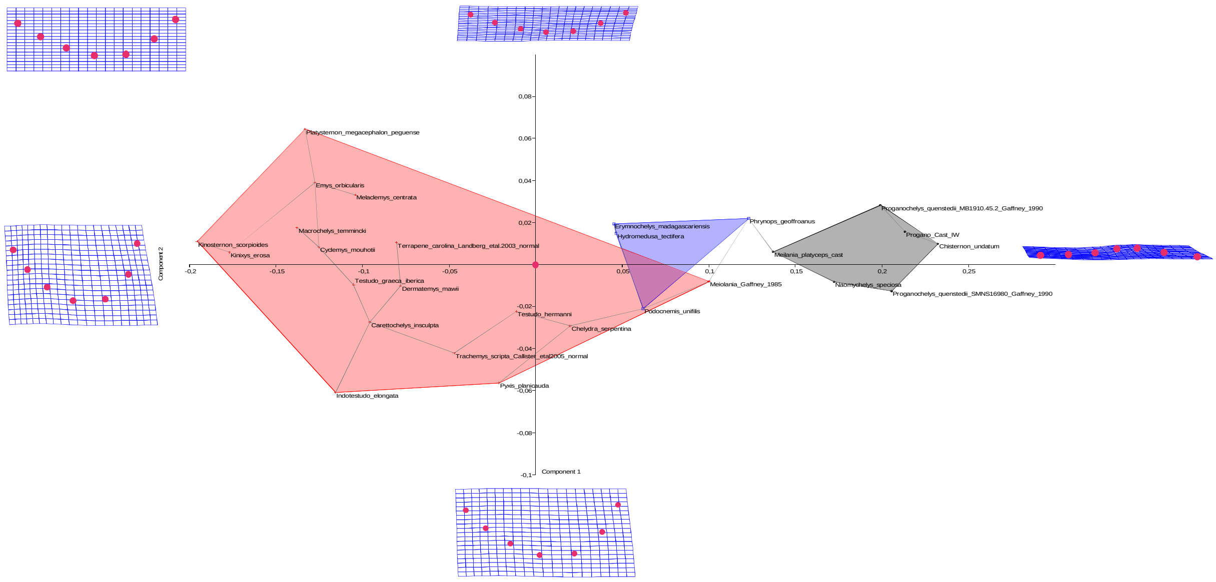

Figure S3. Disparity of the neck/head curve 1/7, using a two-dimensional geometric morphometric analysis. PC1/2 of the neutral position of the neck in macerated and fossil specimens. Seven landmarks were used (Table S9, Fig. 2Fb-i). Convex hulls of cryptodires = red, of pleurodires = dark blue, of fossils = black. 'Minimum span tree' is shown between the species dots and connect the most similar shapes. The relative warp of the mean shape (PC1=0, PC2=0; red dot in the middle of the graph) is shown in the upper left corner. The relative warps of the maximum labelled points of each axis are shown beneath the respective axis end.

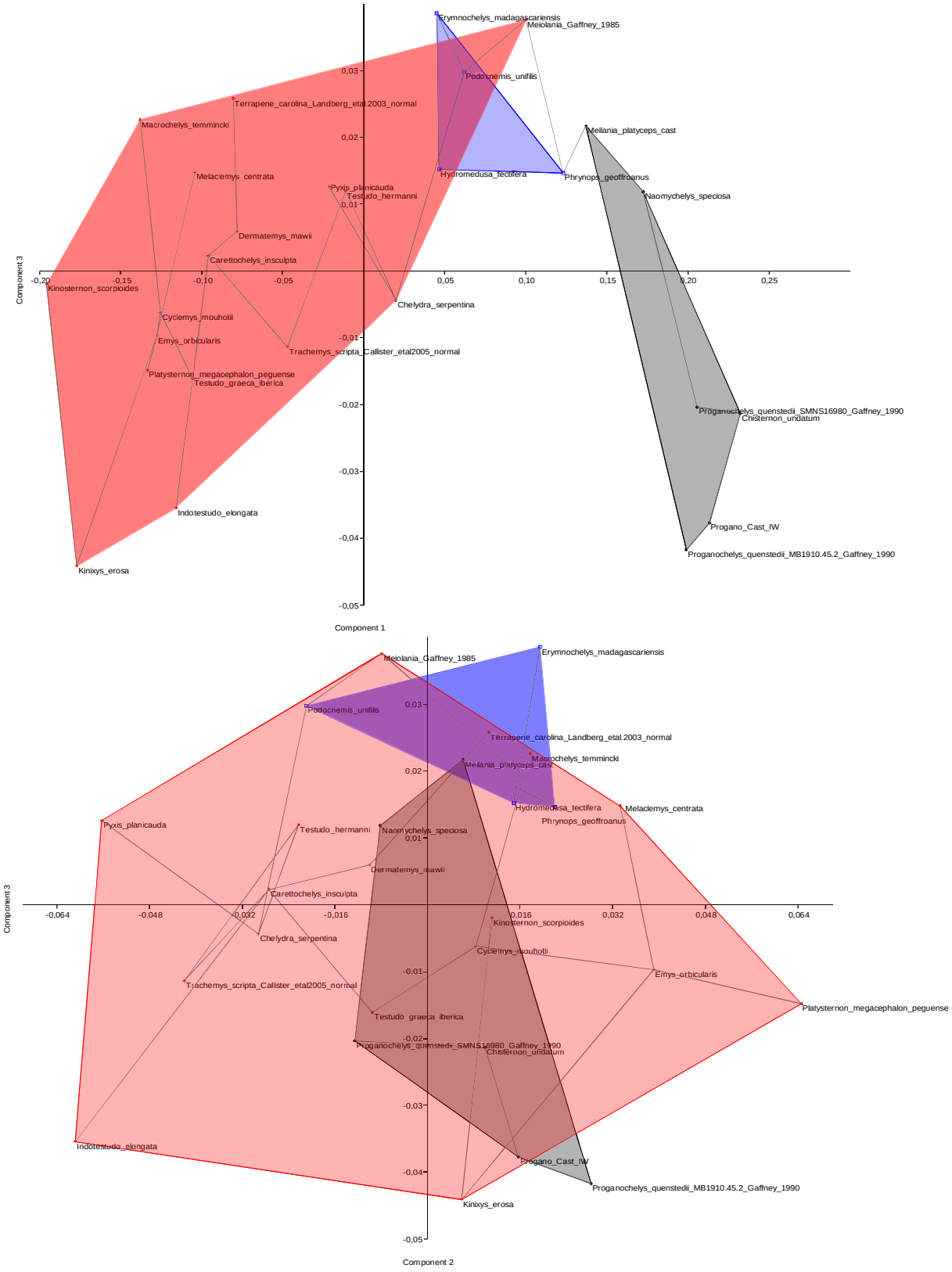

Figure S4. PC1/3 and PC2/3 of Figure S3.

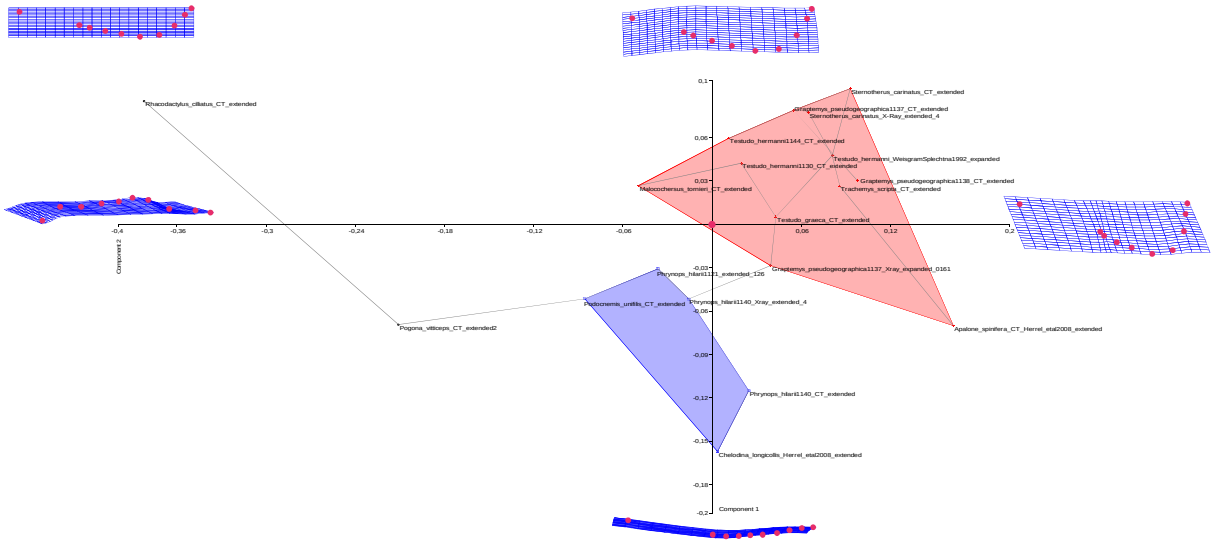

Figure S5. Disparity of the neck/head curve 2/7, using a two-dimensional geometric morphometric analysis. PC1/2 of the extended position of the neck/head. Ten landmarks were used (Table S9, Fig. 2Fa-j). Clear shape difference between cryptodires and pleurodires.

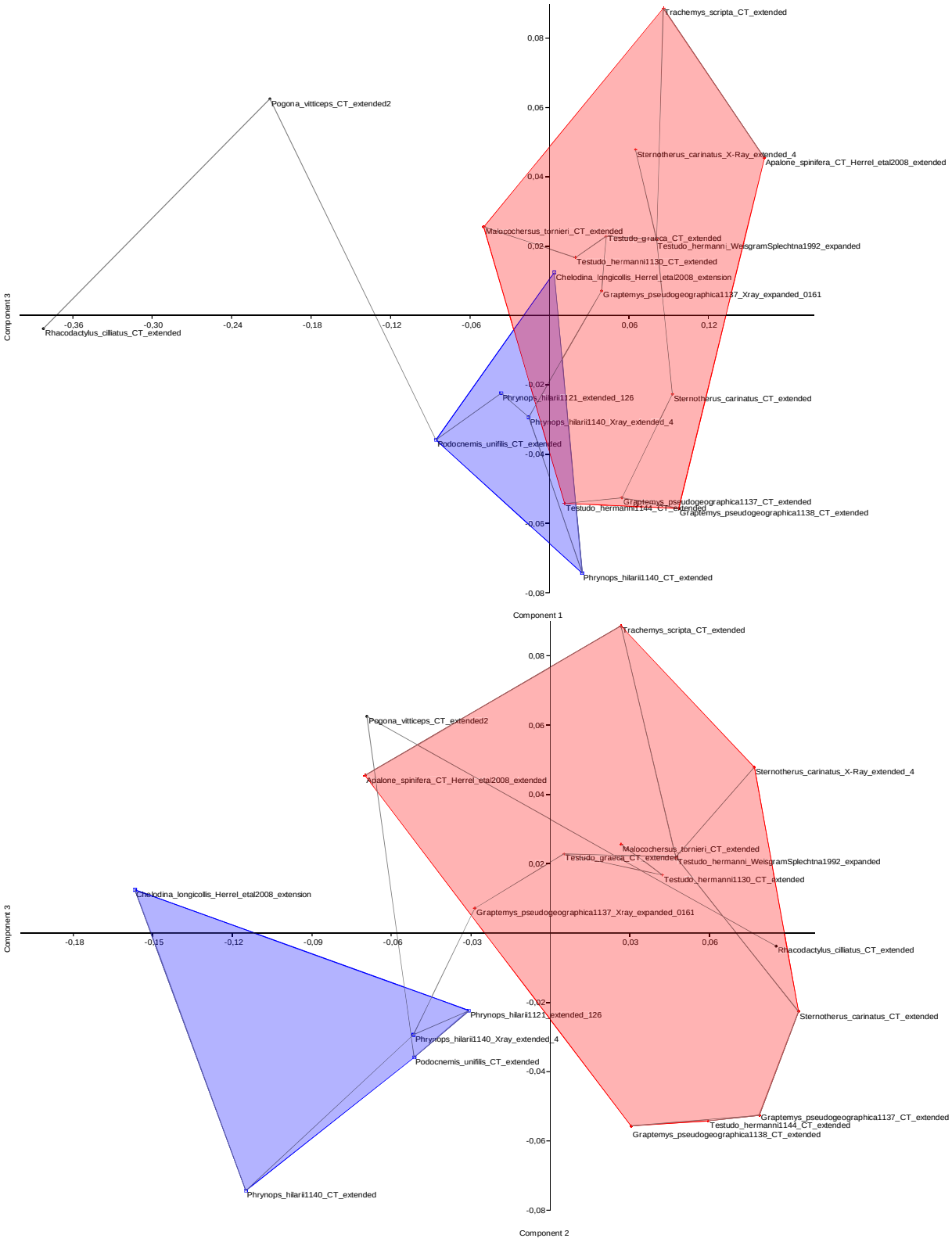

Figure S6. PC1/3 and PC2/3 of Figure S5.

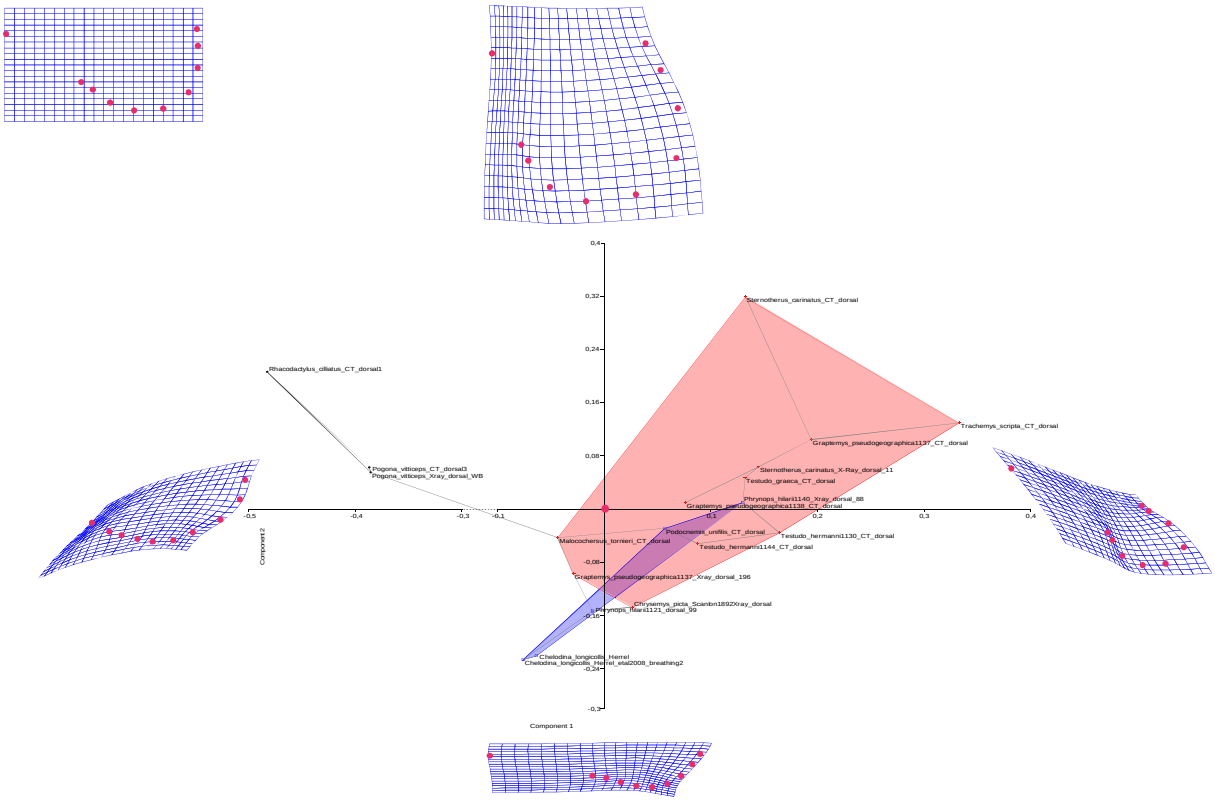

Figure S7. Disparity of the neck/head curve 3/7, using a two-dimensional geometric morphometric analysis. PC1/2 of the dorsal flexion of the neck/head. Ten landmarks were used (Table S9, Fig. 2Fa-j). Except for two cryptodires, the shapes of the neck/head of pleurodires and cryptodires in dorsal flexion are similar and overlap.

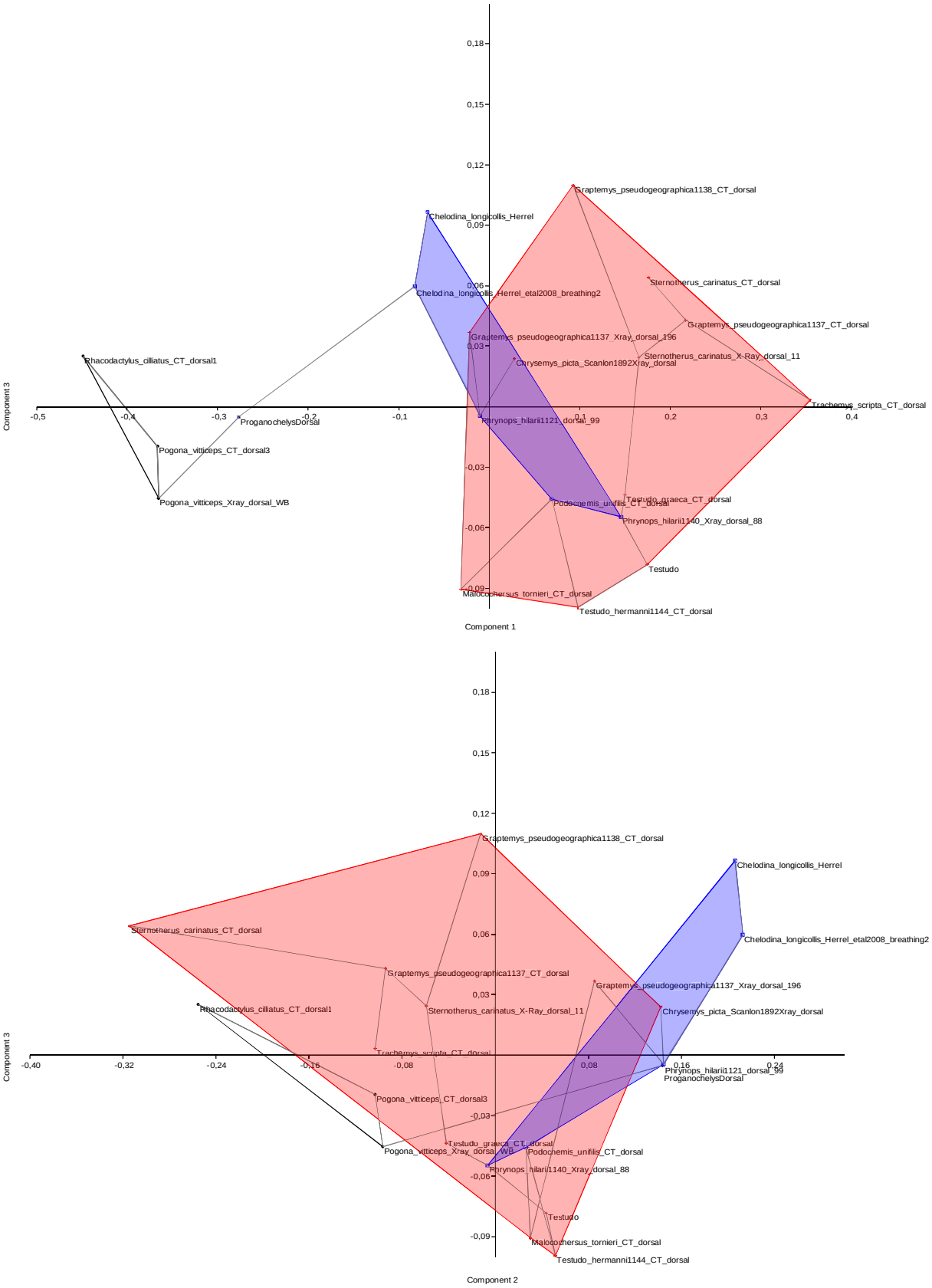

Figure S8. PC1/3 and PC2/3 of Figure S7.

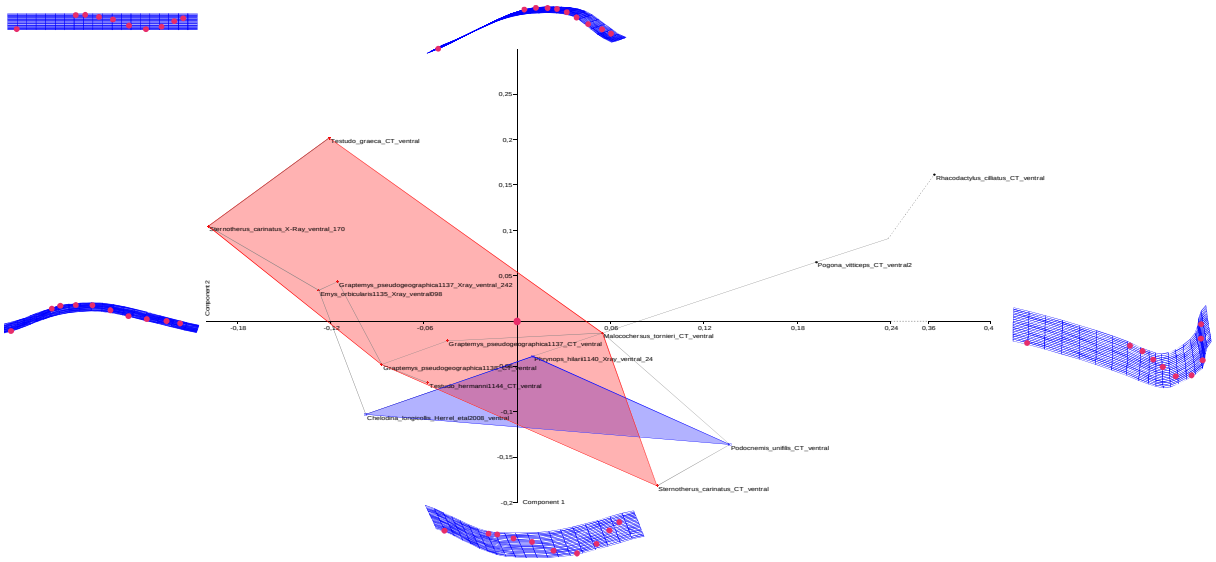

Figure S9. Disparity of the neck/head curve 4/7, using a two-dimensional geometric morphometric analysis. PC1/2 of the ventral flexion of the neck/head. Ten landmarks were used (Table S9, Fig. 2Fa-j). Except for one cryptodire (*Sternotherus*), the ventral flexion of cryptodires and pleurodires has different shapes.

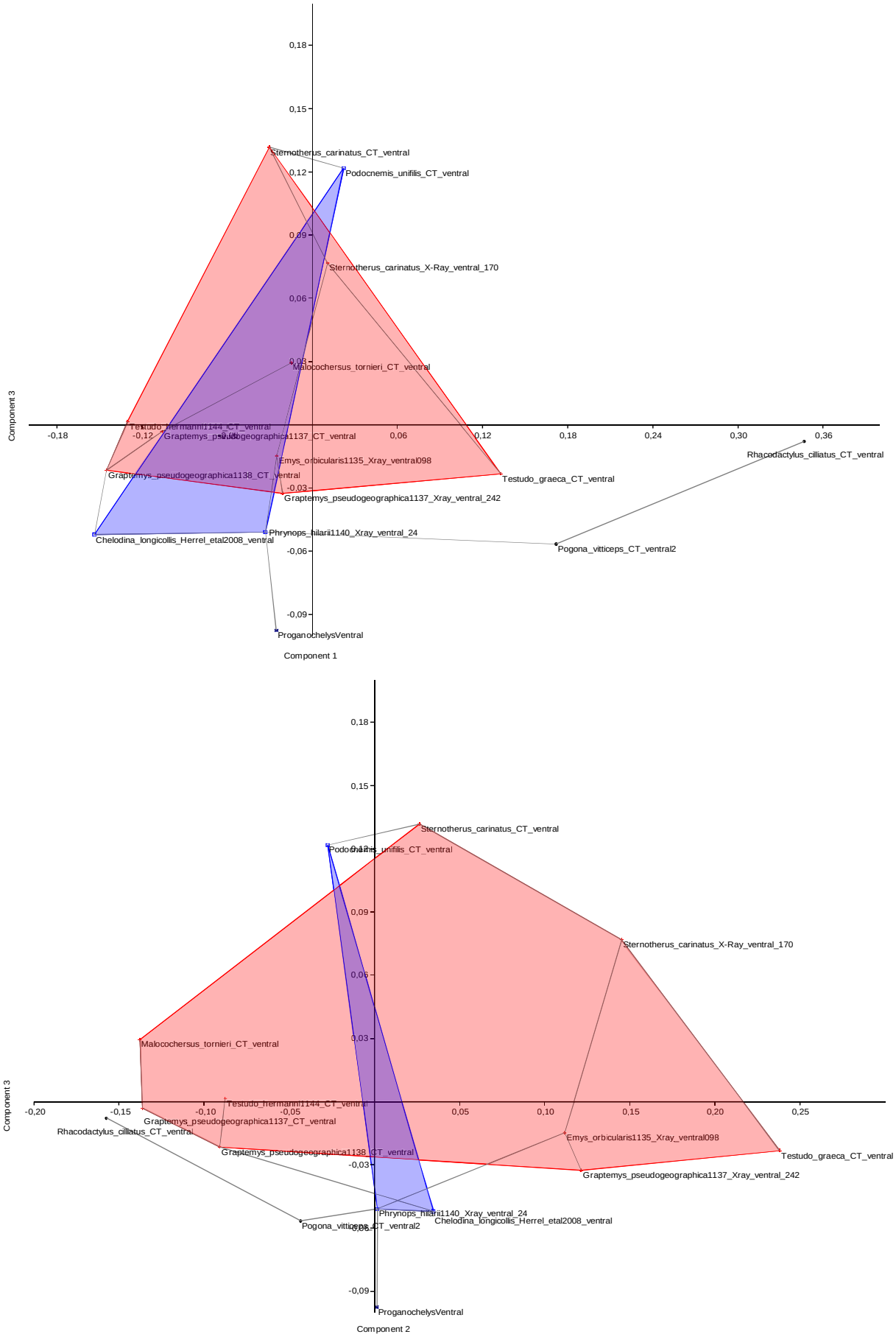

Figure S10. PC1/3 and PC2/3 of Figure S9.

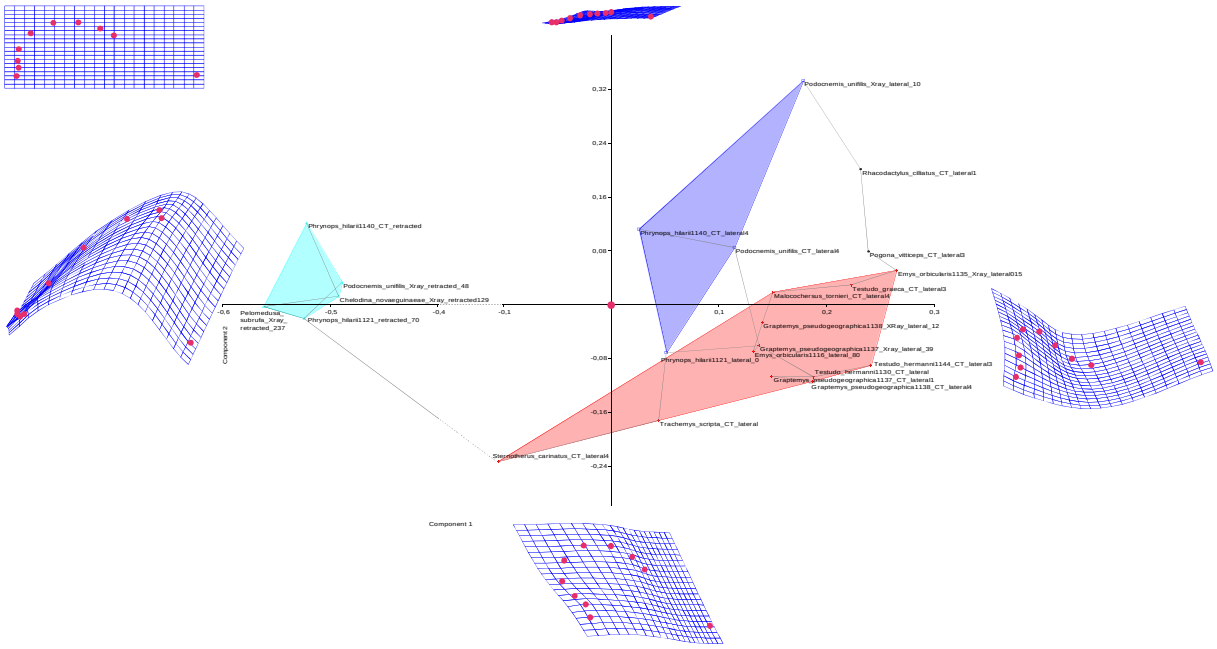

Figure S11. Disparity of the neck/head curve 5/7, using a two-dimensional geometric morphometric analysis. Lateral flexion of the neck/head and the retracted neck/head in pleurodires. Light blue = pleurodires with retracted neck/head. Ten landmarks were used (Table S9, Fig. 2Fa-j).

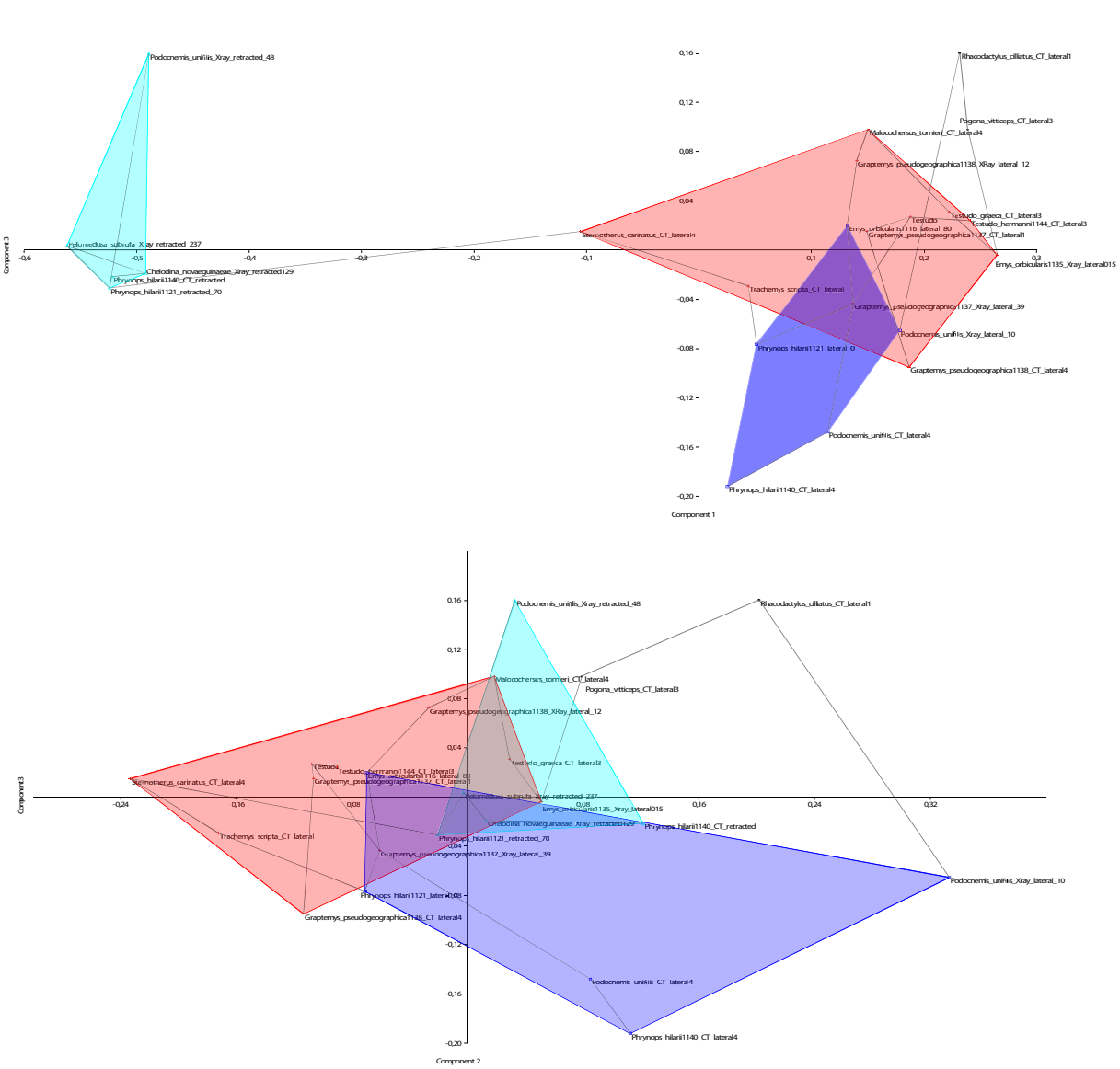

Figure S12. PC1/3 and PC2/3 of Figure S11.

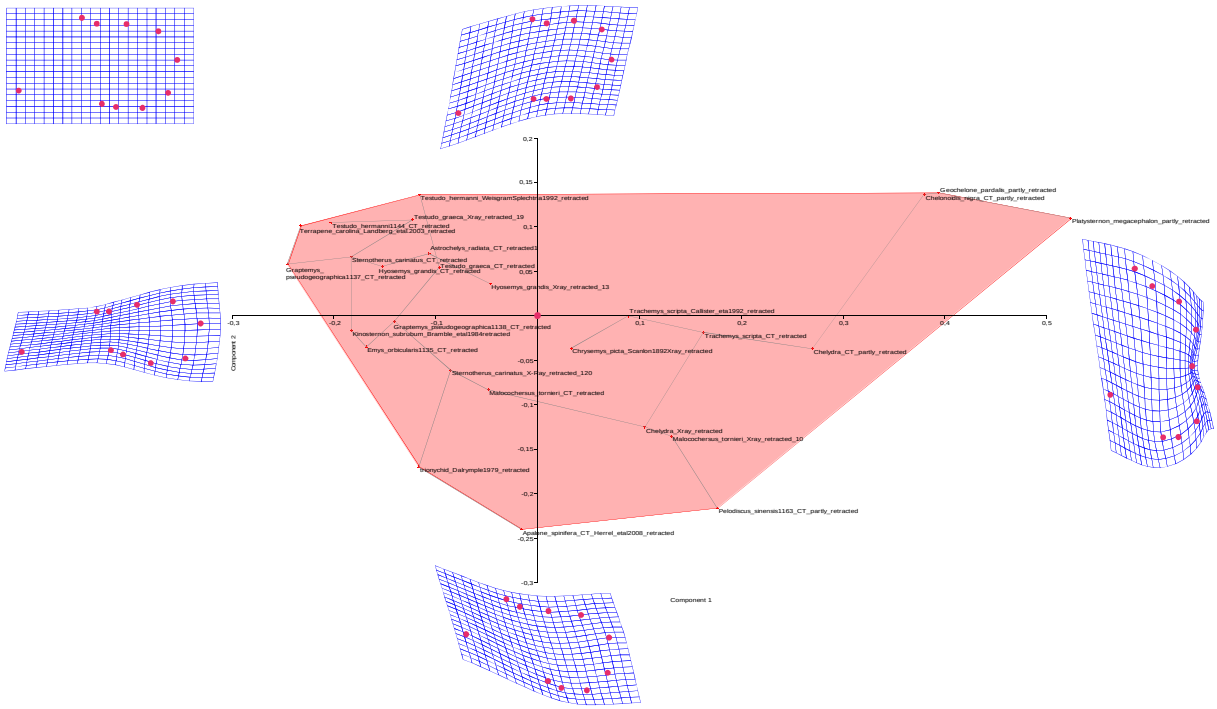

Figure S13. Disparity of the neck/head curve 6/7, using a two-dimensional geometric morphometric analysis. PC1/2 of the retracted neck/head in cryptodires. Ten landmarks were used (Table S9, Fig. 2Fa-j).

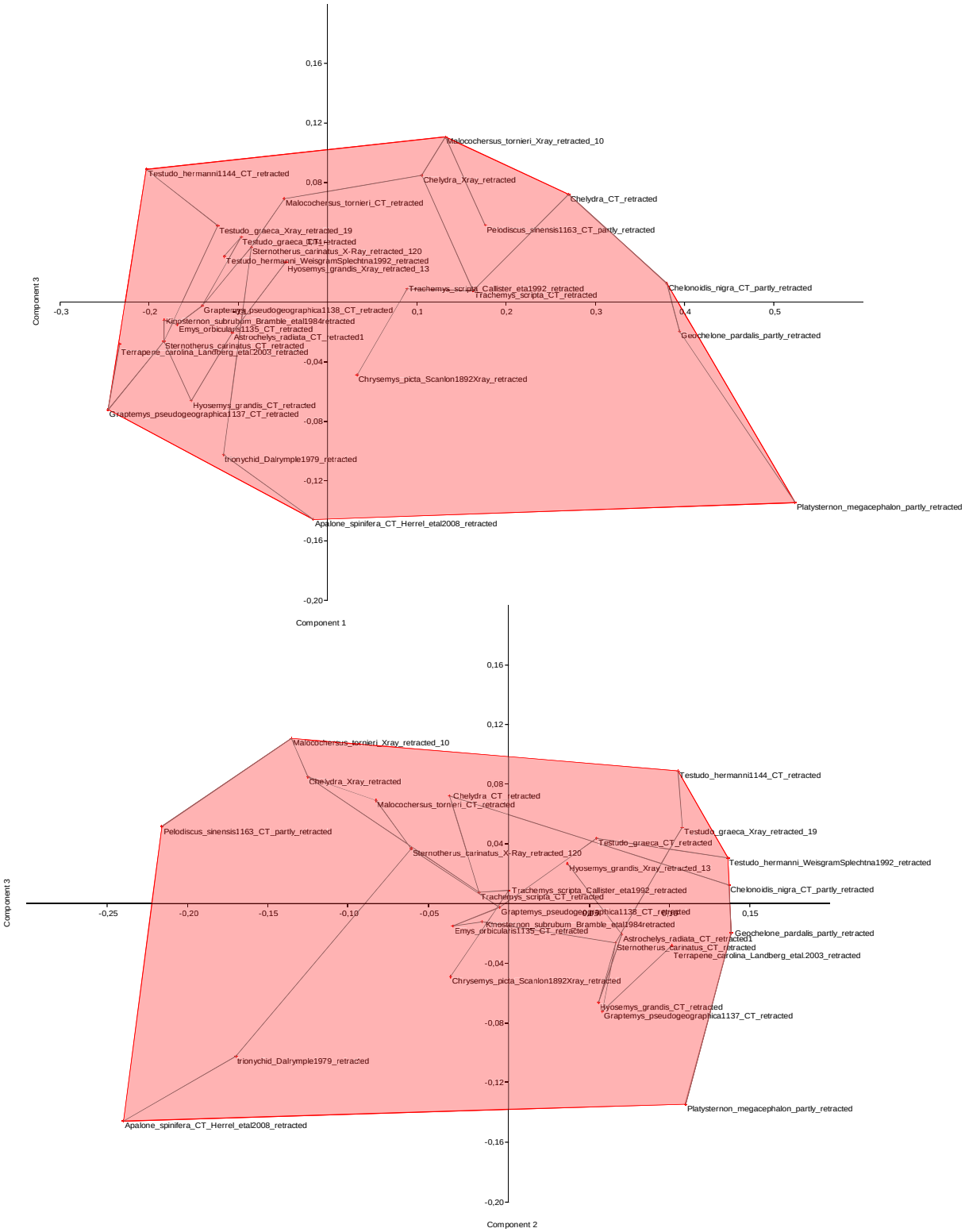

Figure S14. PC1/3 and PC2/3 of Figure S13.

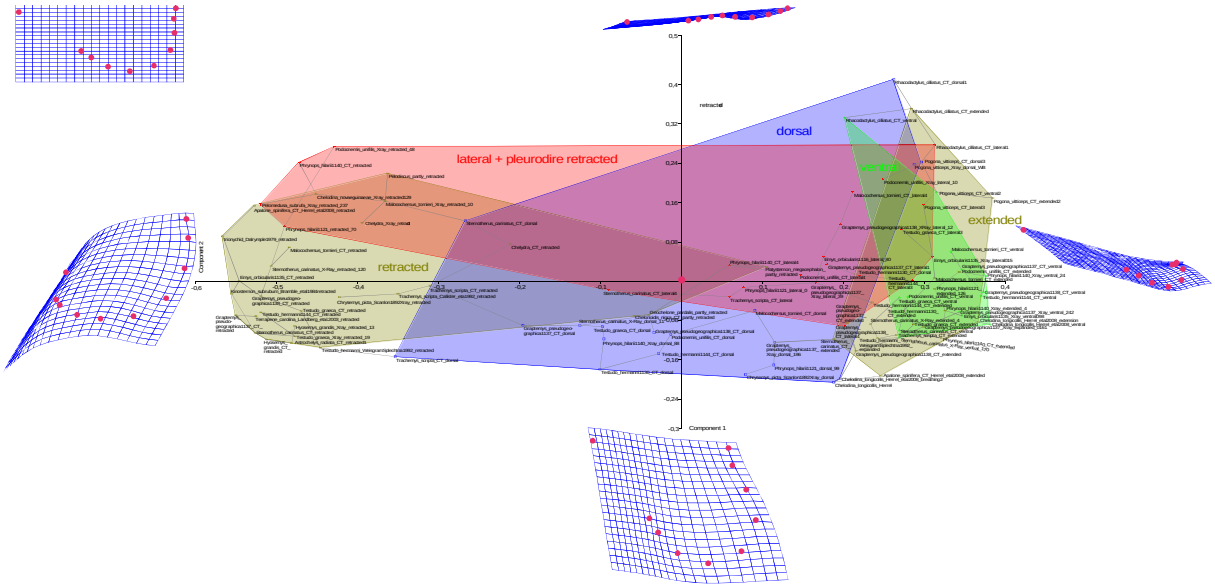

Figure S15. Disparity of the neck/head curve 7/7, using a two-dimensional geometric morphometric analysis. All specimens of extant species with different positions of the neck/head. Note that both, horizontal and vertical plane are compiled in this analysis. Ten landmarks were used (Table S9, Fig. 2Fa-j).

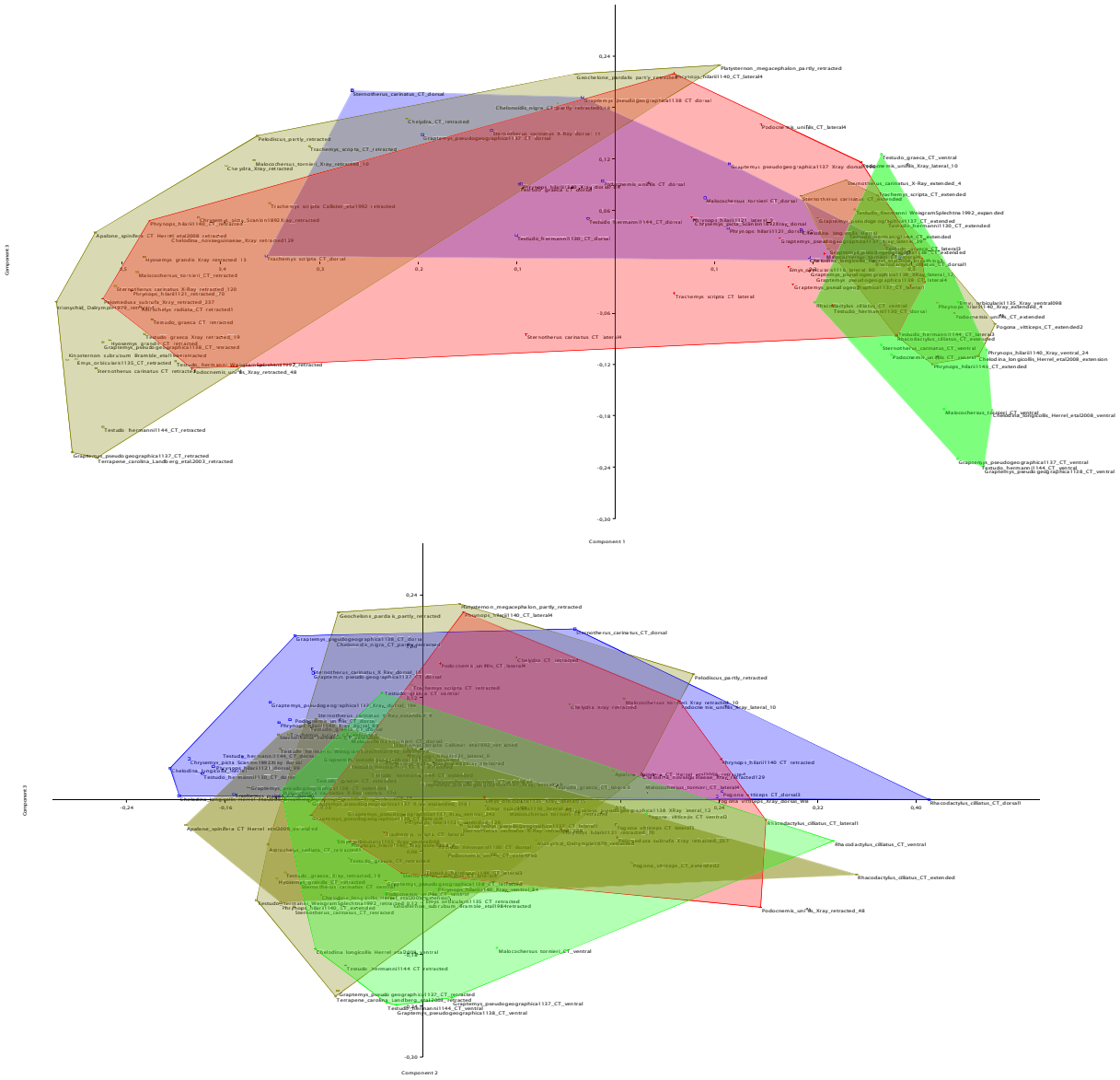

Figure S16. PC1/3 and PC2/3 of Figure S15.