

Baab, K.L., McNulty, K.P., **Brown, P.** Allometric scaling of craniofacial shape: implications for the Liang Bua hominins. *PaleoAnthropology A2*. ABSTRACT

### **Baab et al., " Allometric Scaling of Craniofacial Shape: Implications for the Liang Bua Hominins"**

There has been considerable controversy concerning the taxonomy and evolutionary history of the hominin fossils recovered from the Indonesian island of Flores. One hypothesis is that these individuals were the result of insular dwarfing of *H. erectus* or a small bodied and as yet unknown hominin from the Asian mainland (e.g., Brown et al., 2004). Alternatively, some have claimed that LB 1 is a microcephalic modern human. This study will take a new approach to investigating the affinities of the Flores hominins by focusing on the three dimensional shape of the LB 1 craniofacial skeleton. To address the possibility of dwarfing in the evolutionary history of the Flores hominins, we also examined allometric scaling of craniofacial shape within the African apes and humans. As a first step, generalized Procrustes analysis was performed and principal components analysis (PCA) was used to explore the shape of the LB 1 neurocranium within a broad range of specimens representing both fossil and extant *Homo* species using geometric morphometric techniques. PCA indicated that the shape of the neurocranium was aligned most closely with *H. erectus*. A landmark set which also incorporated facial landmarks again showed similarities with *H. erectus*, particularly Asian *H. erectus*, but also with modern humans. The second set of analyses occurred in size-shape space, which, in addition to the Procrustes shape coordinates, also includes the logarithm of centroid size as an additional variable (Mitteroecker, 2004). By performing a PCA in size-shape space, we were also able to explore allometric patterns within and between *Gorilla*, *Pan* and *Homo*. While the apes, modern humans and archaic *Homo* all have separate trajectories, their slopes are quite similar. The position of LB 1 in size-shape space is compatible with its interpretation as a scaled down version of an archaic *Homo* species.