Introduction

Since the discovery of Homo naledi in South Africa more than 2000 specimens have been recovered from two chambers (Dinapoli and Lesedi) in the Rising Star system (Berger et al., 2015; Hawks et al., 2017). The age of Homo naledi varies from 236 - 335 ka (Dirks et al., 2017).

Thus far 12 claviculae and 15 scapulae have been recovered from the two chambers. Of the 15 scapulae unerected none are complete and most are limited to the lateral border. The claviculae are better preserved, and one is nearly complete. This work focuses on the two best preserved remains (Fig. 1). U.W. 101-1301 and U.W. 102a-021, to better place Homo naledi in its comparative context and shed more light on its locomotor repertoire.

Materials and methods

Ventral bar / glenoid angle (VbG angle) was measured to determine the orientation of the scapular gelenoid cavity. An acute relative length (VbG angle), corresponding to the lowest relative length), corresponding to the lowest P. paniscus values and the MH2 (A. sediba) right clavicle (Fig. 3). This indicates that the upper thorax of Homo naledi is likely narrow and the scapula positioned higher than human and similar to the conditions in apes (Voisin, 2010).

Clavicle Curvatures: In superior view, curvatures fall within the Hominoid distribution, indicating that U.W. 102a-021 displays a classical S-shaped morphology. This morphology increases muscle power during arm elevation (Voisin, 2006). Contrarily U.W. 102a-021 also displays two curvatures in dorsal view falling within the ranges of the two Pan species (Fig. 4). This morphology is associated to a high scapula relative to the thorax (Voisin, 2006).

Discussion and conclusion

A high scapula is associated with a cranial orientation of the gelenoid cavity and is necessary for habitual use of the upper limbs in overhead positions (Voisin, 2006; Voisin et al., 2014). The narrow upper thorax and the less dorsal scapula of Homo naledi fit well with extant apes and early Pleistocene Homo shoulder architectures (Voisin, 2010, Table 1), thought the latter group display a gelenoid cavity that is more laterally than cranially oriented revealing another peculiarity of Homo naledi (Feuerriegel et al., in prep).

The shoulder girdle remains of Homo naledi demonstrate continued relevance of climbing behaviours in the locomotion of this species contrasting with other, presumably more terrestrial, members of the genus Homo (Berger et al., 2015). Given that Homo naledi was discovered in a cave system, rock climbing may have comprised a significant portion of this behaviour. The similarity of the Homo naledi elbow and shoulder morphology to several species of australopithecines implies stabilising selection for traits favouring climbing behaviours for at least one lineage within the genus Homo (Feuerriegel et al., in prep).

Table 1: Clavicle morphologies and shoulder architectures within genus Homo. Lateral: the scapula is more laterally placed than in modern human. Dorsal: the scapula is dorally placed like in modern human.

<table>
<thead>
<tr>
<th>Homo species</th>
<th>Group 1</th>
<th>Group 2</th>
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<tbody>
<tr>
<td></td>
<td>Clavicle length</td>
<td>Scapula position (in regard to the thorax)</td>
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<td></td>
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<td>Group 1b</td>
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Bibliography


