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3.3-Million-Year-Old Baby Shows Lucy's Species Hung Out in Trees

By Kate Wong | October 25, 2012

Selam, a 3.3-million-year-old Australopithecus afarensis specimen from the site of Dikika in Ethiopia. Image: Courtesy of Zeray Alemseged/Dikika Research Project

The advent of upright walking was a really big deal in human evolution. Scientists have posited that it allowed our ancestors to see above the savanna grass (the better to spot predators and prey), to carry tools and food and babies, to travel long distances more efficiently and to better strut their stuff for potential mates, among other possible perks. Indeed, bipedalism is one of the defining characteristics of our kind. Understandably, then, paleanthropologists are kind of obsessed with how our quadrupedal predecessors made the shift to two feet. Now a new study adds to the growing body of evidence that the transition did not happen overnight.

The 1974 discovery of Lucy, the 3.2-million-year old skeleton of an ancestral species known as *Australopithecus afarensis*, demonstrated that our ancestors evolved adaptations to upright walking before brain size expanded (another key human trait). But experts disagreed vehemently over just how dedicated Lucy's species was to life on the ground. Some thought that *A. afarensis* had thoroughly abandoned the trees, that its anatomy demanded a terrestrial lifestyle and that any features suggestive of tree climbing were merely harmless evolutionary holdovers from an arboreal ancestor. Others maintained that *A. afarensis* still spent a considerable amount of time in the trees, and that the arboreal traits figured importantly in the survival of the species.

Selam's shoulder blade has apelike traits that show her species spent time climbing trees in addition to walking upright on the ground. Image: Courtesy of David J. Green

Eventually the idea that *A. afarensis* was a committed biped seemed to eclipse the competing theory. Then in 2006 researchers led by Zeresenay Alemseged, now at the California Academy of Sciences, announced their discovery of an astonishingly complete skeleton of an *A. afarensis* youngster, dubbed Selam, who died at the age of three. They unearthed the specimen at a site in the Afar region of Ethiopia called Dikika, just a few kilometers from the site of Hadar, where Lucy was found. Importantly, the 3.3-million-year-old skeleton preserves complete shoulder blades, which contain clues to locomotion. In their initial report describing Selam, Alemseged and his colleagues hinted that her shoulder blade anatomy resembled that of a gorilla, suggesting that early human ancestors spent more time climbing trees than previously supposed. The more detailed analysis by Alemseged and David Green of Midwestern University, published in the October 26 *Science,* confirms that preliminary assessment.

Green and Alemseged compared Selam's shoulder blades to those of adult and juvenile great apes, as well as other fossil humans. They found that hominoids (the group composed of apes and humans, living and extinct) have two kinds of shoulder blade: one in which the socket faces up and another in which the socket faces sideways. Modern *Homo sapiens* and fossil members of our genus have the latter type of shoulder blade. Selam, however, has the upward facing kind. She also has another apelike shoulder trait in that the ridge of bone that cuts across the blade, known as the scapular spine, is oriented obliquely rather than horizontally as it is in modern humans. This upward orientation of the shoulder socket and the oblique orientation of the scapular spine help living apes to climb in trees.

Whereas modern human shoulder blades morph during development from a more apelike form into the human form, ape shoulder blade shape remains stable—and probably australopithecine shoulder blade shape did too, according to the new study. Thus the apelike appearance of Selam's shoulder should not be dismissed as merely a juvenile trait. Instead, Green and Alemseged conclude, the findings bolster the hypothesis that *A. afarensis* "participated in a behavioral strategy that incorporated a considerable amount of arboreal behaviors in addition to bipedal locomotion."

In a commentary accompanying the new report, Susan Larson of Stony Brook University notes that the famous *Homo erectus* (sometimes called *H. ergaster*) skeleton known as

the Turkana Boy shows that the shoulder of human ancestors underwent its transformation by around 1.8 million years ago. “This reconfiguration was likely part of the emergence of our own genus *Homo*,” she observes, “and a growing dependence on tools and culture for survival.”

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