

Re: New Hominid Fossil Finds In Ethiopia, 3.5–3.8 mya

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- *From:* Marc Verhaegen <m_verhaegen@xxxxxxxx>
 - *Date:* Thu, 12 Jul 2007 21:35:17 +0200
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Op 12-07-2007 16:48, in artikel
1184251738.479695.62420@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx, Lee Olsen
<paleocity@xxxxxxxx> schreef:

On Jul 12, 12:24 am, Marc Verhaegen <m_verhae...@xxxxxxxx> wrote:

Op 12-07-2007 07:59, in artikel 4695C356.B76C3...@xxxxxxxxxxxxxxxx, Rich
Travsky <traRvE...@xxxxxxxx> schreef:

claudiusd...@xxxxxxxx wrote:

Dr Haile-Selassie said the new dig sites yielded the bones of many monkeys, antelopes and wild pigs, suggesting that the hominids lived in a far greener and more wooded countryside than the bare stony Afar desert region seen today.

What, no oyster shells?

You do you think that??

No, no, my boy: green & wooded, nicely confirming our scenario in our TREE paper (google "aquarboreal"):

Yes, the same opinion paper that claimed mountain beavers are semi-

aquatic. (Google mountain beavers)

My little little boy, even if mountain beavers don't live along freshwaters, this in no way falsifies our paper: just leave out the word "mountain beaver" in this text, ok?:

Australopithecine lifestyle

It has become increasingly clear that most, if not all, hominids dwelt in 'wet' rather than 'dry' habitats, and there is little doubt that the early australopithecines of between four and three million years ago dwelt in well-wooded and even forested milieus such as swampy woodlands or streamside forests. For example, Radosevich and co-workers, in a paper on *Australopithecus afarensis* from Hadar, East Africa, said: 'The bones were found in swale-like features ... it is very likely that they died and partially rotted at or very near this site ... this group of hominids was buried in streamside gallery woodland'⁶. In addition, Rayner and co-workers wrote that the *A. africanus* fossils of Makapansgat, South Africa, were found in 'very different conditions from those prevailing today. Higher rainfall, fertile, alkaline soils and moderate relief supported significant patches of sub-tropical forest and thick bush, rather than savannah ... sub-tropical forest was the hominins' preferred habitat rather than grassland or bushveld, and the adaptation of these animals was therefore fitted to a forest habitat'⁷. Tobias, on the same species, recently wrote:

'From Sterkfontein, suggestions of greater woodland cover at the time when *Australopithecus* was deposited in Member 4, had emerged from studies on fossil pollen, but these were not compelling. Then Wits team member Marian Bamford identified fossil vines or lianas of *Dichapetalum* in the same Member 4: such vines hang from forest trees and would not be expected in open savannah. The team at Makapansgat found floral and faunal evidence that the layers containing *Australopithecus* reflected forest or forest margin conditions. From Hadar, in Ethiopia, where 'Lucy' was found, and from Aramis in Ethiopia, where Tim White's team found *Ardipithecus ramidus*, possibly the oldest hominid ever discovered, well-wooded and even forested conditions were inferred from the fauna accompanying the hominid fossils. All the fossil evidence adds up to the small-brained, bipedal hominids of four to 2.5 million years ago having lived in a woodland or forest niche, not savannah'⁵.

The later robust australopithecines of two to one million years ago, lived in more open, though not treeless, environments, apparently near riverbanks, lake margins and reedbeds. For example, Kromdraai *A. robustus* was found near grassveld and streamside or marsh vegetation, in the vicinity of quail, pipits, starlings and swallows, as well as parrots, lovebirds and similar psittacine birds¹⁹. Turkana *A. aethiopicus* was discovered in 'overbank deposits of a large perennial river', amid water- and reedbeds²⁰. Chesowanja *A. boisei* lay in a lagoon amid exclusively aquatic species²¹. 'Abundant root casts' suggest that the embayment was flanked by reeds and the presence of calcareous algae indicates that the lagoon was warm and shallow. *Bellamyia* and catfish are animals tolerant of relatively stagnant water'²¹.

This impression of marsh vegetation - the early australopithecines in more

wooded and the robusts in more open milieus - is compatible with all other information we have on australopithecines: postcranial skeleton, masticatory and dentitional data, enamel microwear, strontium/calcium ratios, and isotopic evidence.

Fossilized footprints and skeletal remains suggest that australopithecines were bipedal, though their short-legged style of bipedalism was different from that seen in humans²², and apparently included a somewhat forward-leaning trunk posture²³. The StW 573 foot had both bipedal and climbing adaptations. This skeleton's foot morphology is consistent with the bipedal Laetoli footprints, which are not those of fully human feet, but which have very clear ape-like morphology¹ xxx. Other tree-climbing features in early australopithecines include the apelike upward directed shoulder joints (glenoid fossae) and curved finger and toe phalanges, whereas such features are less obvious in the later robusts.

Dental studies suggest that whereas gracile australopithecines preferred softer fruits and vegetables, the robusts¹ diet included harder food items^{24–28},pp. Estimates of robust australopithecine bite force suggest low-energy food that had to be processed in great quantities¹ and food objects hard and round in shape²⁹. DuBrul noticed striking dental parallelisms between the robust australopithecines and the bamboo-eating giant panda (broad, high and heavy cheekbones, reduced prognathism and front teeth, very broad molar teeth, premolar molarization), particularly when compared to gracile australopithecines and non-panda bears respectively²⁵.

Students of fossil hominid teeth agree that broad molars with thick enamel and rounded cusps, while unsuitable for the regular processing of tough foods like leaves or meat, are suitable for the processing of hard food items. Papyrus and reed were abundant in the paleo-environment of the later australopithecines (e.g. Olduvai, Chesowanja, Kromdraai), and Cyperaceae and Gramineae are part of the diet of living African hominoidspp. Gorillas eat sedges and bamboo shoots and stalks, all African hominids eat cane, chimpanzees and humans eat water lilies, and rice and other cereals are staple food for humans. Supplementing their diet with harder parts of plants possibly helped the robusts to bridge the dry season, when fruits and soft vegetables were scarcer.

Studies of dental enamel microwear provide further details. In the early *A. afarensis* (Garusi-Laetoli and Hadar), the cheekteeth enamel has a typical glossy polished surface and the microwear has resemblances to that of capybaras and mountain beavers³⁰. These animals are semi-aquatic rodents that feed mainly on succulent marsh and riverside herbs, as well as grasses and the bark of young trees. It has recently become clear that Western lowland gorillas spend some time eating what researchers call AHV (aquatic herbaceous vegetation) such as Hydrocharitaceae herbs and Cyperaceae sedges³.

Comparisons of molar enamel in South African fossils show that *A. robustus* ate substantially more hard food items than the earlier *A. africanus*³¹.

Incisal microwear suggest that *A. robustus* may have ingested foods that required less extensive incisal preparation than the foods consumed by *A. africanus*³², and incisal reduction in *A. robustus* also suggests a less

frugivorous diet, since ?incisors need not be employed in the manipulation of hard objects¹³³.

The enamel of the East African robusts (*A. boisei* of Olduvai and Peninj) displays more pits, wide parallel striations and deep recessed dentine^{27,pp}. This microwear pattern has some resemblances with that of beavers, which feed on riverine and riverside herbs, the roots of water lilies, bark and woody plants. It thus seems probable that an early australopithecine diet of fruits (larger front teeth) and aquatic herbs (polishing) was supplemented with woody plants in the robusts (more wear). The suggestion of Walker, that *A. boisei* KNM–ER 406 and 729 were bulk–eaters of ?small, hard fruits with casings, pulp, seeds and all¹²⁶, could explain the deep recessed occlusal dentine, but not the glossy appearance of the heavily polished enamel, which is more typical of marsh plant feeders^{27,30}. In terrestrial grazers, tooth wear is very different³⁴. In sheep, for instance, the occlusal wear facets are not rounded.

These microwear data are consistent with the strontium/calcium ratios³⁵, as well as with the isotopic data of South African australopithecines³⁴. Apart from partial carnivory, Sillen provides two possible explanations for the low Sr/Ca ratios of *A. robustus*: eating leaves and shoots of forbs and woody plants, and eating food derived from a wet microhabitat, for instance, from well–drained streamside soils³⁵. Sillen as well as Sponheimer and Lee–Thorp, following ?hunting hypotheses¹, prefer the regular consumption of animal food as an explanation for the Sr/Ca ratios and the isotopic data in *A. robustus*^{35,34}, rather than considering - in our opinion the more logical explanation - that they might have eaten invertebrates as well as cyperaceous sedges and other marshland plants. Sponheimer and Lee–Thorp say that *A. africanus* ?ate not only fruits and leaves but also large quantities of carbon–13–enriched foods such as grasses and sedges or animals that ate these plants, or both¹³⁴. Since terrestrial grasses are incompatible with the polished, rounded microwear^{30,34}, and predominant meat–eating is unlikely in view of the blunt, huge and broad cheekteeth^{25,26,36}, their diet more probably included marshland plants such as Cyperaceae, as is indicated by several very different studies^{27,30,34,35,pp}.

Several independent lines of evidence - paleo–milieu, postcranial skeleton, dental morphology, enamel microwear, Sr/Ca ratios, isotopic data - suggest that some or all australopithecines regularly waded bipedally in search of plants growing in and near shallow waters. They might have waded in much the same way as living hominid species such as bonobos and Western gorillas do today (Figure 4), only much more frequently^{2,3}. This does not exclude the possibility, however, that early hominids, including some australopithecine species, might have processed and consumed animal food when available^{37,38}.