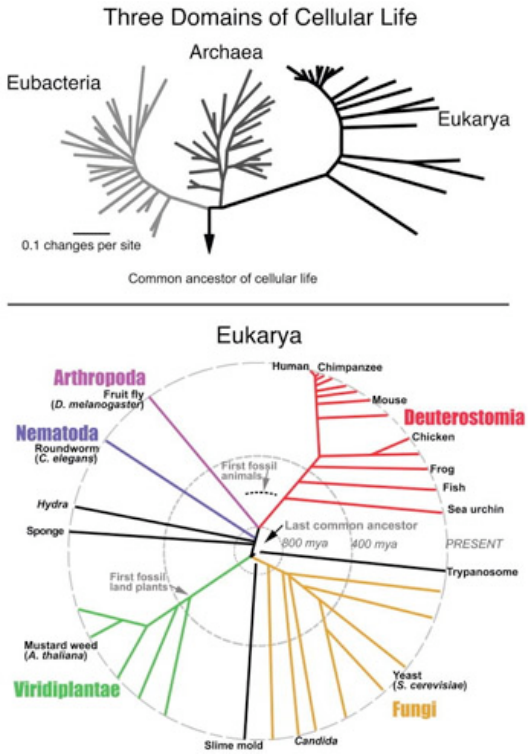
Evolution rewritten, over and over

Aug. 31, 2010
Courtesy of the University of Bristol
and World Science staff

Palaeontologists are always claiming that their latest fossil discovery will "rewrite evolutionary history."

Is this just boasting, or is our knowledge of evolution so feeble that it changes every time we find a new fossil?

A team of scientists at the University of Bristol, U.K. decided to find out, through investigations of dinosaur and human evolution. Their study, published this week in the research journal *Proceedings of the Royal Society B*, suggests most fossil discoveries don't make a huge difference: they confirm, rather than contradict our understanding of evolutionary history.



Biologists organize life forms into evolutionary or "family" trees similar to the ones above, although many details are under constant debate. The "tree of life" above is divided into two parts. A big-picture view, top, shows the three major "domains" of life, two of which consist solely of one-celled organisms. Below the horizontal line is a more detailed view of the subdivision Eukarya, which includes humans and other multi-cellular organisms along with many additional one-celled organisms. (Image courtesy Nat'l Inst. of Health)

This is especially true of the fossil record of human origins from their monkey relatives, the investigators found. Though early human fossils are very rare, and new discoveries make a big splash in the scientific literature and in the media, they sit randomly across the evolutionary tree of early humans.

In other words, the researchers said, most discoveries of new fossil species simply fill in gaps in the fossil record that we already knew existed.

"Human fossils are very rare, and they are costly to recover because of the time involved and their often remote locations. Scientists may be pushed by their sponsors, or by news reporters, to exaggerate the importance of their new find and make claims that 'this new species completely changes our understanding,'" said James Tarver, leader of the study.

The story of dinosaur evolution is a bit more complicated, he added.

New dinosaur fossils are being found in places around the world where they've never been looked for before, such as China, South America and Australia. These fossils, the scientists said, are fundamentally challenging existing ideas about dinosaur evolution. But this seems to tell us that there are still many new species of dinosaurs out there in the rocks.

"These are important results," said Michael Benton, another member of the team. "It might seem negative to say that new finds do, or do not, change our views. However, to find that they don't means that we may be close to saturation in some areas, meaning we know enough of the fossil record in some cases to have a pretty good understanding of that part of the evolutionary tree."

"We can use these studies as a way of targeting new expeditions," added co-author Phil Donoghue. "If dinosaurs are poorly understood from a particular part of the world, or if some other group is altogether incompletely known, that's where we need to devote greater efforts."