Speciation is Complex, But Does Happen

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1 June 1997

globalflood.org/origins-debate.html

The Los Alamos Monitor

Editor:

In "They haven't a clue" (May 9), John Baumgardner again misrepresented evolution as being dependent on chance chemical interactions alone. Perhaps he didn't actually read one of the two letters he was lambasting - my letter of April 9th, in which I pointed out that "Chance alone does not produce evolution. You need heredity, selection, and a little time as well."

Baumgardner also demanded a "single, unambiguous example of the formation of a new species by the accumulation of mutations." As usual, he is setting up another straw man argument. Although these are easy for him to demolish, they do not represent current scientific thought.

Mutations alone are generally not the only factor involved in the appearance of new species. Rather, evolution of new species usually involves the existence of variation in the genetic makeup of a particular parent species: of course, some of this variation is due to mutations. If the parent population is split into subpopulations (by physical isolation, for example), natural selection over time often acts on the variations to produce a gradual divergence of these populations, and the eventual appearance of new and very different species. But this is a slow process requiring many generations, and is often very difficult to observe.

There is abundant indirect evidence of such divergence and speciation -- for example, the appearance of the same "copying-error" mutations in related (but different) species. (The fossil record, comparative anatomy, and regional biodiversity are also rich sources of indirect evidence for evolution). And divergence of a species of fruit fly into two sexually isolated species has actually been accomplished in laboratories (see, for example, Dobzhansky & Pavlovsky, "Experimentally Created Incipient Species of Drosophila" (Nature, Vol. 230, April 2. 1971, pp. 289-292).

Species formation is often much more dramatic in plants than in animals. Consider the case of a saltmarsh grass named Spartina. Two separate

species of Spartina (S. maritima and S. alterniflora) sometimes form a sterile hybrid cross. In the late 1800s, some of these sterile hybrids were affected by a chromosomal abnormality (polyploidy), resulting in a new species (S. anglica) with almost twice the number of chromosomes of either parent. That this new, vigorous, and fertile species evolved directly from the parental species was confirmed when S. anglica was artificially re-created in experimental plants from S. maritima and S. alterniflora stock ("The Science of Genetics," 4th ed., G. W. Burns, 1980, MacMillan, pp. 272-276). While this is not the normal mode for production of new species, and does not involve genetic mutations, it is a very fine example of macroevolution. And many more cases are available in the literature. I encourage Baumgardner to stop calling for examples of evolution in the pages of the Monitor. If he really wants them, he can find quite a few in any decent technical library.

Baumgardner said he wants to call my bluff. The fact is. I'm not bluffing. But don't take my word for it -- go to your library, go on a fossil hunt, or visit the Human Genome project. Check out what scientists really think about evolution. The evidence for evolution is real and pervasive, except to those who are blinded by their preconceptions.

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