

Monkey business produces rare preserved blood in amber fossils

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This tick found as a fossil in amber shows two small holes in its back, as if it were just picked off the animal it was feeding on. Credit: George Poinar, Jr., courtesy of Oregon State University

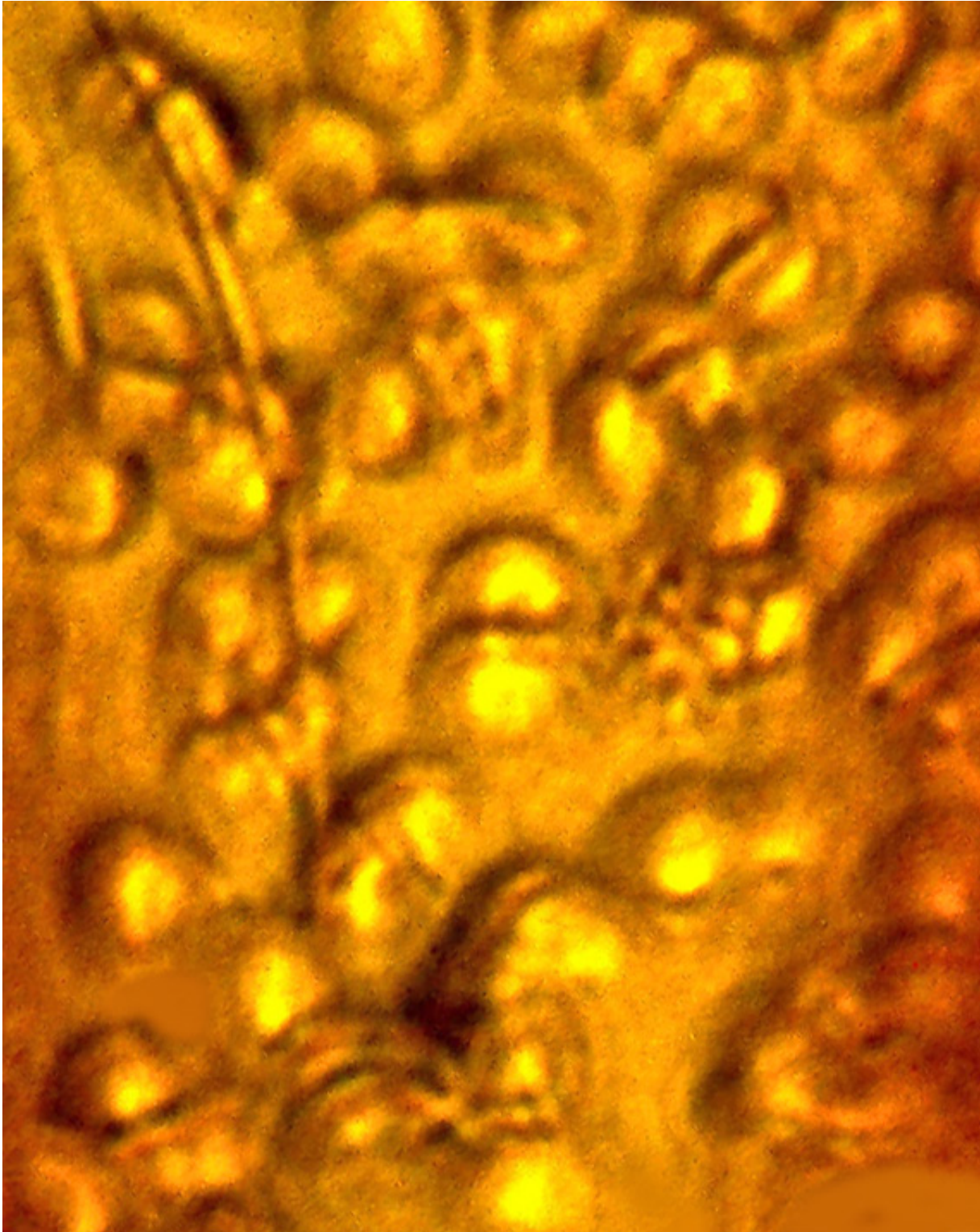
Two monkeys grooming each other about 20-30 million years ago may have helped produce a remarkable new find - the first fossilized red blood cells from a mammal, preserved so perfectly in amber that they appear to have been prepared for display in a laboratory.

The discovery, published in the *Journal of Medical Entomology*, also describes the only known fossils of a type of parasite that still exists today, *Babesia microti*, which infects the [blood cells](#) of humans and other animals.

Two small holes in the back of a blood-engorged tick, which allowed blood to ooze out just as the tick became stuck in tree sap that later fossilized into amber, provide a brief glimpse of life in a tropical jungle millions of years ago in what is now the Dominican Republic.

"These two tiny holes indicate that something picked a tick off the mammal it was feeding on, puncturing it in the process and dropping it immediately into [tree sap](#)," said George Poinar, Jr., professor emeritus in the College of Science at Oregon State University, author of the study and an international expert on plant and animal [life forms](#) found preserved in amber.

"This would be consistent with the grooming behavior of monkeys that we know lived at that time in this region. The fossilized blood cells, infected with these [parasites](#), are simply amazing in their detail. This discovery provides the only known fossils of *Babesia*-type pathogens."



This piece of amber contains the first fossilized red blood cells from a mammal ever discovered -- in this case, infected by a parasite. Credit: Photo by George

Poinar, Jr., courtesy of Oregon State University

The fossil parasites add to the history of the Order Piroplasmida, of which the Babesiidae is one family. In humans, the parasite *B. microti* can cause babesiosis, a disease with symptoms that resemble malaria and can be fatal. A related parasite in cattle can cause Texas cattle fever, which has been a historic problem in the plains states, and just this spring is causing another outbreak that has led to quarantines on more than 500,000 acres of land in Texas.

"The life forms we find in amber can reveal so much about the history and evolution of diseases we still struggle with today," Poinar said. "This parasite, for instance, was clearly around millions of years before humans, and appears to have evolved alongside primates, among other hosts."

Part of what makes these fossils unique, Poinar said, is the clarity by which the parasites and blood cells are preserved, almost as if they had been stained and otherwise treated in a laboratory for inspection. The parasites were different enough in texture and density to stand out clearly within the red [blood cells](#) during the natural embalming process for which [amber](#) is famous.

More information: *Journal of Medical Entomology* (2017). [DOI: 10.1093/jme/tjw247](https://doi.org/10.1093/jme/tjw247)

Provided by Oregon State University

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