



# Press Release

## Dangerous Liaisons

**Earliest record of mating fossil vertebrates discovered by University of Tübingen geoscientist's team.**

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The fossil record consists mostly of the fragmentary remains of ancient animals and plants. But some finds can provide spectacular insights into the life and environment of ancient organisms. The Messel Fossil Pit, a UNESCO world heritage site south of Frankfurt in western Germany, is well known for yielding fossils of unusual quality, including early horses complete with embryos and insects and birds with fossilized colors. In the latest edition of "Biology Letters," a group of scientists lead by Dr. Walter Joyce of the University of Tübingen announces the discovery at Messel of nine pairs of fossilized turtles that perished in the act of mating. Dr. Joyce, a geoscientist from the University of Tübingen, heads the discovery team which includes researchers from the Senckenberg Research Institute Frankfurt and the Hessische Landesmuseum Darmstadt.

"Scientists have collected tens of thousands of fossils at this site in recent decades," notes co-author Dr. Stephan Schaal of the Senckenberg Naturmuseum in Frankfurt, "but only these turtles are known to occur in pairs, a total of nine so far." Detailed analysis of the fossil material revealed that each pair consists of a female and male individual. More importantly, even though the males typically face away from the females, the tail of some male individuals can be found wrapped under the shell of the female. "There is no doubt in my mind," says Dr. Joyce, "These animals died some 47 million years ago in the act of mating. No other vertebrates are known to have died during this important biological process and then been fossilized."

Most scientists agree that the Messel Pit Fossil Site originated as a deep volcanic crater lake that preserved animals and plants that sank to its bottom, but some questions remain, such as whether the lake had poisonous surface or only subsurface waters. Modern relatives of the fossil turtles found at Messel have permeable skin that allows them to breathe and stay under water for a long time. However, this adaptation can become lethal if these turtles enter poisonous waters. The very fact that turtles were seeking to reproduce at Messel reveals that the surface waters of the volcanic lake supported a thriving biotope. Numerous turtles apparently died, however, when they accidentally sank into poisonous sub-surface waters while mating.

**Publication:** W. G. Joyce, N. Micklich, S. F. K. Schaal and T. M. Scheyer. Caught in the act: the first record of copulating fossil vertebrates. *Biology Letters*.

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How can the turtle be so fertile? A pair of *allaeochelys crassesculpta* from the Messel fossil pit. The turtles died 47 million years ago while mating.

Photo: Senckenberg Gesellschaft