Early Mars may not have been hospitable after all: study

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This image released by NASA on August 9, 2012 shows a view taken by NASA's Mars rover Curiosity. Instead of a warm, wet and possibly life-bearing planet as some scientists contend, early Mars may have been a hostile and volatile place with frequent volcanic outbursts, a study said Sunday.

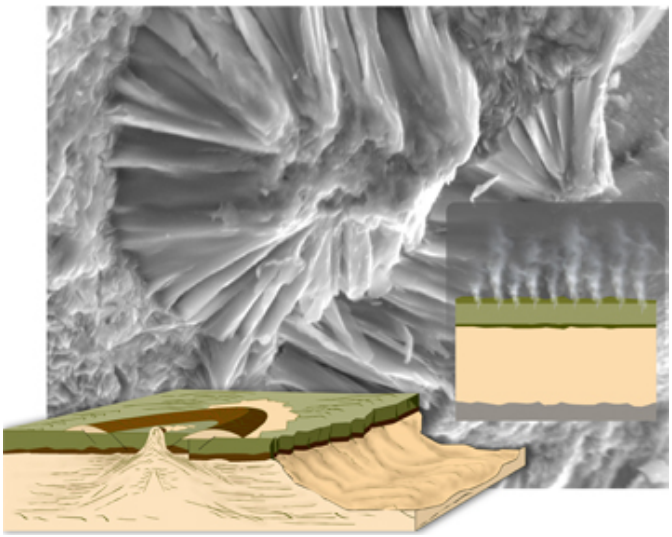
Instead of a warm, wet and possibly life-bearing planet as some scientists contend, early Mars may have been a hostile and volatile place with frequent volcanic outbursts, a study said Sunday.

Earlier research had theorised that certain minerals detected on the surface of the Red Planet indicated the presence of clay formed when water weathered surface rock some 3.7 billion years ago.

This would also have meant the planet was warmer and wetter then, boosting chances that it could have nurtured life forms.

But new research by a team from France and the United States said the minerals, including iron and magnesium, may instead have been deposited by water-rich lava, a mixture of molten and part-molten rock beneath Earth's surface.

Alain Meunier of France's Universite de Poitiers and a team studied clay minerals at Mururoa atoll in French Polynesia that seem similar to martian examples, and showed they were formed from precipitation of lava.



Particles of clay cover the surfaces of crystals in the subaerial basalt flow of the Mururoa Guyot (French Polynesia). Similar clays may have formed in the basaltic rocks of the Noachian crust on Mars (in yellow) which were probably not totally degassed. They could not have formed in Hesperian rocks (in green) which were totally degassed. Credit: A. Meunier and S. Riffaut

The same process has also occurred at other locations on Earth, including the Parana basin in Brazil, said the study in *Nature* Geoscience.

"To crystallise, clays need water but not necessarily liquid water. In other words, clays are not exclusively typical of soils or altered rocks; they may crystallise also directly from magmas," Meunier told AFP by email.

"Magmatic clays have no climatic significance. Consequently, they cannot be used to prove that

the planet was habitable or not during its early history."

If the theory is correct, it "would imply that early Mars may not have been as habitable as previously thought at the time when Earth's life was taking hold," University of Colorado geologist Brian Hynek wrote in a comment.

Two years ago, the same publication carried a study suggesting that a huge, potentially life-giving sea likely covered more than a third of early Mars as single-cell life forms were emerging on our own planet.

The authors of that study said the Red Planet probably had an Earth-like water cycle including precipitation, runoff, cloud formation, ice formation and groundwater accumulation.

Recent probes of our neighbour planet has found no liquid water, though ice has been discovered at the poles. All known life forms need water so the existence of a water source could point to a haven for primitive life.

Hynek said only on-the-spot examination of Mars' clay minerals can provide conclusive proof of their origin.

Two rovers that humans have placed on Mars, Opportunity which landed in 2004 and Curiosity earlier this year, may contribute such evidence.

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