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Date: Thu, 9 Oct 1997 19:26:24 -0400 (EDT)  
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Subject: Re: Jupiter Moon May Have Life Elements

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Forwarded message:  
Subj: Jupiter Moon May Have Life Elements  
Date: 97-10-09 18:04:46 EDT  
From: AOL News

.c The Associated Press

By PAUL RECER  
WASHINGTON (AP) - The discovery of organic compounds on two of Jupiter's moons increases the possibility that all of the elements for life are present on another of the planet's moons, Europa.

The finding, from instruments on the Galileo spacecraft orbiting Jupiter, suggests that Europa may have all three of the ingredients scientists consider essential for life: an energy source, liquid water and organic molecules, said planetary scientist Thomas B. McCord of the University of Hawaii.

``This doesn't mean there is life on Europa,'' said McCord, lead author of a study to be published Friday in the journal Science. ``The exciting thing now is the evidence that Europa may have all three of the ingredients.''

Europa is already known to have water and internal heat sources.

Dale Cruikshank, a research scientist at NASA's Ames Research Center, said the work of McCord and his team should sharpen the research concentration on Europa, which already ``is the subject of very special interest.''

``This finding increases the plausibility for life on Europa,'' Cruikshank said. ``It also supports the idea that there were organic molecules streaming throughout the solar system.''

The study of Jupiter's moons is part of a growing effort by astronomers and planetary experts to find evidence of life within the solar system, particularly on Mars.

A major goal of NASA's Mars exploration, for example, is to search for the fingerprints of life on the Red Planet. Researchers have determined that Mars once had vast pools of water and there is speculation this could have led to the evolution of life. Some believe there may be evidence of life in frozen underground water.

NASA researchers also have found what some believe may be the fossilized remains of microbes in an asteroid that fell to Earth from Mars. The interpretation of that finding, however, is controversial.

In the case of Jupiter's moons, instruments on Galileo detected the complex organic molecules on the surfaces of the moons Callisto and Ganymede, suggesting that such organics are also present on Jupiter's other two large moons, Europa and Io.

``What we have on Callisto and Ganymede are some of the kinds of organic molecules that could be the basis for life,'' said McCord. ``These are the basic ingredients.''

And if Callisto and Ganymede have these compounds, said McCord, then it is highly likely that they also exist on Europa.

Water and an energy source, said McCord are ``two angles on the triangle of life.'' Now, by finding organics present on two other Jovian moons, there is a strong suggestion that the third angle of the triangle may be present on Europa, he said.

Life on Callisto, Io and Ganymede is considered unlikely because they are dry.

No organic chemicals have been detected on Europa, but researchers have speculated that there may be a rich organic soup below the moon's ice cap and that this could be a warm, liquid place for the evolution of life.

None of the research so far has proven that life exists or has ever existed on any of Jupiter's moons, McCord emphasized.

He compared the research progress to how a cake is made.

``We've got the flour and sugar and the water to make the dough,'' said McCord. ``And there's a suggestion that the oven is on.''

But assembling the ingredients does not mean the cake has been made, he said.

The organics were detected by Galileo instruments that capture solar radiation reflected off the surface of the moons. The wavelength of the reflection is unique for each molecule, giving an electromagnetic ``signature'' of the surface chemistry.

McCord said the findings included various combinations of oxygen, carbon, sulphur, hydrogen and nitrogen that can make up several types of organic compounds.

One signature suggested the presence of tholins, an organic ``gunk'' that laboratory experiments have linked to the evolution of life, he said.

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