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Two Cool Creatures and Their Evolution

Posted by Neece at 9:21 am

As Michael Shermer says, "Science is the best tool ever devised for understanding how the world works." It's still done by humans so there will be problems, but it's self-correcting. And really, we have nothing better to help us make sense out of our world. In that vein, I wanted to share two creatures that scientists have found to be very interesting, especially regarding evolution. These are both examples of how amazing our world is.



First is the Cottony Cushion Scale – *Icerya purchasi* – which likes to eat citrus and pittosporum sap. It's now found around the world wherever citrus is grown and is quite a pest. But look how neat it is!

So here is what's so interesting. Most CCSs (Cottony Cushion Scales) are hermaphrodites. There are a few true males but they are very rare. So they are both male and female. But, the CCS fertilizes its eggs with sperm that live inside it as a separate infectious tissue!

So when the CCS fertilizes its own egg with its own sperm, which is considered an infectious tissue, it then invades the embryo with more sperm to create sperm-producing organs in the daughter. (They are called daughters because they look female. The pure male is very different looking)

There is new research into how this insect evolved this way, which is really interesting. It sort of comes down to the male is now just parasitic tissue living inside the female. The research is a mathematical model of how this evolved early on.

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There is a final twist to this tale: Gardner and Ross [the authors of the new paper] think that the scale insects carry a passenger that could have quickened the demise of the males – a bacterium. Many insects carry helpful bacteria that provide them with important nutrients, and the cottony cushion scale is no different. These bacteria can often be found in tight clusters around the infectious tissue, and if they are killed with antibiotics, females are more likely to produce sons.

To Gardner and Ross, this suggests that the bacteria could help to protect the infectious tissue from being destroyed. Why? Because the bacteria are passed down from mother to daughter. Males are a dead-end to them. In this regard, their "interests" are the same as those of the infectious tissue. Sons are a dead-end; daughters provide vessels that sail into the next generation.

Evolution is amazing, isn't it!



Next is a large protozoan! Gromia Sphaerica is about the size of a grape and is a single-celled organism! They are up to 1.5" long. That's pretty huge! They were discovered in 2000 and have recently been found off the coast of the Bahamas. It gets better. This little thing appears to make trails in the mud of the sea floor about 20 inches long. How do they do it?

First, they are single-celled, a giant amoeba. The outer shell of their bodies are called a test and seem to be mostly made of waste. There are pores in the test, and filaments on the bottom of the organism that it uses to move along and make the tracks in the mud, some even going uphill. In this area of the sea, the water is very still.

Here's where it gets really interesting! The tracks made by these Gromia today appear to match mud trail fossils from 1.8 Billion years ago in the Precambrian era. Even the low ridge which runs up the middle of the track appears to be the same. This is evidence that there might have been some early version of the Gromia that existed before the Cambrian explosion (530 million years ago), which



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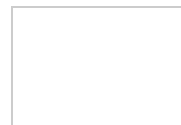
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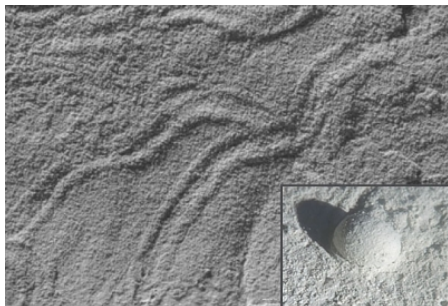
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says that a simple organism could have made those earlier tracks. And those simple organisms could have had complex body plans (relatively speaking).



So the scientists who found them in the Bahamas aren't sure how they eat or reproduce yet. They are too fragile to study in captivity. The area they were found is relatively sterile. They probably rely on resident bacteria to ferment their food for them, and they just live off the byproducts. There don't appear to be any smaller or young Gromia, but there are a lot of them.

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Resources for the Cottony Cushion Scale:

- [Not Exactly Rocket Science](#)
- [Science Daily](#)
- [Skeptic's Guide to the Universe](#)

Resources for Gromia Sphaerica:

- [Skeptic's Guide to the Universe](#)
- [Wikipedia](#)
- [Science Daily](#)

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August 5, 2011 at 6:20 pm 

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Neece Reply:
August 5th, 2011 at 11:52 pm 
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