

Paper: Evolution of species interactions in a biofilm community

Source: <http://sci.tech–archive.net/Archive/sci.bio.evolution/2007–02/msg00007.html>

- *From:* "Robert Karl Stonjek" <rstonjek@xxxxxxxxxxxxxxxx>
 - *Date:* Thu, 1 Feb 2007 17:46:27 –0500 (EST)
-

Nature 445, 533–536 (1 February 2007) | doi:10.1038/nature05514; Received 13 September 2006; Accepted 8 December 2006

Evolution of species interactions in a biofilm community
Susse Kirkelund Hansen, Paul B. Rainey, Janus A. J. Haagensen and Søren Molin

Biofilms are spatially structured communities of microbes whose function is dependent on a complex web of symbiotic interactions. Localized interactions within these assemblages are predicted to affect the coexistence of the component species, community structure and function, but there have been few explicit empirical analyses of the evolution of interactions. Here we show, with the use of a two–species community, that selection in a spatially structured environment leads to the evolution of an exploitative interaction. Simple mutations in the genome of one species caused it to adapt to the presence of the other, forming an intimate and specialized association. The derived community was more stable and more productive than the ancestral community. Our results show that evolution in a spatially structured environment can stabilize interactions between species, provoke marked changes in their symbiotic nature and affect community function.

Source: Nature
<http://www.nature.com/nature/journal/v445/n7127/abs/nature05514.html>

In it together

(Editor's Summary of the above paper)

Biofilms are specialized environments where communities of microorganisms are insulated from the outside world by an extracellular polymer matrix that they themselves secrete. The resulting microbial mats have been compared to tropical rainforests in terms of complexity and biodiversity. Selective pressures on such biofilms are likely to demand intense interactions between the individual bacteria, and an experiment with a simple community of two species (soil dwellers *Pseudomonas putida* and *Acinetobacter* sp.) shows just how close that relationship is. The physical structure of the community altered, to the mutual benefit of both species, as a result of a simple mutation in the genome of one of the species. In the absence of a partner

Paper: Evolution of species interactions in a biofilm community

the mutation (in *P. putida*) would have been deleterious. This system demonstrates the importance of interspecies interactions, and may be useful in work on the evolution of these interactions.

Source: Nature

<http://www.nature.com/nature/journal/v445/n7127/edsumm/e070201-12.html>

Posted by

Robert Karl Stonjek