



Microbial interactions and communications

Paolina Garbeva, PhD

Department of Microbial Ecology, Netherlands Institute of Ecology (NIOO-KNAW), Wageningen

Soil and rhizosphere are complex, heterogenous and dynamic environments harbouring a huge diversity of microorganisms which are often in competitive intra- and inter-specific interactions with each other. Soil microorganisms are the richest source of secondary metabolites such as antimicrobial compounds, siderophores, volatiles, enzymes etc. Many soil-inhabiting bacteria produce these secondary metabolites during interactions to suppress microorganisms competing for the same resources.

The primary focus of my presentation will be on interactions among microbes and the patterns and mechanisms of these interactions, how these interactions shape the structure and affect the functioning of microbial communities and the consequences of these interactions for ecosystem functioning. In my talk I will report and discuss on the significance of bacterial interspecific interactions on antimicrobial compounds production as well as on the ability of bacteria to sense and respond to different competing organisms. Besides this I will report on the role of microbial volatiles in long-distance bacterial-bacterial and fungal-bacterial interactions in soil and rhizosphere.

Paolina Garbeva graduated in 2005 at Leiden University in The Netherlands (promotors Prof. Hans van Veen and Prof. Jan Dick van Elsas). After her PhD, she worked for one year as a post doc at the group of Microbial Ecology, Groningen University. In the period June 2005- June 2006 she worked as post doc at the School of Biological Sciences, University of Aberdeen, UK. In 2006 she received personal NWO Veni grant and returned to The Netherlands Institute of Ecology to work on the project entitled "The suppression of plant-pathogenic fungi as a result of inter-specific bacterial interactions". After receiving personal NWO MEERVOUD grant in April 2010 she obtained tenure track position within the ME group and worked on the project "Bacterial interactions in soil: the role of volatiles as infochemicals and competitive tools". In June 2012 she received personal NWO Vidi grant on the proposal entitled "The secrets of success: the best bacterial competitive strategies in the rhizosphere". Her current research focuses on understanding microbial interactions and competitive strategies in soil ecosystems.

Garbeva is editorial board member of *FEMS Microbiology Letters* since May 2009. She is member of Netherlands Society of Microbiology (since 2007) and the International Society for Microbial Ecology (since 2009). She published 23 papers in international peer-reviewed journals with an H-index of 13.

Selected publications:

- Garbeva, P., Hordijk, C., Gerards, S., and De Boer, W. (2014). Volatiles produced by the mycophagous soil bacterium *Collimonas*. *FEMS Microbiology Ecology*.
- Mendes, R., Garbeva, P., and Raaijmakers, J.M. (2013). The rhizosphere microbiome: significance of plant beneficial, plant pathogenic, and human pathogenic microorganisms. *Fems Microbiology Reviews* 37, 634-663.
- Garbeva, P., Hol, W.H.G., Termorshuizen, A.J., Kowalchuk, G.A., and De Boer, W. (2011a). Fungistasis and general soil biostasis - A new synthesis. *Soil Biology & Biochemistry* 43, 469-477.
- Garbeva, P., Silby, M.W., Raaijmakers, J.M., Levy, S.B., and De Boer, W. (2011b). Transcriptional and antagonistic responses of *Pseudomonas fluorescens* Pf0-1 to phylogenetically different bacterial competitors. *Isme Journal* 5, 973-985.
- Garbeva, P., Tyc, O., Remus-Emsermann, M.N.P., Van Der Wal, A., Vos, M., Silby, M., and De Boer, W. (2011). No Apparent Costs for Facultative Antibiotic Production by the Soil Bacterium *Pseudomonas fluorescens* Pf0-1. *Plos One* 6.