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Beneficial fungi to improve food security: From the genome to the field on the highway of sustainability

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Biocontrol measures will have an important role in the future due to the demand for increasing sustainable food production to meet the needs of an increasing world population and to the new legislation (EU DIRECTIVE 2009/128/EC) establishing a framework to achieve a sustainable use of pesticides to reduce the risk and impacts of chemicals on human health and environment. The agro industry historically delivering chemical pesticides are now investing in biocontrol solutions and the exploitation of beneficial fungi as active ingredients of biopesticides and biostimulants appears to be promising. NGS techniques are now leading to a much deeper understanding of the function of biocontrol organisms in their interactions with pathogens, plants and environment. It is the case of *Trichoderma gamsii* T6085, a fungal isolate studied for many years by our research group for its ability to control Fusarium Head Blight (FHB) on wheat. From experimental data hitherto collected T6085 resulted to be effective against *Fusarium graminearum* and *Fusarium culmorum*, two among the main causal agents of FHB by inhibiting their growth, reducing mycotoxins contamination and controlling the disease both in lab and in field. T6085 resulted also a good competitor against *F. graminearum* for cultural debris. The recent sequencing, assembling and annotation of the genome of this isolate and the comparison with those of other *Trichoderma* spp. furnished a potent tool to better investigate and explain what emerged from experiments helping in clarifying some of the ecological characters of T6085 in view of its development as active ingredient of new biopesticides.

Biography

Sabrina Sarrocco has graduated in Biological Sciences from University of Rome specialized in Plant Biotechnology and PhD in Science of Plant Production from University of Pisa, Italy. She worked as a Temporary Professor in Plant Pathology (2005), and from 2006 as a Technician at the Phytopathological Mycology Lab of the DAFE, University of Pisa; Italy. She was also a Visiting Researcher at the Universities of Copenhagen and Vienna. She is the author of scientific papers (ISI), contributions to conferences and book chapters dealing with plant pathology, biocontrol and fungal molecular biology. She is Member of the Editorial Board of *PlosOne*, *European Journal of Plant Pathology* and *Journal of Plant Disease and Protection*. She is also the Secretary-Treasurer of the Italian Phytopathological Society..

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