

FoodMicro 2022

27th
International
ICFMH
Conference

Organized by



International
Committee on
Food Microbiology
and Hygiene

Under the auspices



Hellenic Scientific
Society of
Mikrobiokosmos

ΓΕΩΠΟΝΙΚΟ ΠΑΝΕΠΙΣΤΗΜΙΟ ΑΘΗΝΩΝ
AGRICULTURAL UNIVERSITY OF ATHENS

**Next Generation
Challenges
in Food
Microbiology**

**August
28-31
2022**

Megaron Athens
International
Conference Centre
ATHENS, GREECE

Hybrid

www.foodmicro2022.com

Abstract Book

Professional Congress Organizer:



+30210 6833600
www.convin.gr

Conference correspondence:

info@foodmicro2022.com
www.foodmicro2022.com



Controlling and predicting microorganisms in food ecosystems

P6.31

Development and application of formulated endophytic fungus for novel plant growth strategies

Kakagianni M¹, Tsiknia M², Ehaliotis C², Papadopoulou K¹

¹University of Thessaly, Larissa, Greece, ²Agricultural University of Athens, Athens, Greece

Most beneficial endophytic fungi are part of the microbial communities of plants and are directly related to promoting plant health and resistance to the abiotic stresses and facilitating their nutrition. *Fusarium solani* K (FsK) strain is such a fungus which is capable of conferring biocontrol of pathogenic fungi in both roots and leaves and protecting tomato plants, including tomato fruits, from the negative effects of reduced water availability. It can therefore be used as a promising alternative microbial inoculum in agriculture. The characteristics of these inocula can be greatly improved by encapsulation systems and suitable properties of the biopolymers.

In this study, we aimed at the selective propagation of finely dispersed *Fusarium solani* K (FsK) strain mycelium in submerged culture and encapsulation in calcium alginate/starch beads to protect the fungus during drying, enable growth in different soils and cultivation media and promote endophytism in tomato plants.

We found that a combination of culture conditions promoted selective formation of finely dispersed mycelium reflected by 4.5-fold decreased pellet diameters, 10-fold increased mycelial biomass concentrations and low blastospore contents of 52×10^6 mL⁻¹ after 48 h. Encapsulation of mycelium enhanced survival under drying by 29.14%. Co-encapsulated starch served as a nutrient source for growth media with best results on sterile and non-sterile peat substrate with 3.99 mm and 4.28 mm radial mycelial growth, respectively.

This study provides the first evidence that survival of FsK mycelium can be substantially improved by encapsulation and that encapsulated FsK is able to grow out of beads in non-sterile soils. These results may provide the basis for future work on increasing efficacy in plant protection strategies against pathogens, enhancing inoculum shelf-life and improving endophytism by formulation technologies.

Acknowledgment: This work was supported by the European Regional Development Fund and Greek Ministry of Education, Research and Religions/EYDE-ETAK through program EPAN EK 2014–2020/Action “EREVNO-DIMIOURGO-KAINOTOMO” [grant number T2EΔK-03311].