Proceedings of the SIGA-SEI-SIBV-SIPAV Web Workshop "Young Scientists for Plant Health"
16 December, 2020
ISBN **978-88-944843-1-1**

Poster Communication Abstract – PH.53

NOVEL NANOSTRUCTURED COMPOUND FOR SUSTAINABLE CONTROL OF TOMATO BACTERIAL SPECK DISEASE

SCHIAVI D.*, GIOVAGNOLI S.**, CAMAIONI E.**, BOTTICELLA E.*, SESTILI F.*, BALESTRA G.M.*

*) Department of Agricultural and Forestry Sciences, DAFNE, University of Tuscia (Italy)
**) Department of Pharmaceutical Sciences, DSF, University of Perugia (Italy)

tomato, Pseduomonas syringae pv. tomato, organic plant protection, chitosan, nanostructured microparticles

Bacterial speck disease, one of the most pervasive threat in tomato cropping, is provoked by Pseudomonas syringae pv. tomato (Pst), and its control is traditionally entrusted to cupric salts. In this work cellulose nanocrystals (CNCs) and starch (ST) obtained from two bread wheat varieties, were used respectively as nanocarrier and stabilizer excipient to synthetize, by spray-drying, a novel green nanostructured ternary compound with chitosan hydrochloride (CH). Chitosan was chosen as active principle among different natural substances that showed an antibacterial effect on Pst in preliminary screening tests. In vitro disk diffusion and agar incorporation assays were conducted in order to quantify the antimicrobial effect of CNCs, ST, CH, and the novel compound. After that, antimicrobial properties and biocompatibility of the nanostructured formulation were investigated in vivo, showing no negative effects on tomato leaf area developments, the capability to reduce Pst epiphytic survival, and the severity and incidence of bacterial speck disease, obtaining results comparable to those by copper hydroxide. The research highlights how the novel CNCs-ST-CH nanostructured green pesticide could be used as a potential ally in sustainable Pst control strategies.