

Conference abstract PO-37

## Microspheres Containing Carnosic Acid for the Treatment of Basil Fungal Diseases

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Microspheres loaded with carnosic acid (CA) as an active ingredient which was extracted from various species of *Salvia* L., were prepared by a spray drying technology. The matrix of the microspheres consisted of 85% deacetylated chitosan (average MW 55000 kDa), poloxamer P407 and carnosic acid. Briefly, chitosan and poloxamer P407 were dissolved in 1% v/v acetic acid followed by dispersion of carnosic acid under vigorous stirring. The dispersion was then fed into a spray dryer (190 Mini, Büchi, Flawil, Switzerland) and processed under the following operative conditions: T inlet 180°C, T outlet 120°C, air aspiration 70% and peristaltic pump 15% (feeding rate 4 mL/min). This process yielded microspheres with 5-8 µm in diameter containing 17% active ingredients corresponding to an encapsulation efficiency of 45% and a practical yield of 34%.

To investigate the protective effect against mycelial growth of *Botrytis cinerea* and *Sclerotinia sclerotiorum* an 0.1% aqueous dispersion of microspheres was sprayed on 4 groups of 200 plants of basil. After 14d the disease incidence (DI) was 10% (*B. cinerea*) and 2 % (*S. sclerotiorum*) as compared to the untreated control (*B. cinerea* 45% DI; *S. sclerotiorum* 18% DI). This protective effect of the microsphere-formulation was comparable to that of equal amounts of carnosic acid in methanol, whereas the solvent alone provoked a quite lower mycelial growth inhibition.

These results highlight for the first time the antifungal activity of carnosic acid and its potential application, most likely favoured by the presence of chitosan [1], of the above formulation for plant protection against fungi.

- [1] Devlieghere F, Vermeulen A, Debevere J. Chitosan: antimicrobial activity, interactions with food components and applicability as a coating on fruit and vegetables. Food Microbiol. 2004; 21: 703–714. doi:10.1016/j.fm.2004.02.008