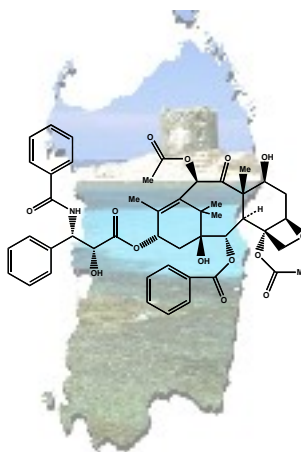




## SardiniaChem2008

GIORNATA DI STUDIO DEDICATA  
ALLA CHIMICA ORGANICA  
DELLE MOLECOLE BIOLOGICAMENTE ATTIVE

30 Maggio 2008, Aula Magna della Facoltà di Scienze – Sassari



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## MICROENCAPSULATION OF *BACILLUS THURINGIENSIS* AND INSECTICIDAL ACTIVITY EVALUATION ON LARVAE OF LEPIDOPTERA

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*Bacillus thuringiensis* (Bt) is one of the bacterial entomopathogens most frequently studied as a toxin producer. Its insecticidal activity was attributed to the parasporal crystals formed during the stationary phase of its growth cycle, and released during sporulation.<sup>1</sup> The efficacy of Bt is highly sensitive to the environmental conditions; when exposed to UV light, the insecticidal proteins undergoes to rapid degradation.

Considerable research has attempted to improve Bt field persistence using ultraviolet absorbers, encapsulation and addition of clay granules to spray formulations.<sup>2</sup>

The aim of this study was to investigate different encapsulation processes in order to obtain the Bt-based formulations consisting of matrix-type microcapsules.

Gelatin and Sodium Alginate were selected as polymeric materials for the preparation of microcapsules. The obtained systems were characterized in terms of morphology and encapsulation efficiency, and their toxicity on larvae of different insect species (*Lymantria dispar*, *Malacosoma neustria* and *Plodia interpunctella*) was assessed in vitro.

The results showed that the microencapsulation process by double emulsion technique gave high encapsulation yields (over 95%). Data concerning the larvicidal effects of the examined formulations, expressed as percentage of mortality, suggested that the prepared microcapsules had toxic effects and determined mortality values of about 60% towards selected insect.

Given these encouraging results, further experiments are in progress to assess the suitability of microcapsules for application as a new tool in integrated control of different pest larvae.

1. Schnepf E, Crickmore N, Van Rie J, Lereclus D, Baum J, Feitelson J, Zeigler DR, Dean DH. *Bacillus thuringiensis* and Its Pesticidal Crystal Proteins. *Microbiology and Molecular Biology Reviews* **1998**, 775–806.
2. Tamez-Guerra P, McGuire MR, Behle RW, Shasha BS, Galan-Wong LJ. Assessment of microencapsulated formulations for improved residual activity of *Bacillus thuringiensis*. *J. Econ. Entomol.* **2000**, 93, 219-225.