

Use of Chitosan-TPP microsphere as a matrix for the encapsulation of somatic embryos of *Capsicum annum* var. *grossum*

¹Senarath, WTPSK, ²Stevens, WF, ¹Lee, Kui-Jae, ¹Rehman, S and ¹Lee, Wang Hyu

¹Faculty of Bioresources Sciences, College of Agriculture, Chonbuk National University, Republic of Korea

²Bioprocess Technology Centre, Asian Institute of Technology, Bangkok, Thailand

Chitosan is a key compound of shrimp waste. It is a biopolymer, which is widely used in the field of medical Sciences. Chitosan-TPP (Tripolyphosphate) complex has more or less similar physical properties as Ca-alginate which can be used for the production of synthetic seeds. Possibility of the use of Chitosan-TPP complex as a matrix for encapsulation of somatic embryos was tested against the Ca-alginate complex (2.5w/v Na-alginate, 100mM CaCl₂ at pH 5.5).

Somatic embryos grown in the induction medium (IM) were drawn into the viscous chitosan solution (1%) and mixed well by inverting the tube carefully. Then the mixture was dropped at regular intervals into the tripolyphosphate (TPP) solution kept on a magnetic stirrer for bead formation. Synthetic seeds formed were washed and transferred into the incubation medium, then allowed either to air-dry or freeze-dry.

Both Ca-alginate and Chitosan-TPP seeds were transferred into the shoot induction medium (SIM) and the number of plantlets produced from each synthetic seed was recorded. There was no significant difference between the germination of somatic embryos encapsulated in Ca-alginate or Chitosan-TPP (14.30 ± 1.9 and 13.91 ± 1.3 plants /bead respectively). There was a significant loss in plant regeneration when Chitosan-TPP beads were freeze-dried (3.2 ± 0.9 plants/bead). Storage of synthetic seeds at 18 °C for different time periods also tested. Storage upto 6 weeks at 18 °C does not effect the regeneration of plants from somatic embryos encapsulated in air-dried Ca-alginate or Chitosan-TPP (13.9 ± 0.6 and 13.5 ± 1.1 respectively) but after 6 weeks, the number of plants which produced from Chitosan-TPP complex reduced significantly (4.31 ± 0.9). The use of Chitosan-TPP microsphere as a matrix for artificial seeds but long term storage could be a problem.