

- The recombinant Bt toxins, Cry1Ac-Cry9Aa and Cry1Ac-Cry9AaMod prepared by domain swapping –overlap extension PCR and alpha helix-1 deletion in Cry1Ac-Cry9Aa for enhancement in toxicity against larvae of polyphagous pest *Helicoverpa armigera*. Domain swapping approach prove to be an excellent way improvement toxicity in Cry toxin. This work concluded that it can generate more recombinants with a different combination of Cry protein domains and bioassay against different lepidopteron pests as well as resistant pests. It has open new avenue to explore the combination of various domains and their activity on insect pest and resistance management. Alpha helix-1 deletion of domain I of Cry toxins is successful strategy would be utilised in order to insect resistance management.
- Chitosan–TPP nanoparticles of insecticidal Cry toxin prepared with nanoencapsulation technique could use as a biocontrol of devastating pest of crops in the aspect of insect pest management. It also concluded that it unable to effective delivery of biopesticides and makes practical application of nanotechnology in the field of biocontrol.
- Box-behnken design can use for the optimization of process parameters of microencapsulation process in the subject to save time and effort.
- W/O emulsion based formulation of bioinsecticide proved to successfully control pest larvae *H.armigera*. Microencaopsulation by emulsion could protect the activity of active ingridents of fromulation in extrem high UV irradiation. The bioefficacy of bioinsecticde comparative significant to chemical insecticide and could apply as an ecofriendly approach as insect pest managment.
- Nanotechnology tools - nanoparticles would employ for insect pest mangment.