



---

## CONJUGATIVE PLASMID TRANSFER BETWEEN INSECTICIDAL STRAINS OF *Bacillus thuringiensis*: USE OF ANTIBIOTIC RESISTANCE TRAITS TO DETECT TRANSCONJUGANTS

Pathmanathan N.<sup>1</sup>, Samarasekara R.<sup>2\*</sup>, Baragamaarachchi R.Y.<sup>2</sup> and Weerasena O.V.D.S.J.<sup>3</sup>

<sup>1</sup>Department of Botany, Faculty of Applied Sciences, University of Sri Jayewardenepura, Sri Lanka

<sup>2</sup>Industrial Technology Institute, Sri Lanka

<sup>3</sup>Institute of Biochemistry, Molecular Biology and Biotechnology, University of Colombo, Sri Lanka

radhika@iti.lk

---

### ABSTRACT

Conjugative plasmid transfer is a way of horizontal gene spread in *Bacillus thuringiensis* (*Bt*); a gram-positive bacterium which consists of plasmids carrying insecticidal *cry* genes. These ‘*Cry* plasmids’ could be transferred to recipient strains by a mating process known as ‘conjugation’ to form transconjugants. Since *cry* genes often coexist with antibiotic resistance plasmids; antibiotic resistance traits of mating pairs act as simple markers to detect transconjugants. This study aimed to determine suitable mating pairs of *Bt*. As a first step antibiotic susceptibility tests were done using Kirby–Bauer disc diffusion method for *Bt* isolates available in the culture collection. Then broth mating protocol was followed for six mating pairs and transconjugant colonies were observed in double selective antibiotic - Luria Bertani (LB) agar medium. According to the results of the conjugation experiments, colonies of *Bt* mating pairs; AB15+AB49, AB1+AB110 and AB110+AB142 were observed. However, due to growth in the negative controls, these colonies were not confirmed as transconjugants. Thus, further molecular studies on *cry* gene transfer are recommended to confirm the above colonies as transconjugants. Furthermore, results showed mating pairs: AB1+AB20, AB7+AB15 and AB2+AB8 were incompatible for mating since transconjugant colonies were not observed during conjugation experiments. In conclusion, this study is a preliminary study to identify suitable mating pairs for future studies thus, pairs AB15+AB49, AB1+AB110 and AB110+AB142 could be considered for future studies.

**Keywords:** *Bacillus thuringiensis* (*Bt*), Plasmid, Conjugation, Transconjugant, *cry* genes