

# Effect of wax degrading bacteria on life cycle of the pink hibiscus mealybug, *Maconellicoccus hirsutus* (Green) (Hemiptera: Pseudococcidae)

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## Abstract

The pink mealybug *Maconellicoccus hirsutus* (Green) (Hemiptera: Pseudococcidae) is a polyphagous insect pest with protective wax covering. Bacterial isolates originating from *M. hirsutus* cadavers were screened for their wax degrading effects and the three most potent wax degrading isolates were identified to be *Serratia marcescens*, *Pseudomonas aeruginosa* and *Bacillus subtilis* by 16S rRNA gene sequencing. Bacteria degrading *M. hirsutus* wax reduced female longevity, offspring production as well as weight and wax content of emerging adults. Treatment with *S. marcescens* was the most effective in reducing wax content, fecundity and honeydew production. Analysis of honeydew produced by *M. hirsutus* after each microbial treatment revealed reduction in amino acids, proteins, and reducing sugars concentration compared to controls. Most negative effect on reducing sugars was observed in the *B. subtilis* treatment suggesting disequilibrium in mealybug metabolism. *S. marcescens* and *P. aeruginosa* treatments showed significantly lower content of wax as compared to control suggesting utilization of wax as carbon source by these microorganisms. This study suggests that the use of each of three bacterial isolates reduces wax content of mealybug and might be useful in devising mealybug control strategies.