

## **A bacterial - scarab mutualism - sex depends on it !**

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The New Zealand grass grub *Costelytra zealandica* (Coleoptera: Scarabeidae) is a univoltine endemic species that has colonised and become a major pest of introduced pastures in New Zealand. Female beetles were previously shown to use phenol as their sex pheromone produced by symbiotic bacteria in the accessory or colleterial gland. In this study, production of phenol was confirmed from the female beetles, while bacteria were isolated from the gland and tested for attractiveness towards grass grub males in traps in the field. The phenol-producing bacterial taxon was identified by partial sequencing of the 16SrRNA gene, as *Morganella morganii*. We then tested the hypothesis that the phenol sex pheromone is biosynthesized from the amino acid tyrosine by the bacteria. This was shown to be correct, by addition of isotopically labelled tyrosine (<sup>13</sup>C) to the bacterial broth, followed by detection of the labelled phenol by SPME-GCMS. Elucidation of this pathway provides specific evidence how the phenol is produced as an insect sex pheromone by a mutualistic bacteria.

