

Pre-selection and biological potential of the egg parasitoid *Anaphes inexpectatus* for the control of the *Eucalyptus* snout beetle, *Gonipterus platensis*



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Abstract

The *Eucalyptus* snout beetle, *Gonipterus platensis* (Marelli), causes severe damage to eucalypt plantations in several countries, despite the presence of the parasitoid *Anaphes nitens* (Girault). Climate and/or host–parasitoid mismatch may explain *A. nitens* shortcomings in some areas in Portugal, Spain, Chile, South Africa, or Australia. Because additional parasitoids may be needed to achieve reliable control of this pest, *Anaphes inexpectatus* Huber and Prinsloo, retrieved from field surveys conducted in Tasmania (the pest's native habitat), was selected for pre-release studies in Portugal. Life history traits of *A. inexpectatus* and *A. nitens* were compared at six temperatures (5, 10, 15, 20, 25, and 30 °C), including development times, thermal constants, viability, parasitism, and behaviour. Temperatures ranging from 10 to 20 °C were adequate for development, while at 25 and 30 °C, deleterious effects of temperature were detected, particularly in *A. nitens*. Development thresholds were similar for *A. inexpectatus* and *A. nitens* (6.0 and 5.4 °C, respectively), but *A. nitens* needed 313 degree-days to complete development, while *A. inexpectatus* needed 263 degree-days. Globally, *A. nitens* produced more progeny, parasitised more eggs, and lived longer than *A. inexpectatus*. Net reproductive rates were higher for *A. inexpectatus* at lower temperatures (10 and 15 °C), and higher for *A. nitens* at moderate temperatures (20 and 25 °C). In addition, *A. inexpectatus* evidenced higher tolerance to the highest temperature tested (30 °C). *Anaphes inexpectatus* is likely to establish under field conditions and may enhance parasitism of *G. platensis*.

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