

Infection of *Aenetus virescens* (Lepidoptera: Hepialidae) larvae by the fungus *Beauveria bassiana*

J. R. GREHAN

Zoology Department, Victoria University, Private Bag, Wellington

Abstract

Beauveria bassiana is recorded in the larvae of *Aenetus virescens* for the first time. Infected larvae were found in forest litter (dead wood) and in live tree hosts. An indication of mortality of larvae in live trees is given. The gross appearance of infected larvae is described.

Keywords: Lepidoptera; Hepialidae: *Aenetus virescens*; fungus; *Beauveria bassiana*; New Zealand.

Beauveria bassiana (Balsamo) Vuillemin attacks a wide range of insect hosts from several orders including Coleoptera, Diptera, Hemiptera, Hymenoptera, and Lepidoptera (Steinhaus & Marsh 1962). Within the Hepialidae it has been recorded from the subterranean larvae of *Wiseana* sp. (Porina) (Steinhaus & Marsh 1962; Helson 1962) and *Triodia sylvina* L. (Perju & Ghizdavu 1977).

Aenetus virescens (Doubleday) is characteristically a woodboring species. Larval development involves 2 phases, an initial period of approximately 3 months in forest litter, generally under logs and pieces of dead wood or on fungi, before moving into live tree host for the second phase (Grehan 1979). *B. bassiana* was first recorded from larvae in the litter phase. Dr P. J. Wigley (Entomology Division, DSIR) and Dr G. J. Samuels (Plant Diseases Division, DSIR) identified the fungus from 7 litter phase larvae and 1 tree phase larva. Voucher specimens have been lodged in the DSIR Plant Diseases Division culture collection (PDDCC 6887).

A. virescens larvae infected with *B. bassiana* exhibited a thick mass of white hyphae that enshrouds the entire larva apart from the head (Fig. 1a, b). Dead larvae which had constructed tunnels were found at the tunnel entrance facing outwards. Larvae which had just died became firm and slightly pink before becoming covered by hyphae.

I have encountered no difficulty in locating infected larvae in the litter phase but I have no quantitative record of infection. In surveying approximately 300 tree phase larvae from March 1978 to August 1980, only 4 infected larvae were found. All but 1 were recent establishments (up to 1 month) and may have already been infected in the litter phase.

B. bassiana sometimes destroys 5-15 % of larvae and pupae of *Triodia sylvina* (Perju & Ghizdavu 1977), but the impact of *B. bassiana* on the larval population of *A. virescens* is unknown. Humid conditions appear to favour *B. bassiana* (Barson 1977) and probably prevail under dead wood in the forest. The establishment and spread of *B. bassiana* in litter phase larvae may be enhanced by the larvae congregating in groups with no apparent barriers preventing physical contact (Grehan 1979).

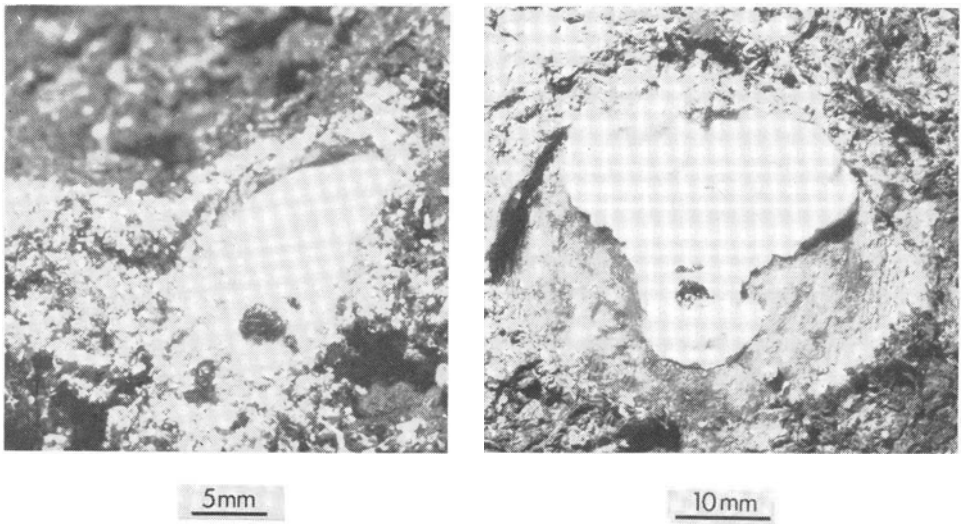


Fig. 1. *Aenetus virescens* larvae infected with *Beauveria bassiana* in (A) live *Carpodetus serratus* and (B) dead wood material. Both specimens are covered with fungal hyphae apart from the head which is visible as a dark patch in the lower part of the fungal growth. Specimen (A) is well established and may have become infected in the tree. The silk/frass cover has been removed and the feeding surface boundary is visible.

Previous records of larval pathogens of *A. virescens* have been restricted to the genus *Cordyceps*. Cunningham (1921) makes an unconfirmed record of *C. gunnii* Berk., and Dingley (1953) records an undetermined species. *C. robertsii* Hooker was erroneously identified as a larval pathogen of *A. virescens*, but this fungus attacks subterranean hepialids (Cunningham 1921). I have recorded 2 as yet unidentified pathogens, a bacterium (P. J. Wigley pers. comm.) in the larva and a fungus in the pupa.

ACKNOWLEDGMENTS

Dr P. J. Wigley (Entomology Division, DSIR) for his interest, and Dr G. W. Gibbs for constructive criticism of the manuscript.

REFERENCES

- BARSON, G. 1977: Laboratory evaluation of *Beauveria bassiana* as a pathogen of the larval stage of the large elm bark beetle, *Scolytus scolytus*. *Journal of Invertebrate Pathology* 29:361-366.
- CUNNINGHAM, G. H. 1921: The genus *Cordyceps* in New Zealand. *Transactions and Proceedings of the New Zealand Institute* 53:372-382.
- DINGLEY, J. M. 1953: The Hypocreales of New Zealand V. The genera *Cordyceps* and *Torrubiella*. *Transactions of the Royal Society of New Zealand* 81:329-343.
- GREHAN, J. R. 1979: Larvae of *Aenetus virescens* (Lepidoptera: Hepialidae) in decaying wood. *New Zealand Journal of Zoology* 6:583-585.
- HELSON, G. A. H. 1962: Microbial Insecticides. *Proceedings of the 5th New Zealand Weed Control Conference*: 271-276.
- PERJU, T.; GHIZDAVU, I. 1977: Contributii la cunoasterea biologiei si ecologiei omizii hameiului, *Trioda sylvina* L. (Hepialidae-Lepidoptera). *Serie Biologie Animala* 29:81-85.
- STEINHAUS, E. A.; MARSH, G. A. 1962: Report of diagnoses of diseased insects 1951-1961. *Hilgardia* 33: 349-390.