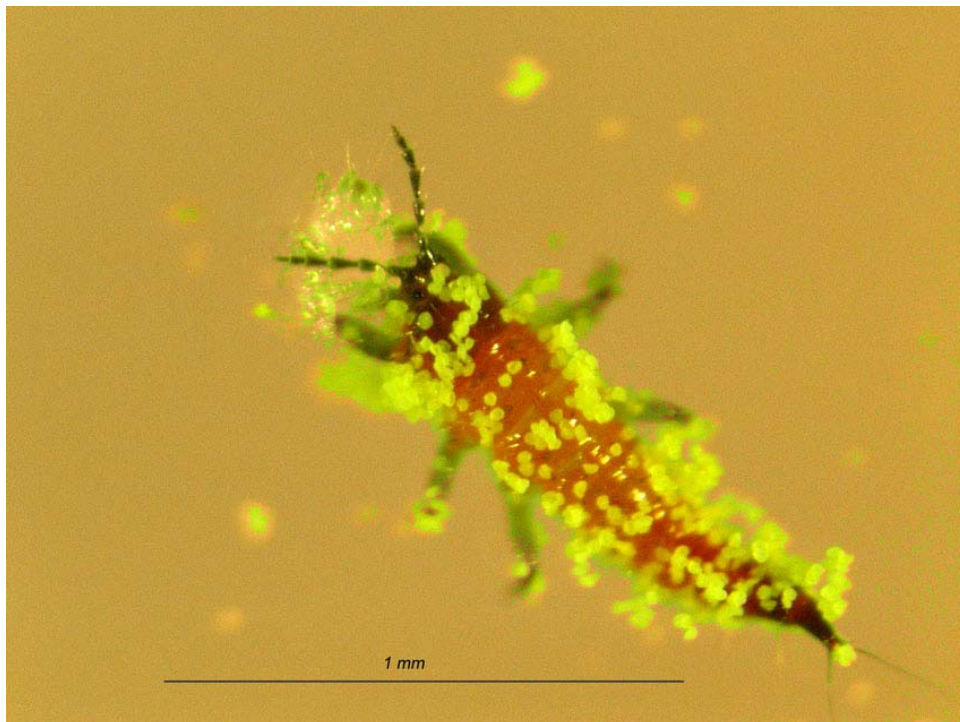


**INVESTIGATION INTO ASPECTS OF THE BIOLOGY OF
TUBULAR BLACK THRIPS, *Haplothrips victoriensis*
BAGNALL (THYSANOPTERA: PHLAEOTHRIPIDAE),
IN SOUTH AUSTRALIA**

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The first instar larva of tubular black thrips with "pollen disguise" feeding on *Tyrophagus* mite.

The thesis submitted for the degree of Master of Science
Discipline of Ecology and Evolutionary Biology



April, 2008

DECLARATION

This thesis contains no material that has been accepted for the award of any other degree or diploma in any university. To the best of knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

I consent to this thesis being made available for photocopying and loan when deposited in the University Library.

Signature:

Date:

(changing this page by a yellow blank sheet here)

Dedicated in loving memories

to my mum & older brother

Pham Thi Tung



(10/01/1945 - 08/10/1998)

Le Cao Nguyen

(22/06/1971 - 29/12/2005)

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Two years can never be a satisfactory time to get everything for done in life but is long enough for every one to do many things successfully. For me, I am also happy to finish this entomological project at the University of Adelaide. The results I found may/may not be significant for future research but in my belief, I have deeply focused on my research and have given it my best efforts. Importantly, I have been very lucky to learn about new things, gain new experiences and have received so much support from my supervisors, the lab groups of Prof. Andy Austin, Assoc. Prof. Mike Keller and the SARDI entomological section, academic staff and my sponsor, friends and families.

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THESIS SUMMARY

Haplothrips victoriensis Bagnall (Thysanoptera: Phlaeothripidae) is an indigenous thrips of southern Australia. It is known as a predator of two-spotted mite. This project investigated various biological characteristics of *H. victoriensis* as a precursor to its potential use in biological control. In addition, *H. victoriensis* is very difficult to distinguish from other *Haplothrips* species in terms of morphology, especially as there are no keys to larvae. DNA barcoding and morphology of the larval stages are used to address these issues.

The thesis is divided into seven chapters comprising an introduction, four main research chapters, conclusion and reference chapters.

Chapter 2 covers the culturing techniques for *H. victoriensis*. Some new cases and rearing processes were designed to culture *H. victoriensis* and its prey. These were following series of rearing techniques investigated including rearing *H. victoriensis* for egg collection, *H. victoriensis* larvae and adults for biological and morphological observations, mass rearing of *H. victoriensis*, WFT and *Tyrophagus* mites, and rearing WFT for egg collection. Predatory *H. victoriensis* was reared in the laboratory with various diets of honey, pollen, *Tyrophagus* mites and western flower thrips (WFT).

Chapter 3 investigates the biological development of *H. victoriensis*, including egg, larva, prepupa, pupa and adult stages. *Haplothrips victoriensis* fed with 10% honey solution, mixed pollen and *Tyrophagus* eggs took about 16-22 days to develop from eggs to adults at 25 °C. Developmental times of immature *H. victoriensis* varied when fed on different food sources. The longevity of *H. victoriensis* was significantly different with different diets.

Chapter 4 examines predatory and cannibalistic characteristics and consumption of *H. victoriensis* on various prey. *Haplothrips victoriensis* was found to feed on many kinds of common prey; Two spotted mite (TSM), *Tyrophagus* mite, WFT, spotted alfalfa aphid, greenhouse whitefly and diamond back moth but not on ash whitefly. Importantly, *H. victoriensis* was also found to be cannibalistic which might affect population fluctuations in the laboratory and in the field.

Chapter 5 examines the ecology and hosts of *H. victoriensis* in South Australia and taxonomy of *H. victoriensis* and some other *Haplothrips* species being similar to *H. victoriensis*. *Haplothrips victoriensis* was found to live on flowers from a range of different plant families. Morphological characteristics of the immature stages of *H. victoriensis* and a key developed to separate common *Haplothrips* in S.A. As well, COI was used to possibly identify *H. victoriensis* and its morphologically similar taxa and investigate whether *H. victoriensis* is a single species or perhaps contains cryptic species. None of the specimens of *H. victoriensis* included in the analyses showed any variation in COI indicating a single species for horticultural areas in S.A.

Chapter 6 provides an overall discussion of the main results and indicates areas of future research.

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