

# First record of the spiral nematode, *Helicotylenchus dihystra*, infecting cotton roots in Australia

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## Introduction

Plant parasitic nematodes are serious pathogens of cotton worldwide and have potential to increase the severity of vascular wilts. In Australia, disease caused by nematodes has not been reported in cotton and the potential for interaction between nematodes and vascular wilts has not been investigated. We briefly investigated whether or not plant pathogenic nematodes were associated with cotton crops in the Namoi Valley of NSW, including plants with severe symptoms of Verticillium wilt.

## Materials and methods

In February and March 2005, cotton crops were examined in two fields near Narrabri, and two fields near Gunnedah in the Namoi Valley, NSW. In each crop, vascular discolouration of stems near the first node was used to differentiate three areas with, and three without, severe symptoms of Verticillium wilt. Each sample included ten plants, with the severity of Verticillium wilt being scored on a scale of 0-4 (0, <5%, 5 to <20%, 20 to <40% and >40% stem cross section with symptoms, respectively) and soil was sampled close to the tap roots (composite of three cores, 9 cm diameter × 20 cm deep). Roots were extracted by soaking soil in sodium hexametaphosphate solution (Calgon®, 0.2% w/v) for 2 h and sieving under tap water. Roots were cleared and stained with acid fuchsin, and observed under a dissecting microscope (x 120) for the presence of nematodes. Nematode extraction and identification was conducted by Biological Crop Protection Pty Ltd on subsamples (approx.10 g) of living roots.

## Results

The majority of nematodes (87%) within roots at sites near Gunnedah were the parasite *Helicotylenchus dihystra* (Fig. 1), (confirmed by Dr J Nobbs, SARDI). The majority of nematodes within roots at sites near Narrabri were bacteriophagous (Rhabditidea) and mycophagous (Aphelenchidea). Total nematode number in cotton roots was not correlated with disease incidence ( $r^2 = 0.03$ ) or severity ( $r^2 = 0.15$ ).

## Discussion

The presence of non-parasitic nematodes within plant roots at the Narrabri sites is curious. It is possible that these nematodes were temporary endophytes of cotton roots, feeding on phyto-parasitic fungi and bacteria, with the late stage of the crop being a factor.

This is the first report of *H. dihystra* parasitising the roots of cotton in Australia. *H. dihystra* has been observed in soil in a cotton crop in Australia (McLeod et al. 1994, *Plant Nematodes of Australia Listed by Plant and Genus*) but roots were not examined. *H. dihystra* has been recorded on cotton in the USA, where it is not considered to be a major pathogen. The potential for *H. dihystra* to cause disease, or interact with vascular pathogens, in cotton under Australian conditions is unknown and requires investigation.

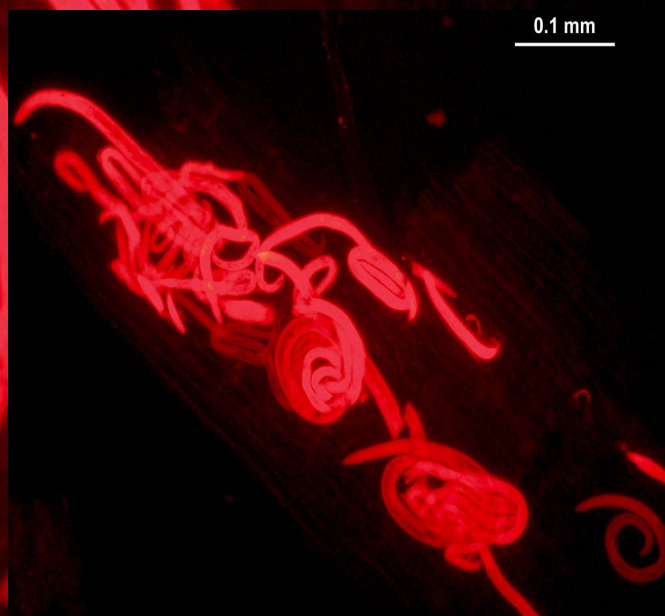


Figure 1. Fluorescence image of several individual *H. dihystra* within a cotton root stained with acid fuchsin