# A NEMATODE PATHOGEN OF ARUM LILY (*ZANTEDESCHIA AETHIOPICA*) REVEALED IN THE SEARCH FOR A POTENTIAL BIOLOGICAL CONTROL AGENT AGAINST THIS NOXIOUS WEED

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## INTRODUCTION

Arum or calla lily (*Zantedeschia aethiopica*) is an important ornamental plant throughout the world. There is a small Australian industry based in Victoria which exports rhizomes within and outside of Australia. In Western Australia *Z. aethiopica* has escaped cultivation to become a noxious weed. The ineffectiveness of chemical means of control have led to the search for pathogens of *Z. aethiopica* as potential bio-control agents of this noxious weed. In a recent survey of *Z. aethiopica* infested sites (1), galled roots were observed on a number of *Z. aethiopica* plants indicating the possible presence of a root-knot nematode. Recent enzymatic studies have demonstrated that species of *Meloidogyne* may be reliably differentiated on the basis of species specific enzyme phenotypes alone, using polyacrylimide gel electrophoresis PAGE (2).

The purpose of this study was to identify the causal agent/s of the galled *Z. aethiopica* roots and to determine the host range of the causative agent/s through a literature search.

## MATERIALS AND METHODS

*Z. aethiopica* plants were excavated at 29 infested sites, collected and processed. Nematodes were extracted from galled roots and identified according to; host symptoms, morphology and gel electrophoresis.

Mature female nematodes were dissected from galled *Z. aethiopica* roots, stored in a 0.9% NACl solution of SDI water for up to 2 hours before being subject to esterase isozyme analysis. This was performed on native 4-15% PHASTGEL Gradient Gels used in the PHAST Electrophoresis Equipment (PHARMACIA). Conditions used were from Val Williams. (Pers. Comm.) and esterase staining was performed according to (2). Unknown *Meloidogyne* nematodes from *Z. aethiopica* were run together with known *Meloidogyne javanica* maintained on tomato (*Lycopersicum esculentum*).

## RESULTS

Galled roots of *Z. aethiopica* were recorded at 2 of the 29 sites surveyed. Both of the sites where galled roots were observed were in the Perth region of the survey. At sites 1 and 2, 5 and 12 % respectively of randomly excavated plants had galled roots. Numerous mature females were dissected from galled *Z. aethiopica* roots. They were morphologically characteristic of mature *Meloidogyne* females.

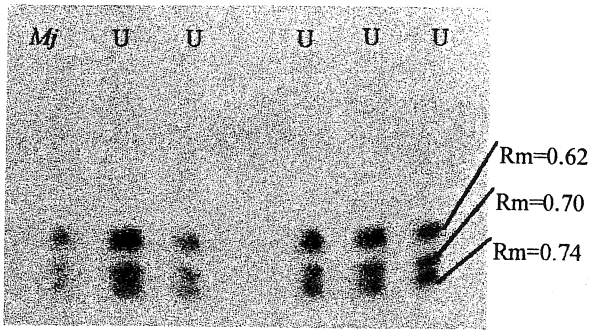


**Figure 1.** Mini gel showing banding pattern of esterase isozymes from unidentified *Meloidogyne* (U) and the known *M. javanica* (Mj).

Electrophoresis revealed three strong bands for each of the female *Meloidogyne* spp. dissected from galled roots at both sites (Figure 1). This banding pattern is identical to that observed for the known *M. javanica* sample (Figure 1) and is universally accepted as uniquely indicative of *M. javanica*.

## DISCUSSION

Given that the International *Meloidogyne* project concluded that 100% of *M. javanica* could be identified to species level on the basis of esterase banding patterns alone (2) it is reasonable to conclude that the nematode parisitizing *Z. aethiopica* is *M. javanica*. This association has not been previously recorded. It is also noteworthy that *Z. aethiopica* is one of the few recorded monocot hosts of *M. javanica*.

*M. javanica* attacks a broad range of plants including many agricultural crops and is therefore unsuitable as a bio-control agent for *Z. aethiopica*. However, there are implications to this new association which include: the need for horticulturalists growing *Z. aethiopica* to be aware of threat of *M. javanica*; and the potential for *Z. aethiopica* to act as an alternate host to *M. javanica*, further demonstrating the need to eradicate this weed.

## REFERENCES

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2. Esbenshade, P. R., and Triantaphyllou, A. C. (1990). Isozyme phenotypes for the identification of *Meloidogyne* species. *J. of Nematology*, **22**: 10-15