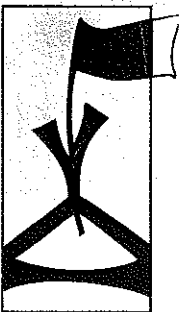


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# DOES PHOSPHITE PREVENT ZOOSPORE PRODUCTION FROM *PHYTOPHTHORA CINNAMOMI*-COLONISED PLANTS IN THE FIELD?

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## INTRODUCTION

*P. cinnamomi* is a major pathogen in native plants of Southwestern Australia. The fungicide phosphite decreases the growth of *P. cinnamomi* in a range of jarrah (*Eucalyptus marginata*) forest species (1). One of the main modes of spread of *P. cinnamomi* in the jarrah forest is via production of zoospores from infected plants and soil (2). *P. cinnamomi* sporangia production is approximately 3.5 times more sensitive to phosphite than mycelial growth *in vitro* (3). *In planta*, sporangia and zoospore production is decreased but not prevented if plants in the glasshouse are infected and sprayed with phosphite (4).

The aim of this experiment was to determine whether phosphite prevents the production of zoospores from *P. cinnamomi* colonised jarrah in the field. It also examined whether zoospores produced from *P. cinnamomi* growing in phosphite treated plants were able to infect plant tissue.

## MATERIALS AND METHODS

Jarrah seedlings were inoculated in an 18-month old rehabilitated bauxite mine (Alcoa Worldwide Alumina-Australia), in summer. Plants were underbark inoculated 5 cm above the soil line with a *P. cinnamomi* colonised Mira cloth disc. Seven days after inoculation the plants were sprayed to run-off with 0, 0.5 or 1 % Foli-R-Fos 400 (Unitec Group Pty Ltd) which contained 0.25 % Synertrol oil (Organic Crop Protectants) as a wetting agent.

Fourteen days after inoculation the Mira cloth discs were removed and the plants were flooded. A watertight receptacle was constructed around the plant collar using a 10 L plastic bucket. *P. cinnamomi*-free minesite soil (250 mL) and 3 L of deionised water were added to each receptacle. There were 12 replicate plants for each phosphite treatment and 12 control plants that were not treated with phosphite or inoculated with *P. cinnamomi* but were flooded.

Twenty-one days after inoculation, 60 mL of water from each plant was sampled and plated onto selective media. *Pimelea ferruginea* leaves (20) were floated in the water surrounding the plants for 24 hours before they were plated onto selective agar. Wire netting was placed around the plant stem to prevent mycelium from the infected stem infecting the baits. The percentage of baits infected and the number of zoospores detected was averaged for 5 sampling events. The plants were harvested 30 days after inoculation and the length of stem colonised by *P. cinnamomi* was determined.

## RESULTS AND DISCUSSION

Application of phosphite decreased total colonisation and production of zoospores in *P. cinnamomi* infected jarrah seedlings (Figure 1a). This result concurs with a previous glasshouse experiment (4). In addition, it was found that zoospores produced from phosphite treated plants were able to infect non-treated baits (Figure 1b).

Results from this experiment show that while application of phosphite decreases the growth of *P. cinnamomi* in infected plants it does not prevent *P. cinnamomi* from producing zoospores. Thus, *P. cinnamomi* zoospores may still move in surface and

sub-surface water from areas that have been treated with phosphite to adjacent non-treated areas. Our results indicate that phosphite will not necessarily prevent the spread of *P. cinnamomi* in the jarrah forest of Western Australia.

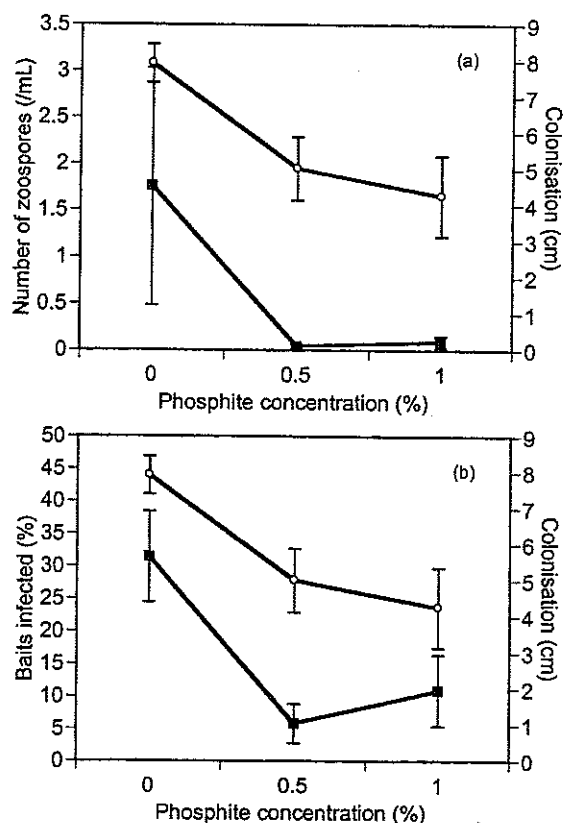


Figure 1. The effect of treating jarrah with 0, 0.5 and 1 % phosphite on (a) the number of zoospores produced or (b) the percent of *Pimelea ferruginea* baits infected in the water used to flood plants which have been inoculated with *Phytophthora cinnamomi*. Average number of zoospores produced or baits infected (■) and *P. cinnamomi* colonisation (○). Bars represent standard error of the mean.

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