

# CHLAMYDOSPORE WALL THICKNESS – IS IT THE KEY FACTOR IN THE SURVIVAL OF *PHYTOPHTHORA CINNAMOMI* IN AUSTRALIA?

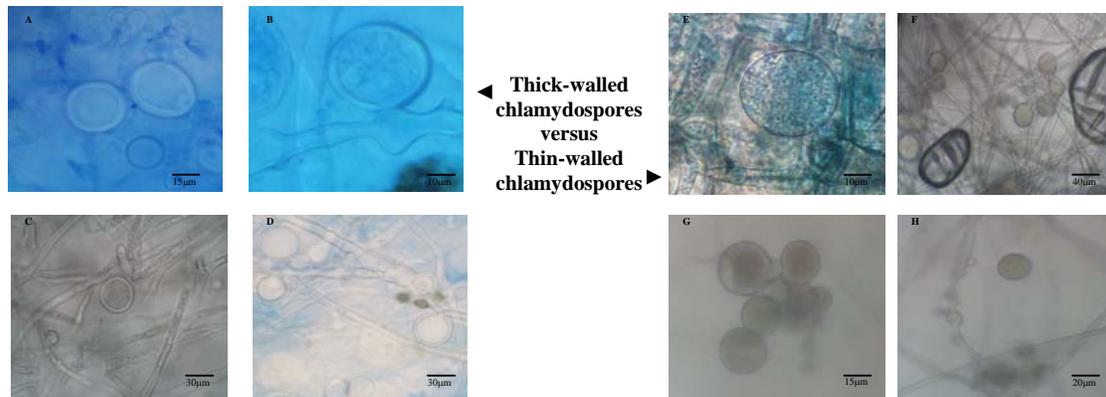
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## INTRODUCTION:

Chlamydospores are the asexual reproductive structures of *Phytophthora cinnamomi* first described by Rands in 1922. They are distinguished from hyphal swellings by a septum but this can be difficult to see. It is often stated in the literature that *P. cinnamomi* chlamydospores may be thin or thick-walled dormant structures but experimental evidence to support both these claims is limited and ambiguous. Most literature concerns thin-walled chlamydospores and there is little evidence for the existence of thick-walled chlamydospores. There is a significant lack of knowledge as to the actual role these structures play in the long-term survival of *P. cinnamomi*.



**Figure A-C.** Produced in pea broth plus soil extract

**Figure D.** Produced in Ribeiro's medium

containing 10µg phosphite

**Figure E.** Produced in lupin root

**Figure F – H.** Produced in Ribeiro's medium.

## Thick-walled chlamydospores may have an advantage in survival over thin-walled chlamydospores by

- Protection from antagonistic microorganisms when the plant root no longer provides a buffered area (ie. decomposition),
- Reducing desiccation by harsh environmental conditions,
- Allowing chlamydospores to exist dormantly.

**Table 1: Known experiments showing proof of the existence of thick-walled chlamydospores**

Experiment	Ref.	Proof?
Chlamydospores formed thicker walls than usual in susceptible avocado roots in non-sterile soil.	2	Spores not germinated for confirmation of identity
Production of thick-walled chlamydospores (1.0–1.5µm) in lupin roots buried in moist field soil.	1	Confirmed identity through germination
Thick-walled chlamydospores (1.0–2.6 µm, average 1.75 µm) in naturally infested soil.	3	Confirmed identity through germination

## ACKNOWLEDGEMENTS

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## CURRENT WORK

- Studying ability of *P. cinnamomi* to grow and survive saprophytically.
- Providing strong evidence for existence of thick-walled chlamydospores.
- Influence of phosphite on chlamydospore production, survival and germination.
- Insertion of GFP gene into *P. cinnamomi* to study:
  - Long-term survival of chlamydospores in roots and soil,
  - Chlamydospore dormancy,
  - Differences between thin and thick-walled chlamydospores.

## CONCLUSIONS

- Limited published evidence of thick-walled chlamydospores.
- Thick-walled chlamydospores may allow the pathogen to survive adverse environmental conditions.
- Thick-walled chlamydospores may differ in function to thin-walled chlamydospores.
- A laboratory method to produce thick-walled chlamydospores in large numbers for study is needed.

## REFERENCES

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