

The

OPRAtive Word

Technical Note 15

November 2009

Ceratocystis paradoxa: Friend or foe?

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INTRODUCTION

Ceratocystis (Thielaviopsis) paradoxa is a ubiquitous fungus that is found throughout the tropics and in many agricultural environments. *C. paradoxa* and its anamorph are implicated in diseases of pineapple, date palms and other monocots.

T. paradoxa occurs naturally in all countries where oil palm (*Elaeis guineensis*) is grown and has not been implicated in any diseases in SE Asia or the Pacific. In Colombia it is considered to be the causal agent of spear rot in young palms.

C. PARADOXA AND OIL PALM (*E. GUINEENSIS*)

Studies in PNG indicate that *T. paradoxa* is abundant in the oil palm plantation environment (Figures 1 and 2). The fungus plays an important role in the degradation of pruned frond bases and palm trunks.

Indications are that it is as abundant as *Trichoderma* fungi and comprises nearly 30% of fungal flora detected on palm debris (Figure 3). The teleomorph *C. paradoxa* is rarely found in the natural environment.



Figure 1. The base of pruned fronds on oil palm are rapidly colonised by *T. paradoxa* under humid conditions.



Figure 2. Oil Palm logs colonised naturally by *T. paradoxa* under humid conditions in the plantation.

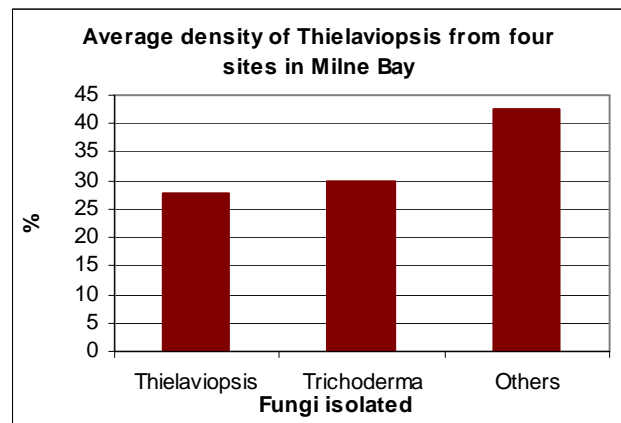


Figure 3. Average percentage of *T. paradoxa* found on oil palm debris in 10 randomly placed transects under an oil palm crop.

DEGRADATION EXPERIMENTS

The potential for use as a biocontrol for *Ganoderma* was investigated. *T. paradoxa* was found to be an efficient surface coloniser of oil palm tissue but internal degradation of palms stem tissue was dependent on high moisture levels (Figures 4-6).

Laboratory studies also indicate that *T. paradoxa* does not interact with *Ganoderma*.



Figure 4. Oil palm wood blocks inoculated with *T. paradoxa* showing colonization (black area) after 1 day under controlled conditions.



Figure 5. Growth of one straw of *T. paradoxa* on inoculated oil palm blocks after 7 days



Figure 6. Colonisation of *T. paradoxa* on cut logs after 1 week under field conditions.



Figure 7. A poisoned palm showing secondary infection by *T. paradoxa* after poisoning. Note the bending of the stem.

T. PARADOXA AS A PATHOGEN

There is no evidence from PNG and SE Asia to suggest that *C. paradoxa* or its anamorph are primary causal agents of any diseases on oil palm. Inoculation experiments on young palms in the nursery showed that *T. paradoxa* and *C. paradoxa* could not colonise living tissue but only grew on moribund or dying tissue (Figure 8).

The fungus was able to cause mortality only when injury to the bud was a prerequisite.



Figure 8. Inoculation experiments using *T. paradoxa* (left) and *C. paradoxa* (right) showing colonisation of the leaf tissue distal to the frond base.

CONCLUSION

The results of our studies suggest that *T. paradoxa* is abundant in the oil palm plantation environment and is not a pathogen of oil palm in PNG. Its use as a biocontrol agent for *Ganoderma* would probably not alter its status as a saprophyte in this environment. There is no scientific basis to prevent its use as a wood degrading agent under plantation conditions. However, it would be pertinent to understand its pathogenicity on other crops before widespread use.

ACKNOWLEDGEMENTS

This work was funded by the European Union under STABEX grants to Papua New Guinea.

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