In vitro METHODS FOR EVALUATION OF ANTAGONISTIC FUNGI AGAINST PATHOGENIC *Ganoderma*

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Fungi are well-known antagonists of many plant pathogens, and some of them, mainly *Trichoderma* (Shukla and Uniyal, 1989; Wijesekera *et al*., 1996; Ilias and Abdullah, 1999), *Aspergillus* (Shukla and Uniyal, 1989) and *Penicillium* (Dharmaputra *et al*., 1989) have been evaluated against *Ganoderma*. This article describes an *in vitro* method to evaluate the potential of fungi as biological control agents (BCA) against *Ganoderma* pathogenic to oil palm.

PROCEDURES

The procedure involved is:

- sample collection and isolation of the fungus;
- bioassays – dual culture and cultural filtrate (*Figure 1*);
- data recording of the radial growth of the *Ganoderma* and its percentage
- inhibition of radial growth (PIRG) and data analysis; and
- identification - based on cultural and morphological characteristics of the fungus cultured.

SERVICE OFFERED

This fungal evaluation is offered as a service by MPOB to researchers and anyone else interested. A report on the results will be given with recommendations on the action to take. Some illustration of the work undertaken with the service and the results to date are given below.

FUNGI AS BIOLOGICAL CONTROL AGENTS

The report will include the following:

- fungal isolate – a pure culture of the fungus is obtained from either the soil, root or stem tissue. The fungus is cultured on selected media (examples are shown in *Figures* 2 to 6).
- based on the bioassays, the PIRG and percentage of mycelial dry weight (PMDW) will be reported. Generally, the isolates with high PIRG in dual culture also exhibit greater activity in the culture filtrate assay, and thus, greater potential as BCA against *Ganoderma*. The isolates with high PIRG and/or PMDW can then be tested to control *Ganoderma* in the field.
- Using the dual culture assay, MPOB has evaluated 2894 isolates of fungi against pathogenic *Ganoderma in vitro* of which 320 (11.06%) gave PIRG > 50%. With the culture filtrate assay, of the 318 isolates tested against pathogenic *Ganoderma*, 29 (9.12%) gave PMDW > 50%.

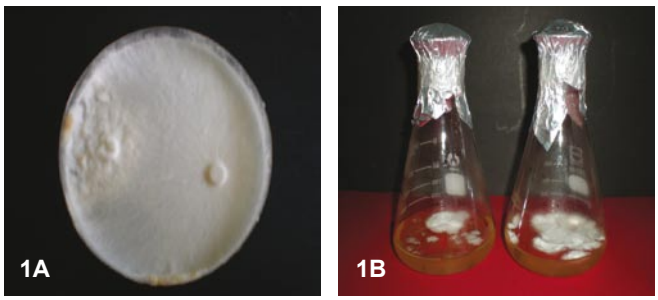

Figure 1. Bioassays. Dual culture (1A) and culture filtrate (1B).

Figure 2. Trichoderma *sp.*

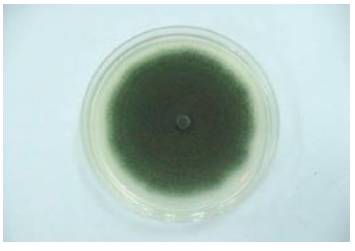

Figure 3. Aspergillus *sp.*

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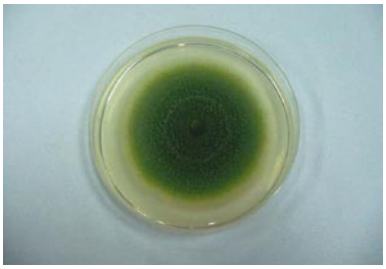

Figure 4. Penicillium *sp.*

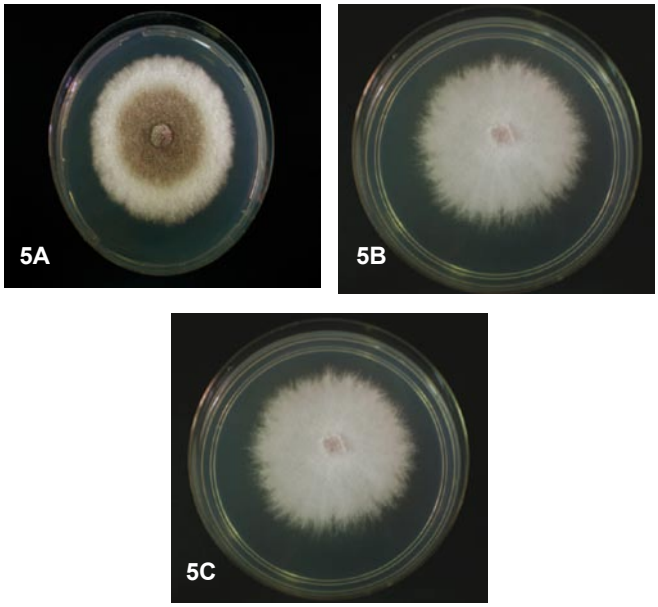

Figure 5. Endophytic fungi on a medium.

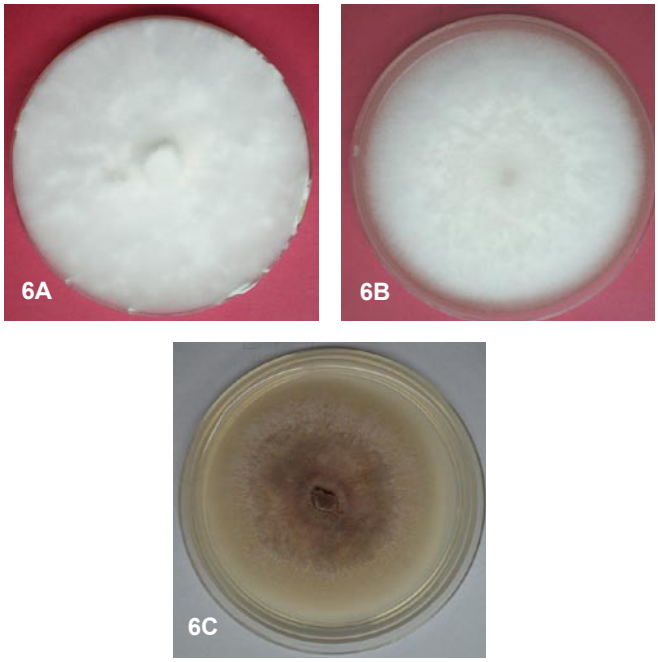

Figure 6. Basidiomycete fungi.

BENEFITS AND COST

This a fast, easy and cheap method to screen fungi for their potential as BCA against pathogenic *Ganoderma*. MPOB offers this service to interested parties at a minimal cost per fungus evaluated.

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