FUNGAL IDENTIFICATION SYSTEM 3 (FIDS 3)

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Fungi play important roles in soil structure, soil fertility and soil-plant interaction. Therefore, it is crucial to identify them. The FIDS 1 is a fungal identification system using ITS region which identifies a limited range of fungal species whereas, the FIDS 2 identified the fungal through LSU fragments with broader range of fungal species and the system is suitable for large number of samples. The FIDS 3 is a fungal identification system using 18s rDNA region. Sequence data from this region is widely used in molecular analysis for organisms evolutionary reconstruction, it slows evolutionary rate hence suitable for ancient divergences reconstruction. It is the most frequently used gene in phylogenetic studies and an important marker for random target polymerase chain reaction (PCR) in environmental biodiversity screening. The 18S rDNA-based approach is a useful tool for screening of fungal communities, and that they represent a more comprehensive picture of the community (Hunt *et al.*, 2004). The fungal-specific primer pair of EF4/fung5 was developed for identification of the fungal diversity (Smit *et al.*, 1999). This primer has been proven to identify the broader range of fungi species within Ascomycota, Basidiomycota, Zygomycota and Chytridiomycota (Smit *et al.*, 1999; Borneman and Hartin, 2000; Hunt *et al.*, 2004).

OBJECTIVE

To identify fungal species using 18S-PCR analysis.

METHODOLOGY

A summary of the steps involved in fungal identification using Fungal Identification System 3 (FIDS 3) is shown in *Figure 1*. DNA analysis has become the most preferred method in fungal identification, since it provides a reliable and comprehensive picture of the fungal community. The 18S rDNA PCR-based fingerprinting has been widely used for assessing the genetic diversity of fungi. The results allow high discrimination between organisms at the level of genera, species or strains depending on the primers and amplification conditions employed.

SERVICE OFFERED

The service offered is a stable and reliable method to identify fungal species from various samples using rapid fungal identification by 18S rDNA-PCR analysis. The service is inclusive of DNA extraction, PCR amplification, gel electrophoresis, DNA purification, DNA sequencing, blasting and interpretation of the data.

BENEFITS

The benefits are specific fungal identification by DNA fingerprinting and identification of large number of fungi in an environment.

COST

The cost per strain of fungi is RM 1800. The fee may be revised without prior notice.

REFERENCES

HUNT, J; BODDY, L; RANDERSON, P F and ROGERS, H J (2004). An evaluation of 18S rDNA approaches for the study of fungal diversity in grassland soils. *Microbial Ecology*, *47*: 385-395.

SMIT, E; LEEFLANG, P; GLANDORF, B; VAN ELSAS, J D and WERNARS, K (1999). Analysis of fungal diversity in the wheat rhizosphere by

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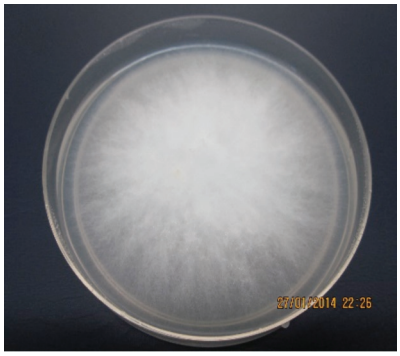
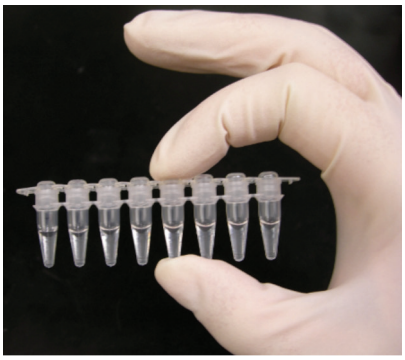
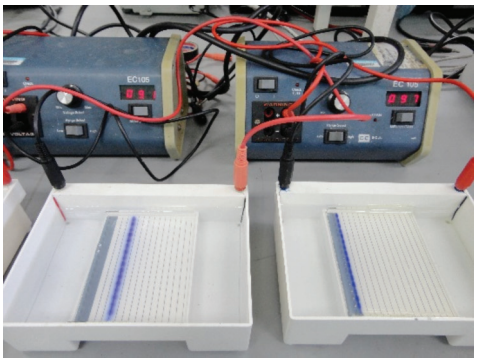


Pure culture of fungi on PDA/MEA agar

DNA extraction of cultured fungi using kit

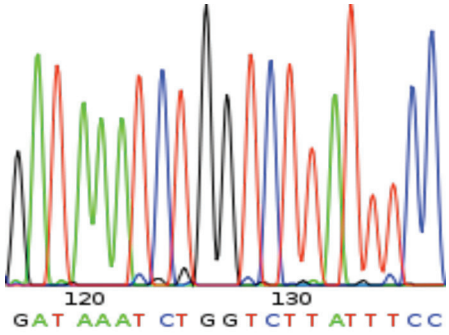


DNA amplification using EF4/fung5 primers



PCR product on agarose gel electrophoresis

DNA purification (550 bp) from agarose gel using kit



DNA sequencing and blasting
(www.ncbi.nih.gov/BLAST)

Figure 1. Fungal identification using MPOB Fungal Identification System 3 (FIDS 3).

sequencing of cloned PCR-amplified genes encoding 18S rRNA and temperature gradient gel electrophoresis. *Applied and Environmental Microbiology, 65(6)*: 2614-2621.

BORNEMAN, J and HARTIN, R J (2000). PCR primers that amplify fungal rRNA genes fromenvironmental samples. *Applied and Environmental Microbiology, 66(10)*: 4356-4360.

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