

# Selection and Characterization of Suitable Ectomycorrhizal Isolates for Application in Heavy Metal Polluted Sites

**Prasun Ray and Alok Adholeya**

Centre for mycorrhizal Research, The Energy and Resources Institute (TERI), Darbari Seth Bock, Habitat Place, Lodhi Road, New Delhi-110003, India

KEYWORDS: Bioremediation, Coal Ash, Ectomycorrhiza, Heavy metal tolerance,

## ABSTRACT

Sixteen isolates of ectomycorrhizal fungi on the basis of their host were selected from Centre for Mycorrhizal Culture Collection, TERI, India. They were tested for determination of optimum pH, metal uptake, translocation and tolerance limit, organic acid exudation and host colonization ability on three variants of coal ash namely ESP ash, pond ash and bottom ash *in vitro* and *in situ*.

Studies on aluminum, arsenic, cadmium, chromium, lead and nickel were done on the basis of their abundance and toxicity in coal ash using atomic absorption spectrophotometer.

Of the sixteen isolates selected, four isolates namely *Laccaria fraterna* (Cooke & Masee) Pegler, (EM-1083); *Pisolithus tinctorius* (Mich. Ex Pers) Coker & Couch, (EM-1290, EM-1293 & EM-1299) were found suitable on the basis of various screening experiments done as mentioned above.

Further, an attempt was made to develop isolate specific primers for these suitable isolates for field detection wherein success was obtained in *Pisolithus tinctorius* (EM-1293).

Finally, an approach was made to develop root organ culture (ROC) based inoculum of ectomycorrhizal fungi with an objective to develop new mass production technology and subsequent introduction of new inoculum delivery system.

The findings give essential information and confidence towards the ability of the identified ectomycorrhizal isolates to reclaim coal ash overburdened sites through phytoremediation techniques using *Eucalyptus* as host.

To conclude, results obtained from this study confirm that similar efforts can be undertaken to select suitable microorganisms for further field based exploitation studies so that better application based results in real environment can be achieved.

**Submitted for consideration in the 2007 World of Coal Ash Conference, May 7-10, 2007.**