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# PRODUCTION OF AM FUNGI FOR APPLICATION IN IRON MINE OVERBURDEN DUMP SOIL

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**ABSTRACT: Sterilized nursery soil was mixed with different aged (0-9 year old) iron mine overburden (OB) un-sterilized soil in 1:1 ratio and filled in plastic pots (capacity 3.5kg) and maize (*Zea mays*) seeds were sown during the year 2014. After 4 months shoot length, root length, number of AM spore in rhizosphere soil and % root colonization of maize plants was measured. Significant increase in shoots length and roots lengths was observed. Maximum number of spore and % root colonization was observed in un-sterilized nursery soil followed by soil from 9 year old mine overburden. The population of AM spores in sterilized soil of OB dump and sterilized nursery soil was very low. AM fungi species isolated includes: *Acaulospora bireticulata, A. scrobiculata, Gigaspora margarita, G. margarita, Glomus aggregatum, G. constrictum, G. deserticola, G. fasciculatum, G. geosporum, G. macrocarpum, G. microaggregatum, G. microcarpum, G. mosseae, G. veriforme, G. walkeri, Paraglomus laccatum and Scutellospora pellucida*. *Glomus* spp. was most dominated followed by *Acaulospora* spp. From the experiments, it was concluded that AM fungi are able to survive and grow in degraded land. Applications of these fungi during plantation reduce doses of chemical fertilizer.**

**Key word:** Chhattisgarh, iron ore mine, relative spore density, trap plant

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Arbuscular mycorrhizal (AM) fungi are the most common type of biofertilizer used in agriculture system, forestry and horticulture. These are beneficial soil-inhabiting fungi that establish symbiotic association within the roots of plants. AM fungi co-exist within the extracellular spaces of root cortical tissues and increase the uptake of water, phosphorus, nitrogen and micronutrient in the host plant (Brundrett, 1991; Sharma et al., 2014). AM fungi benefits host plant not only by improving nutrient uptake but also by increasing production of growth hormones. Several plants colonized by AM fungi showed increased advantages over non-colonized plants (Verma, 2009). Advantages include drought tolerance, activation of plant defense mechanism, increased growth, reduced pathogen pressure and general benefits to plant health (Brundrett, 1991; Verma and Jamaluddin 1994, Mukerji et al., 1996). AM fungi also provide a useful measure of relative soil quality and health (Klingeman et al., 2002).

Considering the need of this low cost forest input and agroforestry, the lack of massive inoculum is an obstacle coming in the way of large scale production of AM fungi. AM fungi are obligate symbionts and are grown in association with living root tissues (Al-Raddad, 1995). Significant development of AM fungi to complete life cycle is only achieved in the presence of compatible host plant (Sahay et al., 1998; Tahat et al., 2008; Chauhan et al., 2013). The reason for the obligate biotrophy is that AM fungi lost some of its carbon fixing abilities or the genetic machinery that supports them during the long evolution of symbiotic relationship with the host. AM fungi are known to completely dependent upon host plant for fixing carbon supply (Douds and Millner, 1999). In vitro culture of AM fungi was achieved for the first time by Mosse (1962). Since this pioneering work, several efforts aimed for culturing the axenic or monoxenic culture of AM fungi using different sources of inoculum were made by many workers (Becard and Piche, 1992; Chabot et al., 1992). Warner and Mosse (1980) has reported that AM fungi can grow in soil to establish an independent base from which they can infect root and the growth of extramatrical hyphae depends on the organic matter present in the soil (Hepper and Warner, 1983).

Mining is the second largest industry after agriculture and has played a vital role in the development of civilization from ancient days (Khoshoo, 1984). India is a developing country and produces as