

## Impact of mining on morphology, anatomy and, arbuscular mycorrhizal (AM) fungal status of *Cassia tora* L.

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### SUMMARY

Arbuscular mycorrhizal fungal propagules and morphological and anatomical variations were observed in *Cassia tora* L. from the disturbed and the undisturbed site of Codli iron ore mine. Maximum spores were recovered from undisturbed site 150 spores/100g rhizosphere soil while from disturbed site only 78 spores/100g rhizosphere soil were reported. Arbuscular mycorrhizal fungal colonization recorded from undisturbed site was 70% and from disturbed site was 50% and was characterized by the presence of hyphae, hyphal coils vesicles and arbuscules. A total of 7 arbuscular mycorrhizal fungal species belonging to four genera viz., *Acaulospora*, *Gigaspora*, *Glomus*, and *Scutellospora* were recorded. It was observed that *Cassia tora* from mining areas exhibited significant morphological and anatomical variation and showed poor growth in terms of plant height, shoot length, root length and leaf length as well as the internal features varied significantly when compared with the plants from the surrounding undisturbed area of the mine site.

Key words: Arbuscular mycorrhizal fungi, Disturbed site, Undisturbed site, Morphology, Anatomy.

Mining appears to be one of the most degrading actions of man on earth as it physically tears up the earth surface, producing gaping holes and barren heaps, changes the geomorphic pattern and contaminates the environment. When mining operations are in full swing, the air is heavily polluted. Thus, the particulate matter remains suspended in the air due to the continuous day and night operations which in turn affects the normal plant growth.

Impact of soil disturbances on arbuscular mycorrhizal fungal association will depend on the nature of fungal propagules and changes in soil conditions. Mycorrhizal propagules can be severely influenced by damage to vegetation and soil resulting from natural processes or human interventions (Dhillon *et al.*, 1988; Klopatek *et al.*, 1988).

Arbuscular mycorrhizal (AM) fungi play a very important role in the improvement of plant growth. They are vital for the uptake and accumulation of ions from the soil and their translocation to the hosts because of their high metabolic rate and strategically diffuse distribution in the upper soil layers. The fungus serves as a highly efficient extension of the host root system (Bolan, 1991). The present study reports a comparative account of root colonization, spore density and diversity of arbuscular mycorrhizal fungal species and the morphology and anatomy of *Cassia tora* from disturbed and undisturbed area of Codli iron ore mine site.

### MATERIALS AND METHODS

Studies on AM fungal association, morphology and anatomy of *Cassia tora* was carried out from Codli a 30-year-old iron ore mine, situated in Sanguem, South Goa (15°20' 53" N Latitude and 74°8' 33" E Longitude) and its surrounding undisturbed area (Fig. 1).

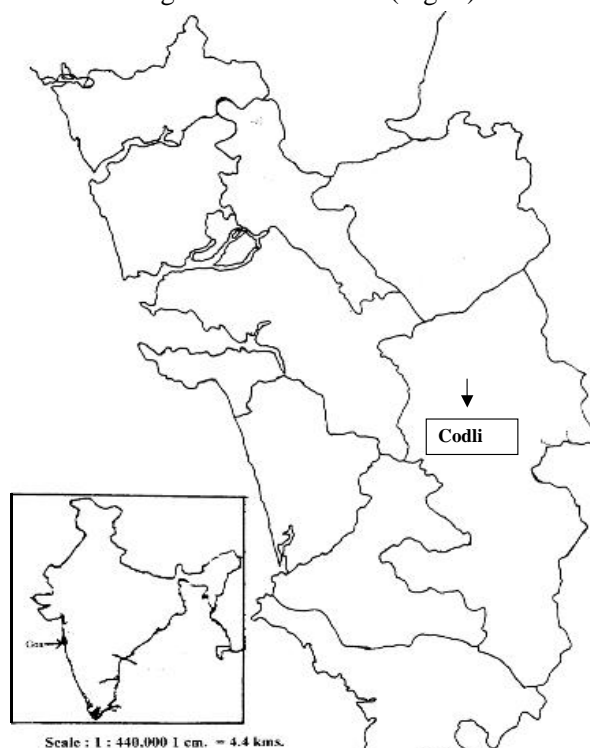


Fig. 1 : Map of Goa showing study site - Codli