INTRODUCTION

PROMOTION OF EUCALYPTUS

The population growth and industrialisation coupled with socio-economic priorities has enhanced the demands of accentuating the pressure on already meagre forest regions in India. As a result, the natural forests - the final stage of succession, requiring several decades to develop, got destroyed, making the environment poorer. To fill the gap between supply and demand of forest products, cultivation of eucalypts - an exotic from Australia, gained momentum on Indian soil, during the last 15 years.

Eucalyptus (Myrtaceae) - a native of Australia embodying over 625 species has occupied a prominent place in India through various plantation schemes like social-forestry, agro-forestry and farm-forestry. It was introduced, as a garden tree in this country in 1790 by Tipu Sultan. However, plantation of E. globulus was undertaken at a large scale in the Nilgiri hills, in 1856. Today, over 0.62 million hectare of Indian land is covered by various species of this tree. Its usefulness as a source of pulpwood became an unsaid criterion for promoting it as a monoculture plantation on any available land with disregard to edaphic requirement. The man's greed for immediate gain has led it to cross the forest frontier to take entry into even the agricultural fields. The public and private sector organisations apart from land holders joined hands to symbois in favour of their own professional and economic targets.

The success of this tree is attributed to its fast growth rate, least post-plantation care, more coverage per unit area, shear competence of its eco-adjustment under raised growth conditions apart from its capacity to colonize completely the exposed sites enduring adverse biotic and climatic conditions.

CONTROVERSY

Even after 20 years of campaigning for an ambitious programme of Eucalyptus plantation, scientists, growers and foresters are sharply divided over the merits and demerits of growing it. A steadily brewing controversy as regards the ecological, social and economic merits and demerits of it has engulfed the minds of agriculturists, environmentalists, ecologists and even a conscious common man. The controversy was initiated in an organised form in the state of Karnataka, in 1984, by "Rayat Sangam", a small educated practical farmers association. It launched a meaningful programme of uprooting the Eucalyptus and its saplings from the state soil. The accusation is that large scale planting of the tree can not be anything but damaging the edaphic environs. The
antagonistic views expressed by naturalists and environmentalists have made *Eucalyptus* another culprit of the recent environmental crisis.

The critics of *Eucalyptus* point out that the tree lowers water table, dries up perennial streams, depletes soil fertility, keeps away wild life, deprives the need of the common man and brings in ecological disaster by promoting the development of pests in monoculture plantations. Such criticism/controversy has lately attracted a considerable attention of researchers towards the environmental effect of large scale monoculture plantations of this tree.

It is argued that due to lesser leaf production in comparison to bole and branches, coupled with lesser leaf fall resulting in lesser recycling of nutrients, apart from delayed decomposition of fallen leaves due to volatile oils and waxy coating on leaf surface, on one hand and comparatively huge water and soil sap requirements to meet the demand of the fast growing and dividing cells on the other, depletes the soil of its treasure of minerals and water.

**ANTI-PHYTO-SOCIAL PROPERTIES**

It is a common observation that the *Eucalyptus* affects the establishment and growth of herbaceous vegetation (which otherwise, in deciduous forests grow luxuriantly) under its canopy, despite the fact that there is enough space. The study gains importance because of the charge that the plants which are depleting the soil of its nutrients for its growth and gain is not permitting the establishment and growth of herbaceous vegetation, which otherwise is ought to replenish or replace the nutrient bank through periodic recycling apart from conserving water in the soil.

In 1969, and 1970, del Moral and Muller demonstrated that the light, moisture, and minerals under *Eucalyptus* are adequate for the herbaceous growth. It was suggested that the lack of annual herbs under *Eucalyptus* canopy, primarily pertains to some sort of allelopathic property of the tree (del Moral and Muller, 1969, 1970; Al-Mousawi and Al-Naib, 1975, 1976).

The present work thus pursued to investigate scientifically the *Eucalyptus* engineered "environmental auditing "through its allelopathic potential, if any, with the following objectives in view:

a) To compare the floristic composition and the total biomass under the monoculture plantation of *Eucalyptus* in comparison to that of other indigenous trees and their mixed culture.

b) To visualise the effect of *Eucalyptus* plantation on the performance of cultivated crops under agro-forestry systems.

c) To study the influence of *Eucalyptus* shelterbelts on crops.
d) Estimation of mineral status of the soil surface under *Eucalyptus*

e) Extraction of active components of the plant through polar and non-polar solvent systems and to study their bioefficacies on the other plant system.

f) Isolation and identification of active allelopathic component(s) from the plants.

g) Study the impact of the allelochemics on the physiological functions including germination, seed vigour and mean seedling length of a target plant.

h) To compare the content and potential of leachable allelochemics among different parts of *E. tereticornis*.

i) Screening of crop susceptible/resistant to the allelochemics of *Eucalyptus*

j) Effect of active allelochemics from the tree at the molecular and macromolecular (including some enzyme systems) level to attempt to elucidate the mechanism of action