Summary and Conclusions

Environmental pollution can be avoided by the development of clean technologies using microbial consortia and is one of the main areas of environmental biotechnology. Composting is a natural process that turns organic material into a dark rich substance. This substance, called compost or humus, is a wonderful conditioner for the soil. It also termed the process of bioconversion of waste into hygienic soil conditioner and fertilizer. Coir industry provides livelihood to a large work force in southern states of India viz. Kerala, Tamil Nadu, Karnataka and Andhra Pradesh. However accumulation of coir pith hillocks and coconut husk leachates causes pollution of both land and water in the environment.

White rot fungi are the group of fungi, which can degrade the lignin present in the coir pith. More often the presence of lignin is responsible for the difficulty of biodegradation of coir pith. The biodegradative ability of different fungal species Pleurotus sajor caju, Pleurotus florida, Pleurotus eous and Calocybe indica has been studied and the results revealed that all the tested white rot fungi degrade coir pith and reduce the percentage of lignin present in it together with enhancing the NPK and ammonia content.

Although coir pith is a problematic waste, it has been found to harbor useful micro-organisms with potential use as plant nutrient. Nitrogen fixing bacteria from the raw coir pith accumulated in coir fiber extraction units could be isolated and confirmed through molecular techniques. Therefore it can be
concluded that coir pith can be a source of many useful micro-organisms including nitrogen fixing bacteria.

In this study, a novel improved technology could be developed to convert the recalcitrant coir pith into environmental friendly organic manure. The standard method of composting involves the substitution of urea with nitrogen fixing bacteria *viz. Azotobacter vinelandii* and *Azospirillum brasilense* leading to the development of an improved method of coir pith. The combined action of the microorganisms could enhance the biodegradation of coir pith. In the present study, *Pleurotus sajor caju*, an edible mushroom which has the ability to degrade coir pith, and the addition of nitrogen fixing bacteria like *Azotobacter vinelandii* and *Azospirillum brasilense* could accelerate the action of the fungi on coir pith. The use of these microorganisms brings about definite changes in the NPK, Ammonia, Organic Carbon and Lignin contents in coir pith. This study will encourage the use of biodegraded coir pith as organic manure for agri/horti purpose to get better yields and can serve as a better technology to solve the problem of accumulated coir pith in coir based industries.

The efficiency of the biodegraded coir pith by this improved method was estimated by growing the plants in the compost. A number of medicinal and ornamental plants were cultivated in coir pith compost successfully. Four medicinal plants were used for the study and it was grown in pots filled with garden soil and compost. An increase in the growth of the plants was observed in the pots containing higher percentage of coir pith compost. Coir pith facilitates easy growth of plant roots and provides sufficient nutrients for its growth. In the case of ornamental plants, coir pith can be used exclusively without mixing garden soil. Therefore the composted coir pith by this improved method can be used as a soil less media for roof gardening practices.

Coir pith composted with *Pleurotus sajor caju* and *Azotobacter vinelandii* can be developed on a brand name AZOTO-V and that with *Pleurotus sajor caju*
and *Azospirillum brasilense* can be named AZOSPIRIL-B, packed in 1 kg packets and marketed for cultivation of ornamental plants mainly for roof gardening replacing garden soil.

COSTING FOR COIR PITH COMPOST

**BASIS. 5 MT**

**RECURRING EXPENDITURE**

1. PITHPLUS @ Rs.50 / KG  
   500.00
2. *Azotobacter/Azospirillum* @ Rs.50 / KG  
   100.00
3. LABOUR CHARGE @ Rs.300 / HEAD  
   600.00
4. OVERHEAD  
   100.00
   **TOTAL**  
   Rs.1300.00

i.e. 0.26 /= per Kg.

say, 26 paise per Kg.

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