Publications

1. **Kumarasamy, P.,** Govindaraj. S., Vignesh. S., Babu Rajendran. R. and Arthur James. R., (2010), 'Assessment of organochlorine pesticides in smaller river basin, South India', *Water Air, Soil Pollution* (under review).

2. **Kumarasamy, P**., Alaguraja, P., Deepasaraswathi, M., Sekar, M., Muthuveerran, P., Yuvaraj, D., Thirunavukkarasu, A and Arthur James, R. (2010), 'Soil suitability and water quality study in Tirupur areas using Geographic Information System techniques', *International Journal of Earth Science and Engineering*, (*Accepted*)

3. **Kumarasamy**, **P.,** Vignesh, S., Arthur James, R., Muthukumar, K., Rajendran. A., (2009). "Enumeration and identification of pathogenic pollution indicators in Cauvery river, South India". *Research Journal of Microbiology*. 4 (12): 540-549. ISSN 1816-4935.

4. **Kumarasamy**, **P.,** Vignesh, S. Arthur James, R., Rajendran, A., (2009). "Approaches on phytopathogenic fungi transformation of thymol to phenol, 2-(1, 1-dimethylethyl) and 1- dodecene by *Curvularia lunata* and *Colletotrichum capsici". Current Biotica*. Vol 3 (3) ISSN 0973-4031.

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Enumeration and Identification of Pathogenic Pollution Indicators in Cauvery River, South India

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Abstract: This study was aimed to estimate current levels of pollution indicator as well as many groups of human pathogenic bacteria and their seasonal variations in different locations of Cauvery river, South India. The samples were collected from 16 different sites along river from Stanley reservoir to estuary regions (Bay of Bengal). The microbiological scrutiny was performed during monsoon (2007), Winter, Summer and Spring (2008) seasons taken for the bacterial analysis of Total Viable Counts (TVC), Total Coliform counts (TC), Total Streptococci counts (TS) and also four different types of pathogenic bacterial load were counts, which are indicator organisms of pollution studies. Total viable counts were found in the range of 6.2-26.0 ($\times 10^4$) mL^{-1} in monsoon, 5.2-20.0 ($\times 10^4$) mL^{-1} in summer, 4.0-17.9 ($\times 10^4$) mL^{-1} in winter and 3.3-15.5 ($\times 10^4$) mL^{-1} in spring. The TC was found in the range of 4.1-21.0 ($\times 10^3$) mL^{-1}, 3.6-17.0($\times 10^3$) mL^{-1}, 2.9-14.1 ($\times 10^3$) mL^{-1} and 2.3-12.0 ($\times 10^3$) mL^{-1}, for TS, it was 4.3-18.0 ($\times 10^2$) mL^{-1}, 3.2-13.0 ($\times 10^2$) mL^{-1}, 2.6-11.0 ($\times 10^2$) mL^{-1} and 2.0-9.6 ($\times 10^2$) mL^{-1} during monsoon, summer, winter and spring, respectively. Counts of EC, SA/SH, SF and PA were in the range of 300-3700 mL^{-1}, 20-280, 20-270 and 40-490 mL^{-1}, respectively. The Cauvery river basin has been facing severe anthropogenic activities, mostly due to religious belief, dense population, municipal sewage and industrial waste confluences etc. A huge bacterial gene pool was obtained after this study which was indicative of immense bacterial diversity in the region.

Key words: Cauvery river, pathogenic bacteria, pollution indicators, coliforms

INTRODUCTION

Rivers are playing major task of an important water resource for our planet. Unfortunately, river is being polluted by indiscriminate disposal of sewerage, industrial waste and plethora of human activities, which affects its physico-chemical characteristics and microbiological quality (Koshy and Nayar, 1999). The lifeline of majority of population in cities, towns and villages are considered sacred. In the recent past, expanding human population, industrialization, intensive agricultural practices and discharges of massive amount of wastewater into the river have resulted in deterioration of water quality. The impact of anthropogenic activities has been so extensive that the water bodies have lost their self-purification capacity to a large extent. Water has played a significant role in the transmission of human disease and indicator microorganisms. Free from contamination with faecal matter is the most important parameter of water quality because human faecal matter

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Approaches on phytopathogenic fungi transformation of thymol to phenol, 2-(1, 1-dimethylethyl) and 1-dodecene by *Curvularia lunata* and *Colletotrichum capsici*

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ABSTRACT

The antifungal and antibacterial properties of thymol as a substrate was investigated for the fungal biotransformation by using cell suspension cultures of *Curvularia lunata* and *Colletotrichum capsici* in the czapek-dox broth (CDB) and potato dextrose broth (PDB) medium. The substrate was extracted with ethyl acetate after 14 days period of incubation to explore transformed compounds by thin layer chromatography (TLC) followed by Gas Chromatography (GC) coupled with Mass Spectrometry (MS) studies. The modified substrate was identified as structural mass of the three compounds in MS *viz.,* phenol, 2-(1, 1-dimethylethyl) (51.0%), and 1-dodecene (13.64%), and 1-dodecene (11.01%) as an isomer of the products. It was concluded that these three compounds are isomers of the substrate and its structural altered compounds through fungi enzyme activities.

KEYWORDS: CDB, GC-MS, phytopathogenic fungi, PDB, TLC

INTRODUCTION

An alternative approach of the microbial transformation should therefore be proposed for identification and investigation novel compounds. It is interest to investigate whether it is possible to prepare a substrate for a microorganism to react at a specific position and with a required mode of action by Chatchawan, 2008. The main problem for microbial transformation is to find an appropriate microorganism to react with a certain substrate and the ability of the enzyme to react at the specific position to yield the required product. It is obvious that many strains of bacteria or fungi have to be screened for their capabilities to transform each substrate (Xiao-chi Ma, 2006). The filamentous fungi have been used as whole cell biocatalysts because of their ability to mediate many different reactions including oxidative, reductive, and hydrolytic transformation of a wide range of substances (Azerad, 1999). The secondary metabolites produced by plants act as chemical defense mechanism against phytopathogenic microorganisms (Vazquez et al., 2001). Hence, the monoterpenoids are either natural or synthetic compound that have relatively a wide spectrum of activity against agricultural and public health pest control purposes. On the other hand, monoterpenes