1. **Introduction**

Pesticides are chemicals used to eliminate or control a variety of agricultural pests that can hamper soil bacterial habitat and crops, thus reduce farm productivity (Subashini *et al.*, 2007). The most commonly applied pesticides are insecticides that kill insects. These insecticides are a public health concern up to certain concentrations in soil. Many chemical insecticides are known to cause poisoning, infertility and birth defects as well as damage the nervous system and potentially cause cancer. (Elsai *et al.*, 2010)

There are many alternatives to the use of insecticides. For example - use of predatory insects, mechanical pest traps, plantation of crops at different places in each season etc. However in case of grape wine yards plants are kept as it is for grape production for about 5 -10 yrs. This results in the accumulation of insecticides in grape wine yard soils and cause adverse effects on grapes, factory livestock farms, animal feed, public health as well as microbial community present in that particular wine yard soils.

One of the major problems asides from toxicity and carcinogenicity of insecticides is their long persistence in grape wine yard soils that amplifies toxicity and health risk problems in area of insecticide accumulated soil.

Grape cultivation is one of the remunerative farming practices in India. Grapes are grown under variety of soil and climatic conditions in three distinct agro climatic zones namely sub-tropical, hot tropical and mild tropical climatic regions in India. Hot tropical region covers Nasik, Sangli, Solapur, Pune, Satara, Latur and Osmanabad districts of Maharashtra. The important pests of grapes in India are flea beetles, thrips, mealy bugs, leaf hoppers and to control these pests the insecticides commonly used are Dichlorvas, Quinolphos and Phosphamidon which are organophosphorous insecticides.

One major aspect in Agricultural Microbiology and Microbial Ecology is the understanding of microbial diversity. A primary condition for describing the diversity of microbial communities is to characterize their pure isolates. Methods commonly used in taxonomy can be utilized to differentiate between organisms from such communities, but they
require cultivation of purified isolates from environmental samples i.e. soil samples. Due to the selectivity of each selected cultivation technique, growth of specific members is enhanced.

Biodegradation of persistent compounds is an important mechanism for their dissemination in the environment & in predicting the persistence of synthetic insecticides in soil. It is necessary to determine the role of endogenous bacterial community in the overall degradation process. Lydy and Linck, (2003) studied the toxicity of organophosphorous insecticide additives on insects and found that additive causes metabolic disturbance leading to the formation of toxic metabolites and death. Pure cultures of a range of soil bacteria have been reported to transform insecticides to non-toxic products (Ghosh and Rokade, 2011). So these isolates of soil bacteria could be of great potential in reducing the level of insecticides in grape wine yards.

These organophosphorous insecticides used in grape yards cause harmful effects on soil micro flora and crop plants. They are not easily degradable and cause adverse effects on plant growth through the process of bioaccumulation. The proposed research work is aimed at the isolation and identification of natural bacterial strains resistant to organophosphorous insecticides from insecticide contaminated soils that is grape wine yards. The study will be useful for the bioremediation of soil pollution and pesticide free agricultural practices.

Therefore, it is interesting to study the biodiversity of pesticide resistant bacterial community in the grape wine yard soils.