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Comparative study of antibacterial activity of garlic and cinnamon at different temperature and its application on preservation of fish

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The antibacterial effect of aqueous garlic and cinnamon extract at five different temperatures (40O C, 60O C, 80O C, 100O C, 120O C) against five multidrug resistant bacterial isolates (2 gram negative and 3 gram positive), including Bacillus cereus, Staphylococcus aureus, Enterococcus faecalis, E. Coli and Proteus mirabilis were studied by well diffusion method. The maximum antibacterial effect of aqueous garlic and cinnamon extract of different temperature obtained in Enterococcus faecalis and E. Coli at 60O C (1.041) and in Enterococcus faecalis at 60O C (0.87) respectively. This antibacterial property was applied on preservation of fish. A time dependent antibacterial study was done using the gum acacia coating with garlic and cinnamon paste. It is observed that the microbial load present on the fish was totally reduced on second day. In short, the aqueous garlic and cinnamon extract and pastes show a wide range of antibacterial activity at 40O C to 60O C and satisfy all the criteria for antibacterial agent as compared to antibiotic Gentamicin. These results suggests that garlic and cinnamon can be used as food preservative and thus the use of other chemical preservatives can be minimized, which would be beneficial for environment and consumer health; or a plastic for food preservation can be invented using the antibacterial activity of garlic and cinnamon, the inner wall of the plastic coated with garlic and cinnamon paste.

Keywords: Aqueous garlic extract, Aqueous cinnamon extract, Gentamicin, activity index, fish and coating.

Biography

Nandita Dasgupta is in B.Tech Biotechnology 3rd year at the age of 21 years from VIT University, Vellore. She was the Student coordinator of VIT Biosummit'12, a meet between industrialists and academia. She has published 3 papers in reputed journals. She was also student coordinator in many college tech and cultural fests. She has good subject command in depth and technical skills with excellent management skills.

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DFT studies of ferulic acid derivative, FA15 using computational approach

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Application of computational biology involves the data based development of analytical and theoretical techniques that employs mathematical modeling and simulation methodology to perform the in-silico study of biological systems. Molecule FA15 (2-methyl-1-butyl ferulate) is a high potential chemo-preventive agent, both structurally and functionally. In respect to activity shown by FA15, it suppresses iNOS/COX-2 expression and also the release of TNF-α. It also has in-vivo suppressive nature towards oxidative stress, papiloma development and inflammation. Moreover it shows suppressive effect on LPS/IFN-γ induced degradation of IκB-α, which is a suppressive nuclear factor. In our work, the objective is to resolve the molecular structure of FA15. For this purpose Gaussian 09 (computational chemistry software) was used. Software Gaussian 09 is the latest version of Gaussian series programs. This computational tool presents unique capabilities for electronic molecular based modeling. Several versions of Gaussian software are available for specific scientific and computational oriented tasks. The stereo-molecular chemistry of FA15 molecule was fully optimized at discrete basis sets. We also computed the chemical shifts associated to Proton (1H) and Carbon (13C) presents in the FA15 molecules. A multistage approach had been devised to calculate bond length, dipole moment, total energy etc in respect to the molecular structure of FA15.

Biography

Naresh Kumar is pursuing his Ph.D from Department of Biotechnology, Indian Institute of Technology Roorkee, Roorkee, Uttarakhand, India. He is working on computational biology of biological molecules. He has completed his post graduation in Biotechnology and had worked in Indian Institute of Science, Bangalore during his post graduation. He has qualified CSIR-JRF in 2009. He frequently reviewed the research papers in African Journal of Microbiology (an international journal). He has one publication in journal and many publications in the national and international conferences.

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