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## Synergism of antibiotics and plant extracts in antibacterial activity against methicillin resistant *Staphylococcus aureus*

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ntibiotics are one of the most important weapons in fighting bacterial infections and have greatly benefited the health- ${
m A}$  related quality of human life. However, over the past few decades, these health benefits are under threat as many commonly used antibiotics have become less effective against certain illnesses not only because many of them produce toxic reactions but also due to emergence of drug resistant bacteria. Resistance development is an even bigger problem since the bacterial resistance is often not restricted to the specific antibiotic prescribed, but generally extends to other compounds of the same class. Bacterial resistance and its rapid increase is a major concern of global public health and are emerging as one of the most significant challenges to human health. Treating bacterial infections by antibiotics is beneficial but their indiscriminate use has led to an alarming resistance among microorganisms as well as led to re-emergence of old infectious diseases. One approach to treat infectious diseases is the use of plant extracts individually and /or as an alternative approach is the use of combination of antibiotics with plant extracts. Combination therapy is helpful and useful for patients with serious infections caused by drug resistant pathogens. In this work Mimosa pudica, Ixora coccinea, Colocasia esculenta, Boerhaavia diffusa, extract was prepared and commonly preferred antibiotics to treat MRSA, were collected. The antibacterial activity of plant extract and antibiotics was evaluated. The plant extract and antibiotics individually didn't show good antibacterial activity against MRSA. The combination therapy/synergism was performed. The combine antibacterial activity of plant extract and antibiotic was evaluated. The combine mixture of Colocasia esculenta and Gentamicin antibiotic shown high antibacterial activity against MRSA, the activity of gentamicin was increased up to 10-fold. Herb-drug interactions tested by checkerboard method and expressed as fractional inhibitory concentration (FIC) index showed indifferent and synergistic effects. The minimal inhibitory concentration to treat MRSA was 40 mg/ml. In the time kill assay, MRSA was totally inhibited by synergistic mixture in 6 hours. The synergism is a new concept of developing drug molecule for treating drug resistant bacteria and prevent emergence of new drug resistant bacteria.

## Biography

Jency Blesson is working as an Assistant Professor in the Dept. of Biotechnology and Biochemical Engineering, Sree Buddha College of Engineering, Kerala, India. She is a Post graduate in Microbiology from University of Madras and she was awarded PhD in Biotechnology in the year 2009 at the age of 29 from University of Kerala. She is a faculty member of Post graduate degree courses in molecular medicine, microbiology, biotechnology and biochemical engineering. Her research areas are drug formulations to overcome antibiotic resistance, use of various natural phytochemicals in successful treatment of diseases such as hypertension, hypercholesterolemia etc, synergestic effect of antibiotics and natural plant extracts to overcome antibiotic resistance. She has guided several projects in this area. She has several national, international publications and Gen Bank submissions related to her research.

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