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Marine phytochemicals as a source of pharmacological interest for drug resistant Methicillin Resistant *Staphylococcus aureus* (MRSA)

S. PRAKASH
Department of Biotechnology, Udaya School of Engineering, Ammandivillai P.O., KANYAKUMARI (T.N.) INDIA

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Antimicrobial drug resistance occurs in hospitals worldwide. One of the globally important micro-organisms is Methicillin Resistant *Staphylococcus aureus* (MRSA) which now causes more than 40% of all *S. aureus* bacteremias. Hence scientists are searching for natural compounds to control MRSA. Many marine organisms are known to produce bioactive compounds, but historically man has derived relatively few pharmaceutical agents from marine species. It is certainly true that most of the pharmacologically active products have been isolated from the sea especially from microalgae. In the present study a survey was made in the Nagercoil government hospital for studying bed sore infectious *Staphylococcus aureus*. From the samples collected, 20% were *Staphylococcus* spp. and 80% were other bacterial species. Of the 20% of *Staphylococcus aureus*, 33.4% Methicillin Resistant *Staphylococcus aureus* (MRSA). Different solvent extracts of four marine micro algae were screened against MRSA pathogens. The extraction of antimicrobials from marine micro algae reveals that n-Butanol gave maximum extraction. Among the total Four microalgal extracts used against the bed sore MRSA pathogens *Isochrysis galbana* extract showed highest percentage inhibition (52%) when compared to other extracts. The present study would therefore seems particularly worthy for further investigations of valuable compounds from marine microalgae.

Key words : Drug resistant, *Staphylococcus aureus*, Methicillin.

INTRODUCTION

Staphylococcus aureus, often referred to simply as 'staph', is a bacteria commonly found on the skin of healthy people. Occasionally, staph can get in to the body and cause infection. This infection can be minor (such as pimples, boils and other skin conditions) or serious (such as blood infections or pneumonia). Methicillin is an antibiotic commonly used to treat staph infections. Although methicillin is very effective in treating most staph infections, some staph bacteria have developed resistance to methicillin and can no longer be killed by this antibiotic. These resistant bacteria are called Methicillin Resistant *Staphylococcus aureus* or MRSA. Methicillin Resistant *Staphylococcus aureus* (MRSA) strains were first described in England in 1961, shortly after methicillin became available for clinical use. They have subsequently spread through out the world and are an important cause of nosocomial infections in many geographic areas, including the United States. Data from the National Nosocomial Infection Surveillance System reveal MRSA accounts for up to 40% of nosocomial *S. aureus* infections in large hospitals and 25% to 30% of such infections in smaller hospitals. MRSA is of special concern because it is resistant not only to methicillin, oxacillin, and nafcillin but also to all other β-lactams, including cephalosporins, imipenem and meropenem, and aztreonam. Most strains of MRSA are multidrug resistant.Resistance to erythromycin and clindamycin are very common and many strains are resistant to gentamycin, tobramycin and ciprofloxacin. In some geographic areas, resistance to co-trimazole and rifampin are also common. Many strains are susceptible to minocycline. Recently, strains resistant to methicillin and oxacillin but susceptible to many non-b-lactum agents such as clindamycin and gentamycin. Hence scientists are searching for natural compounds to control MRSA. Many marine organisms are known to produce bioactive compounds, but historically man has derived relatively few pharmaceutical agents from marine species (Rinehart and Shied, 1989). It is certainly true that most of the pharmacologically active products have been isolated from the sea especially from algae. The constant need to find new antibiotics is largely the result of an increased resistance in pathogenic bacteria caused by the continued use of these drugs. In recent years, several reports on antibacterial and antifungal activities of marine plants have been published (Khaleefa *et al*., 1975; Caccamesa *et al*., 1980; Reichelt and Borowitzk,1984). Antibacterial activity in connection with phytoplankton was first observed by Sieburth (1960) and Aubert *et al.* (1968) against some soil bacteria. Since then a number of screening programs led to the discovery of antibacterial