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EVALUATION OF THE ANTIBACTERIAL POTENTIAL OF DIFFERENT EXTRACT CONCENTRATION OF *SPIRULINA PLATENSIS* ON *STAPHYLOCOCCUS AUREUS*

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ABSTRACT :

Disc of different concentration *i.e.,* 800, 1600, 3200, 6400, 12800mg/ml of different extract solution like water, ethanol, methanol and acetone of *Spirulina platensis* were prepared and placed on *Staphylococcus aureus* culture plate and inoculated at 37^{0}C for 24 hrs. Antibacterial activity of *Spirulina platensis* against *Staphylococcus aureus* was analyzed and recorded. It was analyzed that water extract of *Spirulina platensis* against *Staphylococcus aureus* have highly antibacterial activity than other extract. Extract of *Spirulina platensis* in acetone have less antibacterial activity against *Staphylococcus aureus* (Table-1). Methanol and Ethanol extract of *Spirulina platensis* have less antibacterial effect against *Staphylococcus aureus.*

KEY WORDS : *Spirulina platensis, Staphylococcus aureus, Antibacterial, Cyanobacteria and Hypercholesterolemia.*

INTRODUCTION:

Drug discoveries are highly empirical screening of large number of pure compounds to provide new leads. Indiscriminate uses of antibiotic causes multidrug resistance organisms like Methicillin-resistant *Staphylococcus aureus* (MRSA) (Ali, *et al.,* 2002). It causes food poisoning, often life threatening, human infections of the blood stream, skin, lungs, and other organs (Chakraborty, *et al.,* 2010; Bouhlal, *et al.,* 2010). Spirulina is a specific type of blue-green vegetable micro-algae and is unique to only lakes which exhibit a high alkalinity. Certain African, Asian, and Mexican civilizations located within the vicinities of such lakes began to unravel spirulina's beneficial medicinal properties thousands of years ago. Spirulina's have rich nutrition of nearly 71 percent total protein. Its protein is five times more that of meat, and nearly three times greater than that of soybean. In addition to this aut standing amino acid profile, spirulina also contains a host of other beneficial nutrients including; carotenoids, essential fatty acids, B-complex

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vitamins, vitamin E, copper, manganese, magnesium, iron, selenium and zinc (Dillon, *et al.,* 1995). In fact, spirulina's minerals and growth factor qualities are second to milk and even primrose oil. Preparations of Spirulina are also used for their therapeutic properties in the treatment of many diseases, including hypercholesterolemia and atherosclerosis (Nakaya, *et al.,* 1998; Ramamurthy, *et al.,* 1996) as well as to reduced the body weight in obese humans (Becker, *et al.,* 1986). The Spirulina components which are responsible for these therapeutic properties are thought to be compounds with antioxidant properties such as polyunsaturated fatty acids, phycocyanin and phenolics (Bhat, *et al.,* 2001; Estrada, *et al.,* 2001 and Nagaoka, *et al.,* 2005).Marine microalgae have a great value in antimicrobial activity, because of their biologically active metabolites (Chiheb, *et al.,* 2009, Bouhlal, *et al.,* 2010; Bouhlal, *et al.,* 2011, Kim and Karadeniz, 2011; De Felício, *et al.,* 2010). For those biologically active compound marine microalgae are attracted interest of scientists to work on those plants against bacteria causing various diseases (Kandhasamy and Arunachalam, 2008). Many compounds of marine algae show antibacterial activities such as lyengaroside (Ali, *et al.,* 2002), polyhydroxylated fucophlorethol (Sandsdalen, *et al.,* 2003), halogenated compounds (Vairappan, *et al.,* 2003), polyphenolic compound (Devi, *et al.,* 2008), polysaccharide (Laurienzo, *et al.,* 2010) and guanianesesquiterpene (Chakraborty, *et al.,* 2010). Various strains of Cyanobacteria are known to produce intracellular and extracellular metabolites with diverse biological activities such as antibacterial, antifungal, cytotoxic, algaecide, immunosuppressive (Hirahashi, *et al.,* 2002) and antiviral activities (Hayashi, *et al.,* 1996).

The aim of the present study was to investigate the antibacterial activity of different extracts concentration of *Spirulina platensis* against *Staphylococcus aureus.*

MATERIALS METHOD:

Spirulina platens powder was purchased from Pondicherry Spirulina Farms, Chinna Veerampattinam, Pondicherry-60500. Stock solution (5gm/ml) of Spirulina powder extract in different extraction solution like water , ethanol, methanol and acetone was prepared by socking in 100ml solution in a closed flask for 24 hrs, shaked frequently during first 6 hrs & allowed to stand off for the next 18 hrs. Solution was filtrated in clean and dry china bowl.

Antibacterial Activity Assay: 380g/l Mueller Hinton agar medium was prepared in distilled water and autoclaved at 121^0C for 15minutes. left for cooling and 30ml media was pour in each Petri plate. After solidification, *Staphylococcus aureus* were inoculated and incubated at 37^0C for 24 hrs. 800, 1600, 3200, 6400, 12800 mg/ml concentration of different extract extraction Spirulina disc was prepared and placed on *Staphylococcus aureus* culture plate.

RESULT AND DISCUSSION:

In the present study *Spirulina platensis* extract was prepared in different solution like Water, Methanol, Ethanol and Acetone. Antimicrobialactivity of *Spirulina platensis* against *Staphylococcus aureus* was analyzed and recorded. It was clearly observed that water extract of *Spirulina platensis* against *Staphylococcus aureus* have highest antimicrobial activity than other extract, while extract of *Spirulina platensis* in acetone have lowest antibacterial activity against *Staphylococcus aureus* (Table-1).

Table: 1 shows antibacterial potential against *Staphylococcus aureus* of different concentration of *Spirulina platensis* extracts

Extraction in different solution	Different concentration of *Spirulina platnsis*				
	800mg/ml	1600mg/ml	3200mg/ml	6400mg/ml	12800mg/ml
Water Extract	-	+	+	++	++
Methanol Extract	-	-	+	+	++
Ethanol Extract	-	-	-	+	+
Acetone Extract	-	-	-	-	+

- = No growth; + = light growth; ++ = Moderate growth.

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