Introduction

Various strains of cyanobacteria are known to produce intracellular and extracellular metabolites with diverse biological activities such as antialgal, antibacterial, antifungal and antiviral activity. Incubation temperature, pH of culture medium, incubation period, medium constituents and light intensity are the most important factors influencing antimicrobial production (**Noaman *et al*., 2004**)

One potential commercial application of microalgae derived compounds that has, as yet received little attention in the area of pharmaceuticals, antibiotics and other biologically active compounds. Both extracts of cells and extracts of the growth media of various algae have been proved to have antibacterial activity *in vitro* against Gram +ve and Gram -ve bacteria. (**Katircioglu *et al*., 2006**)

Spirulina platensis is a planktonic photosynthetic filamentous cyanobacterium that forms massive populations in tropical and subtropical water bodies which have high level of carbonate and biocarbonate, and have high pH values of up to 11. This cyonobacterium is recognizable by the main morphological feature of the genus; *i.e.* the arrangement of multicellular cylindrical trichomes in an open lift-hand helix along the entire length of the filaments (**Vonshak, 1997**).

The genus *Spirulina* has gained an importance and international demand for its high phytonutrients value and pigments, which have applications in healthy foods, feed, therapeutics and diagnostics **(Becker, 1994).** It represents the second most important commercial microalgae (after *Chlorella*) for the production of biomass used as healthy food and animal feed (**Vonshak and Tomaselli, 2000**). Its annual world wide production in year 2000 was estimated to be approximately 2000 ton (**Hu, 2004**). *Spirulina*, has been used as food and nutritional supplements since

along time (**Dillon *et al*., 1995**). It is generally considered as a rich source of proteins, vitamins, essential amino acids, minerals, essential fatty acids such as γ - linolenic acid and sulfolipids **(Mendes *et al*; 2003).** Moreover in addition to ω - poly-unsaturated fatty acids, it also has ω -6 poly unsaturated fatty acids, phycocyanin and other phytochemicals (**Chamorro. *et al*., 2002**). Some *Spirulina* sp. pharmacological activities have been previously reviewed (**Belay *et al.,* 2002**), *Spirulina* sp. also exhibits antiviral (**Hernandez – Corona *et al*., 2002**), antibacterial **(Ozdemir *et al.,* 2004),** antiplatelet (**Hsiao *et al*., 2005**), anticardiotoxic **(Khan *et al*., 2005),** Hypocholesterolemic (**Nagaoka, *et al*; 2005**), antinephratoxic (**Khan *et al*., 2006**) and anti-hepatoxic effect (**Mohan *et al*., 2006**). Some of the previous pharmacological activities may be attributed to the antioxidant activity of *Spirulina* (**Lu *et al*., 2006**) or of some of its components such as phycocyanin (**Hsiao *et al*., 2005**).

Aim of the work

The present study aimed to investigate the optimum conditions that promote *Spirulina platensis* mass production and its antimicrobial activities, in addition, extraction, purification and identification of the active metabolic product.