Biological studies on the blue green alga,spirulina.

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The present work carried out to investigate the ability of S. platensis to produce antimicrobial substance, by the following objectives.I. Determination of the best solvent for bioactive metabolites extractionII. Studying some growth conditions (temperature, pH, light intensity, light duration and aeration) affecting S. platensis growth and its antimicrobial activities.III. Production, extraction, purification and identification of the antimicrobial substance produced by S. platensis.The following results were obtained:1- The biomass production using Aiba & Ogawa medium was gradually increased from the 1st day to the 9th day with maximum biomass production of 111.70 mg drt wt. /100 ml occured.2- Standard sources of nitrogen (2.5 g/l NaNO3) and phosphate (0.5 g/l K2HPO4) exhibited the maximum biomass production.3- Ethanol was the best water miscible solvent to extract the antimicrobially active compound from the whole culture (cells with exometabolites) as well as ethyl acetate and diethyl ether (water immiscible).4- The maximum biomass production (132.27 mg dry wt./100 ml) and antimicrobial activities of S. platenis whole culture against Staphylococcus aureus recorded the maximum inhibition zone of 35.33 mm while culture filtrate recorded inhibition zone of 35.67 mm against Candida albicans. The antibiotic extract from cells grown at 35 □C exhibited the largest inhibition zone against Pseudomonas aeruginosa (30.0 mm).5- pH 9.0 showed the maximum biomass production of 92.13 mg dry wt./100 ml and the maximum inhibition zone produ- ced from S. platensis whole culture (was 48. mm against Candida albicans and 39.67 mm ,29.67 mm against Candida albicans by culture filtrate and cells extract respectively.6- Biomass production of S. platensis exhibited the maximum value at light intensity of 2.0 and 2.25 klux without significant difference.7- Antimicrobial activity by whole culture, culture filtrate and cells extraction showed the maximum inhibition zone against Candida albicans, 34.67, 40.0 and 29.67 mm, respectively.8- The aerated medium showed the maximum mass production (94.73 □ 0.1154 mg dry wt./ 100 ml). the antimicrobial activities produced from aerated S. platensis medium recorded the highest inhibition zones resulted from whole culture, filtrate and extracted cells.9- Antibiotic produced by S. platensis was extracted from the culture medium after 9 days of incubation at 30 □C, pH 9.0 and 2.5 Klux using diethyl ether (water immiscible solvent). It was obvious from the bio-autography that, antibiotic is one compound.10- The physical properties of the antibiotic shown that it was greenish yellow in colour without characteristic odour. Its melting point ~ 40 □C, soluble in

chloroform, methanol, diethyl ether while sparingly soluble in acetone.