

# [Abstract: (8 mm), k. pneumonia (8 mm),](https://assignbuster.com/abstract-8-mm-k-pneumonia-8-mm/)

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Abstract:           The brown seaweed, sea lettuce, Sargassum tenerrimum (J. Agardh, 1848) washandpicked from Bhatkarwada rocky shore  of Ratnagiri  (16o59’25. 5″N, 73o16’32. 9″E) in the month of December2014. The collectes samples were cleaned, shade dried, grounded and kept underfreezer till further use for purpose of extraction. Crude extracts wereprepared by using the solvent ethanol and methanol from the green seaweed, S. tenerrimum. The screening for theirantibacterial activity against 8 bacterial pathogens viz.

Escherichia coli, Staphylococcusaureus, Klebsiella pneumonia, Pseudomonas aeruginosa, Salmonella typhi, Shigella flexneri, Corynebacteriumdiphtheria and Sarcina lutea. Thetest bacterial strains were procured from Biotechnology Department of GogateJogalekar College, Ratnagiri, Maharashtra. Thediscs loaded with the penicillin 0. 2? g antibiotic were tested as standard whereas           the discs loaded with the extractingagent were tested as control. The extract of U.

fasciata (0. 50? l) extractedin methanol was found effectiveagainst S. aureus (8 mm), K.

pneumonia (8 mm), and P. aeruginosa (8 mm). Theextract of U. fasciata extracted in ethanol having maximum activity againstS.

lutea (11 mm) and S. aureus (10 mm), where as minimum activity against K. pneumonia (8 mm), P. aeruginosa (7 mm),  andC. diphtheria (9 mm). The green seaweed, Ulva fasciata from Ratnagiri coast are found potentialsource of natural antibacterial substances.

Key Words: The green seaweed, Bacterial pathogens, Antibacterial activity, Ratnagiri Introduction: ·        Marinealgae are exploited mainly for the industrial production of phycocolloids suchas agar-agar, alginate and carrageenan, not for health aspects (Khan S. I. and Satam S.

B., 2003). ·        Biostimulantproperties of seaweeds are explored for use in agriculture and theantimicrobial activities for the development of novel antibiotics.

·        Selective utilization of marinealgae as poten-tial source of pharmaceutical agents has been in-creasing inrecent years. ·        Extractsof marine algae were reported to exhibit antibacterial activity (Siddhanata et. al., 1997 and Mahasneh et. al., 1995).

·        Antibacterialactivities on bacteria and fungi were reported by Hellio et. al. (2000). ·        Karthikaideviet. al. (2009) reported that ethanolextract shows the better results against Staphylococcus sp. ·        Extractsprepared from fresh seaweed samples are reported to show negligibleantimicrobial activity as compared to that obtained with dried seaweeds.·        Theregion of Konkan of Maharashtra state is richly endowed with vegetation ofmarine algae and Ratnagiri is no exception.

So the work was undertaken to studythe antibacterial activities of selected seaweeds from Ratnagiri coast. Materials and methods: a) SampleCollection:·        Thesamples of the green seaweed, sea lettuce, Ulvafasciata (Delile, 1813) were from Bhatkarwada rocky shore of Ratnagiri(Ratnagiri Coast, Lat 16°99? N; Long 73°27? E) in the month of October 2014. ·        Thecollected seaweeds samples were and brought to the laboratory in plastic bags. ·        Thencleaned with fresh water to remove all the extraneous matter such as epiphytes, sand particles, pebbles and shell, and spread out at room temperature fordrying. ·        Theshade dried seaweed samples were samples were grounded to fine powder and thepowdered samples were then stored in refrigerator for further use.

b) Sample Storage:·        Theshade dried seaweed samples were samples were grounded to fine powder ·        Thepowdered samples were then stored in refrigerator for further use. c) Extracts Preparation:·        Seaweed extract prepared using ethanol and methanol solvent for 72hrs from dried seaweed fine powder. ·        Bothsolvent was used in a ratio of 1: 4 (100 gm powderedseaweed: 400ml solvent). ·        Extracted liquids were centrifuge at 8000 rpm for 10 mins at roomtemperature and supernatant were collected, filters and evaporated. ·        The samples of extract were stored and refrigerated at 40Cprior to use. d) Microbial strains:·        Pure strain of 8 bacteria procured fromGogate Jogalekar College, Ratnagiri used for the further assay study.

·        Thetest bacterial strains were Escherichiacoli, Staphylococcus aureus, Klebsiellapneumonia, Pseudomonas aeruginosa, Salmonella typhi, Shigella flexneri, Corynebacterium diphtheria and Sarcinalutea. ·        Thebacterial stock cultures were maintained on Mueller Hinton Agar medium at 4 °C. e) Antibacterial assay:·        Thebioassay was carried out using the agar diffusion method (Hun et. al. 1994). ·        Thepaper disc of 6 mm diameter prepared from whatman No. 1 filter paper. ·        Eachextract was loaded in sterile filter paper disc and air dried.

·        Indicatormicrobes were spread on Muller-hinton agar plates with sterile discs placed onplates. After incubation for 24 hours at 370C, a clear zone around adisc indicates antimicrobial activity. ·        Discloaded with the extracting agent were tested as control. ·        Discloaded with the penicillin 0. 2µl antibiotic were tested as standard. ·        The antibacterial activity wasevaluated by measuring the diameter of inhibition zone.

Resultand Discussion:                  The extractability withMethanol solvent found more than Ethanol for the green seaweed Ulva fasciata. The results of theexperiment of bioassay are given in the table 1.             The investigation made on extractof Ulva fasciata extracted in methanol having antibacterial activity against Staphylococcus aureus (8mm), Klebsiellapneumoniae (8mm), Pseudomonas aeruginosa (8mm). Where as no antibacterialactivityshown against Escherichia coli, Salmonella typhi, Shigella flexneri, Corynebacterium diphtheriae and Sarcinalutea.              Extract of Ulva fasciataextracted in ethanol having maximum activity against Sarcina lutea (11mm)andStaphylococcus aureus (10mm), minimum activity against Klebsiella pneumoniae (8mm), Pseudomonas aeruginosa (7mm) and Corynebacterium diphtheriae (9mm). Where as noantibacterial activity shown against Escherichia coli, Salmonella typhi and Shigellaflexneri. Table: 1. Antimicrobial activity of selectedseaweeds on 8 bacterial strains: SN \*Bacterial Strain A B E F G 1 E.

coli — — 12mm — 7mm 2 Staphilococcus aureus 8mm 10mm 8mm 7mm 7mm 3 Klebsiella pneumonia 7mm 7mm — — 7mm 4 Pseudomonas aergiuosa 8mm 7mm — — 7mm 5 Salmonella typhi — — — — — 6 Shigella flexneri — — — — — 7 Corynebacterium diphtheria — 9mm — — — 8 Sarcina lutea — 11mm 10mm 7mm — \*Sample ( Dose= 0. 50 µl )A= Ulva fasciata: Methanol(1: 4)B= Ulva fasciata : Ethanol (1: 4)E= Stantard Disc with AntibioticF= Control Disc with solvent MethanolG= Control Disc with solvent Ethanol Conclusion:            The extract of U. fasciata (0.

50? l) extractedin methanol was found effectiveagainst S. aureus (8 mm), K. pneumonia (8 mm), and P. aeruginosa (8 mm). Theextract of U. fasciata extracted in ethanol having maximum activity againstS. lutea (11 mm) and S.

aureus (10 mm), where as minimum activity against K. pneumonia (8 mm), P. aeruginosa (7 mm),  andC.

diphtheria (9 mm). The green seaweed, Ulva fasciata from Ratnagiri coast are found potentialsource of natural antibacterial substances. Acknowledgements:            The authors wish to thank theSenior Scientific officer and Research officer of Marine Biological ResearchStation, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Ratnagiri for hiskind encouragement and facilities provided. Thanks to Department of Biotechnology, Gogate JogalekarCollege, Ratnagiri for providingstrain of bacteria.

References: 1. HellioGB, Bremer G, Pons Y, Cottenceau Le Gal, (2000). Antibacterial and antifungalactivities of extracts of marine algae from Brittany France. Use as antifoulingagents. Appl Microbiol Biotech. Vol.

54: 543–549. 2. Hun WW, Hock GS, MoiPS. (1994). Antibacterial properties ofMalaysian seaweeds. Algae biotechnology in the Asia-Pacific-region. Kula Lumpur: University of Malaya; pp.

75–81. 3. Khan S. I. andSatam S.

B. (2003). Seaweed Mariculture: Scope and Potential in India, Aquaculture Asia, 8(4): 426-29. 4. Mahasneh IM, Kashasneh JM, Ziodeh M.

Antibiotic activity of marine algae against multiantibiotic resistant bacteria. Microbiology. 1995; 83: 23–26. 5.

Siddhananta AK, ModyBK, Ramavat VD, Chauhan HS, Garg AK, Goel M (1997). Bioactivity of marineorganisms: part VIII. Screening of some marine flora of western coast of India. Indian J Exp Biol. Vol.

35: 638–643. 6. Sreenivasa Rao P, Parekh KS (1981) Antibacterial activity of Indian seaweed extracts. Bot Mar. 1981; 24: 577–582.