

UV-Spectroscopic Studies on the Potential State of Spirulina Cultures using Varied Culture Media in Uncontrolled Laboratory Conditions in Ballari Region

Nagabhushan C M

Department of Studies in Zoology

Vijayanagara Sri Krishnadevaraya University, Ballari, Karnataka, India

nagabhushancm@vskub.ac.in

Abstract: *Spirulina platensis* is a filamentous cyanobacteria obtained from the wild was subject to exposure to different concentrations of media namely Zarrouk's and BG-11. The hydrological parameters were maintained naturally in the arid regions of Ballari district. The increased temperature during summer months and dry air substantially had a negative effect on the quality of the filamentous algae. The UV Spectroscopy absorbance showed increased levels with increase in pigment concentration. The study revealed that highest absorbance patterns are due to greater number of chromophores found in the order of the samples $A_2 > A > S_2 > S_1$ respectively.

Keywords: *Spirulina platensis*, Zarrouk's media, BG-11, Spectroscopy

REFERENCES

- [1]. Borowitzka, M.A. (1988): Vitamins and fine chemicals from micro-algae. Micro-algal Biotechnology. Publisher: Cambridge University Press, Cambridge, UK, 153-196.
- [2]. Britton G, Trevor W. Goodwin. (1981): Carotenoproteins. In Carotenoid Chemistry & Biochemistry, ISBN: 9781483279848
- [3]. Britz, Peter (1996): The suitability of selected protein sources for inclusion in formulated diets for the South African abalone, *Haliotis midae*, Aquaculture, 140, DO - 10.1016/0044-8486(95)01197-8
- [4]. Capelli, Bob, Cysewski, Gerald (2010): Potential health benefits of *Spirulina* microalgae, vol (9), Nutrafoods, DOI - 10.1007/BF03223332
- [5]. Ciferri, O. (1983): *Spirulina*, the edible microorganism. Microbiological Reviews 47, 551-578.
- [6]. D Selvendran. (2015): Large Scale Algal Biomass (*Spirulina*) Production in India. Algal Biorefinery: An Integrated Approach. 151-167.
- [7]. David. (2018): Chlorella – a Trojan horse among superfoods. <https://www.mz-store.com/blog/chlorella-a-trojan-horse-among-superfoods/>
- [8]. Dubey RC. (2006): A textbook of Biotechnology. S. Chand, ISBN: 8121926084
- [9]. Eladl Eltanahy and Aya Torky (2021): Microalgae as Cell Factories: Food and Feed-grade High-value Metabolites, Microalgal Biotechnology: Recent Advances, Market Potential, and Sustainability, pp. 1-35 DOI: 10.1039/9781839162473-00001.
- [10]. Fathima, K. and Salma, P. (2001): Effect of *Spirulina* as a Nutritional Supplement on malnourished children. The Indian Journal of nutrition and dietetics , (2),5, DOI: <https://www.doi.org/10.36106/ijnr>
- [11]. Gabriela Gutiérrez-Salmeán, Luis Fabila-Castillo (2015): Nutritional and toxicological aspects of *Spirulina* (*Arthrospira*), 32, 42-50. ISSN 0212-1611.
- [12]. Howell B.K. & Matthews, A.D. (1991): The carotenoids of wild and blue disease affected farmed tiger shrimp (*Penaeus monodon*, Fabricius. Comparative Biochemistry & Physiology, 1991;98(2-3):375-9, DOI: 10.1016/0305-0491(91)90193
- [13]. Lu, J. & Takeuchi, T. (2004): Spawning and egg quality of the tilapia, *Oreochromis niloticus* fed solely on raw *Spirulina platensis* throughout three generations. Aquaculture, Elsevier Science, ISSN :0044-8486 DOI10.1016/j.aquaculture.2003.12.027.

- [14]. Md Ahsan Bin Habib et al. (2008): A review on culture, production and use of spirulina as food for humans and feeds for domestic animals. AGRIS , Publisher: Food and Agriculture Organization of the United Nations, ISBN:9789251061060
- [15]. Md. Fuad Hossain, R.R. Ratnayake, Shamim Mahbub, K.L. Wasantha Kumara, D.N. Magana-Arachchi, (2020): Identification and culturing of cyanobacteria isolated from freshwater bodies of Sri Lanka for biodiesel production, Saudi Journal of Biological Sciences, 27, 6,1514-1520, ISSN 1319-562X, DOI: <https://doi.org/10.1016/j.sjbs.2020.03.024>.
- [16]. Mohan, A., Misra, N., Srivastav, D., Umapathy, D., & Kumar, S. (2014): Spirulina, the nature's wonder: A review. Lipids, 5, 7-10.
- [17]. Nakagawa, H., Gomez-Diaz, G. (1975): Usefulness of Spirulina sp. meal as feed additive for giant freshwater prawn, Macrobrachium rosenbergii Suisanzoshoku (Japan),. 43, 521-526, ISSN : 0371-4217.
- [18]. Patricia A Chambers, Robert E DeWreede, Elizabeth A Irlandi, and Herbert Vandermeulen(1999): Management issues in aquatic macrophyte ecology: a Canadian perspective. Canadian Journal of Botany. 77(4): 471-487. DOI: <https://doi.org/10.1139/b99-092>.
- [19]. R Dineshkumar , Sampathkumar, Pitchai - Rajendran, Narendran(2016): Cultivation of Spirulina platensis in different selective media, 45, R.Y. Stanier et al. (1971).
- [20]. Ruma Arora Soni, K. Sudhakar, R.S. Rana (2019): Comparative study on the growth performance of Spirulina platensis on modifying culture media,Energy Reports, 5, 327-336, ISSN 2352-4847, DOI:<https://doi.org/10.1016/j.egyr.2019.02.009>.
- [21]. S. Rajendran. (2013): Growth measurement technique of microalgae. 52–54.
- [22]. Samuel GS, Sofi MY, Masih S (2010): Potential of different light intensities on the productivity of Spirulina platensis under Agra conditions. Research Journal of Agriculture Science;1(4):468-469
- [23]. Sasson, A. (1997): Microalgal biotechnologies: Recent developments and prospects for developing countries. In 2. Asia-Pacific Marine Biotechnology Conference and 3. Asia-Pacific Conference on Algal Biotechnology, Phuket (Thailand),.
- [24]. T. Kannappan, M. M. Karthikeyan. (2013): Diversity of fishes in relation to physico-chemical properties of Manakudy estuary Southwest coast of India. International Journal of Biodiversity and Conservation ,5(7), 396-407. DOI: <https://doi.org/10.5897/IJBC12.049>
- [25]. Teas, Jane, Hebert, James, Fitton, Jhelen, Zimba, Paul (2004): 507-10 Algae -- a poor man's HAART? 62, Medical hypotheses DOI: 10.1016/j.mehy.2003.10.005
- [26]. Trotta, Teresa, Porro, Chiara, Cianciulli, Antonia, Panaro, Maria Antonietta(2022): Beneficial Effects of Spirulina Consumption on Brain Health, Nutrients 14, 676 DOI:10.3390/nu14030676.
- [27]. Thanh-Sang Vo (2015): Nutritional and Pharmaceutical properties of microalgae Spirulina. Handbook of Marine micro algae . DOI:10.1016/B978-0-12-800776-1.00019-4
- [28]. United Nations World Food Conference. (1974): Intergovernmental Institution for the Use of Microalgae Spirulina Against Malnutrition.
- [29]. Vincent, W.F. (2009): Effects of Climate Change on Lakes. Encyclopedia of Inland Waters, Elsevier . 55-60, DOI: <https://doi.org/10.1016/B978-012370626-3.00233-7>.
- [30]. Vonshak, A., Kancharaksa, N., Bunnag, B. (1996): Role of light and photosynthesis on the acclimation process of the cyanobacterium Spirulina platensis to salinity stress. J Appl Phycol 8, 119–124 DOI: <https://doi.org/10.1007/BF02186314>.
- [31]. Vonshak, A. (ed.). (1997): Spirulina platensis (Arthrospira). In Physiology, Cell Biology and Biotechnology .
- [32]. Vonshak(1990): Recent advances in microalgal biotechnology,Biotechnology Advances, 8, 4, 709-727,ISSN 0734-9750,h DOI:[https://doi.org/10.1016/0734-9750\(90\)91993-Q](https://doi.org/10.1016/0734-9750(90)91993-Q).
- [33]. Wang, Zhi Zhao, Ying (2005): 622 - 628, Morphological reversion of *Spirulina (Arthrospira) platensis* (Cyanophyta): from Linear to Helical, Journal of Phycology ,41, DOI: 10.1111/j.1529-8817.2005.00087.x
- [34]. Zarrouk. (1966): Influence de divers facteurs physiques et chimiques sur la croissance et la photosynthese de *Spirulina maxima*.
- [35]. Zeenat, R et al. (1990): Synergistic effect of cyanobacteria and DAP on tomato yield. Science & Culture 56,

