

## References

---

- Abe K, Nishimura N, Hirano M (1999). Simultaneous production of b-carotene, vitamin E and vitamin C by the aerial microalga *Trentepohlia aurea*. *J Appl Phycol*, 11:331–336.
- Abinandan S., M.Premkumar, K.Praveen, S.Shanthakumar (2013). Nutrient Removal From Sewage – An Experimental Study At Laboratory Scale Using Microalgae; *International Journal of ChemTech Research CODEN( USA): IJCRGG*, 5(5): 2090-2095.
- Abou-Shanab Reda A. I., Marwa M. El-Dalatony, Mostafa M. EL-Sheekh, Min-Kyu Ji, El-Sayed Salama, Akhil N. Kabra, and Byong-Hun Jeon (2014). Cultivation of a New Microalga, *Micractinium reisseri*, in Municipal Wastewater for Nutrient Removal, Biomass, Lipid, and Fatty Acid Production. *Biotechnology and Bioprocess Engineering* 19: 510-518
- Abou-Shanab Reda A.I., Min-Kyu Ji, Hyun-Chul Kim, Ki-Jung Paeng, Byong-Hun Jeon (2013). Microalgal species growing on piggery wastewater as a valuable candidate for nutrient removal and biodiesel production. *Journal of Environmental Management* 115:257-264.
- Adakole J.A., D.S. Abolude (2012). Pollutional status of Kubanni Lake through metal concentrations in water and sediment columns, Zaria, Nigeria. *Res. J. Environ. Earth Sci.* 4: 424-427.
- Agarwal R.M., Charpe S.D., Raghuwanshi F.C. and Lamdhade G.T (2015). Synthesis and Characterization of Magnesium oxide Nanoparticles with 1:1 molar ratio via Liquid-Phase Method. *IJAIEEM*, 4(2).
- Ahluwalia, S.S., Goyal, D. (2007). Microbial and plant derived biomass for removal of heavy metals from wastewater. *Bioresource Technol.* 98:2243–2257.
- Aillon, K.L., Y. Xie, N. El-Gendy, C.J. Berkland and M.L. Forrest, (2009). Effects of nanomaterial physicochemical properties on in vivo toxicity. *Adv. Drug Deliv. Rev.*, 61: 457-466.
- Ajayan KV, Selvaraju M. (2012). Heavy metal induced antioxidant defense system of green microalgae and its effective role in phycoremediation of tannery effluent. *Pak J Biol Sci* 15:1056–1062.
- Ajayan Kayil Veedu, Muthusamy Selvaraju, Pachikaran Unnikannan, And Palliyath sruthi (2015). Phycoremediation of Tannery Wastewater Using Microalgae *Scenedesmus* Species. *International Journal of Phytoremediation*, 17: 907–916.
- Aksu Z, Tezer S (2005). Biosorption of reactive dyes on the green algae *Chlorella vulgaris*. *Process Biochem* 40: 1347–1361.

Al-Homaidan A.A., H.J. Al-Houri, A.A. Al-Hazzani, G. Elgaaly, N.M.S. Moubayed (2014). Biosorption of copper ions from aqueous solutions by *Spirulina platensis* biomass, Arab. J. Chem. 7:57–62.

Allakhverdiev, S.I., Nishiyama, Y. Takahashi, S., Miyairi, S., Suzuki, I., Murata, N. (2005). Systematic analysis of the relation of electron transport and ATP synthesis to the photo damage and repair of photosystem II in *Synecho cystis*. Plant Physiol. 137:263-273.

Allakhverdiev, I.S., Sakamoto, A., Nishiyama, Y., Inaba, M., Murata, N., (2000). Ionic and osmotic effects of NaCl-induced inactivation of photosystems I and II in *Synechococcus* sp. Plant Physiol. 123 (3):1047–1056

Al-Mayaly Ithar Kamil (2011). Use of filamentous alga *Mougeotia* sp. to Remove Lead Ions from Contaminated Water under Laboratory Conditions. International Journal of Basic & Applied Sciences IJBAS-IJENS,11(6):110-118.

Alva M. Sacristán de, V.M. Luna-Pabello, E. Cadena, E. Ortíz (2013). Green microalga *Scenedesmus acutus* grown on municipal wastewater to couple nutrient removal with lipid accumulation for biodiesel production, Bioresour. Technol. 146: 744–748

APHA (1998). Standard Method for Examination of Water and Wastewater. American Public Health Association, Washington.

Amerasinghe P., R. M. Bhardwaj, C. Scott, K. Jella, and F. Marshall (2013). Urban wastewater and agricultural reuse challenges in India,” IWMI Research Report 147, International Water Management Institute (IWMI), Colombo, Sri Lanka. <http://ageconsearch.umn.edu/bitstream/1158342/2/H045769>.

Ana Lucia Rengifo-Gallego and Enrique Javier Peña Salamanca (2015). Interaction Algae–Bacteria Consortia: A New Application of Heavy Metals Bioremediation Ansari A.A. et al. (eds.), Phytoremediation: Management of Environmental Contaminants, Volume 2, DOI 10.1007/978-3-319-10969-5\_6, © Springer International Publishing Switzerland.

Anderson, D.M. (1978). Morel, F.M.M. Copper sensitivity of *Gonyaulax tamarensis*. Limnol. Oceanogr.23:283–295.

Ang EL, Zhao H, Obbard JP (2005) Recent advances in the bioremediation of persistent organic pollutants via biomolecular engineering. Enzyme Microbiol Technol 37: 487-496.

Annual Report of (Gujarat Pollution Control Board) 2014-2015.

Arnon DI. (1949). Copper enzymes in isolated chloroplasts, polyphenoxidase in *Beta vulgaris*. plant physiology 24: 1-15.

- Aruoja, V., Dubourguier, H.-C., Kasemets, K. & Kahru, A. (2009). Toxicity of nanoparticles of CuO, ZnO and TiO<sub>2</sub> to microalgae *Pseudokirchneriella subcapitata*. *Science of the total environment*. 407(4):1461–1468
- Aruoja, V., Suman Pokhrel, Mariliis Sihtmäe, Monika Mortimer, Lutz Mädler and Anne Kahru (2015). Toxicity of 12 metal-based nanoparticles to algae, bacteria and protozoa. *Environmental Science: Nano*. 2(6):630–644
- Arunakumara, K.K.I.U.; Xuecheng, Z (2009). Effects of heavy metals (Pb<sup>2+</sup> and Cd<sup>2+</sup>) on the ultrastructure, growth and pigment contents of the unicellular cyanobacterium *Synechocystis* PCC 6803. *Chin. J. Oceanol. Limnol.*, 27:383–388.
- Arunakumara, K.K.I.U.; Xuecheng, Z.; Xiaojin, S (2008). Bioaccumulation of Pb<sup>2+</sup> and its effects on growth, morphology and pigment contents of *Spirulina*(*Arthrospira*) *platensis*. *J. Ocean Univ. Chin.* 2008, 7, 397–403.
- Aslan, S., Kapdan, I.K., (2006). Batch kinetics of nitrogen and phosphorus removal from synthetic wastewater by algae. *Ecol. Eng.* 28:64–70.
- Asulabh, K.S., Supriya, G., Ramachandra, T.V. (2012). Effect of salinity concentrations on growth rate and lipid concentration in *Microcystis* sp., *Chlorococum* sp. and *Chaetoceros* sp. In: *LAKE: National Conference on Conservation and Management of Wetland Ecosystems*, 27–32.
- Ayodhya D Kshirsagar (2013). Bioremediation of Wastewater by Using Microalgae: An Experimental Study. *Int. J. LifeSc. Bt & Pharm.* 2(3).
- Azarpira PBH, Dhupal K, Pondhe G (2014). Comparative studies on phycoremediation of sewage water by using blue green algae. *Int J Biosci*, 4:58–64.
- Aziz M. A. and W. J. Ng (1993). Industrial wastewater treatment using an activated algae-reactor, *Water Sci. Technol.*, 28:71-76.
- Azov, Y (1982). Effect of pH on inorganic carbon uptake in algal cultures. *Appl. Environ. Microbiol.* 43:1300–1306.
- Badrul Huda Muhammad, Nuryanto Rahmat, Suhandono Steven, Fadhilah Syarifah, Wiarsih Shelly, Prakoso Fiky Agung (2014). Synthesis and Characterization of Nano Calcium Oxide from Eggshell to be Catalyst of Biodiesel Waste Oil, *Proceedings of the 3rd Applied Science for Technology Innovation, ASTECHNOVA. International Energy Conference*.
- Ballén-Segura, M., Hernández, L., Parra, D. Vega, A., Pérez, K. (2016). Using *Scenedesmus* sp. For the Phycoremediation of Tannery Wastewater, *TECCIENCIA*, 11(21):69-75.

- Barakat MA (2011). New trends in removing heavy metals from industrial wastewater. *Arab J Chem*, 4(4):361–377
- Baumgarten E., M. Nagel and R. Tischner (1999). Reduction of the nitrogen and carbon content in swine waste with algae and bacteria. *Applied Microbiology and Biotechnology*. 52(2):281–284.
- Bayramoğlu, G., Tuzun, I., Celik, G., Yilmaz, M., Arica, M.Y. (2006). Biosorption of mercury(II), cadmium(II) and lead(II) ions from aqueous system by microalgae *Chlamydomonas reinhardtii* immobilized in alginate beads. *Int. J. Miner. Process.* 81:35–43.
- Beal CM, Hebner RE, Webber ME, Ruoff RS, Seibert AF, King CW (2012). Comprehensive evaluation of algae production: experimental and target results. *Energies* 5:1943–81.
- Belotti G, Bravi M, de Caprariis B, de Filippis P, Scarsella M (2013). Effect of Nitrogen and Phosphorus Starvations on *Chlorella vulgaris* Lipids Productivity and Quality under Different Trophic Regimens for Biodiesel Production. *American Journal of Plant Sciences* 4: 44-51.
- Belotti, G., Caprariis, B. D., Filippis, P. D., Scarsella, M., and Verdone, N. (2014). Effect of *Chlorella vulgaris* growing conditions on bio-oil production via fast pyrolysis. *Biomass Bioenerg.* 61:187–195.
- Bhatnagar A, Bhatnagar M, Chinnasamy S, Das KC (2010). *Chlorella minutissima*—a promising fuel alga for cultivation in municipal wastewaters. *Appl Biochem Biotechnol*, 161:523–36.
- Bishnoi, N.R.; Kumar, R.; Kumar, S.; Rani, S (2007). Biosorption of Cr (III) from aqueous solution using algal biomass *Spirogyra* spp. *J. Hazard. Mater.* 145:142–147.
- Bligh, E. G.; Dyer, W. J. A rapid method of total lipid extraction and purification (1959). *Can. J. Biochem. Physiol.* 37: 911–917.
- Boelee NC, Temmink H, Janssen M, Buisman CJN, Wijffels RH (2012). Scenario analysis of nutrient removal from municipal wastewater by microalgal biofilms. *Water*; 4:460–73.
- Bojović BM, Stojanović J (2005). Chlorophyll and carotenoid content in wheat cultivars as a function of mineral nutrition. *Archives of Biological Sciences* 57(4): 283-290.
- Borowitzka, M. (1998). Limits to growth. In M. Borowitzka, *Wastewater treatment with algae* (pp. 203-226). Berlin: Springer Berlin Heidelberg

- Cabanelas ITD, Arbib Z, Chinalia FA, Souza CO, Perales JA, Almeida PF (2013). From waste to energy: microalgae production in wastewater and glycerol. *Appl Energy*, 109:283–90.
- Cai T, Park SY, Li Y (2013). Nutrient recovery from wastewater streams by microalgae: status and prospects. *Renew Sustain Energy Rev* 19; 360–369.
- Cao Chang-Yan, Jin Qu, Fang Wei, Hua Liu, and Wei-Guo Song (2012). Superb Adsorption Capacity and Mechanism of Flower like Magnesium Oxide Nanostructures for Lead and Cadmium Ions. *ACS Appl. Mater. Interfaces*, 4:4283–4287.
- Cembella A.D. (2003). Chemical ecology of eukaryotic microalgae in marine ecosystems, *Phycologia* 42:420–447.
- Chen Yimin, Changan Xu and Seetharaman Vaidyanathan (2017). Microalgae: a robust “green bio-bridge” between energy and environment. *Critical Reviews in Biotechnology*, 1-18.
- Chen CY, Yeh KL, Aisyah R, Lee DJ, Chang JS (2011). Cultivation, photobioreactor design and harvesting of microalgae for biodiesel production: a critical review. *Bioresour Technol*, 102(1):71–8.
- Chen, C.Y.; Durbin, E.G (1994). Effects of pH on the growth and carbon uptake of marine phytoplankton. *Mar. Ecol.-Prog. Ser.*, 109:83–94.
- Chen CY, Chang HW, Kao PC, Pan JL, Chang JS (2012). Biosorption of Cadmium by CO<sub>2</sub>-fixing Microalga *Scenedesmus obliquus* CNW-N. *Biores Technol*, 105:74–80.
- Chisti Y (2007). Biodiesel from microalgae. *Biotechnology Advances*, 25:294–306
- Chu, S.P. (1942). The Influence of the Mineral Composition of the Medium on the Growth of Planktonic Algae: Part I. Methods and Culture Media. *The Journal of Ecology*, 30: 284-325.
- Cho, S., Ji, S.-C., Hur, S., Bae, J., Park, I.-S., Song, Y.-C. (2007). Optimum temperature and salinity conditions for growth of green algae *Chlorella ellipsoidea* and *Nannochloris oculata*. *Fish. Sci.* 73: 1050-1056.
- Choi Hee-Jeong (2016). Dairy wastewater treatment using microalgae for potential biodiesel application. *Environ. Eng. Res.*, 21(4): 393-400
- Chojnacka, K., Chojnacki, A., Górecka, H., (2004). Trace element removal by *Spirulina* sp. from copper smelter and refinery effluents. *Hydrometallurgy* 73, 147–153.
- Colak O, Kaya Z. (1988). A study on the possibilities of biological wastewater treatment using algae. *Doga Biyoloji Seris* 12:18–29.

Converti A, Casazza AA, Ortiz EY, Perego P, Del Borghi M (2009). Effect of temperature and nitrogen concentration on the growth and lipid content of *Nannochloropsis oculata* and *Chlorella vulgaris* for biodiesel production. *Chemical Engineering and Processing: Process Intensification* 48(6): 1146-1151.

Correia Leandro Marques, Rosana Maria Alves Saboya, Natália de Sousa Campelo, Juan Antonio Cecilia, Enrique Rodríguez-Castellón, Célio Loureiro Cavalcante Jr., Rodrigo Silveira Vieira (2014). Characterization of calcium oxide catalysts from natural sources and their application in the transesterification of sunflower oil, *Bioresource Technology* 151:207–213.

CPCB (Central Pollution Control Board) (2011). 1–9  
<http://unstats.un.org/unsd/environment/envpdf/pap/wassess3-b/india.pdf>.

CPCB (2009-10). Status of sewage treatment in India (CUPS/61/2005-06)-Central Pollution Control Board.

CPCB. 2005a. Parivesh Sewage Pollution – News Letter. Central Pollution Control Board, Ministry of Environment and Forests, Govt. of India, Parivesh Bhawan, East Arjun Nagar, Delhi 110 032.  
<http://cpcbenvvis.nic.in/newsletter/sewagepollution/contentsewagepoll-0205.htm>

CPCB. (2005b). Performance status of common effluent treatment plants in India. Central Pollution Control Board, India.

CPCB (2015). Inventorization of Sewage Treatment Plants. Pages 1-81.

Chinnasamy S., A. Bhatnagar, R.W. Hunt, K. Das (2010). Microalgae cultivation in a wastewater dominated by carpet mill effluents for biofuel applications, *Bioresour. Technol.* 101:3097–3105.

Crist R.H., K. Oberholser, N. Shank, M. Nguyen (1981). Nature of bonding between metallic ions and algal cell walls. *Environ. Sci. Technol.*, 15:1212–1217.

Dahmen, I., Chtourou, H., Jebali, A., Daassi, D., Karray, F., Hassairi, I., Sayadi, S., Abdelkafi, S., Dhouib, A., (2013). Optimization of the critical medium components for better growth of *Picochlorum* Sp. and the role of stressful environments for higher lipid production. *J. Sci. Food Agric.* .<http://dx.doi.org/10.1002/jsfa.6470>.

Daneshvar, N., Ayazloo, M., Khataee, A.R., Pourhassan, M., (2007). Biological decolorization of dye solution containing Malachite Green by microalgae *Cosmarium* sp. *Bioresour. Technol.* 98 (6):1176–1182.

Dalrymple OK, Halfhide T, Udom I, Gilles B, Wolan J, Zhang Q, Ergas S. (2013). Wastewater use in algae production for generation of renewable resources: a review and preliminary results. *Aquat Biosyst.* 9(1): 2-11.

- Davis TA, Volesky B, Mucci A (2003). A review of biochemistry of heavy metal Biosorption by brown algae. *Water Res* 37: 4311–4330
- De-Bashan LE, Moreno M, Hernandez J, Bashan Y (2002). Removal of ammonium and phosphorus ions from synthetic wastewater by the microalgae *Chlorella vulgaris* immobilized in alginate beads with the microalgae growth-promoting bacterium *Azospirillum brasilense*. *Water Res* 36:2941–2948.
- De-Bashan LE, Bashan Y (2010). Immobilized microalgae for removing pollutants: review of practical aspects. *Bioresour Technol*, 101:1611–1627.
- De-Bashan LE, Hernandez J-P, Morey T (2004). Microalgae growth-promoting bacteria as “helpers” for microalgae: a novel approach for removing ammonium and phosphorus from municipal wastewater. *Water Res.*, 38:466–474.
- Delucca R. and M. D. McCracken (1977). Observations on interactions between naturally-collected bacteria and several species of algae, *Hydrobiologia*, 55:71-75.
- Demirbas, M.F. (2011). Biofuels from algae for sustainable development. *Appl. Energy*, 88:3473–3480.
- De Moraes, M.G. and Costa, J.A.V., (2007). Isolation and selection of microalgae from coal fired thermoelectric power plant for biofixation of carbon dioxide. *Energy conservation and Management*, 48 (7): 2169–2173.
- Di Caprio, F., Altimari, P., Pagnanelli, F. (2015). Integrated biomass production and biodegradation of olive mill wastewater by cultivation of *Scenedesmus* sp. *Algal Res.*, 9:306–311.
- Dickinson KE, Whitney CG, McGinn PJ (2013). Nutrient remediation rates in municipal wastewater and their effect on biochemical composition of the microalga *Scenedesmus* sp. *AMDD. Algal Res* 2:127–134.
- Doke Jayant, V.Kalyan Raman & V.S.Ghole (2005). Bioremediation potential of *Spirulina* sp.: toxicity and sorption Studies of Co and Pb; *International Journal on Algae*, 7(2): 118-128
- Dominic VJ, Soumya Murali and Nisha MC (2009). Phycoremediation efficiency of three micro algae *Chlorella vulgaris*, *Synechocystis salina* and *Gloeocapsa Gelatinosa*. *Academic Review*, 138-146.
- Dönmez, G.Ç, Aksu, Z., Öztürk, A., Kutsal, T. (1999). A comparative study on heavy metal biosorption characteristics of some algae. *Process Biochem.* 34:885–892.

- Dopazo J (1994). Estimating errors and confidence intervals for branch lengths in phylogenetic trees by a bootstrap approach. *Journal of Molecular Evolution*, 38:300-304.
- Doshi, H., Seth, C., Ray, A., Kothari, I.L. (2008). Bioaccumulation of heavy metals by green algae. *Curr. Microbiol.*, 56:246–255.
- Dubois, M., K. A. Gilles, J. K. Hamilton, P. A. Rebers and F. Smith (1956). Colorimetric method for the determination of sugar and related substances. *Anal. Chem.*28: 350 - 356.
- Durrant, A.E., Scrimshaw, M.D., Stratful, I., Lester, J.N. (1999). Review of the feasibility of recovering phosphate from wastewater for use as a raw material by the phosphate industry. *Environ. Technol.* 20: 749–758.
- Voltolina D., B. Cordero, M. Nieves, and L. P. Soto (1999). Growth of *Scenedesmus* sp. in artificial wastewater. *Bioresource Technology*, 68 (3): 265–268.
- Ebrahimian, A., Kariminia, H.-R., Vosoughi, M., (2014). Lipid production in mixotrophic cultivation of *Chlorella vulgaris* in a mixture of primary and secondary municipal wastewater. *Renew. Energy*, 71:502–508.
- Edwards CD, Beatty JC, Loiselle JBR, Vlassov KA, Lefebvre DD (2013). Aerobic transformation of cadmium through metal sulfide biosynthesis in photosynthetic microorganisms. *BMC Microbiol* 13:161.
- El-Sheek, M.M., Rady, A.A., (1994). Effect of phosphorus starvation on growth, photosynthesis and some metabolic processes in the unicellular green alga *Chlorella kessleri*. *Phyton (Horn, Austria)* 35:139–151.
- El-Sheekh M, Abomohra AEF, Hanelt D (2012). Optimization of biomass and fatty acid productivity of *Scenedesmus obliquus* as a promising microalga for biodiesel production. *World J Microbiol Biotechnol.* doi:10.1007/s11274-012-1248-2.
- Elumalai Sanniyasi, Selvarajan Ramganes, Anuvarshini, Thimmarayan Sangeetha, David, Roopsingh (2014). Phycoremediation for Leather Industrial Effluent - Treatment and Recycling Using Green Microalgae and its Consortia. *Int.J.Curr.Biotechnol.*2 (10).
- El-Gohary, F., Tawfik, A. (2009). Decolorization and COD reduction of disperse and reactive dyes wastewater using chemical-coagulation followed by sequential batch reactor (SBR) process. *Desalination* 249:1159-1164.
- Elliott, L.G., Feehan, C., Laurens, L.M.L., Pienkos, P.T., Darzins, A., Posewitz, M.C. (2012). Establishment of a bioenergy-focused microalgal culture collection. *Algal Res.*, 1:102–113.



Environmental Canada (1997). Review of the impacts of municipal wastewater effluents on Canadian waters and human health. Ecosystem Science Directorate, Environmental Conservation Service, Environmental Canada, p. 25.

Essa AM (1995). Osmoregulatory metabolites accumulated in halophilic algae grown on organic wastes. M.Sc., Cairo University, Egypt.

Falkowski PG, Raven JA (1997). Aquatic photosynthesis. Blackwell, Malden, p 375.

Fan, J., Cui, Y., Wan, M., Wang, W., and Li, Y. (2014). Lipid accumulation and biosynthesis genes response of the oleaginous *Chlorella pyrenoidosa* under three nutrition stressors. *Biotechnol. Biofuels* 7:17.

Farooq W, Lee YC, Ryu BG, Kim BH, Kim HS, Choi YE, Yang JW (2013). Two-stage cultivation of two *Chlorella* sp. strains by simultaneous treatment of brewery wastewater and maximizing lipid productivity. *Bioresour Technol*, 132:230–238.

Fazil Esra Imamoglu , Vardar Sukan, Meltem Conk Dalay (2007). Effect of Different Culture Media and Light Intensities on Growth of *Haematococcus pluvialis*; *International Journal of Natural and Engineering Sciences* 1 (3): 05-09.

Florea A.M., D. Büsselberg (2006). Occurrence, use and potential toxic effects of metals and metal compounds, *Biometals*.19: 419-427.

Feng YJ, Li C, Zhang DW (2011). Lipid production of *Chlorella vulgaris* cultured in artificial wastewater medium. *Bioresource Technology*, 102:101–5.

Fergola P., M. Cerasuolo, A. Pollio, G. Pinto, M. Della Greca (2007). Allelopathy and competition between *Chlorella vulgaris* and *Pseudokirchneriella subcapitata*: experiments and mathematical model, *Ecol. Model.* 208:205–214.

Franta, J.R., Wildere, P.A. (1997). Biological treatment of paper mill wastewater by sequencing batch reactor technology to reduce residual organic. *Wat. Sci. Tech.* 35: 29–133.

Franklin, N. M., Nicola J. Rogers, Simon C. Apte, Graeme E. Batley, Gerald E. Gadd, and Philip S. Casey (2007). Comparative toxicity of nanoparticulate ZnO, bulk ZnO, and ZnCl<sub>2</sub> to a freshwater microalga (*Pseudokirchneriella subcapitata*): the importance of particle solubility. *Environmental science & technology.* 41(24):8484–8490

F. Shahbaa, Bdewi, Omed Gh. Abdullah, Bakhtyar K. Aziz, Ayad A. R. Mutar. Synthesis (2016). Structural and Optical Characterization of MgO Nanocrystalline Embedded in PVA Matrix. *J Inorg Organomet Polym*, 26:326–334.

Fukami K., T. Nishijima, Y. Ishida (1997). Stimulative and inhibitory effects of bacteria on the growth of microalgae, *Hydrobiologia* 358:185–191.

- Fulekar M. H., Jaya Sharma & Akalpita Tendulkar (2012). Bioremediation of heavy metals using bio stimulation in laboratory bioreactor. *Environ Monit Assess*, 184:7299–7307
- Gao F, Yang ZH, Li C, Wang YJ, Jin WH, Deng YB (2014). Concentrated microalgae cultivation in treated sewage by membrane photobioreactors operated in batch flow mode. *Bioresour Technol*, 167:441–6.
- Garcia-Soto, M.M., de la Fuente., & Camacho, E.M. (2006). Boron removal by means of adsorption with magnesium oxide, *Separation and Purification Technology*, 48:36–44.
- Gensemer, R.W.; Smith, R.E.H.; Duthie, H.C (1993). Comparative effects of pH and aluminum on silica limited growth and nutrient uptake in *Asterionella ralfsiivar. Americana* (Bacillariophyceae). *J. Phycol.*29:36–44.
- Ghiasi M. and A. Malekzadeh (2012). Synthesis of CaCO<sub>3</sub> nanoparticles via citrate method and sequential preparation of CaO and Ca (OH)<sub>2</sub> nanoparticles. *Cryst. Res. Technol.* 47(4):471 – 478.
- Ghoneima Mohamed M., Hanaa S. El-Desoky, Khalid M. El-Moselhy, Adel Amer, Emad H. Abou El-Naga, Lamiaa I. Mohamedein, Ahmed E. Al-Prol (2014). Removal of cadmium from aqueous solution using marine green algae, *Ulva lactuca*; *Egyptian Journal of Aquatic Research*,40:235–242.
- Gill, P.K., Sharma, A.D., Singh, P. and Bhullar, S.S. (2002). Osmotic stress induced changes in germination, growth and soluble sugar contents of *Sorghum bicolor* (L.) Moench seeds under various abiotic stresses. *Plant Physiol.*, 128: 12 – 25
- Girard J, Roy M, Ben M, Gagnon J, Faucheux N, Heitz M, Tremblay R, Deschenes J (2014). Mixotrophic cultivation of green microalgae *Scenedesmus obliquus* on cheese whey permeate for biodiesel production. *Algal Res*, 5:241–248
- Godlewska Zylkiewicz, B. (2001). Analytical applications of living organisms for pre-concentration of trace metals and their speciation. *Crit. Rev. Anal. Chem.* 31 (3):175-189.
- Godos I. De, C. González, E. Becares, P.A. García-Encina, R. Muñoz (2009). Simultaneous nutrients and carbon removal during pretreated swine slurry degradation in a tubular biofilm photobioreactor, *Appl. Microbiol. Biotechnol.* 82:187–194
- Goldman, J.C.; Azov, Y.; Riley, C.B.; Dennett, M.R (1982). The effect of pH in intensive microalgal cultures. I. biomass regulation. *J. Exp. Mar. Biol. Ecol.*, 57:1–13.
- Gopinath. M., Kaveriammal.S and Elayarasi.M (2014). Phytoremediation of domestic waste water of Gudiyatham town by Microalgae *Chlorella vulgaris*. *International Journal of Environmental Biology*, 4(4): 243-247
- Govind P., S. Madhuri (2014). Heavy metals causing toxicity in animal's and fishes. *Res. J. Anim. Vet. Fish. Sci.* 2: 17-23.

- Gross E.M. (2003). Allelopathy of aquatic autotrophs, *Crit. Rev. Plant Sci.* 22:313–339.
- Gu, N., Lin, Q., Li, G., Qin, G., Lin, J., Huang, L., (2012). Effect of salinity change on biomass and biochemical composition of *Nannochloropsis oculata*. *J. World Aquac. Soc.* 43:97-106.
- Gurbuz F, Ciftci H, Akcil A (2009). Biodegradation of cyanide containing effluents by *Scenedesmus obliquus*. *J Hazard Mater* 162(1):74–79.
- Guschina, I.A., Harwood, J.L. (2009). Algal lipids and effect of the environment on their biochemistry. In: Arts, M.T., Brett, M.T., Kainz, M. (eds.) *Lipids in Aquatic Ecosystems*, Springer, New York, 1 – 24.
- Hammouda O., Gaber A. and Abdel-Rao U.F.N., (1994). Microalgae and wastewater treatment. *Ecotoxicol. Environ. Saf.* 31: 205-210.
- Han, R., Zou, W., Wang, Y., & Zhu, L. (2007). Removal of uranium (VI) from aqueous solutions by manganese oxide coated zeolite: Discussion of adsorption isotherms and pH effect. *Journal of Environmental Radioactivity*, 93:127–143.
- Han F, Huang J, Li Y, Wang W, Wan M, Shen G, Wang J (2013). Enhanced lipid productivity of *Chlorella pyrenoidosa* through the culture strategy of semi continuous cultivation with nitrogen limitation and pH control by CO<sub>2</sub>. *Bioresour Technol*, 136:418–424
- Han L, Pei H, Hu W, Jiang L, Ma G, Zhang S (2015). Integrated campus sewage treatment and biomass production by *Scenedesmus quadricauda* SDEC-13. *Bioresour Technol*, 175:262–8.
- Hanhua Hu. E Kunshan Gao (2006). Response of growth and fatty acid compositions Of *Nannochloropsis* sp. to environmental factors under elevated CO<sub>2</sub> concentration. *Biotechnol Lett*, 28:987–992.
- Hannon, M., Gimpel, J., Tran, M., Rasala, B., and Mayfield, S. (2010). Biofuels from algae: challenges and potential. *Biofuels* 1, 763–784. doi: 10.4155/bfs.10.44.
- Hao, Y.M., C. Man and Z.B. Hu, (2010). Effective removal of Cu (II) ions from aqueous solution by amino-functionalized magnetic nanoparticles. *J. Hazard. Mater.* 184: 392-399.
- Hawkes JS (1997). What is a heavy metal? *J Chem Educ* 74(11): 1374–1378.
- He Meilin, Yongquan Yan, Feng Pei, Mingzhu Wu, Temesgen Gebreluel, Shanmei Zou & Changhai Wang (2017). Improvement on lipid production by *Scenedesmus obliquus* triggered by low dose exposure to nanoparticles. *Scientific reports*, 7:15526; 1 – 12.
- He P., B. Mao, F. Lü, L. Shao, D. Lee, J. Chang (2013a). The combined effect of bacteria and *Chlorella vulgaris* on the treatment of municipal wastewaters, *Bioresour. Technol.*, 146:562–568.

- Heraud, P., Wood, B.R., Tobin, M.J., Beardall, J., McNaughton, D., (2005). Mapping of nutrient-induced biochemical changes in living algal cells using synchrotron infrared microspectroscopy. *FEMS Microbiol. Lett.* 249:219–225.
- Hernandez D., B. Riaño, M. Coca, M. García-González (2013). Treatment of agro-industrial wastewater using microalgae-bacteria consortium combined with anaerobic digestion of the produced biomass, *Bioresour. Technol.* 135:598–603.
- Hernandez, J.-P., de-Bashan, L.E., Bashan, Y., (2006). Starvation enhances phosphorus removal from wastewater by the microalga *Chlorella* spp. co-immobilized with *Azospirillum brasilense*. *Enzyme Microb. Technol.* 38, 190–198.
- Hiremath S, Mathad P (2010). Impact of salinity on the physiological and biochemical traits of *Chlorella vulgaris* Beijerinck. *J. Algal Biomass Utiln.* 1(2):51–59
- Ho, S.H., Chen, W.M., Chang, J.S., (2010). *Scenedesmus obliquus* CNW-N as a potential candidate for CO<sub>2</sub> mitigation and biodiesel production. *Bioresour. Technol.* 101, 8725–8730.
- Ho, S. H., Chen, C. Y., and Chang, J. S. (2012). Effect of light intensity and nitrogen starvation on CO<sub>2</sub> fixation and lipid/carbohydrate production of an indigenous microalgae *Scenedesmus obliquus* CNW-N. *Bioresour. Technol.* 113:244–252. doi: 10.1016/j.biortech.2011.11.133
- Holan ZR, Volesky B (1994). Biosorption of lead and nickel by biomass of marine algae. *Biotechnol Bioeng.* 43: 1001–1009.
- Hongyang S, Yalei Z, Chunmin W, Xuefei Z, Jinpeng L (2011). Cultivation of *Chlorella pyrenoidosa* in soybean processing wastewater. *Bioresource Technology*; 102:9884–90
- Hong, K.S., Lee, H.M., Bae, J.S., Ha, M.G., Jin, J.S., Hong, T.E., Kim, J.P., Jeong, E.D., (2011). Removal of heavy metal ions by using calcium carbonate extracted from starfish treated by protease and amylase. *J. Anal. Sci. Technol.* 2 (2):75–82.
- Hu, Q. (2004). Environmental effects on cell composition in *Handbook of Microalgal Culture*, ed A.Richmond (Oxford: Blackwell), 83–93.
- Hu, Q., Sommerfeld, M., Jarvis, E., Ghirardi, M., Posewitz, M., Seibert, M., et al. (2008). Microalgal triacylglycerols as feedstocks for biofuel production: perspectives and advances. *Plant J.* 54, 621–639.
- Huo, S., Wang, Z., Zhu, S., Zhou, W., Dong, R., Yuan, Z. (2012). Cultivation of *Chlorella zofingiensis* in bench-scale outdoor ponds by regulation of pH using dairy wastewater in winter, South China. *Bioresour. Technol.* 121:76–82.
- Ilavarasi A. D. Mubarakali, R. Praveenkumar, E. Baldev and N. Thajuddin (2011). Optimization of various growth media to freshwater Microalgae for Biomass Production. *biotechnology* 10(6): 540-545.

- Ikaran Z, Suárez-Alvarez S, Urreta I, Castañón S (2015). The effect of nitrogen limitation on the physiology and metabolism of *Chlorella vulgaris* var L3. *Algal Research*, 10: 134-144.
- Imamoglu Esra, fazilet vardar sukan, meltem conk dalay (2007). Effect of Different Culture Media and Light Intensities on Growth of *Haematococcus pluvialis*. *International Journal of Natural and Engineering Sciences* 1 (3): 05-09.
- Ithar Kamil Al-Mayaly (2011). Use of filamentous alga *Mougeotia* sp. to Remove Lead Ions from Contaminated Water under Laboratory Conditions *International Journal of Basic & Applied Sciences*, 11(6):110-118.
- Jacome-Pilco CR, Cristiani-Urbina E, Flores-Cotera LB, VelascoGarcía R, Ponce-Noyola T, Canizares-Villanueva RO (2009). Continuous Cr(VI) removal by *Scenedesmus incrassatulus* in an airlift photobioreactor. *Biores Technol* 100(8):2388–2391.
- Jais NM, Mohamed RMSR, Apandi WA, Matias-Peralta H (2015). Removal of nutrients and selected heavy metals in wet market wastewater by using microalgae *Scenedesmus* sp. *Appl Mech Mater* 773–774:1210–1214.
- Jaishankar M., T. Tseten, N. Anbalagan, B.B. Mathew, K.N. Beeregowda (2014). Toxicity, mechanism and health effects of some heavy metals, *Interdiscip. Toxicol.* 7: 60-72.
- Jia Min-Kyu, Hyun-Shik Yun, Sanghyun Park, Hongkyun Lee, Young-Tae Park, Sunyoung Bae, Jungyeob Ham, Jaeyoung Choi (2015). Effect of food wastewater on biomass production by a green microalga *Scenedesmus obliquus* for bioenergy generation. *Bioresource Technology* 179: 624–628.
- Jai Park Heung, JEONG Seong Wook, YANG Jae Kyu, KIM Boo Gil, LEE Seung Mok (2007). Removal of heavy metals using waste eggshell. *Journal of Environmental Sciences* 19:1436–1441.
- Jagmann N, Philipp B. (2014). Design of synthetic microbial communities for biotechnological production processes. *Journal of Biotechnology* 184, 209–218.
- James, G. O., Hocart, C. H., Hillier, W., Price, G. D., and Djordjevic, M. A. (2013). Temperature modulation of fatty acid profiles for biofuel production in nitrogen deprived *Chlamydomonas reinhardtii*. *Bioresource. Technol.* 127: 441–447.
- Jayant dokei, V. Kalyanraman & V.S. Ghole (2005). Bioremediation potential of *Spirulina* sp.: toxicity and sorption Studies of Co and Pb. *International Journal on Algae*, 7(2):118-128.
- Jayarambabu N, Siva Kumari B, Venkateswara Rao K, Prabhu YT (2016). Enhancement of growth in maize by biogenic- synthesized mgo nanoparticles. *International Journal of Pure and Applied Zoology* 4(3):262-270.

- Jaysudha S. and P. Sampathkumar (2014). Nutrient removal from tannery effluent by free and Immobilized cells of marine microalgae *Chlorella salina*; International Journal of Environmental Biology, 4(1): 21-26
- Ji, C.-F., Yu, X.-J., Chen, Z.-A., Xue, S., Legrand, J., and Zhang, W. (2011). Effects of nutrient deprivation on biochemical compositions and photohydrogen production of *Tetraselmis subcordiformis*. Int. J. Hydrogen Energy 36:5817–5821. doi: 10.1016/j.ijhydene.2010.12.138
- Ji., F., Liu, Y., Hao, R., Li, G., Zhou, Y. and Dong, R. (2014). Biomass Production and Nutrients Removal by a New Microalgae Strain *Desmodesmus* sp. in Anaerobic Digestion Wastewater. Bioresource Technology, 161:200-207.
- Ji, J., Long, Z. & Lin, D. (2011). Toxicity of oxide nanoparticles to the green algae *Chlorella* sp. Chemical Engineering Journal, 170(2):525–530
- Ji, M.-K., Kabra, A.N., Salama, E.-S., Roh, H.-S., Kim, J.R., Dae, S.L., Jeon, B.-H. (2014). Effect of mine wastewater on nutrient removal and lipid production by a green microalga *Micractinium reisseri* from concentrated municipal wastewater. Bioresource Technol. 157:84–90.
- Ji, M.-K., R. A. I. Abou-Shanab, S.-H. Kim, E.-S. Salama, S.-H. Lee, A.-N. Kabra, Y.-S. Lee, S. Hong, and B.-H. Jeon (2013). Cultivation of microalgae species in tertiary municipal wastewater supplemented with CO<sub>2</sub> for nutrient removal and biomass production. Ecol. Eng. 58: 142-148.
- Jitha.G and Madhu G (2016). Cultivation of *oscillatoria* sp in dairy Waste water in two stage photo Bioreactors for biodiesel production. Civil Engineering and Urban Planning: An International Journal (CiVEJ), 3(2).
- Juneja Ankita, Ruben Michael Ceballos and Ganti S. Murthy (2013). Effects of Environmental Factors and Nutrient Availability on the Biochemical Composition of Algae for Biofuels Production: A Review. Energies 6:4607-4638.
- Junior, A. M. M., Neto, E.B., Koenig, M. L. Eskinazi Leça, E. (2007). Chemical Composition of Three Microalgae Species for Possible Use in Mariculture. Braz. arch boil technol. 50 (3): 461- 467.
- Kalita, N., Baruah, G., Goswami, R.C.D., Talukdar, J., Kalita, M.C., (2011). *Ankistrodesmus falcatus*: a promising candidate for lipid production, its biochemical analysis and strategies to enhance lipid productivity. J. Microbiol. Biotechnol. Res. 1:148–157.
- Kalpesh, K.S., Holger, S., Peer, M.S., (2012). High lipid induction in microalgae for biodiesel production. Energies 5:1532–1553.
- Kanchana S., J. Jeyanthi, R. Kathiravan, K. Suganya (2014). Biosorption of heavy metals using algae: a review, Int. J. Pharma Bio Sci., 3: 1-9.

- Kayil Veedu Ajayan, Muthusamy Selvaraju, Pachikaran Unnikannan, and Palliyath Sruthi (2015). Phycoremediation of Tannery Wastewater Using Microalgae *Scenedesmus* Species. *International Journal of Phytoremediation*, 17: 907–916.
- Kenanga Sari, Tri Retnaningsih Soeprbowati, Riche Hariyati (2014). Phycoremediation of waste water from a plastic manufacturing industry with *Chlorella pyrenoidosa* H. Chick in laboratory study; *Waste Tech.*, 2(1):13-16.
- Khaton Helena, Norazira Abdu Rahman, Sanjoy Banerjee, Nazurah Harun, Siti Suhada Suleiman, Nur Hazwani Zakaria, Fathurrahman Lananan, Siti Hajar Abdul Hamid, Azizah Endut (2014). Effects of different salinities and pH on the growth and proximate composition of *Nannochloropsis* sp. and *Tetraselmis* sp. isolated from South China Sea cultured under control and natural condition. *International Biodeterioration & Biodegradation* 95:11-18.
- Khalil Zeinab I., Mohsen M. S. Asker, Salwa El-Sayed, Imam A. Kobbia (2010). Effect of pH on growth and biochemical responses of *Dunaliella Bardawil* and *Chlorella ellipsoidea*. *World J Microbiol Biotechnol*, 26:1225–1231.
- Khozin-Goldberg, I., Cohen, Z., (2006). The effect of phosphate starvation on the lipid and fatty acid composition of the fresh water eustigmatophyte *Monodus subterraneus*. *Phytochemistry* 67,696–701.
- Kilham, S., Kreeger, D., Goulden, C., Lynn, S., (1997). Effects of nutrient limitation on biochemical constituents of *Ankistrodesmus falcatus*. *Fresh Water Biol.* 38:591–596.
- Kim Ga-Yeong, Yeo-Myeong Yun, Hang-Sik Shin, Hee-Sik Kim, Jong-In Han (2015). *Scenedesmus*-based treatment of nitrogen and phosphorus from effluent of anaerobic digester and bio-oil production. *Bioresource Technology* 196:235–240.
- Kim, H.C., Choi, W.J., Chae, A.N., Park, J., Kim, H.J., Song, K.G., (2016). Evaluating integrated strategies for robust treatment of high saline piggery wastewater. *Water Res.* 89:222–231.
- Kimura M (1980). A simple method for estimating evolutionary rate of base substitutions through comparative studies of nucleotide sequences. *Journal of Molecular Evolution*, 16:111-120.
- Kirroliaa, A., Bishnoia, R.N., Singh, N. (2011). Salinity as a factor affecting the physiological and biochemical traits of *Scenedesmus quadricauda*. *J. Algal Biomass Utln.* 2:28–34.
- Kole, C. Phullara Kole, K Manoj Randunu, Poonam Choudhary, Ramakrishna Podila, Pu Chun Ke, Apparao M Rao and Richard K Marcus (2013). Nanobiotechnology can boost crop production and quality: first evidence from increased plant biomass, fruit yield and phytomedicine content in bitter melon (*Momordica charantia*). *BMC Biotechnology.* 13(1):37

- Kong QX, Li L, Martinez B, Chen P, Ruan R (2010). Culture of microalgae *Chlamydomonas reinhardtii* in wastewater for biomass feedstock production. *Appl Biochem Biotechnol*, 160:9–18.
- Komolafe O., S.B. Velasquez Orta, I. Monje-Ramirez, I.Y. Noguez, A.P. Harvey, M.T. Orta Ledesma (2014). Biodiesel production from indigenous microalgae grown in wastewater, *Bioresour. Technol.*, 154 297–304.
- Koreivienė J., R. Valčiukas, J. Karosienė, P. Baltrėnas (2014). Testing of *Chlorella*/*Scenedesmus* microalgae consortia for remediation of wastewater, CO<sub>2</sub> mitigation and algae biomass feasibility for lipid production. *J. Environ. Eng. Landsc. Manag.* 22:105–114.
- Kothari Richa, Ravindra Prasad, Virendra Kumar, D.P. Singh (2013). Production of biodiesel from microalgae *Chlamydomonas polypyrenoideum* grown on dairy industry wastewater; *Bioresource Technology* 144:499–503.
- Kothari R, Pathak VV, Kumar V, Singh DP (2012). Experimental study for growth potential of unicellular alga *Chlorella phrenoidosa* on dairy wastewater: an integrated approach for treatment and biofuel production. *Biores Technol* 116:466–470.
- Kumar RM. (2003). Financing of wastewater Treatment Projects. Infrastructure Development Finance Corporation and Confederation of Indian Industries. Water Summit, Hyderabad, 4–5 December.
- Kumar, M.S., Zhihong, H.M., Sandy, K.W., (2010). Influence of nutrient loads, feeding frequency and inoculum source on growth of *Chlorella vulgaris* in digested piggery effluent culture medium. *Bioresource Technology* 101:60120-6018
- Kumar S., Stecher G., and Tamura K. (2016). MEGA7: molecular Evolutionary genetics analysis Version 7.0 for bigger datasets. *Molecular Biology and evolution* 33: 1870 – 1874.
- Lamaia C., Kruatrachuea M., Pokethitiyooka P., Upathamb E. S. and Soonthornsarathoola, V. (2005). Toxicity and accumulation of lead and cadmium in the filamentous green alga *Cladophora fracta*: A laboratory study. *Sci. Asia.* 31: 121-127.
- Lardon, L., Helias, A., Sialve, B., Steyer, J.P., Bernard, O., (2009). Life cycle assessment biodiesel production from microalgae. *Environmental Science and Technology*, 43:6475-6481.
- Larsdotter, K. (2006). Wastewater treatment with microalgae – A Literature Review. *Vatten*, 31-38.
- Lau, P.S., Tam, N.F.Y., Wong, Y.S., (1995). Effect of algal density on nutrient removal from primary settled wastewater. *Environ. Pollut.* 89:59–66.



- Laurens, L. M. L., and Wolfrum, E. J. (2011). Feasibility of spectroscopic characterization of algal lipids: Chemometric correlation of NIR and FTIR spectra with exogenous lipids in algal biomass. *Bioenergy Res.*, 4:22–35.
- Lee C. S., S.-A. Lee, S.-R. Ko, H.-M. Oh, and C.-Y. Ahn (2015). Effects of photoperiod on nutrient removal, biomass production, and algal-bacterial population dynamics in lab-scale photobioreactors treating municipal wastewater. *Water Res.*, 68:680-691
- Liang Y, Sarkany N, Cui Y (2009). Biomass and lipid productivities of *Chlorella vulgaris* under autotrophic, heterotrophic and mixotrophic growth conditions. *Biotechnology letters* 31(7): 1043-1049.
- Liang Q., W. Renjun, Z. Peng, C. Ruinan, Z. Wenli, T. Liuqing, and T. Xuexi (2014). Interaction between *Chlorella vulgaris* and bacteria: interference and resource competition, *Acta Oceanol. Sin.*, 33:135-140.
- Liang Z., Y. Liu, F. Ge, Y. Xu, N. Tao, F. Peng, M. Wong (2013). Efficiency assessment and pH effect in removing nitrogen and phosphorus by algae-bacteria combined system of *Chlorella vulgaris* and *Bacillus licheniformis*. *Chemosphere* 92:1383–1389
- Li, J. and J.Z. Zhang (2009). Optical properties and applications of hybrid semiconductor nanomaterials. *Coord. Chem. Rev.*, 253: 3015-3041.
- Li SC (2003). Effects of low phosphate stress on plant photosynthesis and respiration. *J Shihezi University* 7:157–160.
- Li Y, Chen YF, Chen P, Min M, Zhou W, Martinez B (2011). Characterization of a microalga *Chlorella* sp. well adapted to highly concentrated municipal wastewater for nutrient removal and biodiesel production. *Bioresour Technol*, 102:5138–44.
- Li, Yecong, Chen, Yi-Feng, Chen, Paul, Min, Min, Zhou, Wenguang, Martinez, Blanca, Zhu, Jun, Ruan, Roger, (2011). Characterization of a microalga *Chlorella* sp. Well adapted to highly concentrate municipal wastewater for nutrient removal and biodiesel production. *Bioresource Technology* 102, 5138-5144.
- Li, X.; Hu, H.Y.; Gan, K.; Sun, Y.X (2010). Effects of different nitrogen and phosphorus concentrations on the growth, nutrient uptake, and lipid accumulation of a freshwater microalga *Scenedesmus* sp. *Bioresour. Technol.*, 101:5494–5500.
- Lim Sing-Lai, Wan-Loy Chu, Siew-Moi Phang (2010). Use of *Chlorella vulgaris* for bioremediation of textile wastewater; *Bioresource Technology* 101:7314–7322.
- Liu J (2014). Optimisation of biomass and lipid production by adjusting the interspecific competition mode of *Dunaliella salina* and *Nannochloropsis gaditana* in mixed culture. *J Appl Phycol.*, 26:163–171.

- Liu, L., Hawkins, D.M., Ghosh, S. and Young, S.S. (2003). Robust singular value decomposition analysis of microarray data. *Proc. Natl. Acad. Sci. U. S. A.*, 100:13167-13172.
- Liu, W., Au, D.W.T., Anderson, D.M., Lam, P.K.S., Wu, R.S.S., (2007). Effects of nutrients, salinity, pH and light:dark cycle on the production of reactive oxygen species in the algae *Chattonella marina*. *J. Exp. Mar. Biol. Ecol.* 346:76-86
- Lomenech, C., Simoni, E., Drot, R., Ehrhardt, J.-J., & Mielczarski, J. (2003). Sorption of uranium (VI) species on zircon: Structural investigation of the solid/solution interface, *Journal of Colloid and Interface Science*, 261:221–232.
- Lowry, O. H., N.J. Rosebrough, A. L. Farr and R.J. Randall (1951). Protein Measurement with Folin – phenol reagent. *J. Biol. Chem.* 193: 265 - 275.
- M.A. Legodi, D. de Waal, J.H. Potgieter, and S.S. Potgieter (2001). Rapid determination of CaCO<sub>3</sub> in mixtures utilising FT—IR spectroscopy *Mineral Eng.* 14(9):1107-1111.
- Mahapatra DM, Chanakya H, Ramachandra T (2013). *Euglena sp.* as a suitable source of lipids for potential use as biofuel and sustainable wastewater treatment. *J Appl Phycol*; 25:855–65.
- Malla Fayaz A., Shakeel A. Khan, Rashmi, Gulshan K. Sharma, Navindu Gupta, Abraham (2015). Phycoremediation potential of *Chlorella minutissima* on primary and tertiary treated wastewater for nutrient removal and biodiesel production. *Ecological Engineering* 75:343–349.
- Mallick N (2002). Biotechnological potential of immobilized algae for wastewater N, P and metal removal: a review. *Biometals*, 15:377–390.
- Mandalam Ramkumar K., Bernhard. Palsson (1998). Elemental Balancing of Biomass and Medium Composition Enhances Growth Capacity in High-Density *Chlorella vulgaris* Cultures. *Biotechnology And Bioengineering* 59 (5).
- Manke A., Wang L. & Rojanasakul Y. (2013). Mechanisms of nanoparticle-induced oxidative stress and toxicity. *BioMed research international*.
- Markou, G., Chatzipavlidis, I., and Georgakakis, D. (2012). Carbohydrates production and bio-flocculation characteristics in cultures of *Arthrospira (Spirulina) platensis*: improvements through phosphorus limitation process. *Bioenerg. Res.* 5:915–925.
- Martinez ME, Jimenez JM, El Yousfi F. (1999). Influence of phosphorus concentration and temperature on growth and phosphorus uptake by the microalga *Scenedesmus obliquus*. *Bioresour Technol* 67: 233–240.
- Martinez, M.E., Sanchez, S., Jimenez, J.M., El Yousfi, F., Munoz, L., (2000). Nitrogen and phosphorus removal from urban wastewater by the microalga *Scenedesmus obliquus*. *Bioresour. Technol.*, 73 (3):263–272

- Masojidek J, Prasil O (2010). The development of microalgal biotechnology in the Czech Republic. *J Ind Microbiol Biotechnol*, 37:1307–1317.
- Mata Teresa M., António A.Martins, Nidia. S.Caetano (2010). Microalgae for biodiesel production and other applications: A review. *Renewable and Sustainable Energy Reviews*. 14 (1): 217-232.
- Matsunaga T, Takeyama H, Nakao T, Yamazawa A (1999). Screening of marine microalgae for bioremediation of cadmium-polluted seawater. *J Biotechnol*; 70:33–8.
- McGinn P.J., K.E. Dickinson, K.C. Park, C.G. Whitney, S.P. Mac Quarrie, F.J. Black, J.-C. Frigon, S.R. Guiot, S.J.B. O'Leary (2012). Assessment of the bioenergy and bioremediation potentials of the microalga *Scenedesmus* sp. AMDD cultivated in municipal wastewater effluent in batch and continuous mode. *Algal Res.*, 1:155–165.
- Mehta SK, Gaur JP (2005). Use of algae for removing heavy metal ions from wastewater: progress and prospects. *Crit Rev Biotechnology* 25: 113–152.;
- Mendes L.B.B., A.B. Vermelho (2013). Allelopathy as a potential strategy to improve microalgae cultivation, *Biotechnol. Biofuels* 6:152–165.
- Min Min, Liang Wang, Yecong Li, Michael J. Mohr, Bing Hu, Wenguang Zhou, Paul Chen, Roger Ruan (2011). Cultivating *Chlorella* sp. in a Pilot-Scale Photobioreactor Using Centrate Wastewater for Microalgae Biomass Production and Wastewater Nutrient Removal *Appl Biochem Biotechnol*, 165:123–137
- Mitra D, van Leeuwen (Hans) J, Lamsal B (2012). Heterotrophic/mixotrophic cultivation of oleaginous *Chlorella vulgaris* on industrial co-products. *Algal Res*, 1(1):40–48
- Mouget J.-L., A. Dakhama, M. C. Lavoie, and J. Noue (1995). Algal growth enhancement by bacteria: Is consumption of photosynthetic oxygen involved? *FEMS Microbiol. Ecol.*, 18:35-43.
- Monteiro, C.M., Castro, P.M.L., Malcata, F.X., (2011a). Microalga-mediated bioremediation of heavy metal-contaminated surface waters. In: Khan., M.S., Zaidi, A., Goel, R., Musarrat, J. (Eds.), *Biomanagement of Metal-Contaminated Soils: Environmental Pollution*. Springer, Netherlands, pp. 365–385.
- Monteiro, C.M., Castro, P.M.L., Malcata, F.X., (2012). Metal uptake by microalgae: underlying mechanisms and practical applications. *Biotechnol. Prog.* 28 (2), 299–311.
- Moradi M, Ismail AM (2007). Responses of photosynthesis, chlorophyll fluorescence and ROS-Scavenging systems to salt stress. During seedling and reproductive stages of Rice *Ann Botany* 99:1161– 1173.

- Munoz R, Guieysse B (2006). Algal bacterial processes for the treatment of hazardous contaminants: a review. *Water Res* 40(15):2799–2815
- Murdock JN, Wetzel DL (2009). FT-IR micro spectroscopy enhances biological and ecological analysis of algae. *Appl Spectrosc Rev* 44:335–361
- Nayak Manoranjan, Swagat S. Rath, Manikkannan Thirunavoukkarasu, Prasanna K. Panda, Barada K. Mishra, and Rama C. Mohanty (2013). Maximizing Biomass Productivity and CO<sub>2</sub> Biofixation of Microalga, *Scenedesmus* sp. by Using Sodium Hydroxide. *J. Microbiol. Biotechnol*, 23 (9): 1260–1268.
- Nayak Manoranjan, Manikkannan Thirunavoukkarasu, and Rama C. Mohanty (2016). Cultivation of freshwater microalga *Scenedesmus* sp. using a low-cost inorganic fertilizer for enhanced biomass and lipid yield; *J. Gen. Appl. Microbiol.*, 62:7–13.
- Novoveská L., A.K.M. Zapata, J.B. Zabolotney, M.C. Atwood, E.R. Sundstrom (2016). Optimizing microalgae cultivation and wastewater treatment in large-scale offshore photobioreactors, *Algal Res.* 18:86–94.
- Nyquist RA, Kagel RO (1971). *Infrared spectra of inorganic materials*. New York and London: Academic Press.
- Ogbonna J C, Yoshizawa H and Tanaka H. (2000). Treatment of high strength organic wastewater by a mixed culture of photosynthetic microorganisms. *J. Appl. Phycol.* 12: 277-284.
- Olguin, E.J., (2003). Phycoremediation: key issues for cost-effective nutrient removal processes. *Biotechnol. Advances.* 22 (1–2):81–91.
- Olguin EJ, Sanchez-Galvan G (2012). Heavy metal removal in phytofiltration and phycoremediation: the need to differentiate between bio adsorption and bioaccumulation. *New Biotechnol*, 30(1):3–8
- Ouyang Huiling, Kong Xiangzhen, He Wei, Qin Ning, He Qishuang, Wang Yan, Wang Rong & XU FuLiu (2012). Effects of five heavy metals at sub-lethal concentrations on the growth and photosynthesis of *Chlorella vulgaris*. *Chin Sci Bull* September, 57:25
- Ozmen, M., K. Can, G. Arslan, A. Tor, Y. Cengeloglu and M. Ersoz (2010). Adsorption of Cu (II) from aqueous solution by using modified Fe<sub>3</sub>O<sub>4</sub> magnetic nanoparticles. *Desalination*, 254: 162-169.
- Paerl, H.W. (1996). A comparison of cyanobacterial bloom dynamics in freshwater, estuarine and marine environments. *Phycologia.* 35:25-35.
- Pancha Imran, Kaumeel Chokshi, Rahul Kumar Maurya, Khanjan Trivedi, Shailesh Kumar Patidar, Arup Ghosh, Sandhya Mishra (2015). Salinity induced oxidative stress

enhanced biofuel production potential of microalgae *Scenedesmus* sp. CCNM 1077. *Bioresource Technology* 189 341–348.

Paran Gani, Norshuhaila Mohamed Sunar, Hazel Matias-Peralta and Ab Aziz Abdul Latiff (2016). Application of phycoremediation technology in the Treatment of food processing wastewater by Freshwater microalgae *Botryococcus* SP. *Journal of Engineering and Applied Sciences*, 11(11):7288-7292.

Park Y., K.-W. Je, K. Lee, S.-E. Jung, and T.-J. Choi (2007). Growth promotion of *Chlorella ellipsoidea* by co-inoculation with *Brevundimonas* sp. isolated from the microalga. *Hydrobiologia*, 598:219-228.

Park J., R. Craggs (2011). Algal production in wastewater treatment high rate algal ponds for potential biofuel use, *Water Sci. Technol.* 63:2403–2410.

Patel R. and Kiran R patel (2006). *Experimental microbiology*. 1: 95-101.

Patil, P. D., Gude, V. G., Mannarswamy, A., Deng, S., Cooke, P., Munson-McGee, S., Rhodes, I., Lammers, P., and Nirmalakhandan, N. (2010). Optimization of direct conversion of wet algae to biodiesel under supercritical methanol conditions. *Bioresour. Technol.* 102:118–122.

Pathak Vinayak V., Richa Kothari, A.K. Chopra, D.P. Singh (2015). Experimental and kinetic studies for phycoremediation and dye removal by *Chlorella pyrenoidosa* from textile wastewater; *Journal of Environmental Management* 163:270-277.

Pathak V. V., D. P. Singh, R. Kothari and A. K. Chopra (2014). Phycoremediation of textile wastewater by unicellular microalga *Chlorella pyrenoidosa*; *Cell. Mol. Biol.*, 60 (5): 35-40.

Pena-Castro JM, Martinez-Jeronimo F, Esparza-Garcia F, Canizares Villanueva RO (2004). Heavy metals removal by the microalga *Scenedesmus* in *crassatulus* in continuous cultures. *Biores Technol* 94(2):219–222.

Pisal Dipak S and S S Lele (2005). Carotenoid production from microalgae, *Dunaliella salina*. *Indian journal of biotechnology*. 4:476-483.

Pittman J. K., A. P. Dean, and O. Osundeko (2011). The potential of sustainable algal biofuel production using wastewater resources. *Bioresource Technology*. 102(1): 7–25.

P. Rajasulochana, V. Preethy (2016). Comparison on efficiency of various techniques in treatment of waste and sewage water – A comprehensive review. *Resource-Efficient Technologies*, 2:175–184.

Pradeep U. Verma, Anshita R. Purohit, Naimesh J.Patel (2012). Pollution status of chandolia Lake located in Ahmedabad – Gujarat. *International journal of engineering research and its applications*, 2(4):1600-1606.

- Prajapati SK, Kaushik P, Malik A, Vijay VK (2013). Phycoremediation coupled production of algal biomass, harvesting and anaerobic digestion: possibilities and challenges. *Biotechnol Adv* 31(8): 1408–1425.
- Prajapati, S.K., Kaushik, P., Malik, A., Vijay, V.K., (2013b). Phycoremediation and biogas potential of native algal isolates from soil and wastewater. *Bioresour. Technol.* 135:232-238.
- Prandini, J.M., da Silva, M.L., Mezzari, M.P., Pirolli, M., Michelon, W., Soares, H.M., (2016). Enhancement of nutrient removal from swine wastewater digestate coupled to biogas purification by microalgae *Scenedesmus* spp. *Bioresour. Technol.*, 202:67–75.
- Průbyl, P., Cepák, V., and Zachleder, V. (2012). Production of lipids in 10 strains of *Chlorella* and *Parachlorella*, and enhanced lipid productivity in *Chlorella vulgaris*. *Appl. Microbiol. Biotechnol.* 94:549–561. doi: 10.1007/s00253-012-3915-5,
- Qin L., Z. Wang, Y. Sun, Q. Shu, P. Feng, L. Zhu, J. Xu, Z. Yuan (2016). Microalgae consortia cultivation in dairy wastewater to improve the potential of nutrient removal and biodiesel feedstock production. *Environ. Sci. Pollut., Res.* 1-9.
- Qureshimatva UM, Maurya RR, Gamit SB, Patel RD and Solanki HA (2015). Determination of Physico-Chemical Parameters and Water Quality Index (Wqi) of Chandlodia Lake, Ahmedabad, Gujarat, India; *J Environ Anal Toxicol*, 5(4)1-6.
- Rajamani S, Siripornadulsil S, Falcao V, Torres M, Colepicolo P, Sayre R. (2007). Phycoremediation of heavy metals using transgenic microalgae. *Adv Exp Med Biol.* 616: 99–109.
- Ramachandra T, Durga Madhab M, Shilpi S, Joshi N (2013). Algal biofuel from urban wastewater in India: scope and challenges. *Renew Sustain Energy Rev*, 21:767–77
- Ramanan R, Kannan K, Deshkar A, Yadav R, Chakrabarti T (2010). Enhanced algal CO<sub>2</sub> sequestration through calcite deposition by *Chlorella* sp. and *Spirulina platensis* in a mini-raceway pond. *Bioresour Technol*, 101(8):2616–2622.
- Ramanujam Kalimuthan, Mahalingam Sundrarajan (2014). Antibacterial effects of biosynthesized MgO nanoparticles using ethanolic fruit extract of *Embllica officinalis*. *Journal of Photochemistry and Photobiology B: Biology* 141:296–300.
- Randrianarison Gilbert & Muhammad Aqeel Ashraf (2017). Microalgae: a potential plant for energy production, *Geology, Ecology, and Landscapes*, 1(2):104-120.
- Raouf N. Abdel-, A.A. Al-Homaidan, I.B.M. Ibrahim (2012). Microalgae and wastewater treatment. *Saudi Journal of Biological Sciences.* 19: 257–275
- Rawat I, Ranjith Kumar R, Mutanda T, Bux F (2011). Dual role of microalgae: phycoremediation of domestic wastewater and biomass production for sustainable biofuels production. *Appl Energy* 88: 3411–3424.

- Reda Min-Kyu Ji, A.I. Abou-Shanab, Seong-Heon Kim, El-Sayed Salama, Sang-Hun Lee, Akhil N. Kabra, Youn-Suk Lee, Sungwoo Hong, Byong-Hun Jeon 2013. Cultivation of microalgae species in tertiary municipal wastewater supplemented with CO<sub>2</sub> for nutrient removal and biomass production. *Ecological Engineering* 58: 142– 148.
- Renuka N., A. Sood, S.K. Ratha, R. Prasanna, A.S. Ahluwalia (2013). Evaluation of microalgal consortia for treatment of primary treated sewage effluent and biomass production, *J. Appl. Phycol.* 25:1529–1537.
- Richmond, A. (1986). Cell response to environmental factors, in: Richmond A. (Ed.), *Handbook of Microalgal Mass Culture*, CRC Press, Florida pp. 89–95.
- Riquelme C. E. (1988). Interaction between Microalgae and Bacteria in Coastal Seawater. PhD Dissertation, Kyoto University, Japan.
- Roopnarain A. V.M. Gray, S.D. Sym (2014). Phosphorus limitation and starvation effects on cell growth and lipid accumulation in *Isochrysis galbana* U4 for biodiesel production. *Bioresource Technology* 156:408–411.
- Rosenberg JN, Mathias A, Korth K, Betenbaugh MJ, Oyler GA (2011). Microalgal biomass production and carbon dioxide sequestration from an integrated ethanol biorefinery in Iowa: a technical appraisal and economic feasibility evaluation. *Biomass Bioenerg* 35(9):3865–3876.
- Rout, G. R. and Das, P. (2003). Effect of metal toxicity on plant growth and metabolism. I. Zinc. *Agronomy*. 23: 3–11.
- Ruangsomboon Suneerat (2012). Effect of light, nutrient, cultivation time and salinity on lipid production of newly isolated strain of the green microalga, *Botryococcus braunii* KMITL 2. *Bioresource Technology* 109:261–265.
- Ruiz-Marin, A., Mendoza-Espinosa, L.G., Stephenson, T., (2010). Growth and nutrient removal in free and immobilized green algae in batch and semi-continuous cultures treating real wastewater. *Bioresour. Technol.* 101:58–64.
- Saitou N & Nei M (1987). The neighbor-joining method: A new method for reconstructing phylogenetic trees. *Molecular Biology and Evolution*, 4:406-425.
- Sanaa Shanab, Ashraf Essa and Emad Shalaby (2012). Bio removal capacity of three heavy metals by some microalgae species (Egyptian Isolates). *Plant Signaling & Behavior* 7(3):1–8.
- Sandalio L.M., Dalurzo H. C., Gómez M., Romero-Puertas M. C. and Del Rio L. A. (2001). Cadmium-induced changes in the growth and oxidative metabolism of pea plants. *J. Exp. Bot.* 52: 2115–2126
- Salama ES, Kim CH, Reda AI, Shanab A, Kyu JM, Kwan OK, Seong HK, Byong HJ (2013). Biomass, lipid content, and fatty acid composition of freshwater *Chlamydomonas*

Mexicana and *Scenedesmus obliquus* grown under salt stress. *Bioprocess Biosyst Eng*, 36:827– 833.

Sayegh, F.A.Q., Montagnes, D.J.S. (2011). Temperature shifts induce intraspecific variation in microalgal production and biochemical composition. *Bioresour Technol*. 102: 3007-3013.

Sbihi, K., Cherifi, O., El Gharmali, A., Oudra, B., Aziz, F., (2012). Accumulation and toxicological effects of cadmium, copper and zinc on the growth and photosynthesis of the freshwater diatom *Planorhynchium lanceolatum* (Brébisson) Lange-Bertalot: A laboratory study. *J. Mater. Environ. Sci.* 3 (3):497–506.

Shin Dong Yun, Hyun Uk Cho, Joseph Christian Utomo, Yun-Nam Choi, Xu Xu, Jong Moon Park (2015). Biodiesel production from *Scenedesmus bijuga* grown in anaerobically digested food wastewater effluent, *Bioresource Technology* 184:215–221.

Sridhara Chary, N., Kamala, C.T., Samuel Suman Raj, D., 2008. Assessing risk of heavy metals from consuming food grown on sewage irrigated soils and food chain transfer. *Ecotoxicol. Environ. Saf.* 69 (3), 513-524

Silambarasan T., M. Vikramathithan, R. Dhandapani, D.J. Mukesh kumar, and P.T. Kalaichelvan (2012). Biological treatment of dairy effluent by microalgae; *World Journal of Science and Technology*, 2(7):132-134.

Silva-Benavides A.M., G. Torzillo (2012). Nitrogen and phosphorus removal through laboratory batch cultures of microalga *Chlorella vulgaris* and cyanobacterium *Planktothrix isothrix* grown as monoalgal and as co-cultures, *J. Appl. Phycol.* 24:267–276.

Singh, G.P., Srivastava, P. (1991). Impact of varied culture conditions on growth and morphology of *Ankistrodesmus fusiformis*. *J I B S.* 70:341-345

Singh, N.K., Dhar, D.W. (2007). Nitrogen and phosphorous scavenging potential in microalgae. *Indian J. Biotechnol.* 6: 52 – 56.

Singare P.U., R.M. Mishra, M.P. Trivedi (2012). Sediment contamination due to toxic heavy metals in Mithi River of Mumbai. *Adv. Anal. Chem.* 2: 14-24.

Solenkova N.V., J.D. Newman, J.S. Berger, G. Thurston, J.S. Hochman, G.A. Lamas (2014). Metal pollutants and cardiovascular disease: mechanisms and consequences of exposure. *Am. Heart J.* 168: 812-822.

S. Mahdavi, M. Jalali, A (2012). Afkhami, Removal of heavy metals from aqueous solutions using Fe<sub>3</sub>O<sub>4</sub>, ZnO, and CuO nanoparticles, *J. Nanopart. Res.* 14:1–18.

Sreekanth D., K. Pooja, Y.Seeta, V. Himabindu, P.Manikya Reddy (2014). Bioremediation of Dairy Wastewater Using Microalgae For The Production Of Biodiesel. *IJSEAT*, 2 (11):783-791.



- Sorokin, C.; Krauss, R.W. (1958). The Effects of light intensity on the growth rates of green algae. *Plant Physiol.* 33: 109–113.
- Sridhara Chary, N., Kamala, C.T., Samuel Suman Raj, D., (2008). Assessing risk of heavy metals from consuming food grown on sewage irrigated soils and food chain transfer. *Ecotoxicol. Environ. Saf.*, 69 (3):513-524.
- Stengel DB, Connan S, Popper ZA (2011) Algal chemodiversity and bioactivity: sources of natural variability and implications. *Biotechnol Adv*, 29:483–501
- Sturm BSM, Lamer SL. (2011). An energy evaluation of coupling nutrient removal from wastewater with algal biomass production. *Applied Energy*; 88:3499–506
- Su, Y., Mennerich, A., Urban, B. (2011). Municipal wastewater treatment and biomass accumulation with a wastewater-born and settleable algal-bacterial culture. *Water Res*, 45(11):3351-3358.
- Su Y., A. Mennerich, B (2012). Urban, Synergistic cooperation between wastewater-born algae and activated sludge for wastewater treatment: influence of algae and sludge inoculation ratios, *Bioresour. Technol.* 105:67–73.
- Subashchandrabose SR, Ramakrishnan B, Megharaj M, Venkateswarlu K, Naidu R (2013). Mixotrophic cyanobacteria and microalgae as distinctive biological agents for organic pollutant degradation. *Environ Int.* 51: 59–72
- Sun Y., A. Mennerich, B (2013). Urban, Coupled nutrient removal and biomass production with mixed algal culture: impact of biotic and abiotic factors, *Bioresour. Technol.*, 118:469–476.
- Sunda, W. (1975). The Relationship between Cupric Ion Activity and the Toxicity of Copper to Phytoplankton. Ph.D. Thesis, Massachusetts Institute of Technology, Cambridge, MA, USA.
- Sweetly J. (2014). Macroalgae as a potentially low-cost biosorbent for heavy metal removal: a review, *Int. J. Pharm. Biol. Arch.*, 5:17–26.
- Sydney E, Da Silva T, Tokarski A, Novak A, De Carvalho J, Woiciechowski A (2011). Screening of microalgae with potential for biodiesel production and nutrient removal from treated domestic sewage. *Appl Energy*, 88 :( 29):1–4.
- Talebi, A.F., Tabatabaei, M., Mohtashami, S.K., Tohidfar, M., Moradi, F., (2013). Comparative salt stress study on intracellular ion concentration in marine and salt-adapted freshwater strains of microalgae. *Not. Sci. Biol.* 5:309–315.
- Talukdar J, Kalita MC, Goswami BC, Hong DD, Das HC (2014). Liquid hydrocarbon production potential of a novel strain of the microalga *Botryococcus braunii*: assessing the reliability of in situ hydrocarbon recovery by wet process solvent. *Energy Fuel* 28(6): 3747–3758.

- Tanabe, Y., Kato, S., Matsuura, H., Watanabe, M.M. (2012). A botryococcus strain with bacterial ectosymbionts grows fast and produces high amount of hydrocarbons. *Procedia Environ. Sci.* 15:22–26.
- Tamura K, Dudley J, Nei M & Kumar S (2007). MEGA4: Molecular Evolutionary Genetics Analysis (MEGA) software version 4.0. *Molecular Biology and Evolution* 24:1596-1599.
- Tamura K., Nei M. and Kumar S. (2004). Prospects for inferring very large phylogenies by using the neighbor-joining method. *Proceedings of the National academy of sciences (USA)* 101: 11030-11035
- Titman, D. 1976. Ecological competition between algae: Experimental confirmation of resource-based competition theory. *Science* 192: 463–465.
- Tomaselli, L. Torzillo, G. Giovanetti, L. Bocci, F. Tredici, M.R. Pusharaj, B. Pupuazzo, T. Balloni, T. and Meterassi, R. (1987). Recent research of *Spirulina* in Itali. *Hydrobiol.*, 151: 79-82.
- Thompson, G.A., (1996). Lipids and membrane function in green algae. *Biochim. Biophys. Acta* 13(02):17–45.
- Toumi, A., Nejmeddine, A. and Hamouri, B. (2000). Heavy metal removal in waste stabilization ponds and high rate ponds. *Water Sci. Technol.*,42, 17–21.
- Toze S. (2006). Reuse of effluent water—benefits and risks. *Agricultural Water Management*.80: 147-159.
- Travieso, L., Benitez, F., Dupeiron, R., (1992). Sewage treatment using immobilized microalgae. *Bioresour. Technol.* 40:183–187
- Trujillo EM, Jeffers TH, Ferguson C, Stevenson HQ (1991). Mathematically modelling the removal of heavy metals from waste water using immobilized biomass. *Environ Sci Tech.* 25: 1559-1565.
- Umerfaruq MQ, Solanki HA (2015). Physico-chemical Parameters of Water in Bibi Lake, Ahmedabad, Gujarat, India. *J Pollut Eff Cont* 3: 134.
- United Nations World Water Development Report, (2003). *Water for People, Water for Life*. UNESCO. [www.unesdoc.unesco.org](http://www.unesdoc.unesco.org)
- Unnithan VV, Unc A, Smith GB (2014). Mini-review: a priori considerations for bacteria–algae interactions in algal biofuel systems receiving municipal wastewaters. *Algal Res*, 4:35–40.
- Vaičiulytė S, Padovani G, Kostkevičienė J, Carozzi P (2014). Batch Growth of *Chlorella Vulgaris* CICALA 896 versus Semi-Continuous Regimen for Enhancing Oil-Rich Biomass Productivity. *Energies* 7(6): 3840-3857.

- Vaishaly A.G., B.B. Mathew, N.B. Krishnamurthy (2015). Health effects caused by metal contaminated ground water. *Int. J. Adv. Sci. Res.* 1:60-64.
- Valderrama LT, Del Campo CM, Rodriguez CM, De-Bashan LE, Bashan Y (2002). Treatment of recalcitrant wastewater from ethanol and citric acid production using the microalga *Chlorella vulgaris* and the macrophyte *Lemnaminuscula*. *Water Res* 36(17):4185–4192
- Valenzuela-Enrique, E. Milla'n-Núñez, R., Núñez-Cebrero, F. (2002). Protein, carbohydrate, lipid and chlorophyll a content in *Isochrysis aff. galbana* (clone T-Iso) cultured with a low cost alternative to the f/2 medium. *Aquacult. Eng.* 25:207-216
- Van Assche, F. and Clijsters, H. (1990). Effects of metals on enzyme activity in plants. *Plant Cell Environ.* 13: 195–206.
- Van Den Hende S., H. Vervaeren, S. Desmet, N. Boon (2011). Bioflocculation of microalgae and bacteria combined with flue gas to improve sewage treatment, *New Biotechnol.* 29:23–31
- Vazquez, D.R., Arredondo, V.B.O., (1991). Halo adaptation of the green alga *Botryococcus braunii* ('A' Race). *Phytochemistry* 30:2919–2925.
- Veeresh M, Veeresh A, Huddar BD, Hosetti BB (2010). Dynamics of industrial waste stabilization pond treatment process. *Environ Monit Assess*, 169:55–65.
- Vieira, R. and Volesky, B. (2000). Biosorption: a solution to pollution? *Int. Microbiol.*, 3:17–24.
- Wang B, Li Y, Wu N, Lan C. (2008). CO<sub>2</sub> bio-mitigation using microalgae. *Applied Microbiology and Biotechnology*, 79(5):707–18
- Wang H, Xiong H, Hui Z, Zeng X (2012). Mixotrophic cultivation of *Chlorella pyrenoidosa* with diluted primary piggy wastewater to produce lipids. *Bioresour Technol*, 104:215–220.
- Wang L, Min M, Li Y, Chen P, Chen Y, Liu Y, Wang Y, Ruan R (2010). Cultivation of green algae *Chlorella* sp. in different wastewaters from municipal wastewater treatment plant. *Appl Biochem Biotechnol*, 162:1174–1186.
- Wang W, Han F, Li Y, Wu Y, Wang J, et al. (2014). Medium screening and optimization for photoautotrophic culture of *Chlorella pyrenoidosa* with high lipid productivity indoors and outdoors. *Bioresource technology* 170: 395-403.
- Wang, L., Min, M., Li, Y., Chen, P., Chen, Y., Liu, Y., Wang, Y., Ruan, R., (2010a). Cultivation of green algae *Chlorella* sp. in different wastewaters from municipal wastewater treatment plant. *Appl. Biochem. Biotechnol.* 9: 009-8866-7.
- Wang, Y., Guo, W., Yen, H.W., Ho, S.H., Lo, Y.C., Cheng, C.L., Ren, N., Chang, J.S. (2015b). Cultivation of *Chlorella vulgaris* JSC-6 with swine wastewater for simultaneous nutrient/COD removal and carbohydrate production. *Bioresource Technol.* 198: 619–625.

- Wang Yue, Shih-Hsin Ho, Chieh-Lun Cheng, Wan-Qian Guo, Dillirani Nagarajan, Nan-Qi Ren, Duu-Jong Lee, Jo-Shu Chang (2016). Perspectives on the feasibility of using microalgae for industrial wastewater treatment. *Bioresource Technology*, 222:485–497.
- Wang, Z., Li, J., Zhao, J. & Xing, B (2011). Toxicity and internalization of CuO nanoparticles to prokaryotic alga *Microcystis aeruginosa* as affected by dissolved organic matter. *Environmental Science & Technology*. 45(14), 6032–6040.
- Wang Yizheng, Jiang Yu, Ping Wang, Siwei Deng, Jiahua Chang, Zongxin Ran (2017). Response of energy microalgae *Chlamydomonas reinhardtii* to nitrogen and phosphorus stress. *Environmental Science and Pollution Research*, doi.org/10.1007/s11356-017-0931-0.
- Warr, S.R.C. Reed, R.H. Chudek, J.A. Foster, R. and Stewart W.D.P. (1985). Osmotic adjustment in *Spirulina platensis*, *Planta*. 163: 424 - 429.
- Water & Sanitation in Urban Gujarat, (2013).
- Wehrheim B, Wettern M. (1994). Biosorption of cadmium, copper and lead by isolated mother cell walls and whole cells of *Chlorella fusca*. *Appl Microbiol Biotech* 41:725-728.
- WHO (2007). Health risks of heavy metals from long-range transboundary air pollution. World Health Organization, WHO Regional Office for Europe, Copenhagen. ISBN 978 92 8907179 6.
- Woertz, I., Feffer, A., Lundquist, T., & Nelson, Y. (2009). Algae grown on dairy and municipal wastewater for simultaneous nutrient removal and lipid production for biofuel feedstock. *J.Environmental Eng.*, 1115–1122.
- World Health Organization Working Group (1986). Health impact of acidic deposition. *Science of the total environment*. 52:157-187.
- World Mapper Project, (2007a). Domestic Water Use Data. <<http://www.worldmapper.org/>>.
- World Mapper Project, (2007b). Industrial Water Use Data. <<http://www.worldmapper.org/>>.
- Wilkie AC, Edmundson SJ, Duncan JG (2011) Indigenous algae for local bioresource production: phycoprospecting. *Energy Sustain Dev*, 15:365–371
- Wilkie A.C., W.W. Mulbry (2002). Recovery of dairy manure nutrients by benthic freshwater algae, *Bioresour. Technol.*, 84:81–91.
- Witoon Thongthai (2011). Characterization of calcium oxide derived from waste eggshell and its application as CO<sub>2</sub> sorbent. *Ceramics International* 37:3291–3298.
- Xiong, J.Q., Kurade, M.B., Abou-Shanab, R.A.I., Ji, M.K., Choi, J., Kim, J.O., Jeon, B.H., (2016). Biodegradation of carbamazepine using freshwater microalgae

*Chlamydomonas mexicana* and *Scenedesmus obliquus* and the determination of its metabolic fate. *Bioresour. Technol.* 205:183–190.

Xin L, Hong-ying H, Ke G, Ying-xue S (2010). Effects of different nitrogen and phosphorus concentrations on the growth, nutrient uptake, and lipid accumulation of a freshwater microalga *Scenedesmus* sp. *Bioresource Technology*, 101:5494–500

Xu, Y.J., Wang, Y., Yang, Y., Zhou, D.D., (2016). The role of starvation in biomass harvesting and lipid accumulation: Co-culture of microalgae-bacteria in synthetic wastewater. *Environ. Prog. Sustainable Energy*, 35 (1):103–109.

Yang, J., Xu, M., Hu, Q., Sommerfeld, M., Chen, Y., (2011). Life-cycle analysis on biodiesel production from microalgae: water footprint and nutrients balance. *Bioresource Technology* 102:159-165

Yates, M.V. and Gerba, C.P. (1997). Microbial considerations in wastewater reclamation and reuse. In *Wastewater reclamation and reuse*, (Ed. T Asano), CRC Press. 1163-1192.

Yie Hua Tan, Mohammad Omar Abdullah, Cirilo Nolasco-Hipolito, Yun Hin Taufiq-Yap (2015). Waste ostrich- and chicken-eggshells as heterogeneous base catalyst for biodiesel production from used cooking oil: Catalyst characterization and biodiesel yield performance; *Applied Energy* 160:58–70.

Y. H. Cheung and M. H. Wong (1981). Properties of animal manures and sewage sludges and their utilization for algal growth, *Agricultural Wastes*, 3(2):109–122.

Yun Hyun-Shik, Hongkyun Lee, Young-Tae Park, Min-Kyu Ji, Akhil N. Kabra, Chung Jeon, Byong-Hun Jeon, Jaeyoung Choi (2014). Isolation of Novel Microalgae from Acid Mine Drainage and Its Potential Application for Biodiesel Production. *Appl Biochem Biotechnol*, 173:2054–2064.

Yuwalee Unpaprom, Sawitree Tipnee, Ramaraj Rameshprabu (2015). Biodiesel from green alga *Scenedesmus acuminatus*; *International Journal of Sustainable and Green Energy*; 4(1-1): 1-6.

Zeraatkar Amin Keyvan, Hossein Ahmadzadeh, Ahmad Farhad Talebi Navid R. Moheiman, Mark P. McHenry (2016). Potential use of algae for heavy metal bioremediation a critical review. *Journal of Environmental Management* 18: 817-831.

Zhang, J., S. Zhai, S. Li, Z. Xiao, Y. Song, Q. An and G. Tian, 2013. Pb(II) removal of Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub>-NH<sub>2</sub> core-shell nanomaterials prepared via a controllable sol-gel process. *Chem. Eng. J.*, 215-216: 461-471.

Zhang, T., Gong, H., Wen, X., Lu, C., (2010). Salt stress induces a decrease in excitation energy transfer from phycobilisomes to photosystem II but an increase to photosystem I in the cyanobacteria *Spirulina platensis*. *J. Plant Physiol.* 167:951–958.

Zhang, Y., Su, H., Zhong, Y., Zhang, C., Shen, Z., Sang, W., Yan, G. & Zhou, X. (2012). The effect of bacterial contamination on the heterotrophic cultivation of *Chlorella*

pyrenoidosa in wastewater from the production of soybean products. *Water Research* 46, 5509 – 5516.

Zhao, B., and Su, Y. (2014). Process effect of microalgal-carbon dioxide fixation and biomass production: a review. *Renew. Sust. Ener. Rev.* 31: 121–132.

Zhou, W., Li, Y., Min, M., Hu, B., Chen, P., Ruan, R. (2011). Local bioprospecting for high-lipid producing microalgal strains to be grown on concentrated municipal wastewater for biofuel production. *Bioresour. Technol.*, 102 (13):6909–6919.

Zhao P, Yu X, Li (2014). Enhancing lipid productivity by co-cultivation of *Chlorella* sp. U4341 and *Monoraphidium* sp. FXY-10. *J Biosci Bioeng.*, 118:72–77.

Zhao Long-Sheng, Kang Li, Qian-Min Wang, Xiao-Yan Song, Hai-Nan Su, Bin-Bin Xie, Xi-Ying Zhang, Feng Huang<sup>1</sup>, Xiu-Lan Chen, Bai-Cheng Zhou, Yu-Zhong Zhang (2017). Nitrogen Starvation Impacts the Photosynthetic Performance of *Porphyridium cruentum* Revealed by Chlorophyll a Fluorescence. *Scientific Reports*, 7:8542.

Zhila NO, Kalacheva GS, Volova TG (2010). Effect of salinity on the biochemical composition of the alga *Botryococcus braunii* Kutz IPPAS H-252. *J Appl Phycol* 23:47–52.

Zhong, L.S., J.S. Hu, H.P. Liang, A.M. Cao, W.G. Song and L.J. Wan (2006). Self-assembled 3D flowerlike iron oxide nanostructures and their application in water treatment. *Adv. Mater.*, 18: 2426-2431.

Zhou W, Chen P, Min M, Ma X, Wang J, Griffith R (2014). Environment enhancing algal biofuel production using wastewaters. *Renew Sustain Energy*, 36:256–69

Zhou W, Min M, Li Y, Hu B, Ma X, Cheng Y, (2012). A hetero-photoautotrophic two-stage cultivation process to improve wastewater nutrient removal and enhance algal lipid accumulation. *Bioresource Technology*, 110:448–55.

Zhou W., Y. Li, M. Min, B. Hu, P. Chen, R. Ruan (2011). Local bioprospecting for high-lipid producing microalgal strains to be grown on concentrated municipal wastewater for biofuel production, *Bioresour. Technol*, 102:6909–6919.

Zhu, L., Wang, Z., Takala, J., Hiltunen, E., Qin, L., Xu, Z., Qin, X., Yuan, Z. (2013b). Scaleup potential of cultivating *Chlorella zofingiensis* in piggy wastewater for biodiesel production. *Bioresource. Technol.* 137, 318–325.

**List of publications**

1. **Shalini Chaudhary**, M.H.Fulekar. Phycoremediation Potential of *Scenedesmus obliquus* on Tertiary Treated CETP Effluent and Lipid Production. International Journal of Advance Engineering and Research Development, 5(2), 2018, 1077-1082, ISSN No. 2348-4470 (**UGC approved – SJIF : 5.71**)
2. Bhawana Pathak, **Shalini Chaudhary** and M. H. Fulekar (2013). Biomass - Resource for Sustainable Development; International Journal of Advancements in Research & Technology, 2(6), ISSN No. 2278-7763 (**IF: 0.48**)
3. **Shalini Chaudhary** and M.H.Fulekar. Comparative assessment of different indigenous strains of *Scenedesmus sp.* for remediation of Tertiary Treated CETP Effluent and Lipid Production. (**Under review**)
4. **Shalini Chaudhary** and M.H.Fulekar. Toxicity and bioaccumulation of three different heavy metals on fresh water microalgal strains. (**Under review**)
5. **Shalini Chaudhary** and M.H.Fulekar. Removal of three different heavy metal by an Algae-bacterium Co-Culture from simulated wastewater at laboratory scale. (**Under review**)
6. **Shalini Chaudhary** and M.H.Fulekar. Potential of microalgae for bioremediation of wastewater and Heavy metal removal. (**Manuscript Submitted**)
7. **Shalini Chaudhary** and M.H.Fulekar. Phycoremediation: Clean and green technology for wastewater treatment and Heavy metal removal. (**Manuscript Submitted**)
8. **Shalini Chaudhary** and M.H.Fulekar. Isolation, Identification and Characterization of fresh water indigenous microalgae from three different Lakes of Ahmedabad, Gujarat. (**Manuscript Submitted**)
9. **Shalini Chaudhary** and M.H.Fulekar. Heavy metal removal by mixed microalgae culture in presence of synthesized Calcium oxide and Magnesium oxide Nanocatalyst. (**Manuscript Submitted**)

## Gene bank submission

---

1. **Shalini Chaudhary** and M.H.Fulekar. *Bacillus sp. strain cb3* 16S ribosomal RNA gene, partial sequence. GenBank: MF540530.1
2. **Shalini Chaudhary** and M.H.Fulekar. *Bacillus sp. strain cb5* 16S ribosomal RNA gene, partial sequence. GenBank: MF540532.1
3. **Shalini Chaudhary** and M.H.Fulekar. *Brevundimonas diminuta strain 7156* 16S ribosomal RNA gene, partial sequence. GenBank: MG430353.1
4. **Shalini Chaudhary** and M.H.Fulekar. *Idiomarina maritima strain cb9* 16S ribosomal RNA gene, partial sequence. GenBank: MF540534.1
5. **Shalini Chaudhary** and M.H.Fulekar. *Micrococcus sp. strain cb4* 16S ribosomal RNA gene, partial sequence. GenBank: MF540531.1
6. **Shalini Chaudhary** and M.H.Fulekar. *Pseudomonas mendocina strain 7155* 16S ribosomal RNA gene, partial sequence. GenBank: MG430352.1
7. **Shalini Chaudhary** and M.H.Fulekar. *Shewanella algae strain cb7* 16S ribosomal RNA gene, partial sequence. GenBank: MF540533.1
8. **Shalini Chaudhary** and M.H.Fulekar. *Sphingomonas sp. strain cb10* 16S ribosomal RNA gene, partial sequence. GenBank: MF540535.1
9. **Shalini Chaudhary** and M.H.Fulekar. Submitted **5 microalgae sequences** in NCBI Gene bank namely: *Scenedesmus rotundus*; *Micractinium reisseri*; *Acutodesmus obliquus strain UTEX 393*; *Acutodesmus obliquus strain KGE30* and *Scenedesmus obliquus* – Accession No. awaited



## List of conferences/seminar/workshops

---

1. **Oral presentation** on “Assessment of Nutrient Removal Efficiency of *Scenedesmus obliquus* from CETP effluent”. 3<sup>rd</sup> International Young Scientist Congress (IYSC 2017), organized by ISCA in collaboration with Mehsana Urban Institute of Science, Ganpat University, Mehsana Gujarat, India, 8-9<sup>th</sup> May 2017.
2. **Oral presentation** on “Phycoremediation of wastewater: Sustainable approach for remediation and biodiesel production”. 6<sup>th</sup> International Science congress (ISC-2016), organized by ISCA in collaboration with Hutatma Rajguru Mahavidyalaya, Rajgurunagar, pune, Maharastra India, 8-9<sup>th</sup> December 2016.
3. **Poster presentation** on “Microalgae: Promising Technology for Carbon sequestration”. National Workshop on Climate Change & Sustainable Development. Organized by SESD, Central University of Gujarat, 15<sup>th</sup>-16<sup>th</sup> March, 2018.
4. **Poster presentation** on “Degradation of organic toxicant during Municipal Solid Waste composting process”. National Seminar “Advances in Environmental science and Technology” organized by SESD, Central University of Gujarat, 25-26 Feb 2014.
5. **Poster presentation** on “Production of algal biofuel: A biotechnological approach”. National Conference on Environment and Sustainable Development organized by SESD, 15-16 March, 2012.
6. Participated in **Workshop** on Scientific Writing *organized* by ISCA in collaboration with Mehsana Urban Institute of Science, Ganpat University, Mehsana Gujarat, India, 8-9<sup>th</sup> May 2017.
7. Participated in **National Symposium** “Advances in Environmental Sciences” organized by School of Environment and Sustainable Development (SESD), Central University of Gujarat, 27 Feb 2015.
8. Participated in **National conference** on Green Chemistry, organized by Gujarat Environment management institute (GEMI), Gandhinagar and institute of research and development, GFSU, Gandhinagar on 23-24<sup>th</sup> September, 2013 at Ahmedabad.
9. Participated in **International Symposium** “Recent advances in cancer research therapeutics to chemoprevention” organized by school of life sciences, Central University of Gujarat, 8-9<sup>th</sup> Feb 2012.