

## Amrik Singh Ahluwalia

Department of Botany, Panjab University  
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### PROFILE

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- *Present Designation*

- Professor**

- Department of Botany

- Panjab University, Chandigarh

- *Nationality*

- Indian**

- *Marital Status*

- Married, with two children**

- *Date of Birth*

- February 2, 1955**

- *Residential Address*

- G-6, Sector 14, Panjab University, Chandigarh 160014**

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### EXPERIENCE

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- *Teaching – 35 years*

- B.Sc. (Hons. School), M.Sc. (Hons. School), M.Phil., Ph.D.**

- *Research – 37 years*

- Coordinator, DRS (UGC)**

**2007-2011**

- Deputy Coordinator, DRS (UGC)**

**2002-2007, 2013-2018**

- Supervision of M.Sc., M.Phil. and Ph.D. Students**

- Own Research**

- *Administrative experience*

- Chairperson (Nov 1, 2011-Oct 31, 2014)**

- Department of Botany

- Panjab University, Chandigarh

- Dean, Students' Welfare (Aug.1, 2011-July 31, 2013)**

- Panjab University, Chandigarh

- Director, Youth Welfare (Oct 30,2011-May 2, 2012)**

- Panjab University, Chandigarh

- Dean, Faculty of Science(Feb 1, 2009-Jan 31, 2012)**

Panjab University, Chandigarh

**Treasurer (2008-2009), Vice President (2009-2012), President (2012-2015)**

Asian Allelopathy Society

People's Republic of China

**President (Aug 2006-Aug 2008)**

Panjab University Teachers' Association (PUTA)

*(elected unanimously for second term)*

**Convener ( Aug 2006-Aug 2007)**

Punjab Federation of University Teachers' Associations (PFUTA)

*(elected unanimously)*

**Member Executive (2009-2012), Vice President(2012-2015)**

Punjab Academy of Sciences

**Coordinator**

Common Entrance Test, CET (2011), (PG-CET) 2014

Panjab University, Chandigarh

**Chief Coordinator (Feb.1,2009-Jan 31,2012)**

Emerging Areas in Science and Technology

**Chairperson (2009-2011)**

Department of Environment and Vocational Studies

Panjab University, Chandigarh

**President (20010-2012)**

Panjab University Environment Society

**Member, Executive Council(2011-12)**

Panjab University Alumni Association

**Member, Executive Council(2012-2015)**

The Indian Fern Society

**Coordinator(2010-2011)**

System Biology and Bioinformatics

Panjab University, Chandigarh

**Coordinator(2009-2011)**

Center for Excellence in Biomedical Sciences

Panjab University, Chandigarh

**Fellow(2006-2008, 2012-2013)**

Panjab University Senate

**Member, Board of Finance(2006-2007)**

Panjab University, Chandigarh

**Warden(1999-2001)**

Boys' Hostel No. 1

Panjab University, Chandigarh

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## AWARDS & ACHIEVEMENTS

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- International Birbal Sahni Birth Centenary Award and Birbal Savitri Sahni Honour, 2015
- Professor Pran Nath Mehra Award, 2012
- Professor Y S R K Sarma Award, 2010
- Fellow, Indian Botanical Society, India
- Fellow, Society of Plant Research, India
- Fellow, The Indian Fern Society, Chandigarh
- Awarded National Merit Scholarship, 1970 – 72
- P. A. U. Merit Scholarship, 1973 – 76
- National Merit/PAU Merit Scholarship, 1976 - 1977)
- CSIR - Junior Research Fellowship, Dec. 1977 to Nov. 1979
- CSIR - Senior Research Fellowship, Dec. 1979 to Jan. 1981
- Awarded prizes for standing first in various courses in B.Sc. (Hons. School) & M.Sc. (Hons. School) examinations.
- Selected to participate in an 11 month International training course on Selected Topics in Modern Biology held at Biological Research Centre, Szeged, Hungary, sponsored by UNESCO, 1984-85.
- Contributed about 450 questions items of different patterns to the question bank of AIU, New Delhi.
- Awarded NCC 'B' & 'C' certificates and attended NCC camps as well.

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## EDUCATION

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*Banaras Hindu University, Varanasi, India*

**Doctor of Philosophy 1981**

*Panjab Agricultural University, Ludhiana*

**Master of Science (Hons. School) 1977**

*Panjab Agricultural University, Ludhiana*

**Bachelor of Science (Hons. School)1976**

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## PROFESSIONAL HISTORY

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<b>Professor</b>	<b>July 1998 to date</b>
Department of Botany Panjab University, Chandigarh	
<b>Reader (Open Selection)</b>	<b>May 1989 – July 1998</b>
Department of Botany Panjab University, Chandigarh	
<b>Lecturer (Senior Scale)</b>	<b>Feb. 1981 – April 1989</b>
Department of Botany Panjab University, Chandigarh	

## PUBLICATIONS

- *Research Papers*  
**Annexure 1.a**
- *Book Chapters*  
**Annexure 1.b**
- *Books Authored/Edited*  
**Annexure 1.c**

## RESEARCH

- *Specialization*  
**Experimental phycology, Algal biofertilizers and biotechnology, Algae in aquaculture, Food and environmental phycology, Allelopathy, Azolla Biology, Carbon Sequestration and biodiesel from microalgae**
- *Referee for Research Journals*
- *Ph.D. students Supervised/Co-supervised - 16*
- *M.Phil./M.Sc. Students supervised - 30*
- *Research Projects (as Principal Investigator/Co-Investigator) - 08*  
**For details, refer Annexure 2**

## ACADEMIC AFFILIATIONS

### **UGC Nominee on SAP committees (1.4.2015-31.3.2020, 1.4.2016 – 31.3.2021)**

- a. Advisory Committee for SAP-DRSIII, Department of Zoology and Aquaculture, A. Nagarjuna University, Nagarjunanagar (AP).( **1.4.2015-31.3.2020**).
- b. Advisory Committee for SAP DRS-1, Department of Environmental Biotechnology, Bharathidasan University, Tiruchirappalli (TN).( **1.4.2016 – 31.3.2021**)

**Member**

State Level Expert Appraisal Committee, Chandigarh, (May 12, 2016 to May 11, 2019),  
Notified in The Gazette of India, New Delhi, May 12, 2016.

**Subject Expert**

Board of Studies in Botanical & Environmental Sciences (PG), Guru Nanak Dev  
University, Amritsar, Punjab, From 1.7.2016 to 30.6.2018.

**Member**

External Expert, Faculty of Life Sciences, Kurukshetra University, Kurukshetra, From  
1.4.2016 to 31.3.2018.

**Chief Editor**

Campus Reporter, Panjab University

**2011-2013**

**Executive Editor**

**2010-2015**

Vegetos-an International Journal

**Executive Member**

**2006 to date**

Indian Society of Phycology

**Member**

**2003 to date**

Editorial Board

P. U. Research Journal (Science)

**Editor**

**2003 - 2005**

Campus Reporter, Panjab University (Science Section)

**Member**

**2001 to date**

P.G. Board of Studies in Botany, P.U. Chandigarh

**Member**

**2000 to date**

Research Degree Committee, P.U. Chandigarh

**Member**

**2001 to date**

Faculty of Science, P.U. Chandigarh

**Member**

**2001 to date**

Academic Council, P.U. Chandigarh

**Coordinator**

**1997 - 2000**

North-India Chapter of Society of Green Vegetation Research, Calcutta

**Nominated Member**

**1993 - 1994**

Executive Board of Phycological Society, India

**Member**

**1985 - 1986**

Editorial Board, Annals of Biology

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## Annexure 1.a

### Research Papers

1. Taak, J. K., Singh, K. P. and A. S. Ahluwalia 2016. To study hydrogeology and wetland-groundwater interactions around Sukhna Wetland, Chandigarh, India. *Hydrology Current Research* 7(2):1-6. (ISSN: 2157-7587 HYCR, an open access journal).
2. Amb, M. K. and **A. S. Ahluwalia** 2016. Allelopathy: Potential Role to Achieve New Milestones in Rice Cultivation. *Rice Science* 23 (4): 165-183.
3. Renuka, N., Prasanna, R., Sood, A., Ahluwalia, A. S., Bansal, R., Babu, S., Singh, R., Shivay, Y. S. And Nain, L. (2016). Exploring the efficacy of wastewater-grown microalgal biomass as a biofertilizer for wheat. *Environmental Science and Pollution Research* 23(7): 6608-6620. (Impact factor 2.83).
4. Renuka, N., Sood, A., Prasanna, R. and **Ahluwalia, A.S.** (2015). Phycoremediation of wastewaters: A synergistic approach using microalgae for bioremediation and biomass generation, *International Journal of Environmental Science and Technology* 12(4):1443-1460 (Impact factor 2.19).
5. Gupta, H, Kohli, R. K. and **Ahluwalia, A. S.** (2015). Mapping consistency in India's climate change position: Dynamics and dilemmas of Science diplomacy. *Ambio* Doi 10.1007/s13280-014-0609-5 ( I F 2.789).
6. Gupta, H., Kohli, R. K., Ahluwalia, A. S. and Pooja Pal 2014. Climate Change and Biodiversity-Analysis of the Policy Framework, *Environment Policy and Law* 44(6):539-544.
7. Jindal, R., Thakur, R. K., Singh, U. B. and **Ahluwalia, A. S.** (2014). Phytoplankton dynamics and water quality of Prashar Lake, Himachal Pradesh, India. *Sustainability of Water Quality and Ecology*. 3-4:101-113. <http://dx.doi.org/10.1016/j.sewage.2014.12.003> (Elsevier).
8. Bhatia, K. K., Puri, S. and **Ahluwalia, A. S.** (2014). Efficacy and safety of Spirulina in biomedical field: Evidence based critical appraisal. *Vegetos*. 27(3): 104-116.
9. **Bansal, S., Kaur, N., Chaudhary, G. R., Mehta, S. K. and Ahluwalia, A. S.** 2014. Physiochemical Properties of New Formulations of 1-Ethyl-3-methylimidazolium Bis(trifluoromethylsulfonyl)imide with Tritons, *Journal of Chemical & Engineering Data*
10. Jindal, R., Thakur, R. K., Singh, U. B., **Ahluwalia, A. S.** (2014). Phytoplankton dynamics and species diversity in a shallow eutrophic, natural mid-altitude lake in Himachal Pradesh (India): role of physicochemical factors. *Chemistry and Ecology*. ISSN: 0275-7540 (Print), ISSN: 1029-0370 (Online). DOI:10.1080/02757540.2013.871267 (Taylor & Francis). (I.F. 1.180)
11. Renuka, N., Sood, A., Prasanna, R. and **Ahluwalia, A.S.** (2014). Influence of seasonal variation in water quality on the microalgal diversity of sewage wastewater. *South African Journal of Botany*. 90: 137-145. (I F 1.409).
12. Pranshuta and **Ahluwalia, A. S.** (2014). Diatoms: Applications in Nanobiotechnology. *Journal Punjab Academy of Sciences* 11-12(1&2):30-34.
13. Sharma, R., Rishi, M. S., **Ahluwalia, A. S.** and Lata, R. (2014). Comparative Change in Landuse/Landcover in the Buffer Zone of Kashlog Limestone Mines, Darlaghat, Himachal Pradesh, India Using Remote Sensing and GIS Tools. *International Journal of Remote Sensing and Geoscience* 3(6):27-30.
14. Amb, M. K. and **Ahluwalia, A. S.** (2014). Role of Phytoplankton in Detecting Climate Change: A Review. *Journal Punjab Academy of Sciences* 11-12(1&2):45-48.
15. Sidhu, M. C. and Ahluwalia, A. S. (2014). Significance of Gurbani for Scientific Progress. *Journal of Sri Guru Granth Sahib Studies* 2(1):106-113.
16. Gupta, H. and **Ahluwalia, A. S.** (2014). Ecosystem based Adaptation to Climate Change: Future Implications. *Journal Punjab Academy of Sciences* 11-12(1&2):73-76.

17. Chaudhary, G. R., Bansal, S., Mehta, S. K. and **Ahluwalia, A. S.** (2014). Thermophysical and Spectroscopic Studies of Pure 1-Butyl-3-methylimidazolium Tetrafluoroborate and Its Aqueous Mixtures. *Journal of Solution Chemistry*. 43 (2): 340-359. (I F 1.128).
18. Singh, H., Khattar, J.I.S. and **Ahluwalia, A.S.** (2014). Cyanobacteria and agricultural crops. *Vegetos-An International Journal of Plant Research*, **27(1)**:37-44.
19. Singh, U. B. and **Ahluwalia, A. S.** (2013). Microalgae: a promising tool for carbon sequestration. *Mitigation and Adaptation Strategies for Global Change*. 18(1): 73-95. ISSN:1381-2386 (print version) ISSN: 1573-1596 (electronic version). (Springer). (I.F. 2.019).
20. Singh, U. B., **Ahluwalia, A. S.**, Jindal, R., Sharma, C. (2013) Water quality assessment of some freshwater bodies supporting vegetation in and around Chandigarh (India), using multivariate statistical methods. *Water Quality, Exposure and Health*. 5(3): 149-161. ISSN: 1876-1658 (print version) ISSN: 1876-1666 (electronic version). (Springer).
21. Thakur, R. K., Jindal, R., Singh, U. B., **Ahluwalia, A. S.** (2013). Plankton diversity and water quality assessment of three freshwater lakes of Mandi (Himachal Pradesh, India) with special reference to planktonic indicators. *Environment Monitoring & Assessment*. 185(10): 8355-8373. ISSN: 0167-6369 (print version) ISSN: 1573-2959 (electronic version). (Springer). (I.F. 1.679)
22. Renuka, N., Sood, A., Ratha, S.K., Prasanna, R. and **Ahluwalia, A.S.** (2013). Evaluation of microalgal consortia for treatment of primary treated sewage effluent and biomass production. *Journal of Applied Phycology*. 25 (5): 1529-1537. (I F 2.411).
23. Singh, H., **Ahluwalia, A. S** and Khattar, J. I. S. (2013). Induction of sporulation by different nitrogen sources in *Anabaena naviculoides*, a diazotrophic strain capable of colonizing paddy field soil of Punjab (India). *Vegetos* 26(1): 283-292. (I.F. 0.04, NAAS 6.2).
24. Singh, U. B., **Ahluwalia, A. S.**, Sharma, C., Jindal, R., Thakur, R. K. (2013). Planktonic indicators: a promising tool for monitoring water quality (early-warning signals). *Ecology, Environment and Conservation*. 19 (3): 793-800. ISSN: 0971-765X. (NAAS 5.02).
25. Singh, U. B., Thakur, R. K., Verma, R. and **Ahluwalia, A.S.** 2013. Nutritional studies of *Chara corallina*. *Recent Research in Science and Technology*. 5(3): 10-14.
26. Singh, H., **Ahluwalia, A. S.** and Khattar, J. I. S. (2013). Induction of sporulation by selected carbon sources in *Anabaena naviculoides*, a diazotrophic strain capable of colonizing paddy field soil of Punjab (India). *Phykos*. 43(2): 18-25.
27. Sharma, C., Jindal, R., Singh, U. B., **Ahluwalia, A. S.** and Thakur, R. K. (2013). Population dynamics and species diversity of plankton in relation to hydrobiological characteristics of river Sutlej, Punjab, India. *Ecology, Environment and Conservation*. 19 (3): 717-724. ISSN: 0971-765X. (NAAS 5.02)
28. Renuka, N., Sood, A., Ratha, S.K., Prasanna, R. and **Ahluwalia, A.S.** (2012). Nutrient sequestration, biomass production by microalgae and phytoremediation of sewage water. *International Journal of Phytoremediation*. 15(8): 789-800. (I F 1.298).
29. Sidhu, M.C., Kaur, K. and **Ahluwalia, A.S.** (2012). Ethno-medicinal studies of plants in Jalandhar District of Punjab, India. *Vegetos*, 25 (2):143-150.
30. Chaudhary, G. R., Bansal, S., Mehta, S. K. and **Ahluwalia, A. S.** (2012). Thermophysical and Spectroscopic studies of room temperature ionic liquid, 1-butyl-3-methylimidazolium hexafluorophosphate in Tritons. *Journal of Chemical Thermodynamics*. 50:63-70. (I F 2.794.)
31. Sood, A., Uniyal, P.L., Prasanna, R. and **Ahluwalia, A.S.** (2012). Phytoremediation Potential of Aquatic Macrophyte, *Azolla*. *Ambio*. 41: 122-137. (I F 1.705).
32. Prashar, I. B., Chandel, V. C. and **Ahluwalia, A. S.** (2012). Influence of culture conditions on mycelia growth and luminescence of *Panellus stipticus* (bull.) P. Karst. *Journal of Research in Biology* 3: 152-159.
33. Sidhu, M.A. and **Ahluwalia, A.S.** (2011). Water quality and Cyanobacterial Diversity in Lower Western Himachal lakes. *Vegetos*. 24(2): 165-170. (I F 0.03).

34. Sidhu, M.C., Kaur, K. and **Ahluwalia, A.S.** (2011). Traditional Plant Remedies in Hoshiarpur District of Punjab, India. *Journal of Phytology*. 3(9): 10-19.
35. Sidhu, M.C., Thakur, S. and **Ahluwalia, A.S.** (2011). Biodiversity of medicinal plants of Panjab University, Chandigarh, India- A Review. *Journal of Biodiversity and Ecological Science* 1(3):213-220.
36. Sidhu, M.C., Kaur, K., Singh, S. and **Ahluwalia, A.S.** (2011). Traditional plant remedies for public health in Nawanshahar district of Punjab. *International Journal of Pharmaceutical Research and Development*. 3(7): 27-34.
37. Singh, H., Khattar, J.I.S. and **Ahluwalia, A.S.** (2011). Cyanobacterial differentiation with special reference to akinetes. *Journal, Punjab Academy of Sciences*, **7-8(1&2)**: 49-58.
38. Sidhu, M.C., Singh, S. and **Ahluwalia, A.S.** (2010). Assessment of medicinal plant remedies among inhabitants of Kapurthala District, Punjab (India). A case study. *Vegetos* 23(1): 167-176. (I F 0.03).
39. Mahajan, A., Neetu and **Ahluwalia, A. S.** (2010). Effect of processing on functional properties of *Spirulina* protein preparations. *African Journal of Microbiological Research*. 4(1): 55-60.
40. Sood, A. and **Ahluwalia, A.S.** (2009). Cyanobacterial- Plant Symbioses with Emphasis on *Azolla- Anabaena* Symbiotic System. *Indian Fern Journal*. 26: 166-178.
41. Krishan, K. Sidhu, M.C., Dutta, J., Bansal, P., Yasothornsrikul, S., Menezes, R.G., Kanchan, T. Wongwilairat, R. and **Ahluwalia, A.S.** (2008). Is decline in stature related to physical activity?- The case of farmers in Punjab State of North India. *Bioscience Hypotheses*. 1: 326-327.
42. Dhingra, R. and **Ahluwalia, A. S.** (2007). Some Chaetophoralean Taxa (Chlorophyta) from Punjab, India. *Pb. Univ. Res.J. (Sci)* 57:161-164.
43. Dhingra, R. and **Ahluwalia, A. S.** (2007). *Cyanostylon* Geitler (Cyanophyta) from Punjab, India. *J. Indian Bot. Soc.* 86(3&4):22-24.
44. Dhingra, R. and **Ahluwalia, A. S.** (2007). Genus *Phormidium* Kutzing ex Gomont (Cyanoprokaryote) from diverse habitats of Punjab. *J Indian Bot. Soc.* 86(3&4):86-94.
45. Dhingra, R. and **Ahluwalia, A. S.** (2007). Cyanobacterial blooms in ponds of Punjab, India. *Vegetos* 20(1): 79-82.
46. Sood, A., **Ahluwalia, A. S.** and Dua, S. (2005). Indicators of phosphorus deficiency in *Azolla pinnata* (Salviniales, Pteridophyta). *Acta Bot. Hung.* **47**:197-205.
47. **Ahluwalia, A.S.** (2004). Cyanobacterial Differentiation. *Pb. Univ. Res.J.(Sci)* **54** : 7-11.
48. Pabby, A., **Ahluwalia, A. S.** and Dua, S. (2002). Response of *Azolla pinnata* and *Azolla microphylla* towards different temperature regimes. *Indian J. Plant Physiol.* **7(2)**: 140-145.
49. Kaur, M., **Ahluwalia, A.S.** and Dahuja, S. (2002). Toxicity of a rice field herbicide in a nitrogen-fixing alga *Cylindrospermum* sp. *J. Environ. Biol.* **23(4)**: 359-363.
50. **Ahluwalia, A.S.**, Kaur, M., and Dahuja, S. (2002). Toxicity of rice field herbicide in some N<sub>2</sub>-fixing algae. *Indian J. Environ. Hlth.* **44(4)**: 298-302.
51. **Ahluwalia, A. S.**, Pabby, A. and Dua, S. (2002). *Azolla*: A green gold mine with diversified applications. *Indian Fern J.* **19**: 1-9.
52. Pabby, A., **Ahluwalia, A. S.**, and Dua, S. (2002). Changes in ammonia assimilating enzymes at elevated temperatures in *Azolla pinnata* R. Br. and *A. microphylla* Kaul." *Indian J. Microbiol.* **42**:315-318.
53. Kaur, M., **Ahluwalia, A. S.** and Chaudhary, S. (2002). Effect of bimetallic combinations of heavy metals on growth and development of a Cyanobacterium, *Anabaena doliolum*. *Phykos* **41**:27-34.
54. Pabby, A., Dua, S. and **Ahluwalia, A.S.** (2001). Changes in ammonia assimilation enzymes in response to different nitrate levels in *Azolla pinnata* and *Azolla microphylla*. *J. Plant Physiol.* **158**: 899-903.



55. Pabby, A., **Ahluwalia, A. S.**, and Dua, S. (2000). Effect of phosphorus deficiency on the metabolic set up of *Azolla microphylla* Kaulfuss. *J. Punjab Acad. Sci.* **2**: 51-55.
56. Pabby, A., Dua, S. and **Ahluwalia, A.S.** (2000). Changes in nitrogen metabolism of *Azolla microphylla* and *A.pinnata* on supplementation of nitrogen fertilizer. *Phykos* **39**: 51-59.
57. **Ahluwalia, A. S.**, and Kaur M. (1998). Effect of manganese on growth and differentiation in a blue-green and a green alga. *Ecol. Environ. Conser.* **4**: 223-227.
58. Kaur, M., Dahuja, S. and **Ahluwalia, A. S.** (1997). Response of diazotrophic cyanobacteria to butachlor. *Phykos* **36**: 93-101.
59. **Ahluwalia, A. S.** (1993). Habitats and distribution (Cyanophyta). *Indian Phycol. Rev.* **2**: 41-58.
60. Dua, S., Kaur, M. and **Ahluwalia, A. S.** (1993). Functional properties of two pollutant grown green algae. *J. Food Sci. Technol.* **30**: 25-28.
61. **Ahluwalia, A. S.**, Dua, S., Walia, H. and Duggal, R. (1993). Cultural and biochemical studies in a free-floating water fern, *Azolla pinnata* R. Brown. *Indian Fern J.* **10**: 98-103.
62. Kaur, M., Dua, S., and **Ahluwalia, A. S.** (1993). Effect of effluents of paper factories on the growth of *Scenedesmus*. *Phykos* **32**: 57-63.
63. **Ahluwalia, A. S.**, Reena, Dahuja, S. (1993). Studies on the role of algalization on growth and yield of rice (*Oryza sativa* Linn). *Res. Bull. Panjab Univ.* **43**: 55-60.
64. **Ahluwalia, A.S.**, and Kaur, M. (1989). Nickel toxicity on growth and heterocyst formation in a N<sub>2</sub>-fixing blue green alga. *Phykos* **28**: 196-200.
65. **Ahluwalia, A. S.**, and Kumar, H. D. (1989). Akinete formation and division in *Anabaena oscillarioides* (Cyanophyta, Nostocales). *Microbios Lett.* **41**: 87-94.
66. **Ahluwalia, A.S.**, Kaur, M. and Dua, S. (1989). Physico-chemical characteristics and effect of some industrial effluents on the growth of green alga *Scenedesmus* sp. *Indian J. Environ. Hlth.* **31**: 112-119.
67. **Ahluwalia, A.S.**, and Kaur, M. (1988). Effect of some heavy metal compounds on growth and differentiation in blue green and a green alga. *Microbios* **53**: 37-45.
68. **Ahluwalia, A. S.** (1988). Influence of saturn and knockweed on the growth and heterocyst formation in a nitrogen fixing blue green alga. *Pesticides* **22**: 43-44.
69. **Ahluwalia, A.S.** (1988). *Cephaleuros* – an important parasitic alga. *Everyman`s Sci.* **23**:134-135.
70. **Ahluwalia, A. S.**, and Paul, R. (1987). Fatty acid composition of a nitrogen fixing blue green alga, *Nostoc ellipsosporum*. *Ann. Biol.* **3**: 56-58.
71. Paul, R., and **Ahluwalia, A. S.** (1986). Biochemical studies during differentiation in two *Anabaena* spp. *Beit. Biol. Pflanzen.* **61**: 327-335.
72. **Ahluwalia, A. S.** (1985). Effect of amino acids and some chemicals on cellular differentiation in nitrogen-fixing blue green alga, *Anabaena oscillarioides*. *Ann. Biol.* **1**: 137-144.
73. **Ahluwalia, A. S.** (1984) . Neeli Harri Kai atay Vayumandal de Nitrogen da Yogikikaran. *Vigyan dey Naksh* **20**: 18-27 (In Punjabi).
74. **Ahluwalia, A. S.** and Kumar, H. D. (1983). Isolation of mucilage forming nitrogen-fixing blue-green alga. *J. Indian Bot. Soc.* **62**: 206-207.
75. Bhattacharya, M., Gaur, J.P., **Ahluwalia, A. S.**, Rai, R. K. and Kumar, H. D. (1983). Effect of exogenous addition of adenosine on some green algae and cyanobacteria. *J. Indian Bot. Soc.* **62**: 334-339.
76. **Ahluwalia, A. S.** and Kumar, H. D. (1982). Akinete differentiation and nitrogenase activity in the Cyanobacterium *Anabaena*. *Biol. Plant.* **24**: 136-141.
77. **Ahluwalia, A. S.** and Kumar, H. D. (1982). Pattern of akinete differentiation and nitrogenase activity in the cyanobacterium *Nostoc*. *Beitr. Biol. Pflanzen.* **57**: 455-467.
78. **Ahluwalia, A. S.**, Rai, R.K., and Kumar, H. D. (1980). Chromatic adaptation and photoreversal in blue-green alga *Calothrix clavata* West. *J. Biosci.* **2**: 63-68.
79. **Ahluwalia, A. S.** and Kumar, H. D. (1980). Akinete germination in the blue-green alga *Nostoc ellipsosporum* (Desm.) Rebenh. Ex. Born et Flah. *Indian J. Exp. Biol.* **18**: 663-664.

80. Tyagi, V.V.S. and **Ahluwalia, A. S.** (1978). Heterocyst formation in the blue-green alga *Anabaena doliolum*, a study of some aspects of photoregulation. *Ann. Bot.* **42**: 1333-1341.

### Annexure 1.b

#### Book Chapters

1. Kumar, S., Kumar, P. and A. S. Ahluwalia 2015. Biofuels: From first to fourth generation. In Proceedings of National Conference on Global Research Initiatives for Sustainable Agriculture and Allied Sciences (GRISASS-2015), December 12-13, 2015. Eds: Singh, S. P. *et al.*, Astha Foundation, Meerut (UP), India. Pp89-93.( ISBN No. 8190 39644-8).
2. Singh, U. B., Singh, B. And Ahluwalia, A. S. (2015). Optical Studies of Nano-extract Obtained from *Spirulina* and its Potential use in Alternative Medicine. In: Singh, B., Kaushik, A., Mehta, S. K. And Tripathi, S. K., Eds., *Nanotechnology: Novel Perspectives and Prospects*, McGraw Hill Education (India) Private Limited, New Delhi. Pp.819-824.
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## Annexure 1.c

### Books Authored/Edited

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4. Prashar, I.B. and Ahluwalia, A.S. 2007 (Eds). *Achievements and Prospects in Pteridophytes*. Bishen Singh Mahendra Pal Singh, Dehradun. P. 161.
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## Annexure 2

### Research

#### Summary of Research Work

- Presented evidences that heterocyst formation is controlled by the availability of photosynthetic products. The correspondence of action spectrum of heterocyst formation with absorption spectrum of photosynthetic pigments supported this finding.
- For the first time it was shown that akinetes of blue-green alga *Anabaena oscillarioides* show division into two daughter akinetes by developing a narrow constriction. This is unique in the sense that these are the perennating structures and their division may be an abnormality or an adaptation to increase the number of perennating reproductive units.
- Pattern formation during akinete differentiation has been recorded in *Nostoc ellipsosporum* and *Anabaena oscillarioides*. The appearance of heterocyst, akinete and nitrogenase activity in these algae has been shown.
- Formation of aseriate packets of cells and their reversion to normal and branched filaments have been shown in *Nostoc ellipsosporum*.
- Indigenous algae are better in establishing themselves in the fields than foreign inoculum and show a better yield thereby supplementing for a part of the urea fertilizer.
- Physico-chemical analysis of proteins from *Spirulina* and some green algae have been studied to find their suitability as food supplement.
- An indiscriminate use of herbicides in rice fields inadvertently would also destroy the precious microflora inhabiting the fields. This microflora is mainly constituted by nitrogen fixing BGA and will substantially cut the yield of the crops growing in these fields.
- It has been difficult to isolate algae forming excessive mucilage during their growth. Our studies have made this easier. Such filaments are kept in dark with light falling from a particular narrow area. The motility of hormogonia towards light area isolated the alga for further culture.
- The presence of heavy metals severely affects the growth of blue-green and green algae thus causing disturbances in the primary food chain. It has been observed that presence of carbon skeleton compounds (acetate; and saccharides) can reduce the metal toxicity, towards these primary producers.
- The change in pigmentation of algae (especially the water-soluble phycobiliproteins) under different light regimes often leads to problems in identification of algae. This change has been found to be regulated by some phytochromes which show red: green reversal pattern as compared to red:far-red system in higher plants (Phytochrome system).
- Role of algae in sewage treatment has been studied. The growth of algal organisms

significantly reduced the biological oxygen demand (BOD) and even colour of the effluents thus leading to amelioration of pollution load.

- Presence of  $\alpha$ -linolenic acid (an essential unsaturated fatty acid) has been found in heterocystous blue-green algae (*Nostoc*) alongwith other fatty acids. Long chain fatty acids have been observed only in akinetes.
- Studies have been undertaken on biology of *Azolla* and *Azolla-Anabaena azollae* symbiosis. The behavior of the water fern and its endobiont has been observed under various growth conditions. Temperature and nutrient status have been found to be critical in their establishment and for the maintenance of their association.
- Some observations have been recorded in the biochemical changes occurring during differentiation of heterocysts and akinetes. This information can help in studies of pattern formation in algae.
- Allelopathic interactions have been studied in rice straw: algal system. It is suggested that since rice straw releases toxic compounds during its degradation and kills the useful algae, this practice needs to be taken care of. Leachates even affected the germination frequency of next crop seeds as has been shown by us through explicit bioassays in the laboratory.
- Treatment of sewage wastewaters through algal consortia from native algal flora and possible use of such biomass as fertilizer.
- Potential of Microalgae for Production of Environmental Friendly Biofuel' is in progress

### Referee for Research Journals

Annals of Biology, Annales Botanici Fennici, Aquatic Botany, Indian Journal of Microbiology, Indian Journal of Plant Physiology, Journal of Applied Bioscience, Journal of Bio based Materials and Bio energy, USA, Journal of Bombay Natural History Society (JBNHS), Journal of Environmental Biology, Journal of Indian Botanical Society, Phycos, Phytomorphology, Panjab University Journal of Science, Vegetos, Current Science, Letters in Applied Microbiology, J. Applied Microbiology, Pesticide Biochemistry and Physiology, J Environmental Management, Biomass & Bioenergy, etc.

### Conferences/Workshops Organized

- Chairperson, Organising Committee of National Conference on, "Current Trends in Plant Sciences with Special Reference to Phycology and Mycology", October 28-29, 2014. Department of Botany, PU, Chandigarh.
- Chairperson, Organising Committee of National Conference on, " Perspectives & Trends in Plant Sciences and Biotechnology", February 21-23, 2014. Department of Botany, PU, Chandigarh.
- 2nd International Conference on Allelopathy, under the aegis of Asian Allelopathy Society, with the theme, Allelopathy: A Multi-faceted Process, December 14-18, 2012, Department of Botany, PU, Chandigarh, as Organizing Secretary.
- Workshop on Microorganisms: Let us Observe and Learn, Supported by Punjab State Council of Science and Technology, Chandigarh, NCSTC, DST, GOI, New Delhi, November 14-16, 2011, Department of Botany, PU, Chandigarh. As Chairperson and Convenor.
- Biotechnica Chandigarh 2010, Panjab University, Chandigarh, November 16-17, 2010, as Chairman of the Organizing committee.

- 13<sup>th</sup> Punjab Science Congress, with the theme Climate Change: Concerns and Solutions, Panjab University, Chandigarh, under the aegis of Punjab Academy of Sciences, February 7-9, 2010, as Organizing Secretary.

#### **Radio Talks/Popular Lectures**

- Invited lecture on “Power of Prayer, DAV College, Chandigarh, September 27, 2014.
- Algal blooms and aquatic life: an interview in Punjabi. AIR, Jalandhar. August 9, 2001.
- Local flora, Ornamental plants and Forests of Punjab. AIR, Jalandhar (In Punjabi). March 19, 2001.
- Chemical communication in plants. AIR, Jalandhar (In Punjabi). November 5, 1999.
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