

CV OF DR. (MRS.) BAVITA ASTHIR

- 1. Name (in block letters)** : Dr. (Mrs.) BAVITA ASTHIR
- 2. Date of birth** : 17.03.1963
- 3. Designation and address** : Sr. Biochemist cum Head,
Department of Biochemistry,
Punjab Agricultural University
Ludhiana, Punjab, INDIA
Email: b.asthir@rediffmail.com

4. Academic Qualifications :

Class	Division	Percentage of marks	University/Board/ Institution	Year of Passing
Ph.D Biochemistry	1 st	75.8 (3.63/4.00)	Punjab Agricultural University Ludhiana, Punjab	1991
M.Sc (Hons) Biochemistry	1 st	68.4 (3.42/4.00)	-do-	1986
B.Sc (Hons) Biochemistry	1 st	66.0 (3.05/4.00)	-do-	1984
Matriculation	1 st	72.6	Punjab School Education Board, Chandigarh	1979

5. Additional qualifications/Training acquired in India and/or Abroad

S.No	Title of the Course:	Duration	Name of the Organising Institution
1.	Academic Staff Commonwealth Fellowship during the year 1999-2000 by the Association of Commonwealth Universities, UK	10 th May 1999 - 9 th Oct 2000	Scottish Agricultural College, Edinburgh, UK
2.	Advance Training in Biological Sciences	25 th June - 25 th July 2001	Deptt. of Biochemistry, COBSH, PAU Ludhiana
3.	German Academic Exchange Service (DAAD) Scholarship under the "Special Programme Integrated Environmental Engineering"	1 st June - 31 st Aug 2004	Lehrstuhl fur Pharmazeutische Biologie, Julius-von-Sachs-Platz 2, Wuerzburg, Germany
4.	DAAD-Project Euro-Indian Week: A new Passage to India	1 st July - 8 th July 2011	Wuerzburg, Germany

6. Job responsibilities of the post held now :

Teaching, Research, Administration and Extension

7. Administrative experience

- Head of the Biochemistry Department, PAU Ludhiana, Punjab, INDIA since 2nd September 2013
- Chairperson research committee and member of budget and extension
- Nominee of DR for the purchase committee at college level
- Dean PG Nominee in the department for session 2007- 2009, 2010-2011 and 2012-13
- Committee member for giving remarks on APR in the department
- Committee member of various selection committee for the post of Assistant Prof, Professor under CAS and JRF/SRF
- Chaired session during International Conference held in Pakistan Feb 2013
- Member of synopsis reviewing committee at college level
- PI of Adhoc projects
- Prepared Brochure for the Department

8. Teaching/research/extension contributions

(A) TEACHING

- Fundamentals of Biochemistry
- Experiments in Biochemistry
- Enzymology
- Plant Biochemistry
- Biochemistry of Biotic and Abiotic Stresses
- Molecular Biochemistry
- Intermediary Metabolism

c) Postgraduate Students Guided:

Status	No. of students guided as Major Advisor		No. of students guided as Advisory committee member	
	M.Sc.	Ph.D	M.Sc.	Ph.D
Completed	12	4	20	7
Continuing	1	4	14	12

Title of thesis completed under direct supervision: **M.Sc. thesis : 12**
Ph.D. thesis : 4

M.Sc Thesis (1998 onwards) : 12	
1. Distribution of protein-subfractions, amino acids, and starch characteristics in wheat genotypes as affected by nitrogen fertilization	Divya Jain
2. Effect of putrescine and high temperature on the antioxidant enzymes in wheat (<i>Triticum aestivum</i> L.)	Rashpal Kumar
3. Role of sulphhydryl compounds in improving thermotolerance in wheat	Radhika Thaper

4. Biochemical and molecular analysis of wheat invertases	Ravneet Kaur
5. Identification of drought tolerance related biochemical indices in a wheat recombinant population	Ankit
6. Studies on carbon and nitrogen metabolism in relation to sink strength under high temperature stress in wheat (<i>Triticum aestivum</i> L.)	Shashi Bala
7. Studies on sucrose and starch metabolism in developing grains of different genotypes of wheat (<i>Triticum aestivum</i> L.) under heat stress conditions	Puneet Kaur Rai
8. Role of polyamines and antioxidant enzymes in stripe rust of wheat (<i>Triticum aestivum</i>) seedlings	Anjali Koundal
9. High temperature tolerance and leaf blight resistance in relation to carbohydrate metabolism in barley seedlings	Sondeep Singh
10. Role of diamine oxidase, polyamine oxidase and polyamines in acquired thermotolerance in wheat	Akashdeep
11. Role of antioxidative enzymes in relation to red rot of sugarcane	Kanwalpreet Kaur
12. A study on carbohydrate metabolism in the developing grains of heat susceptible and tolerant varieties of wheat	Amrinder Kaur
Ph.D Thesis: 4	
1. Biochemical characterization of wheat genotypes with respect to nitrogen use efficiency	Gurpreet Kaur
2. Biochemical evaluation of irrigated flooded transplanted and aerobic rice (<i>Oryza sativa</i> L.)	Maneesha Kumari
3. Comparative studies on heat and drought tolerance mechanisms in wheat using biochemical traits	Shashi Bala
4. Study of grain carbon metabolism in relation to nitrogen use efficiency in wheat	Balraj Kaur

(B) RESEARCH

Mechanisms of grain filling processes under abiotic stresses were studied in wheat and the effects of several exogenously fed metal ions were elucidated in the pathway. Potential role of antioxidants and their enzyme activities were explored in wheat. By manipulating carbon and nitrogen, research with culturing detached ears of wheat, barley and chickpea have clearly shown that sink (seed) carbon metabolism plays a key role in controlling dry matter accumulation and hence grain yield. This innovative culturing technique was employed for the first time in India mimicking *in vivo* grain – filling conditions. The detailed kinetic parameters of peroxidase, superoxide dismutase and invertases and its relevance in heat tolerant genotypes of wheat has been brought out. Using enzymological and histochemical techniques, it was shown that amine oxidases are present in the tissues through which photosynthetic assimilates travel into the grain. The deposition of β 1-3 glucan was identified using confocal laser scanning microscopy and lignin (histochemically) in certain cells of developing wheat grain. Clones covering sequences of invertase genes were obtained by PCR on genomic DNA with reverse and forward primers designated according to data base sequence of invertase. The results obtained will help the breeders in identifying beneficial genes/markers of high temperature tolerance targeted to produce superior wheat cultivars. Wheat genotypes were extensively characterized for their maximum nitrogen use efficiency at different doses of nitrogen.

b) Number of adhoc projects handled

S.No	Name of the Project	Funding Source/ Budget (lakhs)	Working Since	Worked as
1.	Physiological and Biochemical Mechanism of wheat Response to Heat Stress in Relation to Grain Development and Quality	CSIR, New Delhi/ 7.58	1997-2000 concluded	Co-Principal Investigator
2.	Biochemical and Molecular strategies of wheat (<i>Triticum aestivum</i> L.) response to heat stress in relation to grain filling	Punjab Govt / 20	2006-2007 concluded	Incharge
3.	Heat Stress Response in Relation to C and N metabolism during Grain Development in Wheat (<i>Triticum aestivum</i>)	UGC, New Delhi/ 4.15	2004-2007 concluded	Principal Investigator
4.	Development of early maturing and heat tolerant germplasm in wheat	RDF – 25 0.53	2010-2011	Co-Principal Investigator
5.	Biochemical and Physiological mechanisms and indices of heat tolerance in cultivated and wild germplasm of wheat	DBT, New Delhi/ 124	2007-2012 concluded	Principal Investigator
6.	Role of metal oxides/nanoparticles in improving growth and antioxidant status under heat and drought stress in wheat SR/WOS-A/LS-1098/2014 Gurpreet Kaur	DST, New Delhi Women Scientist Scheme	2014	Mentor

a) Paper Publications

1. **Asthir B (2015)** Mechanisms of heat tolerance in crop plants: an Overview. *Biologia Plantarum* **NAAS – 7.74**
2. Kaur G and **Asthir B (2015)** Proline: A key player in plant abiotic stress tolerance. *Biologia Plantarum* **NAAS – 7.74**
3. **Asthir B**, Kaur R and Bains N S (2015) Variation of invertase activities in four wheat cultivars as influenced by thiourea and high temperature. *Acta Physiol Plant* 37:1712. **NAAS – 7.31**
4. **Asthir B**, Thapar R, Farooq M and Bains N S (2015) Biochemical Responses of Thiourea in Ameliorating High Temperature Stress by Enhancing Antioxidant Defense System in Wheat. *Russ J Plant Physiol* **NAAS – 6.76**
5. Kaur G, **Asthir B**, Bains N S and Farooq M (2015) Nitrogen nutrition, its assimilation and remobilization in diverse wheat genotypes. *Int J Agric Biol* **NAAS – 6.90**

6. Kaur B, **Asthir B** and Bains N S (2015) Apical stem culturing to enhance cell sap assimilates towards grain sucrose and glutamine metabolism in wheat. **Cereal Research Communication** (Accepted). **NAAS – 6.62**
7. Kaur B, Kaur G and **Asthir B** (2015) Biochemical aspects of nitrogen use efficiency: An Overview. **J Plant Nutrition** (Accepted). **NAAS – 6.53**
8. Kaur G, **Asthir B** and Bains N S (2015) Genotypic variation for nitrogen uptake and assimilation using hydroponic culture technique in wheat. **J Plant Nutrition** (Accepted). **NAAS – 6.53**
9. Kaur B, **Asthir B** and Bains N S (2015) Relationship of nitrogen use efficiency with nitrogen metabolizing enzymes of wheat genotypes under different nitrogen doses. **Proc Natl. Acad. Sci.** (Biol Sci) **NAAS – 6.4**
10. Kaur G, **Asthir B** and Bains N S (2015) Nitrogen levels effect on wheat nitrogen use efficiency and yield under field conditions. **Afr J Agric Res** **NAAS – 4.0**
11. Bhatia S and **Asthir B** (2014) Calcium mitigates heat stress effect in wheat seedling growth by altering carbohydrate metabolism. **Indian J Plant Physiol** 19(2):138-143. **NAAS –4.66**
12. Kumari M, **Asthir B** and Bains N S (2014) Temporal dynamics of antioxidant defence system in relation to polyamine catabolism in rice raised under direct-seeded and transplanted conditions. **Rice Science** 21 (6): 343-353. **NAAS – 4.59**
13. Bala S, **Asthir B** and Bains N S (2014) Effect of terminal heat stress on yield and yield attributes of wheat. **Indian J App Res** 4: 1-2. **IF – 2.1652**
14. **Asthir B**, Gulati A and Bains N S (2014) Controlling water deficit by osmolytes and enzymes: Enhancement of carbohydrate mobilization to overcome osmotic stress in wheat subjected to water deficit conditions. **Afr J Biotechnol.** 13(20): 2072-2083. **NAAS – 4.0**
15. **Asthir B** and Bhatia S (2014) *In vivo* studies on artificial induction of thermotolerance to detached panicles of wheat (*Triticum aestivum* L.) cultivars under heat stress. **J Food Sci Technol** 51(1): 118-123. **NAAS – 6.9**
16. Bala S and **Asthir B** (2013) Activity of sucrose metabolizing enzymes in two diverse wheat varieties and their effects on starch accumulation. **Crop Improvement** 40(2):197-202. **NAAS – 3.71**
17. Verma D K, Mohan M and **Asthir B** (2013) Physicochemical and cooking characteristics of some promising Basmati genotypes. **As J Food Ag-Ind** 6 (02): 94-99.
18. **Asthir B**, Thapar R, Farooq M and Bains N S (2013) Exogenous application of thiourea improves the performance of late sown wheat by inducing terminal heat resistance. **Int J Agric Biol** 15: 1337–1342. **NAAS – 6.62**

19. Mall R K, Verma D K, Tripathi H C, Pathak R K, **Asthir B (2013)** Bio-fertilizers in context of farmers and agriculture in India. **Indian Farmers' Digest** 46: 16-18.
20. **Asthir B**, Bala S and Bains N S (2013) Metabolic Profiling of Grain Carbon and Nitrogen in Wheat as Influenced by High Temperature **Cereal Research Communication** 41: 230-242. **NAAS – 6.62**
21. **Asthir B**, Bala S and Bains N S (2012) Nitric oxide alleviates oxidative damage induced by high temperature stress in wheat. **Indian J Exp Biology** 50: 372-378. **NAAS – 7.2**
22. **Asthir B**, Rai P K, Bains N S and Sohu V S (2012) Genotypic variation for high temperature tolerance in relation to carbon partitioning and grain sink activity in wheat. **Am J Plant Sci** 3: 381-390.
23. **Asthir B**, Koundal A and Bains N S (2012) Putrescine modulates antioxidant defense response in wheat under high temperature stress. **Biologia Plantarum** 56: 757-761. **NAAS – 7.6**
24. Verma D K, Mohan M, Yadav V K, **Asthir B** and Soni S K (2012) Inquisition of some physico-chemical characteristics of newly evolved basmati rice. **Environment & Ecology** 30 (1): 114—117. **NAAS – 2.1**
25. **Asthir B** and Deep A (2011) Thermotolerance and antioxidant response induced by putrescine and heat acclimation in wheat seedlings. **Seed Science & Biotechnology** 5 (1) 42-46.
26. **Asthir B**, Koundal A and Bains N S (2011) Kinetic properties of cell wall bound superoxide dismutase in the leaves of wheat following pathogen infection. **Indian J. Biochem. Biophys.** 48: 341-345. **NAAS – 7.3**
27. **Asthir B** and Bhatia S (2011) Kinetic and thermodynamic properties of wall-bound invertase in heat tolerant and susceptible cultivars of wheat. **Acta Physiologiae Plantarum.** 33: 697-703. **NAAS – 7.5**
28. **Asthir B**, Kaur S, Spoor W and Roitsch T (2010) Spatial and temporal dynamics of peroxidase and amine oxidase activity is linked to polyamines and lignin in wheat grains. **Biologia Plantarum** 54: 525-529. **NAAS – 7.6**
29. Bala S, **Asthir B** and Bains N S (2010) High temperature response leads to altered membrane permeability in conjunction with carbon utilization in wheat. **Seed Science & Biotechnology** 4: 10-14.
30. Goyal M and **Asthir B** (2010) Polyamine catabolism influences antioxidative defense mechanism in shoots and roots of five wheat genotypes under high temperature stress. **Plant Growth Regulation** 60: 13-25. **NAAS – 7.6**

31. **Asthir B**, Koundal A, Bains N S and Mann S K (2010) Stimulation of antioxidative enzymes and polyamines during stripe rust disease of wheat. **Biologia Plantarum** 54: 329-333.
NAAS – 7.6
32. **Asthir B**, Koundal A and Bains N S (2009) Kinetic and thermodynamic behaviour of wall-bound peroxidase from wheat leaves infected with stripe rust. **Plant Growth Regulation** 59: 117-124.
NAAS – 7.6
33. **Asthir B**, Kaur S and Mann S K (2009) Effect of salicylic and abscisic acid administered through detached tillers on antioxidant system in developing wheat grains under heat stress. **Acta Physiologiae Plantarum** 31: 1091-1096.
NAAS – 7.5
34. **Asthir B**, Bala S, Bains NS and Gosal S S (2009) Response of carbohydrate and protein metabolism to high temperature stress in developing grains of two wheat genotypes. **Crop Improvement**, PAU 36: 37-43.
NAAS – 3.7
35. Singh S and **Asthir B** (2009) Interactive effects of high temperature and phytohormones on carbohydrate metabolism in barley seedlings. *Seed Science and Biotechnology* 3: 44-47.
36. Singh S, **Asthir B**, Bains N S and Mann S K (2009) Induction of carbohydrate metabolism in relation to leaf blight in barley (*Hordeum vulgare*). *Advances in Biological Research* 3: 61-66.
37. Singh S and **Asthir B** (2009) Biochemical and Physiological Parameters: Swift tools for Screening High Temperature Tolerance in Barley. *Functional Plant Science and Biotechnology* 3: 70-75.
38. **Asthir B**, Kamalpreet, Batta S K and Sharma B (2009) Role of antioxidative enzymes in red rot resistance in sugarcane. **Sugar Tech** 11: 282-287.
NAAS – 5.0
39. **Asthir B**, Kaur S, Kaur S and Mann APS (2008) Calcium induced thermotolerance in relation to antioxidative enzymes in two cultivars of wheat seedlings. **Tropical Agriculture** 85: No 2, 126-132.
IF 0.097
40. **Asthir B**, Bhatia S, Kaur S and Mann APS (2008) Differential response in kinetic properties of peroxidase in heat tolerant and susceptible cultivars of wheat grains. **Tropical Agriculture** 85: No 4, 251-256.
IF 0.097
41. Singh S, **Asthir B** and Bains N S (2008) High temperature tolerance in relation to carbohydrate metabolism in Barley. *Ecology, Environment and Conservation* 14: 561-565.
NAAS – 3.5
42. Kaur G, Basra A S, Basra R K, Kaur G and **Asthir B** (2008) Thermotolerance induced by heat acclimation and salicylic acid in mungbean (*Vigna radiata* L.) seedlings. *Environment and Ecology* 26: 598-601.
NAAS – 2.1

43. Sharma P and **Asthir B** (2008) Role of sucrose catabolising enzymes associated with fibre elongation in hybrid and parental lines of cotton. *Ecology, Environment and Conservation* 14: 457-460. **NAAS – 3.5**
44. **Asthir B**, Kaur S, Kaur S and Mann A P S (2007) Induction of thermotolerance in heat tolerant and susceptible cultivars of wheat by heat acclimation and salicylic acid. *Ecology, Environment and Conservation* 13: 515-520. **NAAS – 3.5**
45. **Asthir B**, Kaur S, Bhatia S, Kaur S and Mann A P S (2006) Differential response in kinetic properties of superoxide dismutase in heat tolerant and susceptible cultivars of wheat grains. *Environment and Ecology* 24: 863-868. **NAAS – 2.1**
46. **Asthir B**, Spoor W and Duffus C M (2004) Involvement of polyamines, diamine oxidase and polyamine oxidase in resistance of barley to *Blumeria graminis* f.sp. *hordei*. *Euphytica* 136: 307-312. **NAAS – 7.69**
47. **Asthir B**, Duffus C M and Spoor W (2004) Correlation of gibberellin-induced growth, polyamine levels and amine oxidases in epicotyl, root and leaf blade of barley seedlings. *Plant Growth Regulation* 42: 193-201. **NAAS – 7.6**
48. **Asthir B**, Duffus C M, Smith R C and Spoor W (2002) Diamine oxidase is involved in H₂O₂ production in the chalazal cells during barley grain filling. *Journal of Experimental Botany* 53: 677-682. **NAAS –11.79**
49. **Asthir B**, Spoor W, Duffus C M and Parton R M (2001) The location of (1-3)- β -glucan in the nucellar projection and in the vascular tissue of the crease in developing barley grain using a (1-3)- β -glucan specific monoclonal antibody. *Planta* 214: 85-88. **NAAS – 9.38**
50. **Asthir B**, Basra A S and Batta S K (1999) Differential response of carbon and nitrogen metabolism to fluoride application in fruiting structures of chickpea. *Acta Physiologia Plantarum* 21: 67-73. **NAAS – 7.5**
51. **Asthir B**, Basra A S and Batta S K (1998) Fluoride-induced alteration of carbon and nitrogen metabolism in developing wheat grains. *Biologia Plantarum* 41: 287-292. **NAAS – 7.6**
52. **Asthir B**, Kaur A and Basra A S (1998) Kinetic behaviour of soluble invertases may be connected with the differential heat sensitivity of two wheat genotypes. *Acta Physiologia Plantarum* 20: 285-289. **NAAS – 7.5**
53. **Asthir B**, Kaur A and Basra A S (1998) Cultivar variation in heat stability and kinetic properties of soluble invertase in wheat grains. *Acta Physiologia Plantarum* 20: 339-345. **NAAS – 7.5**

54. **Asthir B**, Kaur A and Basra A S (1998) Do phytohormones influence the uptake and metabolism of sucrose in spikelets of wheat? **Phyton** 38: 293-299. **IF – 0.387**
55. **Asthir B** and Singh R (1998) Ion-mediated inhibition of inversion of translocated sucrose in rachis of pearl millet. **Indian Journal of Experimental Biology** 36: 331-332. **NAAS – 7.2**
56. **Asthir B** and Singh R (1997) Purification and characterization of neutral invertase from chickpea nodules. **Indian Journal of Biochemistry & Biophysics** 34: 529-534. **NAAS – 7.3**
57. **Asthir B** and Singh R (1997) Uptake and metabolism of sugars by Sorghum caryopsis. **Indian Journal of Experimental Biology** 34: 526-531. **NAAS – 7.2**
58. Batta S K, Mahajan N, **Asthir B** and Sharma K P (1997) Characterization and inhibition of soluble neutral invertase from sugarcane juice. **Indian Sugar** 46: 965-972.
59. **Asthir B** and Singh R (1995) Fluoride-induced changes in the activities of sucrose-metabolizing enzymes in relation to starch accumulation in sorghum caryopsis, raised through liquid culture. **Plant Physiology & Biochemistry** 33: 219-223. **NAAS – 8.35**
60. **Asthir B**, Singh R and Gupta A K (1995) Sucrose-sucrose fructosyltransferase in relation to fructans in developing grains of pearl millet, *Pennisetum americanum*. **Indian Journal of Experimental Biology** 33: 233-235. **NAAS – 7.2**
61. **Asthir B** and Singh R (1995) Invertase-mediated interconversion of sucrose and hexoses during their translocation in growing pearl millet plant. **Journal of Plant Biochemistry & Biotechnology** 4: 23-28. **NAAS – 6.9**
62. Singh R and **Asthir B** (1988) Import of sucrose and its transformation to starch in the developing sorghum caryopsis. **Physiologia Plantarum** 74: 58-65. **NAAS – 9.26**

Reviews

63. Singh R, Gupta A K, Kaur N, **Asthir B** and Batta S K (1996) Metabolism of carbohydrates in relation to crop productivity. **Journal of Research (PAU)** 33: 239-256.

Proceedings/ Symposia

64. **Asthir B** (2010) Seed storage products their biochemistry and modification: Starch. Lecture delivered in training programme on, 'Breeding Designer Crops' held from March 9 - 29 under the aegis of the Centre of Advanced Faculty Training in Genetics and Plant Breeding (ICAR), Department of Plant Breeding & Genetics, PAU, Ludhiana, Pages 1-6.
65. **Asthir B** (2007) Molecular approaches for developing genotypes for temperature extreme conditions. Lecture delivered in Training Programme on, 'Use of Biotechnological Tools in Crop Improvement' held from Nov 28 - Dec 18 under the aegis of the Centre of Advanced

Studies in Genetics and Plant Breeding (ICAR), Department of Plant Breeding, PAU, Ludhiana, Pages 373-381.

66. Basra A S, Basra R K, Bhatti R and **Asthir B** (1998) Temperature and hormonal responsiveness of germinating wheat seeds: Relationship to carbohydrate metabolism. In: International Symposium on Pre- Harvest sprouting in Cereals held at Detmold Germany June 25, Pages 146-160.

Book

67. Verma D K, **Asthir B**, Bharadwaj D N, Swain S K and Verma S S. (2014) Objective Plant Science At a Glance. Scientific Publishers (India).
68. Verma D K, Mohapatra B, Srivastava S, Dash S K, Singh A V, Asthir B and Bharadwaj D (2014) Objective AGRICULTURAL MICROBIOLOGY At a Glance” Scientific International (Pvt.) Ltd. India (www.siplind.com). ISBN 978-93-84007-26-3

Manual

69. Sharma S and **Asthir B** (2014) Food and Nutritional Biochemistry. Biochem 510 (2+1) Pages 65.

Book Chapter

70. **Asthir B** (2007) Starch metabolism in Plants: Potential Target for Crop Improvement. In Crop Improvement: Strategies and Applications (Eds. Setia R C, Nayyar H and Setia N). IK International Publishing House, Pages 318-342.
71. Verma D K, Mohan M, **Asthir B** and Chandra S (2014) Organic Agriculture: An Approach for Sustainable Food Production and Environment Security (Chapter 2). *In* Organic Farming and Management of Biotic Stresses (Eds. Biswas S K and Pal S) pp 34-43. Biotech Books, New Delhi. **ISBN: 978-81-7622-306-5.**
72. Verma D K, Mohapatra B, Talukdar D, Srivastava S and **Asthir B** (2014) Biological control in crop disease management (CDM): A gateway to environmental security and sustainable agriculture.
73. Anand Y R., Singh S J, Verma D K, Panyam K R, Sumitra P, Meitei K M, Gurumurthy S and **Asthir B**. (2014) Recent Advances In Induced Resistance for Plant Disease Management: An Overview (Chapter-3) In: Innovations in plant Science and Biotechnology (eds. Wani S. H., Malik C. P., Hora A. and Kaur R.) pp.107-143. Pub. Agrobios (India). ISBN: 978-81-7754-553-1.

74. Verma D K, Mohapatra B, Talukdar D, Kumar V, Srivastava S, Sahu M, Mohan M and **Asthir B (2014)** Microbial approach to control *Fusarium* Wilt diseases for sustainable pigeon pea production

Popular Articles

75. **Asthir B**, Sharma A and Bains N S (2009) Are you Allergic to Wheat? Modern Agriculture.
76. Mohapatra B, Verma D K, Sen A, Panda B B and **Asthir B (2013)** Bio-fertilizers- A Gateway to Sustainable Agriculture. Popular Kheti 1: 97-105.

Short Communications

77. Deep A, **Asthir B** and Bains N S (2012) Do polyamines play a role in thermotolerance? Paper was presented in **International Conference** on Sustainable Agriculture for Food and Livelihood Security held at Punjab Agricultural University, Ludhiana under the aegis of The Crop Improvement Society of India from Nov 27-29 (Theme A-P5, Page 43-44).
78. Kaur G and **Asthir B (2012)** Measuring nitrogen metabolism in wheat using liquid culture technique. Crop Improvement Pages 83-84.
79. Bala S, **Asthir B**, Bains N S (2012) Investigating biochemical mechanisms for terminal heat stress tolerance in wheat. Crop Improvement Pages 387-388.

Papers presented in Conferences

1. Kaur G, **Asthir B** and Bains N S (2014) Manipulating cell sap nutrient in wheat using tiller culture technique. Paper was adjudged as the **3rd best presentation during International Conference on Crop Productivity and Sustainability-Shaping the future, under theme 'A'** (Advances in breeding for enhancing crop productivity) held at Baba Farid College, Department of Agriculture, Bathinda from March 20-21.
2. Bala S, **Asthir B** and Bains N S (2014) Comparative response of six wheat genotypes to heat and drought stress. Paper was presented during International Conference on Crop Productivity and Sustainability-Shaping the future, under theme 'A' (Advances in breeding for enhancing crop productivity) held at Baba Farid College, Department of Agriculture, Bathinda from March 20-21.
3. Kumari M, **Asthir B** and Bains N S (2014) Genotypic response of carbohydrate metabolism in rice raised under aerobic and transplanted conditions. Paper was presented during International Conference on Crop Productivity and Sustainability-Shaping the future, under theme 'A' (Advances in breeding for enhancing crop productivity) held at Baba Farid College, Department of Agriculture, Bathinda from March 20-21.
4. Kaur Balraj, **Asthir B** and Bains N S (2014) Improving nitrogen use efficiency in diverse genotypes of wheat. Paper was presented during International Conference on Crop Productivity and Sustainability-Shaping the future, under theme 'A' (Advances in breeding for enhancing crop productivity) held at Baba Farid College, Department of Agriculture, Bathinda from March 20-21.

5. **Asthir B** (2013) Controlling mechanisms of grain filling under abiotic stresses. Paper was **orally presented** during **International Conference on Crop Management in Changing Climate** held at University of Agriculture, Faisalabad, Pakistan from Feb 11-13, Page 40.
6. Kaur G, **Asthir B** and Bains N S (2012) Genotypic variation for nitrogen use efficiency in wheat. Paper was presented during 15th Punjab Science Congress held at Guru Nanak Dev University, Amritsar under the aegis of Punjab Academy of Sciences, Patiala from Feb 7-9 (Abstract No A-135), Page 24.
7. **Asthir B**, Bala S, Sharma A and Bains N S (2011) Effectiveness of Biochemical and Physiological indices for screening high temperature tolerance in bread wheat (*Triticum aestivum*). Paper was presented during **International Conference** on Preparing Agriculture for Climate Change held at Punjab Agricultural University, Ludhiana under the aegis of The Crop Improvement Society of India from Feb 6-8 (Abstract No Theme V-9, Page 282).
8. Gulati A, Bains N S and **Asthir B** (2011) Delineating the mechanism of drought tolerance in wheat cultivar C 273 based on study of physio-biochemical indices in RIL population. Paper was presented in **International Conference** on Preparing Agriculture for Climate Change held at Punjab Agricultural University, Ludhiana under the aegis of The Crop Improvement Society of India from Feb 6-8 (Abstract No Theme II B-3, Page 132).
9. Goyal M and **Asthir B** (2011) Carbohydrate metabolism in relation to high temperature stress in wheat. Paper was presented in **International Conference** on Preparing Agriculture for Climate Change held at Punjab Agricultural University, Ludhiana under the aegis of The Crop Improvement Society of India from Feb 6-8 (Abstract No Theme V-10, Page 283).
10. Bhatia S and **Asthir B** (2011) Phytohormone induced thermotolerance in relation to C and N metabolism in developing wheat grains. Paper was presented in **International Conference** on Preparing Agriculture for Climate Change held at Punjab Agricultural University, Ludhiana under the aegis of The Crop Improvement Society of India from Feb 6-8 (Abstract No Theme V-16, Page 288).
11. Bala S, **Asthir B** and Bains N S (2009) High temperature mediated alteration of carbon and nitrogen metabolism in developing wheat grains. Paper was presented at 12th Punjab Science Congress held at Punjab Agricultural University, Ludhiana under the aegis of Punjab Academy of Sciences, Patiala from Feb 7-9 (Abstract No AP-92).
12. Goyal M and **Asthir B** (2009) Induction of polyamine catabolism under high temperature stress. Paper was presented at 12th Punjab Science Congress held at Punjab Agricultural University, Ludhiana under the aegis of Punjab Academy of Sciences, Patiala from Feb 7-9 (Abstract No AP-104).
13. Bhatia S and **Asthir B** (2008) Calcium induced thermotolerance in relation to carbohydrate metabolism in wheat seedling. Paper was presented in **International Conference** on Climate Change, Biodiversity and Food Security in the South Asian Region organized by Punjab State Council for Science & Technology, Deptt of Science, Technology & Environment, Govt. of Punjab and United Nations Educational, Scientific & Cultural Organization, New Delhi from Nov 3-4.
14. Singh S, **Asthir B**, Bains N S and Mann S K (2008) Induction of carbohydrate metabolism in relation to leaf blight in barley. Paper was **orally presented** in the 11th Punjab Science Congress

held at Thapar University, Patiala under the aegis of Punjab Academy of Sciences, Patiala from Feb 7-9 (Abstract No YSA A1).

15. **Asthir B**, Koundal A, Bains N S and Mann S K (2008) Role of polyamines and antioxidative enzymes in stripe rust of wheat (*Triticum aestivum*) seedlings. Paper was presented at 11th Punjab Science Congress held at Thapar University, Patiala under the aegis of Punjab Academy of Sciences, Patiala from Feb 7-9 (Abstract No AP 30, P 77).
16. Kaur S, **Asthir B** and Mann A P S (2008) Salicylic acid and abscisic acid induced thermotolerance in wheat-A study *in vivo*. Presented in the **National Seminar** on "Environmental Control for Plants, Animals and Fisheries" held at Central Institute of Post-Harvest Engineering and Technology (CIPHET), Ludhiana on March 15-16.
17. Singh S and **Asthir B** (2008) Effect of high temperature and phytohormones on carbohydrate metabolism in barley seedling. Paper was presented at 11th Punjab Science Congress held at Thapar University, Patiala under the aegis of Punjab Academy of Sciences, Patiala from Feb 7-9 (Abstract No AP 87, P 16).
18. **Asthir B**, Singh S and Bains N S (2007) Carbohydrate metabolism and enzyme activities in relation to heat stress in barley. Paper was **orally presented** in the 10th Punjab Science Congress held at DAV Institute of Engg. & Technology, Jalandhar from Feb 7-9.
19. Kaur S, Bhatia S, **Asthir B** and Mann A P S (2005) Differential response in kinetic properties of Peroxidase from wheat cultivars. Paper was presented at 74th Annual Meeting Society of Biological Chemists (India) organized by Central Drug Research Institute, Lucknow University from Nov 7-10 (Abstract No P 289).
20. **Asthir B** and Mann A P S (2004) Role of peroxidase and amine oxidases in high temperature tolerant and susceptible cultivars of developing grains. Paper was presented in the Annual Main Meeting organized by Society of Experimental Biology (**UK**) from Mar 29 to 2nd April at Herriot-Watt University, Edinburgh.
21. Kanwal, **Asthir B** and Mann A P S (2004) Differential response of peroxidase in red rot resistant and susceptible cultivars of sugarcane. Paper was presented in the Annual Main Meeting organized by Society of Experimental Biology (**UK**) from Mar 29 to 2nd April at Herriot-Watt University, Edinburgh.
22. **Asthir B**, Duffus CM and Spoor W (2002) Involvement of polyamines in gibberellin-induced development of barley seedlings. Paper was **orally presented** in the 71st Annual Meeting, Society of Biological Chemists (India) organised by Deptt of Biochemistry and Chemistry, PAU Ludhiana from Nov 14-16.
23. **Asthir B** and Amarinder (2001) Comparative studies on free sugars, starch and soluble invertase in heat susceptible and tolerant varieties of developing wheat grains. Paper was presented at 4th Punjab Science Congress organized by Society for advancement of academics, sports and cultural activities (SAASCA) in Feb 9-1, 2001 at PAU Ludhiana.
24. **Asthir B**, Spoor W, Duffus C M and Parton R (2001) Immunocytochemical localization of callose in the developing barley grain. Paper was presented in the Annual Meeting organized by Society for Experimental Biology from April 2-6 at the University of Kent, **Canterbury, UK** (Abstract No P 7.37).

25. **Asthir B**, Kaur A and Basra AS (2000) Cell wall bound acid invertase of wheat grains of a heat tolerant genotype. Paper was presented in the Annual Meeting organized by Society for Experimental Biology from March 27-31 in the University of **Exeter, UK** (Abstract No 9.60).
26. **Asthir B**, Duffus C M, Smith R. and Spoor W (2000) Amine- oxidase mediated H₂O₂ production in the developing grains of barley. Paper was presented in the Annual Meeting organized by Society for Experimental Biology from March 27-31 in the University of **Exeter, UK** (Abstract No 9.61).
27. Batta S K, Mahajan N, **Asthir B** and Sharma K P (1997) Post-harvest changes in the quality of sugarcane juice in relation to sugar recovery. Paper was presented in Third Agricultural Science Congress organized by National Academy of Agricultural Sciences, PAU Ludhiana from March 12-15 (Abstract No P 239).
28. **Asthir B** and Singh R (1995) Kinetic properties of alkaline invertase from nodules of chickpea. Paper was presented in the Symposium on Biochemistry in relation to Crop Productivity organized by Dept of Biochemistry, PAU, Ludhiana and Society of Biological Chemists (India) from May 3-4 (Abstract No C15).
29. **Asthir B** and Singh R (1993) Sugar uptake and metabolism by developing sorghum caryopsis. Paper was presented in the 62nd Annual Meeting organized by Society of Biological Chemists (India) at Madurai from Dec 19-22. (Abstract No PBMB 005).
30. **Asthir B** and Singh R (1992) Transport and metabolism of sucrose in pearl millet. Paper was presented in the 61st Annual Meeting organized by Society of Biological Chemists (India) at Hyderabad from Dec 21-23. (Abstract No 012).
31. Singh R and **Asthir B** (1988) Import and metabolism of sucrose in the developing cereal caryopsis. Paper was presented in the **International Congress** of Plant Physiology, New Delhi, India from Feb 15-20.
32. **Asthir B** and Singh R (1987) Transport of sucrose and its metabolism in the developing sorghum caryopsis. Paper was presented in the 56th Annual Meeting of Society of Biological Chemists held at Tirupati from Dec 28-30.

13. Distinctions/ Fellowships etc

- Awarded Academic Staff Commonwealth Fellowship during the year 1999-2000 by the Association of Commonwealth Universities, UK.
- Awarded German Academic Exchange Service (DAAD) Scholarship under the “Special Programme Integrated Environmental Engineering” for a period of 01.06.04-31.08.04 Wuerzburg, Germany
- University Merit Scholarship throughout Ph.D (1987-90)
- Punjab State Merit Scholarship in Pre- Medical (1980)
- Received grant from the Royal Society of Edinburgh, UK as a visiting Scientist during 1999-2000.
- Received grant from Scottish Agricultural College, UK (1999-2001).
- Empanelment with Food and Agricultural Organization (FAO) from Mar1998 to Dec 2000

under Registration No 605

- Winner of Travel grant from Company of Biologist (CoB) and Society for Experimental Biology (SEB) UK, 2001
- Received grant from CSIR for attending conference at UK, 2004

13. Membership of Scientific societies/committees etc

- Life member of Society of Biological Chemists, Bangalore, India
- Life member of Punjab Academy of Sciences, Patiala, India
- Life member of Indian Society of Agricultural Biochemist, Kanpur, India
- Member of Commonwealth Scholarship Commission alumni (CSC, UK)
- Member of DAAD alumni (Germany)
- Member of Society of Biological Chemist, UK (2001, 2002)
- Member of Alumni Association, COA, PAU (2012, 2013)
- International advisory committee member of Pakistan during International Conference on Crop Protection For Food Security during Feb 09-11, 2015 held by Department of Agronomy, University of Agriculture, Faisalabad, Pakistan
- Member of Indian Society Plant Physiology, IARI New Delhi, 2014-15.

Referee of research papers for journals

- Acta Physiologia Plantarum
- Biologia Plantarum
- American Journal Plant Sciences
- Indian Journal of Biochemistry and Biophysics
- African Journal of Biotechnology
- Indian J Agric Research
- Journal of Dairying Foods and Home Sciences
- Journal of Research (PAU)
- Plant Cell Reports
- Sugar Technology

14. Conference/Seminars /Workshops/Symposia in which participated

Sr. No.	Year	Name of the Seminar/Symposia/ Conference/Workshop	Organizing Institution
1.	1987	56 st Annual Meeting of Society of Biological Chemist, India, Dec 28-30	Tirupati
2.	1992	61 st Annual General Body Meeting, Society of Biological Chemist, India, Dec 21-23	Hyderabad
3.	1993	62 nd Annual General Body Meeting, Society of Biological Chemist, India, Dec 19-22	Madurai
4.	1995	Symposium on 'Biochemistry in Relation to Crop Productivity', May 3-4	PAU, Ludhiana

5.	1997	3 rd Agricultural Science Congress by National Academy of Agricultural Sciences,	PAU, Ludhiana
6.	1999	National Symposium on HRD Requirements of Biotech Industry in Agriculture Sector on March 12-13.	PAU, Ludhiana
7.	1999	Attended SAC/SASA Molecular Biology Working Group Meeting on 2 nd June	Scottish Agricultural College, Edinburgh, Scotland, UK
8.	1999	Postgraduate conference by SAC on 10 th June	Auchincruive, Ayr, UK
9.	2000	Annual Meeting organized by Society of Biological Chemist, UK, March 27-31.	Exeter, UK
10.	2000	Conference on Funding for research collaboration between Commonwealth countries organized by ACU (UK), May 5	Glasgow, UK
11.	2001	Annual Meeting, Society for Experimental Biology (UK), April 2-6.	Canterbury, UK
12.	2001	Punjab Science Congress organized by SAASCA, Feb 9-10	PAU, Ludhiana
13.	2002	71 st Annual Meeting, Society of Biological Chemists (India), Nov 14-16.	Department of Biochemistry & Chemistry, PAU, Ludhiana
14.	2004	Annual Main Meeting organized by Society of Experimental Biology (UK), Mar 29 to April 2.	Herriot-Watt University, Edinburgh (UK)
15.	2005	Seminar cum Workshop on 'Intellectual Property Rights' on Mar 18.	IPR Cell, Deptt of Business Management at PAU, Ludhiana
16.	2008	11 th Punjab Science Congress held at Thapar Univ. Patiala, Feb 7-9	Punjab Academy of Sciencs, Patiala
17.	2008	State Level Workshop on Management and Monitoring of Field Trials of Genetically Engineered (GE) Crops on Dec 22	School of Agricultural Biotechnology, PAU
18.	2009	12 th Punjab Science Congress organized by Punjab Agricultural University, Ludhiana under the aegis of Punjab Academy of Sciences, Patiala, Feb 7-9	PAU, Ludhiana
19.	2011	International Conference on Preparing Agriculture for Climate Change, Feb 6-8	PAU, Ludhiana
20.	2012	Workshop for Rabi Crops by Directorate of Extension Education, Aug 22-23	PAU, Ludhiana
21.	2012	International Conference on Sustainable Agriculture for Food and Livelihood Security, Nov 27-29	PAU, Ludhiana
22.	2013	Chaired session during International Conference on Crop Management in Changing Climate, Feb 11-13	University of Agriculture, Faislabad, Pakistan
23.	2013	Attended Commonwealth Alumni First Regional Meeting organized by the British Council, Nov 9	The Lalit Hotel, New Delhi
24.	2014	Attended Technical Session of Agriculture Summit, Feb 14 & 17	Mohali, Chandigarh
24.	2014	Attended National Seminar on Role of	Department of Economics &

		Mandi Board in Rural Development organized by Society of Economic Development, March 3	Sociology, PAU, Ludhiana
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