

**Prof. Shanti S. Sharma**

**Specialization: Plant Physiology and Biochemistry**

Main research interests include the molecular physiological aspects of abiotic stresses in plants with a particular emphasis on elucidating the mechanisms of heavy metal (HM) toxicity development and tolerance with implications for realization of phytoremediation. Findings inter alia revealed the (a) mechanism of HM-induced proline accumulation, (b) proline-dependent protection of enzymes against HM poisoning through complexation, (c) free radical scavenging potential of proline, (d) HM-dependent rapid changes in vacuolar dimension and other metabolic aspects strengthening the vacuolar involvement in HM detoxification at different levels of organization), (e) phytoremediation potential of certain plant species including duckweeds and Western Himalayan fern species. Besides, diverse ecophysiological aspects (seed physiology, antioxidative properties etc.) of threatened medicinal plant species from high altitude areas of W. Himalayas have been characterized that have implications for their conservation and cultivation. Research in own laboratory and in collaboration with distinguished foreign research groups (funded by European Commission, JSPS and other fellowship awards, DST-DAAD and DST-JSPS projects etc.) led to publications in journals of high impact factors including Trends in Plant Science, Plant Cell & Environment, Journal of Experimental Botany, Physiologia Plantarum, Annals of Botany, Phytochemistry, BMC Cell Biology etc.

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**Name :** Prof. Shanti S. Sharma

**Email:** shantisharma@hotmail.com

**Contact:** 094182-32910

**Designation**

Professor

**Specialization**

Plant Physiology & Biochemistry

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Dr. Shanti S. Sharma

### Personal Information :

DOB: 15-01-1958

Qualifications: M.Sc., M. Phil., Ph. D. (Meerut University, Meerut)

Email/s: shantisharma@hotmail.com

Contact No/s.: 094182-32910

Teaching and Research Experience: 30 Years

Awards: i. Marie Curie Post Doctoral Fellowship, European Commission  
(1995)

(Free University, Amsterdam, The Netherlands; Dr. Henk Schat)

ii. INSA-DFG award (twice)

(University of Bielefeld, Germany; Prof. Karl-Josef Dietz)

iii. DBT Overseas Associateship (2007)

(University of Bielefeld, Germany; Prof. Karl-Josef Dietz)

iv. JSPS Invitation Fellowship (2009)

(Kobe University, Japan; Prof. Tetsuro Minura)

Address: Department of Biosciences, Himachal Pradesh University, Shimla  
171005

Residence: C-4 Everest Housing Complex, Summer Hill- 171005

### Research Information:

Area of Research: Plant stress physiology, Heavy metal tolerance,  
Phytoremediation, Medicinal plants

Research Publications:

Papers in Journals : 46 (with 2600+ citations)

Papers in Conferences: About 25 abstracts

No. of Ph. D. guided: 11

No. of M. Phil. guided: 44

#### Project Information:

Research Projects completed: 4 including two international (DST-DAAD & DST-JSPS)

Research Project Ongoing:

#### Conferences:

No. of Conferences/Workshops Organized: Nil

Conferences attended (National): 15

Conferences attended international):

Any Other:

#### Selected Publications:

1. **Sharma, S.S.**, Dietz, K.J. and Mimura, T. 2016. Vacuolar compartmentalization as indispensable component of heavy metal detoxification in plants. **Plant Cell & Environment** **39**: 1112-1126.
2. Thakur, S. and **Sharma, S.S.** 2016. Characterization of seed germination, seedling growth and associated metabolic responses of *Brassica juncea* L. cultivars to elevated nickel concentrations. **Protoplasma** DOI: 10.1007/s 00709-0-15-0835.
3. **Sharma, S.S.** and Dietz, K.J. 2009. The relationship between metal toxicity and cellular redox imbalance. **Trends in Plant Science** **14 (1)**: 43-50.
4. Kaul, S., **Sharma, S.S.** and Mehta, I.J.K. 2008. Free radical scavenging potential of proline: evidence from in vitro assays. **Amino Acids** **34**: 315-320.
5. **Sharma, S.S.** and Dietz, K.J. 2006. The significance of amino acids and amino acid-derived molecules in plant responses and adaptation to heavy metal stress. **Journal of Experimental Botany** **57**: 711-726.
6. **Sharma, S.S.**, Kaul, S., Metwally, A., Goyal, K.C., Finkemeir and Dietz, K.-J. 2004. Cadmium toxicity to barley (*Hordeum vulgare*) as affected by varying nutritional status. **Plant Science** **166**: 1287-1295.
7. **Sharma, S.S.**, Schat, H. and Vooijs, R. 1998. In vitro alleviation of heavy metal-induced enzyme inhibition by proline. **Phytochemistry** **49**: 1531-1535.

8. Schat, H., **Sharma, S.S.** and Vooijs, R. 1997. Heavy metal-induced accumulation of free proline in a metal-tolerant and a nontolerant ecotype of *Silene vulgaris*. **Physiologia Plantarum** **101**: 477-482.
9. **Sharma, S.S.** and Gaur, J.P. 1995. Potential of *Lemna polyrrhiza* for removal of heavy metals. **Ecological Engineering** **4**: 37-43.
10. Bassi, R. and **Sharma, S.S.** 1993. Changes in proline content accompanying the uptake of zinc and copper by *Lemna minor*. **Annals of Botany** **72**: 151-154.