

INDERJIT SINGH

Departmental Address

Department of Environmental Studies,
University of Delhi, North Campus
Delhi 110007,
India

Office: (91) 11-27667689

Email: inderjitdu@gmail.com

EDUCATION

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|---|-------------|
| Ph.D. (Botany with specialization in Plant Ecology) | 1986 – 1992 |
| Department of Botany, University of Delhi, Delhi 110007, India | |
| M.Sc. Botany | 1984 – 1986 |
| Botany Department, Panjab University, Chandigarh 160014, India | |
| B.Sc. (Honours) Botany | 1981 – 1984 |
| Botany Department, Hans Raj College, University of Delhi, Delhi 110007, India | |

RESAERCH & PROFESSIONAL EXPERIENCE

1. **Professor**, Centre for Environmental Management of Degraded Ecosystems, University of Delhi, Delhi, **India** (March 2005 – Present),
2. **Professor**, Department of Environmental Studies (July 2010 - Present), University of Delhi, Delhi, **India**
3. **Visiting Professor** (July 2014 - November 2014), University of Alberta, Edmonton, **Canada**
4. **Gerrit Parmile Wilder Chair Professor** (August 2011 – May 2012), Botany Department, University of Hawaii at Manoa, **U.S.A.**
5. **INSA-DFG Visiting Scientist** (April 2007 – July 2007), Max Planck Institute for Chemical Ecology, Jena, **Germany**
6. **Reader** (equivalent to Associate Professor; June 2002 – March 2005), Department of Botany, University of Delhi, Delhi, **India**
7. **Reader** (February 2000 – June 2002), Botany Department, Panjab University, Chandigarh, **India**
8. **Visiting Professor** (June 2001 – July 2001), University of Massachusetts, **USA**
9. **Assistant Professor** (August 1998 – December 1999), The Royal University of Veterinary and Agricultural Sciences (KVL), **Denmark**
10. **Science & Technology Agency Fellow** (November 1997 – July 1998), Plant Ecochemicals Research Center, Sapporo, **Japan**
11. **Visiting Professor** (May 1997 – July 1997), Virginia Tech and State University, **USA**
12. **Visiting Professor** (May 1996 – June 1996), Second University of Napoli, **Italy**
13. **Matsumae Fellow** (July 1995 – November 1995), Hokkaido Tokai University, Sapporo, **Japan**
14. **Post-Doctoral Fellow** (December 1994 – May 1997), Lakehead University, **Canada**

AWARDS & RECOGNITIONS

- **Elected Fellow of Indian National Science Academy (FNA, INSA)**, New Delhi India, effective from 1 Jan 2022.
- **Distinguished Visitor Award** by the University of Alberta, Canada in 2017.
- **Robert H. Whittaker Distinguished Ecologist Award**, Ecological Society of America, 2015
- **INSA-DFG Exchange Fellowship** (2007), Max Planck Institute for Chemical Ecology, Jena.
- **Outstanding Young Weed Scientist**, Weed Science Society of America, USA; 2001
- **Grodinzky Award**, International Allelopathy Society, Canada; 1999
- **STA** (Science & Technology Agency) Fellowship Award, Government of Japan, 1997
- **Matusmae International Fellowship Award**, Matusmae Foundation, Japan; 1995
- **Associate**, Indian Academy of Sciences, Bangalore, India; 1995

ADMINISTRATIVE EXPERIENCE

- **Dean**, Faculty of Science, University of Delhi (November 10, 2018 to May 2, 2019).
- **Head**, Department of Environmental Studies, University of Delhi (August 8, 2012 - August 7, 2015; September 7, 2015 – March 6, 2016), November 10, 2018 – May 2, 2019).
- **Director**, Centre for Environmental Management of Degraded Ecosystems, University of Delhi - July 2005 onwards
- **Past and present membership**, Biodiversity Foundation, Delhi Government, National Steering Committee of GOI-UNDP-CCF-II Project on “Biodiversity Conservation through community based Natural Resource Management”; and various committees of the Department.
- **Former Member**, Special Committee of School of Environmental Sciences, Jawaharlal Nehru University (JNU) (February 18, 2014 for three years).
- **Former member and Chairperson**, Governing Body, Bhaskacharya College of Applied Sciences, University of Delhi (March 3, 2017 to April 24, 2018); **Member**, Governing Body, Ramlal Anand College, University of Delhi (June 11, 2020 - June 10, 2021); **Former member**, Governing Body, Bhaskacharya College of Applied Sciences, and Sri Guru Nanak Dev Khalsa College, University of Delhi.
- **Member**, Post-graduate Board studies in Pollution Control and Environmental Engineering, Pondicherry University till 31 December 2023.
- **Member**, Advisory Board, Centre for Canadian Studies, University of Delhi since 25 Feb 2021.
- **Secretary**, International Allelopathy Society, USA; 2006 – 2011.

EDITORIAL WORK – ASSOCIATE/SECTION EDITOR

- *Plant and Soil*, Springer (Consulting and Section Editor – 2001 to 2014)
- *Journal of Applied Ecology*, Wiley (October 2016)
- *Biological Invasions*, Springer (- present)
- *AoB Plants*, Oxford Press (2013 - present)
- *Scientific Reports*, Nature Publishing Group (2014 - present)
- *NeoBiota*, Pensoft Publishers (2014 - present)
- *Journal of Plant Ecology* Oxford Publishers (served as Associate Editor for few years)
- *Guest Editor, Plant and Soil*, Special issue, “Plant invasions: habitat invisibility and dominance of invasive plants” in 2005.
- *Guest Editor, Biological Invasions*, Special issue, “Biological invasions” in 2008.
- *Guest Editor, AoB Plants*, Special issue on, “The role of below-ground processes in mediating plant invasion” in 2015.

RESEARCH STATEMENT, ACHIEVEMENTS & CURRENT WORK

The primary goal of my research program is to understand ecological drivers and evolutionary processes influencing anthropogenic redistribution of biota, which has shaped my current research interests in the area of plant ecology, biodiversity and conservation.

Research achievements

Biological Invasions: biogeographic patterns and mechanisms

1. My research group has generated quantitative data to show that invasive species exert neutral to positive impacts on local biodiversity in their native ranges but exert negative impacts on native biodiversity in introduced ranges.
Selected publications: Ecology (2011), PLoS ONE (2012),
2. My group has discovered some new routes of invasions or strengthens the understanding of current mechanisms. This includes: (i) evolution of increased competitive ability in an invasive species, (ii) accumulation of native soil pathogens, (iii) biogeographic variations in the production of chemicals and (iv) impact of soil nitrogen on growth of an exotic invader.
Selected publications: Journal of Ecology (2008, 2011), PNAS (2009), Ecology (2011)

Chemical interactions among plants (Allelopathy)

1. My lab was the first to demonstrate that allelopathy forms the basis of understanding the competitive dominance of weeds at various levels of ecological organization and showed that mediation of allelochemical activity by ecological processes, climatic and abiotic and biotic soil factors makes allelopathy conditional.
Selected publications: Am J Bot (1992, 1994, 1998), Can J Bot (1996, 1997, 1999, 2004), Plant & Soil (1995, 2005), Can J For Res (1998), Plant Ecol (1997), Acta Oeco (1999), Physiol Plant (1994, 2002), Planta (2009), Soil Biology & Biochemistry (2006, 2014), PLoS ONE (2009, 2010)

Linking plant chemicals to invasion

1. My research has linked interactions between allelopathy and ecosystem processes in evolutionary contexts along spatial and temporal scale.
Selected publications: Trends in Ecology & Evolution (2010, 2011), Ecology Letters (2011), Trends in Plant Science (2006), Plant Physiology (2012)

Current work

Chemical-driven nutrient fluctuations - My Ph.D. student is studying how Australian natives, *Acacia dealbata* and *A. mearnsii* change the nitrogen forms resulting in vegetation changes.

Genetic diversity among invasive populations - Another Ph.D. student is working on the exotic invasive species *Prosopis juliflora*, a native of South America. He is studying the genetic diversity among *P. juliflora* populations, and also quantifying invasion impacts of *P. juliflora* in different landscapes.

Chemical mediated plant-soil feedbacks – My lab is working to unravel plant chemicals-mediated plant-soil feedbacks. We employ comparative targeted and untargeted comparative metabolomics to study overall differences and/or similarities in the rhizosphere chemistry. My lab is collaborating to isolate pure bacterial strains from soil, which can transform/degrade carbon differentially.

Publication: Visit publication list

TEACHING INTERESTS & EXPERIENCE

I draw my teaching inspiration from my fundamental discoveries in these subjects and my strong belief in their importance. My teaching interests include courses on Community Ecology, Soil Biology or a general course on Plant Ecology. I am interested in offering courses on the Reorganization of plant communities (including Biological Invasion), Chemical Ecology or Soil Ecology. Currently I offer following courses at the Department of Environmental Studies.

Natural & Managed Ecosystems – I teach this course to Masters student enrolled in the Environmental Studies. Approximate strength of students generally is 25. I deal with fundamentals of plant communities with examples from natural and managed ecosystems, allelopathic interactions, plant-herbivore defense, plant competition, reorganization of plant communities, nitrogen cycle, biological invasions and weed biology.

In the past I also offered:

Soil Biology - I discuss the role of soil microbial communities in shaping plant communities and nutrient cycling to highlight the role of soil, role of abiotic and biotic properties of soil in the observed variation in allelopathy and the impact of the non-native species on local species.

Keynote/Plenary/Invited lectures/talk delivered/expert group meeting attended

1. Plenary (online) talk, “Weeds in agroecosystems’ at the Agroecosystem Sustainability: Links between Carbon Sequestration in Soils, Food Security and Climate Change virtual conference, **Lithuania**, December 2, 2020.
2. Invited lecture, “Urban invasions” at the GUBIC meeting, University of Toronto, **Canada**, June 17-21, 2019.
3. Invited to participate in workshops at Stellenbosch University in South Africa, November 6-9, 2018, Stellenbosch, **South Africa**. The workshop focused on the establishment of a research network for invasion science for BRICS countries (Brazil, Russia, India, China and South Africa).
4. Delivered invited lecture, “Causes of biological invasions” at the Natural Resources, University of Alberta, **Canada**, January 11, 2018.
5. Delivered invited lecture, “Plant chemistry as one of the drivers of plant invasion” at the international conference on biological invasions, Hangzhou, **China**, November 11-23, 2017.
6. Delivered a plenary lecture, “Allelopathy: studies on the ecology of plant chemistry” at the 8th World Allelopathy Congress, Marseille, **France**, July 24-28, 2017.
7. Invited by the European and Mediterranean Plant Protection Organization (EPPO) to prepare a pest risk analysis for two invasive plant species, *Prosopis juliflora* and *Hakea sericea*, May 15-19, 2017, Paris, **France**.
8. Discussed research project at the University of Sharjah, April 12-19, 2017, Sharjah, **U.A.E.**
9. Delivered lecture, established collaboration with the University of Kunming and Shenzhen Genome Institute **China**, March 19-24, 2017, to work on the invasion and the management of *Ageratina adenophora* and *Mikania micrantha*.
10. “Impact of *Ageratina adenophora* on aboveground patterns and belowground processes” at the Plant Protection Institute, Chinese Academy of Sciences, Beijing, **China**, March 22-26, 2016.
11. “Ecological-evolutionary perspective of plant chemicals” at the Third Asian Allelopathy Conference, Fuzhou, **China**, October 30 - November 2, 2015.
12. “Ecological impacts of novel chemicals on aboveground patterns and belowground processes” at the University of Pittsburgh, **USA**, June 11, 2015.
13. Participated in the Discussion session at the Second HIMAP, ICIMOD workshop focused on thematic area Drivers of Change, Thimpu, **Bhutan**, February 4-6, 2015.

14. "Ecological impacts of novel chemicals on aboveground patterns and belowground processes" at the 8th International conference on Biological Invasions, Antalya, **Turkey**, November 3-8, 2014.
15. "Exotic plant invasion: impact of aboveground and belowground processes" at the University of Alberta, Edmonton, **Canada**, October 17, 2014 (give a departmental seminar).
16. "Exotic plant invasion in contexts of rural development" at the Aleksandras Stulginskis University, Kauno, **Lithuania**, November 28-29, 2013.
17. "Exotic plant invasion" at the South Agricultural University, Shenyang, **China**, September 13-16, 2013.
18. "Exotic plant invasion: impact of aboveground and belowground processes" at the Lincoln University, *Christchurch*, **New Zealand**, May 26-28, 2013.
19. "Novel weapons hypothesis: an ecological relevant way to study allelopathy" at the World Allelopathy Conference, Guangzhou, **China**, December 15-19, 2011.
20. "Allelopathy: environmental mediation of the ecological roles of plant biochemicals" at the University of Hawaii Manoa, **USA**, November 4, 2011.
21. "Environmental mediation of the ecological roles of allelochemicals" at the University of Toronto, Scarborough, **Canada**, January 13-14, 2011.
22. "New mechanisms exotic invasive might employ for their success" at the IAP in Mediterranean Type Regions of the World, Trabzon, **Turkey**, Aug 2-6, 2010.
23. "Pathways of plant invasions and factors contributing to success of invasion" at the Asia-Pacific Forest Commission meeting, Thimphu, **Bhutan** from June 8-11, 2010.
24. "Allelopathy in natural ecosystems" at the First Asian Allelopathy Conference, Guangzhou, **China**, December 18-22, 2009.
25. "Major and minor hypotheses for invasions" at the National Evolutionary Synthesis Center (NESCent), Department of Biology, Duke University, Durham, **USA** January 9-16, 2009.
26. "Allelopathy and plant invasions" at the *Netherlands* Institute for Ecology (NIOO-KNAW), **The Netherlands**, 2009
27. "Chemicals accumulate local microbes that inhibit native residents" at the 5th World Allelopathy Congress, Saratoga Springs, **USA**, September 21-25, 2008.
28. University of Fribourg, **Switzerland**; December 18, 2007.
29. Delivered four lectures: "Allelopathy in agroecosystem", "Allelopathy history and current situation", "Allelopathy and invasive success of nonnatives" and "Allelopathy: laboratory and field studies" at the Horticultural Central Research Institute, Yalova, **Turkey**; June 13-15, 2006
30. "Chemical ecology of weeds: allelopathy" at the Weed Science Society of America Symposium, New York, **USA**; February 11-16, 2006
31. IV International Allelopathy Congress, Wagga Wagga, **Australia**; August 21-26, 2005
32. "Allelopathy: challenges and achievements" at the International Botanical Congress, Vienna, **Austria**; July 16-23, 2005.
33. "Dissociation of allelopathy from other *in situ* ecosystem processes" at the Max Planck Institute for Chemical Ecology, Jena, **Germany**; July 14-15, 2005.
34. Second University of Napoli, Napoli, **Italy**; July 12-13, 2005.
35. "Allelopathy: experimental problems and challenges" at the international symposium on allelopathy research and application, Guangzhou, **China**; April 27-29, 2004.
36. "Allelopathy: an ecological perspective" at the International Conference on theory and application of ecological agriculture, Nanchang, **China**; April 24-26, 2004.
37. "Implementing allelopathy for pest management problems and prospects" at the international conference on allelopathy, Lavras, **Brazil**, April 13-16, 2004.
38. Third World Allelopathy Congress, Tsukuba, **Japan**; August 26-31, 2002.
39. Organized a half-day symposium with Chester Foy, "Allelopathy: Past Achievements and Future Approaches" at the Weed Science Society of America, Toronto, **Canada**; February 9, 2000.

40. First European Allelopathy Congress, Vigo, **Spain**; June 20-25, 2001.
41. XX Polyphenol Congress, Freising-Weihestephan, **Germany**; September 10-18, 2000.
42. Organized a symposium and give a lecture at the Second World Allelopathy Congress, Lakehead University, **Canada**, August 05-15, 1999.
43. "Using and improving laboratory bioassays in rice allelopathy" at the Workshop on Rice Allelopathy, Manila, **Philippines**; November 24-28, 1996.
44. "Operation of allelopathy in annual and perennial cropland weeds: one example" at the First World Allelopathy Congress, Cadiz, **Spain**; September 14-23, 1996.
45. Organized a symposium at the Botanical Society of America Meeting, University of Iowa, **USA**; July 31-August 12, 1993.

Lectures delivered at the International Conferences

1. Weed Science Society of America Meeting, Hawaii, **USA**; February 7-11, 2005
2. Weed Science Society of America Meeting, Reno, Nevada, **USA**; February 10 -13, 2002
3. Weed Science Society of America Meeting, North Carolina, **USA**; February 11 – 15, 2001
4. European Weed Research Society Meeting, Basel, **Switzerland**; June 28 – July 1, 1999
5. Weed Science Society of America Meeting, California, **USA**; February 8 – 10, 1999
6. Polyphenol Group Congress, Lille, **France**; August 31 – September 06, 1998 (Poster)
7. Weed Science Society of America Meeting, Chicago, **USA**; February 9-12, 1998
8. Weed Science Society of America Meeting, Colorado, **USA**; February 8 – 11, 1993
9. International Society of Chemical Ecology Meeting, Kyoto, **Japan**; July 06 – 09, 1992
10. Weed Science Society of America, Orlando, Florida, **USA**; February 11 – 14, 1992
11. International Society of Chemical Ecology Meeting, Laval University, **Canada**; August 11 – 15, 1990

Invited lectures/talk delivered in refresher courses, meetings, universities in India

1. "Exotic plant invasion and novel chemicals", UGC-STRIDE-IRCECCB – 1st Skill development program on "Biodiversity – from concept to conservation", Madurai Kamaraj University, 22-31 March 2021.
2. "Environmental challenges & the role of society: biological invasion" Department of Hindi, University of Delhi, 14 December 2018.
3. "*Prosopis juliflora* invasion", Botanical Survey of India, Kolkata, 14-15 December 2017
4. "Exotic invasive plants species: impact of aboveground and belowground processes", Botanical Survey of India, Kolkata, 9 March 2017.
5. "Impacts of non-native invasive species on aboveground patterns and belowground processes", Central University of Punjab, Bhatinda, 11 May 2016.
6. "Exotic plant invasion: impact of aboveground and belowground processes", Institute of Environment & Sustainable Development, Banaras Hindu University, March 2014.
7. "Environmental challenges and the role of society", College, Allahabad, 27 Oct 2013.
8. "Biological invasions", Maharishi Dayanand Saraswati University, Ajmer, September 2013.
9. "Impacts of ecosystem and evolutionary relationships on allelopathy", Panjab University, Chandigarh, 14-18 Dec 2012.
10. "Impacts of novel chemicals and soil communities on exotic plant invasion", Botany Department, Panjab University, Chandigarh, 28 August 2010.
11. "Ecology of plant-released chemicals", Botany Department, Panjab University, Chandigarh, 8 February 2010.
12. "Environment Education: a challenge in higher education", Forest Research Institute, Dehra Dun, 23 September 2009.
13. "Worst alien invasives", Botany Department, Panjab University, Chandigarh, 15 July 2009.
14. "Impact of novel biochemical in invaded range is governed by allelopathy exactly the same way as in native land", International Symposium on "Biology, Ecology and

Management of World's Worst Plant Invasive Species", CEMDE, University of Delhi, 11-14 Dec 2006.

15. "An ecosystem-level approach to understand the impact of allelopathy", University of Pune, September 2006.
16. "Allelopathy in crop production", University of Pune, September 2006.
17. "Allelopathy: some ecological aspects", Banaras Hindu University, March 2004.
18. "Allelopathy as a potential mechanism for plant invasion: methodological difficulties and challenges", International Symposium on Ecology of Biological Invasions, University of Delhi, 4-6 December 2003.

REVIEWER FOR PEER-REVIEWED JOURNALS (PAST AND PRESENT)

Trends in Ecology & Evolution, Journal of Ecology, Oikos, Ecology, Ecology Letters, Science, New Phytologist, PNAS, USA, American Journal of Botany, Plant and Soil, Trends in Plant Science, Oecologia, Tropical Agriculture, Plant Ecology, Soil Biology & Biochemistry, Journal of Environmental Quality, Journal of Chemical Ecology, Field Crops Research, Weed Technology, Weed Science, Biochemical Systematics & Ecology, Journal of Crop Science & Agronomy, Annals of Botany, Weed Research, Journal of Experimental Botany, Presilia, NeoBiota, Journal of Tropical Ecology, Journal of Crop Science & Agronomy, AoB Plants, Agronomy Journal, Scientific Reports, Environmental & Experimental Botany,