Dr Pawan K. Jaiwal
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Academic Qualifications

Degree	Year of passing	University
Ph.D.	1984	K. U. Kurukshetra
M. Sc.	1977-1979	-do-
B. Sc. (Honours)	1974-1977	University of Delhi, Delhi

Post-doctoral Research Experience

◇Institute of Plant Science, ETH, Zurich, Switzerland from Oct., 1995-Oct., 1996 (worked in the Lab. of Prof Ingo Potrykus, Inventor of Golden Rice)

◇National Research Centre on Plant Biotechnology, IARI, New Delhi from May 1998-Aug., 1998.

◇University of Ghent, Ghent, Belgium, International Institute of Plant Biotechnology for Developing countries, from Aug. 14-23, 2007.

Professional Experience

Position held	Period	University/Institute
Professor	2006-till date	M. D. University, Rohtak
Reader	1998-2006	-do-

Senior Lecturer	1991-1998	-do-
Lecturer	1986-1991	-do-
Junior/Senior / Res. Assoc. (CSIR, New Delhi)	1980-1985	K. U. Kurukshetra

- **Field of Specialization:** Plant Genetic Engineering /Metabolic Engineering / Legume Functional Genomics
- **Areas of Research**: Development of transgenic grain legumes & oil seed crop plants for resistance to biotic & abiotic stresses, nutrient utilization efficiency, and nutritional improvement of crop plants, and legume genomics
- **Teaching PG courses** in Biotechnology, Plant Biotechnology, Molecular Biology, rDNA technology and metabolic engineering for the last two and half decade

Research Guidance :

- **Guided 17 students for Ph.D., 3 for M.Phil. and several for M.Sc. dissertation**, and currently six Ph.D. students are working in the laboratory

Research Projects Undertaken:

Projects completed:

- Regeneration of salt tolerant legumes through tissue culture" funded by **UGC**, New Delhi
- **Young Scientist Research Project** "and development of salt tolerant genotypes of mungbean through tissue culture Selection" funded by **DST**, New Delhi
- Genetic transformation of a grain legume *Vigna radiata* by *Agrobacterium*-mediated gene transfer" funded by **DBT**, New Delhi
- Role of Proline and ABA in mungbean salt tolerance funded by **DST**, New Delhi
- Pyramiding of insect resistance genes in pigeonpea plants by particle bombardment of meristems" funded by **CSIR**, New Delhi
- National multi-institutional **DBT** project (Net work project) "Development of efficient regeneration and transformation system for *Vigna* species"
- Engineering MYMV resistance in mungbean (*Vigna radiata*) **HSCST** Chandigarh

Projects ongoing

- Multi-institutional DBT project on "Development of yellow mosaic virus resistance in blackgram (*Vigna mungo* L. Hepper): Transformation of blackgram with MYMV-Vig genes".
- Metabolic engineering of CoQ10 in wheat (*Triticum aestivum* L.) funded by UGC, New Delhi

Projects with International collaboration

● Development of salt tolerant legume for sustainable agriculture and nutrition: Identification of QTLs/genes **Indo-Japan Collaboration for Sci &Tech**, funded by JSPS, Japan and DST, New Delhi

Awards/prizes/medals

♦ Merit certificate for standing first class second in University in M.Sc. exams

♦ Awarded **DBT Overseas Associateship by DBT, New Delhi**

♦ Awarded **INSA Visiting Associateship, INSA, New Delhi**

♦ 10th International Association Plant Tissue Culture & B congress fellowship recipient, June 2002

Meetings/Conferences Organized

● Organized 2nd Review meeting of DBT network project on Development of virus resistant transgenic plants at MDU, Rohtak on July 10, 2008 sponsored by DBT, New Delhi.

Lectures Delivered

At International Levels

*Invited lecture on Gene transfer in *Vigna* species at 14th International Workshop on Genetic Resources and Comparative Genomics of soybean and Vigna. National Institute for Agrobiological Sciences (NIAS), Tsukuba, **Japan**, Sept 13 to 19, 2009

* Invited by Chinese Academy of Agricultural Sciences, Beijing, China for a series of lectures on " Genetic transformation of mungbean: Problems and Approaches" at Institute of Crop Sciences, CAAS, Beijing, Jiangsu Academy of Agricultural Sciences (JAAS) and Hebei Academy of Agriculture and Forestry Scienes (HAAFS), China from Nov. 28 to Dec. 5, 2009.

*Delivered a talk on 'Genetic transformation of mungbean (*Vigna radiata*)' at a workshop on Modern Breeding Techniques at Intl. Institute of Plant Biotech for developing countries, University of Ghent, Ghent, Belgium, Aug 14-23, 2007

*Delivered an invited talk on 'Transgenic route for developing mungbean resistant to MYMV' at Final workshop and planning meeting DFID-AVRDC mungbean project organised by Dept for International Development, UK and Asian Vegetable Research and Development Centre, Taiwan, May 27-31, 2004.

At National Level

* Invited for a plenary lecture on "Genetic transformation of Legumes: Problems and Approaches' at a International Conf. on Grain Legumes: Quality Improvement, Value Addition and Trade, Indian Institute of Pulses Research (IIPR), Kanpur, 14-16 February 2009

* Delivered an invited lecture on 'Transgenic plants' at a refresher course in Biology organized by Dept of Zoology, Govt College, Rohtak. (May, 2008)

* Delivered an invited lecture on 'Gene transfer in plants' at a seminar organized by Govt. College, Gurgoan (Feb., 2010)

*Delivered invited talk on "Chickpea regeneration and genetic transformation" at one-day workshop on regeneration and transformation of chickpea organized by National Centre for Plant Genome Research (NCPGR), JNU campus, New Delhi held on Nov. 30, 2000.

*Invited to deliver a talk on "Towards genetic engineering of mungbean resistant to yellow mosaic virus, bruchids and herbicide phosphinothricin" at Natl Sym. on Plant Biotechnology and Molecular Biology and 24th meeting of Plant Tissue Culture Campus, New Delhi, Univ. of Delhi-South Campus, New Delhi.

*Delivered an invited lecture on 'Molecular biology of abiotic stresses' at refresher course in botany organized by Dept of Botany, CCS Meerut Univ., Meerut.

*Delivered an invited lecture on 'Genetic transformation of legumes' at workshop organized by Dept of Biotechnology and Mol. Biol., CCS HAU., Hisar, 2003

*Delivered an invited lecture on 'Transgenic mungbean – a case study' at workshop organized by Dept of Biotechnology and Mol. Biol., CCS HAU., Hisar, Dec 15, 2005.

*Delivered invited lectures twice on 'Genetic transformation' at a refresher courses in Life Sciences organized by School of Life Science, JNU, New Delhi, on Jan 12, 2004 and Jan 25, 2006.

*Delivered an invited lecture on 'Transgenics in legumes' at workshop organized by Dept of Biotechnology and Mol. Biol., CCS HAU., Hisar, Nov 25, 2006

Conferences/workshop/symposium attended (selected only)

International

#Attended and presented a paper at an International conference Dept of Soil, Plants and insects University of Massachusettes, Amhrest, USA (Oct., 2007)

Attended an International conference on Abiotic stress held at Intl. Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi, Nov., 2006

Attended an International Conference on 'Plant Biotechnology-2002 and beyond' Xth IAPTC & B congress June 23-28, 2002 at Orlendo, Florida, USA.

Attended and presented a paper at 4th International Food Legumes Research Conf. on Food Legumes for Nutritional Security & Sustainable Agriculture organised by Indian society of Genetics & Plant Breeding at IARI New Delhi Oct.18-22, 2005.

#Attended and presented a paper at 2nd International congress of Plant Physiol. On Sustainable Plant Productivity under Changing environment organised by Indian Soc. Plant Physiol. & Intl. Assoc. Plant Physiol. at IARI , New Delhi Jan. 12, 2003

Participated in an International Conference on 'Trends in Cellular and Molecular Biol. held at School of Life Sciences, JNU, New Delhi March 6-8, 2003

National (selected only)

Participated and presented a paper in a Conference on 'Current Scenario of Rapeseed Mustard in India' held at Chokhi Dhani, Jaipur Sept 30, 2006

Participated and presented a paper in a Conference on 'Resource Development and Marketing Issues in Rapeseed Mustard" held at National Institute of Agricultural Marketing, Jaipur, March 28-29, 2005

Actively participated in a National Seminar on 'Genetically modified organisms – biosafety aspects' held at Dept of Botany, Univ of Delhi, March 10-11, 2005

Participated in a Patent Awareness Workshop organised by Patent Information Centre, Hisar at MDU, Rohtak on Dec 30, 2005

Participated and presented a paper in a National Symposium on 'Improving crop productivity in an eco-friendly environment: Physiological and Molecular Approaches' held at GB Pant Univ. of Agriculture & Technology, Pantnagar, Oct. 15 to 17, 2003

Actively participated in a National Convention on 'Transgenic Rapeseed Mustard –an assessment" held at India Intl. Centre, New Delhi, Jan 16-17, 2002

Participated in a Workshop on 'Patenting Awareness' held at Univ of Delhi South Campus, New Delhi, Oct. 15, 2001

Member of Editorial board of

- **Associate Editor** of the journal '**Physiol. Mol. Biol. Plants' published by Springer,** India
- **Editor** of the journal on '**Plant Biotechnology and Mol. Biol.'** (Soc. for Biology and Biotech.) Kottayam,
- Editorial board member of **Brassica,** Mustard Research and Promotion consortium, **New** Delhi
- Editorial board member of **Medicinal Plants**, New Delhi

Membership of learned Societies

- **International Association** for Plant Tissue Culture
- Society for Biochemistry and Biotechnology, IARI, New Delhi
- Indian Society for Pulse Research, IPRI, Kanpur
- Indian Academy of Sciences, Bangalore

Professional assignments

- Member of DRC in the subject of Botany, CCS University, Meerut and of Biotechnology, MDU
- Member of PG board of studies in Environmental Sciences, BBA University Lucknow, MDU, Rohtak and CDLU, Sirsa
- Coordinator of B.Tech. Biotechnology at UIET, MDU, Rohtak for two academic sessions

- Member of the Academic Council of YMCA, Faridabad, and MDU, Rohtak,
- Member of selection committees for Life-sciences at M. D. University, Rohtak and Manav Rachna International Univ., Faridabad
- Member of Faculty of Life Sciences, MDU, Rohtak
- Resource person for refresher courses organized by JNU, New Delhi, CCS University, Meerut and HAU, Hisar
- Reviewer of the research papers for the journals Plant Cell Rep., Plant Cell Tiss. Org. Cult., Plant Sci., Transgenic Research, Scientia Horticulture, Acta Physiol. Plant., African J. Biotech., Curr. Sci., Indian J. Exp. Biol., Indian J. Biotechnology, Physiol. Mol Biol. Plants etc.

Training courses / workshops / refresher courses attended

- Attended and actively participated in a short course on "Applications of Biotechnology in Agriculture and Forestry" sponsored by ICAR, New Delhi and organized by Dept. Of Genetics, CCS Haryana Agriculture University, Hisar from Sept. 18-27, 1989
- Attended and actively participated in a short course on "Recent Trends in Plant Tissue Culture and Plant Transformation" sponsored by DBT and Organized by NCL, Pune from Feb 19- March 4, 1990
- Attended **four** Refresher courses on Biotechnology and Botany organized by Academic Staff College, J N U, New Delhi and Academic Staff College, H P Univ., Shimla, Academic Staff College, BHU, Varanasi and Academic Staff College, Panjab Univ., Chandigarh

Research Publications

Books (edited) : 14 published
Reviews/book chapters/popular articles & Research Papers : 100

BOOKS

1. **Jaiwal P K**, Singh R P and Gulati A (eds) 1997 Strategies for the improvement of salt tolerance in higher plants. In **dual edition**, **Oxford and IBH Publ**., New Delhi and Science Publishers**, Enfield (USA)**.
2. **Jaiwal P K** and Singh R P (eds) 2003 FOCUS ON BIOTECHNOLOGY Vol. 10A: Improvement strategies in Leguminosae Biotechnology. **Kluwer Acad.Publ., The Netherlands.**
3. **Jaiwal P K** and Singh R P 2003 FOCUS ON BIOTECHNOLOGY Vol. 10B: Applied Genetics of Leguminosae Biotechnology. **Kluwer Acad. Publ., The Netherlands**
4. Singh R P and **Jaiwal P K** (eds) 2003 Plant Genetic Engineering Vol. 1: Applications and Limitations. **Sci-Tech Pub. Co.**, P O Box 720728, Houston, Texas, **USA**

5. **Jaiwal P K** and Singh R P (eds.) 2003 Plant Genetic Engineering Vol 2: Improvement of Food Crops. **Sci-Tech Pub. Co.**, P O Box 720728, Houston, Texas, **USA**
6. Singh R P and **Jaiwal P K** 2003 (eds) Plant Genetic Engineering Vol. 3: Improvement of Commercial Plants I. **Sci-Tech Pub. Co.**, P O Box 720728, Houston, Texas, **USA**
7. **Jaiwal P K** and Singh R P (eds.) 2003 Plant Genetic Engineering Vol 4: Improvement of Commercial Plants II. **Sci-Tech Pub. Co.**, P O Box 720728, Houston, Texas, **USA**
8. Singh R P and **Jaiwal P K** (eds) 2003 Plant Genetic Engineering Vol. 5: Improvement of Vegetables. **Sci-Tech Pub. Co.**, P O Box 720728, Houston, Texas, **USA**
9. **Jaiwal P K** and Singh R P (eds) 2003 Plant Genetic Engineering Vol 6: Improvement of Fruits. **Sci-Tech Pub. Co.**, P O Box 720728, Houston, Texas, **USA.**
10. Singh R P and **Jaiwal P K** (eds) 2006 Focus on Plant Molecular Biology-2. Biotechnological approaches to improve Nitrogen Use Efficiency, Studium Press, LLC, Houston, Texas, **USA**.
11. Singh R P, Shankar N and **Jaiwal P K** (eds) 2006 Focus on Agriculture-1. Nitrogen Nutrition in Plant Productivity. Studium Press, LLC, Houston, Texas, **USA**.
12. **Jaiwal P K** (ed) 2006 Plant Genetic Engineering Vol. 7: Metabolic Engineering and Molecular Farming-I. Studium Press, LLC, Houston, Texas, **USA**.
13. **Jaiwal P K** and Singh R P (eds) 2006 Plant Genetic Engineering Vol. 8: Metabolic Engineering and Molecular Farming-II. Studium Press,LLC, Houston, Texas, **USA.**
14. **Jaiwal P K**, Singh R P and O P Dhankher (2008). Plant membrane and vacuolar transporters. CAB International Publication, **UK**.

Reviews / book chapters contributed in books published from India & abroad

15. **Jaiwal P K** and Gulati A 1995 Current status and future strategies of *in vitro* culture techniques for genetic improvement of mungbean (*Vigna radiata* L. Wilczek) **Euphytica** 85: 1-15.
16. **Jaiwal P K** and Singh R P 1995 Regulation of nitrogen assimilation by plant growth regulators. In Nitrogen Nutrition in Higher Plants Srivastava H S and Singh R P (eds) Associate Publishing Co., New Delhi pp 401- 416.
17. **Jaiwal P K**, Singh R P and Gulati A 1997 Perception of salt signals by higher plants In Strategies for the improvement of salt tolerance in higher plants Jaiwal P K, Singh R P and Gulati A (eds) Science Publ., USA pp 41-53.
18. Gulati A and **Jaiwal P K**.1997 The potential of plant tissue culture and related techniques for the improvement of salt tolerance in higher plants. In: Strategies for the improvement of salt tolerance in higher plants. Jaiwal P K, Singh R P and Gulati A (eds) Science Publ., USA pp 321 - 349.
19. Singh R P, Choudhury A, Gulati A, Dahiya H C, **Jaiwal P K** and Senger R S

1997 Response of plants to salinity in interaction with other abiotic and biotic factors. In: Strategies for the improvement of salt tolerance in higher plants Jaiwal P K, Singh R P and Gulati A (eds) Science Publ., USA pp. 25-35.

20. Mishra S N, **Jaiwal P K**, Singh R P 1999. Legume- *Rhizobium* symbiosis. In Nitrogen Nutrition of Plants Srivastava H S and Singh R P (eds). Science Publ., USA, pp 1-102.

21. Singh N D, Sonia, Sahoo L, Singh S M & **Jaiwal P K** 1998 Biotechnological approaches for the genetic improvement of pigeon pea In Recent Advances in Biotechnology (ed.) Trivedi P C, Panima Publ., New Delhi. pp 154-173.

22. Sonia, Sharma P, Preeti, Ragni & **Jaiwal P K** 1998 Application of molecular biology and biotechnology for the improvement of chickpea, In Recent Advances in Biotechnology (ed.) Trivedi P C, Panima Publ., New Delhi. pp 135-153.

23. Sahoo, Twinkle Sugla, & **P K Jaiwal** 2003 Genetic transformation and regeneration of *Vigna* species In Applied Genetics of Leguminosae Biotechnology. Jaiwal P K and Singh R P eds Kluwer Acad Publ., The Netherlands, pp. 89-120.

24. Singh N D, Kumar P A and **Jaiwal P K** 2003 *In vitro* regeneration and genetic transformation of pigeonpea. In Applied Genetics of Leguminosae Biotechnology, Jaiwal P K and Singh R P eds Kluwer Academic Publ. , The Netherlands, pp. 47-68.

25. Singh R P, Rizvi M, Sonia, Usha and **Jaiwal P K** (2003) Biotechnological strategies for improving salt tolerance in legumes. In: Improvement strategies in Leguminosae Biotechnology. Jaiwal P K & R P Singh (eds) Kluwer Acad. Publ, The Netherland, pp. 223-243.

26. Sonia, R P Singh, Sharma K K and **Jaiwal P K** (2003) *In vitro* regeneration and transformation of chickpea. In: Applied Genetics of Leguminosae Biotechnology. Jaiwal P K & R P Singh (eds) Kluwer Acad. Publ., The Netherland, pp. 69-87.

27. Sahoo L, Singh N D, Sugla T, Singh R P & **Jaiwal P K** (2003) Genetic transformation in legumes. In: Plant Genetic Engineering Vol 2: Improvement of food crops'. Jaiwal P K & Singh R P (eds) Sci. Tech Publ., USA. pp. 267-336

28. Sahoo L, Sugla T, Baloda A, Singh R P & **Jaiwal P K** (2003) Engineering abiotic stress tolerance in crop plants tolerance in plants. In In Plant Genetic Engineering Vol 1: Applications & limitations. Singh R P & Jaiwal P K (eds) Sci. Tech Publ., USA. pp 123-146.

29. Singh RP, Dhania G, Sharma V, Sharma A and **Jaiwal P K** (2006) Biotechnological approaches to improve phytoremediation efficiency for environmental contaminants. In: Bioremediation – a novel technology. Singh S N and Tripathi R D (eds) Springer-Verlag Publ. pp 1-38.

30. Singh RP, Dhull U, Shankar N and **Jaiwal P K** (2006) Nitrogen utilization in plants under salinity stress. In: Nitrogen Nutrition in Plant Productivity. Studium Press, LLC, Houston, Texas, USA. pp 203-276

31. Singh R P, Dahiya S and **Jaiwal P K** (2006) Slow release fertilizers for sustained nitrogen supply and high plant productivity. In: Nitrogen Nutrition in Plant Productivity. Studium Press, LLC, Houston, Texas, USA. pp 329-349.
32. **Jaiwal P K** and Singh R P (2006) Genetical manipulation of nitrogen assimilation to improve nitrogen use efficiency and yield of plants. In: Biotechnological approaches to improve Nitrogen Use Efficiency, Studium Press, LLC, Houston, Texas, USA, pp 257-284.
33. Savita and Jaiwal P K (2006) Bio-fortification of crop plants with minerals In: Plant Membrane and Vacuolar transporters (Ed. Jaiwal P K et al) CAB International, UK.
34. Singh R P, Kumar M and Jaiwal P K (2008) Improvement in nitrogen use efficiency and yield of plants by sustained nutrient supply and enhanced nitrogen assimilation. In: Development in Physiology, Biochemistry and Molecular Biology of Plants (Eds Bose B and Hemantaranjan A.) New India Publishing Agency, New Delhi, pp 1-31.
35. Sahoo L and **Jaiwal P K** (2008) Asiatic beans In: Compendium of Transgenic Crop plants, Transgenic Legume Grains and Forage (Eds. Kole C and Hall T C) **Wiley - Blackwell Publishing** Ltd. Oxford OX4 2DQ, England.
36. Singh RP, Bauddh K, Sainger M, Sainger PA, Singh J and **Jaiwal PK** (2011) Nitrogen use efficiency in higher plants under drought, high temperature, salinity and heavy metal contaminations. In: Nitrogen Use Efficiency in Plants. (Eds) Jain V and Kumar PA, New India Publishing Agency, New Delhi. Pp. 99-123.

Research Papers in referred journals:

37. Yadav S, Parmar SS, Jaiwal P K (2012) Identification of novel and conserved miRNA from two Asian *Vigna* species by computational approaches. **J. Plant Res.** (communicated).
38. Parmar SS, Sainger M, Chaudhary D, Jaiwal PK (2012) Plant regeneration from mature embryo of commercial Indian bread wheat (*Triticum aestivum* L.) cultivar. **Physiol. Mol. Biol. Plants** 18: 177-183.
39. Chhikara S, Dutta I, **Jaiwal P K** and Dhankher O P (2012) Developing an *Agrobacterium*-mediated transformation method for of *Crambe abyssinica*. **Industrial Crops and Products** 37: 457-465.
40. Chhikara S, Chaudhury D, Dhankher OP and **Jaiwal PK** (2012) Combined expression of barley class II chitinase and type I ribosome inactivating protein in transgenic *Brassica juncea* provide protection against fungus *Alternaria brassicae*. **Plant Cell Tiss. Org. Cult**. 108: 83-89.
41. Chikkara S, Chaudhary D, Sainger M. and **Jaiwal P K** (2012) A non-tissue culture approach for generating the transgenics of Indian mustard (*Brassica juncea*). **In Vitro Cellular & Developmental Biol. Plants** 48:7-14.
42. Chhabra G, Chaudhary D, Sainger M and **Jaiwal P K** (2011) Genetic transformation of an Indian isolate of *Lemna minor* by *Agrobacterium tumefaciens* and recovery of transgenic plants. **Physiol. Mol. Biol. Plants** 17: 129-136
43. Kumar R., Mandal B., Geetanjali S., Jain R.K. and **Jaiwal P. K.** (2010) Genome

organization and sequence comparison suggest intraspecies inconguence in M RNA of Watermelon bud necrosis virus. **Archives Virology** 155**:** 1361-1365.

45. Yadav M, Chaudhary D, Singh RP and **Jaiwal P K** (2010) *Agrobacterium* mediated genetic transformation of (*Sesamum indicum*) **Plant Cell Tiss. Org. Cult.** 103: 377-386.
46. Chaudhary D, Sainger M, Sahoo L and **Jaiwal P K** (2010) Genetic transformation of *Vigna* species: Current status and future prospectives. In: 14th International Workshop on Genetic Resources and Comparative Genomics of soybean and Vigna. National Institute for Agrobiological Sciences (**NIAS**), Tsukuba, **Japan**, pp 1-8.
47. Chhabra G., Deepika, Aggarwal V. and Jaiwal P.K. (2009) *In vitro* multiplication of *Psoralea corylifolia* – an endangered medicinal plant. MR Intl. J. Engg. Tech. **1**:79-84.
48. Chabbra G, Madan and **Jaiwal P K** (2008) TDZ induced direct shoot organogenesis and somatic embryogenesis in Lentil (*Lens culinaris*) **Physiol. Mol. Biol. Plants** 14: 347-353
49. Jacobsen HJ, Richter A and **Jaiwal PK** (2008) Transformation and *in vitro* culture in food legumes, In: Proceedings of the Fourth International Food Legumes Research Conference (IFLRC-IV), Food legumes for nutritional security and sustainable agriculture (ed. Kharkwal M C) Vol 1, Soc of Genetics and Plant Breeding, India, pp 347-351.
50. Chabbra G, Singh R P & **Jaiwal P K** (2007) Duckweed (*Lemna* spp.) Biotechnology for commercial exploitation, **Physiol. Mol. Biol. Plants** 13: 1-7
51. Saini R and **Jaiwal P K** (2007) *Agrobacterium tumifaciens*-mediated transformation of blackgram: an assessment of factors influencing the efficiency of *uidA* gene transfer. **Biol. Plant.** 51:69-74.
52. Sonia, Saini R, Singh R P and **Jaiwal P K** (2007) *Agrobacterium tumifaciens*-mediated transfer of *Phaseolus vulgaris* α-amylase inhibitor-1 gene into mungbean (*Vigna radiata* L. Wilczek) using bar as selectable marker. **Plant Cell Rep.** 26:187-198.
53. Sonia, Jaiwal R, Singh RP & **Jaiwal P K (2007)** Genetic engineering for storage pest resistance in plants **Physiol. Mol. Biol. Plants** 13: 101-113.
54. Chaudhury D, Madanpotra S, Jaiwal R, Sani R, Kumar PA and **Jaiwal P K** (2006) *Agrobacterium tumifaciens* –mediated high frequency genetic transformation of an Indian Cowpea (*Vigna unguiculata* L. Walp) cultivar and transmission of transgenes into progeny. **Plant Sci**. 172:692-700.
55. Saini R and **Jaiwal P K** (2005) Efficient transformation of a recalcitrant grain legume *Vigna mungo* L. Hepper via *Agrobacterium*- mediated gene transfer into shoot apical meristem cultures. **Plant Cell Rep**., 24:164-171.
56. Singh N D, Sahoo L, Saini R, Neera Bhalla S, **Jaiwal P K** (2004) *In vitro* plant regeneration and recovery of primary transformants from shoot apical meristem of pigeonpea. **Physiol. Mol. Biol. Plants** 10: 65-74.
57. Saini R, Sonia, Madanpotra S, Badola A, **Jaiwal P K** (2004) An improved protocol for plant regeneration via somatic embryogenesis from cell suspension cultures of *Vigna mungo* L. Hepper. **Physiol. Mol. Biol. Plants** 10: 121-125.

58. Saini R, Sonia and **Jaiwal P K** (2003) Stable genetic transformation of *Vigna mungo* L. Hepper via *Agrobacterium tumefaciens*. **Plant Cell Rep**., 21: 851-859.
59. Singh N D, Sahoo L, N B Sarin and **Jaiwal P K** (2003) Dose and exposure length –dependent morphoregulatory role of TDZ: Organogenesis and somatic embryogenesis in pigeonpea. **Plant Sci.,** 164:341-347**.**
60. Singh R P and **Jaiwal P K** (2003) Arsenic phytoremediation: New hopes for old Problem. **Physiol. Mol. Biol. Plants,** 9: 1-3.
61. **Jaiwal P K**, L. Sahoo, Sonia, N. D. Singh & R P Singh (2002) Strategies to deal with the concern about marker genes in transgenic plants: Some environmental friendly approach. **Curr. Sci**., 83: 128-136
62. Saini R and **Jaiwal P K** (2002) Age, position in mother seedling, orientation on medium and polarity determines the morphogenic response of epicotyl explants of *Vigna mungo* L. **Plant Sci.,** 163: 101-109.
63. L. Sahoo, Twinkle Sugla, N. D. Singh, Sonia, P. Nijsure, A. Gulati, R. P. Singh, and **P K Jaiwal** (2001) Current status and future strategies in genetic improvement of cowpea. **Vegetal Res**. 28:9-16.
64. Singh N D, Sahoo L., Sonia, **Jaiwal P K** (2002) *In vitro* shoot organogenesis and plant regeneration from cotyledonary node and leaf explants of pigeonpea (*Cajanus cajan* L.) **Physiol. Mol. Biol. Plants** 8: 133-140.
65. Sahoo L, Singh N D, Sonia, Sugla T, Singh RP and **Jaiwal P K** (2001) Genetically Modified Crops: A Bane or Boon to Green Revolution. **Physiol. Mol. Biol. Plants** 7: 1-2
66. **Jaiwal P K**, Ragini Kumari, Ignacimuthu S, Potrykus I & Sautter C (2001) *Agrobacterium tumefaciens* - mediated gene transfer in mungbean- a recalcitrant grain legume. **Plant Sci.** 161:239-247.
67. Sonia, Preeti, Singh R P and **Jaiwal P K** (2001) *Agrobacterium*-mediated gene transfer in Chickpea (*Cicer arietinum* L.) Proc 22nd Plant Tissue Culture Association (PTCA) National Seminar held at Almora. pp 407-412.
68. Rizvi S M, **Jaiwal P K** and Singh R P (2001) A possible involvement of cellular polyamine level in Thidiazurin induced somatic embryogenesis in chickpea. Proc 22nd Plant Tissue Culture Association (PTCA) National Seminar held at Almora. pp 163-175.
69. Sahoo L, Sushma, Sugla T, N D Singh and **Jaiwal P K** (2001) *In vitro* plant regeneration and recovery of cowpea (*Vigna unguiculata*) transformants via *Agrobacterium*-mediated transformation. **Plant Cell Biotech. Mol. Biol**.1: 47-54.
70. **Jaiwal P K**, Sonia and Upadhyaya K C (2001) Chickpea regeneration and transformation. **Curr. Sci.** 80: 1368-369.
71. Saini R and **Jaiwal P** K 2000 *In vitro* multiplication of *Pagnum harmala* -a medicinal plant. **Indian J. Exp. Biol.** 38: 499-503.
72. Sonia, L Sahoo, Gulati A, Dahiya S, Singh R P & **Jaiwal P K** 2000 *In vitro* multiplication of a multipurpose tree legume, *Tamarindus indica* from cotyledomary node. **Physiol. Mol Biol Plants** 6: 21- 25.
73. Singh R P and **Jaiwal P K** 1999 Manipulation of ammonia assimilation for increasing the Nitrogen utilization efficiency. **Curr. Sci.** 77: 325-326

74. Sonia, Dahiya S, Gulati A and **Jaiwal P K** 1999 Direct organogenesis in hypocotyl cultures of *Tarmindes indica*. **Biol. Plant.** 41: 331-337
75. Ignacimuthu S, Tereda R, **Jaiwal P K**, Sautter C & Potrykus I (1998). Detection of firefly luciferase activity in rice callus using CCD Camera. **Indian J. Exp. Biol.** 36: 920-923
76. **Jaiwal P K**, Christof S and Potrykus I (1998) *Agrobacterium rhizogenes*-mediated gene transfer in mungbean (*Vigna radiata*). **Curr. Sci.,** 75: 41-45.
77. Sharma P, Sahoo L, Singh N D and Jaiwal P K (1998) Genetic improvement of legumes. **Physiol. and Mol. Biol. Plant**. 4: 1-2.
78. Sonia, Jaiwal P K, Ahad A, Sahoo L (1998) Green Fluorescent Protein: a novel reporter gene. **Curr. Sci.,** 74: 402-405.
79. Gulati A and **Jaiwal P K** (1990) Culture conditions effecting plant regeneration from cotyledons of *Vigna radiata* (L.) Wilczek **Plant Cell Tissue Organ Culture** 23: 1-7.
80. Gulati A and **Jaiwal P K** (1991) *In vitro* high frequency plant regeneration of a tree legume *Tamarindus indica* L. **Plant Cell Reports** 10: 569 - 573.
81. Gulati A and **Jaiwal P K** (1992) *In vitro* induction of multiple shoots and plant regeneration from shoot tips of mungbean (*Vigna radiata* (L.) Wilczek) **Plant Cell Tissue Organ Culture** 29: 199-205.
82. **Jaiwal P K** and Gulati A (1992) Micro-propagation of *Tamarindus indica* L from shoot tip and nodal explants. **Natl. Acad. Sci. Lett**. 15: 63-67.
83. Gulati A and **Jaiwal P K** (1993) Comparative salt responses of callus cultures of *Vigna radiata* to various osmotic and ionic stresses. **J. Plant Physiol**. 141: 120-124.
84. Gulati A and **Jaiwal P K** (1993) *In vitro* selection of salt resistant *Vigna radiata* (L.) Wilczek plants by adventitious shoot formation from cultured cotyledon explants. **J. Plant Physiol.** 142: 99-102.
85. Gulati A and **Jaiwal P K** 1993 Selection and characterization of mannitol-tolerant callus lines of *Vigna radiata* (L.) Wilczek. **Plant Cell Tiss. & Org. Cult.** 34: 35-41.
86. Gulati A and **Jaiwal P K** (1993) *In vitro* selection and characterization of trans-4-hydroxy-L-proline resistant callus lines *Vigna radiata*: Tolerance to NaCl. **Plant Physiol. Biochem**. 31:699-705
87. Gulati A and **Jaiwal P K** (1993) Salt induced polypeptides in two callus lines of *Vigna radiata* (L.) Wilczek which differ in salt resistance. **Natl. Acad. Sci. lett.** 16: 287-292.
88. Gulati A and **Jaiwal P K** 1993 *In vitro* selection of salt resistant *Vigna radiata* L.) Wilczek. **Res. J. Pl. Environ.** 9: 145-152.
89. Gulati A and **Jaiwal P K** 1994 Plant regeneration from cotyledonary node explants of mungbean (*Vigna radiata* (L.)Wilczek). **Plant Cell Reports** 13: 523-527.
90. Gulati A and **Jaiwal P K** 1994 *In vitro* selection and characterization of a callus line of *Vigna radiata* to NaCl, KCl, and $Na_2 SO_4$. **Biol. Plant.** 36:21-28.

91. Gulati A and **Jaiwal P K** 1994 *In vitro* selection and characterization of *Vigna radiata* cell- line resistance to PEG-induced drought stress. **Acta Physiol. Plant.** 16: 53-60.
92. Gulati A and **Jaiwal P K** 1994 Cellular and whole plant responses of *Vigna radiata* to NaCl stress. **Biol. Plant.** 36: 301-307.
93. Gulati A and **Jaiwal P K**1995 Chances in growth, ion and metabolites in two callus lines of *Vigna radiata* which differ in salt tolerance. **J. Agro. & Crop Sci.** 175: 325-334.
94. **Jaiwal P K**, Bala S, Dahiya S and Gulati A 1995 Plant regeneration from cotyledons of *Dalbergia sissoo* Robx - a leguminous timber tree. **Physiol. & Mol. Biol. of Plant** 1: 37-44.
95. Lal S D, Bhardwaj K R and **Jaiwal P K** 1982 Occurrence of rutin in *Asplenium trichomanes* L. **Curr. Sci**. 51: 1036 - 1037.
96. **Jaiwal P K** and Bhambie S 1983 Influence of morphactin on leaf morphology and stomatal apparatus of *Vigna radiata* (L.) Wilczek. **Gionale Botanico Italiano 117**: 39-46.
97. **Jaiwal P K** and Bhambie S 1983 Effect of growth substances on the morphology of *Cicer arietinum* leaf. **Acta Botanica Indica** 11: 1-6.
98. **Jaiwal P K** and Bhambie S 1983 Observations on the effect of groth regulators on cotyledonary stomata of *Cyamopsis tetragonoloba* (L) Taub. **Plant and Nature** 1: 10-15.
99. **Jaiwal P K** and Bhambie S 1984 Influence of some growth regulators on *in vitro* pollen growth of *Cicer arietinum* L. **Sci. and Culture** 50: 207- 209.
100. **Jaiwal P K** and Bhambie S 1984 Chloroflurenol induced leaf aberration in *Cicer arietinum* L. **Curr. Sci**., 53: 216-217.
101. **Jaiwal P K** and Bhambie S 1985 Thermo-sensitivity of pollen behaviour in *Cicer arietinum* L. **Intl. Chickpea Newslett**. 9: 15
102. **Jaiwal P K** and Bhambie S 1985 Effect of salinity on seed germination and seedling growth of chickpea. **Intl. Chickpea Newslett**. 9: 15-16.
103. **Jaiwal P K** and Bhambie S 1985 Chloroflurenol induced changes in leaf morphology in chickpea. **Intl. Chickpea Newslett.** 9: 12.
104. Sharma K K and **Jaiwal P K** 1985 Soil Indicator Plants. **Science Reporter** (CSIR Publ.) Dec. issue.
105. **Jaiwal P K** and Gulati A 1989 Morphactin and abscisic acid induced pseudo nodules formation in roots of Cicer arietinum. **Proc. Natl. Acad. Sci.** 59: 463-466.
106. **Jaiwal P K** and Bhambie S 1989 Effect of growth regulating substances on podding and yield of Vigna radiata. **Acta Botanica Indica** 17: 54-58.
107. **Jaiwal P K** and Singh R P 1989 Effect of growth regulators on peroxidase activity and some metabolites of *Cicer arietinum* during developmental stages, **Proc. Natl. Seminar ISPP Bombay** pp 41-45.
108. Jaiwal P K and Gulati A 1990 Influence of morphactin and its combination with other growth regulators on podding and yield of chickpea (*Cicer arietinum*) Geobios 17: 128-130.

109. Jaiwal P K and Gulati A 1992 Effect of presowing seed soaking treatment with different growth regulating substances on podding and yield of *Vigna radiata* L. Wilczek Geobios 19: 129 - 132.
110. Gulati A and **Jaiwal P K** 1995 *In vitro* evaluation of wild species of *Vigna* for salt tolerance. **Natl. Acad. Sci. Lett.** 19:102 -106.
111. Gulati A and **Jaiwal P K** 1995 Effect of NaCl on nitrogen assimilating enzymes in two contracting cell lines of *Vigna radiata* (L.) Wilczek. **Biol. Plant.** 38: 177-183.
112. Gulati A and **Jaiwal P K** 1996 Micropropagation of *Dalbergia sissoo* from nodal explants of mature tree. **Biol. Plant.** 38: 169-175.
