

BIO-DATA

Name : **M.S.M. RAWAT** M.Sc. Ph.D. (IIT/D), M.N.A.Sc.
Father's Name : Late Sri Khilpat Singh Rawat
Date of Birth : 10th July, 1949
Place of Birth : Chamoli District Uttarakhand, India
Marital Status : Married (two sons)

Designation :
Address : **Emeritus Professor in Chemistry
Doon University, Dehradun
(up to Sept. 2016).**

Address for correspondence:

Post Box 63

Nursery Road, Tewari Mohalla, Srinagar, Garhwal

Tel: 01346 252902@; 9411104325; 7830222580

Email: msmrawat@gmail.com

Former Vice Chancellor

**HNB Garhwal University (Central university),
Srinagar, Uttarakhand (March to July 2014)**

Administrative Experience:

• **Vice Chancellor**

H.N.B. Garhwal University, Srinagar (Garhwal)

UK 246 174

(10th may 2008 to 15th October, 2008)

- **Head of Chemistry & Coordinator of UGC-SAP & DST FIST Department, HNB Garhwal University, Srinagar (Garhwal); 1985 to 15th Jan. 2012**
- **ADSW; 1985-86**
- **Dean Student's Welfare; 1987-1990.**
- **Chief Proctor; 1992-93**
- **Dean Co-ordinator & Dean Student Welfare; 1993-1998**
- **Member, Developmental Council of University**
- **Established Dept. of Pharmaceutical Sciences in 1996 and coordinated teaching and all programs till 2006.**
- **Dean, Faculty of Science; 1998-2001**
- **Prof. In charge-Computer Science and established MCA Lab, 1999- 2001**
- **Chairman and Hon. Librarian, 2006-2012**
- **Chairman Building Committee**
- **Additional Charge of Registrar, HNB Garhwal University, Srinagar. 2000-2001. Conducted the whole examination of the University**
- **Worked as Finance Officer time to time.**

- Being senior most Professor, discharge the duties of Vice- Chancellor time to time in the absence of V.C.
- Appointed Appellate Authority (under RTI Act) of the University from 1996 to 31st July 2014.
- Coordinator UGC SAP DRS I and DST FIST
- Dean School of Sciences from 2010 to 2013.
- Worked as Chairman, Coordinator and Member of NAAC Peer Team.
- Chairman, Member of AICTE and UGC Peer Team.

Brief Summary of Research Achievements:

- Studied photochromism in Schiff's bases and hydrazones and synthesized photochromic Anils.
- Analysed a number of medicinal plants of high altitude zone of Uttarakhand and their bioactive constituents and Chemotaxonomic markers were identified.
- Novel compounds were isolated and their structures were established.
- Bioactivities of many isolated compounds were determined.
- Some potential plant species were investigated for spermicidal activity and attempts were made to establish structure activity relationship.
- Tree-crops interactions were studied. Allelopathic effects of socio- and agro forestry plants on field crops was investigated. Some new allelochemical were identified.
- Nutritional and Keeping Quality of some edible wild fruits of Garhwal region were assessed.
- Worked on polymer Chemistry and grafted PVC and PVA with bifunctional amines. Thermo chromic polymers were also synthesized.
- Attempts were made to identify and evaluate some plants species for pesticidal activity.
- Worked on chemical profiling and certification of the quality of medicinal herbs growing at different places in the region.
- Synthesized phytosomes of some active medicinal plants constituents and used in drug delivery system for improving the availability of phytoconstituents in the system
- Synthesized some biologically active Nitrogen Heterocyclic compounds and prepared biologically active curcumin based molecules.
- **Award and Recognition:**
 - Founder member of International Allelopathy Society.
 - Awarded UGC visiting Fellow
 - Member of National Academy of Sciences, India (1998).
 - Visiting Professor in Nagoya University, Japan (2002)
 - Mission Leader , Education Mission to China (2008)

Educational Qualification:

B.Sc./ M.Sc.	1968/1970 I st Div.(DSB, Nainital)	Agra University
Pre Ph.D.	1980	IIT New Delhi

Ph.D.* 1984

IIT New Delhi

***Title of the thesis :** Study of Photochromism in Organic Compounds
(Photochromism in Schiff's Bases & Hydrazones)

Professional Experience:

Lecturer; Govt. Degree Colleges in Uttar Pradesh; Sept. 1970-July 1977

Lecturer; Dept. of Chemistry, HNB Garhwal University, Aug., 1977-1983
Srinagar (Garhwal)-246174

Teacher Fellow; Dept. of Chemistry, I.I.T. New Delhi; 1979-1984

Reader, Dept. of Chemistry, HNB Garhwal University, Feb., 1984-1990
Srinagar (Garhwal)-246174

Professor & Head in Chemistry; Dept. of Chemistry May 1990-to 15th Jan. 2012
Professor May 1990 to 31st July 2014

Primary area of research: Photochromism & Natural Products

Teaching Experience: **Teaching Degree and Post Graduate Classes since 1st Sept., 1970 to 31st July 2014. 45 Years**

- Convener Board of Studies and Research Degree Committee 1985-2014.
- Instrumental in implementing the UGC curriculum and CBCS system in the University.

Mission Leader- Education Mission to China from 16th November to 22 November, 2008 and visited Beijing, Shenyang, Liaoning, Shanghai Jiao Tong and Fudan Universities to work out the collaborative research programs.

Research Experience : 40Years

Last Pay Scale : 37,400-67000 with Grade pay Rs 10,000/=

D. Phil. Guidance : **Forty Two (45) students**

Research Schemes Completed:

- (i) Study of photochromism in arylidenearylhydrazines (UGC).
- (ii) Keeping quality and nutritional value of the wild edible fruits of Garhwal (CSIR).
Approx. amount - 5 Lakhs.
- (iii) Analysis of rare medicinal plant genera of Garhwal and their chemotaxonomic categorisation (UGC).
Approx. amount - 4 Lakhs
- (iv) Seasonal and altitudinal variations in the bioactives of the potential medicinal plants of Garhwal (All India co-ordinated project for seed biology-DOE, New Delhi).

Approx. amount - 6 Lakhs

- (v) Plant interactions and environmental hazards and their mitigation. (AICTE, New Delhi).

Approx. amount - 11Lakhs

- (vi) Genetic diversity and some large-scale propagation of some Himalayan threatened medicinal and aromatic species.

Project No. BT/BMP/03/20/95

D.B.T. Govt. of India (Co-Investigator)-35 lakhs

- (vii) Identification and Analysis of botanical pesticides

G.B.P.I.E.D. - 5.50 Lacs (completed in Dec. 2006)

- (viii) DST-FIST Programme from 2003-07

Rs.23 lakhs

- (ix) Chemical Profiling for Certification of some Medicinal Herbs of Garhwal

UCOST-Approximately 9.0 Lacs (2007- 11)

- (x) Phytosomes in Improving Hepatoprotective activity of Phytoconstituents.

DST (Govt. of India) Rs. 22 lacks

(XI) Effect of solvents system on the stability of fluorescent crown ether complex of metal ions -- Collaboration with UGC-DAE consortium for scientific research, Indore

(XII).

- 1) DST-FIST Program (II) Rs. 185 lacs
- 2) UGC-SAP Program 50 lacs
- 3) UGC BSR Scheme for research Rs 7.0 Lacs

Member/Convener ship:

- Convener-Board of studies HNB Garhwal University 1987 to date
- Convener - Research Degree Committee HNB Garhwal University, 1987 to date.
- Convener- BOS Pharmaceutical Sciences, HNB Garhwal University Srinagar, since 1996 to 2006
- Member - Faculty Board
- Member - University Court
- Member - Academic Council
- Member - Executive Council HNB Garhwal University, Srinagar (1994-95 & 2000-2001 and 2010-2013)
- University Coordinator for UGC and NAAC teams.
- Chaired Technical Sessions in various conferences.
- Chaired a Technical Session in 13th ISCB International Conference on Interplay of chemical and Biological Sciences: 26-1st March, 2009 in University of Delhi, Delhi.
- Member of the UGC Project Advisory Committee 2009, 2010.

- Member and Coordinator of NAAC and UGC Committees.

Membership, Fellowship of Professional Academic Bodies Society:

- Life Fellow of Indian Chemical Society, Calcutta.
- Member - B.O.S. & R.D.C. of various Universities.
- Member - Indian Science Congress.
- Member and Fellow - International Allelopathy Society (IAS, USA).
- Member - National Institute of Ecology.
- Life member - Indian Society of Mass Spectrometry.
- **Member - American Chemistry Society.**
- **Member - Indian National Academy of Sciences, Allahabad, 1998 (MNASc)**
- **Chairman, member and Member Co-ordinator of National Assessment and Accreditation Council (NAAC), Bangalore.**
- **Nominated Secretary (North Zone) Indian Association of Chemistry Teachers Association (IACT) from 2005-2007 and from 2007—2010.**
- **Vice President of ACT North zone from 2010 to till now.**
- **Member of UGC team for the review of XI Five Year Plan.**
- **Organized a Non-Governmental Organization named Uttaranchal Yuva and Village Development Centre at Narainbagar, Chamoli. This N.G.O. centre has popularized solar equipment's, smokeless Chullah and sanitation schemes in villages of Tehasil Tharali (Chamoli).**
- **Reviewer of many Journals.**
- **Associated with UGC Pathsala scheme as reviewer and writer.**
- **Member of ICFRE Academic Audit Team (2016).**

List of Publications:

1. S. Mal, J.L. Narula and M.S.M. Rawat, "Substitution effect on the strength of intramolecular hydrogen bonding in Schiff's based", *J. Indian Chem. Soc.* LVII, 1981, 652.
2. S. Mal, J.L. Narula and M.S.M. Rawat, "Study of Photochromism in anils of o-hydroxyacetophenone, O-hydroxybenzophenone and 2'-hydroxydeoxybenzoin", *Indian J. Chem.*, 21B, 1982, 120.
3. S. Mal, J.L. Narula and M.S.M. Rawat, "Study of photochromism in N-salicylideneaniline derivatives", *Indian J. Chem.*, 21B, 1983, 38.
4. M.S.M. Rawat and J.L. Narula, "Characterisation and study of photochromism of hydroxylated polyazomethines", *European Poly. J.*, 21, 1983, 38.
5. M.S.M. Rawat and J.L. Narula, "Photochromism in bis--N, N'-salicylideneanilines and N, N'-bisalicylideneamines", *Indian J. Chem.*, 26B, 1987, 232.
6. M.S.M. Rawat, "Photochromism in N, N,-di-(o-nitrobenzylidenes) diamines", *Indian J. Chem.*, 26B, 1987, 238.
7. M.S.M. Rawat and S. Mal, "Study of photochromism in benzenesulphonydrazones", *J. Indian Chem., Soc.*, LXIV, 1987, 295.
8. M.S.M. Rawat, D.S. Negi, G. Pant and M.S. Panwar, "Chemical examination of *Rheum moorcroftianum*, a rare high altitudinal plant of Garhwal", *Fitoterapia*, LIX, 248,(1988).
9. G. Pant, M.S. Panwar, D.S. Negi and M.S.M. Rawat, "Spermicidal activity of steroidal and triterpenic glycosides", *Current Science*, 57, 1988, 66.
10. G. Pant, M.S. Panwar, D.S. Negi and M.S.M. Rawat, "Spermicidal activity and chemical examination of *Pentapanex leschenaultii* fruits", *Herba Pol.*, 34, 1988, 161.
11. G. Pant, M.S. Panwar, D.S. Negi and M.S.M. Rawat, "Spermicidal glycosides from *Pentapanex leschenaultii* fruits", *Planta medica*, 54, 1988, 377.
12. M.S.M. Rawat, D.S. Negi, M.S. Panwar and G. Pant, "Spermicidal activity and chemical analysis of *Ophiopogon intermedius* rhizomes", *Pharmazie*, 43, 1988, 143.
13. M.S.M. Rawat, D.S. Negi, M.S. Panwar and G. Pant, "A spirostanol glycoside from the rhizomes of *Ophiopogon intermedius*", *Phytochemistry*, 27, 1988, 2326.
14. G. Pant, M.S. Panwar, D.S. Negi, M.S.M. Rawat and G.A. Morris, "Spirostanol glycoside from fruits of *Asparagus officinalis*", *Phytochemistry*, 27, 1988, 3324.
15. G. Pant, M.S. Panwar, D.S. Negi, M.S.M. Rawat and G.A. Morris and R.I.G. Thompson, "Structural elucidation of a spirostanol glycoside from *Asparagus officinalis* fruits by concerted use of two dimensional NMR techniques", *Magnetic Resonance in Chemistry*, 26, 1988, 911.
16. M. Srivastava, M.S.M. Rawat, V. Shankar and A.K. Srivastava, "Effect of Industrial effluents on growth behaviour of wheat plants", *J. of Nat. & Phy. Sciences*, Gurukul Kangri Viswavidyalaya, Hardwar, 2, (1-2), 1988, 1-6.
17. M.S.M. Rawat, D.S.Negi, Y. Oshime, T. Okuyama, S. Shibata & G. Pant, "Anthraquinone glycoside from *Rheum moorcroftianum*", *Pharmazie*, 44, 1989, 509.
18. M.S.M. Rawat, D.S. Negi, M.S. Panwar and G. Pant, "Spermicidal activity and chemical investigation of *Albizzia chinensis*", *Fitoterapea*, LX, 168, 1989.

19. M.S.M. Rawat, S. Mal and G. Pant, "Photochromic activity of 4-hydroxybenzylidene salicyloyl", *Current Science*, 58, 1989, 796.
20. M.S.M. Rawat, S. Mal and G. Pant, "Synthesis and photochromic study of arylidenehydrazides", *J. Indian Council of Chemist*, VIII (I), 1992, 69.
21. M.C. Purohit, G. Pant and M.S.M. Rawat, "A new betunilic acid glycoside from the leaves of *Schefflera venulosa*", *Phytochemistry*, 30, 1991, 2419.
22. M.C. Purohit, M.S.M. Rawat and G. Pant, "Anti-microbial activity and phytochemical analysis of *Spiraea vestita*", *Fitoterapia*, LXIII (5), 1992, 461.
23. M.C. Purohit, M.S.M. Rawat and G. Pant, J. Sakakibara and T. Kaiya, "A methyl ester of malelotoside from the sapwood of *Prunus cornuta*", *Phytochemistry*, 32, 1993, 431.
24. M.C. Purohit, G. Pant and M.S.M. Rawat, "Spermicidal activity and chemical analysis of *Schefflera venulosa*", *Fitoterapia*, LXIV (3), 1993, 274.
25. A.K. Nautiyal, M.S.M. Rawat, M.C. Purohit and G. Pant, "Anti-fungal activity and chemical analysis of *Prunus jacquemontii*", *Fitoterapia*, LXV (1), 1994, 79.
26. Y.S. Negi, M.S.M. Rawat, G. Pant Joshi and S. Badoni, "Biochemical investigation of fruits of some common *Ficus* species", *Food Science Technology*, 25, 1992, 582.
27. A. Nautiyal, G. Pant, M.S.M. Rawat and G. Morris, "Identification and Ab initio carbon-13 NMR assignment of a proanthocyanidin from *Prunus jacquemontii*", *Mag. Res. Chem.*, 30, 1992, 5142.
28. M.S.M. Rawat, S. Badoni, G. Pant and Y.S. Negi, "Biochemical investigation of some common wild fruit, *Prog. Hort.*", 26 (1-2), 1994, 35-40.
29. S. Badoni, M.S.M. Rawat, G. Pant and Y.S. Negi, "Nutrient composition of some common *Berberis* species", *Prog. Hort.*, 26 (1-20), 1994, 41-44.
30. M. Srivastava, M.S.M. Rawat and A.K. Srivastava, "Effect of different concentrations of zinc on the survival and growth behavior of *Chlorella vulgaris*", *Poll. Res.*, 10 (1), 1991, 49.
31. M.S.M. Rawat, G. Pant and M.C. Purohit, "Anti-bacterial activity of the rhizomes of *Polygonum amplexicaulii*", *Fitoterapia*, 1993.
32. M.S.M. Rawat, G. Pant and R. Kukreti, J. Sakakibara and A. Nagatsu, "A persicogenin-3'-glucoside from the stem bark of *Prunus amygdalus*", *Phytochemistry*, 38, 1995, 1519.
33. R.K. Joshi, D. Prasad, M.S.M. Rawat and G. Pant, "Allelopathic effect of leaves of *Fraxinus micrantha* on some crops", *Allelopathy Journal*, 3, 1996, 255-260.
34. D. Prasad, R.K. Joshi, G. Pant and M.S.M. Rawat, "Ephedranin A from *Prunus armeniaca* L.", *Fitoterapia*, LXVIII, 1997, 275-276.
35. R.K. Joshi, D. Prasad, C.B. Pande, M.S.M. Rawat and G. Pant, "Allelopathic effect of root and bark extracts of *Prunus jacquemontii* on *Raphanus sativus*", *Allelopathy Journal*, 4, 1997, 329-334.
36. M.S.M. Rawat, G. Pant, D. Prasad, R.K. Joshi and C.B. Pande, "Plant growth inhibitors (Proanthocyanidins) from *Prunus armeniaca*", *Biochemical Systematics and Ecology*, 26, 1998, 13-23.
37. R.K. Joshi, D. Prasad, G. Pant and M.S.M. Rawat, "Abieslactone from *Abies pindrow*", *Fitoterapia*, LXIX (1), 1998, 95.
38. R.K. Joshi, D. Prasad, M.S.M. Rawat and G. Pant, "Constituents of *Fraxinus micrantha*", *Fitoterapia*, LXIX, 275, 1998.
39. C.B. Pande, D. Prasad, R.K. Joshi, M.S.M. Rawat and G. Pant, "Allelopathic potential of *Prunus amygdalus*", *Allelopathy Journal*, 5, 1998, 83-88.
40. D. Prasad, R.K. Joshi, G. Pant, M.S.M. Rawat, K. Inoue, T. Shingu, Z.D. He, "An A-type proanthocyanidins from *Prunus armeniaca*", *J. Nat. Prod.* 61, 1123 (1998).
41. R.K. Joshi, D. Prasad, R. Nautiyal, C.B. Pande, G. Pant and M.S.M. Rawat, "Phytotoxicity of *Cassia fistula* on *Triticum aestivum* seedlings", *Journal of Hill Research*, 11, 1998, 43-48.
42. M.S.M. Rawat, D. Prasad, R.K. Joshi and G. Pant, "Proanthocyanidins from *Prunus armeniaca* roots", *Phytochemistry*, 50, 1998, 321-324.

43. M.C. Purohit, Raman Bahuguna, U.C. Maithani, A.N. Purohit and M.S.M. Rawat, "Variation in Podophylloresin and Podophyllotoxin contents in different populations of *Podophyllum hexandrum*.", *Current Science* 77, 1999, 1078.
44. D. Prasad, M.S.M. Rawat and G. Pant, Allelopathic effect of *Rhamnus virgatus* on some crops, *Allelopathy Journal*, 6, 1999.
45. D.Prasad, Vijay Juyal, Rajdev Singh, V.Rana, Geeta Pant, and M.S.M.Rawat, A new seco-iridoid glycoside from *Lonicera augustifolia*, *Fitoterapia*, 71, 2000, 420.
46. R. Bahuguna, M.C. Purohit, M.S.M. Rawat and A.N. Purohit, Qualitative and Quantitative variations in alkaloids of *Aconitum* species from Garhwal Himalaya, *J. Plant Bio.* 27 (2), 2000, 179-183.
47. U.C. Maithani, M.C. Purohit, R. Bahuguna, M.S.M. Rawat and A.N. Purohit, Qualitative and Quantitative variations in anthraquinone derivatives and quercetin glycosides of *Rheum* sp. from Garhwal Himalaya, *J. Plant Biol.*, 2001.
48. M.S.M. Rawat, G. Pant and Renu Pandey, Xanthones from *Swertia alternifolia*, *Ind. J. Pharm. Sciences* 63 (6), 2001, 516-517.
49. Virendra Singh Rana & MSM Rawat, Antifeedent activity of some medicinal plants against *Sitophilus oryzae*., *SHASHPA*,10(ii), 2003, 171-174.
50. Manoj Kumar, Versha Percha and M.S.M. Rawat, "Fatty acid composition and physicochemical properties of *Dysoxylum binectareferum* seed coat oil" *Indian Forester*, 129(11), 2003, 1395-1398.
51. Manoj Kumar, Versha Percha and M.S.M.Rawat, "Antimicrobial Activity of *Dysoxylum malabaricum*" *J. Natural Remedies*, 47, 2003, 183.
52. Vertika Shukla., Sandeep Negi., M.S.M. Rawat, G. Pant, "Chemical Study of *Ramalina africana* (Ramalinaceae), from Garhwal Himalayas", *Biochemical Systematics and Ecology* 32, 2004, 449-453.
53. Manoj Kumar, Versha Percha and M.S.M. Rawat, "Chemical composition of essential oil from *Dysoxylum benectareferum*, *Indian Drugs*, 41, 2004, 242-243.
54. 56. Manoj Kumar, Versha Percha and M.S.M. Rawat, Composition of essential oil from *Dysoxylum malabaricum*, *Indian Perfumer*,48(2), 2004, 191-192.
55. Sandeep Negi, Vertika Shukla, M.S.M. Rawat, G. Pant & A. Nagatsu; Premnosidic acid, a new iridoid glycoside from *Premna barbata*, *Indian J. Chem. Sec. B*, 43, 2004, 1805-1806.
56. Sandeep Negi, Vertika Shukla, M.S.M. Rawat, G. Pant & A. Nagatsu, A new aliphatic ester from the aerial parts of *Polygonum polystachyum*, *J.Indian Chem.Soc.* 82, 2005, 757-758.
57. Virendra Singh Rana, MSM Rawat, G. Pant & Akito Nagatsu, Chemical constituents and antioxidant activity of *Mallotus roxburghianus* leaves, *Chemistry & Biodiversity*, 2, 2005, 792-798.
58. K. Hirakawa, M. Yoshida, Akito Nagatsu, H. Mizukami, V. Rana, M.S.M. Rawat and S. Kawanishi, Chemopreventive Action of Xanthone Derivatives on photosensitized DNA Damage, *Photochemistry & Photobiology*, 81, 2005, 314-319.
59. Virendra S. Rana & Mohan S. M. Rawat, A new xanthone glycoside and antioxidant constituents from rhizomes of *Swetia speciosa*; *Chemistry & Biodiversity*, 10(2), 2005, 1310-1315.
60. Versha Percha, Atul Kaushik, Jeevan J. Kaushik and M.S.M.Rawat, Antidermatophytic Effect of Crude Leaf Extracts of *Alseodaphne Andersonii*; *Natural Products An Indian Journal*, 2(1), 2006, 19-22.
61. Semalty A.,Semalty M. and Rawat M.S.M.; Phytosomes in Herbal Drug Delivery : A Review; *Indian Drugs*, 43(12), 2006, 937-946.
62. M.S.M. Rawat and Geeta Pant, Bioactives from some Medicinal plants; Conference on Natural Products & Biodiversity, FRI Dehradun: Chemistry and Utilization, Nov. 2-3, 2006

63. M.S.M. Rawat, Vertika Shukla, Sandeep Negi & G. Pant, "Chemical Study on Garhwal Himalayan Lichen: *Usnea emidotteris*", *Indian J. Chem.*, 45B, 2006, 2566-70.
64. M.S.M. Rawat and K.R. Dutt; Comparison of Hepatoprotective Activity of some Plants with Silymarin. *Plant archives*, 7 (1), (2007).
65. M. S. M. Rawat and K. R. Dutt; Hepatoprotective Effect of the Leaves of *Woodfordia floribunda*: *Planta Indica*, 3(1), 2007, 33-34.
66. M.S.M. Rawat; Lead Lecture delivered on Green Chemistry in 2nd Uttarakhand State Science Congress 15-17 Nov. 2007 Kumaon University, Nainital ; abstract pag189 (LL 03)
67. Versha Parcha, Atul Kaushik, J.J. Kaushik ,M.S.M.Rawat, Evaluation of Antimicrobial Potential of *Alseodaphne andersonii* Leaf Extracts Against Pathogenic Bacteria, *J. of Pharmaceutical Biology*, 45, 2007, 1-4.
68. Ajay Semalty, Mona Semalty and M.S.M. Rawat; The Phyto-Phospolipid Complexes- Phytosomes: A Potential Therapeutic Approach for Herbal Hepatoprotective Drug Delivery, *Pharmacognosy Reviews*, 1(2), 2007, 369-374.
69. I. Ali, P. Singh and M.S.M. Rawat and A. Badoni; Analysis of Organo Chlorine pesticides in the Hindon river water, *Journal of Environmental Protection Science*, 2, 2008, 47-53.
70. Semalty A, Semalty M, Rawat MSM. Development & characterization of novel herbal drug delivery system (Phytosomes) of xanthones isolated from *Swertia alternifolia* for improving bioavailability, In Dobhal R, Kotlia BS, Eds, Science and Technology in Uttarakhand, Macmilan India, New Delhi, 2008: 247-253.
71. M. Dimri, M.S.M. Rawat and G. Pant; Essential and fixed oils composition of *Perilla frutescens* and its insecticidal activity against stored grain pest *Sitophilus oryzae*, *Indian Perfumer*, 52(1), 2008, 57-59.
72. Semalty Ajay, Semalty Mona, Devendra Singh and Rawat M.S.M., Development and Physicochemical Evaluation of Pharmacosomes of Diclofenac, *Acta Pharmaceutica*, 59, 2008, 335-344.
73. Semalty M., Semalty A. Joshi G.P., Rawat,M.S.M., Herbal hair growth promotion strategies for Alopecia, *Indian Drugs*(Review Article), 45(9), 2008, 689-700.
74. M.S.M. Rawat, Development of lipid vesicular systems for improving bioavailability of synthetic and herbal drugs, Invited lecture delivered in 13th ISCBS International conference on "Interplay of Chemical and Biological Science: Impact on Health and Environment" 26th Feb. to 1st March 2009 in University of Delhi, Delhi
75. D.S. Rawat, Ram Singh, Nitin Kumar and M.S.M. Rawat, Synthetic and Clinical Status of Marine Derived Anticancer Peptides, A Review: *Comp. Bio. Nat. Proc.*, 7, 2009, 1-28.
76. Y.M. Bahuguna, M.S.M. Rawat, V. Juyal and G. Gnanarajan, Antilithiatic Effect of Grains of *Eleusine coracana*, *Saudi Pharmaceutical Journal* 17(2) 182-187, 2009.
77. Ajay Semalty, Mona Semalty, M.S.M. Rawat and Federico Franceschi, PHYTOSOMES: Phyto-phospolipid Complexes Improving Bioavailability of Herbal Drugs. A Review: *Fitoterapia*, 81, 2010, 306-314 doi:10.1016/j (2009).
78. Yogendra Bahuguna and Mohan Singh Maniyari Rawat, Diuretic Activity of Grains of *Eleusine coracana*, *Journal of Pharmacy Research* 2(4), 775-776 (2009).
79. Bahuguna,Y., Juyal, V., Rawat, M.S.M., Diuretic Activity of Flowers of *Jasminum auriculatum* Vahl, *Journal of Pharmacy Research*, 2(2),215-216 (2009).
80. A. Semalty, M. Semalty, B.S. Rawat, Devendra Singh and M.S.M. Rawat, Pharmacosomes: The Lipid Based New Drug Delivery System, *Expert Opinion on Drug Delivery*, 6(6), (2009), 1-14.
81. Jagmohan S. Negi, Pramod Singh, Geeta Joshi nee Pant and M. S. M. Rawat, Quantitative Assessment of xanthone derivatives in *Swertia chirata* (Wall.) by RP-HPLC with UV detection, *Medicinal Plants International Journal of Phytomedicines and Related Industries*, 1(2), 2009, 97-100.

82. Sati N, Kumar S, Rawat MS. Synthesis, Structure Activity Relationship Studies and Pharmacological Evaluation of 2-Phenyl-3-(Substituted Phenyl)-3H-Quinazolin-4-ones as Serotonin 5-HT(2) Antagonists. *Indian J Pharm Sci.* 2009, 71(5), 572-575.
83. Bhawna Yadav Lamba, Himmat Singh and M.S.M.Rawat, Bio-Fuels/Bio-Diesel Production Technologies- An Analysis, *Oil Asia Journal*, March-April, 35-45(2009).
84. Ajay Singh, M.S.M. Rawat & C.S. Pande "Modification, Application & Health aspects of PVC: A Review", '*Chemical Weekly*' 21Oct. 2008, 195-198,.
85. Ajay Singh, M.S.M. Rawat & C.S. Pande "Grafting of crosslinked poly (vinyl alcohol) with acrylic acid & acrylamide using benzoyl peroxide" Accepted in "*Pigment & Resin Technology*" Emerald international publication, UK.
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 48. Lecture delivered on GREEN CHEMISTRY in the National seminar at MKP College, Dehradun, Dolphin Institute, Dehradun and other colleges (2007-2008).

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