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ACADEMIC

D.Phil. (2009) in Phytochemistry from HNB Garhwal University, Srinagar, UK, India. Advisor: Dr. U. Rawat

M.Sc. (2005) in Organic Chemistry with 70.92% from HNB Garhwal University, Srinagar, UK, India.

POSTDOCTORAL EXPERIENCE

1. UGC-Dr DS Kothari Postdoctoral Fellow (2010-2013) in the Department of Chemistry, Panjab University, Chandigarh, India. Advisor: Prof. G.J.P. Singh
2. TUT/NRF-Postdoctoral Fellow (2013-2015) in the Department of Pharmaceutical Sciences, Tshwane University of Technology, Pretoria, South Africa. Advisor: Prof. A.M. Viljoen

TEACHING & INDUSTRIAL EXPERIENCE

1. Taught Graduate and Post-graduate classes in Chemistry, Biotechnology and Pharmaceutical Chemistry departments in Garhwal University, Srinagar during 2005-2010.
2. Taught Graduate classes in the Department of Applied Sciences, G.B. Pant Govt. Engineering College, Pauri Garhwal during 2007-2008.
3. Taught graduate classes in the Department of Chemistry, Panjab University, Chandigarh during 2010-2013.
4. Supervised Undergraduate and Master Students in the Department of Pharmaceutical Sciences, Tshwane University of Technology, South Africa from 2013 to 2015.
5. Industrial experience in R&D of an India based pharmaceutical industry.

ADMINISTRATIVE EXPERIENCE

1. Officer Incharge, Faculty of Biomedical Sciences, Uttarakhand Ayurved University, Dehradun
2. Officer on Special Duty (OSD) to Vice Chancellor, Uttarakhand Ayurved University, Dehradun.
3. Member secretary of Research Degree Committee (RDC) of Uttarakhand Ayurved University during 2015-16 and 2016-17.
4. Observer/ Coordinator for various examinations of the University.

REVIEWING EXPERIENCE

I review for many peer reviewed journals of international repute; few selected publishers/ journals are **Elsevier** (*J. Ethnopharmacol.*; *Phytochem. Lett.*; *Pathophysiology*; *Studies Nat. Prod. Chem.*; *Rev. Bras. Farmacogn.*; *S. Afr. J. Bot.*; *J. Ayurveda Integr. Med.*; *Biomed. Pharmacother.*; *J. Herb. Med.*), **Springer** (*BMC Complement. Alternat. Med.*; *Arch. Microbiol.*; *3Biotech*; *Rev. Bras. Farmacogn.*), **Taylor & Francis** (*Nat. Prod. Res.*; *Pharm. Biol.*; *J. Liq. Chromatogr. Relat. Technol.*), **John Wiley & Sons** (*Phytochem. Anal.*; *Br. J. Pharmacol.*; *J. Food Biochem. J. Diabetes*), **Bentham Science** (*Mini Rev. Org. Chem.*; *Curr. Drug Discov. Technol.*; *Nat. Prod. J.*; *Curr. Cancer Drug Targets*; *Curr Bioact Compd.*; *Curr. Nutr. Food Sci.*; *Anticancer Agents Med. Chem.*; *Cent. Nerv. Syst. Agents Med. Chem.*), **American Chemical Society** (*J. Agric. Food Chem.*), **Science Alert** (*J. Appl. Sci.*; *Asian J. Sci. Res.*; *Am. J. Drug Discov. Devel.*), **Thieme Publishers** (*Planta Med. Lett.*; *Plant Med. Int. Open*), **Wolters Kluwer** (*Pharmacogn.*

Mag.), **Indian Academy of Sciences** (*Curr. Sci.*), **CSIR-NISCAIR** (*Indian J. Nat. Prod. Resour.*; *Indian J. Exp. Biol.*; *Indian J. Biochem. Biophys.*), **Frontiers** (*Front. Pharmacol.*; *Diabetes Metab. Syndr. Obes.*), **Dove Medical Press** (*Drug Des. Devel. Ther.*), etc.

EDITORIAL EXPERIENCE

S.No.	Journal	Role
1	Journal of Ethnopharmacology (Elsevier, Netherlands)	Editorial Board Member
2	Current Clinical Pharmacology (Bentham Science, United Arab Emirates)	Editorial Board Member
3	Singapore Journal of Chemical Biology (Science Alert, United Arab Emirates)	Editor-in-Chief
4	Journal of Natural Remedies (Informatics Journals, India)	Editorial Board Member
5	Elyns Journal of Pharmaceutical Research (Elyns Publishing, United States)	Editorial Board Member
6	Journal of Conventional Knowledge and Holistic Health (Global SciTech Ocean, India)	Editor-in-Chief
7	Journal of Precision Medicine and Public Health (Clyto Access, United States)	Editorial Board Member
8	Current Medical and Drug Research (Global SciTech Ocean, India)	Managing Editor
9	Pharmacologia (Science Alert, United Arab Emirates)	Associate Editor
10	Journal of Public Health International (Open Access Pub, USA)	Editorial Board Member

GRANTS/ PROJECTS COMPLETED/ ONGOING/ ACCEPTED

S.No.	Title	Status	Duration	Cost	Agency
1	Chemical examination and antidiabetic evaluation of selected Liliaceae and Fabaceae plants of Central Himalaya	Completed	2010-2013	15.528 Lakh	UGC
2	Intervention Technologies in Health Sciences: Isolating bioactive molecules from indigenous medicinal plants of South Africa	Completed	2013-2014	15.0 Lakh	TUT, RSA
3	Quality control and assurance of commercial medicinal and cosmetic products of plants origin	Completed	2014-2015	15.0 Lakh	NRF, RSA
4	Recent Advances in Ayurvedic Herbal Medicine: From Source to Manufacturing (National Conference)	Completed	2016-2017	5.0 Lakh	NMPB
5	Exploring plant-derived SGLT2 inhibitors to treat type-2 diabetes and unraveling their structure activity relationship	Ongoing	2017-2021	37.49 Lakh	NMPB
6	Establishment of herbal garden at Uttarakhand Ayurved University for the promotion of medicinal and aromatic plants	Ongoing	2018-2023	8.1 Lakh	NMPB
7	Conservation and sustainable use of high altitude medicinal and aromatic plants for the socio-economic development (International Conference)	Completed	2019-2020	10 Lakh	NMPB
8	Establishment of herbal garden at Charak International Research Centre for Ayurveda (Kotdwar) for conservation and promotion of medicinal and aromatic plants	Ongoing	2019-2025	16.2 Lakh	NMPB
9	Two days international conference on conservation and sustainable use of high altitude medicinal and aromatic plants for the socio-economic development	Ongoing	2020-2021	10 Lakh	NMPB

MEMBERSHIPS

1. Lifetime member of Vishwa Ayurveda Parishad (VAP), India since 2020 (Membership No. UK-7829).
2. Lifetime member of Vigyan Bharati (VIBHA), India since 2018 (Membership No. 20237).
3. Lifetime member of Asian Chemical Society, India since 2018 (Membership No. ACS/2018/LM437).
4. Member of Asian Council of Science Editors (ACSE), UAE since 2015 (Membership No. 91.516).
5. Supporting member of the Association of Ayurvedic Professionals of North America since 2020.
6. Member of "Discovery of Sanjeevani" committee of Govt. of Uttarakhand - 2016.
7. Member of AYUSH drugs and cosmetics licensing committee, Govt. of Uttarakhand, 2018-19 and 2019-20.

AWARDS/ FELLOWSHIPS/ RECOGNITIONS

1. Best Oral Presentation Award in national conference on recent advances in natural products chemistry and nanotechnology organized by Department of Chemistry, HNB Garhwal University, Srinagar during 9-10 September, 2019.
2. Publons Peer Reviewer Awards (Top 1%) for multidisciplinary category in 2017, Assorted category in 2018, Pharmacology and Toxicology (1%) in 2019.
3. CSIR-HRDG (Govt. of India) and UCOST (Govt. of Uttarakhand) Travel Grant for International Conference on Traditional Medicine, Phytochemistry and Medicinal Plants organized by United Scientific Group, USA during October 15-17, 2018 at Tokyo, Japan.
4. Research and innovation award 2014 in alternative medicine from Tshwane University of Technology, South Africa on 01 October 2015.
5. Postdoctoral Fellowship from National Research Foundation, Govt. of South Africa for 2014-15.
6. Postdoctoral Fellowship from Tshwane University of Technology, Pretoria, South Africa for 2013-14.
7. NRF-Travel Grant for International conference in Bangkok, Thailand during 18-19 December 2014.
8. Postdoctoral Fellowship from UGC, New Delhi under Dr. D.S. Kothari PDF Scheme, for 2010-13.
9. Best Oral Presentation Award in 8th National Convention of Chemistry Teachers on 8-9 November 2008 at Srinagar.

KEYNOTES/ INVITED SPEAKER

1. Invited speaker in Analytical workshop on opportunities and trends in modern instrumentation for science and technology organized by CSIR-IIP Dehradun and Graphic Era University on 7-8 November 2019 at Graphic Era University, Dehradun.
2. Invited speaker in International Conference on Traditional Medicine, Phytochemistry and Medicinal Plants on October 15-17, 2018 at Tokyo, Japan.
3. Invited speaker in National conference on conservation and sustainable utilisation of high altitude medicinal and aromatic plants of Uttarakhand Himalayas, organised by SMPB, Uttarakhand and HRDI, Gopeshwar on 10-11 November 2017 at Dehradun, India.
4. Invited talk in Second International Conference on Holistic Medicine, held on 11-13 September, 2011 in Kerala, India.

EXAMINER/ PAPER SETTER

1. PhD Thesis examiner of various institutions including University of the Witwatersrand (Johannesburg), University of KwaZulu-Natal (Durban), PRIST University (Tamil Nadu), etc.
2. Paper setter (Chemistry) for various examinations including Uttarakhand Subordinate Service Selection Commission and various universities examinations.

ORGANISER OF CONFERENCES/ WORKSHOPS

1. Organizing Secretary of the National Conference on Recent advances in Ayurvedic herbal medicine – From source to manufacturing sponsored by NMPB (Ministry of AYUSH) on 15 and 16 September 2017 at CSIR-IIP Dehradun.

- Organizing Secretary of National Conference on AYUSH Uttarakhand Jointly organized by Uttarakhand Ayurved University and PHD Chamber of Commerce and Industry, on 17th June 2016 at Dehradun.
- Organizing Secretary of Uttarakhand Ayurveda Conference organized by AYUSH Health India at Doon University, Dehradun on July 01, 2017.
- Member of organizing committee of International Conference on Traditional Medicine, Phytochemistry and Medicinal Plants October 15-17, 2018 at Tokyo, Japan.
- Member of International advisory committee for the Fifth Euro-India International Conference on Holistic Medicine (ICHM2015) organised by Institute for Holistic Medical Sciences, Kerala and Ayurveda-und Venen-Klinik, Austria on 11-13 September 2015, in Kottayam, Kerala, India.
- Member of International Scientific Committee of ICIT 2017 : 19th International Conference on Immunological Techniques, Organised by World Academy of Science, Engineering and Technology on December 18-19, 2017 in London, United Kingdom.
- Member of International Scientific Committee of ICBIHD 2018 : 20th International Conference on Bacterial Infection and Host Defense, Organised by World Academy of Science, Engineering and Technology on June 6 - 7, 2018 in San Francisco, USA.
- Organising Secretary of International Conference on conservation and sustainable use of high altitude medicinal and aromatic plants for the socio-economic development organized by Faculty of Biomedical Sciences, Uttarakhand Ayurved University at Forest Research Institute (FRI) Dehradun on 29-30 November 2019.

TRAINING AND WORKSHOPS

- Certificate course in Office Application; Computer fundamentals; good hand in MS Office; Chemistry software like Chemdraw and Chems sketch; Internet etc. from NIIT/SIIT, Srinagar
- Workshop on “Solar photovoltaic system”, organized by REEEP New Delhi and Dept of Physics, HNB Garhwal University held on 26-28 March 2008 at Srinagar Garhwal.
- Short training on “Operation and handling of sophisticated analytical instruments” organized by Indian Institute of Petroleum, Dehradun, during 12-13 January 2005.
- Training on “Youth welfare program for students” organized by NSS, HNB Garhwal Srinagar, during 19-28 February 2002.

RESEARCH SUPERVISION

02 Doctoral and 07 Master students completed/ pursuing their research work under my guidance.

PATENTS

- Joshi SK, **Semwal DK**, Chauhan A, Joshi NC, Kumar A, Semwal R. A process for preparing two-layered dhooam cake to reduce microbial load in indoor environment. Indian patent, Filled on March **2021** (file No. 202111009915), published in *The Patent Office Journal*, No. 11/2021, Page 12768, Dated 12/03/2021.
- Semwal DK**, Chauhan A, Kumar A, Chaubey S, Singhai S, Semwal RB, Joshi SK, Kumar A. Composition for improving immunity against viruses and maladies and method thereof. Indian patent, Filled on August **2020** (file No. 202011035573), published in *The Patent Office Journal*, No. 08/2021, Page 8651, Dated 19/02/2021
- Semwal DK**, Chauhan A, Chaubey S, Joshi NC, Semwal RB, Kumar A, Aswal S, Kumar A. Ant and mosquito repellent composition and process of preparation thereof. Indian patent, July **2019** (file No. 201911029069), published in *The Patent Office Journal*, No. 04/2021, Page 3284, Dated 22/01/2021.

RESEARCH PUBLICATIONS

- Joshi P, Joshi S, **Semwal DK**, Bisht A, Dwivedi J, Sharma S. Chemical composition, antioxidative and antimicrobial activities of turmeric spent oleoresin. *Industrial Crops and Products*, **2021**, 162, 113278. IF 4.244
- Joshi P, Joshi S, **Semwal DK**, Bisht A, Paliwal S, Dwivedi J, Sharma S. Curcumin: An Insight to Molecular Pathways Involved in Anticancer Activity. *Mini-Reviews in Medicinal Chemistry*, **2021**. <https://doi.org/10.2174/1389557521666210122153823>. IF 2.733

3. Joshi P, Joshi S, Rajani U, Semwal RB, **Semwal DK**. Formulation and evaluation of polyherbal cream and lotion to treat psoriasis-induced secondary infections. *Current Reviews in Clinical and Experimental Pharmacology*, **2021**, 16 (1), 73-90.
4. Joshi SK, Semwal R, Kumar A, Chauhan A, **Semwal DK**. Indian cow and A2 beta-casein – A scientific perspective on health benefits. *Journal of Conventional Knowledge and Holistic Health*, **2021**, 5 (1), Art. ID 212.
5. Chauhan A, Kumar A, Goyal S, Joshi SK, **Semwal DK**. Current trends and future strategies for the global impact of COVID-19 pandemic. *Coronaviruses*, **2021**. <https://doi.org/10.2174/2666796702666210208184121>
6. Kumar A, Aswal S, Chauhan A, Semwal RB, Singh R, Andola HC, Joshi SK, **Semwal DK**. Antidiabetic effect of aqueous-ethanol extract from the aerial parts of *Artemisia roxburghiana*. *Natural Product Research*, **2020**. doi.org/10.1080/14786419.2020.1858414. IF 2.158
7. **Semwal DK**, Kumar A, Aswal S, Chauhan A, Semwal RB. Protective and therapeutic effects of natural products against diabetes mellitus via regenerating pancreatic β -cells and restoring their dysfunction. *Phytotherapy Research*, **2020**. DOI: 10.1002/ptr.6885. IF 4.087
8. **Semwal DK**, Chauhan A, Semwal RB, Sircar D, Roy P, Lehmann J. Natural molecules having anti-SARS-CoV activity – Can't they be effective against SARS-CoV-2? *Current Science*, **2020**, 119 (5), 757-770. IF 0.725
9. Semwal RB, **Semwal DK**, Combrinck S, Viljoen A. Health benefits of chromone: common ingredients of our daily diet. *Phytochemistry Reviews*, **2020**, 19, 761-785. IF 4.298.
10. Joshi SK, **Semwal DK**, Kumar A, Chauhan A. Antimicrobial activity of the water-soluble ash extract from the invasive weed *Parthenium hysterophorus* L. *Current Medical and Drug Research*, **2020**, 4 (2), 208.
11. Bijlwan P, Chaubey S, Tiwari RC, Semwal DK. Analytical and comparative antipyretic studies of chirayata (*Swertia chirata*) and neelkanthi (*Ajuga bracteosa*). *European Journal of Biomedical and Pharmaceutical Sciences*, **2020**, 7(8), 442-449.
12. Joshi P, Yadaw GS, Joshi S, Semwal RB, **Semwal DK**. Antioxidant and anti-inflammatory activities of selected medicinal herbs and their polyherbal formulation. *South African Journal of Botany*, **2020**, 130, 440-447. IF 1.792
13. Aswal S, Kumar A, Chauhan A, Semwal RB, Kumar A, **Semwal DK**. A molecular approach on the protective effects of mangiferin against diabetes and diabetes-related complications. *Current Diabetes Reviews*, **2020**, 16(7), 690-698.
14. Semwal RB, Joshi K, Pandian A, Badoni PP, **Semwal DK**. Biological applications and secondary metabolites of *Saussurea costus* (Falc.) Lipsch. *Journal of Conventional Knowledge and Holistic Health*, **2020**, 4(1): Art. ID 201.
15. Pandey P, Singh DC, Pradhan S, Semwal DK. Comparative pharmacognostical & phytochemical study of chakramard seed & gomutra bhavit chakramard seed. *European Journal of Biomedical and Pharmaceutical Sciences*, **2020**, 7(7), 401-407.
16. Kumar A, Aswal S, Semwal RB, Chauhan A, Joshi SK, **Semwal DK**. Role of plant-derived alkaloids against diabetes and diabetes-related complications – a mechanism-based approach. *Phytochemistry Reviews*, **2019**, 18, 1277-1298. IF 4.298
17. Aswal S, Kumar A, Semwal RB, Chauhan A, Kumar A, Lehmann J, **Semwal DK**. *Drimia indica*: A Plant Used in Traditional Medicine and Its Potential for Clinical Uses. *Medicina*, **2019**, 55, 255. IF 1.205
18. **Semwal DK**, Chauhan A, Kumar A, Aswal S, Semwal RB, Kumar A. Status of Indian medicinal plants in the International Union for Conservation of Nature and the future of Ayurvedic drugs: shouldn't think about Ayurvedic fundamentals? *Journal of Integrative Medicine*, **2019**, 17(4), 238-43. IF 2.446
19. Semwal RB, **Semwal DK**, Combrinck S, Trille J, Gibbonse S, Viljoen A. Acacetin – A simple flavone exhibiting diverse pharmacological activities. *Phytochemistry Letters*, **2019**, 32, 56-65. IF 1.459.
20. Kumar A, Aswal S, Chauhan A, Semwal RB, Kumar A, **Semwal DK**. Ethnomedicinal Investigation of Medicinal Plants of Chakrata Region (Uttarakhand) Used in the Traditional Medicine for Diabetes by Jaunsari Tribe. *Natural Products and Bioprospecting*, **2019**, 9, 175-200.
21. Kumar A, Aswal S, Semwal RB, Chauhan A, **Semwal DK**. Insights on the Pharmacological, Phytochemical and Ethnobotanical Aspects of *Artemisia roxburghiana* - A rather less explored but therapeutically important species of lower Himalayas. *Phytochemistry Reviews*, **2019**, 18 (1), 199-214. IF 4.298.
22. Chandra S, Saklani S, **Semwal DK**, Semwal RB. Estimation of nutritional and mineral contents of *Eleusine coracana* and *Echinochloa frumentacea* – Two edible wild crops of India. *Current Nutrition & Food Science*, **2019**, 15(4), 363-6.
23. **Semwal DK**, Dahiya RS, Joshi N, Semwal RB, Aswal S, Kumar A, Chauhan A, Kumar A. Preclinical and Clinical Studies to Evaluate the Effect of *Carica papaya* Leaf Extract on Platelets. *Current Traditional Medicine*, **2018**, 4 (4), 297-304.

24. Semwal R, Semwal RB, **Semwal DK**. Mucoadhesive assessment – An encyclopedic review. *Current Medical and Drug Research*. 2 (2), Article ID 187, **2018**.
25. Semwal RB, Semwal DK, Aswal S, Kumar A. Spectral studies and pharmacological relevance of berberine isolated from *Berberis aristata* roots. *Current Medical and Drug Research*. **2018**; 2; 181.
26. Semwal R, Upadhyaya K, Semwal RB, **Semwal DK**. Acceptability of Nose-to-Brain Drug Targeting in Context to its Advances and Challenges. *Drug Delivery Letters*. 8 (1), 20-28, **2018**.
27. Bhatt U, Sati SC, Bahuguna RP, Semwal RB, **Semwal DK**. Two antidiabetic constituents from *Roylea cinerea* (D.Don) Baill. *Natural Product Research*. **2018**. 32(11):1281-1286. IF 2.158
28. Vinothini K, Sri Devi M, Shalini V, Sekar S, Semwal RB, Arjun P, **Semwal DK**. In vitro micropropagation, total phenolic content and comparative antioxidant activity of different extracts of *Sesbania grandiflora* (L.) Pers. *Current Science*. **2017**; 113 (6), 1142-7. IF 0.725
29. Yadav C, Chaubey S, Kurele R, Semwal DK. Sanjeevani booti - A majestic and elusive all curing divine herb in epic Ramayana. *Journal of Conventional Knowledge and Holistic Health*, **2017**; 1 (1), Article ID 173.
30. Chauhan A, Ojha R, **Semwal DK**, Mishra SP, Semwal RB. Combined treatment with CCI779 and SB203580 induces cellular senescence in renal cell carcinoma cell line via p53 pathway. *Anti-Cancer Agents in Medicinal Chemistry*. **2017**. 17(11), 1545-1554. IF 2.049
31. Chauhan A, Semwal RB, **Semwal DK**. Ayurvedic approaches used in prevention and treatment of type 2 diabetes mellitus. *Journal of Conventional Knowledge and Holistic Health*, **2017**; 1 (1), Article ID 172.
32. Chauhan A, **Semwal DK**, Mishra SP, Semwal RB. Ayurvedic concept of Shatkriyakala: a traditional knowledge of cancer pathogenesis and therapy. *Journal of Integrative Medicine*, **2017**;15(2),88–94. IF 2.446
33. Chauhan A, **Semwal DK**, Mishra SP, Semwal RB. Yoga practice improves the body mass index and blood pressure - A randomized controlled trial. *International Journal of Yoga*, **2017**; 10 (2), 103-6.
34. Arjun P, **Semwal DK**, Semwal RB, Malaisamy M, Sivaraj C, Vijayakumar S. Total phenolic content, volatile constituents and antioxidative effect of *Coriandrum sativum*, *Murraya koenigii* and *Mentha arvensis*. *The Natural Products Journal*. **2017**;7(1),65-74.
35. Mishra SP, Chauhan A, **Semwal DK**. Upgrading Higher Education System - A Step Towards Transforming India. *Academic Awakening*, **2017**, 1 (1), 54-59.
36. Chauhan A, **Semwal DK**, Semwal RB, Mishra SP. Speckle-type POZ protein acts as a predictive biomarker for mTOR target therapy in renal cell carcinoma. *Current Science*. **2016**;111(12),2014-9. IF 0.725
37. **Semwal DK**, Semwal RB, Combrinck S, Viljoen A. Myricetin: A Dietary Molecule with Diverse Biological Activities. *Nutrients*, **2016**, 8(2), 90. IF 4.546
38. Chauhan A, **Semwal DK**, Mishra SP, Semwal RB. Combination of mTOR and MAPK Inhibitors—A Potential Way to Treat Renal Cell Carcinoma. *Medical Sciences*. **2016**, 4(4), 16.
39. **Semwal DK**, Chauhan A, Mishra SP, Semwal RB. Recent Development in Yoga: A Scientific Perspective. *Journal of AYUSH: Ayurveda, Yoga, Unani, Siddha and Homeopathy*. **2016**;5(1),14-20.
40. **Semwal DK**, Semwal RB, Chauhan A, Mishra SP. Treatment of type 2 diabetes with Ayurveda: A case report. *Pharmacologia*. **2016**;7(4),239-242.
41. Chauhan A, **Semwal DK**, Mishra SP, Semwal RB. Ayurvedic research and methodology: Present status and future strategies. *Ayu*. **2015**; 36(4),364-9.
42. **Semwal DK**, Semwal RB. Discovery of natural SGLT2-inhibitors for type 2 diabetes – Possible way to reduce side effects. *Journal of Natural Remedies*. **2015**;15(2),86-87.
43. Semwal RB, **Semwal DK**, Combrinck S, Viljoen A. Gingerols and shogaols: Important nutraceutical principles from ginger. *Phytochemistry*. **2015**;117,554–568. IF 3.044
44. Semwal RB, **Semwal DK**, Vermaak I, Viljoen A. A comprehensive scientific overview of *Garcinia cambogia*. *Fitoterapia*. **2015**; 102 (1),134-48. IF 2.527
45. **Semwal DK**, Mishra SP, Chauhan A, Semwal RB. Adverse health effects of tobacco and role of Ayurveda in their reduction. *Journal of Medical Sciences*. **2015**,15(3),139-46.
46. Semwal RB, **Semwal DK**, Combrinck S, Viljoen A. Butein: From ancient traditional remedy to modern nutraceutical. *Phytochemistry Letters*. **2015**;11(1),188-201. IF 1.459
47. Chandel S, Bagai U, Semwal RB, **Semwal DK**. Antiplasmodial activity of aqueous extract of *Berberis aristata* roots against *Plasmodium berghei* infected BALB/c mice. *Pharmaceutical Biology*. **2015**;53 (12),1735-1740. IF 2.971
48. Semwal RB, **Semwal DK**, Mishra SP, Semwal R. Chemical composition and antibacterial potential of essential oils from *Artemisia capillaris*, *Artemisia nilagirica*, *Citrus limon*, *Cymbopogon flexuosus*, *Hedychium spicatum* and *Ocimum tenuiflorum*. *The Natural Products Journal*. **2015**,5(3),199-205.

49. Semwal DK, Semwal RB. Efficacy and safety of *Stephania glabra*: An alkaloid-rich traditional medicinal plant. *Natural Product Research*. **2015**; 29(5),396-410. IF 2.158
50. Arjun P, Semwal DK, Semwal RB, Mishra SP, Vijayan AB, Krishnamoorthy M. Quality Retention and Shelf-Life Improvement of Fresh-cut Apple, Papaya, Carrot and Cucumber by Chitosan-Soy Based Edible Coating. *Current Nutrition & Food Science*. **2015**, 11 (4), 282-291.
51. Mishra SP, Semwal DK, Chauhan A. Scenario of Ayurveda Education in India: Some recommendations for development. *University News- Association of Indian Universities*. **2015**;53(42):3-8.
52. Semwal DK, Semwal RB, Ahmad A, Kamatou GP, Viljoen AM. Inhibitory effects of extracts and isolates from *Kigelia africana* fruits against pathogenic bacteria and yeasts. *International Journal of Biological, Biomolecular, Agricultural, Food and Biotechnological Engineering*. **2014**;8(12):1321-6.
53. Semwal DK, Semwal RB, Singh G. Benzoquinone derivative and sarsasapogenin glycoside from *Asparagus curillus*. *Chemistry of Natural Compounds*. **2014**;50(5):865-867. IF 0.653
54. Semwal RB, Semwal DK, Badoni PP, Kapoor P. Dyeing performance of aqueous extract and flavanone glycosides from the flowers of *Butea monosperma* (Lam.) Kuntze. *Records of Natural Products*. **2014**;8(1):66-70. IF 1.268
55. Semwal R, Semwal RB, Semwal DK. A gastroretentive drug delivery system of lisinopril imbedded on isabgol-husk. *Current Drug Delivery*. **2014**;11(3):371-9. IF 1.582
56. Semwal DK, Semwal RB, Vermaak I, Viljoen A. From arrow poison to herbal medicine - The ethnobotanical, phytochemical and pharmacological significance of *Cissampelos* (Menispermaceae). *Journal of Ethnopharmacology*. **2014**;155(2):1011-28. IF 3.690
57. Semwal RB, Semwal DK, Combrinck S, Cartwright-Jones C, Viljoen A. *Lawsonia inermis* L. (henna): Ethnobotanical, phytochemical and pharmacological aspects. *Journal of Ethnopharmacology*. **2014**, 155(1), 80-103. IF 3.690
58. Semwal DK, Semwal RB, Singh G. Androstane-type steroidal glycoside from the roots of *Asparagus curillus* buch.- ham. ex roxb. *Helvetica Chimica Acta*. **2013**;96(3):520-4. IF 2.309
59. Semwal DK, Semwal RB. Ethnobotany, pharmacology and phytochemistry of the genus *Phoebe* (Lauraceae). *Mini-Reviews in Organic Chemistry*. **2013**;10(1):12-26. IF 1.824
60. Sharma A, Sati SC, Sati OP, Sati MD, Kothiyal SK, Semwal DK, Mehta A. A new triterpenoid saponin and antimicrobial activity of ethanolic extract from *Sapindus mukorossi* gaertn. *Journal of Chemistry*. **2013**; Article ID 218510. IF 1.790
61. Satheesh Madhav NV, Semwal R, Semwal DK, Semwal RB. Recent trends in oral transmucosal drug delivery systems: An emphasis on the soft palatal route. *Expert Opinion on Drug Delivery*. **2012**, 9(6), 629-47. IF 4.838
62. Semwal DK, Semwal RB, Semwal R. Antibacterial activity of 8-(4'-methoxybenzyl)-xylopinine from *Stephania glabra* tubers. *Pharmacologia*. **2012**;3(10):539-41.
63. Semwal RB, Semwal DK. Analgesic and anti-inflammatory activities of extracts and fatty acids from *Celtis australis* L. *The Natural Products Journal*. **2012**, 2(4), 323-27.
64. Kothiyal SK, Sati SC, Rawat MSM, Sati MD, Semwal DK, Semwal RB, Sharma A, Rawat B, Kumar A. Chemical constituents and biological significance of the genus *Ilex* (Aquifoliaceae). *The Natural Products Journal*. **2012**, 2(3), 212-24.
65. Semwal RB, Semwal DK, Kapoor P. Dyeing properties of *Berberis aristata* DC with natural and synthetic mordants. *Trends in Applied Sciences Research*. **2012**;7(5):392-99.
66. Badoni R, Semwal DK. Dyeing performance of *Symplocos paniculata* and *Celtis australis*. *Asian Dyer*. **2011**, 8(6), 51-8.
67. Semwal DK, Semwal RB, Semwal R, Jacob V, Singh G. Analgesic and antipyretic activities of gindarudine, a morphine alkaloid from *Stephania glabra*. *Current Bioactive Compounds*. **2011**, 7(3), 214-7.
68. Semwal RB, Semwal DK, Semwal R, Singh R, Rawat MSM. Chemical constituents from the stem bark of *Symplocos paniculata* thunb. with antimicrobial, analgesic and anti-inflammatory activities. *Journal of Ethnopharmacology*. **2011**, 135(1), 78-87. IF 3.690
69. Badoni R, Semwal DK, Rawat U, Rawat MSM. Chemical constituents from fruits and stem bark of *Celtis australis* L. *Helvetica Chimica Acta*. **2011**, 94(3), 464-73. IF 2.309
70. Badoni R, Semwal DK, Badoni PP, Kothiyal SK, Rawat U. A novel bacteriohopanoid from *Celtis australis* L. bark. *Chinese Chemical Letters*. **2011**, 22(1), 81-4. IF 4.632
71. Rawat U, Joshi V, Semwal DK, Bamola A, Semwal S, Badoni R, Sati OP. Triterpenoidal saponin and phenolic glycosides of *Rhododendron barbatum* flowers. *Medicinal Plants*. **2011**, 3(1), 73-76.
72. Kothiyal SK, Sati SC, Sati MD, Rawat B, Sharma A, Semwal DK, Badoni R, Rawat MSM. The Alkaloids: Genus *Daphniphyllum* (Daphniphyllaceae). *International Research Journal of Pharmacy*. **2011**, 2(2), 13-21.

73. Badoni R, **Semwal DK**, Kothiyal SK, Rawat U. Chemical constituents and biological applications of the genus *Symplocos*. *Journal of Asian Natural Products Research*. **2010**, 12(12), 1069-80. IF 1.345
74. Semwal R, **Semwal DK**, Badoni R. Chewing gum: A novel approach for drug delivery. *Journal of Applied Research*. **2010**, 10(3), 115-23.
75. **Semwal DK**, Badoni R, Semwal R, Kothiyal SK, Singh GJP, Rawat U. The genus *Stephania* (Menispermaceae): Chemical and pharmacological perspectives. *Journal of Ethnopharmacology*. **2010**, 132(2), 369-83. IF 3.690
76. Semwal R, **Semwal DK**, Badoni R, Gupta S, Madan AK. Targeted drug nanoparticles: An emphasis on self-assembled polymeric system. *Journal of Medical Sciences*. **2010**, 10(5), 130-7.
77. Badoni R, **Semwal DK**, Rawat U, Singh GJP. Celtisanin, a novel sulphonated phenolic from *Celtis australis* L. fruits. *Natural Product Research*. **2010**, 24(13), 1282-6. IF 2.158
78. **Semwal DK**, Rawat U, Badoni R, Semwal R, Singh R. Anti-hyperglycemic effect of *Stephania glabra* tubers in alloxan induced diabetic mice. *Journal of Medicine*. **2010**, 11(1), 17-9.
79. **Semwal DK**, Rawat U, Semwal R, Singh R, Singh GJP. Anti-hyperglycemic effect of 11-hydroxypalmatine, a palmatine derivative from *Stephania glabra* tubers. *Journal of Asian Natural Products Research*. **2010**, 12(2), 99-105. IF 1.345
80. Badoni R, **Semwal DK**, Rawat U. Fatty acid composition and antimicrobial activity of *Celtis australis* L. fruits. *Journal of Scientific Research*. **2010**, 2(2), 397-402.
81. Kothiyal SK, **Semwal DK**, Badoni R, Rawat U. GC-MS analysis of fatty acid and antimicrobial activity of *Ilex dipyrrena* Wallich leaves. *Asian Journal of Traditional Medicine*. **2010**, 5(4), 153-57.
82. Badoni R, **Semwal DK**, Rawat U. Composition variation in essential oils of *Artemisia nilagirica* and *Artemisia capillaris*, growing in India. *Journal of Applied and Natural Science*. **2010**, 2(1), 30-33.
83. Semwal R, **Semwal DK**, Madan AK, Paul P, Mujaffer F, Badoni R. Dendrimers: A novel approach for drug targeting. *Journal of Pharmacy Research*. **2010**, 3(9), 2238-47.
84. Kothiyal SK, **Semwal DK**, Badoni R, Rawat U, Sati SC, Rawat MSM. Seasonal variation in the essential oil composition from *Morina longifolia* wallich. *International Journal of Essential Oil Therapeutics*. **2009**, 3(4), 171-4.
85. Badoni R, **Semwal DK**, Rawat U. Altitudinal variation in the volatile constituents of *Artemisia nilagirica*. *International Journal of Essential Oil Therapeutics*. **2009**, 3(2-3), 66-68.
86. **Semwal DK**, Rawat U, Semwal R, Singh R, Krishan P, Singh M, Singh GJP. Chemical constituents from the leaves of *Boehmeria rugulosa* with antidiabetic and antimicrobial activities. *Journal of Asian Natural Products Research*. **2009**, 11(12), 1045-55. IF 1.345
87. Rawat U, Semwal S, **Semwal DK**, Badoni R, Bamola A. A new flavonoid glycoside from *Salix denticulata* aerial parts. *Molbank*. **2009**, 2009(3), M622.
88. Badoni R, **Semwal DK**, Sati SC, Rawat U. Optimization of dyeing procedure on wool yarn with *Pistacia integerrima* dye using synthetic and natural mordants. *Colourage*. **2009**, 56(9), 67-70.
89. **Semwal DK**, Rawat U. Gindarudine, a novel morphine alkaloid from *Stephania glabra*. *Chinese Chemical Letters*. **2009**, 20(7), 823-6. IF 4.632
90. **Semwal DK**, Rawat U, Semwal R, Singh K, Singh R, Saini B, Krishnan P, Singh M. Hypoglycemic effect of *Phoebe lanceolata* on alloxan-induced diabetic mice. *Pharmacologyonline*. **2009**, 1, 1021-6.
91. Bamola A, **Semwal DK**, Semwal S, Rawat U. Flavonoid glycosides from *Myrica esculenta* leaves. *Journal of the Indian Chemical Society*. **2009**, 86(5), 535-6. IF 0.233
92. **Semwal DK**, Rawat U. Antimicrobial hasubanalactam alkaloid from *Stephania glabra*. *Planta Medica*. **2009**, 75(4), 378-80. IF 2.687
93. **Semwal DK**, Rawat U, Bamola A, Semwal R. Antimicrobial activity of *Phoebe lanceolata* and *Stephania glabra*; preliminary screening studies. *Journal of Scientific Research*. **2009**, 1(3), 662-66.
94. **Semwal DK**, Rawat U, Singh GJP. Further aporphine alkaloids from *Phoebe lanceolata*. *Molbank*. **2008**, 2008(3), M581.
95. **Semwal DK**, Rawat U. Nordelporphine alkaloid from bark of *Phoebe lanceolata*. *Oriental Journal of Chemistry*. **2007**, 23(2), 771-72.
96. **Semwal DK**, Rawat U. Physico-chemical examination of drinking water sample in and near Srinagar city (Uttarakhand). *Acta Ciencia Indica*. **2007**, 33C(3), 231-32.
97. Kandwal D, Bamola A, Semwal S, **Semwal DK**, Rawat U. Phytochemicals from *Rhamnus triqueter*. *Acta Ciencia Indica*. **2007**, 33C(4), 389-90.
98. **Semwal DK**, Bamola A, Rawat U. Chemical constituents from some antidiabetic plants. *Universities' Journal of Phytochemistry and Ayurvedic Heights*. **2007**, 2(3), 40-48.

BOOKS

1. **Semwal DK**. Medicinal Plants: Properties, Uses and Production. Book ID 19826, Nova Science Publishers, USA, **2021**.
2. Uniyal MR, **Semwal DK**, Semwal RB, Ankit Kumar. Elementary Knowledge of Indian Medicinal Plants of Uttarakhand Himalaya. ISBN: 978-1-53619-078-6, Nova Science Publishers, USA, **2021**.
3. Uniyal MR, **Semwal DK**, Semwal RB. A Comprehensive Field Guide to Medicinal Plant Biodiversity of Myanmar and Mauritius. ISBN: 978-1-53617-425-0. Nova Science Publishers, USA, **2020**.
4. **Semwal DK**. Coriander: Dietary Sources, Properties and Health Benefits. ISBN: 978-1-53616-483-1. Nova Science Publishers, USA, **2019**.
5. Uniyal MR, **Semwal DK**, Raj K, Semwal RB, Chauhan A. Traditional Medicinal flora of Mauritius (Indigenous and Endemic). ISBN 978-3-16-148410-0; Pravek Kalp Private Limited, Noida, India, **2018**.
6. Uniyal MR, **Semwal DK**, Raj K, Semwal RB. *Indigenous plants of Myanmar used in traditional medicine*. ISBN: 978-81-934455-2-5; AYUSH Health India, New Delhi, **2017**.
7. Semwal RB, **Semwal DK**. *Naturally occurring alkaloids and iridoids: Chemistry and biological importance*. ISBN: 978-3-8484-1444-4; Lambert Academic Publishing, Germany, **2012**.
8. **Semwal DK**, Semwal RB. *Triterpenoids: an important bioactive class of natural products*. ISBN: 9783-8465-9574-9; Lambert Academic Publishing, Germany, **2011**.

BOOK CHAPTERS

1. **Semwal DK**, Kumar A, Semwal RB, Andola HS. Chapter 3.2.19: *Convolvulus prostratus*. In: Naturally Occurring Chemicals against Alzheimer's Disease, Belwal T, Nabavi SM, Nabavi SF, Dehpour A, Shirooie S (Editors). ISBN 978-0-12-819212-2. Academic Press (Elsevier), **2021**, pp. 409-424.
2. Maurya IK, Semwal RB, **Semwal DK**. Combination therapy against human infections caused by Candida species (Chapter 4). In: Combination Therapy against Multi-drug Resistance, Wani MY, Ahmad A (Editors). ISBN 9780128205761, Elsevier, **2020**, pp. 81-94.
3. Semwal R, Semwal RB, **Semwal DK**. *Drug Delivery Systems: Selection Criteria and Use*. In: Encyclopedia of biomedical polymers and polymeric biomaterial. Mishra M. Edited. ISBN: 1439-898-790 (Taylor & Francis Group, New York). Vol. 4, p. 2938-2949, **2015**.
4. Bamola A, Semwal S, **Semwal D**, Rawat U. *Application and Optimization of Natural Mordants in Modern Dyeing* (Chapter 61) In: Phytochemicals: a therapeutant for critical disease management. D.R. Khanna, A.K. Chopra, G. Prasad, D.S. Malik, R. Bhutiani Edited. ISBN: 9788-1703-55496 (Daya Publishing House, India), pp. 357-361, **2008**.

PAPER PRESENTED IN CONFERENCES/ SEMINARS

1. S. Aswal, A. Kumar, A. Chauhan, **D. K. Semwal**. Current status of Indian medicinal plants - cultivation, collection and trade. International Conference on conservation and sustainable use of high altitude medicinal and aromatic plants for the socio-economic development organized by Faculty of Biomedical Sciences, Uttarakhand Ayurved University at Forest Research Institute (FRI) Dehradun on 29-30 November 2019.
2. **D. K. Semwal**. Role of spectral techniques in the characterization of natural compounds. Analytical workshop on opportunities and trends in modern instrumentation for science and technology organized by CSIR-IIP Dehradun and Graphic Era University on 7-8 November 2019 at Graphic Era University, Dehradun.
3. **D. K. Semwal**. The pharmacognostical studies of *Artemisia roxburghiana* and insect repellent activity of its essential oil. National conference on recent advances in natural products chemistry and nanotechnology organized by Department of Chemistry, HNB Garhwal University, Srinagar during 9-10 September, 2019.
4. **D. K. Semwal**. Exploring ethnobotanical knowledge on the medicinal plants used for diabetes by Jaunsari tribe of Uttarakhand. 8th World Ayurveda Congress & Arogya Expo, organised by World Ayurveda Foundation at Gujarat University, Ahmedabad during December 14-17, 2018.
5. **D. K. Semwal**. *Carica papaya* leaf extract improves platelet count via attenuating their aggregation. 1st Annual Conference of Society for Himalayan Action Research and Development (SHARAD) on Recent advances in chemical and nano sciences, Organised by Department of Chemistry, HNB Garhwal University, BGR Campus

Pauri Garhwal, Uttarakhand during October 29 & 30, 2018.

6. **D. K. Semwal**, A. Chauhan, R. B. Semwal. Ayurvedic Concept of Shatkriyakala in cancer diagnosis and its correlation with modern science. **D. K. Semwal**. Evaluation of the effect of papaya leaf extract on platelets and unraveling its mechanism of action using preclinical and clinical models. International Conference on Traditional Medicine, Phytochemistry and Medicinal Plants organized by United Scientific Group, USA during October 15-17, 2018 at Tokyo, Japan
7. **D. K. Semwal**, A. Chauhan, R. B. Semwal. Scope of plant-derived SGLT2 inhibitors to treat type 2 diabetes. National conference on conservation and sustainable utilisation of high altitude medicinal and aromatic plants of Uttarakhand Himalayas, organised by SMPB, Uttarakhand and HRDI, Gopeshwar on 10-11 November 2017 at Dehradun, India.
8. R. B. Semwal, **D. K. Semwal**. Shatavari (*Asparagus racemosus* Willd.) – A steroidal-rich ayurvedic medicinal plant. National Conference on recent advances in Ayurvedic herbal medicine – from source to manufacturing organised by Uttarakhand Ayurved University, Dehradun at CSIR-IIP Dehradun on 15 & 16 September 2017.
9. A. Chauhan, **D. K. Semwal**, R. B. Semwal, S. P. Mishra. Ayurvedic Rasayanas – The immunity boosters for cancer patients. II Uttarakhand Ayurveda Conference organized by Ayush health India at Doon University, Dehradun on 1 July, 2017.
10. **D. K. Semwal**. Natural antibiotics – A step toward healthy world. National Conference on AYUSH, Uttarakhand organized by PHD Chamber of Commerce and Industry, and Uttarakhand Ayurved University, Dehradun on 17 June, 2016.
11. **D. K. Semwal**, R. B. Semwal, A. Ahmad, G. P. Kamatou, A. M. Viljoen. Inhibitory effects of extracts and isolates from *Kigelia africana* fruits against pathogenic bacteria and yeasts. 16th International Conference on Ethnopharmacology and Drug Discovery, organized by World Academy of Science, Engineering and Technology, Bangkok, Thailand, 18-19 Dec, 2014.
12. **D. K. Semwal**, R. B. Semwal. Effect of crude extracts and fatty acids from *Celtis australis* on pain and inflammation. Global Challenges: New frontiers in Chemical sciences. Kurukshetra Univ. Kurukshetra (Haryana, India). 22-23 Sep 2012.
13. **D. K. Semwal**, R. B. Semwal, G. Singh, P. Kapoor. Benzoquinone derivative and sarsasapogenin glycoside from *Asparagus curillus* (Buch.-Ham.) ex roxb. (Liliaceae). Recent advances in Chemical sciences. Panjab University, Chandigarh. 20 Sep 2012.
14. **D. K. Semwal**, R. B. Semwal. Pharmacological validation of traditional uses of *Stephania glabra* (Roxb.) Miers. II International conference on Holistic Medicine. Institute for Holistic Medical Sciences, Kottayam (Kerala) and the Ayurveda-Und Venen-Klinik, Klagenfurt, Austria on 11-13 Sep 2011 at Kottayam (Kerala).
15. R. Badoni, **D. K. Semwal**. Chemical constituents and pharmacological evaluation of *Celtis australis* L. Chandigarh Science Congress. Panjab University Chandigarh. 26-28 Feb 2011.
16. **D. K. Semwal**, R. Badoni, R. Semwal, G.J.P. Singh, M.S.M. Rawat. Analgesic and antipyretic activities of Gindarudine, A morphine derivative from *Stephania glabra*. Indian Council of Chemists. Panjab University Chandigarh. 19-21 Dec 2010.
17. S. Kumar, **D. K. Semwal**, R. Badoni, U. Rawat. Seasonal variation in the essential oil composition from *Morina longifolia* Wallich. 2nd Rashtriya Yuva Vaigyanik sammelan. Dun Univ. Dehradun. 6-7 Feb 2010.
18. **D. K. Semwal**, R. Badoni, R. Semwal, G.J.P. Singh. Family Liliaceae: A source of novel antidiabetic drugs. Multidisciplinary approaches to diabetes research and health. University of Rajasthan, Jaipur. 14-16 Nov 2010.
19. **D. K. Semwal**, U. Rawat. Phytochemistry and pharmacological importance of *Phoebe lanceolata* Wall. 4th Uttarakhand science congress. GBPUAT Pantnagar. 10-12 Nov 2009.
20. **D. K. Semwal**, R. Badoni, S. C. Sati, S. Kothiyal, U. Rawat. Gindarudin, a novel alkaloid from *Stephania glabra* with analgesic and antipyretic activities. 46th annual convention of Indian chemical Society. Vellore Institute of Tech. Univ. Tamil Nadu. 2-6 Dec 2009.
21. **D. K. Semwal**, U. Rawat. A survey on drinking water samples of Srinagar city. Application of RS & GIS in the natural resources management. HNB Garhwal University Srinagar. 11-13 Sep 2008.
22. **D. K. Semwal**, U. Rawat. Bioactive alkaloids from *Stephania glabra*. 8th National Convention of Chemistry Teachers. HNB Garhwal Univ. & IACT Mumbai. 8-9 Nov 2008.
23. **D. K. Semwal**, U. Rawat. Characterization and hypoglycemic activity of 11-hydroxypalmitine from *Stephania glabra* tuber. 45th annual convention of *Indian Chemical society*. Karnataka University, Dharwad. Nov 2008.
24. **D. K. Semwal**, U. Rawat. Evaluation of Phytochemistry, antidiabetic and antimicrobial activity of *Boehmeria rugulosa* leaves. 3rd Uttarakhand science congress. IIT Roorkee. 10-11 Nov 2008.
25. A. Bamola, **D. K. Semwal**, S. Semwal, U. Rawat. Applications and optimization of natural mordants in modern

- dyeing. Medicinal plants conservation, cultivation and utilization. Gurukul Kangri University Haridwar. 9-11 Mar 2007.
26. **D. K. Semwal**, A. Bamola, S. Semwal, V. Joshi, A. Bhandari, U. Rawat. Antidiabetic activity of some medicinal plants. International seminar on Biogeography and Biodiversity. HNB Garhwal University, Srinagar. 3-5 May 2007.
 27. A. Bamola, **D. K. Semwal**, U. Rawat. Optimisation of dying properties of *Myrica esculenta*. 2nd Uttarakhand science congress. Kumaun University, Nainital. 15-17 November 2007.