



Centre of Advanced Study in
Geology, Panjab University
Chandigarh, 160014 India



Naresh Kochhar, UGC Emeritus Fellow & PI DST Book writing Project on Malani Magmatism.

(nareshkochhar2003@yahoo.com)

Short Biography

Did B.Sc. (Hons.) Geology in 1966, M.Sc. (Hons.) Geology in 1967 and Ph.D. in 1976 from the Panjab University, Chandigarh, India. Appointed as Teaching Assistant in the Centre of Advanced Study in Geology, Panjab University, Chandigarh in the year 1972, Lecturer in 1974, Reader in 1985 and Professor in 1996 until 2008. Co-ordinator, Honour School Examination, Panjab University, 2004-2006.

Did post-doctoral research (Commonwealth scholarship plan) 1976-1981 at the University of Ottawa and Memorial University, St. Johns Canada. INSA-Royal Society International Exchange program Fellowship at the University of St. Andrews and SURRC, East Kilbride, UK in the year 1989.

Supervised Ph.D theses of 15 candidates and M.Phil theses of two candidates at Panjab University, Published 50 research papers on Malani magmatism, including 6 chapters in books, and 10 research papers on Medical Geology and Environmental Geology and 7 research papers on geology of Iran and miscellaneous topics (single author:34, first author:13, others:19). Total citation:602, h-index:13. Gave the concept of Malani supercontinent. Work also cited in text books to mention recent ones: Geology of Rajasthan by S.Sinha-Roy, G. Malhotra and M. Mohanty, 1998, Geology of Haryana and Delhi by J.L. Thussu, 2006 and Geology of India by R. Vaidyanadhan and M. Ramakrishnan, 2008, Geological Society of India publication, the Making of India: Geodynamic Evolution by K.S Valdiya, 2008, Macmillan, New Delhi.

Made significant contributions to the problem of Uranium and other heavy metals in ground water of southwest Punjab and adjoining areas of Haryana.

Also made contributions to Geo-archology and Geo-tourism of Tosham area, and other Harappan sites (Harayana) along the Vedic Sarasvati (International conference on Sarasvati River – 2018, K.U., Kurukshetra.

Has presented research work at many national and fifteen International conferences including six International Geological Congress held in Moscow (1984), Washington DC (1989), Oslo (2004), Florence (2008), Brisbane (2012) and Cape Town (2016) and Hammamet, Tunisia (2018).

Completed three research projects on Malani magmatism funded by INSA, New Delhi (1975-1976), CSIR, New Delhi (1984-1987), DST, New Delhi (1986-1990), DST funded research project on Seismotectonics in NW Himalaya jointly with GNDU, Amritsar group (2005-2009) and UGC funded research project on Chemical quality of ground water in parts of SW Punjab in relation to health hazards (2011-2014, Panjab University)

Fellow of Geological Society of India, Secretary Indian Geologists Association, Life Member Indian Science Congress, Association, Life Member Indian Geological Congress and Member Executive Council, IGC. Roorkee, 2006-2009.

Member National Working Group, IGCP-470 (2002-2007).

Member BARC Expert Committee to study source of uranium in ground water, southwest, Punjab(2012).

Member Expert Group Committee of Brain Storming Session of 36 International Geological Congress-2020, New Delhi.

Awarded Indian National Science Academy medal for Young Scientists' in the year 1976 for contributions to the Malani igneous suites of rocks of Rajasthan and Tusham area, Haryana.

Subject Expert: UPSC, MoES, New Delhi, HPSC, Shimla, PSC, Patiala, RPSC, Jaipur, TNPSC, Chennai, OPSC, Cuttak, NAAC, Bengaluru, MHRD National Mission on Education through ICT, (NME-ICT), e-PG Pathshala M.Sc. Environmental Science:Petrology and Geochemistry,2017(CUP, Bathinda) and many other universities.

Resource Person: INSA Outreach Program in remote areas colleges and schools, 2017, UGC Academic Staff College and DST INSPIRE PROGRAM.

Panelist on Environmental issues on DD, Star News and Day and night channel, Written many popular articles on Earthquakes, Medical Geology, Uranium in ground water in Malwa region southwest, Punjab etc in newspapers.

Recipient Bharat Gaurav (Pride of India) Award 2016.



INSA Young Scientist's Medal, 1976



**Bharat Gaurav Award, 2016
Receiving from Sh. B.N. Singh,
Former Governor of Tamilnadu**

CURRICULUM VITAE OF PROFESSOR NARESH KOCHHAR

Name : **NARESH KOCHHAR**

Birth Date : April 3, 1945

Designation : PI.DST Book writing project on Malani
Magmatism (USERS Scheme)

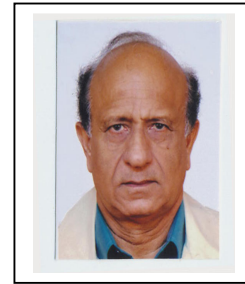
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Specialization : Igneous Petrology, Geochemistry, Precambrian Geology,
Environmental Geochemistry.



ACADEMIC QUALIFICATION :

PDF 1976-1981 University of Ottawa, Ottawa. MUN, St. John's, Canada.
Ph.D. 1976 Panjab University, Chandigarh.
M.Sc. (Hons.) 1967 Panjab University, Chandigarh.
B.Sc. (Hons.) 1966 Panjab University, Chandigarh.

PROFESSIONAL EXPERIENCE:

2011-13 UGC Emeritus Fellow
1996-08 Professor Panjab University, Chandigarh.
1985-96 Reader Panjab University, Chandigarh.
1974-85 Lecturer Panjab University, Chandigarh.
1972-74 Teaching Assistant Panjab University, Chandigarh.
1976-81 PDF, Commonwealth Scholar, University of Ottawa. Memorial University,
St. John's Canada.

h- index 13, Total citations : 700

Single Author: 35; First Author: 12 and others : 19

PUBLICATIONS: 68, work cited in SCI, and Text Books.

- ◆ Research Paper in Referred Indian Journal : 56
- ◆ Chapter in Books : 07
- ◆ Research Papers in Referred International Journals : 11
- ◆ Research Papers in International conference : 20
- ◆ Research Papers in National Conferences, IGCP Workshops etc. (2000 -). : 35

MANPOWER TRAINING :

Ph.D. : 15 (underway: 2)
M. Phill : 02

RESEARCH PROJECTS COMPLETED:

INSA Malani Project (1975-1976)

CSIR Malani Project (1984-1987)

DST Malani Project (1986-1990)

DST Project on Seismotectonics in NW Himalaya in relation to radon emanation (Jointly with Prof. S. Singh, GNDU, Amritsar. (2005-2009).

UGC Project : Evaluation of Chemical Quality of Ground water in parts of SW Punjab and adjoining areas of Haryana in relation to health hazards. (2011-2014)
Jointly with Naval Kishore Sharma, Madhuri Rishi and Veena Dadwal

AWARDS/HONOURS:

- ❖ Recipient Indian National Science Academy Medal for Young Scientists, 1975.
- ❖ INSA-Royal Society International Exchange fellowship, U.K., 1989.
- ❖ Member INSA delegation to 27th IGC, Moscow, Russia, 1984.
- ❖ Member INSA delegation to 32nd IGC, Florence Italy, 2004.
- ❖ Secretary, Indian Geologists' Association, Chandigarh.
- ❖ Member, National Working Group, IGCP-470 (2002-2007).
- ❖ Member Executive Council, Indian Geological Congress, Roorkee, 2006-2007, 2008-2009.
- ❖ Appointed Expert to discuss the source of high content of Uranium in groundwater of Malwa region, SW Punjab by Health safety and Environment Group, BARC, Trombay, Mumbai, 2012
- ❖ Research work cited in many Text Books including Geology of Rajasthan, 1998, Geology of India, 2008, Geological Society of India, Bangalore, Publications. The making of India: Geodynamic Evolution – K.S. Valdiya, Macmillan, 2008.

ACADEMIC ASSIGNMENTS:

- Reviewer for Journal Geological Society of India, Bangalore, Current Science, Bangalore, Proc. Indian Academy of Sciences (Earth Planet Sci.), Bangalore, Gondwana Research, Japan, etc., Mineralogy and Petrology Germany.
- Member Board of Research Studies (Science) Jammu University, Kashmir University, Srinagar.
- Ph.D. Examiner, University of Rajasthan, Jaipur, Jammu University, Jammu, GNDU, Amritsar, GJU, Hisar, Osmania University, Hyderabad, BHU, Varanasi, Kumaon University, Nainital, HNB University, Srinagar, Garhwal.
- Member Editorial Board, Indian Journal of Geochemistry, BHU, Varanasi.
- Member Organizing Committee, International Seminar on Applied Geochemistry in the coming decade, Hyderabad, 2001.
- Subject Expert UPSC, MoES, New Delhi, UGC, New Delhi; TNPSC, Chennai, RPSC, Jaipur NAAC, Bangalore, OPSC, Cuttak, PSC, Patiala, HPSC, Shimla.
- Member Expert Group – DST sponsored Seismicity Project, CSIO, Chandigarh.

- Member Selection Committee, Kurukshetra University, Kurukshetra, GNDU, Amritsar, University of Pune, Pune, Jammu University, Jammu, Punjab Remote Sensing Centre, Ludhiana.SASE, Chandigarh, JNV University, Jodhpur etc.
- Resource Person, UGC Refresher Course in Geology: M.L. University, Udaipur, 2003, AMU, Aligarh, 2003.
- Member Advisory Committee, Centre for Environmental Sciences, P.U., Chandigarh 2005-2007.
- Co-ordinator, Hons. School Examinations, Panjab University, Chandigarh, 2004-2006.
- Vice-Chancellor's nominee on various University committees.
- Host to Science Academies Summer Research Fellowship Programme. 2008-2009
- Guest Faculty at Central University of Punjab, Bhatinda, 2011-2012.
- Nominated External Expert to Board of Studies (PG) Geology, KU, Kurukshetra for the year 2012-2014, 2015-2016.
- Resource person. UGC Academic Staff College course on Disaster Management . Punjabi University . Patiala 2013
- Resource person, UGC Academic Staff College Course on Contemporary Environmental Issues: Assessment and Remediation. Kurukshetra University, Kurukshetra, 2014-2015.
- Member Expert Group of Brain Storming session of 36 International Geological Congress: A unique opportunity for advancement in Geosciences (36IGC - 2020), GSI (WR), Jaipur, December 17-18, 2015.
- Subject Expert: MHRD National Mission on Education through ICT, (NME-ICT), e-PG Pathshala, M.Sc. Environmental Science, 2017, Petrology and Geochemistry CUP, Bhatinda.
- Member Selection Committee CUP, Bhatinda, 2017.

PARTICIPATION IN INTERNATIONAL CONFERENCES.

- 1984 : 27th International Geological Congress (IGC), Moscow, Russia.
- 1989 : 28th International Geological Congress (IGC), Washington, D.C., USA.
- 1989 : International Geological Correlation Program (IGCP) -217, Precambrian Granitoids,Helsinki, Finland.

- 2000 : Third South Asia Geological Congress, Lahore, Pakistan.
- 2001 : International Geological Correlation Program (IGCP) -440, Assembly and Breakup of Rodinia and Gondwana and Growth of Asia, Osaka, Japan.
- 2004 : International Geological Correlation Program -454, Medical Geology Workshop, GSI, Nagpur.
- 2004 : 32nd International Geological Congress (IGC), Florence, Italy.
- 2006 : Geology of Middle East, Al-Ain, UAE.
- 2008 : 33rd International Geological Congress, Oslo, Norway.
- 2009 : 6th Annual Meeting of Asian Oceania Geosciences Society (AOGS), Singapore
- 2009 : 5th Meeting International Geological Correlation Program (IGCP)-510, A-Type granites, Turkey.
- 2010 : International Geological Correlation Program (IGCP)-512 Precambrian life, Time and Environment: Evolving concepts and modern analysis, Lucknow University, Lucknow.
- 2010 : 7th Annual Meeting of Asian Oceania Geosciences Society (AOGS), Hyderabad.
- 2011 : 8th International Symposium on Gondwana to Asia,(IAGR-2011) Hyderabad, India.
- 2012 : International conference on Radiation, Environment Assessment, Measurement and its impact. BBAU, Central University, Lucknow.
- 2012 : 34th International Geological Congress (IGC), Brisbane, Australia

- 2012 : 5th International Groundwater Conference on the Assessment and Management of Groundwater Resources in Hard Rock Systems with special reference to Basaltic terranes, Maulana Azad College of Arts, Science and Commerce, Aurangbad, December 18-21.
- 2013 : 2nd Symposium on the Geological Resources in the Tethyes Basins, Aswan, Egypt, January 5-8, 2013.
- 2013 : Rodinia 2013: Supercontinental cycles and geodynamics. Lomonosov Moscow State University, Moscow, Russia, May 20-24, 2013.
- 2013 : Meet on Precambrian Evolution and Deep Exploration of the Continental Lithosphere, Beijing, China. IAGR Conference Series No. 15, pp.51-57.
- 2016 : 35th International Geological Congress, Cape Town, South Africa.
- 2017 : Rodinia 2017, IGCP 648, Supercontinent cycles and global geodynamics, Seagull Townsville, Queensland, Australia.
- 2018 : 1st Springer Conference of the Arabian Journal of Geosciences (CAJG-1), Hammamet, Tunisia.

**INVITED AND CONTRIBUTED TALKS DELIVERED, TECHNICAL SESSIONS CHAIRED
(2000-)**

- 2000** Mantle plume, anorogenic magmatism and supercontinent. Workshop on plume tectonics, NGRI, Hyderabad, June 13-14, 2000.
- 2001** Anorogenic magmatism, mantle plume and assembly of the Late Proterozoic Malani supercontinent, NW Indian shield. International Symposium on the Assembly and breakup of Rodinia and Gondwana, and growth of Asia; OSAKA Japan, Oct. 26-36, 2001
- 2003** *Delivered lectures on granites; geochemical classification and tectonic environment at UGC Refresher course held at MLS University, Udaipur, 2003 and at AMU, Aligarh, 2003.
- 2004** Geological features and health problems. Seminar on Environmental Challenges to health, Punjab. Department of Botany and Environmental Sciences and Kheti Virsat, GNDU, Amritsar, Also Chaired one Technical Session
- 2004** Radon and chemical quality of groundwater in parts of SW Punjab in relation to the buried Aravalli-Delhi ridge. IGCP-workshop on Medial Geology, GSI, Nagpur, Feb. 2-4, 2004.
- The Malani supercontinent: Seychelles connection during Late Proterozoic. 32nd IGC, Florence, Italy, August. 20-28, 2004.
- Geological evolution of the Malani igneous suite (MIS) NW Indian shield: Constraints from the MIS and its Seychelles connection during Late Proterozoic. IGCP workshop 453 Uniformitarian revisited: Comparison between ancient and modern orogens of India. GSI, Nagpur, Nov. 2-3, 2004.
- 2005** A-type Malani magmatism, NW peninsular India. International conference of Precambrian continental growth and tectonism. Bundelkhand University, Jhansi, Feb. 22-24, 2005.
- Selenium toxicity in Punjab. IGC National seminar on Earth sciences in relation to society. University of Delhi, Delhi, Dec. 2-4, 2005.
- 2006** The Malani supercontinent: Middle East connection during Late Proterozoic. International Conference on Geology of Middle East, Al-Ain, UAE, March 20-22, 2006.
- 2007** *A-type Malani magmatism. National conference on Emerging trends in research in Geology of NW Indian shield M.L. S. University, Udaipur, Jan 24-25, 2006.

*Radon activity in air, water and soil around Dharamshala, H.P. in relation to seismotectonics. National conference on Accelerator and low level radiation. IUAC, New Delhi, April 26-27, 2007. (Chaired one session)

*The Malani supercontinent. 9th Convention of Indian Mineralogical Association, NGRI, Hyderabad, July, 19-20, 2007. (Chaired one session)

*Health hazards due to poor quality of ground water in Sirsa, Haryana. UGC National seminar on Water Crises and remedial measures. KVA DAV College for Women, Karnal, Nov. 21-22, 2007. (Chaired one session)

A-type Malani magmatism: significance of the Pan-African event in NW Indian shield and the assembly of the Late Proterozoic Malani supercontinent. IGCP-470 workshop on Pan-African Event in the Indian subcontinent, GSI, Lucknow, Dec. 27-28, 2007.

Seismotectonics of Dharamshala area H.P. in relation to radon emanations. National Symposium of Solid state nuclear track detectors and their application. HNB University, Tehri Garhwal, June 21-23, 2007

2008 The assembly of Malani supercontinent. International conference on Tectonics of Indian subcontinent, IIT Mumbai, March 3-7, 2008.

*Seismotectonics of Dharamshala area, H.P. in relation to radon studies. Theme meeting on Radon- 2008, BARC, Trombay, Mumbai, March 11-13., 2008.

Geochemical characteristics of the Malani igneous suite of rocks, NW peninsular Indian shield. National symposium on Significant milestones in the growth of geochemistry in India during the 50 years period 1958-2008, AMD, Hyderabad, Feb. 20-22-, 2008.

The Malani supercontinent: south China connection during Late Proterozoic. 33rd IGC, Oslo, Norway, Aug. 6-15. 2008. IGCP- 509.

The Malani supercontinent: The Middle East connection during Late Proterozoic, 33rd IGC, Oslo, Norway, Aug. 6-15, 2008. Geology of Africa

2009* Environmental radioactivity: a case study of HHP granitic region of Tusham ring complex, Haryana, India. National Conference on Accelerator and low level radiation safety (NCALLRS) IUAC, New Delhi, Nov. 18-20, 2009.

2009* Radon and helium studies for earthquake prediction and fault delineation in NW Himalayas, India, NCALLRS, IUAC, New Delhi. Nov.18-20, 2009.

2009* Uranium in Malwa region: probable cause of cancer. UGC National Seminar on Groundwater recharge, quality and auditing in hard rock. Deogiri College, Aurangabad- Nov. 26-27, 2009. (Key note paper).

2010 Malani supercontinent: geochemistry, Strutian glaciation and paleomagnetic constraints. IGCP-512 Int. Conference on Precambrian Life-Evolving concepts and modern analysis. Lucknow University, Lucknow, Feb. 2-9, 2010 – Chaired one Session.

2010* A-type Malani magmatism, NW Peninsular India. 7th AOGS, Hyderabad. July 5-9, 2010

- 2011*** Uranium in Malwa region SW Punjab. National conference on Multidisciplinary approach in frontier areas of environment, GJU, Hissar March 4-5, 2011. Also chaired one Tech. Session
- 2011** Were Siberia, Mongolia, Kazakhstan part of the Malani supercontinent during late Proterozoic? 6th International Symposium on Gondwana to Asia: Indian and Gondwana NGRI, Hyderabad, August 26-30, 2011.
- 2012** Uranium in Malwa region, South West Punjab, India. International conference on Radiation, Environment Assessment, Measurement and its impact. BBAU, Central University, Lucknow. April 12-14, 2012.
Also chaired on technical session.
- 2012*** Uranium in groundwater of Malwa region, SW Punjab. BARC, Trombay, Mumbai, 4th July 2012.
- 2012** Evaluation of chemical quality of groundwater in parts of Sirsa(Haryana), Mansa, Bhatinda and Muktsar Districts, SW Punjab with emphasis on Uranium in relation to human health, Fifth International Groundwater Conference, Aurangabad, December 18-21,2012.
- 2013** NW Indian shield elements in the Himalaya: implications for the Greater Malani supercontinent. 2nd Symposium Geological Resources in the Tethys region Aswan, Egypt., January 5-8, 2013.
- 2013** The Greater Malani supercontinent. Rodinia 2013, Supercontinental Cycles and Geodynamics, LMS University, Moscow, Russia.
- 2013** The Greater Malani supercontinent: South China, Siberia, Mongolia, Kazakhstan and Tarim connection during the Neoproterozoic. Meet on Precambrian Evolution and Deep Exploration of the Continental Lithosphere, Beijing, China, IAGR Conference Series No. 15, pp. 51-57
- 2014** The Malani igneous suite of rocks, NW peninsular india. SEC Fieldguide-1. The Marwar supergroup, Rajasthan Western India. Acted as subject expert
- 2014*** Siwana Fort Caldera Environment .. Implications for Uranium exploration In the Malani Igneous suite of rocks. International Seminar on Magmatism , Tectonism and Mineralisation (MTM 2014) , Kumaon University Nainital Chaired 1 technical session.
- 2015** The Malani Supercontinent. 102nd Session of Indian Science Congress, Mumbai. Also Chaired one Technical Session.
- 2015** Uranium in the Malwa region, Punjab. Workshop on Environment, Department of Environment Science and Janhit- The Jagran Group, Panjab University, Chandigarh.
- 2016** The Greater Malani supercontinent. Supercontinent Cycles and Geodynamics (IGCP-648), 35 IGC, Cape Town, South Africa.
- 2017** Archean continental crust beneath Maritius : Implications for the Geater Malani continent. (Theme: New progress and constraints on Supercontinent reconstructions) Rodinia 2017 conference and IGCP -648 activities, Seagull, Townsville, Queensland, Australia.
- 2017** Written a report on Challenges of drinking water with RO system installed at residence and public places in Punjab for the Punjab Pollution Control Board, Patiala.

* Invited talks

CONTRIBUTIONS MADE TOWARDS EDUCATIONAL/ SCIENTIFIC MANAGEMENT ORGANIZED:

- IGA sponsored National Seminar on Geohazards in NW Himalaya at Jammu, 2003.
- CAS sponsored National Seminar on Indian Plate at Chandigarh, 2001.
- DST, New Delhi sponsored short course on Paleoseismology and Earthquake Geology at Chandigarh, 2002.
- IGA sponsored field meeting at Nadah, Panchkula, Haryana, 2001.
- Delivered a lecture on Uranium contamination of groundwater of certain areas of Punjab and Haryana under the aegis of Society for Promotion of Science and Technology in India at Nirvachan Sadan, Panchkula, Haryana on November 3, 2012
- Contributed popular articles in newspapers on societal awareness topics i.e. Earthquakes, Environment and Medical geology.

N. Kochhar

Manpower Training

Ph.D.; Igneous Petrology and Geochemistry

| S.No. | Year | Name | Topic |
|-------|------|-------------------|--|
| 1 | 1988 | G. Vallinayagam | Geology and geochemistry of alkali granites and the associated acid volcanics around Mokalsar, dist. Barmer, W. Rajasthan, India, and their bearing on rift tectonics. Research Supervisor: N. Kochhar |
| 2. | 1990 | Sunil Dhar | Geology and geochemistry of the Jalor granites and the associated acid volcanics around Jalor, W. Rajasthan, India. Research Supervisor: N. Kochhar |
| 3 | 1992 | Rajni Sharma | Petrology and geochemistry of alkali granites and the associated acid volcanics around Jhunjhunu, dist. Jhunjhunu, Rajasthan, India. Research Supervisor: N. Kochhar |
| 4 | 1992 | R. Baskar | Petrology and geochemistry of alkali granites and the associated acid volcanics around Goliya Bhayian, dist. Barmer, W. Rajasthan India. Research Supervisor: N. Kochhar |
| 5 | 2003 | Mahin M. Esfahani | Petrology of Hasan Robot granites and associated rocks, northwest of Esfahan, Central Iran. Research Supervisors: L.N. Gupta and N. Kochhar |

M. Phil

| S.No. | Year | Name | Topic |
|-------|------|---------------|---|
| 1 | 1989 | R. Baskar | Petrology and geochemistry of the alkali granites and the associated acid volcanics around Mawri, dist. Barmer, W. Rajasthan. Research Supervisor: N. Kochhar |
| 2 | 1990 | R. Chellasamy | Petrology and geochemistry of the alkali granites and the associated acid volcanics around Gura Nal., dist. Barmer, W. Rajasthan. Research Supervisor: N. Kochhar |

Ph.D.; Environmental Geochemistry and Medical Geology

| S.No. | Year | Name | Topic |
|-------|------|---------------|--|
| 1 | 1991 | S.K. Mittal | A study of the hydrogeology of the Sirhind canal tract (Punjab State, India) with reference to the ecosystem. Research Supervisors : A.K. Prasad and N. Kochhar |
| 2 | 2006 | Arun Kumar | Hydrogeological and geochemical studies of part of Sirhind Nala sub-basin, in relation to buried Aravalli-Delhi ridge, SW Punjab, India Research Supervisors: N. Kochhar. and S.K. Mittal |
| 3 | 2007 | Manish Dogra | Geology and geochemistry of the granitoids of Dharamshala region, H.P. (India) with emphasis on the radon concentration in the eco-system of the area. Research Supervisor: N. Kochhar |
| 4 | 2008 | D. P.Singh | Geological aspects of environmental degradation due to mining activity in parts of Sirmour district, H.P. ,India Research Supervisors: N. Kochhar and Madhuri Rishi |
| 5 | 2011 | N. Ghosh | Assessment of Geochemical quality of groundwater in parts of Distt. Patiala (Punjab), India with special reference to Artificial recharge mechanism Research Supervisors: Madhuri Rishi and N. Kochhar |
| 6 | 2012 | Kamal Deep | Quality assessment of water resources with reference to Industrial pollution in Nalagarh valley of district Solan, H.P., India Research Supervisors: Madhuri Rishi and N. Kochhar |
| 7 | 2012 | Venu | Microlevel assessment of water and soil quality in parts of district Sangrur, Punjab, India in relation to agriculture and health hazards. Research Supervisors: Madhuri Rishi and N. Kochhar |
| 8 | 2013 | Renu | Geo-environmental impact assessment: A study of Sorang Hydro- Electric Power Project in Distt. Kinnaur, Himachal Pradesh, India. Research Supervisors: Madhuri Rishi and N. Kochhar |
| 9 | 2015 | Prerna Sharma | A Comparative study of groundwater quality in parts of Muktsar and Faridkot districts of Southwest Punjab, India in relation to human health and agriculture . Research Supervisors: Madhuri Rishi and N. Kochhar |

| | | | |
|----|---------|-----------------|---|
| 10 | Ongoing | Lakhvinder Kaur | Deciphering water pollution vulnerability zones of river Yamuna in alluvial plains of Panipat, Haryana, India Research Supervisors: Madhuri Rishi and N. Kochhar |
| 11 | Ongoing | Nandini Thakur | Vulnerability assessment of the status of Himalayan springs in the headwaters of Beas basin in Kullu valley, Himachal Pradesh, India. Research Supervisors: Madhuri Rishi and N. Kochhar |

LIST OF PUBLICATIONS OF PROF. NARESH KOCHHAR IN STANDARD REFERRED JOURNALS

1. Kochhar, N., A note on the passive volcanic effusions in the Tushan igneous complex. *Bull. Ind. Geol. Assoc.* v. 3. 1970, p. 34.
2. Kochhar, N., The problem of volcanic-plutonic association in the light of studies on the Tushan ring complex, north peninsular India. *Bull. Volc.* Tome xxxvi-3. 1972, pp. 497-550.
3. Kochhar, N., The occurrence of a ring dyke in the Tushan igneous complex, Hissar (Haryana) *Jr. Geol. Soc. Ind.* v. 14, 1973. pp. 190-193.
4. Kochhar, N., Indo-Gangetic basin ring structures and continental drift. *Nature (London)*, v. 242. 1973, pp. 141-142.
5. Kochhar, N., The age of Malani series *Jr. Geol. Soc. Ind.* v. 15. 1974. pp. 316-317.
6. Kochhar, N., Embayed quartz crystals in acidic volcanic rocks. *Rec. Res. Geology*, v. 3. 1977, pp. 342-345.
7. Kochhar, N., Post-emplacment alkali modifications in rapidly cooled acid volcanic rocks. *Am. Min.*, v. 62. 1977. pp. 33-335.
8. Kochhar, N., Petrochemistry and petrogenesis of the Malani igneous suite: Discussion, *Geol. Soc., Am. Bull.* v. 92. 1982. pp. 50-51.
9. Kochhar, N., Tusham ring complex Bhiwani India. *Proc. Indian Natn. Sci. Acad.*, v. 49, A. 1983. pp. 459-49.
10. Kochhar, N., Paleo-uplift and cooling rates from various orogenic belts of India as revealed by radiometric ages. *Discussion, Tectonophysics*, v.107, 1984. pp. 164-167.
11. Kochhar, N., Malani igneous suite: Hot-spot magmatism and cratonization of the northern part of the Indian shield. *Jr. Geol. Soc. Ind.* v. 25. 1984. pp. 155-161.
12. †Kochhar, N., Malani igneous suite: prophyry copper and tin deposits from the Tusham ring complex, north peninsular India. (Invited paper) *Geologicky Zbornik-Geologica Carpathica (Bratislava)*, v. 36, no. 2. 1985. pp. 245-255.
13. Kochhar, N., Pande, K., and Gopalan, K., Rb/Sr Geochronology of Tusham igneous complex, Bhiwani India. *Jr. Geol. Soc. Ind.* v. 26. 1985. pp. 216-219.
14. Kochhar, N., Alkaline magmatism in Delhi Supergroup. *Jr. Geol. Soc. Ind.* v. 30. 1987. pp. 537-539.

15. Kochhar, N., Vallinayagam, G. and Bhushan, S.K., Significance of perlite in the Precambrian acid volcanic rocks, *Ind. Minerals*, v. 42. 1988. pp. 148-152.
16. †Kochhar, N., High heat producing (HHP) granites of the Malani igneous suite, N. peninsular India. *Minerals*, v. 43. 1989. nos. 3 & 4. pp. 109-30.
17. Eby G.N., and Kochhar,N., 1990 Geochemistry and petrogenesis of the Malani igneous suite, north peninsular India. *Jour. Geol. Soc. Ind.*,v.36(2), pp 109-130
18. Kochhar,N., Sharma, Rajni, and Vallinayagam, G., Tin bearing potential of Malani representatives of the Jhunjhunu area, Dist. Jhunjhunu, Rajasthan, *Ind. Minerals*, v. 45. 1991. pp. 99-104.
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* Research paper in Environmental Geochemistry and Medical Geology.

† Research paper on U and rare metal potential in Malani rocks.

N. Kochhar

Research Contributions

SUMMARY

Research Project

Geochemistry and petrogenesis of the Malani igneous suite, northwestern peninsular India with special reference to the assembly of Malani Supercontinent.

Kochhar is probably the only scientist working in a University department who has been assiduously carrying out geological investigations for the past 30 years, on the Late Proterozoic rocks of the Malani Igneous Suite (55,000 Km²; 732 Ma) exposed in the Trans Aravalli block of the Indian shield at Siwana, Jalor, Tusham and Jhunjhunu. Kochhar has published over 50 research papers and 26 abstracts (conferences / IGCP programmes) dealing with field relationship, geochemistry, mineral chemistry and petrogenesis, crustal evolution and assembly of Malani supercontinent in standard national and international journals of repute and books and text book series brought out by Geological Society of India. Geology of Rajasthan, 1998, and Geology of Haryana and Delhi, 2006, Geology of India, 2008 and Making of India, 2008. His research work has been cited in SCI.

Summary of Contributions

Petrogenesis: Kochhar has not only made original contributions to the A-type, high heat producing (HHP), 'within plate' Malani granites and the associated acid volcanics vis-à-vis field relations, geochemistry and petrogenesis, but has also given concepts to the volcano-plutonic associations, ring structures, hot-spot tectonics, crustal growth and assembly of Malani supercontinent. Major elements, trace elements including REEs studies and mineral chemistry of biotite amphiboles and pyroxenes. The magmatism is bimodal in nature and the geochemical signatures to its HHP and A-type characteristics. Sr, Pb and Nb isotopic data indicate mantle derived primary magmas subsequently modified by crustal contamination for coeval Siwana and Jalor complexes and the presence of Archean crust in the Marwar terrain. Felsic volcanics are derived by fractional crystallisation of mantle derived magmas.

Crustal Evolution and Malani Supercontinent

After the accretion and stabilization of the Aravalli-Delhi mobile belt some 1650 Ma B.P., there was intense build up of stress fields which gave rise to linear zones of extension and high heat flow. Along these NE-SW trending lineaments, the Malani

magmatism was triggered by hot-spot tectonics. The Malani magmatism marked the cratonisation of the northern Indian shield.

The A-type Malani magmatism, its volcano-plutonic setting, and the chemistry of the associated basic dyke rocks attest to the tensional tectonic environment of the TAB of the Indian shield. The Malani magmatism coupled with alkaline magmatism precursor to two abortive intraplate rifting attempts to 1500-1100 Ma and 750 Ma B.P. by the Indian lithosphere. The assembly of the Malani Supercontinent comprising the TAB of the Indian shield, Central Iran, Arabian-Nubian shield, Somalia and Seychelles, Madagascar, South China, Siberia, Mongolia, and Kazakhstan has been proposed by Kochhar. All these micro-continents record the ca 750 Ma Pan-African tectonomagmatic thermal event of widespread anorogenic (A-type) magmatism, crustal stress pattern and rifting. The migration of Indian sub-continent during the Malani rhyolite period to steep northern latitude (75° across the equator) may be due to mantle plume activity. This also caused Precambrian glaciation and subsequent desiccation.

The Malani plume activity (the Sarnu-Dandali low velocity anomaly marks the fossil plume head) around 730 Ma B.P. caused the separation of TAB of the Indian shield from Eastern Gondwana and subsequent amalgamation in the supercontinent.

The presence of Archean crust of BGC affinity beneath the Mauritius also support the existence of the Granter Malani supercontinent.



Dr. Naresh Kochhar, Department of Geology, Panjab University, Chandigarh receiving Indian National Science Academy Medal for Young Scientists for the year 1975 from Smt. Indira Gandhi, the then Prime Minister of India at Indian Science Congress Session, Waltair on January 3, 1976.