

**Dr. Rakesh Mohan Sharma,
M.Sc. Ph.D.,
Professor of Forensic Science,
Department of Forensic Science,
Punjabi University,
Patiala – 147002, India
91 94 170 92234 (Cell)
91-175-3046271 (O)
91-1752283131 (R)
Fax : 91-175-2286682,
2283073
rmsforensics@gmail.com**

Area of Specialization

Forensic Analytical Chemistry & Criminalistics

Research Activities :

R&D collaborations

Collaborating with Central Forensic Science Laboratory, Chandigarh, a Center of Excellence in Forensic Physical sciences on Emerging Areas of Forensic Science.

Active in Advancing Forensic Science as a Tool Against Terrorism .

Supervised following Research Projects in the Frontier areas of Forensic Science for doctoral work.

Some Analytical Studies of Heroin Samples Encountered in Forensic Cases, 1996

Studies in the Evaluation of Detective Chemicals in Forensic Cases, 2002

Characterization of RDX in Explosive Formulations and Residues by Chromatography and Spectroscopy 2003

Speaker Identification Based on Acoustic Features of Speech Sound in Telephonic Conversation for Forensic Applications 2005

**Effect of the Recording Devices on Speech Signal for Speaker Identification, 2006
Study of Acoustic Characteristics Based on Phonetic Features in Some Dialects of Hindi for Forensic Speaker Identification 2006**

Characterization of Noise Associated with Forensic Speech Samples for Speech

Recognition and Speaker Identification 2009

Heading a strong research group working on following research problems :

Some analytical Studies in the Evaluation of Arson Residue

Studies on the Thermal Stability of Explosives in the Presence of Some Organic Acids, Basis and Ions

Characterization and Quantification of some Heavy Toxic Metals in Ayurvedic Formulations

Spectrographic and Automatic Analyses of Speech Samples Recorded in Forensic Contexts

Administrative Responsibilities:

December 2018-Till date

Director(Planning and Monitoring)

January 2018-Till date

Dean (Faculty of Physical Sciences)

January 2016 – January 3rd 2018

Associate Dean (Research), Punjabi University, Patiala, India

August 2004-September 2007

Chairman, Department of Forensic Science, Punjabi University, Patiala, India

Chairman of the Organizing Committee

April 4-8 th , 2005

National Workshop on Forensic Facial Reconstruction

August 11-13 th , 2006

National Symposium on Cyber Forensics and Computer Crimes.

May 2006 – May 2008

Provost of the University

May 2006 – July 2006

Director, Public Relations

June 2002 – May 2006

Senior Warden, Boys Hostels

September 1997 – June 1999
Warden, Boys Hostel

Academic Positions :

July 2006 – Present
Professor of Forensic Science, Punjabi University, Patiala

July 1998-July 2006
Assoc. Professor of Forensic Science, Punjabi University, Patiala

January 1988- July 1998
Asst. Professor of Forensic Science, Punjabi University, Patiala

March 1984 – December 1987
Research fellow in Forensic Science, Punjabi University, Patiala Under Bureau of Police Research & Development, Ministry of Home, Government of India, New Delhi

Honors and Awards :

Member Explosives Standards Working Group(ESWG),US Department of Homeland Security.

Guest Faculty 1. Maharaja Ranjit Singh Punjab Police Academy, Phillaur

. 2.Punjab Police Commando Training Center, Fort Bahadurgarh. Patiala

➤ Regularly delivering special lectures to Police Officers on Specialized topics namely :

- International trends in terrorism – Role of Forensic Experts
- Threat to VIP's from IEDs and other modes of Mass destruction available with terrorists and use of new scientific methods in the detection and neutralization of these devices.
- Changing Trends In IED.
- Advances in Forensic Science/ Forensic medicine and its role in crime investigation.

➤ Invited speaker

- Australian Bomb Data Center, Annual Conference, 17-19 November 2010, Canberra , Australia

- **International Symposium on Analysis and Detection of Explosives, 22-25 November, 2010, Canberra, Australia**
- **Best Paper Award by Medico legal Society of India**

1996

Kaur, J., Saini, A., Kaur, M. and Sharma, R.M., "UV Spectrophotometric determination of Caffeine in popular brands of Soft Drinks" *J. Forens. Med. Toxicol.*, 1996; XIII (3&4): Pp 1-3.

- **Best Scientific Paper in Forensic Physical Sciences**

2004

- **XV All India Forensic Science Conference, Karnal**
Gopal, C.M., Jain, S.K. and Sharma, R.M., "Comparative study on the variation in Acoustic Parameters of Hindi Speech Sound in Different Telephonic Modes- A Statistical Analysis". Proceedings of XV All India Forensic Science Conference, Karnal, January, 18-20th 2004, Pp.4.
- **XVI All India Forensic Science Conference, Hyderabad**
Mishra, R.K., Jain, S.K. and Sharma, R.M., "Effects of Different Recorders on Hindi Cardinal Vowel Sounds for Speaker Identification and its Forensic Relevance" Proceedings of XVI All India Forensic Science Conference, Hyderabad, India, Dec., 2004, Pp.171-82.

2005

- **XVII All India Forensic Science Conference, Raipur**
Mishra, R.K., Jain, S.K. and Sharma, R.M., "Surface Topography of Recording Medium to study the effect of Different Recorders- A new Approach" Proceedings of XVII All India Forensic Science Conference, Raipur, India, Nov., 2005, Pp.267-73.

2009

- **XX All India Forensic Science Conference held at Jaipur, Rajasthan**
Shivani Sharma, S.K.Jain, R.M.Sharma, S.S.Agrwal, "Characterization of Acoustic and Temporal Parameters for Speaker Identification in case of Disguise Voice, Proc. XXII All India Forensic Science Conference, Jaipur, Rajasthan, (15th-17th Nov., 2009), pp 725-735.

2010

- **O-COCOSDA 2010, Nov 23-24, 2010 at Nepal**
Shivani Sharma, S.K.Jain, R.M.Sharma, S.S.Agrwal: Present Scenario of Forensic Speaker Identification in India, Proc. O-COCOSDA 2010, Nov 23-24, 2010 at Nepal, pp 10-16.

Research Publications

1 Forensic Speech Analysis

1. Mishra, R.K., Jain, S.K. and Sharma, R.M., “Importance of Human Speech Parameters for Genuine use of Digital System”. **Proceedings of International Symposium, Frontiers of Research in Speech and Music**, Chidambaram, India, Jan. 2004, Pp. 234-235.
2. Mishra, R.K., Jain, S.K. and Sharma, R.M., “ Acoustic Characterization of Speech Signal Recorded Through different Recorders for Speaker identification-An Experimental Study” Proc. **International Conference on Speech and Language Technology**, ICSLT-Oriental-COCOSDA, New Delhi, India, Nov. 2004: Pp115-121.
3. Mishra, R.K., Jain, S.K. and Sharma, R.M., “Person Authentication based on Voice in Forensic Context- A Perspective on Legal Issues” ‘**An interdisciplinary approach to Forensic Science**’ by Scientific Selective Book Publishers India, 2005, Chapt. 7, Pp62-78.
4. Mishra, R.K., Jain, S.K. and Sharma, R.M., “ Effects of Different Recorders on Hindi Cardinal Vowel Sounds for Speaker Identification and its Forensic Relevance”, **CBI Bulletin**, May 2006; XIV (2-5), Pp.39-50.
5. Bhargav, N. and Sharma, R.M., “Technological upgradation in forensic science. The Prespective, March 2008 Vol. 11(1), pp 37-43
6. Kulshreshtha,M. Singh, C.P. and Sharma, R.M.:Comparison of accent features embedded in Chattisgarhi and Khariboli Dialect of Hindi for Forensic Speaker Profiling : **The Internet Journal of Forensic Science**. 2008; Volume 3, Number 1.
7. Shivani Sharma, S.K.Jain, R.M.Sharma,:Characterization of Acoustic and Temporal Parameters for Speaker Identification in case of Disguise Voice, **Proc. XXII All India Forensic Science Conference**, Jaipur, Rajasthan,(15th-17th Nov.,2009).pp 725-735.
8. Shivani Sharma, S.K.Jain, R.M.Sharma, S.S.Agrwal: Present Scenario of Forensic Speaker Identification in India, **Proc. O-COCOSDA 2010**, Nov 23-24,2010 at Nepal, pp 10-16.
9. Sharma, S., Jain, S.K., Sharma, R.M., and Agrawal, S. S., “Present Scenario of Forensic Speaker Identification in India” **Proceedings of International conference on Spoken Languages O-COCOSDA (2010)**.
10. Kulshreshtha,M. Singh, C.P and Sharma, R.M., “Speaker Profiling:The Study of Acoustic Characteristics Based on Phonetic Features of Hindi Dialects for Forensic Speaker

Identification” **Forensic Speaker Recognition- Law Enforcement and Counter-Terrorism**, by Springer, New York, 2011, Pp71-100.

11. Jiju P.V., Singh, C.P and Sharma, R.M., “Characterization of Noise Associated with Forensic Speech Samples” ” **Forensic Speaker Recognition- Law Enforcement and Counter-Terrorism**, by Springer, New York, 2011, Pp205-251.
12. Sharma, Shivani ,Jain,S.K.and Sharma,R.M., Speaker Identification from Non Contemporary Speech Samples- Forensic Significance: *The Indian Journal of Criminology and Criminalistics*, 2011; XXXII(1): Pp. 135-147.
13. Sharma, S., Jain, S.K., and Sharma, R.M., “Speaker Identification from Noncontemporary Speech Samples – Forensic Significance,” **The Indian Journal of Criminology and Criminalistics**, (2011) vol. XXXII, no. 1, pp. 135-147.
14. Sharma, S., Jain, S.K., Sharma, and Sharma, R.M., “Internet Telephony and Speaker Identification-Forensic Relevance” accepted for publication in *The Indian Police Journal* July-Sept, (2013)vol.LX.No.3,pp.177-185.
15. Sharma, S., Jain, S.K. and Sharma, R.M., “Spectrographic Study of Voice Samples Recorded in Voice over Internet Protocol(VOIP)” accepted for publication in **Proceedings (IEEE) of International conference on Spoken Languages Publication** Year: 2013 , Page(s): 1 - 4
16. Kulshreshtha,M. Singh, C.P and Sharma, R.M., “Speaker Profiling:The Study of Acoustic Characteristics Based on Phonetic Features of Hindi Dialects for Forensic Speaker Identification”, Pp71-100.
17. Jiju P.V., Singh, C.P and Sharma, R.M., “Characterization of Noise Associated with Forensic Speech Samples”, Pp205-251.
18. Chapters in Book.
Forensic Speaker Recognition- Law Enforcement and Counter-Terrorism, by Springer, New York, 2011, ISBN 978-1-4614-0262-6

Drugs, Explosive, Arson and Allied Substances;

1. Saini, H.K., Sharma, R.M., Sidhu, K.S. and Bami, H.L., “Preliminary study on constituents of mosquito coil smoke” *J. Pesticides*, 1986; XX (2): Pp15-18.
2. Saini, H.K., Sharma, R.M., and Sidhu, K.S., “A Forensic Examination of Hair Oils through Pyrolysis Gas Chromatography” *Ind. J. Forensic Sci.*, 1987; 1: Pp29-35.

3. Kalia, A., Kaur, S., Sharma, R.M. and Verma, R.S., "Analysis of Heroin and its adulterant by TLC" *Ind. J. Forensic Sci.*, 1992; 6: Pp95-98.
4. Singh, P. Sharma, R.M. and Verma, R.S., " A systematic approach to Post blast explosive analysis" *CBI bulletin*, 1992; XXVI(10): Pp12-17.
5. Singh, B. Kaur, M. and Sharma, R.M., "Analysis of some Common drugs of abuse by UV derivative spectrophotometer, *J. Forens. Med. Toxicol.*, 1995; XII(1&2): Pp 45.
6. Kaur, J., Saini, A., Kaur, M. and Sharma, R.M., " UV Spectrophotometric determination of Caffeine in popular brands of Soft Drinks" *J. Forens. Med. Toxicol.*, 1996; XIII (3&4): Pp 1-3.
7. Kumar, R., Kaur, M. and Sharma, R.M., "Analysis of Some Undetonated Explosives by UV Derivative Spectrophotometer" *Current Topics in Forensic Science.*, Proc. 14th Meeting International Association of Forensic science, Tokyo Japan. Aug 26-30, 1996; IV: Pp
8. Sharma, R.M., Singh, G, and Saroa, J.S., " Characterization of Some Common Black gel Pen Inks by Thin Layer Chromatography" *CBI Bulletin*, 2005; XIII(10): Pp.43-49.
9. Sharma, R.M., Singh, M. and Saroa, J.S., "Derivative U.V. Spectrophotometric Analysis of Some Commonly Abused-Over-The-Counter Drugs", *JPAFMT*, 2005; 5: Pp 8-12.
10. Babu, E.S., Kaur, S., Sharma, R.M. and Kartha, K.P.S., "Sensitization of PETN by Oxalic acid- A DSC study". *Sci. Tech. Energetic Materials*, 2006; 67(4): Pp113-116.
11. Kaur, S., Saroa, J.S. and Sharma, R.M., "Thin layer chromatography of Some Common Carbon Papers", *The Forensic Scientist On line journal*, 2006; 9: Pp1-9.
12. Sharma, R.M Countering IED , **Proc. Australian Bomb Data Center**, Annual Conference, (17-19 November 2010) Canberra , Australia, pp 70-73.
13. Sharma, R.M, Emerging Trends in IED- Indian Perspective; **International Symposium on Analysis and Detection of Explosives**, (22-25 November, 2010) Canberra, Australia, pp 100-103.
14. Puri N, Khurna T, Sharma R.M; Derivative UV Spectrophotometric Study on Fluoxetine –An Antidepressant Drug has been accepted for publication in *International Journal of Medical Toxicology and Legal Medicine*; Volume 16 No 1, 2013
15. Kaur A, Khurana T, Sharma R.M; Fourier Transform Infrared Spectroscopic Characterisation Of Some Common Antidepressants In Pharmaceutical Preparations has been accepted for publication in *International Journal of Medical Toxicology and Legal Medicine*; ISSN 0972-0488 , Volume 16 No 1 , 2013.

16. Bumrah G.S, Sharma R.M; Raman Spectroscopy – Basic principle, instrumentation and selected application for the characterization of drugs of abuse; *Egyptian Journal of Forensic Sciences*, 2015
17. Kaur M, Yadav P.K, Bumrah G.S, Kaur S.P, Sharma R.M; Attenuated total reflectance (ATR) fourier transform infrared spectroscopic studies on some common antidepressants; *International Journal of Medical Toxicology and Legal Medicine*, 2015 (1)
18. Gautam P, Sachdeva S, Yadav PK, Bumrah GS, Thakar MK, Sharma RM. Derivative UV spectrophotometric studies on some common antidepressants. **International Journal of Medical Toxicology & Legal Medicine**. 2015;18(2-4):38-43.
19. Aatika, Yadav PK, Bumrah GS, Gambhir S, Sharma RM. Poisoning trends in Panchkula district of Haryana state, India. **Journal of Forensic Medicine & Toxicology**. 2015;32(1):7-16.
20. Bumrah GS, Sachdeva S, Sharma RM. Detection of phosphine in toxicological samples: A review of literature. **International Journal of Medical Toxicology & Legal Medicine**. 2015;18(2-4):21-24.
21. Chahal MK, Yadav PK, Bumrah GS, Sharma RM. Thin layer chromatographic analysis of some common over the counter (OTC) cough-cold preparations. **Egyptian Journal of Forensic Sciences**. 2016;6:351-360.
22. Kaur A, Yadav PK, Bumrah GS, Sharma RM. A critical review of gas chromatography – mass spectrometric analysis of benzodiazepines in matrices of forensic importance. **Journal of The Indian Society of Toxicologist**. 2016;12(1):29-42.
23. Bumrah GS, Sharma RM. Raman spectroscopy – Basic principle, instrumentation and selected applications for the characterization of drugs of abuse. **Egyptian Journal of Forensic Sciences**. 2016;6:209-215.
24. Bumrah GS, Sarin RK, Sharma RM. Derivative Ultraviolet Spectrophotometry: A Rapid, Screening Tool for the Detection of Petroleum Products Residues in Fire Debris Samples. **Malaysian Journal of Forensic Sciences**. 2016;7(1):17-26.
25. Bumrah GS, Sarin RK, Sharma RM. Developments in analysis of fire debris residues. **Journal of Forensic Chemistry and Toxicology Sciences** 2017;3(1):23-38.
26. Punia BS, Yadav PK, Bumrah GS, Sharma RM. Analysis of illicit liquor by headspace gas chromatography – mass spectrometry (HS-GC-MS) - A preliminary study. **Journal of Association of Official Analytical Chemists International**. 2017;100(1):109-125.

27. Bumrah GS, Sarin RK, Sharma RM, Developments in analysis of fire debris residues. **Journal of forensic chemistry and toxicology**. 2017; 3(1); 23-35.
28. Bumrah GS, Sarin RK, Sharma RM. Developments in analysis of fire debris residues. *Journal of Forensic Chemistry and Toxicology* 2017;3(1):23-38.
29. Bumrah GS, Sarin RK, Sharma RM. Analysis of petroleum products in fire debris residues by gas chromatography: A literature review. *Arab Journal of Forensic Sciences & Forensic Medicine* 2017;1(5):512-534.
30. Yadav PK, Sharma RM. Forensic characterization of liquor samples by gas chromatography – mass spectrometry (GC-MS) – A review. *Arab Journal of Forensic Sciences & Forensic Medicine*. 2017. 1(6); 695-714.
31. Kaur A, Yadav PK, Bumrah GS, Sharma RM. Inhalant abuse and detection using Gas Chromatography: A review of Literature. Anil Aggarwal's internet journal of forensic medicine and toxicology. 2017. 20(2);1-15.
32. Kaur H, Yadav PK, Bumrah GS, Mittal R, Sharma RM. Detection of heavy toxic metals in some common ayurvedic preparations using energy dispersive X-ray fluorescence (EDXRF) spectrometry. Anil Aggarwal's internet journal of forensic medicine and toxicology. 2017. 21(1); 1-9.
33. Bumrah GS, Sarin RK, Sharma RM. Derivative ultraviolet spectrophotometric studies on ignitable liquids. *Journal of Forensic Chemistry and Toxicology* 2018;4(1):11-22.
34. Bumrah GS, Sarin RK, Sharma RM. Fire debris analysis – A need to develop databases. *Arab Journal of Forensic Sciences & Forensic Medicine* 2018;1(8):1099-1100.
35. Yadav PK, Sharma RM. Determination of metals in alcoholic beverages using stripping methods – A critical review. *Arab Journal of Forensic Science and Forensic Medicine*. 2019. 1(9); 1232-1247.

36. Yadav PK, Sharma RM. Classification of illicit liquors based on their geographical origin using Attenuated Total Reflectance (ATR) – Fourier Transform Infrared (FT-IR) spectroscopy and chemometrics. *Forensic science international*. 2019. 295; e1-e5.
37. Britto C, Yadav PK, Sharma RM. Derivative UV-Vis spectrophotometric analysis of caramel in some common liquor samples. *Journal of forensic chemistry and toxicology*. 2019. 5(1); 21-25.

Miscellaneous

1. Sharma, R.M., Sehagal, V.N. and Sidhu, K.S., “ Examination of house hold paints by Emission Spectrography” *Ind. J. Forensic Sci.*, 1987; 1: Pp189-195.
2. Ranjana, Sharma, R.M. and Jasuja, O.P., “Thin Layer Chromatographic analysis of some colored pencils” *Ind. J. Forensic Sci.*, 1991; 4(4): Pp193-202.
3. Saini, A., Kaur, M. and Sharma, R.M., “Comparison of Some Lipsticks Smears by the UV-VIS Derivative spectrophotometer” *Current Topics in Forensic Science.*, Proc. 14th Meeting International Association of Forensic science, Tokyo Japan. Aug 26-30, 1996; IV: Pp 160.
4. Sharma, R.M., Joshi, B., and Saroa, J.S., “ Thin Layer Chromatographic Characterization of Some Common Liquid Vermilions (Bindis)” *The Indian Journal of Criminology and Criminalistics*, 2006; XXVII(1): Pp. 76-82.
5. Gupta, N., Saroa, J.S. and Sharma, R.M., “Thin layer chromatography of Nail Enamels” *JFI*, 2006; 56(2): Pp 198-209.
6. Gangwar,D.P., Sharma, R.M., “ Pyrolysis Gas Chromatography- Mass Spectrometry (Py GC-MS) Analysis As A Useful Technique in Forensic Examination of Paint Samples,” **Proc. XIX All India Forensic Science Conference**, Gandhinagar, Gujarat,(18th-20th Jan,2009) Pp.70-74.
7. Bumrah GS, Sharma RM, Jasuja OP. Emerging latent fingerprint technologies: A review. **Research and Reports in Forensic Medical Science**. 2016;6:39-50.
8. Yadav PK, Sharma RM. **Comparison of Some Nail Polish Samples by Attenuated Total Reflectance Fourier Transform Infrared (FTIR) Spectrophotometry. National Conference on Forensic Science**. Department of Forensic Science, Punjabi University, Patiala. (19th – 21st December 2016).