

24th-27th August 2023



14th INTERNATIONAL CONFERENCE 2023

FORENSIC SCIENCE

Online Conference

eConference Proceedings

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ORGANIZERS

"With organization comes empowerment!"

We are glad to have renowned associations who are a part of and worked together in this remarkable journey of achieving the goal of excellence!



INTERNATIONAL ASSOCIATION OF SCIENTISTS AND RESEARCHERS

International Association of Scientists and Researchers is a non-profit organization focused on delivering updated literature and research work to the global scientific and research society and avid learners, unleashing all boundaries to promote education. It aims to provide open access to critically reviewed high-quality research papers, literature and works to provide a user-friendly global platform for researchers and scientists. Reciprocation of their invaluable ideas and researches would allow them to share information and disseminate the recent ground-breaking studies and advancements in various fields, working together for a better world to live in. The association's vision is to encourage and follow its mission of sharing the information online into a research network, welcoming original research, speculative work, and application-based work from multidisciplinary domains of science, arts, commerce and other studies. It aims to contribute to an enhanced understanding of various disciplines globally and augment the interchange of knowledge and ideas associated with international organizations.

SHERLOCK INSTITUTE OF FORENSIC SCIENCE INDIA

SIFS INDIA is registered with Govt. of India and ISO Certified Educational Institute that has acquired a special place of honour globally. They provide a user-friendly platform in education intending to impart high quality and easily accessible forensic education to meet the growing demand of law enforcement and other government and private legal departments. Its main aim is to provide equal opportunities to aspiring students who don't have access to traditional learning methods. It focuses on grooming the career of students in forensic science and criminal Investigation sectors, introducing higher education for the learners at their doorsteps, and providing access to high-quality education to all those who seek it.



Academic Collaborators

UNIVERSITY OF BAGUIO, PHILIPPINES



The University of Baguio, formerly Baguio Technical and Commercial Institute (Baguio Tech), is a private, Filipino, multidisciplinary, autonomous university in Baguio, Philippines. It was founded by Fernando Gonzaga Bautista and Rosa Castillo Bautista on August 8, 1948, with 80 students. The student population in 2018 was about 18,000 in its tertiary level. It offers 21 undergraduate programs, 12 graduate programs, and 10 short-term programs across 11 colleges; a Preparatory High School; Science High School; and a Grade School. It has grown to be an institution of close to 18,000 students and more than 400 faculty members.

UNIVERSITY OF PHILIPPINES, MANILA

The University of the Philippines Manila (UP Manila) is one of the eight constituent universities of the University of the Philippines (UP) System. It is a public and secular institution of higher learning that offers academic and training programs and extension services in the health sciences, education in the health profession, arts, and sciences. Its mission is to provide health science-focused transformative education, enabling and encouraging students to take creative and constructive action serving humanity. It also serves as a research hub in various fields of specialization in the health sciences and leads as a public service university.



HOLY ANGEL UNIVERSITY, PHILIPPINES



Holy Angel University, Philippines offers cutting-edge academic programs from Basic Education to Graduate School and has a package of scholarships and grants programs for qualified and deserving applicants. Every Angelite at HAU continues to enjoy an exceptional campus experience in its ninth decade. Their mission is to provide affordable, high-quality education that develops students into moral, intelligent, and compassionate individuals for the glory of God. Their objective is to establish themselves as a facilitator for rural development and as one of the most prestigious and skillfully run Catholic colleges in the Asia Pacific region.



FEDERAL UNIVERSITY OF TECHNOLOGY, OWERRI

FUTO, as the Oldest University of Technology in Nigeria, was established in 1980 by Executive fiat with the composition and appointment of the first provisional Council by Nigeria's First Executive President, Shehu Shagari. It became the first of three such Universities set up by the Federal Government of Nigeria who sought to establish a University of Technology in each geo-political region and particularly in a State which did not have a conventional University. Its vision is to re-engineer and reposition the Federal University of Technology to be a truly world-class university through recreating, nurturing, and developing uniquely promising students and exceptional staff in Science, Technology, and enterprise to benefit our globalized world.

PSGR KRISHNAMMAL COLLEGE FOR WOMEN, COIMBATORE

PSGR Krishnammal College for Women (PSGRKCW) has blossomed into a reputed and renowned institution of higher education. It is ranked 6th among colleges in India in the National Institutional Ranking Framework (NIRF) 2022 by MHRD, GOI. PSGRKCW is accredited by NAAC with A++ Grade. Their mission is to give young women with a values-based educational opportunity that equips them with the knowledge and skills they need to become responsible global citizens while also fostering hope and confidence. Their goal is to provide impoverished members of our communities with access to high-quality education that is offered effectively, carefully, and respectfully. At the undergraduate, graduate, and doctorate levels, they foster enthusiastic lifelong learners and arm them with the information, skills, competencies, and values of the day. They wish to help young women develop the potential to contribute significantly to society.



“येथे बहुतांचे हित”

SHANKARRAO CHAVAN LAW COLLEGE, PUNE

Shankarrao Chavan Law College, Pune is affiliated to Savitribai Phule Pune University, Approved by Bar Council of India, Recognized by Government of Maharashtra and Accredited with 'A' Grade by National Assessment and Accreditation Council of India, thus Stands as One of the Premier Law Institution in India. It stands to establish themselves as a centre for legal education that prioritises the development of superior legal basics and professional practise skills. It seek to break through traditional teaching-learning obstacles and provide students with the most exposure possible. The mission of SCLC is to give aspiring attorneys the hands-on experience they need to successfully enter, hold, and continue working in the noble field of law.

NATIONAL POST GRADUATE COLLEGE UNIVERSITY OF LUCKNOW, LUCKNOW



National Post Graduate College was established in 1974 by the then Chief-minister of Uttar Pradesh, Late Chandra Bhanu Gupta. The college is situated close to the banks of river Gomti in the heart of the city, has a lush green campus, and is surrounded by several significant academic and administrative institutions. The single life force functioning behind the college administration is to provide quality education to inculcate virtues of disciplined, dedicated and good citizens in the students. The students thus succeed in creating a society with love, freedom, liberty, justice, equality and fraternity.

CLUE4 EVIDENCE FOUNDATION, BENGALURU

Clue4 Evidence Foundation is a non-profit organization that aims to provide a victim support platform, including mediation, investigation, and litigation support. In achieving this, various projects are initiated by engaging the socially deprived category of people by providing suitable training, keeping in mind the Social responsibilities and the need for such initiatives for various individuals by Clue4 Evidence Foundation®.



CENTURION UNIVERSITY, ODISHA



Centurion
UNIVERSITY

Centurion University is duly recognized as a pioneer in 'Skill Integrated Higher Education'. Its unique model lays specific emphasis on creating sustainable livelihoods on a national scale in challenging geographies through education that results in employability and sparks entrepreneurship. This model has been recognized by multiple Governments (Central and State), International Organizations such as UNESCO and the World Bank as well as Policy Think-tanks such as the Niti Ayog. Recently, Centurion University's School of Vocational Education and Training has been recognized as a Center of Excellence by Ministry of Skill Development and Entrepreneurship, Government of India. It is the only University in India to be recognized as such.

GARDEN CITY UNIVERSITY, BENGALURU



Garden City University is established under Karnataka State Act no. 47 of 2013. The Garden City University Act received the assent of the Governor of Karnataka on 26th March 2013 and was published in the Karnataka Gazette on 12th April 2013. The University Grants Commission has listed Garden City University in the recognized list of Private Universities in India. Its vision is to be an institution that will offer affordable world-class education to all classes of students in order to uplift the society we serve, by nurturing human values and ethics and by imparting knowledge which emphasizes on life skills.

SAVEETHA DENTAL COLLEGE, CHENNAI

Saveetha Dental College is one of the finest institutions in the world with a unique curriculum that is a spectacular fusion of the best practices of the east and west. It is our everlasting passion that has helped us train our students with unsurpassed skills in Clinical, Academic and Research domains. College believe that there ultimate success would be to see their students become strong confident successful professionals. They focus on making the learning environments conducive for students to achieve their goals in life.



SRINIVASAN COLLEGE OF ARTS & SCIENCE, PERAMBALUR



Srinivasan College of Arts & Science was established by Shri.A. Srinivasan, Founder - Chairman of Dhanalakshmi Srinivasan Charitable and Educational Trust, Perambalur. The trust was registered on 18th January 1994 under the Tamilnadu Societies Act. Srinivasan College of Arts & Science started with 6 U.G. courses has now blossomed into an institution with 12 Under Graduate programmes and 8 Post Graduate programmes. The college was started on 29th November 2004 as per the G.O No.: MS. 477 and got affiliated to Bharathidasan University, Tiruchirapalli.

JAIPUR NATIONAL UNIVERSITY, JAIPUR



JNU is a premier university that provides research-intensive education dedicated to academic excellence and industry preparedness. JNU aims to be the top ranking university in India to provide unique and exclusive learning opportunities in all disciplines of study through research-intensive, academic excellence programmes that have a positive impact on the world. The University has set many benchmarks in higher education, technical education, and medical education. It is one of the top most universities in Jaipur Rajasthan that provides exceptional academic excellence through a plethora of courses.

K.R. MANGALAM UNIVERSITY, GURUGRAM

K.R. Mangalam University is the fastest-growing higher education institute in Gurugram, India. Since its inception in 2013, the University has been striving to fulfil its prime objective of transforming young lives through ground-breaking pedagogy, global collaborations, and world-class infrastructure. KR Mangalam University aspires to become an internationally recognized institution of higher learning through excellence in inter-disciplinary education, research and innovation, preparing socially responsible life-long learners contributing to nation building.



HOLY CROSS COLLEGE, AGARTALA



Holy Cross College is a private English medium Catholic institution of higher learning founded, animated and enlivened by the Congregation of Holy Cross, a community of scholarship and faith, anchored by a belief in the Inherent dignity of each person. This institution provides opportunities of scholarship for academically qualified high school graduates predominantly from the state of Tripura and the north-eastern region of India. The aim and vision of Holy Cross College is to create integrated global citizens and world class professionals, who will work for a more just, equitable and compassionate society by imparting quality education. In the knowledge society that is emerging, quality education serves as the gateway to the socio- cultural and economic development of persons and the country.

MEDI-CAPS UNIVERSITY, INDORE



Medi-Caps University is a private institution established under the Madhya Pradesh Niji Vishwavidyalaya Adhiniyam, we've been dedicated to providing a positive learning environment and supporting students' professional growth. Their goal is to create globally-minded citizens who can serve humanity through exceptional education and research. It is committed to promoting research and innovation across various academic fields. The university has established a dedicated research and development cell that provides state-of-the-art research infrastructure, including well-equipped laboratories, high-end computing facilities, a library, and access to online databases.

MODY UNIVERSITY, RAJASTHAN

The Mody University is a Private university aimed at helping the girl population avail quality education with world-class techniques in an IT-savvy environment. It gives the students an opportunity to study the subject they want. They can choose from numerous undergraduate and postgraduate courses of different disciplines like Arts, Science, Commerce, Engineering, Management, Law, Fashion, Interior Design, Architecture, Physiotherapy, Agriculture etc. Committed to excellence, it seek to advance education and enhance knowledge to develop transformative skills in women fuelled with innovation, research, integrity, environmental consciousness, social and ethical sensitivity to create the finest women leaders, technocrats and social innovators.



TARLAC STATE UNIVERSITY, PHILIPPINES



Tarlac State University is a public university located in Tarlac City, Philippines. Established in 1906, it is the flagship academic institution of higher education in the province offering different degree programs through its ten colleges and three campuses. With the present population of over 16,000 students enrolled in different programs, the university is envisioned to be an institutional model for its culture and excellence in higher education. It offers a total of 66 courses through its ten colleges. Recently, it started its Bachelor of Laws program (LL.B.) in cooperation of Integrated Bar of the Philippines (Tarlac Chapter). The university also offers degree programs to international students. A number of students from USA, China, Hong Kong, Korea, and India have attended and graduated from TSU.

LYCEUM OF THE PHILIPPINES UNIVERSITY, BATANGAS



The Lyceum of the Philippines University–Batangas is a higher education institution located in Capitol Site, Batangas City. It was founded by Dr. Sotero H. Laurel in 1966 using the educational philosophy of his father, former President José P. Laurel. Serving as the Lyceum of the Philippines University's affiliate satellite campus in the province of Batangas, its flagship courses were Nursing, Medical Technology, Marine Engineering, and Customs Administration. Now, Lyceum of the Philippines University has 42 degree & non-degree programs offerings. The school employs over 500 teaching and non-teaching personnel to cater to the needs of its 10,000 student population, the biggest amongst all Lyceum campuses.

RENAISSANCE UNIVERSITY, INDORE

Renaissance University Indore, Madhya Pradesh, formerly known as Indore Indira Business School is one of the newest private universities in central India. The university has a total of 10 departments, 34-course streams and 60000+ graduates around the globe. The university offers courses as Bachelor's, Master's, Diploma, and certification programs. The university also provides students with state-of-the-art infrastructure as well as world-class facilities. The university also houses a team of highly qualified faculty members who are accomplished in their disciplines and help students receive a quality education through interactive and effective means.



RENAISSANCE UNIVERSITY
INDORE

GURU GHASIDAS VISHWAVIDYALAYA, BILASPUR



Guru Ghasidas Vishwavidyalaya, is a Central University of India, located in Bilaspur C.G. State, established under Central Universities Act 2009, No. 25 of 2009. Formerly called Guru Ghasidas University (GGU), established by an Act of the State Legislative Assembly, was formally inaugurated on June 16, 1983. GGU is an active member of the Association of Indian Universities and Association of Commonwealth Universities. Situated in a socially and economically challenged area, the university is appropriately named to honor the great Satnami Saint Guru Ghasidas (born in 17th century), who championed the cause of the downtrodden and waged a relentless struggle against all forms of social evils and injustice prevailing in the society. The University is a residential Institution.

SHARDA UNIVERSITY, GREATER NOIDA



Sharda University is a leading Educational institution based out of Greater Noida, Delhi NCR. A venture of the renowned Sharda Group of Institutions (SGI), The University has established itself as a high quality education provider with prime focus on holistic learning and imbining competitive abilities in students. The University is approved by UGC and prides itself in being the only multi-discipline campus in the NCR, spread over 63 acres and equipped with world class facilities. Sharda University promises to become one of the India's leading universities with an acknowledged reputation for excellence in research and teaching.

RABINDRANATH TAGORE UNIVERSITY, BHOPAL

Rabindranath Tagore University strives to impart skill-based quality education and promote research driven advancement of knowledge for creating successful professionals. Established by the Rabindranath Tagore Group in 2010, it has carved a niche for itself in Madhya Pradesh and Jharkhand. With strong industry linkages, Rabindranath Tagore University's focus lies in the holistic learning and development of a student in order to ensure the effective application of knowledge for a secure future.



GALGOTIAS UNIVERSITY, GREATER NOIDA



Galgotias University is by Smt. Shakuntala Educational and Welfare Society, has been recognized as a leading academic institution by achieving the highest benchmark in academic excellence with NAAC A+ accreditation in the first cycle. The university began operations in the 2011-2012 academic session and welcomed its first batch of students in July 2011. Since then, it has grown to have more than 15,000 students. It aims to become an internationally recognized institution that excels in multidisciplinary and interdisciplinary education, research, and innovation, producing graduates who are globally competitive and poised to become leaders in their fields. Graduates will possess deep knowledge in their chosen fields, strong problem-solving skills, an understanding of the societal context of their profession, effective teamwork abilities, excellent communication skills, and a commitment to lifelong learning.

ADITYA DEGREE COLLEGE, SURAMPALEM



Aditya Degree colleges are the precious gifts presented to the twin Godavari Districts by ADITYA Educational Group. ADITYA Degree College which was established in 1998 in Kakinada fulfilled the hopes and aspirations of many graduates and had been acclaimed as the best degree college under Andhra University. Encouraged by the 100% result in 2003, ADITYA added several feathers to its cap by launching Degree Colleges in Rajahmundry in 2003, in Vizag and Palakol in 2005 and in Tatipaka in 2006. Its vision is to emerge as center of repute for inclusive skill based education inculcating values, professionalism and innovation.

KALINGA UNIVERSITY, RAIPUR

Kalinga University has emerged as a centre of excellence of higher education in Central India. Strategically located in the Smart City of New Raipur, this University has started carving a niche for itself in the education domain and is rising as a shining star on the horizon of quality education. A centre for Doctoral research programmes in various fields. Currently the University is serving the student community through various UG and PG programs namely Engineering, Law, Pharmacy, Arts & Humanities, Science, Commerce & Management, Biotechnology, Information Technology, Library Science, Fashion Design & Interior Design.



BHARTI VISHWAVIDYALAYA, DURG



Bharti Vishwavidyalaya run by Holistic Foundation / “Shri Jug Mahadev Education Society (SJMES), Durg. As a society, they organize exciting new events regularly that provide valuable opportunities to make friends, to learn, and most importantly, to promote the excellent quality of education and mentoring for the students, aspiring to be competent professionals in Information Technology and Education from year 1999. To refine the necessary attitude, aptitude and skills to achieve placement on corporate and education sector, the Institute is supportive to the students by arranging periodical tests and group interaction exercises.

JECRC UNIVERSITY, JAIPUR

JECRC University has been established vide The JECRC University, Jaipur Act, 2012 (Act No.15 of 2012) published in the Gazette of Rajasthan Dated May 2, 2012. The University started its operations and admitted students in various courses w.e.f. the Academic Session 2012-13. The 32-acre JU campus combines unique classical architecture and thoughtful layout and landscaping to create a perfect learning ecosystem. Its vision is to become a renowned centre of higher learning, and work towards academic, professional, cultural and social enrichment of the lives of individuals and communities.



Greetings from the Organizing Desk!



The new era post the global pandemic has affected academics, establishments, and individuals' preparedness worldwide. The CoVID- 19 pandemic has left us all battling for survival and growth leading to endurance changing the scenarios and encouraging learning on a virtual platform. This calls out to encourage the young learners and academicians to keep pace with the same enthusiasm and lead to excellence.

Forensic Science has an interdisciplinary approach, and its true essence can be proved meaningful with collaborative efforts of people present around the globe functioning together as a team. Therefore, with a vision to bring all the academicians, students, and professionals and share their valuable contemplations, the **IASR International Conference on Forensic Science** is structured to lead the way through endeavours focused on taking Forensic to greater heights. We welcome every science enthusiast to become a part of this revolutionizing effort and explore the technological advancements, scientific researches, and opportunities for everyone to flourish.



Dr. Ranjeet Kr. Singh
President
International Association of
Scientists and Researchers



Phaneendar B N
Chairman
Clue4 Evidence Foundation

Organizing Team

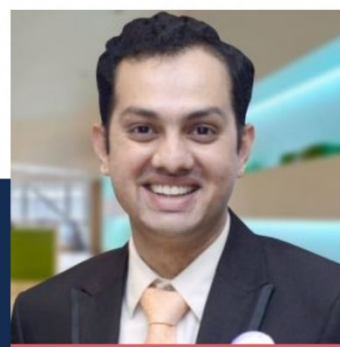
Convenor in Chiefs



Dr. Ranjeet Kr. Singh

President
International Association of
Scientists and Researchers

Convenor in Chiefs



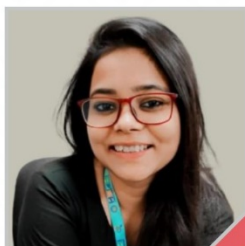
Phaneendar B N

Chairman
Clue4Evidence Foundation

Organizing Secretary



Afreen Tarannum



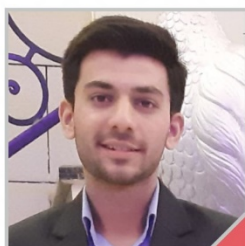
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Shashikumar Nair**

Vivekananda Global University
Jaipur



D. Veda Samhitha

Kristu Jayanti College
Autonomous, Bangalore



Dr. Sagarika Rupainwar

National Forensic Science University
Gandhinagar



**Ganiyeva Nilufar
Hamraevna**

Tashkent Medical Academy and
The Tashkent Dental Institute



Devyani Parkhe

Institute of Forensic Science
Mumbai



Harsh Kumar

Invertis University, Bareilly
Uttar Pradesh



Rashi Singh

Invertis University, Bareilly
Uttar Pradesh



**Patel Smitkumar
Dineshbhai**

National Forensic Science University
Gandhinagar



14th INTERNATIONAL CONFERENCE-2023

FORENSIC SCIENCE

Pre-Conference Workshop

24th August 2023

Workshop on

Forensics to Protect the Vulnerable

An Universal Approach



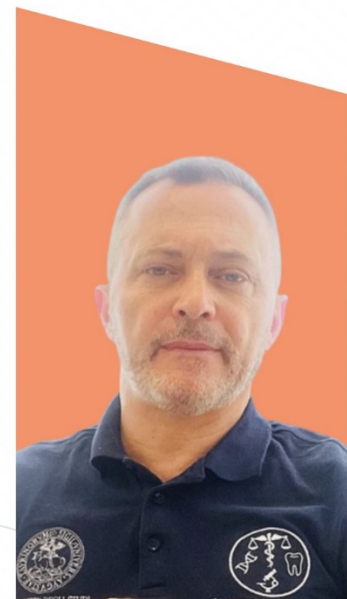
Dr. Evi Untoro

AFOHR Treasurer



Dr. Hemlata Pandey

AFOHR President



Prof. Emilio Nuzzolese

AFOHR Founder President

About the Workshop

Forensics plays a critical role in safeguarding the vulnerable by providing a universal approach to justice and protection. Regardless of age, gender, ethnicity, or social status, individuals facing various forms of exploitation, abuse, or violence can find refuge in the meticulous investigative techniques and scientific methods employed by forensic experts. This universal approach ensures that justice is blind to prejudice and bias, aiming to uncover the truth and hold perpetrators accountable. Whether it's identifying victims of human trafficking, solving cold cases, or gathering evidence in cases of domestic violence, forensics stands as an unwavering sentinel in the pursuit of justice for the vulnerable, ensuring that their voices are heard, their rights protected, and their oppressors brought to justice.

International Association of Scientists and Researchers, IASR and Association Forensic Odontology for Human Rights, AFOHR delightedly hosted a Pre-Conference Workshop to help in understanding the latest forensic techniques used for exploring the ethical and legal challenges of protecting the vulnerable, providing a comprehensive overview of the field. The resource persons talked about the Maltreatment, Border Control Relations, Child Abuse, Torture, Death in Custody and Elderly Abuse in the Legal system and how Forensic can be used to overcome these challenges and help vulnerable.

PROF. EMILIO NUZZOLESE

AFOHR Founder President



Prof. Emilio Nuzzolese is a forensic odontologist, currently serving as an Associate Professor in Legal Medicine at the University of Turin (Italy) and Head of the Human Identification Laboratory, Medico-legal Institute of Turin. He also serves as an honorary judge at Juvenile courts. He graduated in dentistry from the University of Bari (Italy) in 1994. He holds post-graduate degrees in Legal Medicine, Forensic Sciences, and Forensic

Odontology, as well as a Research Doctorate (Ph.D.) in Analytic Morphometry. He served as an expert witness in civil and criminal courts for dental disputes and professional liability and as an expert before the International Penal Court. He has associative involvements, which include participating as an odontologist in the INTERPOL DVI Forensic Odontology Sub-Working Group since 2010. He is also President and Founder of the Civil Protection Association Dental Team, DVI Europe. He is a co-founder of Forensic Odontology for Human Rights. He has been a Fellow of the Odontology Section of the American Academy of Forensic Sciences since 2011. He has presented over 100 papers in national and international forensic science meetings and journals and has been invited as a speaker in several congresses in Italy and abroad (Canada, Indonesia, India, Hungary, Nepal, Romania, USA, UK), among which the forensic dentistry session of the 2006 FDI World Dental Congress in Shenzhen (Republic of China).



DR. HEMLATA PANDEY

AFOHR PRESIDENT

Dr. Hemlata Pandey is a lecturer and program lead in Forensic Odontology at the University of Dundee, Scotland, UK. She provides expertise to The Crown Office and Procurator Fiscal Service (COPFS), which is Scotland's public prosecution service and death investigation authority. She also serves as an Academic advisor to the Indian Board of Forensic Odontology. While in India, she established the first Forensic Odontology and

Human Identification Lab at a government hospital in India and provided expertise to state police departments and the CBI. She has also been involved in disaster response and victim identification in India. She is the president of the Association of Forensic Odontology for Human Rights and a TEDx speaker.



DR. EVI UNTORO

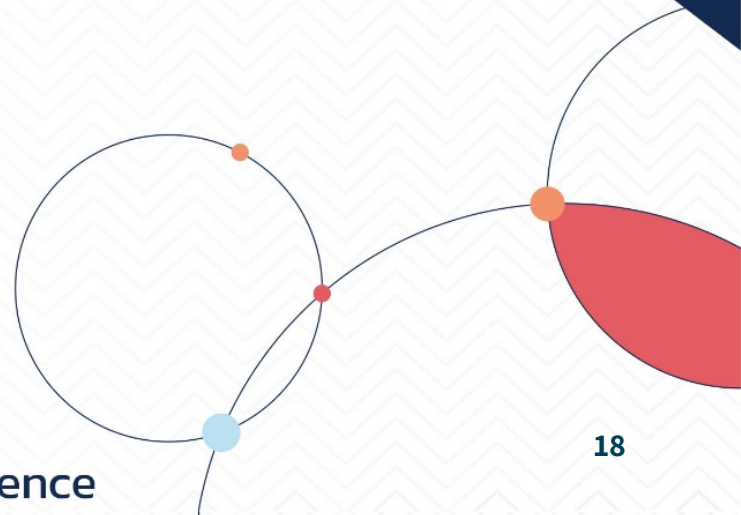
AFOHR TREASURER

Dr. Evi Untoro is a forensic pathologist, medico-legal consultant, and forensic medicine specialist. She is currently serving as Head of the Department of Forensic Medicine, Law, and Sciences. She is a member of the Indonesian National DVI Team (since 2007), the Indonesian Banten Province DVI Team (since 2016), the Advisory Team in Forensic Pathology, etc. She has been working in some private and government hospitals for forensic cases (clinical and pathology) and has also been called upon as a witness expert in some forensic cases around Asia and the Pacific. She has written some articles and publications, as well as forensic books and research in the Forensic DNA Database of Indonesian and Asian (publications on Elsevier 2009 on the Allele Frequency of CODIS 13 of the Indonesian DNA Database). She has 5 years of experience (2005–2010) in the identification of the Japanese soldier's human remains of World War II victims of MIA (missing in action) in Papua and Makassar, Indonesia, with the permission and invitation of the Japanese Government and Japanese Embassy in Indonesia, which added more knowledge and skills to her performance in forensic work. She was involved in many disasters in Indonesia (natural and unnatural) and took joint training on DVI in several other countries using the DVI Interpol Guide as an international standard.

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About the Conference

Forensic Science and Anthropology has been growing significantly over the past few decades; the essential demand of progress has been met with bright young minds putting their extensive efforts into advancements of the field. SIFS India and other fellow organizations have been substantial support pillars in establishing the mark of forensics in India and across the globe. The motive of constant learning and sharing recent studies and advancements have been met constantly with their untiring efforts.

The IASR International Conferences (virtual) has been the torchbearer to provide a platform for avid learners to present their work, get better inputs from experienced individuals and learn from esteemed personalities. Therefore, the Conference aims to provide a platform to researchers, academicians and professionals devoting their efforts to the domains of forensics, such as fingerprint, questioned document, crime scene investigation, forensic odontology, forensic medicine and toxicology, forensic biology and serology, forensic psychology, cyber and digital forensics and forensic physics to flourish the dimensions of the theme of the Conference.



CHALLENGES FOR THE POLICE FORENSIC SCIENCE SERVICES

JOHN A.J.M RIEMEN

Lead Specialist, Dutch Police and Manager and Custodian | National Criminal ABIS

John A.J.M. Riemen is a lead specialist to the Dutch Police and is the manager and custodian of the national criminal ABIS. He is the chosen chair of the Ridgeology sub-working group of Interpol from June 2023, and he has two publications where he served as co-author. He oversees the Centre for Biometrics as part of the National Forensic Service Centre of the National Police and is nationally responsible for fingerprint and face identifications. He has experience in the use of forensic fingerprint technologies, face recognition, disaster victim identification, identity management, identity fraud, and process design in the field of biometrics. John has more than 37 years of experience in law enforcement and more than 21 years in forensic science. He currently serves as a member of the IDEMIA Public Security Executive Users Board as an international user representative.



BIAS IN FORENSICS: IS THERE A SOLUTION?

DR. HEMLATA PANDEY

Lecturer and Program Leader in Forensic Odontology | University of Dundee

Dr. Hemlata Pandey is a lecturer and program lead in Forensic Odontology at the University of Dundee, Scotland, UK. She provides expertise to The Crown Office and Procurator Fiscal Service (COPFS), which is Scotland's public prosecution service and death investigation authority. She also serves as an Academic advisor to the Indian Board of Forensic Odontology. While in India, she established the first Forensic Odontology and Human Identification Lab at a government hospital in India and provided expertise to state police departments and the CBI. She has also been involved in disaster response and victim identification in India. She is the president of the Association of Forensic Odontology for Human Rights and a TEDx speaker.



LAW AND FORENSIC SCIENCE IN THE APPRECIATION OF EVIDENCE

DR. JOSE I. DELA RAMA JR.

Professor and Dean | Tarlac State University, Philippines

Dr. Jose I. Dela Rama Jr. is a Professor and Dean at the Tarlac State University School of Law. He is also a member of the law faculty of the University of St. Thomas, San Sebastian College – Recoletos, Pamantasan ng Lungsod ng Maynila Graduate School of Law, Bulacan State University, and St. Dominic Savio College of Law. He previously served as president of the Integrated Bar of the Philippines (IBP) Gat. Marcelo H. del Pilar Bulacan Chapter and IBP Governor representing Central Luzon. He founded the Justice Jose C. dels Rama Sr. Law Foundation, Inc., in honour of his late father. Through the Foundation, he has opened doors for many law students to have access to legal education through scholarships and other initiatives.



RECENT ADVANCES IN CHEMICAL DEVELOPMENT OF LATENT FINGERPRINTS

DR. G. S. SODHI

Associate Professor and Coordinator | SGBT Khalsa College, University of Delhi

Dr. G.S. Sodhi has published more than 100 research papers and filed 10 Indian patents. He was a visiting fellow at the National Crime Records Bureau, Ministry of Home Affairs, New Delhi, during 1996–97. He received the Union Home Minister Award, the National Technology Day Award, the National Search for Innovation Award, the Lockheed Martin India Innovation Award, and the India Innovation Initiative Award for innovative work in forensic science. His book, entitled Indian Civilization and the Science of Fingerprinting, was published by the Publication Division, Ministry of Information and Broadcasting, Government of India, in 2013. He is a Member of the International Fingerprint Research Group in Jerusalem.



REVISITING VARIOUS CLASSIFICATION SYSTEMS OF LIP PRINTS

PROF. MUKESH KUMAR THAKKAR

HOD, Department of Forensic Science | Punjabi University, Patiala

Dr. Mukesh Kumar Thakkar, a Ph.D. in Forensic Science, has extensive experience in forensic biology and serology, including DNA profiling, criminalistics, fingerprints, and crime scene investigation. He has worked as a Professor, Associate Professor, Reader, and Lecturer in the Department of Forensic Science at Punjabi University, Patiala, and has organized international symposiums and workshops. He has authored chapters in renowned publications and reviewed manuscripts for the Ministry of Information & Broadcasting. He has participated in national projects and initiatives, including the e-PG Pathshala Project and has also been a member of the Academic Advisory Committee of the MHRD in the subject of Law and Legal Studies.



USING FORENSIC SCIENCE TO MAKE BLUE MONEY

DR. JOHN COXHEAD

Director and Professor | International PIEL Centre

John Coxhead is a leading academic with over 30 years of experience in policing. He is a professor of policing praxis, winner of two Queen's Awards for Innovation in Police Learning and Development, and founder of the UK Innovation in Policing Competition. As well as being a regular journal peer reviewer, he is a columnist for Police Professional, the UK's biggest-selling policing publication. His career has entailed working with Interpol, the Serious Organized Crime Agency (SOCA), the Organization for Security and Cooperation in Europe (OSCE), and Her Majesty's Inspectorate.



USING FORENSIC SCIENCE TO MAKE BLUE MONEY

DR. MICHAEL HARRISON

Senior Lecturer, Economics and Finance | Royal Docks Business School of Law,
University of East London

Dr. Michael Harrison is a Senior Lecturer in Economics and Finance in the Royal Docks School of Business and Law – University of East London. He is research active in the areas of High-Frequency Trading and Financial Regulation. Recently, he has also participated in interdisciplinary research projects which focus on financial crime, sustainable banking, and emerging banks. He recently appeared on BBC television discussing KYC requirements in payment systems and has contributed to the literature on the regulation of controlled substances with a front-page article in the New Law Journal.



ADVANCEMENTS IN CSI AND FORENSIC SCIENCE TECHNOLOGY

BARRY A. J. FISHER

Forensic Science Consultant

Barry A. J. Fisher served as the Crime Laboratory Director for the Los Angeles County Sheriff's Department from 1987 until his retirement in 2009. He is a Distinguished Fellow and past-president of the American Academy of Forensic Sciences; past-president of the International Association of Forensic Sciences; past-president of the American Society of Crime Laboratory Directors; and past-chairman of the American Society of Crime Laboratory Directors Laboratory Accreditation Board. He is also the author of the textbook 'Techniques of Crime Scene Investigation, 8th edition'. He speaks throughout the United States and has lectured in Canada, England, Australia, Singapore, France, Israel, Japan, China, and Turkey on forensic science laboratory practises, quality assurance, and related topics.



ROLE OF FORENSICS IN JUSTICE SYSTEM: ISSUES AND CHALLENGES IN INDIA

DR. G. K. GOSWAMI

Additional Director, General of Police | Founder Director, UPSIFS Lucknow

Dr. G.K. Goswami is a Founder Director of Uttar Pradesh State Institute of Forensic Sciences Lucknow and Additional Director, General of Police. He holds, an M.Sc., LL.M., Ph.D. (Medicinal Chemistry), Ph.D. (Law), and 1997 Batch IPS officer of U.P. Cadre, is on deputation to the Govt. of India. He is a flex awardee under the Fulbright fellowship. He served as the Joint Director, Anti-corruption, Central Bureau of Investigation, New Delhi, and the Joint Director, of Central Bureau of Investigation, Lucknow Zone, Lucknow; Director of CBI Academy, Ghaziabad; and an expert on organized crime in United Nations Office on Drug and Crime (UNODC). He has been honoured with the 2nd Bar by the Hon'ble President of India, by decorating him three times with the Police Medal for Gallantry, the highest national award for Police. He has also been awarded the Police Medal for Meritorious Service and the Gold Medal for Gallantry has been conferred upon him by the Governor of Uttar Pradesh. While still serving in the police, he pursued Law and won several Gold Medals and Commendations during his legal studies. He has explored the interface of law and science and authored over two dozen articles published in academic journals and a book in 2016 titled "Assisted Reproduction and Conflicts in Rights".



ISSUES AND CHALLENGES IN FORENSIC ODONTOLOGY IN DVI

DR. EDDY DE VALCK

Forensic Odontologist | DVI Federal Police, Belgium

Dr. Eddy De Valck is a forensic odontologist with over 40 years of experience. He holds a Master of Dental Sciences degree from Catholic University Leuven and specialized training in criminology from the Ministry of Justice Belgium. He has been involved in forensic investigations, particularly dental identification, and has participated in 25 major disasters. He has held prestigious positions, including President of the International Association Forensic Odonto Stomatology (IOFOS) and Deputy Chair of the Scientific Interpol DVI Standing Committee. He is also a guest professor in undergraduate and postgraduate training courses and a lecturer at the Academy of Forensic Medical Sciences in London. He has authored and co-authored textbooks on forensic odontology and legal medicine, and serves as a reviewer for international scientific journals. He is a board member and head of public affairs at ETAF-DVI and a trainer in disaster victim identification management programs.



RECENT SCENARIO OF CRIME SCENE INVESTIGATION IN INDIA

PROF. (DR.) MUKESH YADAV

Additional Director, Medical Education | Government of Uttar Pradesh

Dr. Mukesh Yadav is currently working as an Additional Director Medical Education, Govt. of U.P and Principal at Rani Durgavati Medical College (formerly known as Government Allopathic Medical College), Banda, Uttar Pradesh since 2018. He has more than 26 years of experience in medical education. Previously, he served as a Principal of NC Medical College, Panipat, Haryana. He worked as a Professor & Head of Department of Forensic Medicine & Toxicology in various colleges such as KD Medical College, Mathura, UP; FH Medical College, Tundla, Firozabad, UP; TMMC, Moradabad, UP etc. He has more than 20 years of teaching experience in various private and government medical colleges. He was elected Editor of the Journal of the Indian Academy of Forensic Medicine for the last 7 years, worked hard for the timely publication of JIAFM, and was instrumental in achieving an internal standard and inclusion in various national and international indexing and database agencies. He has contributed many chapters to many leading books published by Indian authors of repute. He has delivered many guest lectures on medicolegal aspects at various national and international conferences and organised medicolegal workshops for doctors and hospitals. He has conducted examinations in various universities throughout India at the UG and PG levels. He has more than 100 publications in various national and international journals to his credit.



DEATH INVESTIGATION : OVERCOMING CULTURAL BARRIERS

PROF (DR.) MA. TERESA G. DE GUZMAN

Professor, University of Philippines, Manila | Executive Director, CESAR Anthropological Research Centre

Dr. Ma. Teresa G. de Guzman is a professor at the University of the Philippines, Manila's Department of Behavioural Sciences, College of Arts and Sciences. A practicing applied anthropologist who earned a Ph.D. in Anthropology with a concentration in Cultural Anthropology from the University of the Philippines. She has extensive experience working with various ethnolinguistic groups in the Philippines, especially the Aeta, Mangyan, and Manobo. In addition to her 20 years of academic experience, she has also logged 25 years of fieldwork. Her research focuses on Indigenous groups, Indigenous Knowledge (IK), Cultural Heritage Impact Assessment, Health and Social Impact Assessment, Disaster Risk Management, Forensic Anthropology (FA), and others. Former chairperson of the Department of Behavioural Sciences for six years, an Associate Dean for Planning and Development and current convenor of the Manila Studies programme, chair of the Ethics Committee's Panel 5, and member of the Ph.D. by Research screening committee She is also the Executive Director of the Interdisciplinary Research and Development (IRD) research and development consulting group.



SCIENTIFIC INTERROGATION METHOD AND LEGAL IMPACT

PROF. (DR.) ASHA SRIVASTAVA

Professor of Practice, Dean, School of Behavioural Forensics |
Centre Head, CoE, Investigative and Forensic Psychology |
Centre Head, Centre of Happiness and Wellbeing

Prof. (Dr.) Asha Srivastava is currently working as a Professor of Practice and Dean of Behavioural Sciences at NFSU. She is the Centre Head, CoE in Investigative & Forensic Psychology, and the Centre Head, Centre of Happiness and Wellbeing. She served as a Principal Scientific Officer and Head of the Forensic Psychology Department at the Central Forensic Science Laboratory (CFSL), Central Bureau of Investigation (CBI), New Delhi. She has more than 28 years of experience in the field of forensic psychological techniques. Besides this, she has 05 years of experience in the fields of Applied Psychology and Clinical Psychology. She also worked as a lecturer, psychologist, and assistant director in different organizations. In addition to this, she has appeared in numerous courts as an expert witness. She has examined more than 5000 subjects in 1700 cases referred by the CBI, NIA, Delhi Police, Armed Forces, and other law enforcement agencies in the country. The high-profile cases were examined, analysed, interpreted, and reported with the help of different forensic psychological techniques. Some of these cases done by her are the Pathankot Air Base Attack, the Sheena Bora murder case, the Sunanda Pushkar death case, etc. She has taken membership in the International Associate of the British and European Polygraph Association and the International Associate of the American Psychological Association. She is a Life Member of the Indian Science Congress, Indian Forensic Science, the Indian Association of Clinical Psychologists, etc.



DIGITAL TRAILS - CHALLENGES AND OPPORTUNITIES FOR LEA

DR. RAKSHIT TANDON

Cyber Security Evangelist | Risk Advisory

Dr. Rakshit Tandon is a renowned Cyber Security Evangelist with over a decade of experience. He holds key positions in various important Security Councils and Chapters and serves as a Cyber Security Consultant to the Internet and Mobile Association of India.

As a Resource Person and Visiting Faculty for Cyber Crime Investigations at the Bureau of Police Research and Development, he trains law enforcement officers across India. Dr. Tandon chairs India Against Child Abuse and contributes to UNICEF's Child Online Protection in India Report. He has sensitized over 5.6 million students on Cyber Safety and delivered speeches at prestigious platforms such as "Talks at Google" and "TEDx Talks." Dr. Tandon has an Honorary Doctorate in Cyber Security and has received notable awards, including the Cyber Soldier 2021, Cyber Mentor Excellence Award 2021, and Golden Achievers Award 2021 etc. In addition, he was honoured as the Cyber Guru of the Year by the Government of Maharashtra in 2015 and received the Global Cyber Crime Helpline Award in 2018. Dr. Tandon serves as a Training Consultant to the United Nations Office on Drugs and Crime, providing expertise on cyber-enabled Trafficking to multiple countries.

FORENSIC DNA TESTING: CHALLENGES AND OPPORTUNITIES



MARIA CORAZON A DE UNGRIA

Head, DNA Analysis Laboratory | Director, Philippine Genome Center

Dr. Maria Corazon A. De Ungria heads the DNA Analysis Laboratory of the Natural Sciences Research Institute, University of the Philippines, Diliman, and is an academican of the National Academy of Science and Technology. She had received prestigious scientific awards such as the Outstanding Young Scientist Award from the Philippine National Academy of Science and Technology as well as the Science Academy for the Developing World (TWAS). She was named the first Filipino regional affiliate of NAST from 2007 to 2011. Her type of leadership was recognised by different sectors, which awarded her with the Outstanding Young Men award, the Ten Outstanding Women in the Nation Service award, and the Asia Society Young Leader Award. She also won the search for the Outstanding Woman Researcher in the Life Sciences organised by the Third World Organisation of Women Scientists in Malaysia and was named as one of the first two National Fellows of the L'Oreal – UNESCO Women in Science Program. After 20 years in government service, she continues to advocate for the use of excellent science in nation-building, recognising the power of science in broadening the base from which we can find creative and novel solutions for the problems that afflict society.

CRIME INVESTIGATION PLATFORM OF THE FUTURE



SAMIR KUMAR DATT

CEO | Foundation Futuristic Technologies Pvt. Ltd.

Samir Kumar Datt is the CEO of Foundation Futuristic Technologies Pvt. Ltd. (AKA Forensics Guru). With over 30 years of experience in the USA, UK, and India, he is the President of the Digital Investigators Association and the author of "Learning Network Forensics," published by Packt Publishers UK. Additionally, he holds an impressive educational background as an alumnus of NIT Rourkela, IIT Kanpur, and IIFT Delhi. Moreover, he is a distinguished fellow of the Indian Police Foundation and serves as a visiting faculty member at prestigious institutions such as NPA Hyderabad, CBI Academy, NICFS Delhi, and many others. He is also an Angel Investor in product startups in the Cyber forensics and investigations field.



THE PROBLEM OF PROOF

ADVOCATE BHARAT CHUGH

Advocate/Founder | The Chambers of Bharat Chugh

Advocate Bharat Chugh currently practices as an Independent Counsel and heads The Chambers of Bharat Chugh. He was a Civil Judge/Metropolitan Magistrate where he served in various judgeship assignments in the 4 years that he spent at the Bench. He has also served as a Partner at L&L Partners (formerly Luthra and Luthra Law Offices), served on various committees/policy discussions, and has also been appointed as amicus curiae by the High Court to assist the court in some serious criminal cases. He is also a member of the Young SIAC (Singapore International Arbitration Centre) steering committee. He is a guest lecturer and resource person at various academies and has conducted training programs for aspiring and serving judges, IPS officers, investigators, prosecutors, arbitrators, defense counsels, company secretaries, aspiring resolution professionals (under IBC), doctors, prison officials, forensic experts, and corporate counsel. He regularly writes on issues relating to law, the criminal justice system, commercial/tech law, arbitration law, and policy.



RULE OF LAW IN REPUBLIC OF KOSOVO

KENAN İDRIZAJ

Security Sciences | Homeland Security Expert | Crime Analyst

Kenan Idrizaj is a Homeland Security expert and crime analyst who has been working at the Kosovo Police since 2002. During his work experience, he treated and analysed cases of incitement, aiding and abetting or advocating terrorism, espionage against Kosovo or detrimental to the security of Kosovo, sabotage directed against Kosovo's vital infrastructures, organised crime against Kosovo, or detrimental to the security of Kosovo in any other way, including money laundering, inciting disaffection in security structures, trafficking of illegal substances, etc. He is a graduate of the Faculty of Law, the Master of Penal Law, and the Master of Local Governance and Democratic Society. He is a doctoral student at the University of Sarajevo, Faculty of Criminalistics, Criminology, and Security Sciences, Department of Security Sciences. He has attended more than 50 national and international trainings in Homeland Security, Crime Analysis, informant treatment, information gathering and analysis, I2B analysis, etc. He is also a Police Instructor at the Academy for Public Safety and Security in the Republic of Kosovo and the author of several scientific papers related to homeland security that have been published in International Scientific Journals.



"ARTIFICIAL INTELLIGENCE IN FORENSIC SCIENCES: NEAR FUTURE, SCOPE AND DANGERS: BOON OR CURSE"

DR. RAKHI KHANNA

Additional Director | RFSL, Kota, Rajasthan

Dr. Rakhi Khanna, Additional Director, Regional Forensic Science Laboratory, Kota, Rajasthan, has 25 years of excellent experience in Forensic Sciences. During this tenure, she headed Toxicology, training, and the laboratory. She had analysed approximately 20,000 cases and provided training on POCSO, DNA, ballistics, crime scene photography, videography, toxicology, etc. to many police personnel, FSL staff, and students from many renowned universities. She has been an associate member of the American Academy of Forensic Sciences since 2020. She had outstanding analytical expertise, and she had many awards: Best Scientific Papers and Best Poster Award in Crime Scene Management in All India Forensic Science Conferences in 2005, 2009, and 2023; Best Speaker Awards by many prestigious groups; International Inspirational Women Awards: Best Women Performer in Government Award 2021; Research Excellence Award; Forensic Expert Award 2023; Expert Toxicology Award 2021; Wonder Women in Forensics Award 2021; International Ambassador-2015; She had been President of the Internal Complaint Committee for the Prevention, Prohibition, and Redressal Act for sexual harassment of women at the workplace in 2013. She had many publications and was a board member of journals such as the International Journal of Pharma Sciences and Scientific Research (IJPSR), AS Medical Sciences, a reviewer of articles, an invited speaker, an organising committee member, a chairperson, and a juryperson.

ESTEEMED CHAIRPERSONS

25TH AUGUST 2023
KEYNOTE TALK

Dr. Rakesh Gorea

Professor & Head at Gian Sagar Medical College & Hospital, Punjab

26TH AUGUST 2023
KEYNOTE TALK

Dr. Ankit Srivastava

Associate Professor, The West Bengal National University of Juridical Sciences, Kolkata

27TH AUGUST 2023
KEYNOTE TALK

Phaneendar BN

Director, Clue4 Evidence Forensic Lab, Bengaluru

Dr. N. P. Waghmare

Director, Forensic Science Laboratory, Goa

Prof. Mohammad Nasimul Islam

Professor, Universiti Teknologi MARA, Malaysia

Mohinder Singh

Emeritus Resource Faculty, School of Forensics, Risk Management & National Security (SFSRMNS)

Dr. Madhulika Sharma

Former Director, Forensic Science Laboratory, Delhi

Dr. Vijay Pal Khanagwal

Prof. & HOD, Kalpana Chawla Govt. Medical College, Karnal

Dr. Shubhra Sanyal

Retired Professor, LNJN NICFS, New Delhi

PLENARY TALK

Prof. T. Nataraja Moorthy

Professor of Forensic Sciences, Management and Science University, Malaysia

PLENARY TALK

Dr. Rajeev Jain

Senior Scientist, Forensic Toxicology, Central Forensic Science Laboratory, Chandigarh

PLENARY TALK

Dr. Mukesh Sharma

Assistant Director, Physics Division, State Forensic Science Laboratory, Rajasthan

Dr. Vivek Sahajpal

Assistant Director, Forensic Science Laboratory, Himachal Pradesh

Dr. Rajesh Kumar

Head of Forensics, Institute of Forensic Science, Aurangabad

Dr. Jayasankar P Pillai

Forensic Odontologist, Government Dental College and Hospital, Gujarat

Dr. Ritesh Kumar Shukla

Associate Professor, School of Arts and Sciences, Ahmedabad University, Gujarat

Dr. Charesma Grace K. Lud-Ayen

Dean, University of Baguio, Philippines

Dr. Prashant Agarwal

Professor, Forensic Science, School of Allied Health Sciences, Sharda University, Greater Noida

ESTEEMED PANEL OF JURY MEMBERS

PROFESSIONAL PAPER PRESENTATIONS

- ✓ **Dr. Kapil Kumar** Gujarat University, Ahmedabad
- ✓ **Dr. Jayasankar Pillai** Government Dental College and Hospital, Ahmedabad
- ✓ **Dr. Rajeev Kumar** Galgotias University, Greater Noida
- ✓ **Dr. Prateek Rastogi** Kasturba Medical College, Mangalore
- ✓ **Dr. Pooja Rastogi** Sharda University, Noida
- ✓ **Dr. HIRAK RANJAN DASH** National Forensic Science University, LNJN, NICFS, Delhi
- ✓ **Dr. Parul Khare Sinha** Sharda University, Noida
- ✓ **Dr. Pragnesh Parmar** All India Institute of Medical Science, Bibinagar

STUDENT PAPER PRESENTATIONS

- ✓ **Dr. Vinny Sharma** Galgotias University, Greater Noida
- ✓ **Hansi Bansal** Government Institute of Forensic Science, Nagpur
- ✓ **Dr. Ashish Badiye** Government Institute of Forensic Science, Nagpur
- ✓ **Dr. Neeti Kapoor** Government Institute of Forensic Science, Nagpur
- ✓ **Dr. Richa Rohtagi** LNJN NICFS, Delhi
- ✓ **Dr. Renu Devi** Mody University, Rajasthan
- ✓ **Dr. Komal Yadav** KR Mangalam University, Gurugram

- ✓ **Dr. Deepak V** MR Ambedkar Dental College & Hospital, Bengaluru
- ✓ **Dr. Vilas Anil Chavan** Aditya Degree College, Andhra Pradesh
- ✓ **Mebin Wilson Thomas** Jain (Deemed-to-be) University, Bengaluru
- ✓ **Dr. Neeraj Taneja** Mobico Comodo Pvt Ltd., Gurugram
- ✓ **Vijay Verma** CFSL, CBI, New Delhi
- ✓ **Dr. Abirami Arthanari** Saveetha Dental College and Hospitals, Chennai
- ✓ **Dr. Nino Kabling** Holy Angel University, Philippines
- ✓ **Dr. Inderjit Singh** Senior Forensic Expert, Patiala
- ✓ **Dr. J. James Rajesh** Velamal Medical College, Hospital & Research Center, Madurai
- ✓ **Prashant Sharma** CFSL DFSS MHA, Hyderabad

PROFESSIONAL POSTER PRESENTATIONS

- ^ **Dr. Muhammad Nasir Ahmad** Yenepoya University, Mangalore
- ^ **Dr. Anita Yadav** Sage University, Bhopal
- ^ **Dr. Sudhir Yadav** Guru Ghasidas University, Bilaspur
- ^ **Dr. Charesma Grace K. Lud** University of Baguio, Philippines

WINNERS!

SCIENTIFIC PRESENTATIONS

Professional Paper Presentations



BHARTI JAIN | KIRUTHIGA U



DR. SANDHYA BHATT | DR. BHAVANI S.N. | DR. AKHILESH PATHAK



DR. MINHA MAJEED KAK | SWEETY SHARMA

Professional Poster Presentations



DR. SUBHASH SHARMA



DR. HIMANI



DR. VANDANA YADAV

Student Paper Presentations



**SHELLA MORINA MD | VR AMRITHA VARSHINI | KOMAL KUSHWAHA
SATRIA PERWIRA | SANMATHI S**



**TIA MAYA AFFRITA | RIYA GHOSH | SOUMYA MALVIYA | DR. RISHI RAJINDRAN
SUMI SUNDARESAN**



**SONAM JAMDAR | SWEETY SANTRA | DR. DEEPAK SHARMA | DR. PERUMAL
SHEFALI KAVERAMMA M.S | RASHMI SHARMA**

POSTER PRESENTATION (PROFESSIONAL CATEGORY)

- ❖ **PPO01 | DR. HIMANI**
Complete Transaction of Spinal Cord and Thoracic Aorta Due to Blunt Trauma: A Finding in Case of a RTA
- ❖ **PPO02 | DR. NIDA SHAIKH**
3D Printing in Forensic Science: “Digital Files into Physical Objects”
- ❖ **PPO03 | MUKTI CHAVDA**
EDNA: Exploring New Paradigm in the Field of DNA Forensics
- ❖ **PPO04 | M. KHOLIL IKHSAN**
Stillbirth or Infanticide? Medicolegal Autopsy
- ❖ **PPO05 | DR. RAVI LAMBA**
Odontoid Process Fracture Due to Blunt Trauma: A Rare Finding in Case of RTA
- ❖ **PPO06 | DR. VANDANA YADAV**
Simon’s Bleedings - As a Diagnostic Sign of Antemortem Hanging
- ❖ **PPO07 | SREERAM K. Y**
Understanding the Various Contaminants Found in Cleaning Products and their Impact on DNA Quantification
- ❖ **PPO08 | DR. SHIANA JO**
A Comparative Study of CBCT and Occlusal Radiographs for Determining Sexual Dimorphism Using Linear and Angular Measurements
- ❖ **PPO09 | PROF. (DR.) AASHRITHA. S.**
Forensic Odontology the New Dimension in Dentistry
- ❖ **PPO10 | EKKY ANDHIKA ILHAM**
Autopsy Finding of Fatal Child Abuse-Related Homicide: Case Report
- ❖ **PPO11 | SARI NUR INDAHTY PURNAMANINGSIH**
Degree of Injury to Visum Et Repertum Victims of Traffic Accidents Using the TRISS Score
- ❖ **PPO12 | DR. MANDEEP KUMAR**
Poison or Not: The Matter is Hot, Mysteries on the Go to be Solved
- ❖ **PPO13 | DR. MOHIT YADAV**
Road Rage or Road Sage? Brain Bleed but Skull Fractures
- ❖ **PPO14 | DR. SUBHASH SHARMA**
Burn or Not Burn: A Dilemma on The Turn in a Case of Post R.S.A Case

- ❖ **PP015 | DR. CHANDER BHAN**
The Criminal Procedure (Identification) Bill, 2022
- ❖ **PP016 | DR. SHANMATHY SURESHBABU**
Insects in tracing Post mortem interval: Friend or Foe?

PAPER PRESENTATION (PROFESSIONAL CATEGORY)

- ❖ **PPA01 | BHARTI JAIN**
Cellulose Paper Sorptive Extraction (CPSE): A Simple and Affordable Microextraction Method for Rapid Analysis of Lorazepam Residues in Food Samples in Cases of Drug Facilitated Crimes
- ❖ **PPA02 | YAKUBU MAGAJI YUGUDA**
The Power of DCS5 for the Detection, Capture, and Enhancement of Latent Fingerprints in Forensic Science
- ❖ **PPA03 | DR. SAIMA SULTAN**
Forensic Odontology - An Overview
- ❖ **PPA04 | DR. SANDHYA BHATT**
Youth & Aggression: Causes & Risk Factor
- ❖ **PPA05 | DR. MINHA MAJEED KAK**
Chieloscopy and Dermatoglyphics as Sex Determinants in Forensics
- ❖ **PPA06 | DR. BHAVANI.S.N.**
Sex Determination by Linear and Diagonal Odontometric Data of Indian Population – A Scoping Review
- ❖ **PPA07 | BETA AHLAM GIZELA**
Characteristics of Injury in Women and Children in Ugm (Universitas Gadjah Mada) Academic Hospital Yogyakarta 2020-2021
- ❖ **PPA08 | DR. DEEPTI SHARMA**
Artificial Intelligence & Age Estimation: Revolutionizing Forensic Dentistry
- ❖ **PPA09 | DR. SHRUTI GUPTA**
Diagnostic Role of Salivary Biomarkers in Occupational Health
- ❖ **PPA10 | DR. ANUPAMA C**
Role Of Prosthodontist in Forensic Odontology - A Literature Review
- ❖ **PPA11 | DR. J.JAMES RAJESH**
Forensic Scientist or the Autopsy Surgeon - Who is Superior
- ❖ **PPA12 | PROF. T. NATARAJA MOORTHY**
Clandestine Burial Crime Scene Investigation

- ❖ **PPA13 | KULDEEP PANCHAL**
Reliability of Postmortem ABO Blood Grouping: A Study of 100 Cases
- ❖ **PPA14 | DR. LAVINA ARYA**
Human Bite Mark: The Dental Blueprint!
- ❖ **PPA15 | MS. KIRUTHIGA U**
Establishing Identity and Estimating Age of the Donor Through Poroscopy
- ❖ **PPA16 | DR. ANILA KARUNAKARAN**
Review of Studies Done to Identify a Population Using Palatal Rugae
- ❖ **PPA17 | DR. NEERAJA. R**
Pedodontists: What is The Role of Forensic Odontology?
- ❖ **PPA18 | DR. SONIA GUPTA**
Amelographics: An Adjunctive Tool in Personal Identification
- ❖ **PPA19 | DINESH D**
Use of Nucleotide Sequence For The Identification of Varanus Bengalensis Which is Poached and Smuggled as a Source of Consumable Flesh
- ❖ **PPA20 | SWEETY SHARMA**
Sex Determination from Hair Shaft Using ATR FTIR Spectroscopy and Chemometrics
- ❖ **PPA21 | DR. AKHILESH PATHAK**
Autopsy of a Rare Case of Near Strangulation
- ❖ **PPA22 | DR. SHAMINESWARI TAMIL SELVAN**
The Role of Metal Nanoparticles in DNA Isolation: A Review
- ❖ **PPA23 | I KETUT HERU SURYANEGARA**
Physical Violence Increases The Risk of Aortic Rupture, Causing Cardiac Tamponade: A Case Study
- ❖ **PPA24 | JYOTHI ABRAHAM**
Privilege Against Self-Incrimination in the Digital Era With Special Reference to European Court of Human Rights Cases
- ❖ **PPA25 | DR. NAVEEN SHARMA**
Clinically Undiagnosed Tubal Ectopic Pregnancy - A Case Report
- ❖ **PPA26 | KAROLIN P. JOSE**
Development Of Triphenylamine Fluorophore Tethered Terpyridine Probe for Methanol Detection Towards Forensic Applications
- ❖ **PPA27 | DR. DINESH KUMAR SINGH**
Admissibility of Scientific evidence in Criminal Investigation In India: An Analysis

PAPER PRESENTATION (STUDENT CATEGORY)

- ❖ **SPA01 | SONAM JAMDAR**
Optimization of Disc Washing Process of FTA Cards from Human Blood Sample from Different Time Points for Forensic Identification
- ❖ **SPA02 | RITIKA PRADHAN**
Detection of Transfluthrin from Spiked Eatables Through Thin-Layer Chromatography
- ❖ **SPA03 | SAMRUDDHI DHANANJAY PAYAS**
The Estimation of Genome Potential for the Purpose of Performing STR Analysis In Bloodstains Collected from Different Temperatures
- ❖ **SPA04 | SAMEER RAVINDRA SHIMPI**
The Quantitative Assessment of the Genome for Forensic Purpose on the Cigarette Butts in Different Time Intervals Using q-PCR Analysis
- ❖ **SPA05 | WILLIAM DANIEL NAPITUPULU**
Determination of Sex and Age Estimation in Human Skull: A Case Report
- ❖ **SPA06 | SHELLA MORINA, MD**
Carbon Monoxide Intoxication, How Simple Laboratory Examination Can Help?: A Case Report
- ❖ **SPA07 | HIMANSHU KHANDEKAR**
Analyzing the Dead Using C-14 Dating Method- A Critical Review
- ❖ **SPA08 | TIA MAYA AFFRITA**
Soil Examination as an Attempt to Estimate Postmortem Interval and Postburial Interval
- ❖ **SPA09 | SHIVANI DAHIWALE**
Food Adulteration
- ❖ **SPA10 | PATEL PINA N**
A Comparative Study of Offline Scanned Documents and Digital Images for Alteration Using Analysis of Histograms.
- ❖ **SPA11 | TANUSHREE DHEER**
Analytical Methods to Approach Feasibility of Analysis in Samples Pertaining to Sexual Assaults
- ❖ **SPA12 | SHREYA MISHRA**
Bite Marks in Forensic Odontology
- ❖ **SPA13 | SHREYA BAKSHI**
Tooth Fossils
- ❖ **SPA14 | V R AMRITHA VARSHINI**
Personality Assessment Through Handwriting Analysis

- ❖ **SPA15 | ADITYA SINGH**
Role of Forensic Psychology in a Child's Aggressive Behavior Leading to Perpetration of Crime
- ❖ **SPA16 | SWEETY SANTRA**
Study on Persistence and Detection of Blood Stain DNA on Pig Skin Exposed to Different Aquatic Conditions
- ❖ **SPA17 | SATHYA REKHA PAMPARI**
Significance of Surgical Implants In Unidentified Dead Bodies During Autopsy
- ❖ **SPA18 | DEEP PATEL**
Development of Latent Fingerprint by Using the Corn Powder
- ❖ **SPA19 | RIYA GHOSH**
Beyond the Scalpel: Exploring Virtual Autopsy for Forensic Analysis
- ❖ **SPA20 | RASHI SINGH**
Unveiling the Unseen: The Power of Memory Forensics in Incident Response
- ❖ **SPA21 | SUMA GUMMADI**
Current Trends in Forensic Odontology
- ❖ **SPA22 | D VEDA SAMHITHA**
Examination of Gunshot Residue
- ❖ **SPA23 | PREET KUMAR**
Virtual Autopsy: Respecting the Dignity of Dead With Technology - A Review Study
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**POSTER
PRESENTATION
PROFESSIONAL
CATEGORY**

COMPLETE TRANSACTION OF SPINAL CORD AND THORACIC AORTA DUE TO BLUNT TRAUMA: A FINDING IN CASE OF A RTA

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Abstract

Spinal cord injury is a condition that involves damage to the spinal cord and its surrounding structures due to trauma, compression, or distortion. The most common causes of spinal cord injury are motor vehicle accidents, falls, or violence. Depending on the extent of the injury, the spinal cord may be partially or completely transected. Aortic transection is another serious injury that can occur from blunt trauma, especially in the thoracic region. It involves a tear in the wall of the aorta, the largest artery in the body. This injury is often fatal, as it can cause massive bleeding and shock. Aortic transection is the second leading cause of death in trauma patients, after brain injury. Brain injury accounts for half of the deaths in trauma patients, while aortic or cardiac injury accounts for 17%, and hemorrhage for 12%. We conducted autopsy on a 32 year old male individual who met with a road traffic accident. Various grievous injuries were found during the autopsy among which complete transection of vertebral column along with spinal cord and thoracic aorta at the level of T3 and T4 was present. There was wide separation of third and fourth vertebrae showing blood infiltration. Surrounding soft tissues and muscle were showing hemorrhages. Fatalities due to such injuries are not uncommon, however a strong suspicion in all trauma related cases regarding spinal injury and aortic injuries and evaluation for the same will be vital in saving the life. Thorough examination of such vital structures specially in cases of blunt trauma is of utmost importance.

Keywords: Complete Transection, Spinal Cord, Thoracic Aorta, RTA, Blunt Trauma

3D PRINTING IN FORENSIC SCIENCE: DIGITAL FILES INTO PHYSICAL OBJECTS

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Abstract

Due to the capability to provide information in all three axis (x, y and z) when compared to 2D photographs, three-dimensional (3D) printing technologies has been a rapid development and utilization in the fields of forensics .A realistic physical 3d structure from a computer-aided design (CAD) model or a digital 3D model is produced in Three-dimensional (3D) printing. 3D printing allows better visualisation, interpretation, preservation and analysis of the evidence and has proved to be a boon and revolutionized Indian society in recent years. The applications of 3D printing and presents current needs to develop and incorporate 3D printing technology in Indian forensics are focused in present poster. While the application of 3D printing to forensic science is beneficial, currently there is limited research demonstrated in the literature and a lack of reporting skewing the visibility of the applications.

Keywords: 3D Printing, Computer-aided design, Forensic Science, Digital Files

eDNA: EXPLORING NEW PARADIGM IN THE FIELD OF DNA FORENSICS

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Abstract

Identification of the involved specie in any case related to forensics is the base of all analysis and examination techniques used in the domain of forensic investigative sciences. In such necessity, lack of efficient and non-standardised methods along with the limitation of acquiring samples for examination from a narrow class of evidences that has certain discovered techniques as analysis tool, makes it difficult to examine a wide variety of evidences and also with efficiency. The technique of using eDNA (environmental DNA), a new focal point in the field of DNA sequencing, has potential to become a vital tool in examination of new, ancient, terrestrial or aquatic samples of evidences from environment. eDNA or environmental DNA is the genetic material shed by living organisms in form of hair, skin cells, faeces, sweat etc in water, dust, soil or air. The general technique commences with collection of the trace evidences found in the surrounding environment and extraction of DNA from possible source of eDNA. For example, in case of examination of aquatic species, the water acts as a source of eDNA which is separated from water by using cellulose nitrate membrane. It is then followed by metabarcoding. This helps in tracing any specie or in addressing the challenges of monitoring biodiversity. Plant eDNA and microbial eDNA, along with DNA shed by other species, can help in forensic tracking of unique vegetation that leads to crime scene and also in fields like toxicology, post-mortem interval estimation and suspect identification. Highest efficiency of this technique of eDNA can be achieved when it has wider acceptance and admissibility in courtroom while standing strong on the scientific base of carefully standardised method and development of eDNA databases to eliminate most of the challenges to its validity with the passage of time.

Keywords: eDNA, Environmental, Forensics, Ecology, Trace Evidence, Metabarcoding

STILLBIRTH OR INFANTICIDE?: MEDICOLEGAL AUTOPSY

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Abstract

Within the framework of Indonesian law, infanticide is a killing committed by the biological mother at the time the child is born or shortly thereafter. We report the case of finding a baby in a plastic bag that was placed in a deserted place, police investigators follow up on this finding and send the baby's body to the Forensic Medicine and Medicolegal Installation of RSUD Dr. Soetomo, Surabaya. On external examination identified as male, with a body weight of 3800 grams, a body length of 52 centimeters, and a head circumference of 35 centimeters, the umbilical cord was cut sharply, and the base of the cut was tied with a rope made of thread, redness at the base of the navel, bruises on the corpse did not go away with pressure, stiffness there were no corpses and signs of smothering was found in the form of bruises in the nose and mouth area. On internal examination found signs of a live birth baby in the form of macroscopic expansion of both lungs, blunt edges of the lungs, pink in color, partially covering the heart, positive lung floating test, and viable signs from positive ossification core examination on the calcaneus bone, distal femur, and proximal tibia. On histopathological examination of the lung tissue, alveoli were found to be filled with air, indicating lung expansion after birth. Based on these findings, police investigators finally caught the perpetrator of the disposal of the baby, the perpetrator was a mother who gave birth, the results of further interrogation by the mother admitted that the baby was born alive and killed by smothering the nose and mouth and dumping it in a quiet place for fear that the birth would be discovered.

Keywords: Infanticide, Medicolegal, Lung Floating Test, Live Birth

ODONTOID PROCESS FRACTURE DUE TO BLUNT TRAUMA: A RARE FINDING IN CASE OF RTA

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Abstract

The atlantoaxial joint is unique among the vertebral joints because it lacks intervertebral discs; thus, it allows more movement than the rest of the spine. The axis, or C2 vertebra, has a projection called the odontoid process or the dens, which articulates with the atlas, or C1 vertebra. The odontoid process can fracture due to trauma, such as road traffic accidents or falls. This is a rare but serious injury that can affect the spinal cord and brainstem. Type I odontoid fractures are rare. Type II is the most common of the types of odontoid fractures and accounts for over 50% of all odontoid fractures. Type III odontoid fractures make up most of the remaining odontoid fractures. We report a case of a 31-year-old female who died from multiple injuries, including odontoid process and hyoid bone fracture. The autopsy revealed a diffuse hematoma in the retropharyngeal and paravertebral regions. The odontoid process was completely detached from the axis, with irregular and blood-stained fracture edges along with other serious injuries. About 25% to 40% of patients with odontoid process fracture die at the scene of the accident. Therefore, it is essential to examine the vertebral column carefully during autopsy to determine the cause of death accurately.

Keywords: Odontoid Process, Atlas, Axis, Vertebral Column, RTA, Fracture

SIMON'S BLEEDINGS - AS A DIAGNOSTIC SIGN OF ANTEMORTEM HANGING

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Abstract

Hanging is a type of ligature strangulation that causes death by gravitational drag. Direct findings such as ligature marks, internal neck injuries, and haemorrhages are commonly observed during autopsy. However, indirect lesions, considered as vital signs, also play a significant role in diagnosing death by hanging. In this research, we conducted an autopsy on a 33-year-old male who was brought dead to the casualty with the ligature material intact around the neck. The examination revealed a reddish continuous ligature mark above the level of the thyroid cartilage, with a knot mark situated below the left angle of the mandible. Internal examination showed a focal hematoma in the left sternocleidomastoid muscle, conjunctival congestion, multiple petechiae over the posterior ventricular surface of the heart, and stripe-like haemorrhages on the ventral surface of the intervertebral discs between L2-L3 and L4-L5. Simon's bleeding is usually seen in the lumbar region of the vertebrae. This report highlights the significance of Simon's sign as a valid diagnostic autopsy sign of premortem hanging and proof of premortem hanging. Furthermore, it can be considered as an objective vital finding with high diagnostic value in cases where there are minimum findings on the cervical organs. However, the absence of hemorrhages does not exclude death by hanging, indicating that a combination of vital findings is essential in concluding the cause of death in such cases.

Keywords: Hanging, Vital sign, Simon's bleed, Lumbar vertebrae, Antemortem

UNDERSTANDING THE VARIOUS CONTAMINANTS FOUND IN CLEANING PRODUCTS AND THEIR IMPACT ON DNA QUANTIFICATION.

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Abstract

Body fluid identification is important in forensic science because it can provide crucial evidence in a criminal investigation and help the court reach a decision. Making a link in between identifying the fluid or tissue and the DNA profile, adds weight to the evidences respectively. One major factor considered in terms of the admissibility of this evidence is its integrity. But the integrity of this evidence is questioned in the trial when that particular evidence was subjected to any sort of contamination or was in contact with certain contaminants that were present at the crime scene. The presence of certain contaminants in a specific piece of biological evidence that was subjected to the respective evidence analysis [may result in a false positive or false negative reaction, degradation of certain cells, etc.] may lead to misinterpretation of results in terms of that particular evidence analysis, according to articles and research papers in this context. This may increase the susceptibility of that particular piece of evidence in terms of its integrity. But this study is carried out in order to analyse the effect of the contaminants present in cleaning products such as bleaching powder, phenyl, and floor cleaner, Lizol, and their impact on the DNA quantification[using gel electrophoresis] carried out in body fluids such as blood, urine, and saliva. In this study, three swabs of each body fluid sample [such as blood, urine, and saliva] are taken and exposed to cleaning products such as bleaching powder, phenyl, and floor cleaner, Lizol. Then these are subjected to DNA extraction, followed by gel electrophoresis, and the observations are noted. Thus, this study can help in analyzing the level of impacts on DNA quantification due to the presence of contaminants present in cleaning products with respect to evidence integrity.

Keywords: DNA extraction, Body fluids, Contaminants, Household cleaners, Forensic science, DNA, Gel electrophoresis

A COMPARATIVE STUDY OF CBCT AND OCCLUSAL RADIOGRAPHS FOR DETERMINING SEXUAL DIMORPHISM USING LINEAR AND ANGULAR MEASUREMENTS

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Abstract

Introduction: Gender determination is often relied upon in forensic investigations. Both maxilla and mandible can be used for gender determination, because of its compact nature. Various radiographs have been utilized for gender identification like skull radiographs, conventional radiographs like periapical, occlusal and hand wrist radiographs. In present times, the latest imaging modality of CBCT is also used. **Aim:** To compare angular and linear measurements using occlusal radiographs and CBCT for determining sexual dimorphism. **Materials and method:** 10 occlusal and 10 CBCT of patients-radiographs were grouped into males and females. Radiographs were carefully processed, and the images obtained were traced for angular and linear measurements. The teeth used for measuring the angular and linear measurements in each arch are canine, first and second premolar. **Results:** Results established evidence that both measurements could be used for gender dimorphism.

Keywords: Dimorphism, Linear Measurements, Angular Measurements, Gender Determination

FORENSIC ODONTOLOGY THE NEW DIMENSION IN DENTISTRY – A REVIEW

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Abstract

Introduction: The most common role of the forensic dentist is the identification of deceased individuals. Dental identifications have always played a key role in natural and manmade disaster situations. (1) Review of the literature: An all-acrylic resin appliance such as a full denture or a cast partial denture could be inscribed with the patient's full name sealed inconspicuously into the surface of a denture by various processes. Palatal rugae (Plica palatine) are the irregular and asymmetric anatomical folds that are located on the anterior third of the palate behind the incisive papillae. They are considered to be unique to an individual and their morphology remains stable throughout life. A rough idea of the age can be taken from the sequence and the numbers of teeth erupted in case of children and adolescents. Odontometrics, a technique to take measurements on the teeth has been used by the scientists for sex determination. (2) Conclusion This overview is an attempt to describe the significance of various kinds of dental evidence, techniques and methods used in forensic odontology for identification purposes.

Keywords: Forensic odontology, Age estimation, Denture identification, Palatal, Rugae, Odontometrics

AUTOPSY FINDING OF FATAL CHILD ABUSE - RELATED HOMICIDE: CASE REPORT

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Abstract

Introduction: Fatal child abuse is one of the child homicide categories. Physical punishment can escalate to abusive or harsh physical punishment, resulting in injury or death. In determining a fatal child abuse-related homicide, the medical investigation must eliminate all possibilities of accidental or natural death. Also, a common factor in fatal child abuse is the presence of adults in a household not related to the victim. **Case presentation:** A 6-year-old girl experienced physical punishment for years from her biological mother and mother's partner as physical punishment to discipline her. On external examination, we found bruises and abrasions on the head, face, chest, back, waist, right upper limb, right arm, and also on the right and left leg with various ages of injury. Autopsy findings showed bleeding in the subarachnoid and alveoli. **Conclusions:** The cause of death of the victim was a blunt force to the head which resulted in subarachnoid hemorrhage. This case report also highlights characteristics associated with fatal child abuse precipitated by the caregiver's use of harsh physical punishment also the involved mother's female companions in the household as one of the common factors.

Keyword: Child abuse, Homicide, Forensic, Autopsy, Physical Punishment

DEGREE OF INJURY TO VISUM ET REPERTUM VICTIMS OF TRAFFIC ACCIDENTS USING THE TRISS SCORE

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Abstract

Introduction : The authors report a traffic accident trauma in the context of an accident. A 19-year-old woman had a road accident due to sudden braking on January 4, 2023, at 05.45 WIB.

Methods: We perform external and radiological examinations. **Results:** The examination results showed stable vital signs. There were bruises on the left eyelid, left cheek, and right knee, and a torn wound on the left cheek. On X-ray examination of the head, a closed fracture appeared on the left cheekbone. **Discussion:** A traffic accident is an unforeseen and unplanned event that includes a vehicle, other road users, or other cars and can cause minor, moderate, or severe injuries. A Visum et Repertum (VER) is then submitted in response to an investigator's written (official) inquiry outlining a medical examination of a person for legal purposes. The degree of injury must exist at the conclusion of Ver. According to Indonesian criminal law, there are three types of injury, which are minor, moderate, and severe. **Conclusions :** The determination of injury degree after current in Indonesia is still determined based on the scholarship and experience of the examining physician. We try to use Trauma Related Injury Severity Score (TRISS) analysis to assist in determining the degree of injury seen from anatomical and physiological aspects.

Keywords: Degree of injury, Traffic accidents, TRISS, Visum et Repertum

POISON OR NOT: THE MATTER IS HOT, MYSTERIES ON THE GO TO BE SOLVED

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Abstract

With lethal medications widely available on the market nowadays, death can occur in a variety of ways. It can originate from any kind of chemical, whether one that has the potential to poison or one that becomes poisonous when ingested in excess by a customer. The substances that are most commonly used as domestic items, such as liquid detergent, cockroach killer powder, rat killer bars, pesticides, and even naphthalene balls, are regularly also used to make people intoxicated. Naphthalene balls can be used for a number of things, such as fragrances, fragrant candles, and to preserve grains to hasten insect infection. Forensic specialists are frequently consulted in circumstances when determining the cause and manner of death of a person is particularly challenging. It depends not only on the characteristics of the substance consumed but also on the morphology of the person and the amount of the substance swallowed by the victim—either on purpose or by accident—as well as other factors. Here, we are given a case that is comparable. It was necessary to emphasize that it might be homicidal, unintentional, or suicidal in nature.

Keywords: Lethal, Chemical, Poison, Pesticides, Naphthalene, Homicidal, Suicidal

ROAD RAGE OR ROAD SAGE?: BRAIN BLEED BUT SKULL FRACTURES

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Abstract

An impact to the head may fracture the skull or injure the internal structures of the skull. The magnitude and seriousness of a head injury to the skull and its contents may not always immediately correlate with the amount of force delivered to the head. Any head blow or strike could cause craniocerebral injury of any kind. Triivial head trauma instances can not necessarily draw attention to a typical autopsy surgeon discovery. It requires careful observation and a desire to learn more to be able to distinguish between and take into account the mechanism, force of impact, victim's clothing, surrounding surroundings, speed, velocity of the hit, and many other elements with relation to each and every occurrence. It makes forensic medicine more challenging and intriguing. Based on a tiny number of variables, no one can foresee what the circumstances will be or what amount of harm they would cause. A specialist can be quite beneficial in this circumstance. However, occasionally accidents involving large vehicles travelling at high speeds vs automobiles may cause bleeding in the brain without breaking any of the bones in the skull vault or the base of the skull. Here is a description of one of these odd cases.

Keywords: Fractures, Craniocerebral, Trauma, Automobiles

BURN OR NOT BURN: A DILEMMA ON THE TURN IN A CASE OF POST R.S.A CASE

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Abstract

Autopsy surgeons occasionally encounter cases with multiple potential causes of death or with new information that alters the apparent direct cause of death. In cases where there are otherwise no flame injuries, skin diseases like TEN, SSSS, and bullous lesions may present similarly to 2nd degree burns. If a patient has ever had epilepsy and was previously taking anti-epileptic medications like phenytoin and levetiracetam, it is not uncommon for him to experience an unusual hypersensitivity reaction to a medication once his immune system has been compromised by a protracted illness, an extended hospital stay, or a significant physical trauma like a head injury. Drugs like Phenytoin, Diclofenac, and Levetiracetam can cause mucositis, fever, and skin lesions that closely resemble 2nd degree burns with little discernible difference. Drugs like phenytoin and levetiracetam can cause skin abnormalities that can raise questions about whether a burn case actually occurred, putting the autopsy surgeons in a difficult medical-legal situation. In order to make an accurate diagnosis and resolve this medicolegal conundrum, a very thorough investigation of the patient's medical history and hospital records is crucial.

Keywords: Burn, TEN, SSSS, Anti-epileptic, Hypersensitivity Reaction

THE CRIMINAL PROCEDURE (IDENTIFICATION) BILL, 2022

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Abstract

The Identification of Prisoners Act, 1920 allows police officers to collect certain identifiable information (fingerprints and footprints) of persons including convicts and arrested persons. Also, a Magistrate may order measurements or photographs of a person to be taken to aid the investigation of an offence. In case of acquittal or discharge of the person, all material must be destroyed. There have been advances in technology that allow other measurements to be used for criminal investigations. The DNA Technology (Use and Application) Regulation Bill, 2019 (pending in Lok Sabha) provides a framework for using DNA technology for this purpose. In 1980, the Law Commission of India, while examining the 1920 Act, had noted the need to revise it to bring it in line with modern trends in criminal investigation. In March 2003, the Expert Committee on Reforms of the Criminal Justice System (Chair: Dr. Justice V. S. Malimath) recommended amending the 1920 Act to empower the Magistrate to authorise the collection of data such as blood samples for DNA, hair, saliva, and semen. The Criminal Procedure (Identification) Bill, 2022 was introduced in Lok Sabha on March 28, 2022 and became an ACT on 18th April 2022. The ACT has replaced the Identification of Prisoners Act, 1920. Through this poster, I am going to discuss few points regarding the Criminal Procedure (Identification) ACT, 2022 and its implications with regards to privacy.

Keywords: Identification, Privacy, Data collection, DNA technology, Magistrate

INSECTS IN TRACING POST MORTEM INTERVAL: FRIEND OR FOE?

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Abstract

Forensic entomology is a branch of forensic science concerned with the study of insects found at crime scenes and the decomposition of carcasses. Insect evidence is becoming more common and important in legal proceedings. Though insects do not commit crimes, they serve as carriers of ingested human remains. Various insect species rely on human remains for nutrition and to lay eggs in the context of reproduction. Under certain environmental conditions, insect larvae are highly dependent on human remains for nutrition. This provides an overview of the post-mortem interval estimation. The insects reveal a wealth of information, including whether the corpse was relocated, seasonal changes, prescribed medicines consumed by the deceased, identification of the individual using DNA profiling, and gunshot residues or explosive residues. These details can sometimes be found in larval tissues rather than human samples. Insects assist us in tracing evidence, but they are not always helpful because decomposition erases evidence. These insects can alter the injuries and even the victim's clothing in fatal stabbings. When the victim is discovered after a period of time, the natural process of decomposition erases all evidence, making reconstruction of the crime difficult. It also aids in determining the cause and manner of death. The current study is a review of the literature on various insects that contributed to the death investigation. When solving a crime, it also fosters a friendly relationship between the insects and forensic experts. This review looks at methods for estimating the minimum time since death, also known as the minimum post-mortem interval, with insects as the primary source of concern. It also emphasizes data retrieval in a standardized manner.

Keywords: Forensic Entomology, Insects, Post mortem interval, Crime scene investigation, Death investigation



**PAPER
PRESENTATION
PROFESSIONAL
CATEGORY**

CELLULOSE PAPER SORPTIVE EXTRACTION (CPSE): A SIMPLE AND AFFORDABLE MICROEXTRACTION METHOD FOR RAPID ANALYSIS OF LORAZEPAM RESIDUES IN FOOD SAMPLES IN CASES OF DRUG-FACILITATED CRIMES

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Abstract

The incidence of drug-facilitated crimes (DFCs) has witnessed a significant rise in recent times. Victims often report being assaulted or robbed while under the influence of drugs. Lorazepam (LZ) is frequently employed in DFCs due to its ability to render victims docile, thanks to its potent numbing effects. Consequently, there is a pressing need for a straightforward and environmentally friendly analytical method to analyse LZ in spiked food matrices connected to criminal activities. This study presents a simple, eco-friendly, and high-throughput analytical method for detecting LZ in commonly encountered food and drink matrices involved in DFCs, utilizing cellulose paper sorptive extraction (CPSE). Pristine cellulose paper (CP), a commonly used laboratory filter paper, was utilized as a sorptive medium for extracting LZ from food matrices. Five pieces of CP (1.5 × 1.5) were immersed in diluted food matrices (such as cream biscuits and tea) and agitated on a rotary shaker at 200 rpm for 30 minutes. The CPs were subsequently dried, and the adsorbed LZ was back-extracted using 2 mL of methanol. The resulting extract was then subjected to GC-MS analysis in selected ion monitoring (SIM) mode. The method exhibited linearity within the range of 0.2–10 µg mL⁻¹ (or µg g⁻¹), with coefficient of determination (R²) values ranging from 0.996 to 0.998. The limit of detection and limit of quantification for cream biscuits were found to be 0.054 and 0.18 µg g⁻¹, respectively, while for tea samples, they were 0.05 and 0.16 µg mL⁻¹, respectively. The relative standard deviations (%RSD) for all measurements remained below 10%. The entire sample preparation process utilized 2 mL of methanol per sample. The eco-friendliness of the proposed procedure was evaluated using Analytical Eco-Scale and GAPI greenness assessment tools. Finally, the CPSE-GC-MS method was applied to determine LZ in forensic food samples involved in DFCs.

Keywords: Cellulose Paper Sorptive Extraction, Drug Facilitated Crime, Lorazepam, Gas Chromatography-Mass Spectrometry, Forensic Chemistry

THE POWER OF DCS5 FOR THE DETECTION, CAPTURE AND ENHANCEMENT OF LATENT FINGERPRINTS IN FORENSIC SCIENCE

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Abstract

Latent fingerprints, often invisible to the naked eye, can provide invaluable evidence in criminal investigations. This article presents a new advance technique of latent fingerprint development in forensic sciences. At present, traditional developing methods such as powder dusting, cyanoacrylate fuming, chemical method, and small particle reagent method, have all been gradually compromised given their emerging drawbacks such as low contrast, sensitivity, and selectivity, as well as high toxicity and also fluorescent nanomaterials which possess its own drawback. Advancements in imaging technology have revolutionized the field of forensic science, particularly in latent fingerprint detection. Among these innovative systems, the DCS5 Imaging System stands out as a powerful tool for capturing and analyzing latent fingerprints compared to latent fingerprint development by traditional methods. This article explores the capabilities of the DCS5 system and its significant impact in development, detection, capture and enhancement of latent fingerprint on any surface, highlighting its impact on forensic investigations.

Keywords: DCS5, Imaging System, Latent fingerprint, Forensic science

FORENSIC ODONTOLOGY- AN OVERVIEW

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Abstract

Forensic odontology is an evolving science and has a greater scope of development. Despite breakthrough in science and technology our society faces fresh challenges in every possible way, from an increase in the crime rate to a rise in natural disasters. Forensic odontology has played a key role in the identification of individuals, especially casualties in criminal investigations and/or mass disasters and in identification of decomposed and disfigured bodies like that of drowned persons, fire victims, and victims of motor vehicle accidents. The various methods employed in forensic odontology include rugoscopy, cheiloscopy, bite marks, tooth prints, radiographs, photographic study and molecular methods. This presentation provides an overview of the evolving trends in conventional methods, and the recent concepts used in forensic odontology.

Keywords: Forensic Odontology, Identification, Conventional Methods, Recent Advances

YOUTH & AGGRESSION: CAUSES & RISK FACTORS

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Abstract

The present study aims to assess the level of aggression among the college students. Attempt has also been made to understand the causes and risk factors that may escalate aggressive behavior in the youngsters, including the role of family & family structure, peers, violent video games, media, economic status, level of education of parents and many more. In the current scenario, a high level of aggressive tendencies can be seen in the youth, which is a cause of major concern among the people. There is a surge in the criminal activities, creating an atmosphere of fear and uncertainty. Just blaming the offender only may not be sufficient, there are various factors that need to be examined, and addressed at different levels, if we aim to bring long term changes in our society. Some of the other objectives of the present study is to understand the gender differences for the level of aggression, relationship between family structure and level of aggression of the students and also to investigate association between the time spent on video games and the level of aggression. For assessing the level of aggression, the Buss–Perry Aggression Questionnaire, designed by Arnold Buss and Mark Perry, will be used. To understand the causes and risk factors for aggression, Interview of 10 experts from the field of Psychology and Psychiatry, will be taken who would talk about the different factors that are resulting in greater aggressive tendencies and behaviour in the youth today. The study aims to develop an insight among the parents, the educators and policy makers, about the factors that are making the youngsters more prone towards the aggressive behaviour. Such an understanding can help them to take preventive measures, resulting in a healthy development of the young force both physically and mentally.

Keywords: Aggression, Risk factors, Mental health, Aggression Questionnaire

CHIELOSOPY AND DERMATOGLYPHICS AS SEX DETERMINANTS IN FORENSICS

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Abstract

Background: Personal identification has an important role in forensic sciences. Lip print and thumb print can be used for personal identification since they are unique for individuals and do not change during the life of a person. **Objective:** To analyse predominant patterns of lip print in females and males, to analyse predominant patterns of finger print in females and males and to identify if there exists any correlation between lip prints and finger prints. **Material and Method:** A cross sectional study was conducted at Government Dental College and hospital Srinagar including 400 individuals (200 females and 200 males) with age group between 18-40 years. Fingerprint and lip print of all the subjects were collected and compared, and the results were analyzed based on Micheal Kucken classification system for fingerprints and Suzuki and Tsuchihashi classification for lip prints. Descriptive and inferential statistics were carried out. Level of significance was set as 0.05. **Result:** Reticular lip print pattern was found in majority (36.4%) of the males, whereas vertical grooves (29.6%) and branched grooves (29.6%) were common in females. Finger prints showed that loop pattern was more common in both males and females. This study showed a significant correlation between lip prints and thumb pattern in males while females showed no significance. **Conclusion:** The reticular grooves is commonly seen lip print in males. Branched and vertical grooves running across entire lip is equally predominant lip print in females. Loop finger pattern is common in both males and females. There was a significant correlation seen between lip print and finger pattern in males.

Keywords: Lip Print, Cheiloscopy, Finger print, Dermatoglyphics, Sex Determination

SEX DETERMINATION BY LINEAR AND DIAGONAL ODONTOMETRIC DATA OF INDIAN POPULATION – A SCOPING REVIEW

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Abstract

Introduction: Identification of unknown human remains is based on building the biological profile of the remains. Teeth exhibits sexual dimorphism in a population and also with in the population. Numerous odontometric studies conducted on different tooth in Indian population but still there is a huge lacuna of odontometric data from population-based studies. Currently, there is a need for odontometric data of Indian population that may supplement anthropological and forensic identifications. **Aim:** the aim of the present study was to carry out the systematic literature review on studies reported to determine the sexual dimorphism using linear and diagonal odontometric of crown in different population groups of India. **Material and Method:** The focused question was whether linear and diagonal odontometrics of crown in permanent tooth exhibits sexual dimorphism in different population groups of India. For the same a systematic literature search was conducted on studies reported in past 10 years by using different data base like PubMed, Cochrane literature review and google scholar by two reviewers. Data extracted were sample population, sample size, method used, linear or diagonal measurements accessed, results and accuracy percentage. **Results:** Literature search revealed 181 studies on odontometric analysis in Indian samples. Depending on inclusion and exclusion criteria 8 quality articles were analysed which includes 1173 participants. The percentage of accuracy that helps for identification of subjects by odontometric analysis of all tooth ranges from 47% to 97.2%. **Conclusion:** All the tooth Indian samples exhibits varying amount of sexual dimorphism which can be used in forensic and anthropological identification. **Key words:** Crown dimensions, Linear Odontometrics, Diagonal Odontometrics, Sexual dimorphism of tooth, Mesiodistal diameter of tooth.

Keywords: Sex Determination, Odontometric Data, Sexual Dimorphism, Population

CHARACTERISTICS OF INJURY IN WOMEN AND CHILDREN IN UGM (UNIVERSITAS GADJAH MADA) ACADEMIC HOSPITAL YOGYAKARTA 2020- 2021

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Abstract

Violence and traffic accident are two serious problems that must be tackled by all countries. Sustainable Development Goals (SDGs) has stated a goal which assist the elimination of violence against women and children by 2030. At the same time, The United Nations (UN) General Assembly also established the Decade of Action for Road Safety 2021-2030, with the goal of preventing at least 50% of road traffic deaths and injuries by 2030. This study aims to obtain the characteristics of injury in women and children and to determine the association of sociodemographic of the patient to the severity of injury. This descriptive observational with a cross-sectional method study obtained the data from the medical records of 801 patients from UGM Academic Hospital Yogyakarta in January 2020 to December 2021. Univariate and bivariate analysis were done. The most common type of violence is physical violence, with contusion in women and abrasion in children being the most common wound types, and head as the most prevalent location of injury. In traffic accident cases, abrasion was the most common type of wound and lower extremity as the most common location. There is a significant relationship between the patient's age and the injury's severity, which brings them to either outpatient, inpatient and/or having surgery as medical treatment.

Keywords: Characteristics of Injury, Violence, Traffic Accident, Women, Children

ARTIFICIAL INTELLIGENCE & AGE ESTIMATION: REVOLUTIONIZING FORENSIC DENTISTRY

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Abstract

Age estimation plays a vital role in the identification of unknown corpses, accidents, crime, disaster victims and also provide valid identification of living individuals. Teeth are a crucial indicator of aging among the various other biological markers for age determination. Age is evaluated mostly based on X-rays, assessing crown formation, mineralization of a tooth, root growth and apex maturation, and eruption sequence of teeth in the oral cavity. Many methods have been developed for children, adolescents, adults and the elderly. However, these conventional methods focus on one or two characteristics in panoramic radiographic images, and ignoring the other parts of the images except for focused regions. Considering the high potential for errors and bias associated with conventional age estimation methods, it has been hypothesized that the elimination of subjective aspects and automatic performance of age estimation result in improved performance. Throughout the last decade, continuous efforts are being made to improve the accuracy of age approximation using new prediction methods, using artificial intelligence (AI) based estimations, by the incorporation of deep learning algorithms and convolutional neural networks (CNNs) based on dental data. This review is an attempt to highlight the scope of AI in accurate age determination.

Keywords: Age estimation, Artificial Intelligence, Forensic Dentistry, Dental Data, Radiographs

DIAGNOSTIC ROLE OF SALIVARY BIOMARKERS IN OCCUPATIONAL HEALTH

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Abstract

Individuals working in various industries are exposed to different types of harmful agents and are prone to develop occupational diseases. Periodic biological monitoring helps in reducing the exposure to these chemicals and thus occupational diseases by evaluating appropriate biomarkers in biological fluids. Different fluids like blood and urine are mainly used for biological monitoring but each has its own advantages and disadvantages. Apart from exposure to harmful chemicals one major challenge of the work environment is occupational stress which if unmanaged can lead to serious health and personal issues. Recently, saliva has emerged as a notable biofluid for diverse diagnostics tests as it has several components that may provide biomarkers reflecting individual's health status. Many toxins and their metabolites are excreted in saliva and salivary biomarkers provide a novel approach in occupational health practice, thus, currently researchers are exploring potential of saliva as a diagnostic biofluid for biological monitoring. The present paper highlights the role of saliva as a diagnostic biofluid in detection of occupational and environmental exposure.

Keywords: Biological monitoring, Biomarkers, Occupation, Saliva, Stress

ROLE OF PROSTHODONTIST IN FORENSIC ODONTOLOGY- A LITERATURE REVIEW

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Abstract

Forensic odontology is the forensic science that is concerned with dental evidence. It is a relatively new science that utilizes the dentist's knowledge to serve the judicial system. The most common role of the forensic dentist is the identification of deceased individuals. Dental structures are the hardest and most resilient tissues of the human body. Teeth on exposure to post mortem influences will survive longer than other body tissues as the materials used to restore damaged teeth are extremely resistant to physical, chemical, and biological destruction. Forensic identification based on assessment of prosthodontic appliances is assuming greater significance, as labelling of dentures and other prosthetic appliance could provide vital clues for patient identification. The most common role of the forensic dentist is the identification of deceased individuals. Forensic identification based on assessment of prosthodontic appliances is assuming greater significance, as labelling of dentures and other prosthetic appliance could provide vital clues for patient identification. Various recommendations have been made concerning the importance of denture identification. This paper presents a review of available literature highlighting the fact that how a prosthodontist can play a key role in identification of a deceased individual if trained to do so.

Keywords: Prosthodontics, Forensic Odontology, Denture Labelling, Palatal Rugoscopy, Custom Restoration

FORENSIC SCIENTIST OR THE AUTOPSY SURGEON - WHO IS SUPERIOR

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Abstract

A Forensic Scientist is a law enforcement professional who analyzes crime scene evidence. They may evaluate evidence on the site of a crime scene or in a laboratory setting. A Forensic Scientist's ultimate goal is to help other law enforcement professionals figure out the details related to a crime, such as who committed the crime, what exactly occurred during the crime, etc. An Autopsy Surgeon is a medical physician trained to evaluate a corpse which had an unnatural death. Autopsy Surgeons aim to determine how and why a person died. They perform autopsies and laboratory tests related to the deceased's body to help them figure out the causes and circumstances related to that person's death. In many cases, both the specialist have contributed together equally towards the success of the case. These two specialists form the main core of any crime investigation. In many countries, the autopsy surgeon or the forensic pathologist are made as the medical examiners and they look over the entire crime investigations even in those countries, without forensic scientist's contribution, no cases could be solved as they help in creating the prime evidence. In any court of law, evidence are the most necessary tool for framing an accused in a case and about it, the contribution of forensic scientist is comparatively more than that forensic medicine experts. In India, about collection of various pieces of evidence, Forensic Scientists have the upper hand as they visit the crime scene while the autopsy surgeon is confined only to the dead bodies. Thus, in any crime investigation, the role of an Autopsy Surgeon and a Forensic Scientist are equally important.

Keywords: Forensic Scientist, Autopsy Surgeon, Crime Scene Investigation, Evidence

CLANDESTINE BURIAL CRIME SCENE INVESTIGATION

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Abstract

Oral Presenter: Forensic science starts from the crime scene. Crime scene contains a lot of physical evidence, also known as "silent witness". In the current scenarios, criminals are intelligent in avoiding their evidence at the scenes. The dead body of a victim is essential evidence in homicide cases, and the homicide victim is concealed in settings such as wells, pits, sinkholes or other confined subterranean spaces/under the earth's surface. In clandestine burial incidences, mostly the victims are buried superficially since the perpetrators try to leave the place as quickly as possible. A covert grave is an unrecorded burial, often in a remote location and usually dug below 1 m below ground level—instances wherein the victim is found buried either naked or with a dress or wrapped. Once the burial scene has been identified, forensically significant evidence should be documented. The individual's identity needs to be confirmed, and the evidence made it possible to locate and prosecute those responsible for the murder. Knowledge of primary and secondary crime scenes is required to reconstruct the crime occurrence. Some police investigators underestimated or overlooked the pieces of evidence like fibre, hair and footprints in many incidents and neglected them from the initial investigation stage, presuming that they were unimportant. I am sharing my crime scene experience on "the burial scene investigation" as investigated to understand the crime concealment act and the identification of the primary crime scene. A primary crime scene is the place of the crime committed, while the burial place is the secondary crime scene, and the forensic investigator has to link these two scenes for further reconstruction.

Keyword: Clandestine, Burial, Crime Scene Investigation, Evidence, Identification

RELIABILITY OF POSTMORTEM ABO BLOOD GROUPING: A STUDY OF 100 CASES

Kuldeep Panchal¹

Abstract

Blood grouping has been one of the cornerstones for identification of biological materials in forensic investigations. Antigens of the ABO system can be detected even prior to birth. ABO blood groups can also be detected after death for a long period in many body tissues (teeth, bones, etc.). Blood has its own forensic value in many medico-legal issues. The present study looked at a total number of 100 autopsy cases brought for medico-legal investigations in the mortuary of the Department of Forensic Medicine in collaboration with the Department of Pathology at the Postgraduate Institute of Medical Sciences (PGIMS), Rohtak (Haryana, India). The blood samples were collected from right ventricle without any anticoagulant. ABO blood grouping was performed by direct haemagglutination technique using monoclonal antisera. Reverse blood grouping was also attempted. Our results showed that ABO blood group antigens can be detected from blood fluid after death, even in decomposed bodies with an estimated post-mortem interval (EPMI) of <85 hours. Our results also show that as post-mortem interval increases beyond a certain limit there is a decrease in antigens on RBCs in the post-mortem blood. Keywords: Blood, ABO blood groups, decomposed bodies, postmortem interval, forensic investigations.

Keywords: Haemagglutination technique, Postmortem, Blood Grouping

HUMAN BITE MARK: THE DENTAL BLUEPRINT!

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Abstract

Bitemarks are important evidence and an integral part of forensic odontology. It gives a piece of unique information about the crime and can be present on the victim, suspect or foodstuff, and other materials. The pressure, shape, location arch size, etc are a few important characteristics of bite marks. Human bite marks are elliptical or circular and governed by specific traits of teeth shape and arrangement etc. Photography, salivary swabbing, and impressions of the bite mark are important steps in collecting dental evidence. The collection of bite marks from the victim and the suspect has to be precise. The further analysis involves registration, comparison, evaluation, and preparing the report. This review overviews current trends and understanding important steps in recording and analyzing this important dental evidence.

Keywords: Human Bite Mark, Forensic Odontology, Dental Evidence, Teeth Shape, Teeth Size

ESTABLISHING IDENTITY AND ESTIMATING AGE OF THE DONOR THROUGH POROSCOPY

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Abstract

Dermatoglyphics is the study of the unique patterns present in the epidermal layer of the fingertips and its ridges and valleys' characteristics which can be employed for the personal identification of an individual. These patterns are formed during fetal development and remain constant throughout a person's life, except in cases of permanent injuries or certain medical conditions. Recently, Poroscopy in dermatoglyphic studies is also being used for forensic purposes. Fingerprint analysis, which involves the examination of the ridges and pores on the fingertips, is a common method used in criminal investigations to identify suspects. Poroscopy as a third level of fingerprint analysis can help the experts to identify criminals with their unique characteristic features such as the sweat gland openings and shapes that can aid in fingerprint analysis and in personal identification. This is empirical research studying the importance of the pores, which is expected to have the potential in personal identification, and in the age estimation of the donor from the forensic perspective. 600 samples were collected using a stratified sample collection method from all over the country to analyze the difference in the pore conditions such as structure, pattern, and pore density between the genders and people of different age categories. The study showed significant results and the potential ability of the Poroscopy in personal identification and its potential in age estimation of the donor.

Keywords: Fingerprints, Dermatoglyphics, Poroscopy, Personal Identification, Criminal Profiling

REVIEW OF STUDIES DONE TO IDENTIFY A POPULATION USING PALATAL RUGAE

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Abstract

Introduction: Palatal rugae are folds of mucous membrane with a dense connective tissue core which appear in different patterns in the anterior palate. Rugae are genetically determined and remain fairly constant throughout life in their pattern of presentation. Statistically significant differences have been found in rugae patterns in several studies conducted among various ethnic population groups across the world. However, different authors have used various methods to identify and record the rugae. Of the available classifications, some authors have opted for newer modifications. The statistical tests used also are varied based on the requirement in the study. **Review of the literature:** Poojya et al in 2015 have reviewed the significance of palatal rugae as a reliable aid in forensics¹. Hosmani et al in 2018 have stated that rugae shape have great utility in population differentiation as in individual identification². **Conclusion:** This review paper attempts to study the methods and results of the studies published in PUBMED indexed journals retrieved using the key word string: (palatal rugae) AND ((population) OR (ethnicity)) AND ((identification) OR (differentiation) OR (determination)). Filters were used to restrict the articles to only free full text articles between 2013 and 2023. Forty-five articles were obtained. Of these 10 articles were discarded as they did not relate to ethnic population groups. The remaining thirty-five articles were included in the study. The articles were examined under four headings: 1) Method of recording the rugae patterns 2) Classifications used 3) Statistical tests used and 4) Significant differences obtained. The data so obtained is analyzed for the frequency and distribution of each variable studied. It is found that visual examination after delineating the rugae was the mainstay in recording. Thomas and Kotze's classification is widely used. Many tests have been used by authors for rugae analyses including Chi squared tests and independent t-tests. Significant differences have been observed in the various parameters between the populations groups studied.

Keywords: Palatal Rugae, Population, Ethnicity, Identification, Determination

PEDODONTISTS: WHAT IS THE ROLE IN FORENSIC ODONTOLOGY?

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Abstract

Introduction: Forensic identification often requires an interdisciplinary approach. A pedodontist can help a forensic odontologist by applying their skills for recognition and reporting of child abuse and neglect, mass disaster dental identification, cheiloscopy, rugoscopy, age assessment, bitemark analysis, and labelling of appliances that could provide vital clues for person identification. **Review of Literature:** The aim of this review was to collect all literature available on PubMed, PubMed Central, MEDLINE, Google Scholar, and Google search engines on the role of pedodontists in forensic Odontology. This review also sheds light on the recommendations of The American Academy of Paediatric Dentistry, which recognizing the role that dental records play in forensic identification, encourages pedodontists to implement simple practices that can aid in identification of unknown infants, children, and adolescents. The AAPD recommends that parents establish a dental home, where clinical data is gathered, stored, and updated routinely and can be made available to assist in identification of missing and abducted persons. Child Identification program gathers a physical description and features fingerprinting, several still photos of various profiles, a video recording or mannerisms with voice interview, and various DNA samples collected on dental impressions and/or cheek swabs. **Conclusion:** It can be concluded that from personal identification to child abuse, there is a special role played by the pedodontist in the field of forensics. There is lack of access to secured antemortem databases of all the varying dental features in India which can be stored for future comparisons and identification purposes. This is the need of today's time and should be implemented and taken into the consideration as soon as possible.

Keywords: Pedodontist, Forensic Odontology, Identification, Paediatric Dentistry, Child Abuse and Neglect

AMELOGLYPHICS: AN ADJUCTIVE TOOL IN PERSONAL IDENTIFICATION

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Abstract

Background: The enamel rod end patterns are known as tooth prints and the study of these prints is termed as amelogyphics. The tooth prints are unique and they exhibit dissimilarity both between teeth of different individuals and of the same individual. This uniqueness might be used as a valuable tool for personal identification. **Aims and objective:** To determine the reproducibility and reliability of the tooth prints as a valuable tool for the identification of an individual. **Materials and method:** In the present study, thirty extracted permanent teeth (15 males and 15 females) were selected for the study and the middle third central portion of all the teeth were subjected to acid etching using 10% orthophosphoric acid for taking impression of enamel rod end pattern using cellophane tape and then observed under the microscope. **Results:** In the present study, enamel rod end patterns were specific for an individual and also specific for a particular tooth. **Conclusion:** The study of tooth prints could be used as a valuable tool for the personal identification of an individual in forensic investigations especially in severe burn and deceased cases

Keywords: Tooth Prints, Forensic Odontology, Enamel Rods, Acid Etching, Criminal

USE OF NUCLEOTIDE SEQUENCE FOR THE IDENTIFICATION OF VARANUS BENGALENSIS WHICH IS POACHED AND SMUGGLED AS A SOURCE OF CONSUMABLE FLESH

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Abstract

The illegal wildlife trade remains a global concern, posing a significant threat to numerous endangered species. *Varanus bengalensis*, commonly known as the Bengal monitor lizard, has become a prime target for poaching, smuggling, and consumption due to its unique physical attributes and cultural beliefs associated with its flesh. To combat this illicit activity, molecular techniques involving nucleotide sequence analysis have emerged as powerful tools for identifying and tracking wildlife species. This abstract presents a comprehensive overview of the application of nucleotide sequence analysis for the identification of poached and smuggled *Varanus bengalensis*, specifically focusing on the detection of its flesh in illegal wildlife trade. Through the analysis of specific genetic markers, such as mitochondrial DNA (mtDNA). It is possible to differentiate *Varanus bengalensis* from other closely related species. The mtDNA analysis involves the sequencing of specific regions to identify unique nucleotide sequences that are characteristic of *Varanus bengalensis*. This method enables the identification of samples even when they are processed or disguised, providing crucial evidence for law enforcement agencies to prosecute poachers and smugglers. The utilization of nucleotide sequence analysis for the identification of poached *Varanus bengalensis* holds significant promise for conservation efforts. By enhancing forensic capabilities, authorities can not only improve the detection and prevention of poaching incidents but also establish effective conservation strategies for this threatened species. This abstract emphasizes the urgent need for further research and collaboration among scientists, law enforcement agencies, and policymakers to effectively combat the illegal trade of *Varanus bengalensis* and protect its population from further decline. By leveraging molecular techniques, we can enhance wildlife conservation and contribute to the preservation of biodiversity in our ecosystems.

Keywords: Wildlife, Mt DNA, *Varanus Bengalensis*, Nucleotide Sequences, Molecular Identification

SEX DETERMINATION FROM HAIR SHAFT USING ATR FTIR SPECTROSCOPY AND CHEMOMETRICS

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Abstract

Hair, forensic evidence of ubiquitous origin has been greatly undermined with regards to its evidential value. When found with a root, individualization is carried out using DNA profiling but in other cases examination remains at its genesis. The current work aimed at exploring other forensically relevant aspects non-destructively using Attenuated Total Reflectance-Fourier Transform Infrared Spectroscopy (ATR-FTIR). Sex determination of the human hair samples was carried out as key objectives of the undertaken study. Based upon the differential vibration intensities and stretching of the various chemical groups associated with hair and its proteins, the sex determination was carried out. Chemometric algorithms of PCA and PLS-DA were used for statistical inference of spectral data. Sex determination was determined with 100% accuracy using the aforementioned methodology. Sex determination from hair non-destructively using ATR FTIR and chemometrics is first of its kind study. This study may hold a great scope for forensic analysis by serving as a screening test for a number of samples recovered from the crime scene before they are subjected to exorbitant and destructive techniques.

Keywords: Forensic science, Hair, Trace Evidence, Sex Determination, ATR FTIR, Chemometrics

AUTOPSY OF A RARE CASE OF NEAR STRANGULATION

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Abstract

Near strangulation is a term used to describe a situation where an individual has experienced a partial or incomplete obstruction of their airway or blood vessels in their neck, which can result in a reduction of oxygen supply to the brain. This can happen when there is pressure applied over the neck by a ligature or a hand, without causing complete obstruction of the airway or blood vessels. In such cases, the body is not suspended and the body weight is not the constricting force. Near strangulation is a serious medical emergency that can cause significant harm to the individual's health and even be fatal. Even if an individual appears to recover from a near strangulation event, they should seek immediate medical attention as there may be long-term damage that is not immediately apparent. The case presented here is a rare form of near strangulation in which a female was strangulated by her husband and died in the hospital after three months of treatment. The everyday situations in which near strangulation occurs, its pathophysiology, and autopsy findings are discussed in detail.

Keywords: Near strangulation, Asphyxia, Autopsy, Cerebral hypoxia

THE ROLE OF METAL NANOPARTICLES IN DNA ISOLATION: A REVIEW

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Abstract

Introduction Nanoparticles play a significant role in science and technology due to their small size and unique properties. In this article, we focus on metal nanoparticles, specifically iron and copper-based nanoparticles and their applications in DNA isolation within the field of forensic science. Metal nanoparticles, including gold, silver, titanium, platinum, copper, zinc, iron, offer diverse possibilities for various applications. Literature Review Researchers have utilized coated and uncoated magnetic nanoparticles (MNPs) to extract DNA from different human samples. Most of the articles have used magnetite (Fe₃O₄) particles which are a type of metal oxide nanoparticles. In blood samples, Fe₃O₄ MNPs coated with dimercaptosuccinic acid (DMSA) enable direct PCR usage without purification. According to researchers, coating minimally affects the magnetic properties of Fe₃O₄, enhancing DNA yield through hydrogen bonding. Advances have also been made in DNA isolation from urine samples using carboxyl-group modified MNPs, providing a simple, rapid, and non-invasive alternative to traditional methods. Another group of researchers state that uncoated Fe₃O₄ nanoparticles have proven to be effective in DNA extraction from saliva, offering high yield and purity due to their large surface area. Copper nanoparticles have been used for DNA isolation from powdered and decalcified skeletal samples, resulting in high-quality DNA with minimal protein contamination. Conclusion Fe₃O₄ magnetic nanoparticles have found extensive use in forensic science for DNA isolation from various human samples whereas copper nanoparticles have been used limitedly for DNA isolation from skeletal samples. Future research should focus on alternative DNA sources, comparison between yields from different samples, the impact of coating on the efficacy of MNPs and exploring alternative metal nanoparticles for DNA isolation.

Keywords: Nanoparticles, Metal nanoparticles, DNA isolation, Magnetite (Fe₃O₄), Polymerase Chain Reaction (PCR)

PHYSICAL VIOLENCE INCREASES THE RISK OF AORTIC RUPTURE, CAUSING CARDIAC TAMPONADE: A CASE STUDY

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Abstract

Introduction: The authors report a sudden cardiac death due to spontaneous aortic rupture. A 25-year-old woman was allegedly tortured by her husband on April 11, 2023. **Method:** We perform external, internal, and histopathologic examinations. **Results:** On external examination, the lips and fingertips looked bluish, and the mucous membranes of the eyes showed dilated blood vessels and bleeding spots. There were abrasions on the nose and right eyelid and bruises on the forehead. On internal examination, we found blood absorption under the skin of the forehead, dilation of the blood vessels in the brain, widening of the intercostal space, the left lung appeared to be deflated, a ruptured aortic arch wall seen, there was a blood clot in the pericardium of 100 ml. A reddish wound appeared on the cervix with no signs of malignancy on laboratory findings. **Discussion:** Spontaneous aortic rupture is a complication of cardiovascular disorders that causes blood retention in the pericardium. This results in cardiac tamponade. The development of tamponade is blocking blood flow from the lungs and other organs, including the brain. In addition, the heart also cannot pump blood to other organs, so oxygen circulation is disrupted. Rapid death occurs due to anoxia of the brain. **Conclusion:** A woman was found dead in her house, allegedly after being tortured by her husband. The results of the examination found abrasions and bruises in the face area, some old abrasions on the body, dilation of the blood vessels of the brain, the ribs dilated, the left lung appears to be deflated, the wall of the aortic arch seen to be ruptured, there is a blood clot in the pericardium of 100 ml, resulting in the pericardial cavity being filled with blood thereby impeding the movement of the heart and unable to pump blood.

Keywords: Aneurysm, Aortic Rupture, Cardiac Tamponade, Physical Violence, Sudden Death

PRIVILEGE AGAINST SELF-INCRIMINATION IN DIGITAL ERA WITH SPECIAL REFERENCE TO EUROPEAN COURT OF HUMAN RIGHTS CASES

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Abstract

In this Article, the privilege against self-incrimination is analyzed, with the data encryption in digital gadgets and the complexity involved, the author attempts to base his in-depth analysis on the jurisprudence of the European Court of Human Rights case laws regarding self-incrimination. Taken into consideration the reasoning drawn from the various cases brought before the European Court of Human Rights, the author tried to analyse cases such as forcing a person to produce a decryption key or self-decrypting information and subsequently submits the content in a readable format. The conclusion was that the privilege against self-incrimination also applies to the context of encryption / decryption of computer data. The author also attempted to settle the question of the scope of the privilege in the sense that it precludes coercion to active cooperation.

Keywords: Self-incrimination, Encryption, Decryption, Encryption, European Court of Human Rights

CLINICALLY UNDIAGNOSED TUBAL ECTOPIC PREGNANCY- A CASE REPORT

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Abstract

Any pregnancy in which conceptus is implant and mature outside the endometrial cavity, is called ectopic pregnancy. Ectopic pregnancy is the most life-threatening emergency in pregnancy. Increase in incidence of such cases is a real concern related to pregnancy. Ectopic pregnancy may lead to massive hemorrhage, infertility or remained asymptomatic during early pregnancy. Early diagnosis and treatment are crucial to save the life of patients who would otherwise die. In the present case, author report and discuss a case of young adult primigravida brought with history of pain in abdomen, vomiting and menstrual irregularities. She has no history of amenorrhea, vaginal bleeding and her urine pregnancy test was negative. Clinically this case was diagnosed and treated as a case of pancreatitis due to pseudo increase in enzymes level and sonologist reports the empty uterine cavity with fluid in pouch of douglas. But autopsy surgeon diagnosed this as a case of ruptured ectopic pregnancy.

Keywords: Abortion, Forensic autopsy, Ectopic pregnancy, Maternal mortality

DEVELOPMENT OF TRIPHENYLAMINE FLUOROPHORE TETHERED TERPYRIDINE PROBE FOR METHANOL DETECTION TOWARDS FORENSIC APPLICATIONS

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Abstract

Alcohol poisoning is increasing day by day. Particularly, this is due to the adulteration of methanol with various alcoholic beverages. Therefore, the detection of methanol is the prime motive of researches to reduce the mortality rates caused by methanol poisoning related to forensic toxicology. Thus, herein we present, triphenylamine appended terpyridine donor-acceptor fluorescent probe (TPA-TP) that exhibits specific detection of methanol in presence of other volatile organic compounds. The role of the terpyridine group in the TPA-TP toward methanol detection and relevant mechanism has been demonstrated. Besides, TPA-TP coated Whatman filter paper based strips was established and evaluated for detection of methanol. We found that TPA-TP is a sensitive, selective, and inexpensive probe for methanol detection over benzene, ethanol and biodiesel by naked-eye investigated using fluorescence spectroscopy methods and single crystal X-ray structure analysis.

Keywords: Methanol detection, Triphenylamine, Fluorescent probe, Alcohol poisoning, Forensic science

**PAPER
PRESENTATION
STUDENT
CATEGORY**

OPTIMIZATION OF DISC WASHING PROCESS OF FTA CARDS FROM HUMAN BLOOD SAMPLE FROM DIFFERENT TIME POINTS FOR FORENSIC IDENTIFICATION

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Abstract

A crucial feature of forensic identification is the optimization of the disc washing procedure for Filter Paper Technology with a Cellulose Matrix (FTA) cards, especially in the analysis of human blood samples obtained at various times. The purpose of this study is to examine the effects of temperatures used for storage (-20°C, 4°C, and 25°C) on the disc washing procedure of FTA cards and to suggest methods for improving the workflow of forensic identification. The research investigates the impact of various storage conditions on the quality and quantity of DNA retrieved from FTA cards by evaluating the literature and examining studies on DNA deterioration over time. The results offer important information for streamlining the disc washing procedure, determining the best storage temperature for maintaining DNA integrity, and dealing with problems brought on by DNA degradation. This research advances the field of forensic DNA analysis and ensures the highest standards in forensic identification practices by making it easier to retrieve high-quality DNA profiles from blood samples, hence boosting the accuracy as well as dependability of forensic identification.

Keywords: Forensic Identification, Filter Paper Technology with a Cellulose Matrix (FTA) cards, Disc Washing Procedure, Storage Temperatures, DNA Integrity

DETECTION OF TRANSFLUTHRIN FROM SPIKED EATABLES THROUGH THIN-LAYER CHROMATOGRAPHY

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Abstract

The Mortein, All Out, Good Knight, etc., Liquid Vaporiser containing Transfluthrin, a pyrethroid, commonly used as a Mosquito-repellent, is found in almost every household and is easily accessible to everyone. However, the widespread availability of this liquid has raised concerns about its potential misuse in committing various crimes such as suicide, homicide, and accidental poisoning. In the study, the Mosquito-repellent Liquid Vaporiser was utilized as a standard for the experiment. Food substances were spiked with the Liquid Vaporiser and thin-layer chromatography (TLC) was performed to identify the same. For spotting, the Mosquito-repellent Liquid Vaporiser was dissolved and mixed with ethanol to acquire aqueous and organic layers. The spiked substances, Porridge, Alcohol, Sweet, Cerelac, Lentils, and Cold drink were then extracted with n-hexane, and the TLC plates were activated by heating them in an oven at 105°C for 30 minutes. Several mobile phases were prepared for the TLC experiment, including Hexane: Acetone (8:2), Hexane: Chloroform: Acetic Acid (9:5:0.5), Hexane: Ethyl Acetate (8:2), and Benzene: Hexane (1:1). To visualize the separated components, a UV chamber was used. Among all the tested samples, Hexane: Benzene (1:1) yielded the most favorable and accurate results in all the mobile phases.

Keywords: Mosquito Repellent, Transfluthrin, Thin-Layer Chromatography, Rf value

THE ESTIMATION OF GENOME POTENTIAL FOR THE PURPOSE OF PERFORMING STR ANALYSIS IN BLOODSTAINS COLLECTED FROM DIFFERENT TEMPERATURES

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Abstract

DNA analysis is used in forensic investigations to identify individuals and solve crimes. Important pieces of evidence are frequently found at crime scenes, including bloodstains. However, both the quantity and the quality of the extracted DNA can vary depending on the conditions in which bloodstains are exposed before analysis, such as different temperatures. This study, to evaluate the genome potential for performing short tandem repeat (STR) analysis on bloodstains collected from three different temperature settings: -20°C, 4°C, and room temperature. The study will evaluate how temperature affects DNA extraction and typing. Previous studies have demonstrated that burns and high heat can cause DNA to degrade and lower DNA quantities in bloodstains. Additionally, research has shown that even after being heated to specific temperatures, cleaned bloodstains can still produce sufficient DNA for analysis. This research will help to clarify the challenges and limitations involved in conducting STR analysis on bloodstains exposed to a range of temperatures by examining the effects of various temperatures on DNA quantity and quality in bloodstains. The results will help investigators in the forensic field increase DNA recovery techniques and raise the accuracy of DNA profiling in criminal investigations.

Keywords: Short Tandem Repeat (STR analysis on Bloodstain), Temperatures, DNA

THE QUANTITATIVE ASSESSMENT OF THE GENOME FOR FORENSIC PURPOSE ON THE CIGARETTE BUTTS IN DIFFERENT TIME INTERVALS USING q-PCR ANALYSIS

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Abstract

Cigarette butts are valuable forensic evidence, but their quality and quantity can be affected by environmental factors and deposition time. This thesis aims to enhance the accuracy and reliability of DNA analysis using quantitative polymerase chain reaction (qPCR) analysis. Controlled experiments are conducted using simulated cigarette butt samples under different environmental conditions and time intervals. The results reveal variations in DNA degradation patterns over different time intervals, allowing for precise determinations of DNA quantity and comparisons between samples. The findings provide insights into the stability and degradation rates of DNA on cigarette butts, enabling forensic investigators to determine the optimal time frame for successful DNA analysis. This study has significant implications for forensic scientists, investigators, and legal professionals involved in criminal cases involving cigarette butt evidence. Further research is needed to explore additional factors influencing DNA degradation and refine q-PCR methodologies for forensic DNA analysis on cigarette butt evidence.

Keywords: DNA, Cigarette, Research, Forensic, Time Intervals.

DETERMINATION OF SEX AND AGE ESTIMATION IN HUMAN SKULL: A CASE REPORT

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Abstract

Introduction: In Indonesia, the discovery of unidentified bodies is still common and some of them are only skulls. This presents its own challenges for forensic pathologist in identification, including determining sex and age. **Case Report:** In April, 2023, a human skull without mandible was accidentally found in a river in Mojokerto, East Java, Indonesia. The skull was then taken to the nearest hospital for further examination according to the post mortem examination request letter issued by the police. On examination, it was found that the size of the skull tends to be small, the frontal bone is small and round, and the supraorbital protrusions, mastoid process and protuberantia occipitalis are small and smooth. In addition, the suture lines were still clearly visible with more than half of the degree of obliteration with a score of 2 at each assessed suture point resulting in a total of 14 in the dome region and 10 in the antero-lateral region. **Discussion:** Determination of sex based on the characteristics of the skull has a fairly high accuracy. In this case, the skull characteristics suggest a feminine predominance. Any human skeleton can be used as a basis for age estimation, but in the skull the most commonly used is the degree of obliteration of the sutures, ranging from degrees 0-3. The total score for the degree of obliterations was 14 in the dome region and 10 in the antero-lateral region resulting in an estimated age of 45-52 years old. **Conclusion:** The human skull without mandibles and teeth found in this case is female with an estimated age of 45-52 years old.

Keywords: Age Estimation, Identification, Sex Determination, Skull, Suture

CARBON MONOXIDE INTOXICATION, HOW SIMPLE LABORATORY EXAMINATION CAN HELP?: A CASE REPORT

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Abstract

Introduction: Carbon monoxide is a type of toxic gas that can have a systemic effect on the human body. The symptoms that appear depend on the level of carbon monoxide circulating in the body. In cases where bodies are suspected to have died from carbon monoxide poisoning, simple laboratory tests at autopsy can be performed to determine the presence and levels of carbon monoxide, both in the blood and organs. **Case report:** In December 2022, a man's body was found in a sealed car. The body was then taken to the hospital for an autopsy according to the request for visum et repertum. At autopsy, we found cherry red coloration of the skin, mucous membranes and internal organs, red froth at the nostrils and mouth, blisters of skin, and signs of asphyxia. In a simple forensic laboratory examination with the Hoppe-Seyler test and the formalin test, it gave positive results. **Discussion:** CO is a colorless and odorless gas, which is lighter than water. It produces incomplete combustion of carbonaceous materials, such as automobile exhaust. The entry of CO into the bloodstream will bind to hemoglobin and form COHb which in certain levels can cause death. Red lividity is usually associated with COHb levels >30%. A positive HoppeSeyler test indicates a COHb level of >50%, while a positive formalin test on blood and organs indicates a COHb level of >25%. The results of this examination will be better if confirmed with a test for a quantitative test for CO levels in the blood. **Conclusion:** Autopsy findings and simple laboratory examination results on the corpse indicate the presence of carbon monoxide in the body which can be the cause of death.

Keywords: Autopsy, Carbon Monoxide, Intoxication, Simple Laboratory Examination

ANALYZING THE DEAD USING C-14 DATING METHOD- A CRITICAL REVIEW

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Abstract

In the field of crime scene investigation, determining the birth and death years of unidentified human remains is crucial, especially in mass disaster cases. The use of C-14 (radiocarbon) in forensic analysis has become increasingly important for identifying skeleton remains. Anthropologists employ various morphological methods to estimate the age of these remains. In our study, we conducted a comprehensive review and comparison of these identification methods. Two devices based on beta decay, namely the Liquid Oscillation Counter (LOC) and Gas Proportion Counting, are utilized to count photon emissions and measure C-14 levels. Additionally, Accelerated Mass Spectrometry (AMS) has proven to be one of the most accurate Radiocarbon dating methods. It requires less sample material and delivers faster results compared to LOC. As technology advances, the SCAR method has emerged as a time-saving, Cost-effective, and reliable option. By employing the above techniques, both soft and hard tissues can be analyzed to obtain more accurate results. This suggests that C-14 dating of both types of tissues is a reliable indicator of the year of death. Future research could explore the possibility of determining the year of death by measuring radiocarbon levels in the pupal cases of insects that feed on post-mortem soft tissues. This innovative approach holds potential for further enhancing our understanding of forensic investigations.

Keywords: Radiocarbon, Carbon-14 Dating, Insects, Identification, Hard and Soft tissues.

SOIL EXAMINATION AS AN ATTEMPT TO ESTIMATE POSTMORTEM INTERVAL AND POSTBURIAL INTERVAL

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Abstract

Introduction: The postmortem interval is the period from the time of death until the body is discovered while the time between the deposition at the burial site and the time of recovery is known as the postburial interval. This differs since postburial interval represents the time in which the cadaver has been buried in a grave site as opposed to the entire period since death. Estimating postmortem interval and postburial interval can be a complicated process, especially if a long time since a death has passed. **Review of the literature:** More studies using various methods in conducting postmortem interval and postburial intervals were done to make the estimation more precise, including using soil changes as a determinant. All the changes resulted from decomposition process including the seeping of decomposition fluid, rupturing the bloated cadaver exposing the internal environment and surrounding environment, also skeletonization will changes the condition of the surrounding soil. The changes on the soil, including physical changes such as soil disruption, biochemistry changes such as changes in pH and soil mineral, and microbial changes which known as microbial clock. **Conclusion:** These changes can be seen throughout each stage of decomposition and are considered to be used as ancillary data to estimate postmortem interval and postburial interval.

Keywords: Taphonomy, Postmortem Interval, Postburial Interval, Soil Examination, Soil Changes.

FOOD ADULTERATION

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Abstract

Flavors are dried piece of a plant other than leaves regularly utilized for colouring or seasoning of food. Despite this, spices have medicinal value in addition to their use as preservers. Flavors are developed everywhere. Underway of flavors India assumes a significant part as India is the greatest producer, buyer and exporter of flavors. 75 out of 109 assortments of flavors are created in India. In medieval times, flavors were considered as valuable as gold due to its medicinal and additive properties. Spice adulteration is now a serious problem that makes products more impure and makes them unfit for consumption. Debasement is routinely done due to purchaser's way of behaving as they need to purchase stuffs at a least conceivable cost. Ground flavors typically debased with counterfeit tones, starch, chalk powder, and so on. These added substances increment their weight and furthermore upgrades appearance. Defilement isn't just declining the nature of food yet additionally influencing the soundness of people. This study sums up Identification of food adulteration in various spices and other foods also through different physical and compound techniques. For the purpose of determining the degree of adulteration and the quality differences between the aforementioned spices, samples, both branded and unbranded, were collected. Chemical analysis and visual inspection were used for the detection. The goal of this study is to raise public awareness of food adulteration.

Keywords: Food Adulteration, Impact, Adulterated, Concept, Sources, Contamination, Detection

A COMPARATIVE STUDY OF OFFLINE SCANNED DOCUMENTS AND DIGITAL IMAGES FOR ALTERATION USING ANALYSIS OF HISTOGRAMS.

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Abstract

This study aims to examine the comparative analysis of offline scanned documents and digital images to detect alterations by analyzing their histograms. In the digital age, document manipulation significantly threatens document authenticity. By leveraging histogram analysis, which provides a visual representation of pixel intensity distribution, this study seeks to identify differences between altered scanned documents and original digital images. The primary objective is to develop a reliable method for detecting document alterations by comparing histograms. Alterations made to documents can affect the pixel intensity distribution, leaving detectable traces within the histogram. Through meticulous analysis of these histogram variations, this study aims to establish a dependable baseline for identifying suspicious or fraudulent documents

Keywords: Scanned Documents, Digital Image, Alteration, Histogram

ANALYTICAL METHODS TO APPROACH FEASIBILITY OF ANALYSIS IN SAMPLES PERTAINING TO SEXUAL ASSAULTS

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Abstract

Sexual abuse or assault is an universally prevalent crime irrespective of age, gender, ethnic background or social class. It has devastating effects on the victim not only in terms of physical health but also affects mental health. But nowadays the scenario is changing. There has been an alarming increase in the rate of drug assisted crime commission. One example of such a crime is drug facilitated sexual abuse. The drugs used for the crime are known as date rape drugs. The term “date rape drugs” can be defined as the drugs used to make to body of the victim incapable of any action or reaction. The drugs include a wide range of hypnotics, sedatives or tranquilizers. The date rape drugs are colorless, odorless and tasteless and thus can be easily spiked in eatables or drinks, without creating any suspicion. The most commonly used drugs include: Rohypnol, GHB, Ketamine, Benzodiazepines etc. The prevalence of drugs used for DFSA differs from region to region based on the social norms followed in a particular region or the use of prescription drugs in the society. The most convenient way for administering drugs is by spiking drinks (alcohol) or eatables (chocolate or pastries). The drug when given to the victims produces symptoms like - loss of sense of time and identity, loss of consciousness, memory loss, numbness, depression and slurred speech. From a forensic point of view the samples essential for the toxicological analysis for determination of drug and its concentration include blood, urine, plasma, oral fluid or hair. However the detection of drugs or their metabolites in these samples is only possible till 24 to 48 hours after intake. The different technologies used for the confirmatory analysis of sample are gas chromatography- mass spectrometry (GC/MS), gas chromatography-tandem mass spectrometry (GC-MS/MS), liquid chromatography coupled to mass spectrometry (LC/MS) and liquid chromatography- tandem mass spectrometry (LC-MS/MS).

Keywords: Sexual Abuse, Date Rape, DFSA, Rohypnol, Benzodiazepines, Drug Abuse

BITE MARKS IN FORENSIC ODONTOLOGY

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Abstract

Forensic Dentistry or Forensic Odontology plays a crucial role in identifying the bodies of victims or deceased in mass casualties, natural disasters, crime scenes, heinous crime cases and terrorist attacks. Teeth are often used as weapons when an attacker attacks the victim or when a victim tries to protect himself or herself from an attacker. It is relatively easier to collect and record evidence from the injury and the teeth for comparison of the shapes, sizes and pattern that are present. However, this comparative analysis is often very difficult, especially since human skin is curved, elastic, distortable and undergoing oedema. Also, traces of saliva deposited during biting can be recovered to collect DNA evidence which can be used to identify the person. Bite marks are a significant part in criminal investigation, when various other means of identification cannot be performed due to the destruction of facial structures and fingerprints. It is so far becoming the most demanding as well a vital piece of evidence in criminal investigations thus making it an important part of forensic dentistry. Bite mark identification is based on the exclusivity and singularity of individual dentition. The unique characteristics of dentition are used to find the best match between the existing patterned injury and the suspected perpetrator in bite mark identification. These marks are also valuable not only in identification purposes but also in determining the type of physical abuse and age bracket of the criminal. Forensic odontologists are associated with the analysis and investigation of bite marks and presentation of the evidence in the court. With regards to criminal investigation, the human bite mark provides the forensic odontologist with evidence in the form of physical, biological, behavioral aspects of biting behavior. If dentists are aware of the various methods to collect and preserve bite mark evidence from victims and suspects it may be possible for them to help the judicial system to identify and prosecute violent offenders. Bite marks are an indispensable and vital piece of evidence which can help in solving various cases of the criminal justice system.

Keywords: Bite marks, Bite mark analysis, Forensic Odontology, Identification, Evidence

TOOTH FOSSILS

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Abstract

Tooth being the hardest substance of the body and being unearthed for years hence they can be considered as tooth fossils. Forensic odontology being a subspeciality branch of dentistry used for identification of deceased persons. This is usually a single victim but comparisons between postmortem findings and antemortem dental records have been shown to be the preeminent method for identification in mass disaster situations. Forensic odontology brings knowledge of orofacial structures, their variation between people of differing ancestry, and the implications of dental treatment to the identification process. Forensic anthropology being a interesting topic there are various causes related to it. Various clinical readings and proper testimony may help in proper upgradation of the subject and will help us for proper understanding of the subject because until a history is properly analyzed. Various aspects such as dental status, facial symmetry and palatal rugae identification for the identification purpose are analyzed, the procedures and measures are perused.

Keywords: Tooth Fossils, Forensic Odontology, Postmortem, Antemortem, Forensic Anthropology, Dental status, Facial Symmetry, Palatal Rugae Identification

PERSONALITY ASSESSMENT THROUGH HANDWRITING ANALYSIS

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Abstract

Personality is a set of characteristics in a person which is distinctive and shaped throughout one's childhood, adolescent, adulthood, etc. it is their feelings, thoughts, and behavior which is formed through various social interactions, during their development. These qualities or traits of the individual is unique to others. Similar to personality, handwriting is also unique and different for every individual. Handwriting is a kind of writing style which is unique in context of pen pressure, thickness, slant, alphabet representation, etc. certain traits found in the individual contribute to these distinct forms of depiction or characterization. Handwriting is also known as brain writing. It can be a reflection of one's patterns in line of thinking and actions. For instance, loopy and rounded letters can be an indicator of a person being imaginative, creative and having artistic traits. This study aims to bring out the importance of manual deciphering of handwriting styles and prediction of personality in everyday life while also bringing out the relevance of 'H' factor of personality [Honesty-Humility] as proposed by Ashton and Lee. We intend to identify personality traits through specific handwriting styles using the HEXACO Personality Inventory-Revised [HEXACO-PI-R] on a group of college students. Various forms of handwriting styles such as pen pressure, slant, baseline, etc. are taken into thought for evaluating personality traits of the subjects from the writing samples obtained.

Keywords: Handwriting, HEXACO, Personality, Evaluation

ROLE OF FORENSIC PSYCHOLOGY IN A CHILD'S AGGRESSIVE BEHAVIOR LEADING TO PERPETRATION OF CRIME

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Abstract

Forensic psychological theory break down the crime into what made a person to commit the crime, what were the reaction during commission of the crime and what kind of a mindset the criminal had. This theory can be applied for assisting judges and attorneys making discussion about minor's juvenile justice system. The data evaluated by the forensic psychologist give a key information about the behavioral, emotional and cognitive functioning of the youth, and on the basis of their individual characteristic traits of psychological dynamics, psychologist classify the juvenile delinquents into five groups: psychotic, situational, mentally defective, neurotic and cultural. For shaping development across the course of life, early childhood is considered to be a critical stage. Many parents are concerned about siblings' fights and aggressive behavior for each other. There are reported so many types of aggression that are very common among siblings. The reason for this aggression or conflicts can be associated with the growing complexities in the family and the dynamics. Many children at a young age end up residing with half siblings or step siblings or step mother and father and experience violence like hitting, kicking etc. This study evaluates the possible reasons and outcomes of youth committing crimes and gaining a criminalistic mindset.

Keywords: Family aggression, Sibling conflicts, Aggression amongst Children, Forensic Psychology, Criminal Psychology

STUDY ON PERSISTENCE AND DETECTION OF BLOOD STAIN DNA ON PIG SKIN EXPOSED TO DIFFERENT AQUATIC CONDITIONS

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Abstract

In forensic casework, it is not clear how many days DNA can have the tenacity on submerged skin, we examined the probable ways for recovery of blood stain DNA from skin samples immersed in different aquatic environments and temperatures for forensic purposes in this casework. We used pig skin, smudged with human blood, before immersing it in different aquatic conditions i.e cold water, room-temperature or warm water as well as in a stream and a pond for up to seven days prior to DNA, able to recover all 16 reproducible STRs after 2 days. And, in Room-temperature water and warm water both yielded varying results for blood stain DNA. For pond and stream samples, DNA was possibly recovered only within two days. While the pond and stream samples were at relatively cold temperatures, DNA recovery may have been affected by the presence of water insects, microorganisms and snails in the pond, mud and pressure of the stream. All in all, the results demonstrate that specifically those immersed in cold water, we could detect a complete DNA profile from blood stains after several days. Our study opens the way for future in-depth studies, examining larger datasets and a wider range of conditions.

Keywords: Persistence, Blood stain DNA, Immersed body Forensic, Skin exposed to water, Detection of DNA

SIGNIFICANCE OF SURGICAL IMPLANTS IN UNIDENTIFIED DEAD BODIES DURING AUTOPSY

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Abstract

This paper aims at understanding the importance of surgical implants, Implants like dental prosthetics, such as crowns, bridges, or implants can be helpful in establishing the identity of deceased through dental records. Generally, the term “implants” refers to a wide variety of different medical devices from solid metal implants such as – orthopedic plates/screws, to bioelectronics such as pacemakers or neurostimulators. Some implants are temporary and may be designed to be removed or replaced, while others are meant to be permanent which are not intended to be removed. Surgical implants such as Joint replacements, pacemakers, or prosthetic devices can provide the valuable information about the medical history of the deceased person. These implants also helps in the investigating the cause of death, like, pacemaker or an implanted defibrillator can indicate a potential heart condition or malfunction the caused the death. Post-mortem and ante- mortem dental radiographs, fingerprints, DNA samples from Human remains, physical and medical traits including skeletal radiographs, numbered surgical implants helps in the identification process. Orthopedic surgical implantable devices provide valuable identity information when conventional methods of identification are not applicable or in challenging circumstances. It is a method that needs Antemortem and Postmortem radiographs, comprehensive information of the orthopedic implantable devices like company, serial no., logo, name, medical records of the previous surgical intervention, and for the family member’s history to match with the identification. The specific location of an implant within the body can provide valuable clues. For example, the presence of cochlear implant suggests the person had hearing impairment, while an implanted insulin pump could indicate diabetes Such information can help in creating a profile of the individual, aiding the identification process.

Keywords: Unidentified corpse, Identification, Surgical implants, Postmortem, Orthopedic Implantable devices, Dental autopsy, Forensic Odontology, Cause of Death

DEVELOPMENT OF LATENT FINGERPRINT BY USING THE CORN POWDER

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Abstract

One of the earliest techniques in forensic science is the development of fingerprints, which is a popular technique for identifying criminals. Due to their ease of use and effectiveness, the powder and ninhydrin methods remain the most popular ones in forensic investigation. Latent fingerprint detection is frequently done using powder dusting. In order to replace expensive, toxic, and complex powders, we need to find a cheap, non-toxic, widely accessible powder. For the visualisation of latent finger prints, we use corn seed powder in this method. Determining the most affordable and accessible household powder used in Indian homes for the purpose of developing fingerprints. The majority of rigide cases showed clear ridge detail on different surfaces in the results, as opposed to rigides developed using non-conventional powder. This paper describes the use of a non-conventional powder for the visualisation of latent fingerprints on porous, semi-porous, and non-porous surfaces.

Keyword: Forensic Science, Ninhydrin Methods, Non-Conventional Powder, Fingerprint Development

BEYOND THE SCALPEL: EXPLORING VIRTUAL AUTOPSY FOR FORENSIC ANALYSIS

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Abstract

Virtual autopsy, also known as digital or non-invasive autopsy, is a cutting-edge technique that has emerged as a promising adjunct to traditional post-mortem examinations. This process employs advanced imaging technologies and computerized analysis to render the 3D images of the scanned data of the body and explore the human body in a virtual environment. By combining high-resolution imaging techniques such as computed tomography (CT) and magnetic resonance imaging (MRI) with sophisticated visualization and analysis software, virtual autopsies offer numerous advantages over conventional autopsies while providing invaluable insights into the cause and circumstances of death. In cases like thanatological investigations, carbonised and putrefied body identifications, mass disaster cases, age estimation, anthropological studies, and skin lesion assessments, virtual autopsy uses high-tech medical imaging approaches to provide more effective and more accurate visualisation. Despite its potential, virtual autopsy also faces challenges. The availability of specialized imaging equipment and the need for trained personnel limit its widespread adoption. Additionally, virtual autopsies may have limitations in detecting certain types of injuries or subtle pathological changes that can be better assessed through traditional autopsies. However, the accuracy of virtual autopsy is 98% and advancements in technology are likely to lead to improved imaging techniques, including higher resolution scans and faster data processing, resulting in more detailed and accurate virtual reconstructions of the body. Integration with artificial intelligence and machine learning algorithms may enable automated analysis of digital data, aiding in the identification of patterns, anomalies, and potential causes of death. These advancements have the potential to revolutionize post-mortem examinations, making them more efficient, precise, and accessible, ultimately advancing the field of forensic medicine and the pursuit of justice.

Keywords: Post Mortem Examination, Virtual Autopsy, Forensic Investigations, Imaging Techniques, Forensic Pathologists

UNVEILING THE UNSEEN: THE POWER OF MEMORY FORENSICS IN INCIDENT RESPONSE

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Abstract

Memory forensics plays a vital role in the field of digital forensics and cybersecurity, enabling investigators to uncover valuable digital artifacts and conduct in-depth analysis of cyber incidents. This poster presentation aims to provide an overview of the importance of memory forensics and its impact on incident response investigations. As technology continues to advance, so do the threats to cybersecurity. Cyberattacks have become increasingly sophisticated, and traditional security measures are no longer enough to protect against them. In recent years, memory forensics and RAM monitoring techniques have emerged as effective tools (Volatility, Rekall, and Redline) for detecting and mitigating security threats in a running system and in highlight the key concepts and techniques involved in memory forensics, including memory acquisition, analysis frameworks, and artifact extraction. It will emphasize the significance of capturing a forensically sound memory image early in the incident response process to preserve critical volatile data. Furthermore, the poster will delve into the specific areas of investigation that memory forensics enables, such as identifying malicious files, persistence mechanisms, and network connections etc. It will showcase how memory analysis techniques help in mapping out the attacker's activities, understanding their tactics, and establishing the extent of compromise. Lastly, the poster will emphasize the significance of meticulous documentation and clear reporting in memory forensics investigations. It will emphasize the need for standardized methodologies, proper evidence handling, and detailed documentation of findings to ensure credibility, facilitate collaboration, and support legal proceedings.

Keywords: Memory forensics, Digital forensics, Cyberattacks, RAM (Random Access Memory), Network

CURRENT TRENDS IN FORENSIC ODONTOLOGY

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Abstract

Forensic odontology is an evolving science and has a greater scope of development. It has established itself as a science that is essential in identifying the deceased and in medico legal situations. Even if the deceased person is skeletonized, decomposed, burned, or dismembered, the dental tissues are frequently still there. Using dental tissues, a number of techniques have been established to establish an individual's age, sex, and ethnicity. Forensic dental identification techniques for data collecting and supporting technologies have changed significantly. Every person has a distinct identity in life. A developing field of research with the most potential for growth is forensic odontology. Identification of dental remains, retrieval, and examination of evidence that matches with the suspects' is the most difficult aspect of forensic dentistry. The legitimacy of the evidence in forensic dentistry would be improved by an impartial comparison employing modern technologies. It has been proven to be an indispensable science in legal and medical situations involving the identification of the deceased. In cases of child abuse, domestic violence, and bite mark analysis as well as identification fixing in mass disasters, the forensic odontologist uses his or her understanding of dentistry. As a result, in recent years, forensic odontologists have been given more duties and responsibilities in a variety of medico legal cases.

Keywords: Child abuse, Domestic Violence, Forensic Dentistry, Mass Disaster, Medicolegal cases, Bite Mark Analysis, Recent Advances, Evolution, Forensic Odontology

EXAMINATION OF GUNSHOT RESIDUE

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Abstract

Introduction: The presentation mainly focuses on the topic of Gunshot residue analysis, which briefly explains what GSR evidence is, where it is found, and how it helps investigators investigate the crime scene. **Objectives:** The objectives behind the presentation mainly describe a story of trace evidence of spherical particles of around 1-2 microns in size, mostly composed of heavy metals. These heavy metals, which are present in the GSR residue, can be collected and identified by different means hence, **Methodology:** The methods adopted are of different types, based on developing and analysing the gunshot residue, like the visual examination method, i.e., the primary method, and the secondary method, including chemical examination. The methodology clearly explains different methods of analysis, like visual examination, which helps in the identification of blackening or scorching caused by firearms, and chemical analysis, which helps in the identification of heavy metals present in the residue. Also, instrumental analysis helps in identifying the elemental composition of gunshot residue. The alternate methods used for the examination and the limitations and challenges encountered during the examination have been clearly explained in this presentation. **Result:** The result obtained from gsr evidence analysis depends on various factors, including the location and density of the particles, the type of firearm and ammunition used, and the distance between the firearm and the target; hence, the results obtained can be positive or negative. **Conclusion:** This presentation explains the importance of gunshot residue analysis and moreover discusses about the methods that are used to examine Gsr evidence and the challenges that encountered.

Keywords: Gunshot Residue, Trace Evidence, Visual Examination, Chemical Examination, Instrumental Examination, Positive Result, Negative Result

VIRTUAL AUTOPSY: RESPECTING THE DIGNITY OF DEAD WITH TECHNOLOGY- A REVIEW STUDY

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Abstract

Virtual autopsies, or virtopsies, have gained significant traction as promising alternatives to traditional manual autopsies, offering advantages in terms of accuracy and time efficiency. This review study provides an extensive examination of the historical background, benefits, and significance of virtopsies in forensic investigations, with a specific focus on their potential applications in India. Various advanced imaging methods, such as computed tomography (CT), magnetic resonance imaging (MRI), and 3D reconstruction technologies, are discussed in detail, showcasing their capabilities in examining internal and external bodily injuries, detecting foreign objects, and determining causes and manners of death. Moreover, the review highlights the value of digital approaches in crime scene reconstruction and evidence preservation, while also exploring the feasibility and future prospects of virtopsies in the realm of forensic investigations. The importance of interdisciplinary collaboration between science and technology is emphasized as a means to overcome time constraints and enhance the precision of forensic analyses. Ultimately, the widespread adoption of virtopsies has the potential to revolutionize the fields of forensic medicine, pathology, radiography, and law enforcement, making them invaluable tools for the advancement of forensic sciences.

Keywords: CT-Scan, MRI, Imaging, Virtual Autopsy, Forensic Science

IMPACT OF SOCIAL MEDIA ON BEHAVIOUR AND INFLUENCES ON CRIMES

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Abstract

The rapid growth of social media platforms has transformed the way individuals interact, communicate, and engage with information. Social media has become an integral part of modern-day communication and has had a significant impact on the way people interact with each other. Social media regulates society and has the power to alter morality, human behaviour, and outcomes. It reflects in two ways: positive as well as negative. The study was conducted to explore the impact of social media on behaviour and its influence on criminal activities. The sample size included 200 individuals in the age group of 15 to 25 years, including both males and females, from the city of Thiruvananthapuram, Kerala. The purposive sampling method was adapted, and a structured questionnaire was used for the data collection. In light of this study, it was revealed that the impact of social media is highly reflected in the behaviour of people and its influence on criminal activities. The youth have been impacted by social media in terms of the tendencies that are visible on social media that lead to criminal activity. The study's main finding is that social media has changed people's behaviour, and that behaviour has caused certain people to engage in criminal activity.

Keyword: Social Media, Crime, Communication, Criminal Activity

FORENSIC KNOWLEDGE OF POLICE INVESTIGATORS IN SOLVING CRIMES

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Abstract

Forensic science is a dynamic field of knowledge and skills that can be very useful and helpful in carrying out criminal investigation. The purpose of the study was to ascertain how police officers of various ranks felt about the use of forensic services in criminal investigations. The sample size of 100 police officers of all categories of departments like Constable, Head Constable, Sub Inspector, Inspector, Deputy Inspector General of police, Superintendent of police, Director General of police from Kerala and police trainers under Central Academy of Police and Training [CAPT] in Bhopal region. The data was gathered using a structured questionnaire and a purposeful sampling approach. In light of the study, most of the police officers were not aware about the role of forensic services played in criminal investigations. The grade and year of experience affect their level of knowledge. First responders like Constables and Sub inspectors have limited knowledge of forensic science, whereas officers working at higher levels of the police department, such as the Director General of Police, Deputy Inspector General of Police, Superintendent of Police, and Inspectors, are able to utilize forensic science during investigations.

Keywords: Forensic science, Criminal Investigation, Police Officers, Forensic Services, First responders

TEENAGERS COMMITTING SUICIDE – A RETROSPECTIVE STUDY

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Abstract

Suicide occurs more often in older people than in younger people, but it is still one of the leading causes of death in late childhood and adolescence worldwide. The study focuses on the reasons for suicide among teenagers. The study aims to analyse the common reasons teenagers commit suicide. For the study, various police stations in Kerala were visited based on the collected details of teenage suicides that had been reported between the years 2018 and 2021. The findings of this study showed that the majority of suicides occurred between the ages of 15 and 24. The majority of the cases reported were due to family problems, drug addiction, or illness. A range of suicide prevention interventions were suggested to minimise opportunities for suicide imitation.

Keywords: Teenagers, Suicide, People, Years, Reasons, Adolescence

FORENSIC EXAMINATION OF PAINT SAMPLES USING THIN LAYER CHROMATOGRAPHY, FOURIER TRANSFORM INFRARED SPECTROSCOPY AND ATOMIC ABSORPTION SPECTROSCOPY

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Abstract

Paint as trace evidence can be found at crime scene in various forms as wet, dry, fragments, chips or smears. It has the potential to establish link between crime scene, victim or suspect. Therefore the analysis of paint is very important with forensic point of view. In this study, an attempt has been done to analyze the different types of paint. Household paint (enamel), acrylic paint and nail polish were taken for this study. The analysis has been done by 3 different methods. Thin Layer Chromatography (TLC) used for determining the number of components present in paint. Total 12 paint samples in wet condition were analyzed through TLC method after the development of solvent system and R_f value for each separated component was calculated individually. Second technique that was performed for analysis was FTIR. 24 paint samples in dry condition were analyzed through this technique for the determination of functional group present in the paint sample. Pellets for each sample were prepared and then analyzed. Third technique used was AAS. It is destructive in nature as it involves sample preparation for metal analysis. For this study, 24 paint sample in dry form were taken for analysis of heavy metal such as lead, cobalt, nickel and cadmium. Among these metals, the amount of lead and cobalt were found to be more in samples.

Keywords: Paint, Forensic analysis, Enamel, Acrylic, Nail Polish, TLC, FTIR, AAS

COLLECTION AND IDENTIFICATION OF THE HAIR OF DIFFERENT WILD ANIMALS

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Abstract

The present study was conducted to identify morphological and numerical features of hair samples of wild animals using light and scanning electron microscopy to make a key for their identification. Hair samples were collected from different body regions of different species of animals, and animal hair structures were analyzed. Animals of the same species are more likely to have similar scale patterns. The guard hair diameter, color, shaft, cuticle pattern, the medulla, the scale patterns, and the root were examined using a light microscope. In the present study, different animal samples are collected from Mathikettan Shola National Park and Zoological Park in Thiruvananthapuram, Kerala. The samples were collected by using brushes and forceps, and each sample was packed separately in zip-lock bags to prevent mixing and preserve the integrity of the sample. Photographs of every sample were taken for visual reference, and they were taken to the laboratory for further examination. The analysis of the surface cuticular pattern, cross section, and medullary index provides information regarding the wild species of the animals.

Keywords: Animal Hair, Photography, Microscope, Medullary Index, Color

IDENTIFICATION OF PUGMARK OF DIFFERENT WILD ANIMALS

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Abstract

In the current investigation, sample of 10 pugmarks of various creatures were collected from different territories of Mathikettan Shola National Park, Idukki district in Kerala. The collection was done through photographic technique. Each pugmark sample from a variety of animal species was first collected, and then each one was carefully inspected to compare the forefoot and hind foot of that particular animal species. Comparison of Fore Foot and Hind Foot was done on the basis of physical examination such as shape, size, dimension, dew marks, claw marks, and specific features. From the observation, it is interpreted that fore foot and hind foot of same animal species have different characteristics which were not same. From the perception, it is clear that the pugmarks are indistinguishable which implies each pugmark are different from various species, no two pugmarks were same. Pugmarks allow us to not only perform the species identification but also to determine if a creature has fore foot or hind hoot, as well as to recognize the individual species and determine whether a creature has fore foot or hind foot.

Keywords: Pugmarks, Photography, Animals, Fore Foot, Hind Foot

JUVENILE DELINQUENCY: A CURRENT SCENARIO ANALYSIS

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Abstract

Juvenile delinquency can be defined as an antisocial or criminal activity done by the children under eighteen years of age. There is an increase of juvenile crimes in India at a panic rate, where most of them are involved in violent crimes. The increase in such crimes is a serious threat to the society and nation. This study aims to analyze the most reported type of crimes and age group of children involved in crime in the current scenario. For this study has been done by visiting a juvenile home and a few police stations in Kerala and collected details of recent juvenile crimes that have been reported there between the year 2015 to 2020. The result of the study revealed that most of the juveniles involved in the criminal activities were between the age group of 15-18 years. Majority of the cases reported were of theft and burglary. Towards conclusion, the study suggested some preventive measure for juvenile crimes in our society for a better future ahead.

Keywords: Juvenile Delinquency, Antisocial, Criminal Activity, Burglary, Theft, Current Scenario

COLLECTION OF TYRE MARKS AND ITS ANALYSIS

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Abstract

Tyre marks can signify the presence of the vehicle at the crime scene and are used as evidence which is of great help in identification of the preparator by placing suspect at the scene by matching the tyre with the tyre of suspected vehicle as it is difficult for two different vehicles to leave the same impression. Tyre marks impression are also helpful in hit and run cases as it provides the path and direction of the culprit arrival and departure from the crime scene it also provides the link between the vehicle the victim the crime scene and culprit and can be used for the reconstruction of crime scene. The purpose of this study was to analyze the characteristics of the tyre marks and classify them into the class categories to make it easy for the investigator to recognize the type of tyre marks just by the look of it. For this study 100 samples were collected of two-wheeler including bike and scooty of front and rear tyre marks with their configuration and make of model along with the vehicle type. It was recorded that different manufacturing brand have different tread designs which make it easy to recognize the model of the tyre and the size varies according to the vehicle.

Keywords: Tyre Marks, Classification, Tread Design, Characteristics

FORENSIC IDENTIFICATION USING DENTAL ANATOMY - PALATAL RUGOSCOPY AND INCISIVE FORAMEN

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Abstract

Dental anatomy is important for forensic identification; palatal rugoscopy and the incisive foramen are useful instruments. Analyzing the distinct rugae patterns on the hard palate is the focus of palatal rugoscopy, whereas the incisive foramen is an aperture with a range of individual variations. Both approaches provide reliable biometric markers, which are helpful when using more conventional identification techniques. Database integration of dental records improves identification precision. Standardization, record accessibility, and ethical issues with data privacy are all difficulties. Despite these difficulties, technological developments and teamwork can enhance the usefulness of dental identification in forensic investigations.

Keywords: Forensic identification, Dental anatomy, Palatal rugoscopy, Incisive foramen, Biometric markers.

DETERMINATION OF HAZARDOUS METALS IN NAIL POLISH

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Abstract

Nail shines has been advancing observably somewhat recently, some nail clean brands adding names revealing the rejection of specific poisonous fixing, for example, lead, cadmium, chromium, nickel which are added as fixings can be found in follow sum.. Ingesting high levels of heavy metals can result in behavioral problems, stomach irritation, reproductive and immune toxicity and cancer. The point of this study is to analyze the degree of weighty metals in various brands of nail clean sold in market and evaluate the potential dangers related with their utilization. In this work corrosive absorption process that is Acid digestion was utilized for test arrangement and assurance of amount of weighty metals including Disc, Co, Cr, Ni, and Pb. To know the concentration of metals calibration curve was prepared practicing AAS (Atomic Absorption Spectroscopy), by which the concentrations of branded and local nail enamels inspected and gauge its potential health threat.

Keywords: Metals, Nail Polish and Enamels, Toxic Substance, AAS, Forensic Chemistry

THE DEARTH OF FORENSIC ODONTOLOGY APPS IN THE ERA OF DIGITALISATION- ARE WE STILL LAGGING BEHIND?

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Abstract

Thirty-two teeth with five clinical surfaces offer 1.8 billion combinations, and thus linking forensic science and law with dentistry in the form of “Forensic Odontology”. As early as 1972, International Organization for Forensic Odonto-Stomatology started off and by 2000 Indian Association of Forensic Odontology was established followed by commencement of International Association of Scientists and Researchers in 2016. Dental tissues are often used for individual identification and to determine the age, sex, and ethnicity of a person. Recent advances in the field of genetics and molecular biology have contributed to the rapid growth of forensic odontology including computer aided facial reconstruction. Despite being in 21st century which is the era of social media which can provide valuable investigative tool, no forensic odontology app exists with the aim of assisting the human identification process, through the search of antemortem data to be used as adjunct data in the comparison with postmortem data collected. Thus, the aim of this paper presentation is to create awareness about an upcoming application for smartphones called “Selfie Forensic ID” App. This app will employ selfie of lower third of face as an archive of dental data of the front teeth of missing persons sharing with social networks (available for free download from Android and Apple store). Numerous facial features such as diastema, malpositioned teeth, lip etc. could represent strong identifiers in the comparison of antemortem and postmortem data.

Keywords: Digital Forensic Odontology, Selfie Forensic Id, Social media as a Forensic Tool, Forensic Odontology app, Current Trends in Forensic Odontology.

COMPARATIVE ANALYSIS OF HUMAN AND NON-HUMAN SPECIES ON THE BASIS OF ELEMENTAL ANALYSIS

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Abstract

Forensic odontology is a field that focuses on identifying human and non-human species through dental evidence. The dentition of humans differs in various ways from that of other species in terms of form and function. This study aimed to compare human and non-human teeth based on elemental parameters for identification purposes. A total of 30 tooth samples, including 5 humans, 5 dogs, 5 cats, 5 sheep, 5 goats, and 5 buffalo teeth samples, were subjected to elemental analysis. The results of the elemental analysis revealed significant variations between different species. Sheep teeth exhibited the highest calcium content, followed by humans, goats, cats, dogs, and buffaloes. Some elements such as Si, Ti, Al, Mn, Ba, and Br were absent in humans, while Al, Zn, Mn, Ag, and Br were absent in goats. Cats lacked Cu, Ag, and Br, and buffaloes lacked Si, Al, Ti, and Mn. By analyzing the percentages of different elements present in various species, a comprehensive approach for differentiating human and non-human species based on teeth was proposed. This study emphasizes the importance of considering elemental analysis as a valuable tool in forensic odontology for species identification. By evaluating the elemental composition of teeth, forensic experts can enhance their ability to distinguish human remains from non-human specimens, contributing to accurate forensic investigations.

Keywords: Forensic Odontology, Non-human Dentition, Human Dentition, Identification, Elemental analysis

DENTAL IDENTIFICATION IN MASS DISASTERS

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Abstract

Mass disasters are inevitable events, guided by destructive forces which results in mass mortality. Mass disaster is defined as an event that happens with or without admonishing and causes or intimidate to cause death or injury, damage to property or to the environment and illustration of community. The main task of forensic experts involved in mass disasters is victim identification whether injured, dead or buried in mass graves. The identification procedure includes comparing and coordinating the DNA profiles of the victim to antemortem items or living families. The primary identifiers are DNA, fingerprint and odontology parameters. Dental radiographs give reasonable accurate and reliable information for identification of an individual. Mass disaster causes damage, ecological disturbance and loss of human life on a huge scale. The basis for these ranges from natural to unnatural causes both of which causes huge destruction of life. It demands help from people attached to healthcare issuing pre-identified, structured and planned support to the victim of the disaster. Dental identification is one of the most authentic methods of modified identification in cases of mass disasters. Dentists assist investigators to identifying the human remains. Teeth and jaws are habitually well protected from fire and mechanical trauma and are highly opponent to postmortem demolition and decomposition. The identification of large number of causalities in mass disaster is complicated due to severe disfigurement, charring and decomposition. Teeth are the hardest and chemically most steady tissues in the body. This paper featured the role of a dentist in such huge disasters.

Keywords: Odontology, Identification, Mass Disaster, Dentist, Victim, Forensic

STOP THE VIOLENCE: PROTECTING OUR DOCTORS AND PRESERVING QUALITY HEALTHCARE

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Abstract

Introduction: Violence against doctors in obstetrics is a growing concern in many countries around the world. Obstetricians and gynecologists are at high risk of experiencing physical and verbal abuse from patients, their families, and even colleagues. The paper will examine the impact of violence on doctors' mental health, job satisfaction, and quality of patient care. **Objectives:** To determine the factors that contribute to violence against doctors in obstetrics, including cultural and social norms, communication breakdowns, and the lack of security measures. To provide recommendations for healthcare organizations, policymakers, and stakeholders to address violence against doctors and create a safe, supportive work environment. **Methods:** The present cross-sectional study was conducted in Doctors, working in private and/or public set-up, with 1 year of clinical experience, interns, medical students were included. A pre-tested study tool- Google form—was sent to study participants via social media platforms. **Results:** A total of 277 responses were received from doctors and medical students. The subgroup analysis showed that the distribution of violence against doctors according to the place of work (government/ private) was significantly associated with age, marital status, highest qualification, years of experience, and area of practice. **Conclusion:** The paper will conclude with a discussion of the interventions that can be implemented to prevent and manage violence against doctors. Addressing the root causes of violence and implementing effective prevention strategies can ensure a safe and supportive work environment for obstetricians and gynecologists, ultimately leading to better patient outcomes.

Keywords: Violence, Ethics, Doctors, Confidentiality, Security Measures.

OCCULT BRUISE IN THE LONG BONES AS A BASIS FOR RECONSTRUCTION OF THE TRAUMATIC EVENT

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Abstract

Railway accidents often involve blunt trauma injuries that can be fatal or life-threatening. Blunt trauma injuries are complex and diverse, and they may not always be visible on the surface of the body. To diagnose them, a thorough internal examination is required. Moreover, to reconstruct the accident scenario, it is important to distinguish the primary impact injuries from the secondary ones. The primary impact injuries are those that result from the direct contact of the body with the vehicle structure, and they can leave specific patterns or marks on the skin, clothes, soft tissues, and bones. One of these patterns is a bone bruise, which is a subcortical bleeding in the bone marrow caused by micro-fractures of the trabecular bone. The bone bruise can indicate the location and direction of the impact force, and help to identify the impactful part of the vehicle that caused the injury. Therefore, the detection and analysis of bone bruise and other impact injuries are valuable methods for forensic investigation of blunt trauma accidents.

Keywords: Railway Accident, Blunt Trauma, Bone Bruise, Primary Impact, Injuries, Reconstruction

DERMATOGLYPHICS: THE CONNECTING LINK

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Abstract

Introduction: Identification of an individual is one of the most challenging subjects that man has confronted. The study of dermal ridge carving on palmer and planter aspects of the hands and feet is called as 'DERMATOGLYPHICS'. Finger prints of an individual can be used as primary evidence for identification. The details of finger prints can be of great use in forensics as they are responsible for uniqueness and also remain same throughout life. **Aim:** Fingerprints contain significant information about the donor and thus has the possible potential to make a major impact in the field of forensics. This research was conducted to determine the fingerprint patterns (dermatoglyphics) in males and females and also to establish a correlation between fingerprint ridge density and gender determination. **Material and Methods:** The study sample comprised of 300 volunteers (150 males and 150 females) from Indira Gandhi government dental college, Jammu. All 10 fingerprints of the study group sample were obtained on a plain A4 paper using an ink pad and imprints were analyzed according to Henry's classification (1900) with the help of a magnifying lens. For the measurement of fingerprint ridge density, areas of each finger assessed by using Corel draw X16 software. **Results:** The data obtained was analyzed by using Chi-square test and t-test. Majority of the males showed whorl pattern whereas loop pattern was found to be prevalent among females. In males, ridge density ranged from 10-15 ridges/25mm² while in females, it varied from 14-18 ridges/25mm². Thus, Females showed higher values of ridge densities than males. **Conclusion:** Fingerprint pattern and ridge density can be used in gender determination of an unknown individual. This can prove to be a great boon in forensics and justice.

Keywords: Fingerprints, Dermatoglyphics, Gender Determination, Ridge Density, Individual Identification.

THE RELATIONSHIP BETWEEN HOMICIDE AND SUICIDE: A CONCEPTUAL REVIEW OF VIOLENT DEATH

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Abstract

The suicide is being defined as intentional taking of one's life which can be as simple or as complicated as life itself. Many a times suicidal note indicating victim's psychological torment can be found. Suicide cases can cause more problems for detectives than homicidal investigations. The investigator should be aware of means of death, injuries and motive to establish the death as suicidal or homicidal in nature. The victims who are intent on committing suicide are physically and mentally capable of extremely painful bodily injury and trauma. It is important that the deceased may have indicated an intent to commit suicide through activities and statements prior to death. By examining the victim's lifestyle and interviewing the friends and relatives, manner of death could be determined. Homicide and suicide are acts of violence differentiated only by direction of aggression. Suicide had higher mortality, more severe injuries, and more head/neck/facial injuries than homicide. The resolution of mode of death as suicide is based on a series of factors that eliminate homicide, accident, and natural causes of death. A more comprehensive framework that incorporates cultural domains is needed to advance the research field on homicide and suicide.

Keywords: Suicide, Homicide, Investigations, Injuries, Intent, Accident

A CONTENT ANALYSIS STUDY ON REPORTED CRIMES AS WELL AS THE DARK FIGURES IN NEW DELHI AND KOLKATA

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Abstract

Crime is a manifestation of myriad complex factors. The causes of criminal behaviour lie in the social processes and structures. People commit crimes due to the process of socialization that does not develop strong sense of right or wrong. The ever-increasing desires act as a strong stimulus for committing crimes to fulfil these desires. While analysing the occurrence of crimes it should also be considered that why certain area has less reported crimes, because understanding of those particular areas can reveal importantly two things; First: What makes the area crime free in perception and by analysis how the same strategy can be implemented to make other areas likewise in tackling the crime. Second: What kind of crime is silently prevalent in those areas that are not reported but are occurring. Hence it is very important to analyse such cities which are prevalent in different crimes and exceedingly rare in reporting crimes. This paper mainly examines the two major metropolitan cities in India: NEW DELHI-The Crime Hub city of India & KOLKATA-Least Crime Occurring city of India and the crimes reported in the month of September 2022. The paper also compares the different types of crimes that are reported on the newspapers of both the cities. This paper also tries to figure out why the following crimes happen, the reason behind the formation of DARK FIGURES of crimes (unreported crimes), WHY Kolkata is the least crime happening city? WHY Delhi is the highest crime happening city? Some of the crimes focussed were murder, crime against human body, crime against women, cybercrime, kidnapping etc. The paper outlines why the dark figure still exists and why crimes are still going unreported and the reasons that can be revolving around the least reporting of crimes in Kolkata as compared to Delhi.

Keywords: Socialisation, Perception, Dark Figure, Conflict with Law, Tackle

ACCURACY OF AN EQUATION FOR ESTIMATING AGE FROM MANDIBULAR THIRD MOLAR DEVELOPMENT IN KASHMIRI POPULATION- A RADIOGRAPHIC STUDY

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Abstract

Age estimation is a sub-discipline of the forensic sciences and should be an important part of every identification process, especially when information relating to the deceased is unavailable. The procedures of age estimation are complex and involves consideration of various factors. Court of law expects reliable method to estimate age and differentiate between an adult and juvenile. Third molar genesis considerably varied among various ethnic group, hence data from ethnic group should be recorded. Aim of the study was to evaluate accuracy of an equation for estimating age from mandibular third molar development in a Kashmiri population. Materials and methods: Retrospective study with orthopantomograms obtained from the radiology archive of Department of Oral Medicine and Radiology. First phase 100 OPG aged 9-20 evaluated and modified GAT score assigned to right and left mandibular third molar and regression equation was derived. In the second phase 100 OPGs were assessed and modified GAT score assigned to mandibular third molar. The application of 1st part regression equation to scores assigned in 2nd part produced estimated age. Results: Using regression equation following equation was derived $Y=8.427+1.632*mG+0.022*S$. Derived equation was suitable for estimating age of subjects aged 10-19 years with 48% within one year of actual age and approx. 75% within 2 years. Conclusion: Subjects were all derived from Kashmiri population and variability of environment, culture and ethnic composition might affect distribution of tooth development rates. Regression equation derived from third molar scoring in Kashmiri population and application of equation to estimate age highly accurate; within 2 years being 75%.

Keyword: Age Estimation, Third Molar, GAT Method, OPG

GENDER DETERMINATION USING RAMAL DIMENSIONS-A RETROSPECTIVE STUDY

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Abstract

Introduction: Sex determination is an important aspect of forensic odontology which is used in case of disasters, crime scenes. Both the dentition and bony framework can be used for this purpose. Mandible being the strongest bone in skull can also be used for gender determination using various parameters. **Aim of the study:** To determine gender using the condylar height and mandibular ramal breadth using orthopantomogram. **Method:** A retrospective study was conducted on 100 individuals (50 males, 50 females; mean age 34.69 ± 1.85 years) with orthopantomograms obtained from the radiology archive of department of oral medicine and radiology. Linear parameters were measured in mm. The measurements were recorded from the both of right and left side and the data between groups was evaluated with Student t-test. **Results:** In our study two parameters of mandible were measured and mean values were determined and the values were higher in males compared to females. It was found that all variable of mandibular ramus on orthopantomograms showed a statistically significant difference among the sex ($p < 0.05$). **Conclusions:** Mandibular ramus measurements can be a valuable tool for sex determination. However further studies with larger populations are needed to reveal this relation.

Keywords: Ramus, OPG, Condylar Height, Breadth

EFFECT OF EXTERNAL FACTORS ON IMPORTANT ENTOMOLOGICAL CHANGES OVERTIME WHICH AFFECT FORENSIC CONCLUSION

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Abstract

Forensic entomology is an important subject area in forensic science for finding causes of death, reasons for the negligence of adults or babies, and drug trafficking using forensically important invertebrates like insects flies, beetles etc. As different stages of insects' life cycle and material around the crime scene silently express the details about the crime; the information is important in solving the crime. The objective of the study is to identify changes in insect activities related to forensic entomology, due to environmental changes over a period and to specify the entomological identification methods used for investigation. Different research articles were reviewed to gather information. Due to global warming; habitats of forensically important flies had changed over time in different other regions of the world. Further traveling and transportation of goods around the world also contributed to dispersing the distribution of insects. Seasonal variation, of ambient temperature, Relative Humidity (RH), wind speed, etc greatly affect the insect population, oviposition, larval & pupa growth, and activities of adult insects. Information gathered from the crime scene regarding entomological procedures which are followed by entomologists in the world; should be matched with meteorological data and standard entomological data of the zone in getting the final judgment. Therefore; standards of some of the advanced techniques developed & used for entomological diagnosis such as the Postmortem Index, isomorphen diagram, analysis of length of the Immature stages, arthropod succession patterns, controlled rearing, morphological indexes, cluster analysis, DNA analysis, chromatography, etc may be re standardized with time.

Keywords: Forensic Entomology, Crime Investigation, Insect Lifecycle, Postmortem Index, Isomorphen Diagram, Cluster Analysis, DNA Analysis, Chromatography, Morphological Indexes

FATAL BLUNT SEVERE HEMORRHAGIC PANCREATITIS TRAUMA SECONDARY TO ASSAULT AND BATTERY

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Abstract

Introduction. The authors report a fatal case of closed pancreatic trauma in the context of violence. A 21-year-old man was found unconscious on the sidewalk and died shortly after being taken to the hospital. Three hours ago, he had been hit several times in his abdomen. **Methods.** We performed an internal and external examination, toxicity examination, and histological examination. **Results.** At the external examination, we found abdominal bruising. At the internal examination, we found blood absorption of the left chest skin without fractures, left lower lung ecchymosis, edema, congestion, cardiovascular dilatation, colonic vasodilation, dilated gastric vessels with mesocolonic ecchymosis, and expansion was seen. The spleen surface appears wrinkled, with deep lacerations, edema, dilatation, necrosis on the upper anterior aspect of the diaphragm, and profuse hemorrhage on the surface of the pancreatic tissue. A pneumothorax with analysis of air embolism of all four ventricles was also negative at the additional examination. At laboratory examination, the toxicity testing using MSD Agilent Technologies 5975C and Conway GC yielded negative results for levels of narcotics, psychotropics, cyanides, alcohol, and pesticides/insecticides. Histologic examination of the pancreas revealed massive necrosis associated with near-complete acini loss, multiple cytoplasmic necrosis sites, and extensive hemorrhagic hyperemia of the peripancreatic tissue.

Conclusions. This case demonstrates the possibility of pancreatic injury caused by blunt abdominal trauma in the context of violence. Even when this occurs as an isolated injury, certain types of pancreatic fractures that are often involved can result in immediate death. In the postmortem situation, the pancreas should be systematically examined at autopsy. A histological examination should be performed if there is even the slightest suspicion about pancreatic involvement or suspected blunt abdominal injury.

Keywords: Blunt abdominal trauma, Hemorrhagic Pancreatitis, Violence

UNVEILING THE INVESTIGATIVE POTENTIAL OF METADATA IN FORENSIC ANALYSIS OF DIGITAL EVIDENCE

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Abstract

Metadata plays a crucial role in forensic analysis, providing valuable insights into the origin, authenticity, and history of digital files. This research paper explores the significance of metadata in forensic investigations and its potential for uncovering hidden information, establishing provenance, and supporting investigative processes. The paper discusses various types of metadata commonly found in image and document files, including EXIF data, timestamps, geolocation information, and author details. It examines extraction techniques such as manual examination and automated software tools. Metadata analysis methodologies like keyword searching, data visualization, timeline analysis, and correlation techniques are explored for deriving meaningful insights. Case studies are presented to showcase the practical applications of metadata analysis, including establishing authenticity, tracking geolocation and timestamps, and attributing authorship. The paper addresses challenges and limitations in metadata analysis, including data integrity, manipulation risks, and privacy concerns. It presents mitigation strategies and best practices to ensure accuracy and reliability. Legal and ethical considerations related to the collection, preservation, and admissibility of metadata as evidence are discussed, including privacy and data protection regulations. The research identifies future directions, including advancements in extraction techniques, integration of artificial intelligence, and the impact of emerging technologies. Overall, this paper emphasizes the pivotal role of metadata in enhancing forensic examinations, strengthening evidence validity, and ensuring accurate investigations in the digital age. By leveraging metadata analysis, forensic investigators can uncover valuable information, support decision-making processes, and contribute to the successful resolution of digital forensic cases. The findings of this research paper provide valuable insights and practical guidelines for forensic practitioners, highlighting the importance of metadata analysis as a powerful tool in the forensic examination of image and document evidence.

Keywords: Metadata, Forensic Analysis, Image Evidence, Document Evidence, Provenance, Investigative Process

MENTAL FORAMEN-AN IDENTIFICATION TOOL IN GENDER DETERMINATION: A DIGITAL PANORAMIC RADIOGRAPHIC STUDY IN KASHMIRI POPULATION

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Abstract

Introduction: Identification of the skeletal remains is of paramount importance in forensic dentistry and medico-legal investigations. Sex determination plays a vital role in medico-legal cases and in identification in mass disasters with the help of human remains such as fragmented jaws and dentitions. Sex determination based on morphological marks may lead to misdiagnoses, whereas measurements and morphometry methods give accurate results. Mandible play a vital role in sex determination, being a sexually dimorphic, largest, and strongest bone of skull and it is often recovered largely intact. **Aims and Objectives:** The aim of the study was to assess the usefulness of digital panoramic radiographs to determine sex using linear measurements in the Kashmiri population. **Objectives:** 1. To correlate the distance from alveolar crest to inferior border of the mandible with Gender 2. To correlate the distance from inferior border of mental foramen to inferior border of mandible with Gender. **Data collection:** A retrospective study was conducted on total of 240 digital panoramic radiographs of patients (120= Males and 120=female) collected from the radiology archive of department of oral medicine and radiology. **Methodology:** Parameters assessed were: 1) Vertical distance from superior border of alveolar crest to inferior border of body of mandible passing through the centre of mental foramen. 2) Vertical distance between inferior border of mental foramen to inferior border of mandible. **Results:** Statistically significant differences was seen in the mean value of both the above mentioned paraments with males showing higher values than females. **Conclusion:** Distance from superior border of alveolar crest to inferior border of mandible and distance between the inferior border of mental foramen to inferior border of mandible exhibit sexual dimorphism in Kashmiri population.

Keywords: Mental Foramen, Gender, Panoramic Radiograph, Alveolar Crest

DEATH DUE TO VIOLENCE AND SHARP INJURY ON THE NECK: CASE REPORT

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Abstract

Introduction: Sharp force injury fatalities are frequently encountered in forensic medicine. The neck is a complex anatomical area containing blood vessels, the aerodigestive tract, cervical vertebrae, and the spinal cord. Penetration of this area by a foreign object can result in life-threatening injury. The most common cause of death for penetrating neck trauma is massive bleeding from injury to the vascular structures. **Case presentation:** Investigators dispatched a 51-year-old woman to the hospital in Surabaya after receiving a report of an attack allegedly caused by sharp injury on the neck. On external examination there were found one stab wound and two incised wounds on the neck. Bruises on both eyelids, lips, forehead, chin, face, stomach, back dan fingers. Abrasions on the chin, back of the right hand, left knee, leg, and chest. We also found bleeding on conjungtiva. Nails, fingers, and toes appear bluish. These symptoms show sign of asphyxia syndrome. **Discussion:** On internal examination was found a tear in the carotid artery of the neck, also blood absorption under the skin tissue and muscles of the head and neck. Dilatation of blood vessels in the brain, gaster, also bleeding spots in the cerebrum and cerebellum. Histopathological examination showed thyroid tissue with areas of bleeding. **Conclusions:** The cause of death in this victim was due to a sharp injury to the neck which sliced the carotid artery of the neck causing bleeding.

Keyword: Pathology Forensic, Autopsy, Sharp Trauma, Homicide, Carotid Artery

CYBERSECURITY IN FORENSIC SCIENCE

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Abstract

Forensic science plays a crucial role in modern criminal investigations and cyber forensics is a specialized branch of forensic science focused on digital evidence. Cyber forensics involves identification, preservation, extraction and analysis of digital evidence such as data stored on computers, mobile devices, network logs and cloud services. Remote hacking, cyber-attacks and data breaches have become prevalent issues that can result in severe consequences, both in terms of financial losses and compromised safety. The first official digital forensic program was launched by FBI in 1984 called the Magnet Media program. Some of the tools used for cyber forensic investigation are X-Ways WinHex, First on scene, Rifiuti. These tools are useful in gathering records of internet activities carried out from a targeted computer. Digital forensics has gained importance in areas such as cloud forensics and IoT forensics. Cloud forensics refers to the process of investigating and analyzing digital evidence related to incidents that occur in cloud computing environments. As businesses and individuals increasingly rely on cloud services to store, process and manage their data, the need for cloud forensics has grown to address security breaches, data theft, unauthorized access and other cybercrimes that may occur in cloud-based systems. Internet of Things (IoT) forensics is a specialized branch of digital forensics that deals with the investigation and analysis of digital evidence related to IoT devices and systems. As IoT becomes more prevalent in various industries and in people's daily lives, the need for IoT forensics has emerged to address security incidents, privacy breaches and cybercrimes involving IoT devices. There are some limitations in using the cyber security technology such as there might be difference between what is there on the screen which can be seen and what is saved on the disk by applying scientific methods and expertise to digital evidence, cyber forensics helps bring perpetrators to justice and provides crucial support to law enforcement and legal proceedings in the digital age.

Keyword: Cyber Security. Forensic Science, Criminal Investigation, Digital Forensics, Evidence

OBLITERATION IN DOCUMENTS

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Abstract

Obliteration is not a new technique of fraud mechanism but in its modern way of doing fraud through print format and digital technologies the examination and investigation of the obliterated documents has been a challenging task for the document examiner. Forgery by obliteration and forgery by adding text is common method for fraudsters to obliterate the cheques, property papers, signatures, academic documents etc. Using the different wavelengths of light and a thorough visual examination along with various filters in VSC for the examination of obliterated documents either with the same ink or different ink, after the examination obliterated documents revealed the true document. Superimposing the letters or rigorous cutting and overwriting of letters decreases the chances of revealing the document by mechanical and physical methods but with the advancement of techniques it has been easy to reveal such documents. This work has been done by VSC Regula 4307 using infra-red rays and by the technique of absorbing colours. This topic specifically emphasize on the multiple use of different types of pen and inks to create multiple samples and the results obtained were very clear and authentic to prove beyond reasonable doubt. Scope for the improvement still lies in this field as the means of forgery is advancing with the new mediums, there could be more accurate and speedy mode of finding the irregularities in these types of cases. Cases related to cut and paste fabrications, indentations, tracing and ink comparison can be done with the use of hyper spectral imaging technique with the use of flood lights, IRs and multi wavelength LED technology. Still there is a need of clear and efficient software interface to compete with the emerging challenges as the comparison of currency notes, passports, foreign currencies are lacking due to the lack of standard reference sample for comparison and analysis.

Keywords: VSC, Forgery, Obliteration, Documents, Comparison.

ISOTOPE ANALYSIS IN HUMAN TEETH: A POWERFUL TOOL FOR FORENSIC IDENTIFICATION

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Abstract

Over the years, isotope analysis methods have experienced significant growth and have emerged as a valuable tool in determining the geographic origin of human remains and aiding forensic identification when standard procedures like DNA analysis, dental records, and fingerprints prove insufficient or unusable. Isotope analyses, particularly of strontium, carbon, oxygen, nitrogen, and lead, have played a pivotal role in both archaeological and forensic investigations. The preferred material for isotope analysis is dental enamel due to its mineral composition and relative resistance to environmental exchange (diagnosis). Dental enamel records physical-chemical stresses and food-related information during its formation, making it suitable for bioanthropological analysis. Additionally, dental enamel's robustness against decay and external factors, attributed to its high content of hydroxyapatite, renders it the hardest tissue in the human body. This unique quality enables the analysis of long periods after an individual's death, extending the window for investigation. This poster reviews isotope analysis in human teeth has become indispensable asset, augmenting forensic identification and georeferencing efforts in cases that present challenges for traditional methods.

Keywords: Isotopes, Teeth, Forensic, DNA, Identification

AI - THE NEW AGE SHERLOCK IN FORENSIC SCIENCE

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Abstract

Forensic science is a multidisciplinary field that applies scientific principles and techniques to investigate and solve crimes. It involves the collection, analysis, and interpretation of physical evidence found at crime scenes or related to criminal activities. The main objective of forensic science is to provide accurate information that can be used in legal proceedings to establish the guilt or innocence of a suspect. With the advent of modern technology artificial intelligence has found its implication in every poss field including forensic science. Its application in forensic science has the potential to enhance investigative capabilities, streamline processes, and improve the accuracy and efficiency of forensic analyses. AI is being used in automated finger print identification, facial recognition, forensic DNA analysis, voice and speech analysis, pattern recognition, digital forensics, ballistics analysis, predictive policing, data analysis and link analysis, crime scene analysis, cybercrime investigation and so on. Artificial intelligence can serve as a prime potential to fill up the voids with minimal manual intervention and errors.

Keywords: Artificial Intelligence, Forensic Science, Investigation, Evidence, Crime Scene

ARTIFICIAL INTELLIGENCE – POWERED FORENSICS: A KEY IN AIDING FORENSIC INVESTIGATIONS

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Abstract

Forensic science demands the cognitive examination, integrating and handling of massive volumes of complex data. The limitations in time and resources, both computational and human have a negative impact in the results obtained. Artificial intelligence (AI) is an appropriate technique for dealing with many of the current difficulties in forensic science. The involvement of AI-powered technology in Digital forensics makes it more impactful and maximizes its accuracy and efficiency, enabling the resolution of more digital investigations. Countries, smarter and more connected are delivering real-time data to government authorities. Real-time data, combined with AI can aid in the detection of crimes as they occur. Artificial intelligence can be employed in identifying the person who committed the crime by their DNA evidence, pattern recognition, crime scene reconstruction by artificially creating a 3D environment, image-processing and picking up hints in police images, psycho/narco-analysis, detecting bombs by identifying its chemical components, sensors linked to a cloud-based program that can pinpoint gunshots and satellite monitoring. AI in Forensic odontology helps in identification of bite-marks, gender determination and age determination. Various methods are adopted for evaluating, standardizing, and optimizing the use of artificial intelligence models in forensics. The goal of this paper is to provide a high-level overview of AI as it may be applied in Forensic Science. AI as a whole, introduces automation –one of its best aspects, which has a more dynamic approach than rule-based testing.

Keywords: Artificial Intelligence, Forensics, Investigation, Data, Automation

MICROBIAL ANALYSIS OF SOIL IN FORENSICS ANALYSIS

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Abstract

Soil is very valuable evidence due to its diversity and ubiquity. It is very helpful in indicating the origin and helps in establishing relationship between suspect and crime scene. Recent studies on soil microbiology have helped to determine its origin and diversity in soil samples have been successfully developed. Whenever the soil is transferred from one place to another and collected as evidence, its microbial structure can also change with respect to time. Soil is examined on the basis of colour, texture but it can also be examined on the basis of microbiome present in it. In this project we have examined bacteria by isolating them on nutrient agar plate. I have collected total 30 sample from road side starting from Indirapuram to Dasna Ghaziabad, Uttar Pradesh, India within the range of 2km each. With the help of serial dilution the bacteria were isolated on nutrient agar in a petri plate with the help of streaking and incubated for growth till 24hr in an incubator, after that the bacteria were gram stained and viewed under the microscope and the challenging difference was noticed which would be help full in examining soil sample from crime scene and establishing link between crime.

Keywords: Microbial Analysis, Soil, Forensic, Bacteria

SENSITIVITY OF TETRAMETHYL BENZIDINE ON DIFFERENT SURFACES

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Abstract

Blood is one of the most easily accessible biological components and an essential piece of physical evidence in violent crimes. It may be found as a pool of blood on the floors, walls, or items at the crime scene and on the instrument(s) used to commit the crime, such as knives, axes, and rods. The clothing of the victim or accused involved in the stabbing typically contains the bloodstains of the victim. Oftentimes, after committing horrible crimes such as murder, the criminal washes his clothing, weapon, floor, walls, etc. to eliminate any signs of blood. Hence, it is crucial to identify the presence of blood at a crime scene since it can provide crucial evidence for corroboration and reconstruction. A blood-presumptive test is a significant forensic technique for determining the presence of blood. This type of test is extremely useful for excluding samples that are not blood and hence do not require extra testing. The most often used highly sensitive blood determination test is tetramethyl benzidine (TMB). Tetramethyl benzidine detects and identifies blood at a crime scene. Its peroxidase activity detects the presence of blood and provides a visual indicator (blue colour) of the results. The goal of this study is to determine the sensitivity of the Tetramethyl Benzidine Test in identifying blood stains seen on various surfaces after washing with regularly used home reagents such as phenyl, acetic acid, detergent, and water. The research method used is experimental and exploratory. The findings of the investigation demonstrated that benzidine is helpful for detecting blood stains on washed surfaces.

Keywords: Blood, TMB, Crime scene, Bloodstain, Surfaces

TRACES OF BIOLOGICAL EVIDENCE FROM CIGARETTE BUTTS

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Abstract

Cigarette butts serve as additional evidence in cases of sexual assault, homicide, and even suicide, aiding in the investigation of burglary and dacoity. Cigarette butts may be a breakthrough for investigation in those circumstances since they may include remnants of saliva and epithelial cells of lips. Cigarette butts can identify a person through DNA only when there is a presence of saliva or epithelial tissue. The possibility of contamination or loss of biological evidence from cigarette butts arises when the samples are subjected to undergo different tests, including presumptive, preliminary, and confirmatory examinations. The primary focus of this study was to examination of saliva in 100 samples of cigarette butts collected from the vicinity of tea shops. The conclusion drawn from the three distinct analyses highlights the necessity of conducting DNA testing before the biological evidence found in cigarette butts becomes susceptible to contamination. The techniques employed for saliva detection included UV light examination, Starch-Iodine, and Gel diffusion. The amylase in cigarette butts is present in an insufficient amount which makes it difficult to detect, hence giving unfavourable results.

Keywords: UV light, Starch-Iodine test, Amylase, Radial gel diffusion, Preliminary examination

ELECTROCHEMICAL DETECTION OF TOXIC DYE SUNSET YELLOW IN FOOD SAMPLE USING MoS_2 - MoO_3 MODIFIED GOLD ELECTRODE

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Abstract

The detection of toxic dyes is the prime motive of various scientists investigating cases related to food forensics. Sunset yellow, an orange-colored toxic dye is used extensively in the food and pharmaceutical industries to give pleasant and eye-catching color to various edible items. If consumed above the ADI limit, the dye causes various health issues such as allergy, carcinogenic and genotoxic effects, asthma, hyperactivity, migraine, anxiety etc. Recently electrochemical detection methods are gaining a lot of interest due to their advantages compared to chemical and other analytical techniques. In this work we have detected Sunset yellow in a food sample collected from local market using analytical techniques such as Thin Layer Chromatography, UV- Visible Spectroscopy, Fourier Transform Infra-Red Spectroscopy. The electrochemical studies have been done using gold electrode modified with MoS_2 - MoO_3 composite (M-M Composite) as the working electrode and the studies have been conducted in the presence of 0.1 M phosphate buffer of pH 7.2. The synthesized composite was characterized by SEM, Powder XRD, Infra-Red Spectroscopy and EDAX techniques. Cyclic Voltammetry was used for sensing the sunset yellow dye. The bare Au electrode did not sense the toxic dye but the modified electrode was successful in detecting Sunset yellow for the concentration range of $1\mu\text{M}$ to $8\mu\text{M}$. The limit of detection and the limit of quantification for the suspected sunset yellow sample were calculated to be $0.44\mu\text{M}$ and $1.472\mu\text{M}$ respectively.

Keywords: Sunset Yellow, Spectroscopy, Chromatography, Cyclic Voltammetry, M-M Composite

Afterword

The International Association of Scientists and Researchers, IASR, has been the torchbearer for planning a forum for avid learners to present, learn and appreciate the ongoing research and developments in forensic science. The IASR has continuously collaborated with the Sherlock Institute of Forensic Science, SIFS India, to bring about stalwarts and personalities to a single forum and make learners familiar with recent advancements and significant case studies to gather knowledge. This International Conference on Forensic Science 2023 has been a remarkable journey of listening to **22 esteemed speakers** addressing more than a thousand participants from **59+ countries** for **30+ hours**. The conference was one of its kind, which included **9+ themes** of forensics. It also gave hands-on knowledge from skilled forensics professionals through **Pre-Conference Workshop** on Forensics to Protect the Vulnerable. The forum was an open platform for enthusiastic learners to present their work and construct knowledge from **70+ venerable dignitaries** giving their inputs from their pool of knowledge.





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