

Diskussion (und Schlussfolgerungen). Die vorgestellte Kombination eines neuen Verfahrens mit der Modifikation einer bereits bekannten Methode eignet sich zur zeitnahen Bestimmung des postmortalen Intervalls menschlicher Oberschenkelknochen. Die Einzelkomponenten sind kostengünstig und portabel, sodass auch ein flexibler Einsatz jenseits von Laborräumlichkeiten möglich ist.

V-014

Laser spectrophotometric methods in biological tissues postmortem changes estimating for forensic issues solving

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Background. Physical methods of biological tissues (BT) changes evaluation, which use laser technology to study the dynamics of changes in the biocrystalline structure optical properties intravitality and after death, are very perspective in forensic practice. Description of these properties based on optical phenomena such as static and dynamic scattering, diffraction and interference of optical fields. Polarization methods provide new information about the optical-anisotropic structure of BT. It makes possible to establish a link between BT physiological condition and polarizative-phase images parameters of BT architectonics.

To find and develop new diagnostic criteria of lifetime and postmortem changes of biological tissues and fluids estimation to solve issues including setting time of death, hematoma formation time, lifetime formation of injuries, diagnosis of acute myocardial ischemia.

Material and method. High accuracy and objectivity of polarization methods was proved by our department staff in the studies, which involve connective tissue, bones, muscles (skeletal and heart muscles), brain tissues and parenchymal organs tissue samples by polarization methods. The value of statistical points of the 1–4 th order was performed for each two-dimensional distribution of samples images. Statistical processing of the calculated values of set of points that characterize the azimuth and ellipticity distributions within representative sampling was carry out. The depending on the time change of the most sensitive points of statistical values were built to achieve values stabilization.

Our studies of human internal organs hematoma polarization and phase parameters have revealed objective changes of hematoma laser polarimetric images at different intravitality time and time after death.

Results. The objective criteria to differentiate intravital and postmortal injuries, applying laser photometry, polarimetry and phasometry of human dermal layer skin slices based on statistical and spatial-frequency analysis laser image were developed.

Optical diagnostic criteria of ischemic myocardial damage to human corpse were revealed.

In the case of hematoma formation diagnosis an opportunity to perform liquids (liquor, vitreous humor) of the human corpse investigation was identified.

Discussion and conclusion. Methods of laser polarimetry are effective for the diagnosis of PMI estimation, lifetime causing of bodily harm prescription and diagnosis.

V-015

Application of MALDI-TOF MS for the identification and characterization of forensically relevant *Lucilia sericata* and *Calliphora vicina* larvae

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Background. Protein profiling by matrix-assisted laser desorption/ionization time of flight mass spectrometry (MALDI-TOF MS) is rapidly evolving as a tool for the identification and characterization of insects and other arthropods for various applications. We present here the application of this technique to two forensically important blow fly species, *Calliphora vicina* and *Lucilia sericata* (Diptera: Calliphoridae). Both taxa belong to the typical first colonizers of human corpses. The reliable identification and age estimation of the juvenile stages is a mandatory task for PMI estimation. Usually, species identification and age estimation of forensically relevant fly species are conducted using either traditional morphological and morphometric methods that often require experience and practical knowledge or by rather expansive and elaborate molecular methods. Here, we present an application that may be capable to solve both issues, species identification and age estimation of the same specimen, simultaneously.

Material and method. Specimens of both fly taxa were reared under the same conditions at a constant temperature of 20°C. Oviposition took place only for a window of time of two hours to ensure that all larval replicates have the same age. Daily samples of larvae were performed every 24 hours. Proof-of-concept studies were performed for both species until day seven of larval development.

Results. A reference database was constructed using commercial software (MALDI Biotyper) that allowed the separation of both taxa irrespective of the age of the samples. Evaluation of spectra revealed striking temporal changes of the spectral pattern during larval development, reflecting the development of protein composition of the larvae.

Discussion and conclusion. A MALDI-TOF MS-based age estimation was possible, however with reduced precision for the older samples. This is probably due to the observed increase of the variability of spectra with time. Thus, the results show that MALDI-TOF MS is not only a promising tool for the identification but also for the age determination of forensically relevant blow fly larvae.

V-016

Insektenbesiedlung und Verwesung von Schweinekadavern unter verschiedenen Lagerungsbedingungen

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Einleitung (mit Fragestellung und Zielsetzung). Die meisten forensischen Studien zur Insekten sukzession an Aas lassen die Kadaver für Insekten frei zugänglich und setzen sie der Witterung aus. Die Erfahrung zeigt aber, dass Opfer von Tötungen immer wieder zum Zwecke des Transports und der Entsorgung in Gefäßen wie z. B. Koffern gelagert werden, die nur bedingt Insektenbesiedlung zulassen und den Zersetzungsprozess beeinflussen. Eine zeitliche Einschätzung des Geschehens wird dadurch erschwert. Um einen Eindruck über das Ausmaß der Beeinflussung der Insektenbesiedlung und der Verwesung zu erhalten, wurden deshalb Schweinekadaver in drei unterschiedlichen Gefäßtypen an zwei unterschiedlichen Standorten bis zu drei Monate gelagert und nach definierten Zeitabständen die Artenvielfalt der nekrophagen Fauna sowie der Verwesungsstand protokolliert.

Material und Methode. Ende Mai 2015 wurden je 15 ca. 30 kg schwere Schweinekadaver zeitgleich in Kanada und Deutschland ausgebracht. Pro Standort verteilten sich die toten Körper auf jeweils fünf Reisekoffer, Mülltonnen und Maischefässer. Insektenbesiedlung und Verwesungsstand der Kadaver wurden in bestimmten Zeitintervallen dokumentiert (10, 25, 45, 70, 100 Tage), die Temperatur innerhalb und außerhalb der Gefäße gemessen. Zum jeweiligen Zeitpunkt wurde an beiden Standorten jeweils ein Koffer, eine Mülltonne und ein Maischefass entnommen und geöffnet. Die Insektenarten und ihre Entwicklungsstadien wurden erfasst, das Verwesungsstadium der Kadaver protokolliert. Es wurde zudem die Insektenfauna auf den Gefäßen regelmäßig abgesammelt und bestimmt.