

POSTER 35

Why rigor mortis and not just mortis?

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Resumo

Introduction: Rigor mortis or postmortem rigidity is normally known as muscle contraction of the whole body, or just part of it, that happens because of the nucleotide ATP, also known as, adenosinetriphosphate, that decreases after death. [1-3] It's often shown the importance of ATP in muscular contraction, because when a contraction occurs, it needs a sufficient amount of ATP stored in the muscle. Also, we know that it's responsible for elasticity and softness of the muscles [1].

Objective: The main goal of this study was to gain knowledge about the meaning of Rigor mortis, and to learn why and when does it happen. **Methods:** A research was performed in the PubMed database between 1947 and 2021, using the terms "Rigor mortis", "Adenosinetriphosphate", and "Postmortem rigidity". Several studies about this theme appeared, explaining how this internal mechanism works and how it can help predict a lot of things during and investigation by forensics, being those the most focused articles.

Results: There is a lot of intention understanding in what

circumstances does this biochemical process happens. Studies in a few animals, such as rats, pigs, and rabbits, have helped determine which factors can variate the time that Rigor mortis sets in, consequently delaying this mechanism, and the time it disappears. [4] Also, those same studies notice that it was highly affected by a lot of factors, for example environmental temperature, intoxication with stimulants, weight, or high fever before death, so basically everything that can cause reduction of ATP reserves [4, 5]. **Conclusion:** To conclude, Rigor mortis is a lot more than just a contraction of both involuntary and voluntary muscles, it's a complex biochemical mechanism that is very related with the decrease or increase of ATP [4]. After death the percentage of ATP decreases from its normal level, and that's when the phenomenon Rigor mortis starts [4]. It's also important to acknowledge that this phenomenon can change its delay depending on a lot of factors, including, being in different countries due to different environmental temperatures [3, 5].

Keywords: rigor mortis; postmortem rigidity; forensics; adenosinetriphosphate

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POSTER 36

Blowflies's (Diptera: Calliphoridae) nocturnal oviposition in Southern Europe (Portugal)

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Resumo

Introduction: The post-mortem interval (PMI) estimation is the most important application of Forensic

Entomology. During the initial stages of decomposition, the minimum PMI can be estimated by identifying the necrophagous species present in the corpse and then calculating the age of the oldest immature insects [1]. Since Calliphoridae are the first insects to colonize a dead body, they are the focus of the minimum PMI calculation. However, there are several factors that can make this estimation inaccurate, specifically, the possibility of nocturnal oviposition [2]. Although it is assumed that Calliphoridae are inactive during the night, several studies remarked that nocturnal oviposition can occur. However, the results are controversial and there is no consensus among researchers [3]. **Objectives:** Since there are no previous investigations in Southern Europe, the present study aims to verify if nocturnal oviposition can occur in Portugal, through experiments held in the summers of 2021 and 2022. **Methods:** In 2021, field experiments were conducted in Lisbon, Portugal, in an urban location during the months of July, August, and September. Control experiments were held to

verify diurnal oviposition and bait was exposed during the night, two hours after sunset. Using information provided by IMPA (Instituto Português do Mar e da Atmosfera), maximum and minimum temperature, sunset/sunrise time, rainfall, wind speed, and humidity levels were registered. **Results:** Even though the bait was near vegetation and artificial lightning, oviposition and blowflies activity was never observed during the nocturnal experiments. In 2021, the maximum mean temperature during the months of July and August was 28°C while in September it was 26°C, furthermore, the minimum mean temperature was 18°C in July, 19°C in August, and 17°C in September. **Conclusions:** Even though temperatures were adequate for Calliphoridae oviposition both during the day and night [4], its non-occurrence might be explained by other abiotic factors or the circadian rhythms of activity and sleep [5]. These initial experiments indicate that blowflies do not oviposit during the night in our geographical area, but more data will be obtained in additional experiments.

Keywords: forensic entomology; nocturnal oviposition; post-mortem interval; Calliphoridae; Portugal

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POSTER 37

Algor mortis

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Resumo

Introdução: Algor mortis é o arrefecimento do corpo post mortem até atingir a temperatura ambiente [1]. Ocorre devido à perda de regulação homeostática pelo hipotálamo, em conjunto com a perda de calor corporal para o meio ambiente, por mecanismos de transferência de calor (condução, convecção e radiação). Esta condição, juntamente com outros fatores post mortem, é útil para estimar o PMI (intervalo post mortem) [2]. **Objetivos:** O objetivo foi fazer uma revisão da literatura disponível

sobre o algor mortis, num contexto forense.

Material e Métodos: Foi feita uma pesquisa científica, em inglês, de vários artigos do PubMed e do Journal of Forensic Sciences & Criminal Investigation (JFSCI).

Resultados: Inicialmente, a taxa de arrefecimento demora a ser desencadeada, depois torna-se linear e volta a abrandar, à medida que se aproxima da temperatura ambiente, resultando numa curva sigmóide, numa representação gráfica [3]. Verifica-se uma diminuição