POSTER 111

Importance of diatoms in the diagnosis of drowning

Mariana Torres-Portugal[1*], Áurea Carvalho[1,2], Cristina Couto[1,3], Cláudia Ribeiro[1,4]

[1]*TOXRUN – Toxicology Research Unit, University Institute of Health Sciences, CESPU, CRL, 4585-116 Gandra, Portugal.*

[2]*LAQV/REQUIMTE, Pharmacognology Laboratory, Department of Chemical Sciences, Faculty of Pharmacy, University of Porto, 4200-319 Porto, Portugal.*

[3]*LAQV/REQUIMTE, Department of Chemical Sciences, Faculty of Pharmacy, University of Porto, 4050-313 Porto, Portugal.*

[4]*Interdisciplinary Center of Marine and Environmental Research (CIIMAR), University of Porto, Edifício do Terminal de Cruzeiros do Porto de Leixões, Matosinhos, Portugal.*

*✉ *mtpramirez@gmail.com*

Doi: https://doi.org/10.51126/revsalus.v4iSup.378

Resumo

Introduction: Diatoms are unicellular microalgae ubiquitous in lotic or lentic aquatic ecosystems, though they can also be found on humid land surfaces, even if less frequently [1,2]. Individual species and communities are diverse and environmentally specific due to their sensitivity to pH, temperature, and type of aquatic ecosystem [3,4]. Diatom cell wall is composed of silica (SiO2), which provides resistance and different shapes, size, and colours according to the species [5]. Diatoms have been of great importance in forensic investigation providing a useful tool for the diagnosis of drowning. In fact, objects of a crime or persons linked to an accident or crime scene that takes place in water will have algae in or on them [1,2,3]. **Objectives:** This work focuses on the significance of diatoms in the diagnosis of drowning death cases. **Methods:** Search was based on ScienceDirect and PubMed database and considering the following keywords alone or in combination: diatoms, forensic science, and drowning. **Results:** Diatoms have a relevant importance in assisting post-mortem diagnosis of an individual found in an aquatic environment. It is possible to distinguish whether death occurred by drowning or by other cause, through the identification of diatoms present in bone marrow, kidney, liver, or only in the upper respiratory tract [2,3,5]. Distinctive diatoms species and pattern also help in the geolocation as algal communities are distinctive of certain aquatic ecosystems or water quality. In fact, some studies have been shown the correlation between tissue and diatom pattern and drowning sites. Additionally, their adherence to surfaces also allows to establish a link between submerged objects, persons, and aquatic system and even seasons [4,5].**Conclusions:** The identification and pattern of diatoms in a specific aquatic environment can therefore be a useful tool in forensic investigation. The importance of diatoms should not be underestimated, and their role in Forensic Sciences should be evaluated.

Keywords: diatoms; drowning; aquatic ecosystem; microalgae; forensic science

References:

[1] Scott KR, Morgan RM, Jones VJ, Cameron NG. The transferability of diatoms to clothing and the methods appropriate for their collection and analysis in forensic geoscience. Forensic Sci Int, 241: 127-137, 2014.

[2] Zhou Y, Cao Y, Huang J, Deng K, Ma K, Zhang T, Chen L, Zhang J, Huang P. Research advances in forensic diatom testing. Forensic Sci Res 5, (2): 98-105, 2020.

[3] Li H, Kang X, Zheng D, Zhang P, Xiao C, Yu Z, Shi H, Xu Q, Zhao J, Liu C, Wan, L. Are diatom types or patterns in the organs and water samples of drowning cases always consistent? Aust J Forensic Sci, DOI: 10.1080/00450618.2020.1825803, 2020.

[4] Zhao J, Liu C, Bardeesi ASA, Wu Y, Ma Y, Hu S, Shi H, Cheng J. The Diagnostic Value of Quantitative Assessment of Diatom Test for Drowning: An Analysis of 128 Water-related Death Cases using Microwave Digestion-Vacuum Filtration-Automated Scanning Electron Microscopy. J Forensic Sci, 62, (6): 1638–1642, 2017.

[5] Kusber WH, Cantonati M, Lange-Bertalot H. Validation of five diatom novelties published in "Freshwater benthic diatoms of central europe" and taxonomic treatment of the neglected species tryblionella hantzschiana. Phytotaxa, 328, (1): 90–94, 2017.