PROJEKAT STUDENSTKI ISTRAŽIVANJA 2025

ASOCIJACIJA ZA NAPREDAK NAUKE I TEHNOLOGIJE

Periphytic algae as biological traces: monitoring the colonization of periphytic communities on synthetic and natural substrates

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Description:

Periphytic algae are essential components of aquatic ecosystems and have gained growing interest in forensic science due to their potential as biological tracers in investigations. This study explores the colonization dynamics of periphytic algae on various synthetic and natural substrates over a 56-day period in a natural freshwater environment. Substrates including cotton, nylon, leather, metal, plastic, glass, and wood were submerged to assess differences in algal succession and biofilm formation.

Sampling occurred at regular intervals (1, 7, 14, 21, 28, 35, 42, 49, and 56 days) to examine algal composition and biofilm development. Environmental factors such as water temperature, pH, turbidity, light intensity and depth were also monitored to evaluate their impact on colonization rates.

Goal:

The goal of this study is to understand the colonization patterns and succession dynamics of periphytic algae on materials commonly encountered in forensic investigations. By analyzing algal accumulation and community composition over time, the research aims to enhance our understanding of how algae interact with submerged objects and contribute to determining the duration of submersion in forensic contexts. The findings indicate that periphytic algae can offer valuable insights into the exposure time of various materials in aquatic environments, making them useful indicators in forensic casework.

Contribution

This study emphasizes the potential of algae as biological evidence for determining the postmortem submersion interval (PMSI) of objects or bodies recovered from water. A deeper understanding of algal succession on different surfaces could improve forensic methods by refining postmortem interval (PMI) estimations, aiding in the identification of submersion time, and supporting evidence collection in aquatic crime scenes. Additionally, incorporating algal data could assist in distinguishing between accidental drownings and homicides, enhancing the accuracy of forensic investigations

Future research should examine colonization patterns under varying hydrological and seasonal conditions, further bridging the gap between forensic science and phycology (study of algae).

Key words: *algae, biofilm, drownings, biological tracers, postmortem submersion interval.*

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