REVIEW ON IDENTIFICATION AND CONTROL METHODS OF ALGAE AND BLUE GREEN ALGAE DETERIORATION OF WALLS

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ABSTRACT

This study was conducted to review the identification and control methods of algae and algae deterioration of walls that were studied and emphasized by previous researchers worldwide. The research was carried out from March 2024 to June 2024.

According to the previous researchers, Algae are a diverse group of photosynthetic organisms that are an essential component of many research projects about the microbial ecology of microcosms. The size of algae varies; they can be as big as edible kelp or as tiny as single-celled organisms found in the ocean, such as phytoplankton. Algal size can range from organisms the size of edible macroalgae, such as kelp, to microorganisms, such as phytoplankton, which are single-celled algae found in the ocean.

Blue-green algae represent a distinctive stage in the life cycle of a plant and can also be referred to as cyanobacteria. Despite being prokaryotic organisms, they engage in photosynthesis, similar to the how more advanced plants do, and are the only prokaryotes capable of producing oxygen due to water photolysis. They can be found in a wide range of ecosystems, including terrestrial and aquatic environments that are extremely wet. Algae contribute both positively and negatively to their environment due to many factors. Algae are primarily associated with colonizing outdoor stone surfaces, particularly architectural historical buildings. They evolve when exposed to harsh environments, such as those found in building construction settings, as well as their final surface finish. When algae biofilms adhere to the stone surface, they demonstrate a considerable disturbing effect on the stone. The biofilms contribute to both aesthetic and structural biodeterioration challenges that result in aesthetic and structural surface degradation. The surface of many buildings, particularly outdoor surfaces, accumulates a discoloration of both black and green patches due to the airborne algae. Algae growth can take place in the presence of moisture, which includes of rainfall, condensation, and water vapor. Black and green discoloration often occurs on outer walls, underneath window frames, on signage, and near cracked areas of walls. Some walls may exhibit an overall blackened disfigurement. The primary types of discolorations that form on walls due to algae are green algae and cyanobacteria.

Techniques for sampling and quantifying the cyanotoxins are varied and are capable of covering the range of possibilities. They include microscopy, Enzyme-Linked Immunosorbent Assays (ELISA), Protein Phosphatase Inhibition Assays (PPIA), and high-performance liquid chromatography (HPLC) with either tandem mass spectrometry (LCMS), or Ultraviolet/Photodiode Array detection systems.

TABLE OF CONTENT