

Isolation and characterization of Bacteria in the ancient Javanese Pegon manuscript: "Layang Watu Gunung"

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ABSTRACT

This research is one of the efforts and the first step in the preservation of historical ancient manuscripts with an interdisciplinary scientific approach. The Unity of Sciences involved in this research are historical science, archaeology, philology combined with natural sciences such as microbiology and biotechnology approaches. The ancient manuscript whose microorganisms were isolated and observed in this study is an ancient manuscript with *Pegon* letters titled "*Layang Watu Gunung*" which dates from the 19th century. Over time, microorganisms can contaminate the paper on the manuscript which can cause damage or biodeterioration. Efforts to preserve historical manuscripts can be started by identifying in advance what types of microorganisms are contaminating the manuscript. From the results of the study, it was found that the microorganisms that contaminate the *Layang Watu Gunung* Ancient Manuscript are types of bacteria and fungi. For bacteria, the results of the Gram staining test result for contaminant bacteria are Gram Negative Bacteria. This initial research will be the basis for further preservation efforts, the results will be more relevant to be analyzed, especially for other historical manuscripts that are in similar temperature and humidity conditions, namely on the island of Java.

Keywords:

biodeterioration; ancient manuscripts; preservation of manuscripts; microorganisms; pegon script

Introduction

Ancient manuscripts and scripts store important data about the history of a nation and civilization. Microorganism contamination on manuscript paper can cause damage due to biological activity or biodeterioration of the manuscript, as well as health problems for librarians who handle the manuscript. Based on research by Sahab et al. in 2014, the microorganisms that contaminate ancient manuscripts in Egypt are types of bacteria and fungi. Fungi are one type of organism that can decompose or decompose wood or paper (Sahab et al., 2014). Research is needed to overcome damage due to biological activity so that the condition of ancient and historical manuscripts is maintained and preserved properly. The first step is to identify what type of microbes are contaminating. The ancient manuscript "*Layang Watu Gunung*" is one of the ancient manuscripts from the 19th century. This manuscript is written in the *Pegon* script which is Javanese written in Arabic letters. This manuscript contains stories about the Kings of Java, such as the genealogy of the Kings of the Majapahit Kingdom. The story in this manuscript can be connected to the concept of Panengen which is linked back to Islamic figures, or Pangiwa which is linked back to Hindu figures (Ahmad, 2021).