

4.5 Microbiological investigations of Sigiriya Frescos.

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ABSTRACT

The archaeologically valued Frescoes at Sigiriya, a World Heritage Site in Sri Lanka, play a major role in remarkable historic interest. Microbial growth on fresco paintings has been identified worldwide as a significant factor which affects the quality of paintings. Microbiological investigation of fresco paintings therefore has become an important aspect of conservation strategy.

The microbiological investigation of the Sigiriya frescoes was carried out in June 2005 by visual detection, microscopic investigations and using microbial culture techniques. The samples for microbial culture techniques were taken from each colour regions separately using sterile cotton swabs and cultured in Nutrient Agar (NA), Trypton Soy Agar (TSA) and Potato Dextrose Agar (PDA) media.

The observations revealed that the fresco surface was free from any fungal, lichen or cyanobacterial growth but eleven bacterial cultures were isolated from a decayed patch, from non painted plaster and from a cavity. All the isolates belong to the Genus *Bacillus* having no conformity with any of the *Bacillus* spp either indicated in 'Bergey's manual of systematic bacteriology vol I and II or included in the computer database developed by Trevor Bryant, University of Southampton, UK (2005). One isolate showed similar morphological characteristic features to the *Bacillus decoloratiois* sp. Nov. bacterium which has been proposed for the new isolate that was responsible for de-colorization of the fresco paintings in Spain and Austria. However, the biochemical characterization of the isolate showed that is a distinctive species having no conformity with *Bacillus decoloratiois* sp. Nov. Further characterizations using DNA based techniques are being carried out in order to determine whether the isolate is a new species or a similar strain of the *Bacillus decoloratiois* sp. Nov.

In the process of conservation, periodic monitoring and further investigations are being carried out for the detection of microbial growth forms including the *Bacillus* species on the fresco paintings in order to protect them from any microbial de-colorization and degradation.