

The investigation of behavior patterns in traditional Sri Lankan mural paintings

The behavior of a painting is its response to the actions of environment and the changes imposed in it by these actions. Understanding the behavior pattern of a painting provides vital information for the conservator. Behavior depends on the structure and composition of the painting, environmental parameters and the type and intensity of the agents of decay. Different behavior patterns can exist in relation to different painting techniques and microclimates. Thirty sites were selected for the investigation. These were randomly selected to include at least two from each of the following categories namely, technique, climatic zone and architectural form. The structure and composition of the paintings, their behavior and existing defects were analyzed. The methods used for the identification of the composition were micro-chemical tests, chromatography and spectroscopy. Optical and electron microscopy were used to analyze the structure and defects present. Behavior was determined according to the estimated amount of moisture absorption, rate of moisture evaporation and thermal movement. Prime attention was given for the identification of the mechanisms of decay. The patterns of behavior were identified analyzing the similarities and differences in structure, composition, behavior and defects inherent among different categories of samples.

The main behavior patterns identified occurred in paintings consisting of a lime based ground with mineral pigments in a dry climate, lime based ground with inorganic pigments in a wet climate, clay ground with organic pigments in a wet climate and clay ground with inorganic pigments in a wet climate. It was found that the type of ground and the nature of the paint had a distinct impact on the behavior. Architectural form of the building had a negligible impact but the type and nature of the walls had a definite effect. Each behavior pattern is associated with the peculiarities of defect and deterioration. Two distinct forms of behavior were also identified. These are stable behavior, where the painting tolerates the effects of the environment and be in equilibrium with them and the destructive form of behavior, where the painting cannot tolerate the environmental effects due to presence of defects in its structure.