

The synchrotron radiation based investigation of prehistoric rock art from Saleh cave, Borneo island, Indonesia

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Indonesia is a country whose prehistoric rock images with hundreds of sites and varied of motifs. Kalimantan Island (Borneo), one of islands in Indonesia, has prehistoric rock images created during the Pleistocene era based on Uranium analysis dating of a reddish-orange figurative painting of an animal known to be a minimum age of 40 ka and dark purple hand stencil aged around 21-20 ka [1]. In this research, synchrotron X-Ray Diffraction was carried out to determine the major and minor phases of reddish-orange pigment of bull foot image and purple hand stencil from Saleh Cave, East Kalimantan. The analysis showed that both samples contained hematite ($\alpha\text{-Fe}_2\text{O}_3$) as the main component of pigment, with gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) and calcite (CaCO_3) as rock component of the image substrate. However, the purple pigment showed sharper peak corresponds to hematite phase which may suggest more crystalline phase. Mapping element analysis using X-Ray Fluorescence showed a greater distribution of Fe elements in the reddish-orange bull foot pigment. In addition, the two pigment samples show the distribution of Al and Si elements which can be derived from clay material.

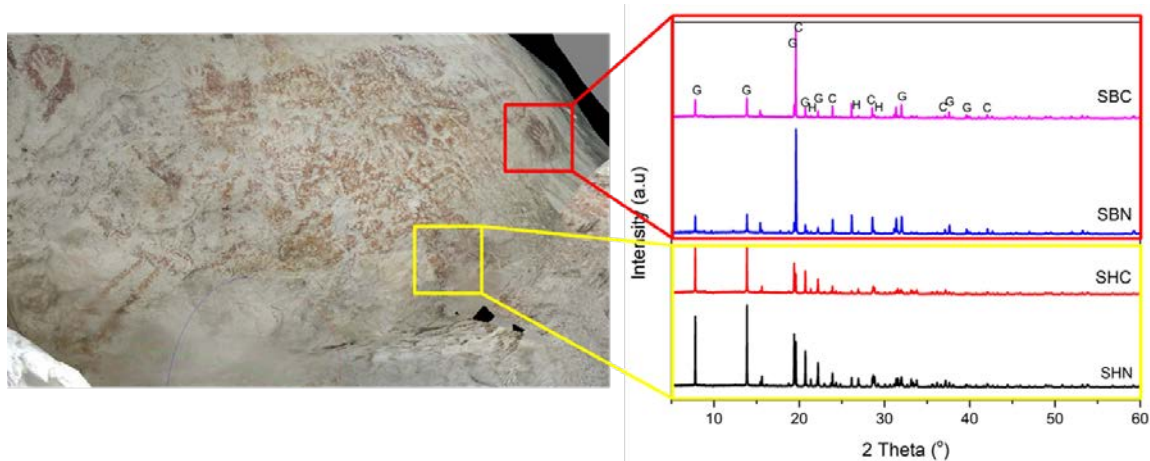


Figure 1: Sampling spot and Diffractogram of pigment

References

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