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Painting the Pacific: A Comparative Analysis of the Lightfastness of Watercolors Made from Indigenous Plants in the Pacific Region

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Painting the Pacific: A Comparative Analysis of the Lightfastness of Watercolors Made from Indigenous Plants in the Pacific Region*

Michael Angelo P. Fernandez and Mari Marutani, PhD

Abstract

Pacific Islanders have traditionally used plants and other natural resources to craft paints, dyes, and other colorants. However, much of society today has transitioned to more accessible, inexpensive colorants, which oftentimes contain toxic pigments and harmful solvents that can be detrimental to human health and the environment. This study will explore using phytochemicals of plants indigenous to the Pacific as safe, natural watercolor paints. The objective of this study is to test the lightfastness of watercolors made from roots of the langiti (*Ochrosia mariannensis*), roots of the ladda (*Morinda citrifolia*), cambium of the binalo (*Thespesia populnea*), and aerial roots of the kaffo' (*Pandanus tectorius*).

In this experiment, water-soluble pigments were extracted from the plant materials through solvent extraction, rotary evaporation, and freeze-drying. The extracted compounds were then bonded to a colorless mordant, potassium aluminum sulfate, through chemical precipitation. The resulting lake pigment was then dried and made into traditional natural watercolors using a mixture of gum arabic and honey. To test for lightfastness, natural watercolors and name-brand ASTM compliant watercolors were subjected to an accelerated UVA exposure test for 14 days. Furthermore, sections of the color swatches were covered to analyze color intensity without exposure to UVA light. Color differences were measured in CIE L*a*b* coordinates in two-day intervals using a spectrophotometer. Data obtained from the triplicated samples were compared by analysis of variance and mean and standard deviation were calculated.

Research is currently being conducted and results will be examined and published at a later date.

KEYWORDS: Pacific; pigment; watercolor; *Ochrosia mariannensis*; *Morinda citrifolia*; *Thespesia populnea*; *Pandanus tectorius*; lake pigment; lightfastness

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Pacific Islanders have traditionally used plants and other natural resources to craft paints, dyes, and other colorants. However, much of society today has transitioned to more accessible, inexpensive colorants, which oftentimes contain toxic pigments and harmful solvents that can be detrimental to human health and the environment. This study will explore using phytochemicals of plants indigenous to the Pacific as safe, natural watercolor paints. The objective of this study is to test the lightfastness of watercolors made from roots of the langiti (*Ochrosia mariannensis*), roots of the ladda (*Morinda citrifolia*), cambium of the binalo (*Thespesia populnea*), and aerial roots of the kaffo' (*Pandanus tectorius*).

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