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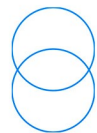
Abstract Collection

Seminar Antarabangsa ke-12

**Ekologi, Habitat Manusia dan
Perubahan Lingkungan di Dunia Melayu**

*12th International Conference on Ecology, Human Habitat
and Environmental Change in Malay World*

"TOWARDS A PARADIGM SHIFT IN ECOLOGY, HUMAN HABITAT AND ENVIRONMENTAL CHANGES IN MALAY WORLD"



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ABSTRACT COLLECTION

**12th International Conference on Ecology, Human Habitat
and Environmental Charge in Malay World**



UNIVERSITI
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**Faculty of Fisheries and Marine, Universitas Riau, Indonesia
Universiti Kebangsaan Malaysia
2024**

Foreword from Chairperson of the Committee

We give thanks to God Almighty, because by His mercy and grace, the Proceedings of 12th International Conference on Ecology, Human Habitat and Environmental Change in Malay World can finally be completed.

This proceeding contains 63 research article titles in both full paper and abstract form written by lecturers, academics and researchers from a number of universities in Indonesia and Malaysia, especially the University of Riau and the National University of Malaysia. All of these articles were presented in this seminar.

We would like to extend our heartfelt thanks to all the authors who have contributed their writings, shared new knowledge, and provided their experiences in this proceeding. We hope that these proceedings will serve not only as a valuable documentary record and a reference source for researchers but also as a means to disseminate new knowledge and ideas that will support the advancement of scientific development in the future.

We also extend our sincere gratitude to the drafting team for their hard work and dedication in publishing these proceedings within a limited timeframe.

**Chairperson of the Committee,
Dr. Ir. Deni Efizon, M.Sc.**

Foreword from the Dean of Fisheries and Marine Faculty

The 12th EHMAP Seminar featured two keynote speakers: Prof. Dr. Ir. Bintal Amin from Universitas Riau (UNRI) and Prof. Madya Asyaari Muhammad from ATMA Universiti Kebangsaan Malaysia (UKM); and two plenary speakers: Dr. Windarti, M.Sc. (UNRI) and Prof. Madya Zuliskandar (ATMA UKM).

We would like to extend our sincere gratitude to all the presenters and seminar participants for their valuable contributions. We hope that this seminar serves as a platform for exchanging scientific information among participants and that the outcomes will contribute to the advancement of science, particularly in the field of environmental studies and related disciplines.

We also look forward to the continued success of this annual seminar, held in collaboration with the Fisheries and Marine Faculty of Riau University and ATMA Universiti Kebangsaan Malaysia, and hope that it will be conducted regularly and sustainably.

Thank you.

**Dean,
Prof. Dr. Ir. Rifardi, M.Sc.**

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Food Spoilage Signal Sensor from Natural Dye of *Bixa Orellana* L.

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Abstract: Annatto (*Bixa orellana* L.) is a species belong to the Bixaceae family. The angular seeds covered by a yellowish red resinous substance, which becomes dry, hard and dark upon maturation. Bixin extracted from annatto seeds is the pigment present in higher concentrations which representing over 80% of total carotenoids. It has drawn worldwide attention owing to its colour richness with its enormous health benefits. It gained great commercial potential in Malaysia for its phytochemically rich nutrients and its adaptability to new environments with abiotic stress tolerance like drought and temperature extremes. Keeping this in view, the present study was undertaken with the aim of exploring the potential of annatto seed pigment as food packaging indicator for food quality or degradation. The methodology involves the extraction of annatto seed pigment through a conventional extraction technique and the fabrication of the bixin-PLA film. The stability of the pigment will be characterized by exposing to the pH and heat stress to assess their suitability for food packaging applications. The study anticipates that the color-changing ability of the annatto pigment can later serve as an early signal of food spoilage for consumers and retailers alike. Thus, the results of colour stability of bixin-PLA film show promising outcomes to be developed as an innovative bioactive food packaging indicator. This system not only enhances food safety but also provides a visually intuitive way for consumers to monitor product shelf-life. Moreover, consumers can make informed decisions about the safety and quality of their purchases. This transparency builds trust and confidence among consumers towards packaged food, addressing concerns related to food spoilage and foodborne illness.

Keywords: annatto; bixin; ethnobotany; natural dye; food packaging indicator.
