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**Science, Technology, Research and Innovation for Development
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**Valorization of Brown Seaweeds through Alginate
Extraction for Fruit and Fish Post-harvest
Preservation**

GRANTEE: Iloilo Science and Technology University (ISATU)

PRINCIPAL INVESTIGATOR: Prof. Hilario S. Taberna, Jr.

INDUSTRY PARTNER: Ephrathah Farms Corp., Unifish, Inc.,
Tiabas Seaweeds Growers Association

GRANT PERIOD: September 1, 2016 to November 30, 2017

GRANT AMOUNT: Php 6,677,591.40 (approximately USD142,076)

Utilizing brown seaweed for production of alginate

Brown seaweeds are abundant in the coastal waters of San Dionisio, Iloilo. However, this resource is not fully utilized, nor does it have a direct economic value to the community. From September to November, considerable amounts of brown seaweeds are swept by strong waves and piled up on beaches.

Studies have shown that brown seaweeds are the main source of a natural product called alginate, a polysaccharide utilized by industries in the production of foods, textiles, cosmetics, and biomedical and pharmaceutical products. In agriculture, alginate is used as an edible coating to prolong the shelf life of fruits and fishes. Currently, there is no domestic production of alginate for fruit and fish for post-harvest preservation.

In order to enhance the economic value of the local brown seaweed species and silver-banded whiting fish, ISATU, with support from USAID STRIDE, undertook a one-year study through a CARWIN grant. The project aims to initiate the creation of a brown seaweed industry that will contribute to the socio-economic development of coastal communities, initially in Iloilo Province, and eventually in other parts of the country where brown seaweeds are abundant.



Prof. Hilario Taberna (right) leads the collection of seaweed samples

The project involves extraction and characterization of alginate from different local brown seaweed species to identify the percentage yield and the characteristics of the extracted alginate. This will ascertain the potential of each brown seaweed species as raw material for alginate production, and its specific industrial application will be rightfully matched.

The extracted alginate will then be applied as a coating material to mangoes to prolong their shelf life and maintain fruit quality under various environmental conditions. Mangoes are climacteric in nature and undergo major negative changes after harvest due to a rise in cellular respiration and increased ethylene production. Mango fruits available in the market are usually stored at ambient temperature, which favors rapid changes in their quality (e.g., firmness, color, acidity, sugar content, and development of aroma). Often mangoes deteriorate fast, which leads to post-harvest losses.

Extracted alginate will also be used as a coating material for silver-banded whiting fish. It will



A local woman in the host community prepares the seaweed for drying

maintain their quality during long storage and extend their shelf life. Due to the erratic volume of catch of silver-banded whiting fish, preservation is necessary to sustain market supply, particularly during lean months. This study will be done in collaboration with Unifish, Inc., a company that is based in San Dionisio involved in fish processing and marketing. Unifish exports products like the processed silver-banded whiting fish to Japan.

This study will be undertaken with Ephrathah Farms Corporation, based in Sariri, Iloilo. Ephrathah is a producer of organic fruits and vegetables and a consolidator of fruits and vegetable produce for a major grocery chain.

These projects are expected to foster strong academe-industry-community partnerships for growth and development in communities in rural areas.