



USAID
FROM THE AMERICAN PEOPLE



**Science, Technology, Research and Innovation for Development
(STRIDE)**



Dietary Proteins from Endemic Philippine Fish Species

GRANTEE: University of the Philippines Visayas Foundation, Inc. (UPVFI)

PRINCIPAL INVESTIGATOR: Dr. Jose P. Peralta

INDUSTRY PARTNER: Pascual Pharma Corporation

GRANT PERIOD: September 1, 2016 to August 31, 2017

GRANT AMOUNT: Php 4,647,595 (approximately USD98,885)

Improving protein ingestion for sick people

Marine life offers a vast number of options as a source of food protein. Proteins, if hydrolyzed by enzymes, will produce hydrolysates. These protein hydrolysates offer a wide array of functional characteristics that make them suitable as food supplements for sick people (or people with low immune responses). The food supplements needed should be easy to digest, provide complete nutrition, and promote healing (and/or increase the immune system responses).



Liquid hydrolysate sent for freeze drying at Southeast Asian Fisheries Development Center in Tigbauan, Iloilo

The overall project, which is envisioned to be a 3-year undertaking, involves a partnership with Pascual Pharma Corporation, a Philippine drug company, which will be the end-user of the products that will be developed. During Year 1, it is proposed that dietary proteins prepared from protein hydrolysates are studied as product ingredients that will make protein ingestion and peptide absorption easier.

The role of Pascual Pharma Corporation in the Project are the following:

- Provide guidance and technical support to the project's progress, as needed;
- Facilitate amino acid assay of the hydrolysate products;
- Facilitate determination of the hydrolysates molecular weight, qualitatively and quantitatively;

- Provide access to equipment needed by the project; and
- Facilitate capability enhancement of selected graduate students and faculty members of the Institute of Fish Processing Technology at UPV.

In Year 2 of the project, the hydrolysates will be blended according to specific needs. In Year 3, the blended products will undergo clinical trials. At this stage, the project will include the technical services of UPM, whose expertise is in the medical sciences. Thereafter, Pascual Pharma Corp. will adopt the products developed, and the project will proceed to commercialization.

The project is partnering with Pascual Pharma Corporation to achieve the following objectives:

- To compare the effectiveness of the following fruit and microbial enzymes in the production of fish hydrolysates against commercial papain (Sigma), Protamex (*Bacillus* protease complex; endoprotease), and Flavourzyme (endoprotease and exopeptidase, *Aspergillus oryzae*), (Biosis: Busan, South Korea);
- To use endemic Philippine marine species as raw materials, and to characterize the hydrolysates produced from these species after reaction with the selected enzymes. Potential endemic Philippine marine species to be used are low commercial value fish (Snake mackerel [*Gempylus serpens*]); 2 tuna species (frigate tuna [*Auxis thazard*], bullet tuna [*Auxis rochei*]); green mussels (*Perna viridis*), and oysters (*Saccostrea spp.*);
- To study the drying characteristics of the hydrolysates, dried product characteristics, and storage stability of the products; and
- To compare the produced hydrolysates to standard hydrolysates such as egg white powder (EW 54822, Prineff, Cameron, Wisconsin, US), and soy protein concentrate (Promine, Solae, St. Louis, Missouri, US).



Mincing of fish using meat and bone separator. During this process, the muscle is separated from the bones and skin

It is envisioned that the project will pave the way in the production of hydrolysate prototypes (in powder form) from the studied marine organisms. The developed hydrolysates will be ready for product blending according to specific needs and depending on intended use.