COUNTRY PROGRESS REPORT ON HERBAL AND MEDICINAL PLANTS: PHILIPPINES

DR. BIGHANI M. MANIPULA
Ecosystems Research and Development Bureau – Department of Environment and Natural Resources
PRESENTATION OUTLINE

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II. Research and Development Activities on Herbal and Medicinal Plants (HMP)
III. Production and Marketing of HMP Products
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Introduction

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INTRODUCTION

- Medicinal plants have been in use since human civilization existed and the first line in sourcing of relief and general healthcare.

- Despite technological advancements, humankind are still going back to the fundamentals when it comes to health and wellness as both developed and developing countries continue to explore the uses of plants in the treatment of illnesses.

- Research undertakings continue to flourish to find out innumerable pharmaceutical purposes of plant parts and their extracts.

- Nonetheless, a lot of these so called “unknown treasures” still lie hidden, and protection and conservation of these herbal and medicinal plants must be part of our primary concern.
Research and Development Activities on Herbal and Medicinal Plants

Country Progress Report on HMPs: Philippines
RESEARCH AND DEVELOPMENT ACTIVITIES ON HMP

- Herbal and medicinal plants and the mechanisms of their therapeutic effects have been studied in the Philippines for a long time.

- The following ten (10) research studies have either been published in local or international journals within the past five (5) years and showcases the variety of effects of different HMPs in controlled conditions.

- There is a small scope of researches conducted in the Philippines, however, it provides an insight that the folkloric aspects of these HMPs are slowly transforming and evolving into scientific and medical facts.
RESEARCH AND DEVELOPMENT ACTIVITIES ON HMP


Study findings indicate that the extracts of said plants can be used as source of natural antioxidants, and as such may support their traditional or ethnomedicinal claims.
RESEARCH AND DEVELOPMENT ACTIVITIES ON HMP

- “Antihyperuricemic and Nephroprotective Effects of Carica papaya Aqueous Leaf Extract in a Murine Model of Hyperuricemia and Acute Renal Tissue Injury (2015)”

A pilot study to determine the effects of the aqueous leaf extract of C. papaya on the blood uric acid levels and kidney histomorphology of adult male albino mice.

Study findings suggests that C. papaya aqueous leaf extract may have antihyperuricemic and nephroprotective effects on mice models with hyperuricemia and acute renal tissue injury.
RESEARCH AND DEVELOPMENT ACTIVITIES ON HMP

“Antibacterial Activities of Ethanol Extracts of Philippine Medicinal Plants Against Multidrug-Resistant Bacteria (2015)”

The study made use of *Psidium guajava*, *Phyllanthus niruri*, *Ehretia macrophylla*, and *Piper betle*.

*P. betle* has the highest potential value against Gram-negative and Gram-positive multidrug-resistant bacteria. Favorable antagonistic activities were also exhibited by ethanol extracts of other plants.


**Joseph Mari B. Querequina**, 1, **Marina O. Ost** 1 and **Sandra C. Sy** 1,2,3

1 The Graduate School, University of Santo Tomas, España, Manila, Philippines
2 Faculty of Pharmacy, University of Santo Tomas, España, Manila, Philippines
3 Research Center for the Natural and Applied Sciences, University of Santo Tomas, España, Manila, Philippines

**ABSTRACT**

*Artocarpus ovatus* Blanco is a plant species of the Philippines belonging to the family Moraceae. This study evaluated the cholesterol-lowering activity of the *A. ovatus* Ethanolic leaf extract in Sprague-Dawley rats and its acute oral toxicity. It was found to be safe and non-toxic up to 2000 mg/kg BW of test animals based on the guidelines of OECD 425 main test. Post toxicity test gross necropsy results are unremarkable. In the cholesterol-lowering bioassay, the ethanolic extract treated rats at doses of 200, 400, and 600 mg/kg showed time dependent reduction of serum levels of total cholesterol, triglycerides and low density lipoproteins with *p*-values less than 0.05. High density lipoproteins concentration improved, high catalase enzymic levels and unremarkable degree of lipid peroxidation were measured and observed after 14 days of oral administration of the extract.

**Keywords**: *Artocarpus ovatus* Blanco, Moraceae, Cholesterol-lowering, Acute oral toxicity, Sprague-Dawley

*Study revealed that *A. ovatus* leaf extract showed time dependent reduction of serum levels of total cholesterol, triglycerides, and low density lipoproteins in Sprague-Dawley rats.*

“Cytotoxic Effects of Betel Vine Piper betle Linn. Leaf Extracts Using Artemia salina Leach (Brine Shrimp Lethality Assay) [2014]”

P. betle leaf extract is found to be containing cytotoxic compounds and may also suggest potential anti-tumor or anti-cancer activities.
The Effects of *Momordica charantia* Crude Leaf Extract on the Enzyme Kinetics of Porcine Alpha Amylase (2013)

The study concludes that the effects of *M. charantia* crude leaf extract on the activity of alpha amylase may be valuable in the search for new remedies for diabetes.
Sweet Potato and Cassava can Modify Cholesterol Profile in Humans with Moderately Raised Serum Cholesterol Levels

Trinidad P. Trinidad*, Rosario S. Sagum, Aida C. Mallillin, Melissa S. Borlagdan, Marco P. de Leon, Theresa F. Aviles

Food and Nutrition Research Institute, Department of Science and Technology, Taguig City, Philippines.
Email: trinidadp@yahoo.com.ph

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ABSTRACT

Sweet potato (Ipomoea batatas) and cassava (Manihot esculenta) are good sources of dietary fiber and resistant starch and are staple foods in the Philippines. The objective of the study is to determine changes in glucose and lipid profile after consumption of sweet potato and cassava in humans with moderately raised serum glucose and lipid profile. Sweet potato (Ipomoea batatas, Super Taiwan variety), and cassava (Manihot esculenta) were used as test foods while white bread was used as the control food. Fifty-nine apparently healthy human adults were fed with the test foods for 90 days and grouped into three control. Sweet potato and Cassava. After an overnight fast, 10 mL blood samples were taken from the study participants for total cholesterol, HDL-C, LDL-C, triglycerides, glucose and hemoglobin A1C measurements. Height, weight and percent fat mass were also determined. The groups given sweet potato and cassava significantly increased HDL-C (P < 0.05). There was a significant decrease in LDL-C in the cassava group (P < 0.05). The group given sweet potato and cassava significantly increased serum triglycerides (P < 0.05). No significant results were observed with regards to BMI, percent fat, glucose, HbA1C, and total cholesterol. In conclusion, sweet potato and cassava increased HDL-C and decreased LDL-C in humans with moderately raised serum glucose and cholesterol levels. Sustainable intake of sweet potato and cassava may be promising in the prevention for risk of cardiovascular diseases as well as obesity and type 2 diabetes mellitus.

**RESEARCH AND DEVELOPMENT ACTIVITIES ON HMP**

- “Suppression of Growth of Some Medically Important Bacterial Pathogens (Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa, and Salmonella typhimurium) with Plant Extracts of Selected Indigenous Semi-Temperature Medicinal Plants in the Philippines (2012)”

- Plant extracts of *Persea americana* (avocado), *Chrysophyllum cainito* (caimito), *Anona muricata* (guyabano), *Artocarpus heterophyllus* (langka), *Carica papaya* (papaya), and *Sandoricum koetjape* (santol) were used.

- E. coli, P. aeruginosa, and S. typhimurium were inhibited by most of the plant extracts. *P. americana* plant extract has highest activity against S. aureus, while C. cainito and A. heterophyllus plant extracts have no effect on S. typhimurium.

**RESEARCH AND DEVELOPMENT ACTIVITIES ON HMP**

- “Anti-Inflammatory Activities of the Aqueous Extract of the Stem of *Tinospora crispa* (2012)”

- Acute inflammations were applied to the hind paws of rat models prior to application of *T. crispa* aqueous extract on inflamed area.

- Results showed that the extract *T. crispa* significantly inhibited the swelling of the paw. *T. crispa* was found to cause stabilization of cellular membranes and inhibition of protein denaturation.
“Antibacterial Activity of Extracts of Twelve Common Medicinal Plants from the Philippines (2011)”

Plant extracts of guava, blue gum, mango, watercress, malunggay, wild tea, lemon, orange, garlic, and onion were found to be effective in the study.

Effects of said plant extracts on Staphylococcus aureus, Bacillus subtilis, Escherichia coli, and Pseudomonas aeruginosa were observed.

Results showed that extracts have bioactive constituents with very strong antibacterial properties which validates its medical use.
Production and Marketing of Herbal and Medicinal Plants

Country Progress Report on HMPs: Philippines
PRODUCTION AND MARKETING OF HMP PRODUCTS

- Cough medicine from lagundi (Vitex negundo) was first introduced in the Philippine market on 1994.
- It faced extreme consumer skepticism and didn’t sell much.
- Concerted efforts to improve the image of herbal medicine and lagundi-derived products has been conducted, this includes licensing agreements as support to this endeavor.
- The drug eventually became successful.
PRODUCTION AND MARKETING OF HMP PRODUCTS

- Lagundi (*Vitex negundo*) farmers in Roxas, Palawan sell dried leaves to pharmaceutical companies who then convert these into capsules and tablets.


- Pascual Laboratories, Inc. is one company that sources its dried lagundi leaves from the said farmers.


*all photos are properties of their respective owners*
Involvement of Private Sectors

Country Progress Report on HMPs: Philippines
In 2017 of May, a research and development center for local medicinal plants was inaugurated. The facility is known as Sentrong Katutubong Yaman (SeKaYa) Research and Development Plant. SeKaYa is an affiliate of United Laboratories, Inc. (UniLab), a pharmaceutical and healthcare company in the Philippines.

The Remnant Institute of Alternative Medicine (RIAM) and the Agricultural Training Institute (ATI) launched the First Philippine Farm and Herbal Tourism in the Philippines in 2015.

With the project, ATI and RIAM play a vital role in educating and providing the necessary health information as well as the skills on production, utilization, harvesting, processing, and marketing.

IN Volvement of private sectors

- Implemented a four-year project entitled “DNA Barcoding for Authentication of Philippine Medicinal Plants” on 2015.
- Aims to create an online database and a medicinal guidebook for flora found in the Philippines with the help of DNA barcoding.
- Project is funded by the Department of Science and Technology.

*taken from http://varsitarian.net/news/20150307/ust_leads_way_in_barcoding_of_ph_medicinal_plants*
Conservation Initiatives on Herbal and Medicinal Plants
Country Progress Report on HMPs: Philippines
CONSERVATION INITIATIVES ON HMP

Quezon province plants seeds of medicinal agro-industries

‘We are now shifting to a healthier lifestyle. We are more conscious of what we eat and drink’

By: Delfin T. Mallari Jr. - @inquirerdotnet  Inquirer Southern Luzon / 12:22 AM April 27, 2016

- Farmer cooperators were enjoined through the local government’s Quezon Herbal Industry Program.
- The program provides cooperators with trainings, seminars, and technical support from the provincial government.
- Interested parties may join as long as they are willing to learn and have an accessible farmland with an adequate water source.

CONSERVATION INITIATIVES ON HMP

- Quezon Protected Landscape Herbal Pavilion
- established on 2015
- a joint activity of the Provincial Government of Quezon, LGU of Atimonan, and DENR R4-A
- serves as a source of various herbal plants

*photo taken from https://chitsblog.wordpress.com/tag/quezon-protected-landscape-herbal-pavilion/
The Ecosystems Research and Development Bureau (ERDB) has been maintaining a medicinal plant genebank since January 1989 in an effort to conserve plant species that may have medicinal properties.

Plants in this genebank include 40 trees, 31 shrubs, 37 herbs, 5 grasses, 3 ferns, and 2 palms.
A book entitled, “Medicinal Plants in the Los Baños Experiment Station for Genetic Resources Conservation” was published this year.

The book details the many plants in ERDB’s Medicinal Plant Genebank and serves as a tool in increasing people’s awareness on said plants.
CONCLUSIONS

- Continuous relevant research on HMPs are abundant in the Philippines and greatly aid in transforming the face of HMPs from folklore to fact.

- In terms of production and marketing, HMP products are also abundant in the Philippine market, with lagundi-based (*Vitex negundo*) products being the most common.

- Pharmaceutical companies and other private institutions are quite active in the research and development and promotion of HMPs.

- In the Philippines, local government units, and government agencies are most relevant in the conservation of HMPs.
MARAMING SALAMAT PO.

Thank you very much.