



Trials and Triumphs in Herbal Medicine Research: The NIRPROMP Experience

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Herbal medicine/products FACTS

- In Asian and African countries, 80% of the population depend on traditional medicine for primary health care.
- Global sales of Chinese Herbal Medicines US\$83 billion in 2012
- CAGR of 7.2 % 2017-2023
- By 2023, Herbal products and remedies are predicted to reach US\$111 Billion

CAGR- compound annual growth rate

Examples of modern medicine derived from plant sources

Medicine	Common name of plant	Scientific name of plant source	Indication	Mechanism of action
Aspirin	Bark of the white willow	<i>Salix alba</i>	Treatment of fever, pain inflammatory conditions and Kawasaki disease; prevention of thromboembolism	decreases production of prostaglandins and TXA ₂ due to its irreversible inactivation of the cyclooxygenase enzyme
Oseltamivir	Star anise	<i>Illicium verum</i>	Treatment and prevention of Influenza A and B	Inhibits neuraminidase
Atropine	Belladonna	<i>Atropa belladonna</i>	Antidote for overdose of cholinergic drugs and organophosphate pesticides; treatment of bradycardia	Inhibits the muscarinic actions of acetylcholine on structures innervated by postganglionic cholinergic nerves
Artemether	Qinghausu	<i>Artemisia annua</i>	Treatment of chloroquine-resistant plasmodium falciparum infections	Inhibition of a parasite Ca ⁺ dependent ATPase



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Types of Herbal products in the Philippines

- Herbal/food supplements
- Traditionally used herbal products
- Herbal medicines



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National Integrated Research Program on Medicinal Plants

- Established in 1974
- Multidisciplinary team- pharmacology, medicine, pharmacy, agriculture, and chemistry

**Nelia P.
Cortes-Maramba**



Cecilia Vargas Zamora

Jerry D. Saludez

**Dr. Conrado
Dayrit**



**Natividad
De Castro**



**Ernesta
Quintana**



Romeo Quijano

Objectives of NIRPROMP

- 1) discover new drugs from plants;
- 2) discover substitute drugs from plants,
- 3) make these discoveries available to the community in various dosage forms,
- 4) help establish a Filipino Pharmaceutical industry.

Secondary gains - include creating new cash crops for Filipino farmers, conserving Philippines foreign exchange reserves and placing the Philippines on the world scientific map



IHM Algorithm of Herbal Medicine Drug Development

Survey of Traditional Healers on herbal medicines and folkloric used/ Literature review

Choose herbal medicines for a specific indication and screen for pharmacologic action

Agricultural Researches

- Cultivation
- Propagation
- Harvesting
- Post-harvest handling

Preclinical researches

Ex. -Acute toxicity
-sub chronic/chronic toxicity
Safety pharmacology
Mutagenicity, clastogenicity
Heavy metal content
In vitro and in vivo bioassays
Isolation of active compound

Pharmaceutical Preparation Researches

- Plant material processing
- Crude drug preparation (Galenicals) and Quality control
- Drug formulation and manufacturing research
- Quality control of Pharmaceutical product

Human Trials

Phase 1
Phase 2
Phase 3

Intellectual Property Rights/Herbal medicine registration with Phil FDA



Medicinal plant formulations:

The program has come up with the following

- Lagundi (*Vitex negundo*) tablet for cough and asthma
- Lagundi (*Vitex negundo*) syrup for children's cough and asthma
- Sambong (*Blumea balsifera*) tablet for urolithiasis and diuresis
- Akapulko (*Cassia alata*) lotion for fungal infections
- Yerba buena (*Mentha cordifolia*) tablet for pain
- Ampalaya (*Momordica charantia*) tablets for diabetes mellitus (Type II)
- Tsaang gubat (*Carmona retusa*) for gastrointestinal and biliary colic
- Ulasimang bato (*Peperomia pelucida*) for hyperuricemia





Conventional medicine

→ 10 to 15 years



DISCOVERY PHASE

DEVELOPMENT PHASE



→ 5 to 6 years

Herbal medicine

\$/Php

**Funded by government agencies:
Philippine Council for Health Research and Development
or Philippine Institute of Traditional and Alternative
Healthcare**

Trials

- 1979: Opposition from Philippine Medical Association

Non-acceptance by medical community despite the scientific evidence



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Prior Art

- PCHRDR requested to produce and publish a monograph on Lagundi
- IP for patent was filed after
- Qualified for UTILITY MODEL only



Prior Art

- A researcher published the formulation of the Akapulco lotion in an article
- IP for patent was filed after
- Qualified for UTILITY MODEL only



Prior Art

- In the academe, requirements for promotion and crossing rank
 - publications in peer-reviewed journals
 - presentations at conferences
- Requirements for publication in peer-reviewed journal for clinical trials- registration at clinical trials databases



- Can only publish after IP has been filed
- Register in databases using codes for plants

Ampalaya

- before filing of IP, but experimentation and testing were found out by other companies
- Numerous food supplements for ampalaya was made
- Difficulty in convincing medical doctors
- 32 varieties of Ampalaya was tested and only 1 variety had the highest hypoglycemic activity comparable to glibenclamide



Technology Transfer Act of 2009

- Before 2009- sharing of royalty was:
60% researchers
40% university

After 2009

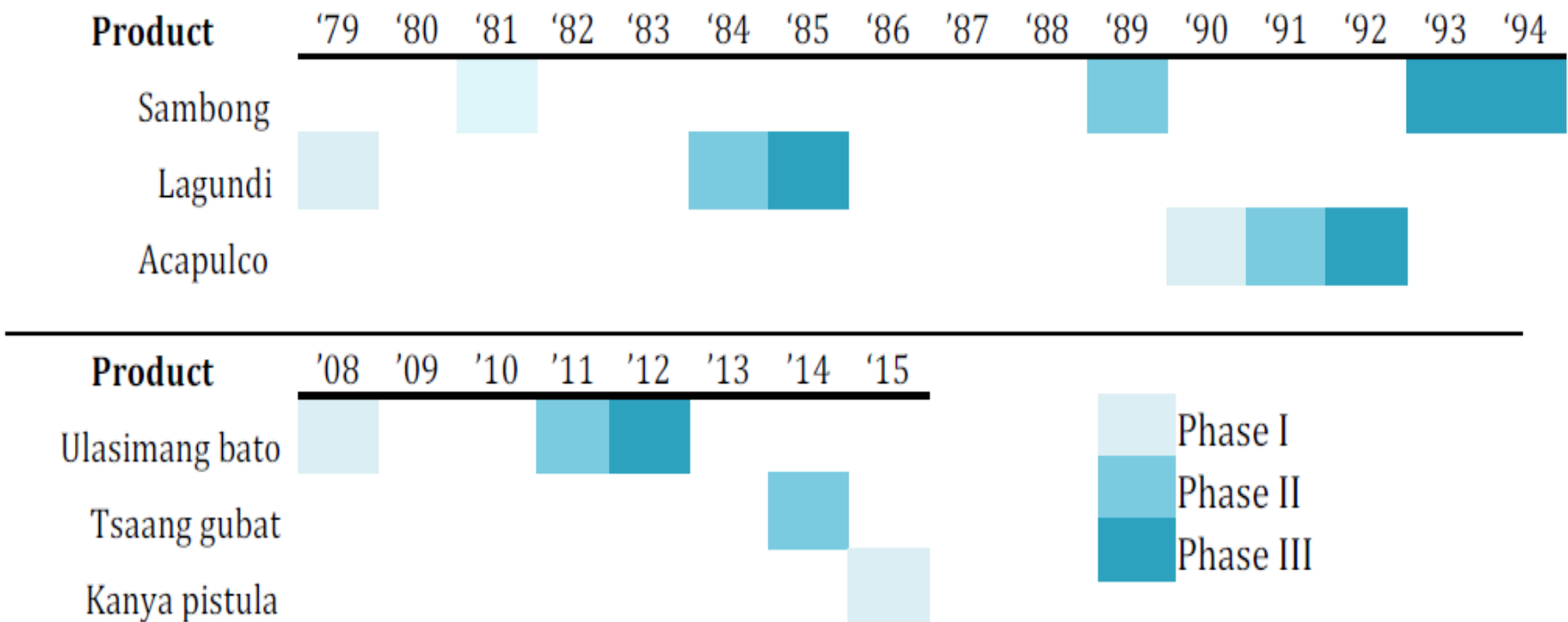
60%



40%



Timeline of Clinical Development of Six Philippine Herbal Medicine*



*does not include safety pharmacology, acute toxicity and preclinical studies

- Difficult/tedious funding process
 - 1 project took 3 years to be funded
- Small grants not enough for large scale trials

Others

- Difficult procurement procedures in government

disbursement, reimbursement

- have to shell out personal funds

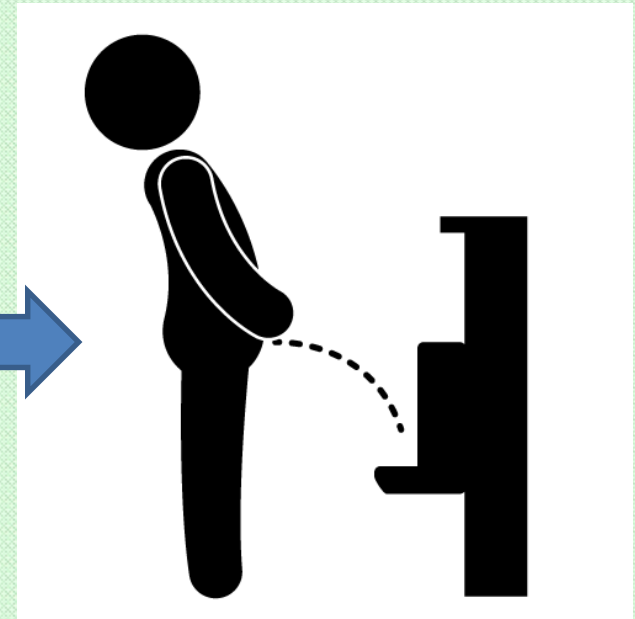
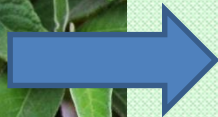
Support for IP fees not fully realized –
mainly out of pocket

Availability of accredited animal breeders



Triumphs

- Serendipity



Different indications



Office of the President
Malacañang, Manila
Philippines

hereby presents this

LINGKOD BAYAN AWARD

to

The Group on National Integrated Research Program on Medicinal Plants

Dr. NATIVIDAD F. DE CASTRO

U. P. College of Pharmacy

Dr. MAGDALENA C. CANTORIA
U. P. College of Pharmacy

Dr. FABIAN M. DAYRIT
Ateneo de Manila University

Dr. ROMEO F. QUIJANO
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U. P. College of Pharmacy

Dr. NELIA P. CORTES-MARAMBA
U. P. College of Medicine

Dr. VIRGINIA R. OCAMPO
U. P. Los Baños

Prof. ERNESTA QUINTANA
U. P. Los Baños

Mr. RODEL MAGHIRANG
U. P. Los Baños

In recognition of their outstanding accomplishment in the propagation, pharmacologic screening, clinical testing, formulation and manufacture of drugs from Philippine Medicinal Plants such as Lagundi, Tsaang Gubat, Yerba Buena and Sambong.

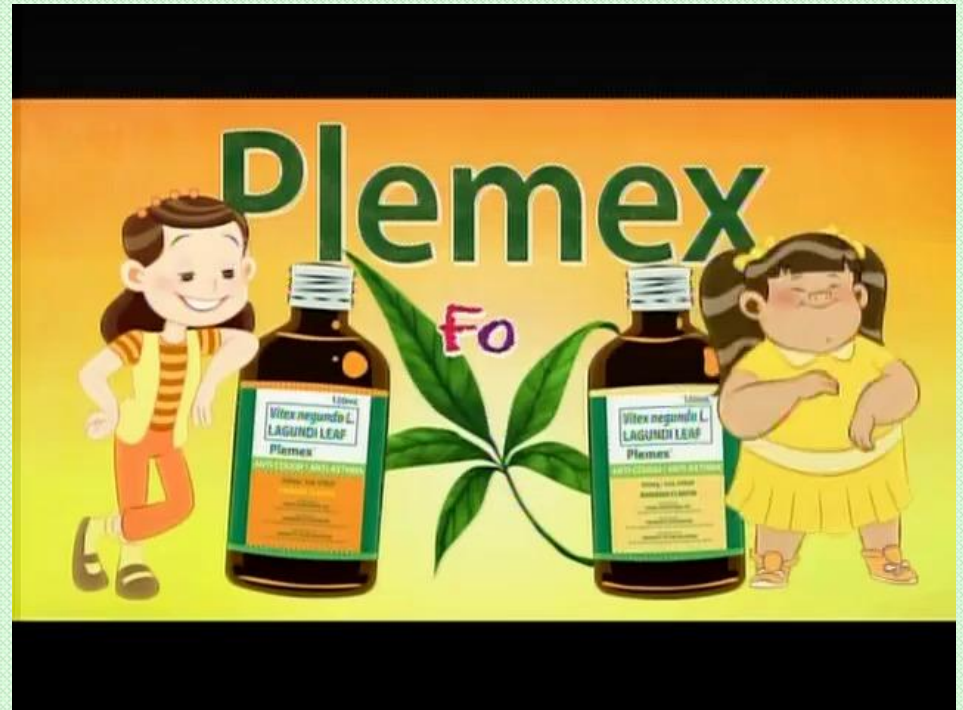
Given this 19th day of September, 1988 on the occasion of the 88th Civil Service Foundation Day Anniversary.

Corazon C. Aquino
CORAZON C. AQUINO
President





Trademarks



Trademarks



SAMBONG

RE-LEAF Forte CAPSULES



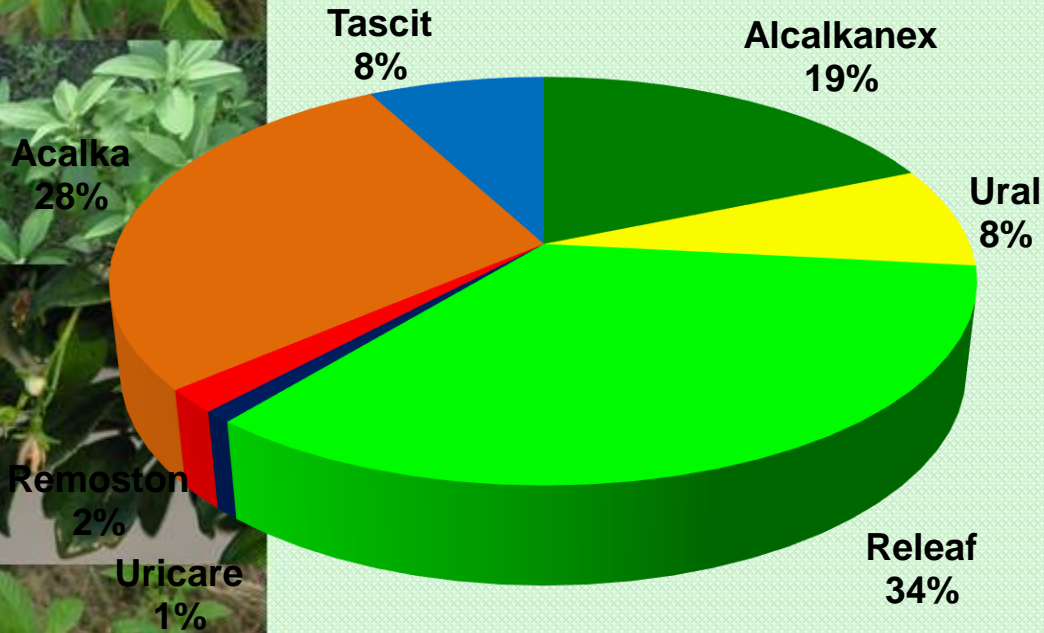
- Anti-urolithiasis and diuretic drug derived and developed from Sambong, an indigenous plant in the Philippines
- One of ten (10) natural products, all clinically tested and developed by the National Integrated Research Program on Philippine Medicinal Plants (NIRPROMP) of the UP-College of Medicine, under Prof. Emeritus Nelia Cortes-Maramba
 - 25 years R&D, with P85M funding from DOST
 - With Patent No. **11997-057575** issued by IPOPHL on April 2, 2006
 - 1997 Licensing to Pascual Laboratories, Inc., with estimated annual sales of P1 Billion for sambong and lagundi drugs
 - With 18 current technology and know-how licenses from U.P. Manila to industry
 - 2011-2013 annual royalties of P12 Million to UPM

Better Acceptance by Physicians

- Faced an uphill battle since 1994 for acceptance of herbal medicine
- Through concerted efforts from the academe and industry, lagundi and sambong are being prescribed to patients who need them
- Sambong is highly prescribed by renal specialists and urologists at the NKTl



MARKET ENVIRONMENT



In USD:

Releaf	225,995,443	34%
Acalca	187,740,674	28%
Rowatinex	123,446,152	19%
Ural	42,749,764	8%
Tascit	51,626,812	8%
Remoston	12,133,834	2%
Uricare	6,102,728	1%
TOTAL	659,795,388	100%



We cannot quantify (at the moment):

- How many patients were relieved of cough symptoms and asthma symptoms by using lagundi...
- How many patients passed out urinary tract stones by using sambong....
- How many patients were spared of an expensive operation or procedure because of using sambong.....
- How many farmers increased their take home pay because of planting lagundi and sambong.....
- How many hectares of idle lands were put to use from cultivating herbal medicines.....
- How the Philippine pharmaceutical industry grew due to herbal medicines.....



Where are we now?

- NIRPROMP precursor to the Institute of Herbal Medicine
- Still engaged in developing efficacious, safe and low cost herbal medicines for the Filipino people
- Communicable and non communicable diseases



Still Many Challenges

- Funding
- Tedious processes
- Relatively lower paycheck in the university compared to industry
- Few plantilla items for researchers
- Need for a national policy on herbal medicine



HERBAL MEDICINE RESEARCH



It's more fun in the
Philippines

