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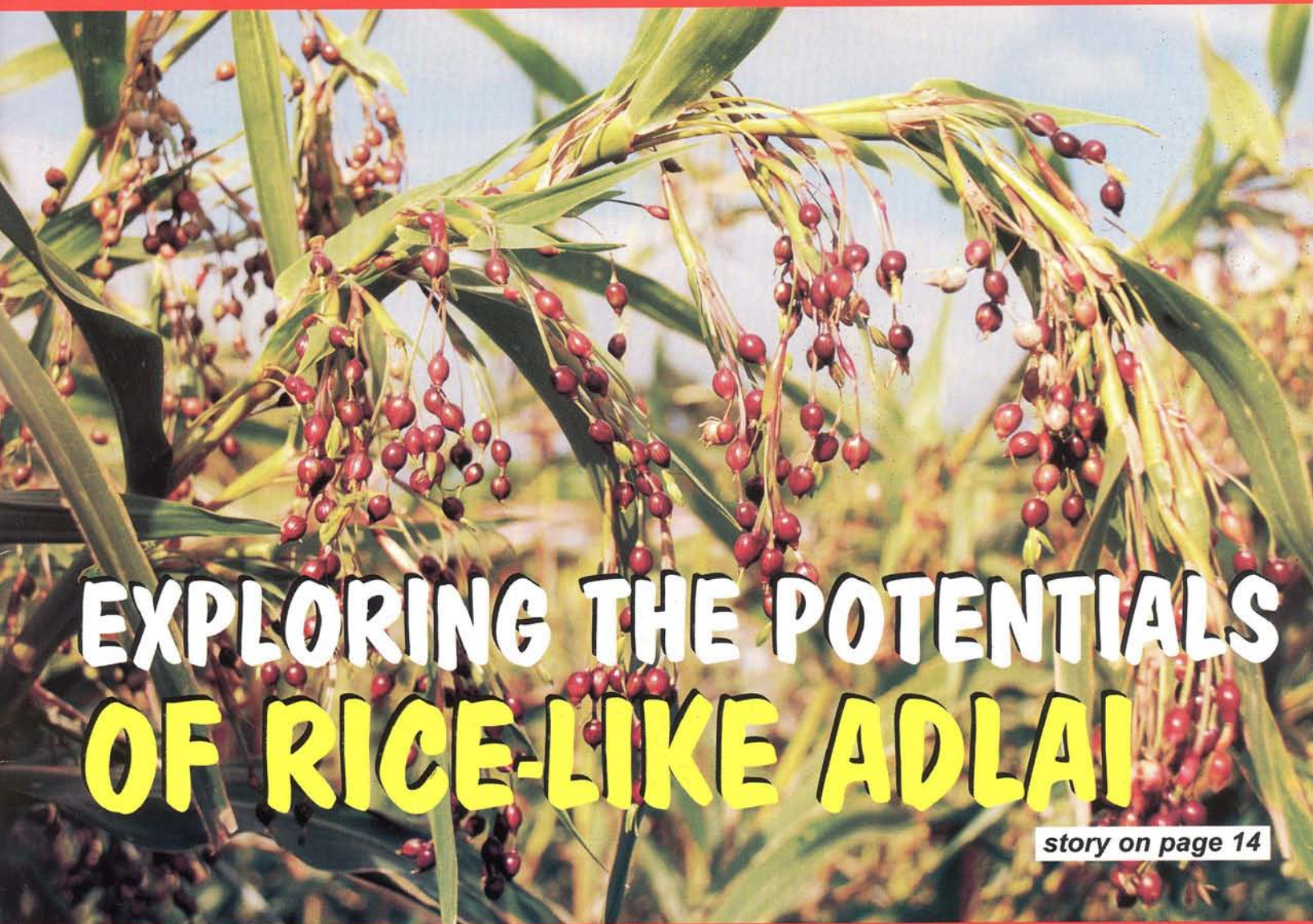


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EXPLORING THE POTENTIALS OF RICE-LIKE ADLAI

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EXPLORING INDIGENOUS PLANT-BASED PRODUCTS TO PROMOTE HEALTH & WELLNESS

by Dr. Nicomedes P. Eleazar, CESO IV

The Department of Agriculture, through the Bureau of Agricultural Research, launched the Indigenous Plants for Health and Wellness Program (IPHW) in response to Proclamation No. 1280 declaring the Month of October 2007 and every year thereafter as the "National Health and Wellness Tourism Month". Little did we know that indigenous plants could play a significant role in the use of alternative medicine and in promoting human development until the last decade with the proliferation of food supplements and beauty products derived from indigenous plants all over the planet.

Increased awareness of health and wellness for body maintenance and development among consumers prompts them to take food supplements and use beauty products derived from various plant species. Taking or using such products actualizes improvement in human health and productivity and increases the level of well-being of consumers and, ultimately, of the society. This development in the global market offers bright potentials for farmers to increase their incomes by intercropping their base crops with indigenous plants.

The Philippines is rich in plant biodiversity as it is home to at least 13,500 species of the known higher vascular plants, many of which are usable as food or other human benefit. Yet, in vegetables, the country produces only 1 percent of Asia's 71 percent of the world's vegetable production. The Philippines' production consists only of traditional vegetables. Much opportunity is lost due to untapped plant species which potentially could be sources of medicine and beauty products. There is a rising demand for raw plant materials that cater to health and well-being consciousness worldwide. In the U.S. alone, US \$4.41 billion was spent on phytotherapeutics or medicines or plant-based medicines in 2005. The market for nutraceuticals (nearly any bioactive component of foods that gives health benefits), functional foods and cosmeceuticals (cosmetic-pharmaceutical hybrids that enhance beauty through ingredients that provide additional health-related function or benefit) is estimated at US \$45 billion in the U.S. alone.

The local production and market for plant-based products are still in their infancy. At present, herbal medicine and products for beauty/health care such as *malunggay* soap, carrot soap, oregano wine, essential oils, etc. already exist. But the benefits that could be derived are still unknown to many and this calls for intensified product promotion.

Strong scientific evidence affirms the health and wellness-promoting properties of various plants. Spices have been reported to possess high antioxidant properties. Yet, research on the beneficial phytochemical content of other indigenous plants found in the different parts of the country is still wanting. R&D on culinary herbs and spices is virtually non-existent.

Seeing the tremendous economic benefits that could be reaped by our farmers from the production of indigenous plants, BAR is therefore keen on the full implementation of the IPHW Program.

This program is given priority attention by integrating it into the Research

and Development and Extension Agenda and Programs for 2011-2016 (RDEAP 2011-2016).

Farmers will be encouraged to grow indigenous plants along with the base crops through BAR's one of its banner programs, the Community-based Participatory Action Research (CPAR) Program.

The promotion of indigenous plant-based products will not only benefit farmers, but also the stakeholders in medical tourism and workers in the spa and salon sectors. Hand in hand with the R&D program is the commercialization and utilization of breakthroughs and other mature technologies.

We, at BAR, will continue to mainstream the provision of technical assistance to investors to enhance the establishment of new agribusinesses. This activity is embedded in the BAR's National Technology Commercialization Program. Included in the program is the conservation of indigenous plants through the development and maintenance of gene banks by the concerned DA bureaus and regional field units.

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SAVING THE UNDERUTILIZED *indigenous crops*

by Victoriano B. Guiam

In 2010, the Mariano Marcos State University (MMSU) in Batac City sounded the alarm on the vanishing indigenous crops of Ilocos Norte. MMSU researchers had found that there are 46 indigenous food plants (IFPs) in the daily diets of various tribal groups in seven remote upland towns of Ilocos Norte that include the Tingguian, Yapayao, Igorot, and Isneg. These IFPs include herbs, palms, shrubs and undershrubs, vines or lianas, grasses, and trees. The researchers had observed that "despite possible genetic erosion brought about by adverse environmental changes, there are still insignificant efforts to safeguard and conserve this component of agrobiodiversity." (Fernandez, 2010)



The Philippines is one of the most important places in the world on diversity of life. More than 52,177 described species are known, of which more than half are found nowhere else on the planet. Philippine biodiversity, therefore, is part and parcel of global heritage. Of these species, the country is known to have more than 3,000 diverse plants that have played important roles in the history of its inhabitants. Through the centuries, Filipinos have found various uses for these species as food, medicine, fiber, essential oil, commercial timber or ornamental.

Cultivated crops, and their closely related wild species, form part of what is known as "plant genetic resources" or PGR. There is global concern for PGR because of genetic erosion and loss of biodiversity. The major culprits have been: 1) the introduction and spread of high yielding and new varieties of crops that have displaced indigenous plants; 2)

intensification of the agricultural system and establishment of commercial plantations that have made growing habitats less favorable for indigenous plants, and overexploitation and excessive gathering of wild plants, inadvertent introduction of pests; and 3) destruction of the natural ecosystem, due to population pressures and urbanization, including environmental pollution. Additional threats have come from natural disasters like volcanic eruptions and tsunamis that can destroy the habitat of indigenous plants, and abiotic stresses such as droughts and floods. However, the biggest threats are in people's neglect and apathy towards conservation of this national patrimony.

Cognizant of the big challenge to PGR, the MMSU officials are setting up a Biodiversity Center that will address the problems concerning Ilocos Norte's disappearing indigenous food plants. Among the first to respond through a declaration of support was newly-

installed Ilocos Norte Governor, Ms. Imee Marcos, who envisions the center to form the core of an eco-tourism thrust in the province.

Also in the northern Philippines, the Cordillera region is home to many tribal groups - the *Batad* people. The region is noted, not only for its cultural history, but also for its rich biodiversity of indigenous plant species which find use as food and folk medicine that are mainly harvested from the wild. All has not been well for this Shangri-La as forest and watershed degradation have occurred at a rampant pace and much of the biodiversity has been lost. Changes in the diet of the people and preference for more western vegetables as a result of cultural inroads from the outside have also displaced indigenous vegetables and put the rich genetic diversity at severe risk. As in Ilocos Norte, university-based researchers are leading the way and are finding ways to conserve and multiply these plants.



However, unlike MMSU, the Benguet State University (BSU) already has a facility, the Semi-Temperate Vegetable Research and Development Centre that looks after indigenous vegetable species. Recently, the Centre made the significant discovery that, while the Cordillera people make use of many of the wild edible plant species for food and medicine, a big number of other wild species with potential nutritional value are being ignored or are used only as pasture for livestock. This preferential treatment is thus contributing to the slow disappearance of Benguet's many species.

In 11 municipalities in the Cordilleras, more than 49 wild species have been noted as being harvested for their young shoots, tops, stalks, flowers, leaves, bulbs and fruits to be eaten as vegetables. Many of belong to the *Asteraceae* (Compositae), *Solanaceae*, *Amaranthaceae* and *Brassicaceae* families of plants. These include gagatang, a local word for several thistle-like species such as *Sonchus oleraceus* L (common sow thistle) and *S. arvensis* (perennial sow thistle) that reportedly are high in flavonoids and are used to treat indigestion, fever and asthma. *Puriket* (*Bidens pilosa*) is rich in iodine, which makes it useful in preventing and treating goiter, while its young roots are used to cure rheumatism and to treat wounds. *Kalunay* (*Amaranthus gracilis*) and *papait* (*Solanum spp.*) are also used as food and medicine by the locals.

According to Professor Lorenza Gonzales-Lirio of BSU, 11 indigenous wild species may be found in the local markets of the Cordillera region. While utilization can work to increase attention and care for indigenous plant species, the increased attention can also put them under further threat when there is no provision for conserving and replacing those taken from the wild. To counter this, Lirio and her colleagues are working with the womenfolk in identifying and documenting the wild species that are used as vegetables and as medicines. Their aim is to raise the levels of awareness and understanding on the importance of wild species by the local people and to identify the best approach for their utilization and conservation.

Professor Lirio's group has turned out a book, titled, 'Indigenous Semi-temperate Vegetables of Cordillera' that documents the indigenous species. Lirio would like to see the book incorporated into the local school syllabus. "If children grow up knowing how useful these indigenous vegetables are, it could change the way the current young generation view them as only a poor man's food," said Professor Lirio. "It is unfortunate if the indigenous wild plants of the area shall be lost unless the work in raising awareness of these species is taken up and their nutritional and medicinal benefits are, once more, truly valued, not just by isolated communities but all across the northern Philippines", she added. (Nanzala & Gonzales-Lirio, 2008).

Also in BSU is an effort to conserve traditional rice varieties and vegetable legumes. Benguet and the rest of the Cordilleras are rich in traditional rice varieties and indigenous legumes that are rich sources of food nutrients. However, farmers' adoption of agribusiness is having a negative effect on traditional crop varieties. According to Dr. Macario Cadatal, dean of the BSU College of Agriculture, "the trend is for farmers to commercialize more cash crops. And with globalization demanding the use of modern varieties, production patterns are being groomed for the bank." This comes at the expense of the old and "less productive", but less demanding, local crop varieties that are more suited to the local growing environment.

The introduction of modern varieties has been both a boon and a bane as it has caused the neglect of local varieties of rice and legumes and the disappearance of much of the germplasm. Local rice varieties, called "rice landraces," that are under threat include the *kintuman*, *bangkitan*, *kabal*, *butalga* and *makanining*, according to Dr. Belinda Tad-awan, a BSU agronomist. (Cariño, 2006).

An environmental non-government organization (NGO) active in the Cordilleras, the Cordillera Ecological Center (or PINE TREE), is making strides towards the conservation of indigenous crop plants. It has established four community seedbanking sites in the region. In Karao, Bokod, in the province of Benguet, some 12 indigenous rice varieties have been saved and are now being grown by the Ibalois and Kalanhuyas. The second is in Lusod, Kabayan, in Benguet, where 29 endemic sweet potato varieties are now being grown for many uses by the same tribal groups. The third seedbank is in Caponga and the fourth is in Central Tublay, also in Benguet, where Ibaloi women-farmers now use seven indigenous bean varieties which is a way of conserving the germplasm. (Bengwayan, 2010)

BAR joins the fray

The Bureau of Agricultural Research itself has been drumming up

support for the conservation of indigenous crop species. This is in line with one of its major thrusts: Saving the agricultural biodiversity.

An early effort was a BAR partnership with the Taiwan-based R&D institution, The World Vegetable Center (also known as the Asian Vegetable R&D Centre), in which lesser known vegetables such as *bayok-bayok*, *himbabao*, *kulitis*, *talinum*, *basella*, and *lablab* were given their due importance in promoting nutrition. The collaborative project titled, "Promotion of Indigenous Vegetable for Poverty Alleviation and Nutrition Improvement of Rural Households in the Philippines," was implemented in the country in 2001-2006 through DA-Regional Field Units and the National Nutrition Council in cooperation with the local government units (LGUs). This initiative also jived very well with the Department of Agriculture's (DA) program on sustainable nutrition advocacy by promoting production, marketing and consumption of highly nutritious vegetables, and BAR's national RDE program on indigenous plants for health and wellness.

The project found that the "less popular veggies" continue to be underutilized because of the lack of available germplasm and seeds for widespread use, inadequate information on their use and importance, lack of information about their performance and input requirements, and insufficient information on how indigenous vegetables can fit into existing production systems. Furthermore, the traditional varieties are being replaced by high yielding commercial varieties, which are more profitable and preferred by

most producers and farmers, thus genetic resource of indigenous vegetables are dwindling and even at risk of extinction.

The project undertook the introduction and selection of indigenous vegetables and promoted these through technology demonstrations on proper cultivation and utilization in selected, target rural areas in the Philippines particularly those with high prevalence of malnutrition and poverty, i.e., the poorest provinces in Regions 5, 6, and 10. Likewise, the project promoted the growing of indigenous vegetables in home gardens and the production of seeds.

During the project's field days, indigenous vegetables were exhibited in plots for technology demonstration that showcased unfamiliar varieties of eggplant, amaranths, cucurbits, radish, bottle gourd, luffa (smooth and ridged types), wax gourd, bittergourd, snake gourd, squash, jute, basella, *kangkong*, ivy gourd, basil, lablab, rosella, okra, yardlong bean, winged bean, cucumber, tomato, and vegetable soybean.

Some 10 promising indigenous vegetables were found to have great potential based on nutrient content, medicinal and health benefits, non-food uses, and volume of production and food preparation. These included: *alugbati* (*Basella alba*), *ampalaya* for leaves or *bayok-bayok* (*Momordica charantia*), *himbabao* (*Allaeanthus luzonicus*), *kulitis* (*Amaranthus spp.*), *labong* (bamboo shoot, *upo* or bottle gourd (*Lagenaria siceria*), *malunggay* (*Moringa spp.*), *pako* (fern), *saluyot* (*Corchorus spp.*), and *talinum* (*Talinum triangulare*). (dela Cruz, 2009)

BAR is also participating in an

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agricultural biodiversity conservation initiative together with the DA Central Office, Department of Environment and Natural Resources (DENR), Department of Internal Local Government (DILG) and environmental NGOs under an umbrella project led by United Nations Development Programme (UNDP) Philippines titled, "Partnerships for Biodiversity Conservation: Mainstreaming in Local Agricultural Landscapes" which shall commence in 2011. Under this project, BAR shall take part in the development of policy and tools to assess the impacts of DA policies, plans and programs on biodiversity; and in the development of a national program for promotion of indigenous crops and biodiversity friendly agricultural practices. It will also work in partnership with local government units (LGUs) and its field offices in the sites to develop capacities of LGUs and implement these tools in demonstration areas.

Under the interagency biodiversity project, a specific responsibility of BAR is to partner with LGUs, academic/research institutions and farmers to set up protocols for in-situ/on-farm crop conservation. BAR shall develop a strategy and program for assisting LGUs to develop systems of in-situ conservation in farmers' fields and ensure sustainable operation of a community-based seed supply system. The promotion of indigenous crops and will be supported by an information and advocacy campaign so that upland farmers will learn the importance of propagating indigenous crops and sustainable management practices, and the benefits that they will gain. Among the crops to be promoted are indigenous rice varieties and indigenous vegetables.

BAR also funded a project implemented by Bioversity International titled, "Conservation and Use of Tropical Fruit Species Diversity in the Philippines". It responded to the need to systematically document existing collections of selected fruit species indigenous to the country (e.g., jackfruit, pili, mangosteen and durian), develop improved guidelines for their management, and characterize and

evaluate these genetic resources so that their useful traits as well as valuable accessions are identified. The project's partners include the National Plant Genetic Resources Laboratory (NPGRL) of the University of the Philippines Los Baños (UPLB), Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD), Bureau of Plant Industry (BPI) and selected state colleges and universities (SUCs). Expected results are a national fruit species collection database, accessions of various indigenous tropical fruit species with desirable traits identified for utilization, and a Framework Plan for the improvement of these tropical fruit species.

Everyday heroism for indigenous crop conservation

Elsewhere in the country there are heroic efforts on the conservation of indigenous crop plants that are unheralded and unsung. Little is known about these efforts except those that have reached the mass media and the internet such as the Benguet experiences. There is the purple yam (*ube*) that is grown by the communities of *Corella* in Bohol and *Kapangan* in Benguet; Native taro (*gabi*) is grown by the people of *Sablan*, Benguet; and indigenous rice varieties that are being conserved by concerned organizations in Panay.

Ube and other indigenous root crops are also the crops of interest to the Philippine Root Crops Research and Training Center (PRCRTC) which has gathered and protected these in *ex situ* collections while local varieties of coconut are held by the Philippine Coconut Authority (PCA). Not to be left out is the Philippine Rice Research

Institute (PhilRice) which counts indigenous rice varieties among its accessions.

Utilization is one way of conserving indigenous crops and this has been the experience with abaca which enjoys the patronage of the growing communities in Regions 5 and 8 and the Fiber Industry Development Authority (FIDA). The same is true with pili of the Bicol region which accounts for 82% of the country's production. As pili has all the potentials for being a top export commodity (it can compete with macadamia, cashew, almond and walnut in terms of quality), DA has launched the Pili Development Program to assist the Bicol communities, particularly those in Albay, in the production of pili nuts, pili resin, pili oil and other products.

Not to be outdone is UPLB. Based on the most recent inventory of the UPLB-based NPGRL, the laboratory holds a collection of nearly 400 species of various plants that include cereals, fibers, sugar cane, forage and pasture crops, fruit trees, legumes, nut trees, oil crops, plantation crops, root crops (including yams), small fruits, and vegetables. Of these, about 75 percent is of local origin. (UPLB-NPGRL. Unpublished document)

There is a need to safeguard the remaining PGR to conserve biodiversity for the next generations of Filipinos. More diversity means that our options for providing for future needs are much greater. At the same time, their potentials should be fully explored to optimize their utilization especially in broadening the food base to feed the growing population. (Antonio et al, 2010). However, it looks impossible to implement any conservation effort without involving the communities

There is a need to safeguard the remaining PGR to conserve biodiversity for the next generations of Filipinos. More diversity means that our options for providing for future needs are much greater.

where the indigenous crop species are found, as well as other stakeholders.

Finding the way forward

Following their study on the vanishing indigenous crops of Ilocos Norte, MMSU researchers have come to their own conclusion on formal efforts to promote the sustainable conservation and utilization of indigenous crops. This includes several actions (Antonio et al, 2010). They recommend that academe and R&D institutions undertake: proactive research on nutritive components of IFPs as well as development of new recipes and processed products; adaptability and domestication trial on wild plant varieties; improvement of cultural management for increased productivity; wider Information Education and Communication (IEC) campaign on the importance of IFPs and how people can help in conserving them; and capability building for potential adopters, entrepreneurs, and growers on processing, product development, and improved cultural management of crops.

On the part of LGUs, the MMSU researchers urge them to promulgate local (municipal or provincial) policies and ordinances on: identification and conservation of endemic or rare plant species' habitats; banning massive collection and export of unique species; integration and institutionalization of

barangay and home gardens in all municipal Clean and Green Programs; and establishment of community genebanks or seedbanks.

The Department of Education is exhorted to integrate IFPs on gardening activities of both elementary and high schools in the province.

The PINE TREE NGO in Benguet has also been dutifully observing the community/ stakeholder participation principle and, based on its experience, has concluded that there are five principles or "laws" of genetic conservation to the implementation of community-based seedbanking (Bengwayan, 2010). These are:

- Agricultural diversity can only be safeguarded through the use of diverse strategies. No one strategy could hope to preserve and protect what took so many human cultures, farming systems and environments so long to produce.
- What agricultural diversity is saved depends on who is consulted. How much is saved depends on how many people are involved.
- Agricultural diversity will not be saved unless it is used. The value of diversity is in its use.
- Agricultural diversity cannot be saved without saving the farm community. Conversely, the farm community cannot be saved without saving diversity.
- The need for diversity is never-ending. Therefore, our efforts to preserve this diversity can never cease.

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Health-promoting approach to tap PHL indigenous plants

by Rita T. dela Cruz

The Philippines is home to at least 13,500 species of higher vascular plants, indicating the high variety and variability of living organisms in this country. It holds the reputation of being the only country in the ASEAN region identified as a biodiversity hotspot (ACB, 2009). With this distinction, it is not difficult to imagine that there is a vast number and availability of plant species that could be tapped for their food-supplementing and nutritional values.

Even with the economic downturn, the demand for health and wellness products continues to increase. The rising incidence of illness and diseases associated with high-fat and high-cholesterol diets has prompted many consumers to be more cautious on

what they eat, hence, there is need to provide them alternative food sources that are not only safe and nutritious but readily available and cheap.

With this, the Bureau of Agricultural Research (BAR), through its "Indigenous Plants for Health and Wellness Program (IPHWP)," is addressing malnutrition in the country by instilling greater awareness of the potentials of and heightening consciousness on the importance of our unpopular and underutilized natural resources exemplified by indigenous plants. Once it reaches full implementation, this health-promoting approach shall contribute to sustaining of human systems and development, and increasing the level of the well-being, health and productivity of

individuals, families, communities, and even the whole society.

The IPHWP takes into consideration Philippine biodiversity, specifically targeting the plant species other than the conventional food crops that have health-promoting values. The program shall not only help improve the health status of the nation but shall also provide the strategy to distinctly develop Philippine products for niche markets.

Indigenous plants as functional foods

Indigenous plants are species or subspecies of wild flora naturally occurring or that have naturally established populations in the country. These indigenous plants can be tapped not only for their nutritious contents

(nutraceutical) but also for their healing (pharmaceutical) and beautifying (cosmeceutical) properties. And most, if not all, of them are readily available and abundant in the country.

Plants naturally contain phytochemicals which possess health-protective or disease-preventing properties. Phytochemicals are bioactive compounds that naturally occur in food plants and which are involved in health promotion and disease prevention. Edible plants providing health-promoting phytochemicals on top of conventional nutrition are called functional foods. The functional foods are foods or dietary components that may provide a health benefit beyond basic nutrition. (RDEAP, 2010)

According to studies, there are around 25,000 different phytochemicals in fruits and vegetables and other plants. Among the phytochemicals with proven scientific evidence for their health-promoting properties are carotenoids, phenolic compounds (flavonoids, phytoestrogens, phenolic acids), phytosterols and phytosterols, tocotrienols, organosulfur compounds (allium compounds and glucosinolates) and non-digestible carbohydrates (dietary fiber and prebiotics). These phytochemicals provide functionality on foods.

Phytochemical-rich fruits and veggies

Dr. Evelyn B. Rodriguez, an associate professor at the Institute of Chemistry, University of the Philippines Los Baños (UPLB), explained that there are many plants in our surroundings that are edible which contain nutrients needed for a healthy body. We just need to be aware of them.

In her presentation titled, "Food Phytochemicals Beneficial to Human Health: Local Food Plant Sources," she mentioned that the colors of fruits or vegetables determine the essential phytochemical that they contain.

Tomatoes, watermelon, and strawberries which are included in the red group are rich in two phytochemicals: lycopene, which reduces the risk of cancer; and anthocyanin, which delays several diseases associated with ageing.

Food Phytochemicals Beneficial to Human Health: LOCAL FOOD PLANT SOURCES

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Squash, mango, oranges, cantaloupes, and carrots of the yellow group are popular sources of beta carotene and flavonoids which reduce the risk of heart diseases, some cancers, and slow down ageing. Green vegetables such as *pechay*, *kangkong*, *gabi* leaves, mustard, spinach, *alugbati*, *saluyot*, and *malunggay* are rich in lutein, which helps maintain good vision. Eat eggplant, grapes, plums, *duhat* and blueberries which belong to the blue/purple group as these are packed with anthocyanin and phenolics which prevent cancer, heart disease and ageing. The

white/ tan/ brown group includes banana, garlic, ginger, onions, mushrooms, potatoes, and white corn which have allyl sulfides and polyphenols that reduce the risk of heart diseases.

According to Dr. Rodriguez, one does not have to eat raw food always to receive the health benefits of foods that are rich in phytochemicals. "Many phytochemicals are reasonably heat-stable and most of them are not water soluble meaning they are not appreciably lost during conventional cooking methods," she said.

Flavorful aroma of herbs and spices

Often, one describes a delightful culinary experience as having distinct tastes and flavorful aroma of herbs and spices in the dishes. Herbs and spices are natural flavoring agents used in cooking and food industry to season, enrich or otherwise alter flavor and odor of certain food to make them pleasing to the taste. (De Guzman and Reglos, 2007)

Although the use of these “natural flavoring agents” has not been that popular among Filipinos compared to the way other Asian neighbors have used them religiously in their meals, the demand for culinary herbs and its products is nevertheless growing with the emergent interest of people in organically grown products.

In a seminar presentation conducted at BAR by Dr. Leonora K. Verzola of the Cordillera Integrated Agricultural Research Center (CIARC), she mentioned how culinary herbs have slowly developed their own market niche. Although comparatively small at present, the organic section of the market is favoring the demand for culinary herbs, reinforced by the desire to consume natural/organic products. The trend towards a greater variety of ethnic cuisine also offers the prospect towards developing this niche for culinary herbs.

Part of BAR's program on



“Indigenous Plants for Health and Wellness” is the promotion of some of the most common herbs and spices indigenous to the country. Some of these are sweet basil, parsley, peppermint, rosemary, tarragon, thyme, oregano, fennel, cilantro, chives, black pepper, and turmeric. Consequently, the Department of Agriculture (DA) recently published a book to promote 10 herbs and spices including basil, cilantro, parsley, chives, mint, dill, fennel, tarragon, rosemary, and thyme.

Aside from their culinary use, the program is also looking into their use as

functional foods and as sources of nutraceuticals, pharmaceuticals, cosmeceuticals and raw materials for the industry. Some of the culinary herbs and spices being studied for their phytochemicals component are annatto, anis, sesame, *kasubha*, zingibers, *tanglad*, pandan, native *bawang*, native onion, *siling labuyo*, *Yerba Buena*, piper species, Philippine oregano, begonia, and *papaia*.

Aside from using and consuming them as fresh cuts, live plants, or dried—part of diversifying herbs and spices is done through processing and value-adding. Among the value-added products being developed are herbal teas, jellies, sauces, herbed vinegars, and wreaths.

Culinary herbs command high prices during off-season or when availability is low in conventional markets. Meanwhile, continuous and sustained production is needed for institutional buyers and eventual strong demand for organic and natural food stores.

Healing and beautifying plants

Aside from the nutraceutical benefit from plants, there are also those with cosmeceutical properties. Plants that go beyond the nutritive-, health- and food-enhancing benefits to humans are plants with healing and beautifying

next page



Health promoting...from page 10

elements or cosmeceutical properties.

They contain natural colors, inherent preservatives, oils and other exudates that can be tapped for the said purposes. Indigenous plants that are potential sources of these constituents are selected, studied and developed into various products for the industry.

One sector that could tap and make use of the potentials of these healing and beautifying plant species is the booming spa industry in the country. As the Philippines is one of the richest reservoirs of plants and animals in the world, it has an abundant source of indigenous and medicinal plants which are believed to have therapeutic benefits. This provides a competitive edge against other countries which are also into the spa industry.

According to Marjorie P. Lopingco of the Spa Association of the Philippines, Inc. (SAPI), tapping the potentials of the indigenous plants in the Philippines has a high prospect for the spa industry in light of the tremendous growth of salons and spas. These have become an antidote to the fast-paced lifestyles of the information age.

Pioneering effort for indigenous plants

For a long time now, the Department of Health (DOH) has been promoting 10 of the country's medicinal plants, namely: *akapulko*, *ampalaya*, *bayabas*, *bawang*, *lagundi*, *niyog-niyogan*, *sambong*, *tsaang gubat*, *ulasimang bato*, and *Yerba Buena*. In their studies, they noted that there are also essential oils that can be extracted from indigenous plants which have shown anti-bacterial, antiviral, anti-fungal, and anti-protozoal properties. Plant species producing oils and local essences are *sampaguita*, patchouli, *ylang-ylang*, lemon grass, and citronella. With the entry of the DA into the promotion of indigenous plants, the DOH effort shall come into full bloom.

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Stevia...from page 22

Truvia, and Pepsi Co.'s PureVia sweetener to be released. Both products use rebaudioside A derived from the stevia plant. Market

Following the US regulatory approval, the global market for stevia sweeteners was reported to have already hit \$500 million. The market research firm, Mintel, declared that this could reach \$10B given a few more years in the mainstream market.

Mintel further stated that stevia is projected to penetrate 20 - 25 percent of the global sugar and sweetener market. It was also reported that, while the US-based Cargill is now a major producer of stevia, China remains the largest producer of stevia leaves and their extracts which are exported mainly to Japan.

Local initiatives

After becoming aware of the benefits and potentials of stevia in the market and in improving the income of farmers, the Bureau of Agricultural Research (BAR) supported initial studies to propagate stevia. The Bicolandia Greenfields Development Organization based in Naga City and its researcher/consultant, Dr. Ma. Elena F. Quimio, are the main proponents of a project that is exploring the adaptability of the crop under local conditions.

Since stevia is known to be quite adaptable to diverse climates particularly in the tropics, the proponents are in the process of establishing a nursery that will serve as a source of planting materials for evaluation by farmer-cooperators. The goal of the proponents is to collaborate with farmer cooperators, who are the

beneficiaries of the project, in the documentation of the experience with the experimental crop and in the evaluation of results from propagating stevia that would help them to educate farmers on good agricultural practices and nursery production for stevia planting materials.

Opportunity

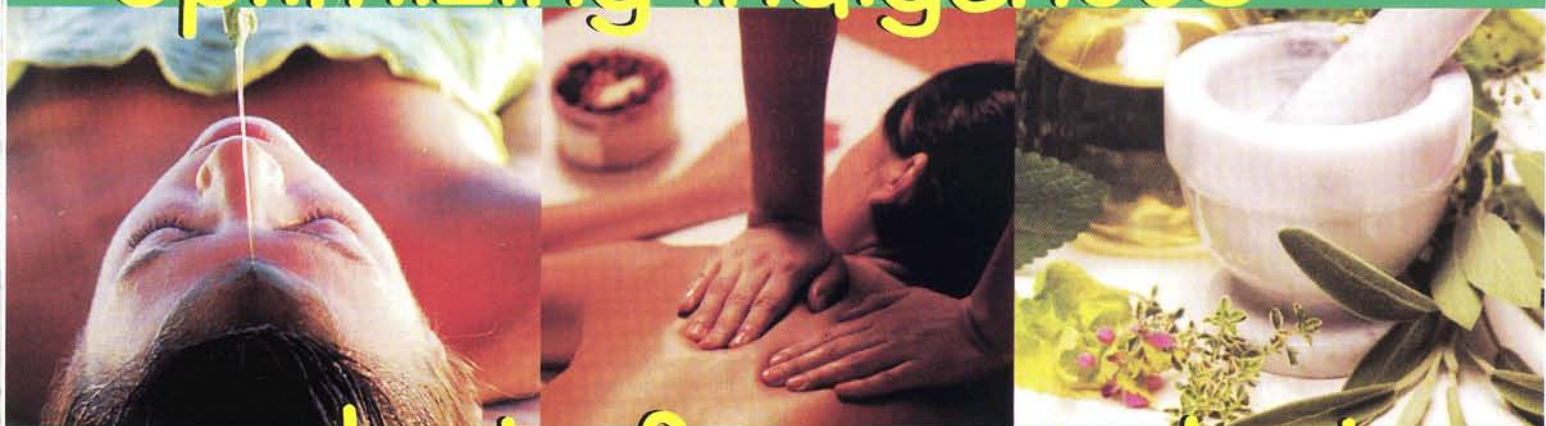
Besides the prospects of stevia in the market, the farmers might as well benefit from the natural ability of this herb to protect the farm. Stevia is likewise considered to have insect-repelling characteristics as it has a natural defense mechanism. Destructive pest and insects are turned-off by its very sweetness.

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Optimizing indigenous



plants for spa industry

by Ma. Eloisa H. Aquino

Swedish, Shiatsu, Thai, Reflexology, Aromatherapy, and Hilot, among others, are some of the most common types of massage availed of by increasing numbers of spa goers in the world. Here in the Philippines, there has been an escalation in establishing health and wellness spas driven by the rising demand of Filipinos, and even tourists, for these relaxation facilities. Massage has always been part of the Filipino's lifestyle.

But lucky enough for the country, health and wellness establishments are now using indigenous plants and locally produced oils. In the process, these are helping to promote and increase utilization of what the Philippines is naturally blessed with. Underutilized plants are now being given attention by the expanding industry.

How it started

The spa phenomenon started a thousand years ago in "Spau", a small town in Belgium. People in the area flocked to bathe in the healing waters due to the abundance of mineral springs in the town. The Europeans then introduced the Spa culture where they practiced "bathing culture" wherever hot or cold springs were found.

In the Asian and Philippine versions of spa, these introduced the use of ancient traditional therapies (*hilot*) and various healing herbs endemic to the region and the country.

In 2008, Health and Wellness Association of Quezon City President and then president of the Spa Association of the Philippines (Inc.), Ms. Marjorie P. Lopingco, talked about the prospects of the spa industry in using indigenous plants found in the Philippines in one of monthly seminars conducted and organized by the Bureau of Agricultural Research (BAR).

Ms. Lopingco reported that the

"SPAmania" was already earning US\$24.3B a year. "The Philippine Wellness Industry shows a 7.9 percent growth rate per year posting a 71 percent increase since 1999," she added.

To date, there are some 158 health and wellness-related registered companies in the country manufacturing organic and natural products, herbal and natural personal care formulations, herbal food supplements, and health services, according to Ms. Lopingco. In addition, these companies generated direct employment with 10-15, 15-30, 30- or more personnel for small, medium, and large wellness facilities, respectively.

The Philippines is blessed with abundant indigenous and medicinal plants which are believed to have therapeutic benefits.

PHILIPPINE OILS & LOCAL ESSENCES

USES AND HEALTH BENEFITS

Sampaguita (*Jasminum sambac*)

Patchouli (*Pogostemon cablin*)

Ylang-ylang (*Cananga odorata*)

Lemon Grass (*Cymbopogon citrates*)

Citronella (*Cymbopogon nardus*)

- used for treating skin diseases, ulcers and fever
awakens inner emotions like purity, innocence and sweetness

- scent in products like paper towels, laundry detergents and air fresheners
- hair conditioner for dreadlocks

- relieves high blood pressure, normalize sebum secretion for skin problems

- a medicinal herb and perfume ingredient

- helps relieve nervous tension and stress with its calming effect

- a major ingredient of insect repellants, soaps and perfume

Philippine indigenous plants for health and wellness

The Philippines is blessed with abundant indigenous and medicinal plants which are believed to have therapeutic benefits. The Department of Health has already endorsed 10 of the country's medicinal plants, namely: *akapulko*, *ampalaya*, *bayabas*, *bawang*, *lagundi*, *niyog-niyogan*, *sambong*, *tsaang gubat*, *ulasimang bato*, and *Yerba Buena*.

Locally-produced oils and local essences from indigenous plants and other local sources show anti-bacterial, antiviral, anti-fungal, and anti-protozoal properties. They are rich in medium-chain triglycerides (MCT), mainly lauric acid. "They provide instant energy and the only fat that induces weight loss and has many dermatologic and cosmetic uses," Ms. Lopingco said.

Other health benefits include improvement in digestion, nutrient absorption, and regulation of bowel movement and even a person's immune system. A good example is Virgin Coconut Oil (VCO). Other plants that yield the desired oils and local essences include *sampaguita*, *patchouli*, *ylang-ylang*, *lemon grass*, and *citronella*.

Public-Private partnership prospects

Ms. Lopingco advocates harmonized effort between the government and the private sector to further develop the industry. "There should be synergy in developing government standards and implementing guidelines, and constant consultation with the private sector," she added.

As for the government's initiative, the Department of Agriculture, through BAR, launched the Indigenous Plants for Health and Wellness Program (IPHW). The IPHW road map serves as the guiding document on the utilization, promotion, and development of indigenous plants and its health promoting properties.

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Exploring the potentials of rice-like *Adlai*

by Amavel A. Velasco

As of the date and time of this writing the world population had reached 6,893,429,555 (according to IRRI website). Of this mass of humanity, about half depends on rice as their main food. Rice is the staple for most Asians including the Philippines. Some of the Filipinos even eat rice 4 times a day, including *merienda*, of course. It is even claimed that almost 80 percent of the Filipino population spends one-fourth of their income on rice alone.

According to an article by the Ateneo Economics Association, the Philippines has been importing 15 percent of its rice supply annually which is equivalent to about 2.2 million tons of the commodity every year.

But with the top rice exporters like Vietnam, Thailand and Cambodia decreasing the amount of rice that they will export and China no

longer self sufficient and becoming a net rice importer, where does that leave the Philippines which is the number one importer of rice in the world? With these scenarios, how are we now supposed to feed our growing population?

We can turn to corn, yes. But most of the corn is being turned into other things like animal feed, oils (cooking oils, margarine) and now, bioethanol for fuel.

But these are not the only concerns we have to deal with.

There are many other threats to corn and rice production. To name a few, there are the conversions of agricultural lands to other uses, pests and diseases, and the ever increasing price of crude oil that also leads to higher fertilizer prices which, in turn, is synonymous to higher cost of production.



There is also climate change. In a symposium on Climate Change held in 21 January 2010 which was sponsored by the Agricultural Training Institute (ATI), Dir. Asterio Saliot said that 82 percent of the production areas of the Philippines are vulnerable to climate change effects, may it be to floods, drought or landslides. This will greatly affect not only our rice production but, ultimately, also the food needs of our growing population which consumes 33,000 tons of rice daily.

These are just a few of the reasons why we need to look for alternatives to the rice and corn crops. Sooner rather than later, we have to find ways to meet the national cereal requirement on top of rice and corn production.

And these are the main reasons why the Bureau of Agricultural Research (BAR) is exploring the potentials of *adlai*.

What is Adlai?

Adlai (*Coix lacryma-jobi* L.) is a freely-branching upright herb that can grow as tall as three feet and propagates through seeds. Also referred to as "Job's Tears" due to the tear-like shape of its grains (which are white or brown in color), it comes from the family *Poaceae* or the grasses, the same





family that wheat, corn, and rice belong to. Adlai is said to have originated in Southeast Asia.

According to the Bureau of Plant Industry (BPI), the leaves are 10-40 cm long, 2.5-4 cm wide, with the base broad and cordate. The spikes are 6-10 cm long, erect and peduncled, while the male spikelets are about 8 mm long.

Grains are usually harvested 4-5 months after sowing. Grains are separated from the stalks through threshing and, like rice, seeds are first sun dried before milling.

To date, there are two varieties known. One is *Coix lacryma-jobi* var. *lacryma-jobi* which has shelled *pseudocarps* which are very hard, pearly white, with oval structures and are used by craftsmen as beads for making rosaries, necklaces, and other objects. The other one is *Coix lacryma-jobi* var. *ma-yuen* which is harvested as a cereal crop and is also used as a medicine in some parts of Asia.

Uses of Adlai

As food and drink, *adlai* is widely cultivated as a cereal in Asia. In India, it is pounded, threshed and winnowed as a cereal. The pounded *adlai* is sometimes mixed with water just like the use of barley in making barley water. Some turn it into a sweet dish by frying and coating it with sugar. It is also boiled and eaten in the same manner as rice.

Grains are also used in soups and broths. In fact, in southern Vietnam, *sam bo luong*, a sweet and cold soup has *adlai* as its main ingredient.

Fermented grains, on the other hand, are also made into beers and wines. Aged vinegar is also made out of it in Japan. *Yulmu cha*, or Job's Tears tea, is a thick drink in Korea made from powdered *adlai*. Another liquor that is made from *adlai* and rice is called *okroju* in Korea.

Aside from its uses as food and drink, *adlai* is used as folk medicine and has pharmacological effects. It is said to be a folk remedy for a wide range of ailments such as abdominal tumors, both esophageal and gastrointestinal, as well as warts. It also finds use in treating abscess, anthrax, appendicitis, arthritis, beriberi, bronchitis, catarrh, diabetes, dysentery, dysuria, edema, fever, goiter, halitosis, headache, hydrothorax, metroxenia, phthisis, pleurisy,

pneumonia, puerperium, rheumatism, small-pox, splenitis, strangury, tenesmus and worms. Some of these claims though still need to be scientifically verified to warrant an "approved therapeutic claim" on labeled containers.

Meanwhile, studies indicate that *adlai* has anti-allergic, anti-mutagenic, hypolipemic, and anti-diabetic effects and exhibits anti-cancer activity. In a study by Hung et al in 2003, *adlai* seeds were found to exert an antiproliferative effect on human lung cancer cells in vitro and in vivo and prevent the development of tobacco carcinogen-induced tumors. The anti-cancer activity of *adlai* was further proven by the study of Lee et. al (2008), who isolated five active compounds from *adlai* bran that inhibit cancer cells. In traditional Chinese medicine, *adlai* hull extract is used to treat dysmenorrhea and was proven in a recent study that, indeed, it is a feasible alternative therapeutic agent.

Why Adlai?

The thing about *adlai* is that it is not new to us. It may be familiar to people but, unless its picture is shown, hardly anybody would be able to identify it. Also, it comes in different names.



Some of the local names are the following: *abukai, agagai, agda, aglai, alimudias, apagi, atakai, balantakan, barubaioko, bintikai, bitogan, dalai, damau, glias, kalabugau, kambot, katayan, katigbi, kibaoung, koldasan, kudlasan, lamudias, lias, paias, palias, pintaka, tidbit, tigbi, tiguas, tikaian*, etc.

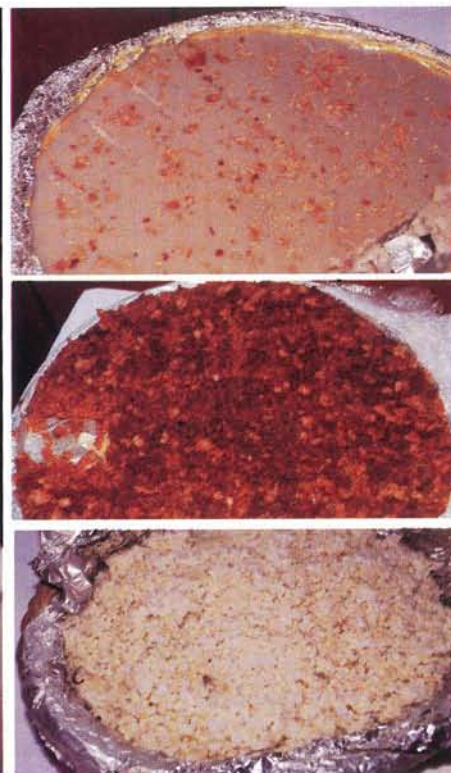
What's good about *adlai* is that some locals/tribes have been planting and eating it just like rice such as the Tumaned Pusaka Subanen dig Midsalip (TUPUSUMI) farmers from Zamboanga del Sur. There have also been some reports of it being planted in some parts of the country only that it has not been well documented and given priority until now.

According to TUPUSUMI farmers, who were generous in providing information about *adlai*, it requires minimal fertilizer in their land. In fact they don't need to apply any chemical fertilizer at all and, instead, they make use of organic matter like dried leaves, etc. It also requires minimal irrigation. Again from the testimonies of the TUPUSUMI farmers, there is no known pest or disease of *adlai* in their area. These could be attributed to the fact that the soil is already fertile and that they only plant *adlai* in small plots of their land together with other crops thus avoiding monocropping and reducing their exposure to the elements.

These things about *adlai* shall be verified or proven correct by BAR's RDE partners in the BAR Adlai R&D Program.

BAR Adlai R&D Program

The Department of Agriculture (DA), through BAR, in collaboration with the non-government organizations (NGOs), Earthkeepers and Masipag; four Regional Integrated Agricultural Research Centers (STIARC, CVIARC, BIARC and NOMIARC); one research station (Quezon Agricultural Experiment Station); and five State Universities and Colleges (Isabela State University, Southern Luzon State University, Central Bicol State University of Agriculture, Camarines Norte State College and



Central Mindanao University) are all set to explore the potentials of *adlai*.

The program is geared towards the development, promotion and utilization of *adlai* as an alternative or complement to rice and corn as a food source for Filipinos.

Researchers from the different partner institutions will determine the adaptability of the available varieties/strains of *adlai* in different sites and verify the package of technologies as to its cultural management. Postharvest/processing and seed production systems will also be developed along with food products and other by-products from the plant. The implementers shall promote *adlai*'s uses as food for the table, feed for livestock and poultry, and other purposes. The group is also planning to recommend promising *adlai* strains/varieties for NSIC registration.

Recent activities include the conduct of the Adlai Production Training cum Planning Workshop in Manolo Fortich, Bukidnon in September 2010 where the focal persons of the different partner institutions trained. In this activity, they tried their hand in making *adlai* into *sinaing, maja blanca* and

sinukmani. Another planning meeting on *Adlai* R&D was held in December 2010 which was graced by DA Secretary, Engr. Proceso Alcala.

There are now on-going crop adaptability trials cum seed production in all RIARCs and SUCs.

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Sapinit: Pinoy's wild berry

by Miko Jazmine J. Mojica

Local biodiversity has often been overlooked for its potential to make a significant impact in the struggle against malnutrition, sustainable source of livelihood, and agricultural risks.

If only enough attention and effort to the use and improvement of the production of natural crop resources were given, these would provide rural communities with more options to enhance their agricultural livelihood as they are locally available, affordable, and ecologically and culturally integrated.

Rediscovering sapinit

In Quezon Province, one such resource is the sapinit or wild raspberry which thrives in Mount Banahaw and in nearby towns such as Real, Infanta, and General Nakar. This plant has become indigenized after its introduction into the country in olden times.

In order to support the crop's production and conservation, the Bureau

of Agricultural Research (BAR) funded a project to develop a package of technology (POT) for sapinit's commercialization, from production to processing, in Quezon province.

The project's proponent, the Quezon Agricultural Experiment Station (DA-QAES) of the Department of Agriculture – Regional Field Unit 4 (DA-RFU 4), said in its progress report to BAR early this year that trials have been conducted to determine the best method for propagating the plant.

Project progress on culture and management of sapinit

In the progress report, the proponents stated that “data on percent mortality, field survival, growth habit, days to flowering, fruit set, yield, pest and disease incidence were gathered to determine which planting material at a particular fertilizer level is most suited for sapinit production.

“Initially, project activities were focused on the development of the POT since there is no locally available literature on its culture and management. We are trying to determine the crop's appropriate planting distance, fertilizer requirement, its susceptibility to pests and diseases, and other cultural management practices” said Dennis Bihis, part of the project team from DA-QAES.

He said that even if foreign literature were available, they might not be applicable to the local wild sapinit variety found in the Philippines particularly in the province of Quezon. Once the results of the trials are established by the project, Bihis said that they will publish recommendations on sapinit's culture and management.

Food products from sapinit

One of the objectives of the project is to develop food products from sapinit to take advantage of its

seasonality. Some of the products being developed and tested are jam, juice, and wine.

According to the QAES researchers, fresh sapinit berries are usually sold in markets near Mt. Banahaw such as San Pablo City, Laguna. However, he said, since vendors harvest them from the wild, only small quantities are available in the market. Since the fruit is seasonal, Bihis said that the price is usually pegged at Php180 per kilogram. "We are preparing fruit samples for submission to accredited laboratories for analysis. We have developed standard procedures for jam and juice and product samples are being prepared for analysis so that their shelf lives and nutrition facts can be determined," they reported.

Project leader Dr. Concepcion Amat, together with researchers Rolando Cuasay, Dennis Bihis, Lani Averion, Arnel Repaso, and Anniewenda Reyes, also reported that initial plant samples have been submitted to the National Institute of Molecular Biology and Biotechnology (BIOTECH) of the University of the Philippines Los Baños (UPLB) in Laguna, for analysis to determine the suitability of

various plant parts for food product development.

Project beneficiaries

As for the involvement of the project's intended beneficiaries, the research team coordinated with the local government unit (LGU) to identify the most suitable group that shall participate in the project's technology demonstration.

According to the proponents, the Rural Improvement Club (RIC) in Barangay Kinabuhayan, Municipality of Dolores was chosen since the group is located in the area where the crop grows, the members are willing to participate in the project, and the organization has a good track record with the LGU which supervises them in terms of local project implementation.

Most of the members of the RIC belong to farming families who usually produce vegetables, have an average household size of five members, and whose members have reached either elementary school or high school.

The beneficiaries agreed to establish the techno-demo area in Sitio

Bangkong Kahoy in Brgy. Kinabuhayan. The site which measures 1,000 square meters was established in March 2009 and the first harvest of sapinit was gathered in December of the same year. The fruits harvested from the techno-demo site were used for the trials on product development. Moreover, training on organic fertilizer production as well as the processing of sapinit into jam, juice, and wine was conducted at QAES.

"After the tests and trials are finished, the initial area will be expanded to serve as production farm where the beneficiaries can source their berries for processing or for sale as fresh produce," said the proponents.

Next steps

As of this writing, the project's Technical Working Group said they are already conducting trials on developing another product from sapinit - tea from its leaves. Moreover, the product label design for sapinit juice is being fine-tuned through the assistance of the Department of Science and Technology's (DOST) Packaging Research and Development Center. They added that they are also coordinating with LGUs for the establishment of other pilot farms within the province.

Indeed, indigenous crops carry lots of potential as a nutritious food source. They are easy to grow and are excellently adapted to the local climate. With adequate research and promotion, such crops can be the basis for viable livelihood options for the rural communities.

Furthermore, in the face of current challenges of extinction due to climate change and environmental degradation, conservation efforts for these crops will be beneficial not only for people but for all the entire chain of interacting components that is responsible for the healthy functioning of our natural ecosystem.###

For more information on sapinit production and processing, you may contact:
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Sesame

Nature's nutritious morsels

by Amavel A. Velasco

word street was later added for the setting of the show was in an urban street scene and thus the Sesame Street.

However, we are not going to talk about Sesame Street here but of the small seed that had inspired all of these. Sesame.

Sesame and its nutrients

Sesame or also known to the science community

as *Sesamum indicum* is an annual crop that grows from 50 to 100 cm and is said to be first domesticated in India. Its leaves are broad lanceolate, narrowing to just 1 cm broad on the flowering stem. The flowers are white to purple, tubular, 3 to 5 cm long, with a four-lobed mouth.

The sesame seeds are said to be rich in iron, magnesium, manganese, copper, and calcium. It also contains vitamin B₁ (thiamine) and vitamin E (tocopherol). They contain *lignans* as well called *sesamin*. *Sesamins* are phytoestrogens with antioxidant and anti-cancer properties. Sesamins are also being used as a dietary fat reduction supplement.

And just in case you're still wondering what it is, maybe this will help, it is called *linga* in our language.

And yes, it is one of the vegetables in the Bahay Kubo song.

Sesame seeds were in fact one of the first crops processed for oil as well as one of the earliest condiments.

As condiments

What do a Big Mac burger and a Chowking butchie have in common? Have you ever noticed? Look closely. It's the sesame seeds!

According to the Nut factory, about one-third of Mexico's sesame crop is exported to the United States and are purchased by McDonald's for their sesame seed buns alone.

The sesame adds flavor to the food. Some biscuits have also come with this small seeds and other popular dishes such as the honey chicken teriyaki.

It is being added to or complements a variety of foods but not that quite popular. Sesame seeds are small that's why some people haven't taken notice of it. But the fact still remains it adds to the savory flavor of the food. As they say, 'tis usually the small details that often left unnoticed.

Food products with sesame

In Japan, whole seeds are found in many salads and baked snacks. Tan and black sesame seed varieties are roasted and used for making the flavoring *gomashio* while in Greece, the seeds are used in cakes.

In Togo, sesame seeds are main soup ingredient while they are eaten on bread in Sicily and France. In Manipur, India black sesame is used as a favorite

Have you ever wondered what's with the "Open sesame!" and "Sesame Street"? Are they somewhat related? Well, aside from having the word sesame, what else?

The ever so popular catch phrase "Open sesame" from the Arabian Nights was inspired by the characteristic of the sesame seed that bursts open once it reaches maturity, also during those times sesame seeds symbolize "wealth". Sesame seeds yields sesame oil, which was expensive that time.

Sesame Street, an American children's television program, on the other hand was inspired by the popular catchphrase. It was a writer of the show that thought it would be nice to call it Sesame Street for Sesame conjures up a sense of excitement and adventure as in the story of Alibaba in the Arabian nights with the command "Open Sesame". The



side dish called 'Thoiding' and in 'Singju', both are kinds of salad. In Assam, black sesame seeds are used to make Til Pitha and Tilor laru (sesame seed balls).

Still in India, in Punjab province and Tamil Nadu, sesame seeds are made into a sweet ball called "Pinni". In Urdu and 'Ell urundai' in Tamil, "Yellunde" (sesame ball, usually in jaggery) in Kannada and tilgul in Marathi is made of its seeds mixed with sugar. Also in Tamil Nadu, sesame oil used extensively in their cuisine, *Milagai Podi*, a ground powder made of sesame and dry chili is used to enhance flavor and consumed along with other traditional foods such as idli.

In Charleston, South Carolina, sesame are made into seed cookies and wafers and while in Caribbean cuisine, it is used as sugar and white sesame seeds and combined into a bar resembling peanut brittle.

In Mexico these seeds are used as sauce additive in adobo and are also sprinkled over breads and cakes.

Sesame oil

In other countries the sesame seeds are more popular for the oil being derived from it. At present they said that the only available sesame oil in the market is the one imported from China and it costs about P92.50 per 148ml.

From 6 edible plant oils, sesame

oil is considered to have the highest antioxidant content. The sesame oil is usually used as cooking oil and as a flavor enhancer as well.

Sesame oil is used for massage (body, hair and scalp) and health treatments of the body and teeth (oil pulling) in the ancient Indian traditional medicine. If we have Listerine and Astring-O-sol now, then they have sesame oil as mouthwash. Indians also perceives the oil to pacify stress related symptoms.

Given the presence of high levels of polyunsaturated fatty acids, there is a claim that it can help control blood pressure and hypertension. Some therapeutic claims of sesame oil:

- Use of it can relieve lethargy, fatigue, and insomnia, while promoting strength and vitality, enhancing blood circulation.
- It has relaxing properties which eases pain and muscle spasm, such as sciatica, dysmenorrhoea, colic, backache, and joint pain.
- When used in infant massage can help calm babies and lull them to sleep improving the growth of the brain and nervous system. Also, there was a medical study in 2000 that claims that infant massage with the sesame oil improves the weight, length, and midarm and midleg circumferences of infants as

compared to other oils.

- It is also being recommended to alleviate dryness associated with menopause. Others claim that it can restore moisture to the skin making it soft, flexible and young looking.
- Others use it as a laxative, as a remedy for toothache and gum diseases, for blurred vision, dizziness and headaches.

Also, sesame or "til" oil is used as oil lamps kept in front of shrines for the Deities in Hinduism.

BAR's CPAR project on sesame

Sesame plantation is not so popular around the Philippines in fact rarely can you find a plantation of sesame. Sesame was a dying industry in Nabua, Camarines. A local used to say they did plant sesame for years but when there were no takers, it ceases to be.

Ten years ago, Nabua Camarines Sur candy processors used to buy sesame seeds from Burias, one of the major islands of Masbate. They would have to ride a bus and a boat to get the seeds. From Camarines Sur only to Masbate city takes about 150 km more or less. But then Burias is found in another island and takes another 20- minute pump boat ride from Masbate City port to get there.

When the demand for sesame increased in the Visayas region, most of



the seeds from Masbate were shipped to the region. And since sesame was not one of the major/priority crops of Nabua, where it was only planted after corn, upland rice, legumes, and other upland crops, and not to mention that there were no proper production technologies, the number of available seeds was not sustained until such time that the commodity slowly disappeared from the market.

After a decade, the sesame industry was revived through the CPAR project titled, "CPAR on the Enhancement of Sesame-based Farming System in the 4th District of Camarines Sur" which was funded by the Bureau of Agricultural Research (BAR).

Even if it is only in its first year of implementation, the CPAR project on sesame is already showing some potential.

The CPAR project was a collaborative project of LGU Nabua and the Bicol Integrated Agricultural Research Center (BIARC).

The project sought to address the critical problems of many upland farmers such low income, few livelihood activities, lack of capital, low production, lack of farm equipment and lack of irrigation supply.

Specifically, the objectives of the project included: 1) conduct research on the adaptability of different high yielding varieties of sesame, 2) apply appropriate technologies on the production and processing of sesame seeds, 3) develop

new products and by-products from sesame for local and export market, 4) generate detailed procedure on sesame oil extraction, and 5) document marketing scheme of sesame products and recommend better options.

BIARC incorporated into the project the five CPAR dimensions: 1) total farm approach, 2) total family approach, 3) total technology approach, 4) total community approach, 5) market driven and credit.

Initial accomplishments

Two barangays are beneficiaries of the CPAR, Topas and La Purisima, Nabua Camarines Sur. They did a preliminary planting of existing varieties in February 3, 2011. These varieties were collected from Iriga City and Nabua Camarines Sur and from Libon, Albay and another two varieties from abroad.

The farmers were trained on the various interventions and package of technology (POT) on sesame production. Training was conducted on November 25, 2010 at Farmers Information Center, LGU-Nabua with Ms. Jocelyn Ricafort of the Bureau of Plant Industry as the resource person who discussed and introduced the POT on the production and post harvest processing of sesame. The training was participated by the initial farmer-partners and would-be adoptors from Barangay Topas and La Purisima.

The farmer-cooperators were provided with locally available varieties of sesame and plastic straw, sacks, plastic

trapal and winnower for their post harvest processing since they have been complaining of the difficulty of harvesting during the rainy seasons.

"The fertilizer recommendation for sesame production is 20-20-20 in soil of low to moderate fertility. To be able to validate the rate in the CPAR site, a calibration trial was established on February 4, 2011 at Topas, Nabua, Camarines Sur," said Ms. Adante, CPAR researcher.

Adante, CPAR researcher.

She further added that the project also documented the existing processing of sesame candy of Ms. Elisa Mendoza, a farmer-partner in Topas in order to assess the possible gaps or improvement for the existing processing.

There were also initial negotiations done with Kolbi Machinery to design a decorticating machine/dehuller for the sesame seeds. Farmers practice of dehulling the seed proved to be difficult and time consuming. The idea of designing an oil extractor was also discussed.

An industry profiling was also conducted. The project hired personnel to interview sesame growers using set of survey questions for the industry profiling. There were 100 target respondents for two initial barangays where sesame production and utilization exist. Ms. Adante said that the goal of the said activity was to come up with existing production system/cost of production, products/by-product utilization, marketing system and markets and profit analysis.

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Stevia:

Zero-calorie natural sweetener

by Miko Jazmine J. Mojica

It may sound foreign to most Filipinos but to many health-conscious persons, stevia (*Stevia rebaudiana*) has been around as a natural sweetener for several decades already.

Grown for its leaves as a sweetener and sugar substitute, stevia is reported to be native to tropical and subtropical regions in North and South America particularly in Paraguay. In the Philippines, some farmers drawn to the herbal medicine trend have started to experiment planting stevia in small areas.

Health benefits

Although known for its bitter or licorice-like aftertaste, stevia is highly-praised for its remarkable sweetness compared to sugar. Foreign literatures report that crude stevia leaves are 10-15 times sweeter than table sugar while steviol glycosides or the refined stevia extract is

reported to be 200-300 times sweeter than table sugar. Thus, it is priced as a low-carbohydrate, low-sugar content natural sweetener of food and drinks.

There are also literatures claiming the medical benefits of stevia including its use in treating obesity, hypertension, and diabetes. It may even help prevent dental cavities and promote healthier skin.

Acceptability

While it is widely cultivated and used in countries such as Paraguay, Brazil, Japan, and China for a considerably long time already, stevia is restricted (US, Australia, New Zealand, Canada, Switzerland, France, Mexico) or banned (Singapore, Hong Kong, Norway) in some countries which do not fully consider stevia as safe.

In 2006, the World Health Organization (WHO), in a joint effort with the Food and Agriculture Organization (FAO), published the results of its "Safety evaluation of certain food additives" including steviol glycosides, the natural constituents of stevia. According to the WHO, among the 10 different glycosides, the group of organic compounds found abundantly in plants that yield sugar, the major constituents are steviol glycosides and

rebaudioside A.

After performing a thorough evaluation, the WHO concluded that steviol glycosides and rebaudioside A are not genotoxic or cause genetic mutations in vitro or in vivo and that the genotoxicity of steviol and some of its oxidative derivatives in vitro are not expressed in vivo. Moreover, the report found no evidence of carcinogenic activity and noted that steviol glycosides have shown some evidence of pharmacological effects in patients with hypertension or those with type-2 diabetes.

The report concluded, however, that further study is required to determine the acceptable daily intake (ADI).

Controversy

Defenders of stevia have pointed out that the real reason behind the bad reputation placed on stevia is its being a naturally occurring herb. As such, stevia is not patentable and would therefore not benefit the huge artificial sweeteners industry. Hence, the restrictions to stevia are believed by some to be due only to industry pressure.

However, in 2008, developments in the USA changed the image of stevia. After previously banning stevia, the US Food and Drug Administration (FDA) declared stevia as 'Generally Regarded as Safe (GRAS)' and this opened the floodgates for its use in that country. This ruling allowed Cargill's and Coca-Cola's

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It's NOT expensive to be well & healthy

Try TaHiKu!

by Rita T. dela Cruz



Talinum



Himbabao



Kulitis

There is a misplaced apprehension, now being addressed by the health and wellness cause, that it is expensive to eat healthy food, even buying raw vegetables. The truth is that, due to lack of awareness and adequate information, many consumers have limited themselves to the same types of vegetables everyday mainly because they are the ones available in the market.

Even though some unfamiliar local vegetables are more nutritious and cheaper—most Filipinos would still choose to buy say, for example, cabbage over *talinum*, eggplant over *himbabao*, or *kangkong* over *kulitis*. Most of these vegetables are “never heard of” particularly by Filipino urban dwellers, hence, they are often ignored and, therefore, remain underutilized.

Recognizing the importance of health and wellness as an important sector for economic growth, the Department of Agriculture, through the Bureau of Agricultural Research (BAR) in collaboration with other agencies, launched the “Indigenous Plants for

Health and Wellness RDE Program” to address food security and malnutrition by promoting, utilizing and developing the country's indigenous plants for health and wellness. Specifically, the program looks into the indigenous plants that can be studied as functional foods or those foods with dietary components that provide health benefits beyond basic nutrition.

If the standard for eating vegetables lies in its supplementing and nutritive value, TaHiKu would probably be on top of the list. TaHiKu stands for *Talinum*, *Himbabao* and *Kulitis*—three of the many underutilized but highly nutritious indigenous plant species that are abundant in the country. They are considered “indigenous” to the Philippines because they naturally grow abundantly in the rural areas. Not everybody is aware of their value as food and as affordable alternative sources of essential nutrients. High-yielding vegetables, being products of scientific breeding work, are not considered indigenous.

Indigenous vegetables are easier

to grow and are more resistant to pests, compared to commercially-grown vegetables but, at the same time, are also acceptable to local tastes. These make indigenous veggies suitable as cash crops in peri-urban systems, a source of vegetables for daily sustenance in home gardens, a source of new crops, and a source of variation for diversification in production systems and in the diet.

Talinum, a tangy taste to your dish

Often grown in household gardens, “*Talinum*” (*Talinum paniculatum*) goes by various names including waterleaf, cariri, Philippine spinach, potherb flameflower, and sweetheart. It is a low-growing herb and, for that, it is usually grown both as food and as an ornament. It can grow under harsh conditions and favors a hot climate.

As food, nearly all parts are useable as vegetable. *Talinum* is packed with Vitamins A and C and is high in calcium. The leaves are cooked in a similar manner as spinach but it comes out having a slight tang to it. Older

leaves are even tangier leaving a sour flavor to the dishes. It can be eaten raw as a salad or cooked as an ingredient of soups and stews. In the absence of *ampalaya* tops or spinach, talinum is a good alternative for *sinabawang mongo*.

For its health benefits, talinum has been used as aid for lactating mothers who have problems producing milk. It can induce sweating and also finds use as an enema for hemorrhoids. Other uses include treatment for liver and kidney problems. An on-going study on octacosanol, a dietary supplement extracted from the roots of talinum, has found the extract useful as an antiviral for treating human herpes and certain inflammatory skin diseases.

Himbabao, a uniquely Filipino veggie

Uniquely Filipino and not widely seen in other cultures, "Himbabao" (*Broussonetia luzonica*) is also known as *aluko* or *baeg*. Although common in specific areas in Luzon (Ilocos and Pangasinan), most Filipinos do not recognize this vegetable.

The himbabao tree grows up to 15 meters and is often found in thickets and second-growth forests at low and medium altitudes. The tree bears flowers that resemble caterpillars. It is easy to grow either as cuttings or as seeds and it can withstand harsh conditions.

This vegetable is very nutritious. The flowers are rich in Vitamins A, B, and C and are packed with calcium, iron, potassium, and phosphorous.

Both the flowers and the leaves are cooked and eaten. The taste of the flower is similar to stringbeans, only softer and seeds are absent. The flowers are usually boiled and served with condiments. They are also used as ingredients for stews, soups, and saute dishes.

Kulitis, more nutritious than spinach

Due to its similar flavor to spinach, the leaves of "Kulitis" (*Amaranthus spinosus* L.) are a good substitute. It is also called amaranth, Chinese spinach, tampala and pigweed. This vegetable is known as a symbol for immortality due to the longevity of its



flowers because, after they are picked, they retain their appearance and freshness long after.

It can be found abundantly in the Philippines and can grow wild in wastelands, dry areas, and pastures. It is a self-sustaining plant species and is drought-resistant.

It is sometimes considered a weed due to its unremarkable appearance and hardy nature. It has other varieties with colorful leaves (purple to yellow or red) that are often grown as ornamentals.

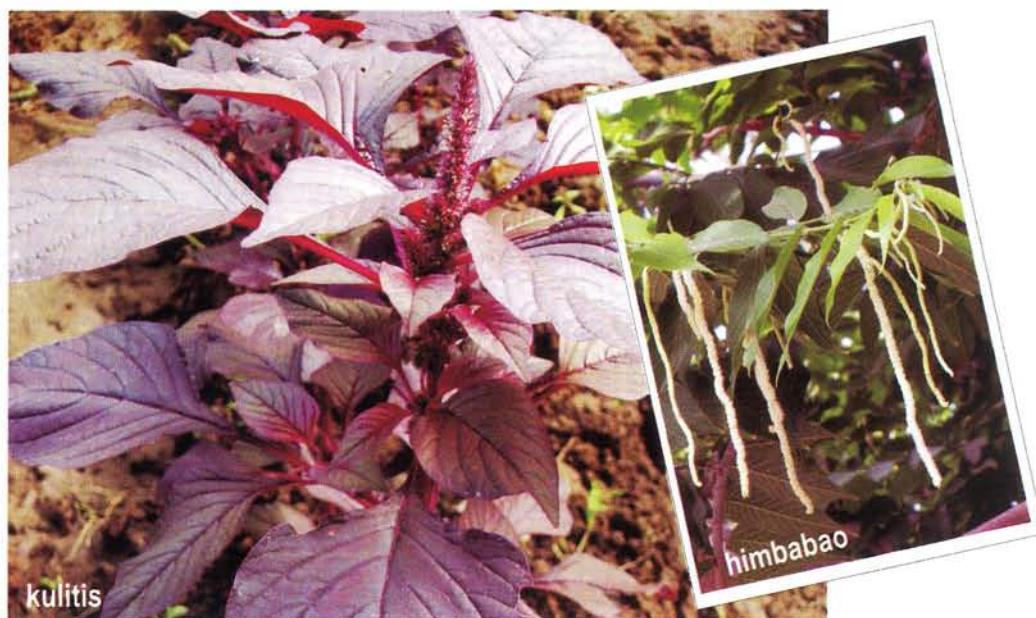
The leaves are rich in Vitamins B and C, and the minerals, iron and calcium. It can be used for salads, soups, stews and saute dishes.

On its health benefits, the poultices from the leaves of kulitis can be

used to cure acne. It is also used in treating boils or abscesses and as a remedy for snake and scorpion bites. Leaf extracts are used in treating dysentery and have shown antiviral properties.

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Extracting beneficial juice from **INDIGENOUS PLANTS**

by Ma. Eloisa

The Philippines has been blessed with indigenous plants but, more often than not, these have been neglected or remain underutilized. For a long time, little did we know that the parts of these plants have own unique characteristics and uses that can be processed into different forms usable to man. Many of these plants have medicinal properties and are now being exploited for their cosmetic and aesthetic values, for aromatherapy, or even their use as spices, food supplements and functional food.

There are around 760 Philippine plants known to have medicinal properties. In particular, Region 9 is one of the regions with an abundance of these plants and is where the practice of herbal medicine and the use of medicinal plants are extensive. Inexpensive as compared to commercial pharmaceutical brands, these botanicals have thrived in the region (Zamboanga del Norte, Zamboanga del Sur, and Zamboanga Sibugay) and are easily available.

DA RFU 9 takes up the challenge

In 2009, a study titled "Development and Promotion of Locally-Available Botanical Plants", was funded under the project 'Technology Management for Competitive Agriculture and Fisheries Sectors' by the Bureau of Agricultural Research (BAR) and the National Agriculture and Fisheries Council (NAFC), with support coming from the Japan Official Development Assistance's (ODA) - 2KR Program Grant Assistance for Underprivileged Farmers. Generally, BAR-NAFC projects aim to speed up the transfer of mature technologies for farmers' and fishers' (in the case of aquaculture and fisheries technologies) use for increased productivity and income by commercializing these technologies, thus, transforming agriculture and fisheries into market-driven sectors'.

"The sky-rocketing prices of synthetic medicines coupled with the increasing incidence of various human diseases prompted us to exploit the

existing herbs and plants in our backyard for good health and healing of illnesses," Project Leader Erlinda Gadon said. These medicinal plants have been found to curative effect for asthma, diabetes, hypertension, inflammation, fevers, and other respiratory and digestive ailments.

Support for this project is also in line with the program of the Department of Agriculture on promoting indigenous plants for health and wellness. The DA, through BAR, formulated the Indigenous Plants for Health and Wellness Program (IPHW). Together with BPI and the University of the Philippines Los Baños, BAR prepared the IPHW roadmap for 2010-2015. This is part of BAR's ongoing initiatives in coordination with other government institutions, SUCs, and private sectors to promote health and wellness and taking into consideration Philippine biodiversity.

The RDE program aims to have a more in-depth study of indigenous plants for various purposes such as functional food, herbal medicine, and as raw materials for pharmaceutical and cosmeceutical products.

Researchers from the Department of Agriculture-Regional Food Processing and Preservation Center and Western Mindanao Integrated Agricultural Research Center (WESMIARC) in Zamboanga Sibugay (of DA Regional Field Unit IX) implemented the project to increase the utilization of locally available botanical plants in the country.

The project aims to: compile and document the present practices & usage of botanical plants as supplement & as herbal medicine; encourage the extensive use of locally-available inexpensive botanical plants as supplements for illness prevention as well as cures for various diseases; and for advocacy to go back to the basic and traditional method of the prevention or curing of illnesses.

Turning out the juice

The study included the preparation of various juice concentrates of *malunggay* (leaves), with lemon grass, calamansi, and yacon. Tea preparations of yerba buena, miracle leaf, *lagundi*, gota kola, *banaba* and *malunggay* were also made for the tests. The indigenous plant raw materials were gathered from existing DA research stations all over the country, some of which may be found only in Region 9.

According to the project proponents, the plants used are scientifically proven to have medicinal and therapeutic properties other than as food. These include:

1. Malunggay or Horse Radish tree (*Moringa oleifera* Lam) is a lowly vegetable crop dubbed as a "miracle vegetable" for its health and medicinal properties. Vitamins A, C, and E are present in *malunggay*. Studies show that the crop could be an effective treatment for ovarian cancer due to the combination of antitumor and hormonal properties found in the root bark extracts. This could be a preventive crop against ulcer, arthritis, heart complications, and kidney diseases.
2. Lemon grass or *tanglad* (*Andropogon*

citratus DC Stapf) is known for its calming effect that relieves a person with insomnia or stress, and has antibacterial and antifungal properties. It can serve as a good cleanser that aids in detoxification processes in liver, pancreas, kidneys, and digestive tract.

3. Calamansi (*Citrus microcarpa* (Bunge) Wijnands) is one of the most common ingredients in juice preparations and can be processed either as beverage, syrup, concentrate, puree, jam, candies, and marmalade. But more than its many uses, calamansi is a rich source of Vitamin C.
4. Yacon (*Smallanthus sonchifolius*) is food for diabetic persons because of its low sugar content. It is also good for those suffering from renal disorders.
5. Gotu Kola, sometimes called "food for the brain" because of its energizing effects on the brain cells, has mild antibacterial, anti-viral, anti-inflammatory, anti-ulcerogenic effects.
6. Banaba (*Lagerstroemia speciosa* Linn.) has long been popular in treating urinary tract infections and even diabetes, edema, fever, jaundice, and dizziness.
7. Yerba Buena (*Mentha cordifolia* Opiz), one of the 10 herbs endorsed by the Department of Health (DOH), is an effective alternative medicine for headaches, toothaches and joint pains.
8. Lagundi (*Vitex negundo* L.) also a DOH-endorsed herbal medicine that is used for curing colds, flu, bronchial asthma, chronic bronchitis and pharyngitis.

Ms. Gadon and her team have conducted seminars and trainings to farmers, housewives, and out-of-school youth on botanical plants utilization and processing (juice and medicine). "We want to help farmers in the rural areas especially the low-income earners who cannot afford to buy medicines," she added.

Tests were conducted for the chemical components, pH, microorganism content, and the benefit and health values. Conduct of sensory evaluation have also been done in various educational institutions to determine the

taste, aroma, flavor, color/appearance, after taste, and over-all acceptability

According to Ms. Gadon, "Not only will these plants provide alternative medicine, especially for those less-fortunate individuals who cannot afford medicines, but it has other impact like income-generation and environmental effects. These can increase the income of farmers as additional or companion plants to their traditional crops," She added that these plants can help create more balance in the environment since some of the botanical plants are naturally insect repellent, thus reducing the need for chemical insecticides.

With the increasing demand for and popularity of alternative medicine, Ms. Gadon suggests that further advocacy efforts be made for herbal medicine and supplements by all concerned.

Ms. Gadon envisions that "Philippine indigenous plants can become a world class source for the most effective and efficient cures for human ailments and the means to maintain good health, thus making us highly productive beings."

The juice concentrates are priced at PhP100 per 325 ml bottle while the tea amounts to PhP 5 per tea bag. Product samples are now displayed and are being promoted at the BAR's Research & Development Technology Commercialization Center at Quezon City.

Consumer acceptance was noted in various local and national Agriculture/Trade Fairs, and activities sponsored by the local government units in which the products were shown. These activities have drawn a lot of interest in the plants processed into different forms as alternative medicine.

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This article was based on the study, "Development and promotion of locally-available botanical plants", by Erlinda G. Gadon and Marry Joy P. Flores of the Regional Food Processing and Preservation Center and Western Mindanao Integrated Agricultural Research Center (WESMIARC) of DA Regional Field Unit IX..

* List of Philippine Herbal Plants, <http://www.stuartxchange.org/CompleteList.html>

Adding a twist to dilis, now fortified with malunggay powder

by Patrick Raymund A. Lesaca

The signing of Presidential Proclamation No. 1280 in 2007 declaring October as National Health and Wellness Tourism month provided the impetus for the heads of national government agencies, including bureaus and other instrumentalities of government, to support the endeavors of the Department of Tourism (DOT) and the Department of Health (DOH) in promoting health and wellness in the countryside. Further, government agencies are directed to ensure the successful implementation of all the plans, programs and activities in accordance with the objectives of said Proclamation.

One institution that took the spirit of the proclamation to heart and which has since conducted research involving an indigenous plant is the Southern Luzon State University - Judge Guillermo Eleazar (SLSU-JGE), formerly the Southern Luzon Polytechnic College, based in Tagkawayan, Quezon.

Among the university's achievements are the development of new research and extension projects and establishment of new linkages with various government agencies that include the Department of Agriculture, Bureau of Agricultural Research (BAR), Land Bank of the Philippines and the ASEAN Regional Center for Biodiversity Conservation (ARCBC), as well as non-government organizations.

Various university research have been conducted every year, majority of which are in the areas of agriculture, bio-diversity, education, food technology, health sciences, and management. Specific to this endeavor is a research study on the utilization of malunggay and its health and wellness benefits. In 2010, SLSU-JGE collaborated with BAR on a BAR-funded research project titled, "Dilis - Fortified Malunggay Powder".

SLSU-JGE researchers were attracted to the prospects of *malunggay* (*Moringa oleifera*) as to its nutritive importance and health benefits. It may be used as an additive



or flavoring of various dishes and food delicacies, and, along this line, the university's researchers conceived of a project on dilis-fortified *malunggay* powder.

Increasing food consumption

The undertaking is meant to increase the levels of food consumption and awareness on highly nutritious foods blended and fortified with *malunggay* and is also geared towards generating market demand for processed *malunggay* fortified with marine products.

The objectives of the said endeavor are basically to help fisherfolk and rural residents improve their productivity and income; increase home consumption of highly nutritious yet inexpensive food; help reduce malnutrition and create livelihood opportunities for residents and non-residents of Tagkawayan.

Malunggay is rich in vitamins A, B, C, calcium, potassium, protein and iron. It also gives a feeling of wellness, gives non sugar-based energy, helps the body's natural defense, and stimulates metabolism. *Malunggay* is now being processed as food

fortificant, food supplement, and even medicine.

Once the technology is ready, this shall be disseminated through linkages and coordination with agencies and local organizations. The Local Government Units (LGUs), cooperatives, fisherfolk organizations and rural worker groups will be tapped to ensure success of the project.

With this project, BAR is fulfilling its part in providing the support and utilization mechanism stated in Presidential Proclamation 1280 in the technical and funding assistance accorded to SLSU. Ultimately, these efforts can only lead to the realization of economic benefits brought about by enterprises based on the finished product. ###

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Adlai Seed Production



Ms. Digna P. Narvacan (2nd from right), STIARC manager and project leader of the "Adaptability Trial of Different Adlai Varieties Under Lipa Conditioned", inspects the grains of *Adlai* (*Coix lacryma-jobi* L.) during a field visit/project documentation. Also in the photo is Ms. Julia A. Lapitan (3rd from left), head of the Applied Communication Division of the Bureau of Agricultural Research (BAR) leading the docu-visit with NBN's Mag-Agri Tayo. The *adlai* adaptability trial is being implemented by the Southern Tagalog Integrated Agricultural Research Center (STIARC), DA-Regional Field Unit 4A and funded by BAR. The three *adlai* varieties (*ginampay*, *tapol*, and *gulian*) are being tested in a two-hectare land at the STIARC station for seed production. Other adaptability trials are being conducted in DA research centers in Regions 2, 5, 9. PHOTO: PRDAFFON



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