

SOCIAL ACCEPTABILITY OF AYTA MAGBUKON INDIGENOUS FOOD PLANTS (IFPs) AS ALTERNATIVE FOOD SOURCES

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Abstract - To alleviate food shortage, the use of indigenous food plants should be encouraged for it can greatly aid in addressing the issue on food insecurity and hunger. This study aimed to determine the social acceptability of the Ayta Magbukon indigenous food plants as alternative food sources among the selected students, faculty and staff of Bataan Peninsula State University (BPSU). The IFP's included in this study are the shoots of four rattan varieties namely; Limuran (*Calamus ornatus*), Malauban (*Calamus microcarpa* Becc.), Palasan (*Calamus maximus*), and Ditaan (*Daemonorps mollis*). Also included are Aluloy (*Gonostegia hirta*), Takipan (*Caryota rumphiana* Ledd. Ex Martius), Antipolo (*Artocarpus blancoi*), Himbabao (*Broussonetia luzonica* (Blanco) F. Vill), Pingul Bato (*Begonia nigritarum* Steud) and Pako (*Athyrium esculentum*). From this indigenous food plants, six (6) dishes were prepared and evaluated through taste test. The respondents were presented the dishes prepared, and evaluated them in terms of color, flavor, aroma, texture and overall acceptability in normal environment using the 9 point Hedonic scale. Results showed that based on the different attributes, the 10 indigenous food plants which were prepared in six (6) dishes were all acceptable. Relevant information on the economic benefits of these IFP's in terms of food security had been determined. This had awoken the interest of the Ayta Magbukon in the protection and cultivation of this indigenous food plants from which they can actually earn an income by selling them to the lowlanders. The results intensified the promotion and awareness of the importance of IFP's to the community, most especially in protecting the beneficial plants from vanishing in the forest.

Keywords: IFP's, Ayta Magbukon, Hedonic Scale, food security, indigenous foods, social acceptability, vulnerable

INTRODUCTION

The Times magazine stated that food prices are soaring to record levels, threatening many developing countries with mass hunger and political instability. The Finance ministers of the Group of 20 leading economies discussed the problem during a meeting in Paris last February 2011 and how they can help. All have expressed their concern yet most of them were already breaking their promises to help. The Times magazine further disclosed that after the previous harsh price spike in 2008, the G-20 promised to invest 22 billion USD over three years to help vulnerable countries boost their food production. However, the World Bank which was supposed to administer the money has received less than 400 million USD (Manila Bulletin 2011).

The Times magazine added that food prices were now higher than the prices in 2008 peak. This was driven by the rising demand in the developing countries and volatile weather

conditions, including the drought in Russia and Ukraine as well as the dry spell in China that threatened the crops of the world's largest producer of wheat. The United Nations Food and Agriculture Organization (FAO) also warned that countries such as Uganda, Mali, Nigeria and Somalia in Africa; Kyrgyzstan and Tajikistan in Asia; Haiti, Guatemala, Bolivia and Honduras in Latin America were extremely vulnerable to instability because of rising prices. The recent catastrophe that hit Japan last March 2011 will likely double the anxiety the world experiences in terms of food security.

On July of 2006, former Philippine President Gloria Macapagal Arroyo decided to implement an all-out drive to cut hunger incidence in the country by half within one year. The Arroyo administration adopted a holistic approach to mitigate hunger through the Accelerated Hunger Mitigation Program (AHMP). The Philippine Food Insecurity and Vulnerability Information and Mapping System (FIVIMS) identified the food

insecure and vulnerable provinces to locate the hungry and poor families. The FIVIMS analysis showed that 49 out of 77 provinces (63.6%) in the country were vulnerable to food security in varying degrees. Only 10 provinces (13%) were classified as less vulnerable and 18 provinces (23.4%) and not vulnerable. The National Nutrition Council (NNC), in its role as oversight agency of the AHMP, recommended to the former President Arroyo to target the 49 provinces ranked as highly vulnerable by FIVIMS for the AHMP.

The AHMP had introduced the Food for School Program (FSP), a food subsidy program that provides a daily ration of one kilogram of rice to hungry families through children in Grade 1, pre-school and day care centers. The Gulayan ng Masa Program, also a component of AHMP promotes integrated backyard gardening in rural communities through training and provision of seeds and planting materials. Poultry, small ruminants, livestock and fingerlings were distributed in 38 Of the 49 FIVIMS/AHMP provinces. The Tindahan Natin project provided low-priced yet good quality rice and noodles to low income families through accredited stores.

Indeed, the programs implemented by AHMP have helped the Philippine government in its goal to reduce hunger and address the needs of the poor and hungry. However, the importance of indigenous food plants in subsistence agriculture as alternative food sources has been overlooked by the government, not mindful of its potential to contribute to food sufficiency and economic improvement of upland communities.

Radimer (2002) as cited by Belino et.al. (2009) stated that with the increasing population there is the need to address the issue on food insecurity and hunger, specifically in children. In order to feed the world's anticipated population of 9.3 billion people by 2050, , Belino et. al. (2009) articulated the production and justifiable distribution of more food than has been produced should be accomplished in an environmentally sustainable manner.

One of the alternatives recommended by researchers from different academes in the Philippines and abroad, specifically in Africa, as a solution to the problem of food security is the cultivation of indigenous food plants to supplement and fill the variety of food gaps or even replace some staple foods. These resources, often ignored by many people, could be important sources of nutrients. With this premise, the study was conducted to determine the social acceptability of ten (10) indigenous food plants of the Ayta Magbukon, prepared in six (6) dishes as alternative food sources. The dishes

subjected to acceptability test were the same dishes demonstrated and taught by the cultural masters to the students of the Ayta Magbukon School of Living Traditions (SLT), a research work conducted by the same researcher with funding from the National Commission for Culture and the Arts (NCCA).

METHODOLOGY

The study was conducted at the Bataan Peninsula State University Abucay Campus (BPSU-Abucay) where the Agriculture courses of the University are offered. It is located in Bangkal Abucay, Bataan, Philippines, approximately 300 meters above sea level and a home to a large concentration of Ayta Magbukon Tribe.

From the ten (10) IFPs of the Ayta Magbukon included in this study, six (6) dishes were prepared and subjected to taste test. One dish was prepared from four rattan varieties namely; Limuran (*Calamus ornatus*), Malauban (*Calamus microcarpa Becc.*), Palasan (*Calamus maximus*), and Ditaan (*Daemonorops mollis*). One dish each from Aluloy (*Gonostegia hirta*), Takipan (*Caryota rumphiana* Lodd. Ex Martius), Antipolo (*Artocarpus blancoi*), and Himbabao (*Broussonetia luzonica* (Blanco) F. Vill) and one dish for Pingul Bato (*Begonia nigritarum* Steud) and Pako (*Athyrium esculentum*) were also prepared. Table 1 shows the parts of the IFPs used in the study.

Respondents for the taste tests were carefully chosen based on their eagerness to take part in the study. They were the BPSU Abucay college students, faculty and staff. The respondents were asked to taste each dish and requested to answer the questionnaire on the awareness and acceptability of the Ayta Magbukon indigenous food plants.

The attitudes of the respondents towards the attributes or qualities of the prepared dishes were determined using the 9 point hedonic scale, the most common scale used for assessing food preferences. It is a balanced scale around a neutral point with category labels to be fairly evenly spaced psychologically. All six dishes were presented simultaneously, and the respondents were allowed to retaste the dishes and to alter their assessments until they were satisfied.

The respondents' preference of the dishes were evaluated in a normal environment. The attributes of color, flavor, aroma, texture and overall acceptability were evaluated. The dishes presented were ranked according to the following responses: like extremely; like very much; like moderately; like slightly; neither like nor dislike;

. Social Acceptability of Ayta Magbukon Indigenous Food Plants (IPFs) as Alternative Food Sources.

Table 1. Dishes from the 10 Ayta Magbukon IPFs

Dish	IPF's	Parts of the IPF's
Nilurok	Limuran (<i>Calamus ornatus</i>), Malauban (<i>Calamus microcarpa</i> Becc.), Palasan (<i>Calamus maximus</i>), and Ditaan (<i>Daemonorps mollis</i>)	shoots
Inlaga in Aluloy	Aluloy (<i>Gonostegia hirta</i>)	fruits
Tinuktuk	Takipan (<i>Caryota rumphiana</i> Ledd. Ex Martius)	shoots
Inluto in Gata	Antipolo (<i>Artocarpus blancoi</i>)	young fruits
Bulanglang na Babayan	Himbabao (<i>Broussonetia luzonica</i> (Blanco) F. Vill)	Leaves/flower
Imbuu ang Gagang sa Pako at Pingul Bato	Pingul Bato (<i>Begonia nigritarum</i> Steud) and Pako (<i>Athyrium esculentum</i>)	Leaves for Pingul Bato Shoots/fiddle head for Pako

dislike slightly; dislike moderately; dislike very much; and dislike extremely. Data were analyzed using descriptive statistics.

RESULTS AND DISCUSSION

This study gives indications that IPFs should be considered as a serious issue when it comes to developing strategies to fight food insecurity and develop integrated development programs for chronic food insecure areas in the Philippines as well as in other parts of the world.

Thirty (30) respondents were carefully chosen for this study. Of these, seventeen (17) were males and the other thirteen (13), were females. The respondent's age ranged from 18-41 year old for males, and 18-52 years for females.

Results revealed that all respondents were aware of the Ayta Magbukon IPFs. All of them would eat the foods, if offered to them. Furthermore, almost all respondents have displayed awareness of the nourishment and medicinal value of the IPF's used in this study. As seen in Fig. 1, even without using basic statistical

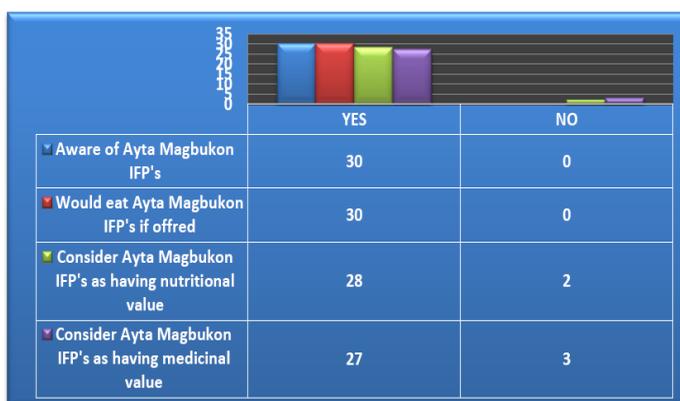


Fig 1. Awareness on The Ayta Magbukon IPFs among Selected Students, Faculty and Staff of BPSU Abucay Campus

David

tools, it could be said that the Ayta Magbukon IFP's have been easily accepted as alternative food sources.

The overall acceptability of the Ayta Magbukon IFP's as shown in Table 2 and well represented in Fig. 2 is a manifestation that IFPs can be potential food sources. All respondents answered positively, with answers varying from

“like slightly” to “like extremely”. Nilurok and Inlaga in Aluloy received the most LE responses while Tinuktuk and Bulanglang na Babayan received the most LS responses. Imbuu ang Gagang sa Pako at Pingul Bato and Inluto in Gata received the most LVM responses followed closely by Inlaga in Aluloy. Bulanglang na Babayan received the most LM responses followed by Inluto in Gata.

Table 2. Overall Acceptability of Ayta Magbukon IFP's Among The BPSU Abucay Campus Respondents. Values Are Stated in Percent (%).

IFP's dishes	n	DE	DVM	DM	DS	NLD	LS	LM	LVM	LE
NILUROK	30	0	0	0	0	0	6.67	20.00	30.00	43.33
INLAGA IN ALULOY	30	0	0	0	0	0	10.00	13.33	40.00	36.67
TINUKTUK	30	0	0	0	0	0	30.00	16.67	33.33	20.00
INLUTO IN GATA	30	0	0	0	0	0	13.33	26.67	43.33	16.67
BULANGLANG NA BABAYAN	30	0	0	0	0	0	16.67	40.00	36.67	6.67
IMBUU ANG GAGANG SA PAKO AT PINGUL BATO	30	0	0	0	0	0	3.33	20.00	46.67	30.00

Legend: n- number of respondents; DE- dislike extremely; DVM- dislike very much; DM- dislike moderately; DS- dislike slightly; NLD; neither like nor dislike; LS- like slightly; LS- like slightly; LM- like moderately; LS- like slightly; LM- like moderately; LVM; like very much; LE-like extremely



Fig 2. Chart representation of Ayta Magbukon IFPs overall acceptability

. Social Acceptability of Ayta Magbukon Indigenous Food Plants (IPFs) as Alternative Food Sources.

The figures which follow represent the respondents' attitude towards the attributes or qualities of the IFP's. Generally, all respondents had a favorable acceptability to the color (Fig. 3), flavor (Fig. 4), and texture (Fig. 6) of dishes presented in the study, ranking the dishes as "liked slightly" to "liked extremely".

For aroma, similar positive responses were obtained (Fig 5). Ninety six percent of the respondents indicated favorable acceptability for this attribute and only 4% responded neither like nor dislike (NLD).

the community, through habit and tradition, as appropriate and desirable sources and the people are accustomed to preparing and eating the dishes made from these sources (FAO, 1998). Local or indigenous communities are the as custodians and stewards of these IFPs forthey have a close relationship with these resources, depend on these to ensure food availability when they do not have enough money to buy food from outside sources. This is the case of the Ayta Magbukon, an indigenous people of Bataan, who for many years have recognized the importance of these food plants in their way of life.

Indigenous foods are food accepted in

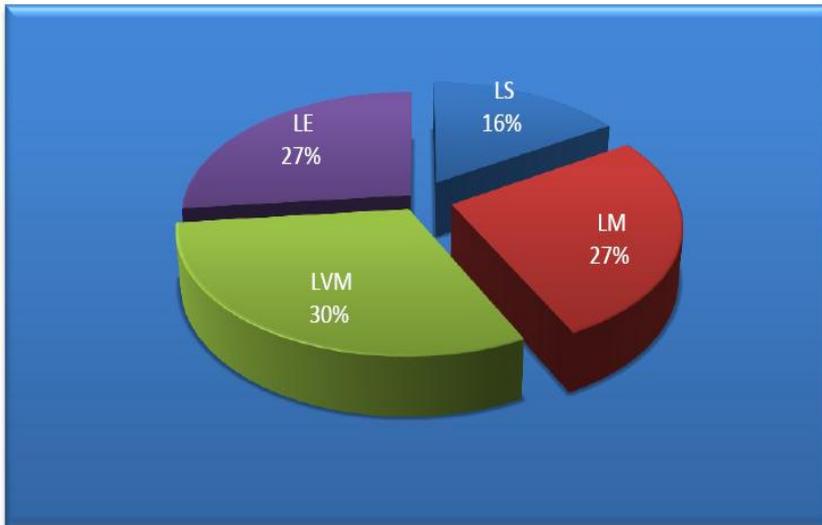


Fig 3. Respondents' Acceptability of Ayta Magbukon IFPs according to Color.

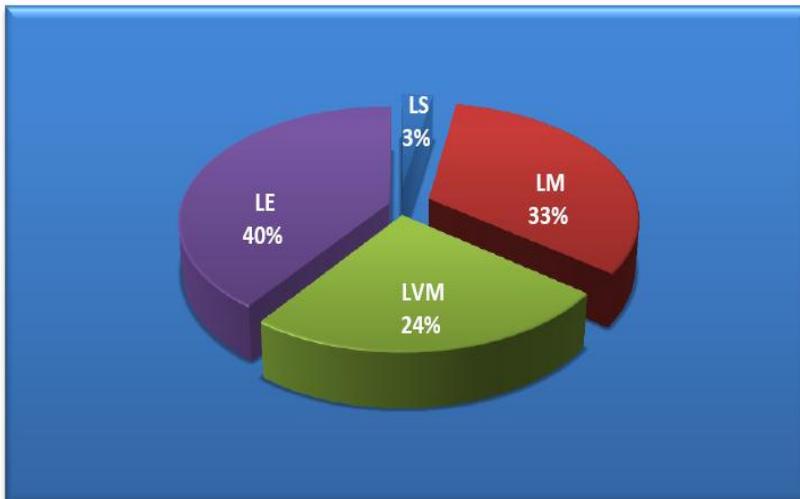


Fig 4. Respondents' Acceptability of Ayta Magbukon IFPs according to Flavor

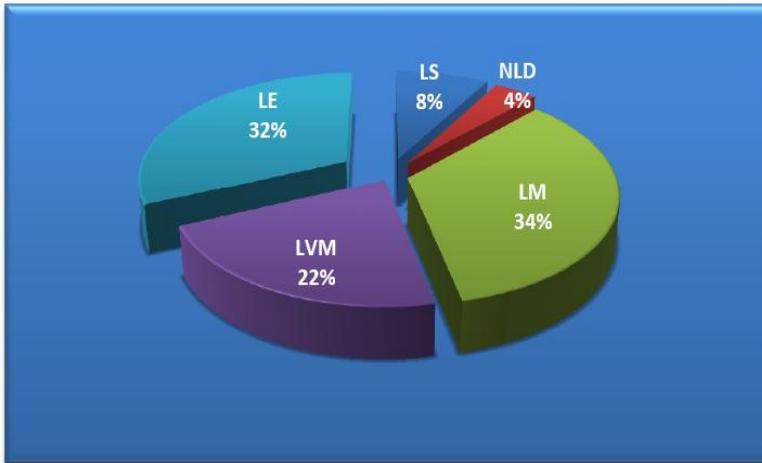


Fig 5. Respondents' Acceptability of Ayta Magbukon IFPs according to Aroma.

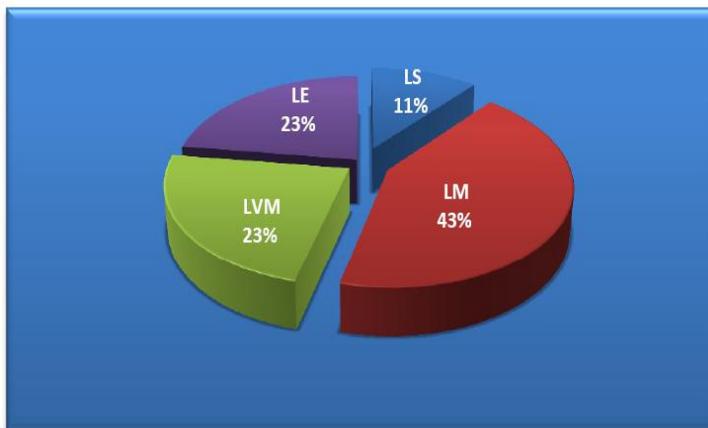


Fig 6. Respondents' Acceptability of Ayta Magbukon IFPs according to Texture

Beyond the nutritional value of the Ayta Magbukon IFPs used in the study which were believed by the respondents, the awareness of the medicinal properties of these IFPs were acknowledged. In the Philippines, there are many studies and researches by the academe and other agencies on the medicinal value of indigenous people food plants specially the ones used by the Aytas. The researcher of this study is documenting the medicinal plants of the Ayta Magbukon, and so far, had documented 38 plant species used by the Ayta Magbukon in certain illnesses such as diarrhea, nausea, cough and malaria. According to the elders, they have been using these plant

sources from time immemorial and are effective. However, it need be studied and confirmed through laboratory analysis.

All respondents were cognizant of the existence of the Ayta Magbukon IFPs. However, they have access to commercially produced foods, hence, the IFPs are being ignored. The results of this study is promising since all respondents expressed their fondness in tasting and eating the IFPs, in general displayed acceptability of the attributes of the IFP's in terms of color, taste, aroma and texture. The results may not be the same in a bigger number of respondents but AFIC (2003), as quoted by Belino et. al. (2009), said

. Social Acceptability of Ayta Magbukon Indigenous Food Plants (IPFs) as Alternative Food Sources.

that according to research, consumer acceptance develops quite rapidly when the benefits of intake to daily diet and health become obvious.

The future demand for food will be driven by population growth and rising incomes; increasing the demand for meat, vegetables, fruits, and other staples. In order to feed the country with a population of more than 90 million, the use of both traditional and nontraditional indigenous food sources should be encouraged, since it can be of enormous assistance in addressing the issues on food insecurity and hunger.

It is inspiring to know that locally, the Talaandig Tribe of Bukidnon has taken the step in addressing this food problem by establishing a food security program (Belino et. al 2009). In Ilocos Norte, the Don Mariano Marcos State University has taken the initiative to document, conserve and promote the Ilocos Norte IFPs (Fernandez, 2011). In Bataan, the Bataan Peninsula State University has surveyed and documented the Ayta Magbukon IFPs for conservation, promotion and protection (De Guzman and Alegado, 2010). The Benguet State University is also conducting research on the classification, conservation and promotion of the ethnic groups in the Cordillera Mountain range (Solimen and Gayao BSU ret., 2011).

The government should be supportive to these endeavors and should encourage more researchers that aim to establish the health benefits of IFP's. Tecson-Mendoza (2007), as cited by Belino et. al (2009) specifically emphasized the need for studies on the functional attributes of traditional foods and of newly developed ones, to establish their health benefits and determine the recommended amount and frequency of intake needed to obtain the benefits. John Marks of USAID (1999) highlighted that the level toxicity of some IFP's worldwide has yet to be determined in a bio-chemical analysis process and their sustainability and palatability for human consumption need to be ascertained. Therefore, it seems imperative to carry out applied researches on the nutritional values of these IFP's and their potential impact on human health as a result of prolonged consumption.

CONCLUSION AND RECOMMENDATIONS

The perception on the nutritional, medicinal and economic values as well as the acceptability of the 10 Ayta Magbukon IFPs among the BPSU Abucay campus students, faculty and staff prepared in six dishes were determined in this study. The results imply that people are conscious that these IFP's not only

affect nourishment but also the health of the body. In the brink of food crisis brought about by various factors that recently hit different countries such as calamities and soaring food prizes, the utilization of these food sources as sustenance should be encouraged by the government. These IFPs have the potentials to contribute to food sufficiency, community health and economic improvement of upland communities such as the Ayta Magbukon.

The local government units (LGUs) should promulgate policies and ordinances pertaining to IFP's, such as conservation and protection of the habitats of endemic and rare plants species. The improvement of cultural management for increased productivity should also be considered. Wider information and educational campaign should be elevated to the potential and value of these resources and the need for protection and management to avoid exploitation. Lastly, the importance of these IFP species in the protection of the environment should also be raised.

There is a need, however, to address the absence of available research on the nutritional value and health benefits of these IFP's. The Academe and R&D institutions should undertake practical research on nutritive components of these IFP's as well as development of new recipes and processed products. Findings of the research should be disseminated through publications and extensions workers.

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David

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