

A COMPENDIUM OF INDIGENOUS VEGETABLES OF ABRA

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ABSTRACT

This study primarily aimed to compile indigenous vegetables commonly found in Abra. Specifically, it characterized indigenous vegetables in terms of scientific name, morphological structures, growth habits, nutritional contents, and their cultural requirements. It documented the morphology of the vegetable species.

Descriptive analysis was applied as a research design for the compendium of the specimens.

Sample specimens were brought to UP Diliman Department of Botany for scientific identification. Actual structures were described in the ASIST Bio lab through the use of microscopes aided by a classification and description key surfed from the web and other library references. Edible structures of each specimen were brought to SLU-NSRU, DOST-Baguio, or UNP Vigan for chemical analysis. Samples of seeds were planted and observed until fruiting time. Pictures or diagrams of each structure were taken or made for documentation.

Data included the classification and identification of each species, its morphological characteristics, its growth habits, and its chemical contents and other cultural requirements of each crop. Five of the seventeen species were newly identified by UP Diliman Department of Botany: Bagbagura and Siksiklat belong to family Leguminosae, Ampupuyat belongs to family Asclepiadaceae, Karimbobet to family Olacaceae, and Pikaw to Family Aracaceae. They have similar root system, stem texture, ovary type, germination time and plant type. The rest of the group belongs to Tiliaceae, Araceae, Aspidiaceae, Amaranthaceae, Moraceae, Cucurbitaceae and Moringaceae.

They differ in many aspects like leaf complexity and arrangement, flower style and inflorescence; fruit types, seed types, habitat, flowering and fruiting time, and type of reproduction. Each of them has its own peculiar characteristic different from all the others. They contain varying amounts of nutrition contents like carbohydrates, fats proteins, food calories, ash, fiber, and moisture including essential minerals and vitamins and other physiological active components. These indigenous plant species can be considered sources of essential nutrients for good nutrition and other chemical substances potential for disease prevention and treatment as they possess medicinal properties.

The wild species of crops can be domesticated and cultivated in backyard gardens or in small scale farming for household consumption as manifested by their wide range of adaptabilities.

It is recommended that a more in-depth characterization or research on improving varieties can be conducted for a more complete documentation. Further investigations on other ways of preparing them as food can be conducted in order to maximize their use and significance as vegetables.

Farmers can engage on a larger scale production considering the low cost requirements of these species. Campaigns for more species as vegetable potentials should be conducted.

I. RATIONALE

Plants account for the largest propagation of the earth's biomass. They provide oxygen, shelter, medicine and the foundation of the food web, determining the survival of other organisms including humans.

Factors such as low income, malnutrition or poor health, and loss of biodiversity greatly affect the quality of life in the country. Indigenous vegetables and their production can be used to address these factors.

The province of Abra possesses a variety of indigenous vegetables carrying a big segment of its bio-diversity. These native floras have been the bounty sources of food for the people, thus constituting the major part of their dietary components and providing vast spectra of nutrients for their nutrition. Food is key to survival and critical for physical and mental development. Efforts to improve quality of life should start at improving access to food-according to Phil Plan of Action for Nutrition, 2005-2010 of the National Nutrition Council.

Production of indigenous vegetables for commercial purposes can help alleviate poverty among populations. Vegetable production revenues reach almost 30 billion pesos every year that makes up 9-10% of the country's total crop sales. The supply of vegetables in the province of Abra comes mostly from those grown domestically and little from those that simply grow in the wild. This is true because we live in the area of commercialization, developed transportation and much improved marketing systems, thus, making agricultural production market-oriented rather than catering to the needs of the local population. Markets and what the markets could supply started to constitute the classy and costly dietary component ignoring the more nutritious local items.

Such market orientation and commercialization for food production led to the devastation of local varieties resulting in the occurrence of several problems like food shortage and malnutrition. Such an observation could be backed up by the 2004 survey of the Provincial Health Office, 18.09% of the 30, 224 Pre-schoolers ages 0-71 months, from the province of Abra who have undergone Operation Timbang, were considered malnourished. In Lagangilang alone, it is 21.89%, while it is 23.4% in the whole Cordillera and 30.6% in the whole Philippines.

Utilization and increased production of indigenous vegetables can promote economic opportunities, empowering the poor and enhancing social security to alleviate poverty and better nutrition. Improved nutrition is an integral component of a wider community development potential for addressing food income needs for the poor.

Knowledge on the use of these local plants is part of the indigenous knowledge systems and practices of indigenous people in the region, country, and the world over which they passed from one generation to the other. The experience of learning from indigenous people and enhancing their Indigenous knowledge Systems and Practices (IKSP) through research is one way of advocating their culture. It is important to document site-specific practices as baseline for further undertakings. Indigenous knowledge is an immensely valuable resource that provides humankind with insights on how communities have interacted with their changing environment as advocated on the Convention on Biodiversity for conservation and sustainability of agricultural and natural resource management systems. (Colting, 2008)

Our local vegetables are now at risk, on the way to extinction. They are being replaced by high-yielding commercial varieties. Once an indigenous variety is lost, it is

lost forever. This research could be a hold-on to prevent the loss of valuable indigenous vegetables.

This study will contribute knowledge to the current campaign of Asian Vegetable Research Development Center regarding collection, utilization, as well as documentation. A lot of these species are still unidentified and uncharacterized yet they are advantageous ones.

II. REVIEW OF LITERATURE

Plant Documentation

The National Center for Plant Genetic Resources stated that the latest surveys regarding the utilization of indigenous vegetables in Poland support the opinion that these vegetables are in danger of extinction, as a result of on-going cultural changes of the countryside. It also stated that despite this situation; old vegetable varieties are still grown in the north-eastern regions of Poland; that fairly large proportion of the Polish population, who preserved their ethnic traditions, still grows a lot of local varieties of vegetables.

It further added that proper documentation of these native products could help promote their importance thus helping to ensure the preservation of their current status as the major dietary components for the native Polish people.

Malaguit (2006) supports the idea that awareness of the importance of the different indigenous vegetables not yet identified and characterized in our locality, can lead to creating a deeper interest in finding out how to propagate them and to discover their potential to make products out of them.

Pataray (2006) states further that the International Center for Underutilized Crops claimed that throughout the years they have been promoting indigenous plants for food and industrial uses. Their activities have focused on dissemination of information on indigenous crops conservation. At present, they still continue to promote and strengthen national capacities to use the indigenous crops of importance for food security and industry. The essence of these programs is identifying, evaluating, conserving the genetic variability of crop and wild species and proper documentation of these with the aim of its utilization and adaptation to a country's needs.

www.kpreds.org.pdf discussed that there are several research programs aiming for the revival of the traditional and indigenous cultivation practices, local vegetable varieties and other potential varieties responsive to natural farming technique without chemicals and fertilizers, as stated by Pataray (2006). It further discussed that promotion and documentation of naturally grown vegetables are part of their research.

Malaguit (2006) points out that by raising the status of indigenous knowledge in the eyes of local communities, people get respected for their own culture and thus people in the locality will know to consume their cultural native vegetables before consuming exotic ones.

A review of species shows that indigenous vegetables could make a positive contribution to world food production. Indigenous vegetables are generally uncultivated and underutilized (Engle and Altovero, 2000).

The Asian Vegetable Research Development Center, as stated further, is looking seriously at the potential of underutilized, locally grown vegetables to increase incomes and improve nutrition in the developing world. It is working to stem the loss of valuable

indigenous vegetables, screening for nutritional value and ability to fit-in year-round production systems and joining efforts with other national partners to collect and conserve indigenous vegetables.

Many small-scale farmers and market-gardeners in many cities of the developing world and the surrounds propagate and make use of indigenous vegetable species largely overlooked by research and development agencies. These species collectively represent a vital store of biodiversity for local, national and international gene pools. These species offer significant opportunities for development of new varieties and crops in order to conserve the local knowledge and genetic strains, provided swift action is taken. Urban agriculture is widely practiced in many cities providing income, nutrition and often a safety-net function to the poorest sectors of society, and as such is an important but under exploited vehicles for poverty alleviation. It makes productive use of undeveloped land, but frequently not considered in urban land use planning and zoning processes and outcomes. (Graham's town, South Africa Jan. 2008)

Conservation and sustainable use of the genetic resources of indigenous food crops offer a tremendous tool for addressing the problem of food security-inadequate quality and quality-at both national and household levels. The food base for the rural population, in the marginal and semi-arid areas, has become narrower, leaving communities more vulnerable to food shortages and nutrient-deficiency diseases. Wild and weedy species, commonly used as vegetables in the past, are disappearing as a result of changes in customs and land use. Local knowledge about the cultivation and management of these species is no the decline as well. At the same time, producers lack knowledge of more efficient, intensive production and management techniques. There is also a lack of knowledge about nutritive value and cooking methods that minimize nutrient leaching during food preparation. Community campaigns promote the use of indigenous vegetables, and hence their production, by carrying out research on nutritive value, agronomy and product development, in particular focusing on the role of vegetables in alleviating malnutrition in the community. (Mathenge, Kenya 2008)

Indigenous vegetables have been known and utilized traditionally as vegetables, species, ornamental and traditional medicine. However, a progressive development in agriculture and economy has pushed them as minor vegetables. Efforts had been initiated to promote utilization of indigenous vegetables to promote economic opportunities, empower the poor, and enhance social security to alleviate poverty and improved nutrition particularly for low-income households. (Hidayat, Indonesia 2008)

Home gardening for improved nutrition is an integral component of a wider community development. This practice has a vast potential for addressing food and income needs for the poor. Indigenous vegetables contain disease-fighting vitamins, important minerals and phytochemical compounds which help to prevent and treat diseases. Increased production of indigenous vegetables helps reduce micronutrient and protein calories deficiencies, achieve food security and diversify diets and income. (Chodha, Africa)

Food legumes constitute a major crop in the Asia-Pacific region because of their unique features including their role in human and animal nutrition nitrogen fixation, adaptation to stress conditions, suitability to various cropping systems, and for all overall sustainability of agricultural production systems. Many of these indigenous food legumes

play a vital role in protein nutrition to poor farm families in the region. (Gowda, Asia Pacific 2008)

National research systems, policy makers, and donors have shown increased interest in underutilized species, recognizing their contribution to alleviate “hidden hunger” and to generate additional household income and this led to a global consultation of a strategic framework for underutilized plant generation of new knowledge through mapping of indigenous knowledge and scientific research to increase the global knowledge base; 2) better communication to raise awareness and build capacity and ultimately to increase demand for underutilized plants their products; 3) influencing policy at all levels to remove barriers to production and marketing; 4) improved market development to improve the supply and demand of underutilized plants and their products(Hoeschle,2008).

III. OBJECTIVES

The general aim of this study was to prepare a compendium of indigenous vegetable species of Abra. Specifically, it characterized the indigenous vegetable species in terms of scientific name, morphological structure, growth habits, cultural requirements and nutritional contents.

IV. PROCEDURE/METHODOLOGY

1. Sample specimens were brought to UP Diliman Department of Botany for scientific identification.
2. Samples of actual structures were described in the ASIST Bio-lab through the use of microscopes aided by a classification and description key surfed from the web and other library references.
3. Samples of seeds were planted and observed until fruiting time.
4. Samples of edible structures were brought to laboratories in SLU, DOST Baguio and UNP Vigan for chemical analysis.

V. DISCUSSION OF RESULTS

This section contains the indigenous vegetable species with their local names, description of structure, distribution, nutritional contents, uses, and cultural requirements.

ALOKON

(*Buoussonetia luzonica* Blanco)

(*Allaeanthus luzonicus* V. Fill)

References:

[http://bucaio.blogspot.com/2006
March 21](http://bucaio.blogspot.com/2006/March/21), 2006

[http://www.foodbuzz.
com/recipes/ph](http://www.foodbuzz.com/recipes/ph)



COMMON/LOCAL NAMES. Alokon or Himbabao (Ilokano), Baég (Pangasinan)

CLASSIFICATION. Family: Moraceae

GENERAL DESCRIPTION OF STRUCTURE. It is a woody, high-growing shrub, or actually a medium-sized deciduous tree. It has alternately arranged leaves with pointed apex, rounded base, and hairy lower surface. Its flowers are very small, borne on very long, slender, spike-like branches (female) inflorescence while the male variety has rounded inflorescence.

DISTRIBUTION. In the Philippines, from Luzon to Mindanao, in the thickets and second-growth forests at low and medium altitude.

MANAGEMENT. It is better kept organic. It does not benefit from any blossom-inducing chemical spray. It blossoms every summer and its leaves fall during cold seasons. Frequent watering should be avoided as this would lead to rotting of stems in propagation.

REPRODUCTION. It can be reproduced by means of seeds, stem cuttings, and grafting. Layering is not often done. It is considered a wild food plant so it can tolerate extreme environmental conditions.

PESTS. Aphids are the most common enemies of this tree.

HARVEST. Its leaves fall during the cold season and bears flowers every summer time.

QUALITIES AND NITRITIONAL VALUES. It is rich in vitamins A, B, and C and contains calcium, phosphorus, potassium and iron. It produces a peculiar aroma that makes the dish more inviting. It adds texture, and additional roughage to any vegetable dish. When cooked, it turns vibrant green, soft and a bit slick.

FOOD PREPARATION. The flowers and the young leaves are the edible portions of the shrub. They can be cooked solely or in mixture with other vegetables in Ilocano dish “*dinengdeng* or *inabraw*” such as with sitaw (string beans), patani (lima beans) flavored with grilled pork. It can be sautéed with shrimps or snails, or cooked in gata (coconut cream) in some places. It is commonly cooked with pakbet seasoned with tomatoes, ginger, onions, and fish sauce (*bagoong*), or mixed with cubes of kamote (*buridibud*). It can also be prepared solely as salad mixed with tomatoes and salt to taste. It can be dried or kept frozen then cooked after sometime.

AMPUPUYAT
(*Dregea volubilis*)

References:



Identification, Classification and
Characterization of Indigenous Vegetables
in Abra -unpublished thesis ASIST 2006

Substrates in Stem Propagation of
Dregea-unpublished thesis ASIST 2004
Philippines Journal Science (Botany)

COMMON / LOCAL NAMES. Saka saka ti uwak, Bagbagkong (Ilokano)

CLASSIFICATION. Family: Asclepiadaceae (Dept. of Botany, U.P. Diliman)

DESCRIPTION. Dregea belongs to family Asclepiadaceae. It is viny annual indigenous plant. Stem hard woody and glabrous when immature; leaves simple, usually appropriate, decussate or whorled, locking stipules, netted venation, mostly green oblong-heart shaped; flowers showy in cluster resembling the feet of a crow, aggregate in cymose inflorescence, sepals and petals in group of 5 yellowish, perfect, inferior ovary, regular; fruit elongated about 6 in long, 4 edged dagger-shaped, cleaved, thick flesh or pulp enclosing tightly packed flat seeds; seeds flattened with tassel at one end to facilitate transport by wind.

DISTRIBUTION. In forests of the Tropics and in ordinary backyards. In the Philippines, all throughout the country particularly in the forested areas; documented in forested municipalities of Abra like in Lagangilang, Bucay and other municipalities.

PRODUCTION. Dregea is a woody vine but can be reproduced by stem cutting which is more effective than using seeds. It can tolerate varied types of soil so different substrates can be used in stem propagation preferably rich humus soil. Coco milk is best soaking medium for stem propagation.

Seeds can also be planted however in the wild; they are windblown when the fruits dehisce propelled by the hairs at one end of the seeds. Seeds germinate about a week after planting. Flowers appear in May-June and fruiting stage follows. Fruit should be gathered before they dehisce if domestication or cultivation is desired.

The crop tolerates extreme environmental conditions of soil type and climate. It favors watering and organic fertilizer but not demand for these.

No data available from formal farming results.

PROSPECTS. This is low cost production as the crop does not demand so much chemical fertilizers yet there is a great market demand for low cost vegetables.

NUTRITIONAL CONTENTS. It contains 14.62 g protein, 7.6 g fat, 41.08 g soluble carbohydrate, 23.5 g fiber, 4.5 g ash, 8.7 g water, 299 calories and glucoside dregein, alkaloid (20) (UNP Vigan City).

FOOD PREPARATION. The flowers and young fruits are the edible portion of the plant.

The flowers can be steamed or boiled and served solo as salad with tomatoes, white onions, and patis or salt to taste, or cooked in sinigang fish or pork, or mixed with other vegetables in the local dish (dinengdeng) topped with roasted fish or sautéed meat.

The young fruits (seeds removed) can be boiled or steamed with tomatoes and onions and patis to taste, or can be roasted to produce the peculiar flavor and eaten with matching fish sauce, or can be mixed with other vegetables sautéed with meat seasoned with tomatoes and fish sauce with ginger, or in the local vian, boiled in water and fish sauce.

BAGBAGURA

(Canavalia specie)

Reference:

Classification, Identification and Characterization of Selected Indigenous Species, Under Graduate Thesis, 2006



COMMON/LOCAL NAME. Bagbagura (Ilokano)

CLASSIFICATION. Family: Leguminosae (Dept. of Botany, U.P. Diliman)

GENERAL DESCRIPTION OF STRUCTURE. It is a hard woody perennial vine with a taproot system, trifoliate compound leaves, irregular perfect complete spike inflorescence, a simple legume pod as fruit and cotyledonous seeds.

DISTRIBUTION. Found in forest areas of the province of Abra with varied soil types and climatic conditions; documented in Lagangilang, Bucay, Dolores, Manabo and other remote municipalities .

PROPAGATION. The vine can be propagated using seeds. Stem cuttings are hardly viable. Seeds germinate during rainy season or whenever favorable environmental conditions are met.

CARE AND MANAGEMENT. It can tolerate varied soil types and climate but produces robust buds and leaves with frequent watering and timely application of organic or chemical fertilizer. It needs trellis support for it to catch more sunlight.

HARVEST. Flowers start to blossom about October and fruits are mature until March.

PESTS AND DISEASES. Grubs are the common enemies in the soil and aphids on the leaves. These can be driven away by spraying *sevin* or other types of insecticides.

QUALITIES AND NUTRITIONAL VALUES. (DOST, Baguio) It contains energy calculation of 62 kcal and:

Ash	Moisture	Crude Protein	Carbohydrates
1.31%	82.3%	4.06%	11.81%

FOOD PREPARATION. The flowers and the young pods are the edible portions of the vine. They can be steamed, blanched or boiled, seasoned with tomatoes, onions, and salt to taste then served as salad. They can be mixed with other vegetables in the local “*dinengdeng* or *inabraw*” seasoned with fish sauce or *bagoong*, or in mashed lima beans or kamote cubes (*buridibod*) topped with roasted fish or grilled pork.

GABI
(*Taro/Yautia*)



References:

Plant of the Philippines SEC UP
PROSEA, PCARRD-DOST, EC
Leaflets
[http: 11 www. mix ph. Com/ 2007 /
food- products. html](http://11www.mix.ph.Com/2007/food-products.html)

COMMON/ LOCAL NAMES. Gabi, lagbay (Tagalog); Aba,ava (Ilocano) pikaw- wild taro, Ablong, dagmai, kimpoi, lagbai (Bisaya); Natong, gabi, linsa (Bikol); Lubingan Ifugao)

CLASSIFICATION: Araceae or Taro or Gabi family

GENERAL DESCRIPTION OF STRUCTURE. Gabi is an herbaceous aroid (plant under the araceae family). The large, long-stalked leaves are arrow-to-heart shaped, springing from an underground fleshy stem or corm. Clusters of naked female flowers in a compact mass on the basal part of a fleshy stalk (spadix) give rise to berries. On the same stalk are the male and neutral flowers protected by a hood, the spathe.

DISTRIBUTION AND ADAPTABILITY. Gabi is native of the Pacific Islands. Found in places with good internal drainage and with high organic matter. The soil requirement is sandy to clay. Can tolerate shading up to 25%. Requires at least 1500 mm water 1 season and uniformly distributed. Generally inhabit tropical places.

Generally grown in the Philippines particularly in the Visayas and Mindanao.

VARIETIES: *Colocasia esculenta* (Linn.) Schott.
Xanthosoma sagittifolium

PRODUCTION. In South East Asia, while few farmers engage in gabi farming, there is a potential and interest in it. Indonesia lessens rice dependence by farming gabi. Philippines harvested about 112,000 tons gabi from about 33,000 hectares in 1992 and

Papua New Guinea harvested from upland and lowland area (77,000 hectares) about 438,000 tons in 1993.

PROPAGATION AND REPRODUCTION. It can grow in varied environments. In rain fed areas, it can reach about 2,000 mm or more. It enjoys open fields continually water supplied, furrow- irrigated, highland or flooded areas.

The planting materials are the upper 1-2 cm corm plus lower 20-25 cm petiole weighing 100-200 g and free from pests; sucker for yautia. In the Philippines, it is rotated with other crops like legumes/cereals or trees and annual crops. Research reports gabi can be propagated by seeds planted from 4,000 to 49,000 plants / hectare.

Conventional land preparation is adapted, 1 to 2x plowing and harrowing. The time for planting is at the onset of rainy season; method used is single in furrows about 10cm deep; spacing, 75 cm between rows and 50 cm between hills.

CARE AND MANAGEMENT. Weed control-combination of hand weeding and cultivation during the first 2 months of growth. Hill-up 2 months after planting.

Harvesting-depends on the need / situation but the optimum time is about 9 months for Colcasia (true gabi) and one year for Xanthosoma. Avoid injuring corms for longer shelf life. Removal of sucker or rhizomes for Colocasia increases yield of mother plants; mulching contribute to better weed control.

PESTS AND DISEASES. In Papua New Guinea, it has been reported that during times with excess precipitation and water, Phytophthora leaf blight attack the plants and cause rotting of corm. Aphids and plant hoppers can damage crops and bring viral diseases.

HARVEST. Can last 4-10 months in rain fed areas and 9-12 months in wet lands. Can be harvested manually by hand. Can last for 2 weeks with part of petiole attached.

QUALITIES AND NUTRITIONAL VALUES. The leaves of gabi are rich in Vitamin A (20,385 LU/ 100 g) and proteins (4.2 g).

Per 100 g of fresh corm are contained 15 mg Vitamin C, 26 g carbohydrates, 1.5 g fiber, 1.1 g proteins, 70 g moisture and 475kJ energy.

The leaves and the starchy corms, rich in minerals, Vitamins A and C must be thoroughly cooked to dissolve the itchy crystals or irritants called raphides. These crystals are salts of calcium, chiefly calcium oxalate, that occur as inclusions in many cells of the cortex, phloem and pith.

Gabi leaves are water- proofed by a waxy coat. The sap gives a permanent black stain to clothes. Corms are organs for horizontal growth and also food reservoirs for growth.

FOOD, OTHER USES, AND PREPARATION. The leaves, corm, stalk, and stolons are all edible when cooked.

In Southern Luzon, particularly in Bicol and Quezon, the leaves are cooked with coco milk bundling small fishes inside.

The corm as source of starch is boiled or fried or prepared as sweetened snack materials. Boiled and mashed corm is also good as food for infants. It is easy to digest and almost free from allergens.

Adult stalks and leaves are cooked and mixed with rice bran and served as pigs feed, perfect as fattener.

In South East Asia gabi serves as ornaments during religions feasts and as medicine.

In Indonesia, it is a staple food. In Java, it is treated with coco milk and sugar or fried as a snack material.

In Malaysia, gabi is used during religions celebrations; as food, served with black pepper, coco milk, meat, and shrimp.

KALUNAY
(*Amaranthus*)



References:

www.pcarrrd.dost.gov.ph

Plants in the Philippines, UP SEC

COMMON NAMES/ LOCAL NAMES: Kilitis English, Amaranth (Bicol); Amaranth; Kalunai, Siitan (Ilokano); Halumapa (Sulu); Halom, Tilitis, Kulitis, Uray, Bayambang (Tagalog); Halom, Tilitis, Kulitis (Visaya); Pigweed, thorny amaranth, Chinese spinach, tampala (English); Alayon (Ifugao), Ayantoto (Pampanga).

CLASSIFICATION. Family Amaranthaceae

GENERAL DESCRIPTION: Erect annual, strongly branching, up to 2.5m tall, with strongly branched tap root. Leaves alternate, long petiolate, simple and entire. Flowers in axillary clusters, upper clusters often leafless and in paniced spikes, unisexual, solitary in the axil of a bract, with 2 bracteoles, 3-5 tepals either free stamens as many as tepals (male flowers) or ovate or oblong ovary with 2-3 stigmas (female flowers). Fruits a dry capsule, dehiscent or indehiscent. Seeds shiny black or brown.

A spiny relative of kulitis called uray (*A. spinosus* L) is a common vegetable in some regions in the Philippines. Though spiny, it makes excellent greens or potherbs when used in the same way as spinach.

DISTRIBUTION AND ADAPTABILITY. It is common in many regions in the Philippines. It is highly adapted under lowland condition. Grows well at day temperatures above 25°C and night temperatures not lower than 15°C. Amaranthus are quantitative short day plants. It consumes high amount of water and uses 6mm/day. Amaranthus prefers fertile, well drained soils with a loose structure.

VARITIES: *A. tricolor*, *A. dubius*, *A. cruentus*, *A. spinosus*

- Tiger leaf—spineless, leaf soft tender and variegated in color
- Red leaf—spineless often used as ornamental

- Green leaf—spineless
- Uray—spiny under surface of cotyledons and on stem reddish in color

CULTURAL PRACTICES:

A. Preparing the field

Amaranth requires thorough land preparation with twice plowing and harrowing and well prepared bed for good growth.

B. Planting

Amaranth is planted either by direct seedling or transplanting. The choice of planting method depends on availability of seed and labor and may also vary with growing season. Direct seeding is appropriate when plenty of seeds is available, labor is limited and during the dry season when frequency of watering is less. Transplanting is preferred when there is limited amount of seed, plenty of labor and during the wet season when heavy rains and flooding are most likely to wash out the seeds.

However, the most common practices is sowing directly in rows with 0.5-1.0 cm deep and space rows 10-20 cm apart. Sow the seeds 5 cm apart within the row and cover with a layer of compost or rice hull, or broadcasting with a seed rate of 2-5g/m² (20-50 kg/ha). If transplanted, the seed requirement is only 2 kg/ha with plant densities of 400 plants/m²

C. Fertilizing

Although amaranth is a low management crop and can grow in poor soils, yield increased with fertilizer application. A combination of both organic and inorganic fertilizers improves yield and maintains soil fertility. The amount of fertilizer to apply depends on soil fertility, soil type, fertilizer recovery rate, and soil organic matter. A soil test is highly recommended to determine the available N, P, and K. fertilizer recommendations depend on local conditions, consult your fertility management specialist or conduct soil analysis to determine optimal rates.

D. Water Management

Amaranth is relatively drought tolerant, insufficient water will reduce yield. Water should be applied especially just after sowing or transplanting to have a good stand. As a rule, the plants should be irrigated if wilting occurs at noontime. During the rainy season, drainage is essential for plant survival and growth. Raised beds, clean furrows and large drainage canals facilitate quick drainage of excess water after heavy rain. Another way to gauge soil moisture content is to take a handful of soil from the bottom of a 15-cm deep hole. Squeeze the soil. If it holds together when you release your grip, there is sufficient soil moisture; if the soil crumbles, it's time to irrigate.

Irrigate thoroughly to maintain vigorous plant growth. Avoid over-irrigation, which may enhance disease development and nutrient leaching. Drip irrigation or micro-sprinkler irrigation is recommended in areas with limited water supply. If sprinkler irrigation must be used, avoid late evening irrigation to prevent diseases.

E. Weed Management

Weeds compete for light, water, and nutrients, thereby resulting in reduced yield. It may be controlled using a combination of methods. Choose the most appropriate method(s) for your location. Thorough land preparation is essential in their early stage. A seedbed free of weed seeds allows amaranth seedlings to get a head start on the weeds and establish a canopy that can shade out emerging weed seedlings. Hand or hoe weeding can be performed as needed.

F. Pests and Disease Management

Insect pests and diseases must be controlled to ensure good yield and marketable quality. Amaranth is susceptible to damage by foliar insects such as leaf miner, leaf rollers cutworms, aphids, flea beetles, and mites.

Traditional methods of spreading wood ash to dispel insects have been replaced by spraying regularly up to twice a week with insecticides. Chemical pesticides should be used mainly as a corrective measure. Choose a pesticide that targets the specific insect that is causing the damage, and try to avoid pesticides that kill or inhibit the development of beneficial organisms. Choose pesticides that have short persistence, i.e., the effects last only a few days. Pesticides should be applied in the evening, and workers should not be allowed into the field until the recommended waiting period (usually 12 to 24 hours) has passed. An alternative but effective method of controlling insect pests is to cover the bed with a fine screen or nylon mesh netting (32-mesh or finer).

G. Harvesting

Amaranths are ready for harvest in 20-45 days after planting or sowing depending on variety and quick growing varieties such as *A. tricolor*. Whole plants are pulled from soil with roots, washed and tied in bundles. With multiple harvests, young leaves and tender shoots are picked at 2-3 week intervals. Eventually, the plants begin to flower and develop fewer leaves. Frequent harvesting of leaves and shoots delays the onset of flowering and thus prolongs the harvest period. Amaranth and other leafy vegetables have large surface-to volume ratio and lose water rapidly. To reduce water loss, harvest during the cooler time of day, such as early morning or late afternoon.

H. Post-harvest handling

Since amaranth wilts rapidly, common practice in markets and shops is to sprinkle with water to keep its fresh appearance. If uprooted, the vegetables can be kept fresh for some days by putting it into basin with the roots in the water and sold in bunches or by weight.

PROPAGATION. Amaranth is propagated by seeds. Depending on the cultivar, photoperiod and cultural practices, flowering may start 4-8 weeks after sowing then the seeds mature after 3-4 months (it will serve as the source of planting materials). However, *A. dubius* will continue its generative stage for a much longer period and when cut regularly, the plant may become shrubby and perennial but even at its mature stage the leaves are succulent which is suitable for consumption as vegetables.

PROSPECTS / OPPORTUNITIES. Amaranth is recognized as an easy to grow and very productive crop. It is probably the highest yielding leaf vegetable of the tropics with its excellent nutritional value thus of high importance for human consumption and as a cheap green vegetables for city dwellers. Research should focus on optimization of cultural practices, effective pest control with fewer residues and plant nutrition.

NUTRIENT VALUE. Amaranth is a rich source of calcium, iron and vitamin A as shown in below.

Nutritional values of amaranth
(Raw and Boiled/100 grams edible Portion)

Nutrients	Raw	Boiled
Moisture (%)	84.4	83.9
Food energy (cal.)	47	27
Protein (g)	4.6	4.4
Fiber (g)	1.1	-
Total Carbohydrates (g)	7.4	4.4
Ash (g)	2.5	-
Calcium (mg)	341	314
Phosphorus (mg)	76	62
Iron (mg)	18	-
Sodium (mg)	51	-
Potassium (mg)	443	-
Vit. A (I.U.)	12,860	12, 235
Thiamine (mg)	0.01	0.01
Riboflavin (mg)	0.37	0.33
Niacin (mg)	1.8	1.7
Ascorbic acid (mg)	120	109

USES/IMPORTANCE. Amaranth is one of the most delicious leafy vegetables. It is a good crop for greens especially during the summer months when it is hard to grow and other kinds of vegetables. Amaranth is used in stews, sinigang, and other dishes wherever spinach (*Spinacea oleracea* L.)

Many wild *Amaranthus* species are used as potherbs. Used as ornamentals are *A. tricolor* forms with red, yellow and green coloured leaves or leaf sections and *A. cruentus* with large bright red inflorescences. *Amaranthus* weeds are used as for fodder (pigweed).

Vegetable amaranths are recommended as a good food with medicinal properties for young children, lactating mothers and for patients with fever, hemorrhage, anemia or kidney complaints. The wild *A. spinosus* L. used as a depurative against venereal diseases and as dressing on boils.

KARDIS

(*Cajanus cajan*)

References:

Plants in the Philippines SEC UP
PROSEA leaflets



COMMON / LOCAL NAMES. Gablos (Tagalog); Kidis (Bontoc); Kadios (bisaya), Kusia (Ifugao); Kardis (Ibanag, Ilocano, Igorot); tabios (Bikol); Pigeon pea (English)

CLASSIFICATION. Family Leguminosae

OTHER SCIENTIFIC NAMES: *Cystirus cajan*, *Cajan inodorum*, *Cajanus bicolor*, *Cajanus indicus*

DESCRIPTION. Perennial woody shrub, mostly grown as an annual for the legume; stems strong, woody, to 4 m tall, freely branching; root system and extensive, to about 2 m, with a taproot. Leaves alternate, pinnately trifoliate, stipulate; stipules small, subulate; leaflets lanceolate to elliptic, entire acute apically and basally, penninerved, resinous on lower surface and pubescent, to 15 cm long and 6 cm wide. Inflorescence in terminal or axillary racemes in the upper branches of the bush. Flowers multi-colored with yellow predominant red, purple, orange occur in streaks or fully cover the dorsal side of the flag, zygomorphic. Pods compressed, 2-9 seeded, not shattering in the field. Seeds lenticular to avoid, to 8 mm in diameter, about 10 seeds per gram, separated from each other in the pod by slight depressions. Germination cryptocotylar.

DISTRIBUTION. Native to India, brought to Africa, North Australia and practically throughout the tropical and sub-tropical regions, as well as the warmer temperate regions (as North Carolina) from 30° N to 30° S. in settled areas throughout the Philippines: cultivated, semi-cultivated, and in some places, spontaneous.

ADAPTABILITY. Remarkably drought resistant, tolerating dry areas with less than 65 cm annual rainfall, even producing seed profusely under dry zone conditions, as the crop matures early and low incidence of pest damage. More or less photoperiod sensitive; short days decrease time of flowering. Under humid conditions, produce defective fertilization and permits attack by pod-caterpillars. Annual precipitation of 6-10 dm is most suitable, with moist conditions for the first 2 growing months, drier conditions for flowering and harvest. Growing best under temperatures of 18-29°C, some tolerate 10°C under dry and 35°C under moister conditions. Sensitive to water logging and frost.. Grows in all types of soils, varying from sand to heavy clay loams; well- drained medium heavy loams being best. Ranging from Warm Temperate Moist to Wet through Tropical desert to Wet Forest Life Zones, tolerates annual precipitation of 5.3-40.3 dm, annual mean temperature of 15.8-27.8°C, pH of 4.5 to 8.4.

REPRODUCTION AND CULTIVATION. Can be reproduced by seeds, sown where desired in pure stands (9-22 kg / ha for rows) or broadcast. Germinate in about 2 weeks. Grown mixed with other crops or in alternate rows with sorghum, groundnuts, sesame, cotton, pineapple, or maize. For pure, sown 2.5-5 cm deep in rows 40-120 cm by 30-60 cm. when mixed, sown in widely spaced rows ranging from 1.2-2.1 m depending

on the associated crop. 3-4 seeds in a hill, later thinned to 2 plants per hill. Plants show little response to fertilizers. For the first month, 20-100 kg / ha phosphoric acid recommended. S, with or without P can significantly increase seed yield and nitrogen fixation. Starts podding in 12 weeks but matures in 5-6 months. The crop be gathered for forage or let persist for 3-5 years. Seeds yields drop considerably after the first year and disease up reduce stand.

PESTS AND DISEASES. The most serious is with disease (*Fusarium udum*) favored by soil temperature 17°-20°C. Rotation with tobacco and inter crop with sorghum decrease the wilt problem. Bacterium *Xanthomonas cajani*, sterility and yellow mosaic viruses and nematodes can attack peas. Podborers (in Africa and Asia), podfly (India), plume moth, weevil bugs, beetles, thrips are localized pests. Malathion for leafhoppers, Dipterex and Gardona for podborers. Bruchids attack in the open fields and build up in stored pods and seeds. The use of insecticides is not economic.

Weed control is required for the first 60 days. Pre-emergence prometryne with post emergence paraquat spray, alachlor plus linuron, terbutryne up to 9 weeks after application have proven useful in weed control (West Indies).

HARVESTING. Sown in June-July (India). Annual medium and late flower in January and yield a first crop in March-April. Early and medium flower in October-November, yield in December-January. Harvests in June-July (East Africa). Green pods harvested for home consumption or canning (Caribbeans). Depending on the pea, the location and time of sowing, flowering can occur 100 to 430 days. First crop harvest be picked by hand. Mature crop harvested by cutting whole plant with a sickle. Cut plants with green leaves dried in the field. Threshing by trampling or by wooden flails be carried out on threshing floors. Grains cleaned by winnowing. Mechanical threshing and seed cleaning is possible. Caribbeans have developed dwarf peas with more uniform pod maturity, mowed and threshed with a combine harvester.

POSTHARVEST. Seeds are dried stored in dry containers to avoid weevils or molds. Seeds could be moistened to prepare into dhal (split) used in soups or eaten with rice. Dried seeds can be ground for flour making or used in taho or frozen and canned (West Indies) exported to US.

NUTRITIONAL CONTENTS. 100 g of sun-dried seeds contain 345 calories, 9.9% moisture, 19.5 g protein, 1.3 g fat, 65.5 g carbohydrate, 1.3 g fiber, 3.8 g ash 161 mg Ca, 285 mg P, 0.72 mg thiamine, 0.14 mg riboflavin, 55 mg beta-carotene equivalent and 2.9 mg niacin. 100 g of immature seeds contain 117 calories, 69.5% moisture, 7.2 g protein, 29 mg Ca 135 mg P, 1.3 mg Fe, 5 mg Na, 563 mg K, 145mg beta-carotene equivalent, 0.40 mg thiamine, 0.25 mg riboflavin, 2.4 mg niacin, and 26 mg ascorbic acid. The oil of the seeds contains 5.7% linolenic acid, 51.4% linolenic, 6.3% oleic, and 36.6% saturated fatty acids. The seeds contain trypsin inhibitors and chymotrypsin inhibitors. Fresh green forage contains 70.4% moisture, 7.1 crude protein, 10.7 crude fiber, 7.9 N-free extract, 1.6 fat, 2.3 ash. The whole plant, dried and ground contains 1.2% moisture, 14.8 crude protein, 28.9 crude fiber, 39.9 N-free extract, 1.7 fat, and 3.5 ash.

USES AND PREPARATION. The green seeds and pods serve as vegetable: mixed with sliced meat, boiled in salt as side-dish to steak, as an ingredient in the local pinakbet (Ilocos region), mixed in hot soup, dried seeds boiled then fried in little oil or roasted before served. Ripe seeds are a source of flour, may be germinated and eaten as sprouts, used in the preparation of taho.

Plant can be used as a perennial forage crop or used for green manure. Often grown as a shade crop for tree crops, a cover crop, or occasionally as a windbreak hedge.

Serves as host for the scale which produces lac or sticklac (in Thailand and North Bengal). The leaves are used as food for the silkworm (in Malagasy Madagascar).

Dried stalks serve for fuel, thatch, and basketry.

As herbal medicine, decoction or infusion of leaves for coughs, diarrhea, abdominal pains; tender leaves chewed for aphthous stomatitis and spongy gums; poulticed leaves for sores or herpes and skin (Indochina) irritations (in Java), powdered leaves to expel bladder-stones; salted leaf juice for jaundice; scorched seeds added to coffee for headache and vertigo; dried roots boiled as expectorant and sedative (in China).

KARIMBOBET (*Olax imbricata*)



Reference:

Identification, Characterization of Selected Indigenous Species of Abra, Under Graduate Thesis, 2006

COMMON/LOCAL NAME. Karimbo-obet (Ilokano)

CLASSIFICATION. Family: Olacaceae (U.P. Diliman)

GENERAL DESCRIPTION OF STRUCTURE. Karimbobet is a perennial woody shrub, branching, and wiry at apical ends reaching as tall as 5 meters in height. It has oblongated leaves alternately arranged on the stem. Its young leaves and stems are the edible portions. It produces one-seeded fruits (nutlets) covered with composite calyx. The composite calyx can also be eaten when ripe and the seeds roasted.

DISTRIBUTION. In the forest areas of the province found as under brush and also in riverine environments; documented in Lagangilang and in other municipalities in the remote areas..

REPRODUCTION. Reproduction type is by means of seeds. Stem cuttings are hardly viable. Germination of seeds can be enhanced through acids as soaking media. Balling is another way of propagating the shrub. It germinates during the rainy season.

CARE AND MANAGEMENT. It reacts positively to organic as well as chemical fertilizers. Though tolerant to extreme environmental conditions, frequent watering produces easy bud formation as the plant enjoys riverine ecosystems.

PESTS AND DISEASES. The grub is the most common enemy of its roots while aphids to its leaves. Insecticides like *sevin* can be used to treat its soil and sprayed to its leaves. Young leaves should not be gathered immediately after spray application.

HARVEST. The shrub produces buds the whole year round. It bears flowers at the start of October and bears fruits until March.

QUALITIES AND NUTRITIONAL VALUES. (DOST Baguio) For every 100g of edible tops, there are:

Ash	Moisture	Crude fat	Crude protein	Nitrogen FE
3.45%	67.8%	0.36%	6.52%	21.8%

The fruits and seeds contain tannin, gums, mucilage, deoxy-sugars, polyphenols, flavonoids, saponins, cardenolides and bufadienolides. The seeds also contain oil (SLU-NSRU, 2006).

FOOD PREPARATIONS. The edible tops can be steamed, blanched, or boiled, seasoned with tomatoes, onions, and ginger with salt to tasted and served as salad. It can be mixed with local viands or *dinengdeng* (inabraw) or sautéed with meat.

The thickened composite calyx are eaten when ripe leaving the hard nutlet in place. These are usually feasted on by rats when fruits fall. The hard seed coats are removed and the nuts are roasted and eaten like the ordinary peanuts.

In other upland localities, the young leaves are cooked mixed with rice bran prepared as pigsfeed.

KATUDAY (*Sesbania grandiflora*)

References:

Edible Leaves of the Torpics F.W. Maintain,
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A. 1983

<http://ww.stuartxchange.com>



COOMON / LOCAL NAMES. Katuray (Tagalog, Ibanag, Pangasinan); Garvay-garvay gainai (Visaya); Katoday, Katuray (Ilocano, Ibanag); Katuray, Garvay-garvay

(Bikol); Kature (Pampango); Kambang-turi (Sulu); Agati sesbania, West Indian pea, Sesban (English)

CLASSIFICATION. Family Leguminosae

SCIENTIFIC SYNONYMS

Aeschynomemne grandiflora L.

Agati grandiflora L.

Robinia grandiflora L.

Sesban grandiflora Poiret

DESCRIPTION. Short-lived, soft-wooded tree with thick cracked bark, open branching, up to 15 m tall 30 cm in diameter. Roots heavily nodulated, can develop flouting roots; stems tomentose (hairy), unarmed; leaf pinnately compound, up to 30 cm long including a petiole 7-15 mm long; rachis slightly pubescent or glabrous; leaflets 20-50 in pairs opposite to alternate on the same leaf, oblong to elliptical, rounded to obtuse to slightly emarginate at apex, glabrous or slightly pubescent on both surfaces. Stipules filiform, stipules broadly lanceolate. Raceme axillary, 2-4 flowered, rachis up to 65 mm long; peduncle 15-35 mm long, tomentose; pedicels pubescent; bracts lanceolate; flowers white, yellowish, rose-pink or red; calyx 15-22 mm long, closed in young buds, splitting or breaking at anthesis, the basal part persistent in the fruit; standard up to 10.5 x 8 cm, no appendages at the claw; wings up to 10.5 x 3 cm without basal tooth, staminal tube 10-12 cm long curved for most of its length; ovary and style glabrous. Pod linear to slightly falcate with broad sutures, 15-50 seeded, septa 7.5-10 mm apart, glabrous, hanging vertically, indehiscent. Seed subre-niform, 6.5 x 5 mm x 2-3 mm, dark brown. Seed weight is 17,000-30,000 seeds / kg.

DISTRIBUTION. Native o Tropical Asia including India, Indonesia, Malaysia, Myanmar and Philippines with Indonesia as center of diversity. Widespread exotic distribution. Cultivated in West Africa for at least 140 years.

CULTURAL REQUIREMENTS. Establishment. Rapidly from seed or by vegetative propagation from stem and branch cuttings. Commonly planted as individual trees or in rows, spaced 1-2 m apart along fence lines, field borders and the bunds of rice paddies. In fertile sites will attain 5-6 m height in 9 months, reduced greatly in second year of growth. Can be planted at high densities (3000 stems / ha) to produce pole timber, or sparsely planted to produce forage and fuel wood.

Soil. Tolerant of a wide range of soils including alkaline, poorly drained, saline or of low fertility, down to pH 4.5, well adapted to heavy clay. No fertilizer is generally required.

Moisture, Temperature and Light. Best adapted to regions with annual rainfall of 2,000-4,000 mm, but grown successfully in semi-arid areas with 800 mm annual rainfall and up to 9 months dry season. Tolerant of flooding over short periods. Only adapted to lowland tropics up to 800 m with mean annual temperatures of 22-30°C. Frost sensitive and intolerant of extended periods of cool temperatures. Poor shade tolerance. Its rapid early growth and erect habit enables plant to access sunlight by overtopping neighbouring plants.

Reproductive development and Defoliation. The hermaphroditic flowers are pollinated by birds. Able to produce ripe pods 9 months after planting. Intolerant of severe and regular pruning when young. Side branches are cut for feed leaving the trees to develop tall poles (Indonesia). At 3 m height, the leader branch can be cut 1.5 m height. Cutting regularly (5 x a year) to form a low hedgerow (1 m tall) can result in 100% mortality. Low hedgerows can be achieved by regular replanting from seed.

Distribution, weed, and production potentials. Moderate ability to spread, from seed. Seed is shortlived, deteriorating rapidly in viability from 1-2 years onwards without low humidity and low temperature storage. Moderate weed potential, not become a weed in managed agro- ecosystems. Seed immediately germinable without requirements for scarification. Highly palatable to ruminant livestock, generally well accepted by monogastrics. Annual yield of 27 kg of green leaf / tree can be achieved from side branches. Green manure yield of 55 t / ha can be achieved in 6.5 months (Java). Wood yield of 20-25 m³ / ha / ys in commercial plantations (Indonesia). Major component of ruminant diets comprising 70% of total forage during dry season. Milk yield increase by 8% when cattle are fed 5 kg fresh leaf / day (India).

Toxicity. Seeds contain a toxin poisonous to fish. Contains low qualities of condensed tannins also contains canavanine.

Pests and diseases. Susceptible to severe pest attacks from leaf Webbers, leaf feeders and stem borers. Highly susceptible to the root-knot nematode. Susceptible to grey leaf spot and mosaic virus.

NUTRITIVE CONTENTS. The leaves contain over 36% crude protein (dry weight) and with high mineral and vitamin content. The flowers contain 25-30% crude protein.

FOOD USES AND PREPARATION. The young leaves, flowers, and tender pods are all favorite Asian vegetables and are sold in local ethnic markets. The leaves make a nutritious, spinach-like vegetable, used as greens, in stews, soups and curries or salads. They are prepared by blanching in boiling water for less than a minute or may be dipped or fried in butter.

The flowers are eaten as vegetables alone or mixed but the center of the flowers should be removed to reduce bitterness.

OTHER USES. Inter crop; it can be used as a shade or nurse tree particularly for black pepper. It nodulates freely and is believed to restore fertility.

Animal forage; the green leaves and pods are fed to cattle and goats making them increase weight and milk production.

Can be used for ornamental plantings, living fences, windbreaks, gum and tannin production, pulp and paper production.

KUMPITIS
(*Clitoria ternatea*)

References:

PROSEA leaflet



COMMON / LOCAL NAMES. Kolokanting (Tagalog); Giting princesa (Bicol); Balog-balog (Bisaya); Samsamping Kumpitis (Ilocano); Butterfly pea (English)

CLASSIFICATION. Family Leguminosae

GENERAL DESCRIPTION OF STRUCTURE. Butterfly pea belongs to the family Fabacea and sub-family papilionacea. It is a deep-rooted, tall slender, climbing legume with five leaflets and a deep blue flower. It is a 90 to 162 cm tall, long-lived perennial herb with an erect habit. Its flowers are blue scabbards linear and flat, 6-12 cm long similar to those of beans. The thick horizontal root, which may grow to more than 2m long, bears one to several purplish, glaucous wiry stems. The leathery leaves consist of three-five leaflets. Clitoria have chasmogamous (insect pollinating) and cleitogamous (self-pollinating) flower. Flower colour, position and structure varies from species to species.

ORIGIN AND DISTRIBUTION. Butterfly pea originated in tropical Asia. It has been widely distributed to many tropical and sub tropical countries where it has become naturalized (South and Central America, East and West Indies, China and India). It is grown as a persistent perennial. In these areas, the flower are used to give a blue tinge to rice cakes and boiled rice. The young pods may be consumed like string beans. Leaves are also used to dye food or are eaten as a pot herb. In the Philippines, it has been recorded to be growing in the Ilocos, Nueva Vizcaya, Pangasinan, Nueva Ecija, Bicol and Abra.

VARIETIES: *Clitoria ternatea*, *Clitoria purpurea*, *Clitoria fragrans*; *Clitoria purpurea* has attractive papilionaceous dark blue flowers; *Clitoria ternatea* has creamy white flowers which are solitary and very attractive. The pods are slightly pubescent or glabrous and contains 6-8 brown / black coloured seeds / pod; *Clitoria fragrans* has chasmogamous flowers occurring in pairs, each corolla consisting of 3.5 to 4.5 cm long standard petal and a small white keel petal.

REQUIREMENTS AND ADAPTABILITY.. Can tolerate varied soil types preferably pH 7-8 with average to low fertility. Grows well in fertile soil, clayey in sub-humid or semi- arid tropical areas. . Grows at altitudes 0-1600 m above sea level, with 800 mm or 32 inches precipitation not water logged, and with 19-28°C temperature. Can be planted in grassy areas, meadows, riversides or backyard, requiring enough sunlight.

REPRODUCTION AND PROPAGATION. *Clitoria* can be reproduced by seeds from dried pods. The seeds are planted at the onset of the rainy season, 1-5 kg seeds / ha of seedbed at a depth of 1.5-4 cm, 10-15 kg / ha when mixed with grasses. Seeds can be broadcast at 10 kg / ha in. burned grassy plots. In monocultures, 20-25 kg of seeds can be planted per hectare.

CARE AND MANAGEMENT. Clitoria can simultaneously grow when mixed with other grasses, and can already crawl within 4-6 weeks. For seed production, weeding is required at the start of growth, or treats soil with herbicide (trifluralin) before planting to control grasses. Bentazone can also be used to control more resistant grasses. 40 kg N / ha can be applied at planting time and 80 kg N / ha as maintenance. For vegetable production, the plants are staked in trellis to facilitate easy harvest. For livestock, cutting and rotational grazing is advisable when associated with grasses.

PESTS AND DISEASES. Molds usually attack clitoria but do not cause considerable damage. Benomyl is needed to treat the seeds with molds and other infecting agents.

QUALITIES AND NUTRITIONAL VALUES. The seed is very high in protein (15-25%) hence increasing the nitrogen levels in run-down cultivated paddocks. The levels of wide protein and wide fiber in the leaves are 21% and 21-29% respectively. Total plant protein ranges from 14-20%. The seed contains 25-38% protein, 5% total sugar and 10% oil. Nitrogen concentrations of whole tops range from 1.7-4.0% depending on season and phase of growth. In Brazil and India, good quality hay out of Clitoria is well accepted by livestock. Crude fiber content can rise from 29 to 38% and carotenoid, 400-587 mg / kg, 38-47% acid detergent fiber, 11-16% lignin and 21-29% cellulose or 44% crude cellulose.

USES: FOOD AND FOOD PREPARATION. In the Philippines, the fruits are considered as vegetable, mixed with other vegetables and prepared in the recipe pinakbet among the Ilocanos. It can also be prepared as vegetable salad seasoned with tomatoes and fish sauce or salt. It is generally preferred by livestock over other legumes. With its thin stem and large leaves, it is ideal for forage and hay making, plant cover for coconuts in Southern India, rubber in Malaysia. Because of the attractive nature of the flowers, they are valued as an important ornamental crop for garden lovers. Clitoria are planted for the production of dye and in India, it is widely used as a brain tonic which is believed to promote memory and intelligence by increasing acetyl choline content of the brain.

MARUNGGAY (*Moringa oliefera*)

References :

http://en.wikipedia.org/wikimoringa_oliefera

<http://www.hort.purdue.edu/newcrop/duke-energy/Moringa-oliefera.html>



COMMON/LOCAL NAMES. Marunggay, Maronggi (Ilokano); Malunggay (Tagalog); Kamunggay (Cebuano); Horseradish-tree, Ben-oil Tree, Drumstick-Tree (English)

CLASSIFICATION. Family: Moringaceae

DESCRIPTION OF STRUCTURE. Short, slender, deciduous, perennial tree, to about 10 m tall; rather slender with drooping branches; branches and stems brittle, with corky bark; leaves feathery, pale green, compound, tripinnate, 30-60 cm long, with many small leaflets, 1.3-2 cm long, 0.6-0.3 cm wide, lateral ones somewhat elliptic terminal one obovate and slightly larger than the lateral ones; flowers fragrant, white or creamy-white, 2.5 cm in diameter, borne in sprays, with 5 at the top of the flower; stamens yellow; pods pendulous, brown, triangular, splitting lengthwise into 3 parts when dry, 30-120 cm long, 1.8 cm wide, containing about 20 seeds embedded in the pith, pod tapering at both ends, 9-ribbed; seeds dark brown, with 3 papery wings. Main root thick. Fruit production in March and April in Sri Lanka.

DISTRIBUTION. Native to India, Arabia and possibly in Africa and East Indies; widely cultivated and naturalized in tropical Africa, tropical America, Sri Lanka, India, Mexico, Malaysia and the Philippine Islands.

CULTIVATION. Propagated by planting limb cuttings, 1 to 2 m long from June to August preferably. Starts bearing pods 6 to 8 months after planting. But regular bearing commences after the second year. Bears for several years. Can be propagated by seed. Optimum cultivation depends on the right environment for the plant to thrive. Loves sun and heat. As a seedling, monitor the environment in the beginning until established. Seeds can be germinated year round. Needs well draining soil. Increase the drainage by adding perlite or other porous substance . in planting seeds, observe an inch from the surface of the soil then cover and tamp gently.

ADAPTABILITY. Ranging from subtropical dry to moist through tropical very dry to moist forest life zones, tolerates annual precipitation of 4.8 to 40.3 dm, annual temperature of 18.7 to 28.5 °C and soil pH of 4.5 to 8.0. Thrives in subtropical and tropical climates, flowering and fruiting freely and continuously. Grows best on a dry sandy soil. Drought resistant.

BIOTIC FACTORS. Fruitflies infest the fruits. Weevils attack the leaves. Fungi attack the tree

HARVESTING. Fruit or other parts usually harvested as desired. In India, fruiting between March and April, and again September and October. Seed gathered in March and April for oil. In the Philippines, fruiting between March and April.

NUTRITIONAL CONTENTS. Per 100 g, the pod is reported to contain 86.9 g H₂O, 2.5 g protein, 0.1 g fat, 8.5 g total carbohydrate, 4.8 g fiber, 2.0 g ash, 30 mg Ca, 110 mg P, 5.3 mg Fe, 184 IU vit. A, 0.2 mg niacin, and 120 mg ascorbic acid. Leaves contain 7.5 g H₂O, 6.7 g protein, 1.7 g fat, 14.3 g total carbohydrate, 0.9 g fiber, 2.3 g ash, 440 mg Ca, 70 mg P, 7 mg Fe, 110 µg Cu, 5.1 µg I, 11, 300 IU vit. A, 120 µg vit. B, 0.8 mg nicotinic acid, 220 mg ascorbic acid, and 7.4 mg tocopherol per 100 g. Estrogenic substances, including the anti-tumor compound, β-sitosterol, and a pectinesterase. Seed kernel (70-74% of seed) contains 4.08 H₂O, 38.4 g crude protein, 34.7% fatty oil, 16.4 g N free

extract, 3.5 g fiber, and 3.2 g ash. The seed oil contains 9.3% palmitic, 7.4% stearic, 8.6% behenic, and 65.7% oleic acids among the fatty acids. Root-bark yields two alkaloids: moringine and moringinine. Bureau of Plant Industry reports weight per weight, moringa leaves have the calcium equivalent of 4 glasses of milk, the vitamin C content of 7 oranges, potassium of 3 bananas, 3 times the iron of spinach, 4 times the vitamin A in carrots, and 2 times the protein in milk.

USES. Almost every part of plant is of value for food. Seed is said to be eaten like a peanut in Malaya. Foliage eaten as greens, in salads, in vegetable curries, as pickles and for seasoning. Leaves pounded up and used for scrubbing utensils and for cleaning walls. Seeds yield 38-40% of a non-drying oil, known as Ben oil, used in arts and for lubricating watches and other delicate machinery. Oil is clear, sweet and odorless, never becoming rancid; consequently it is edible and useful in the manufacture of perfumes and hairdressings. Wood yields blue dye. Leaves and young branches are relished by livestock. Commonly planted in Africa as a living fence (Hausa) tree. Bark can serve for tanning; it also yields a coarse fiber.

FOOD PREPARATION. In India, the immature green pods are prepared in a similar fashion to green beans and have a slight asparagus taste. The seeds removed from the mature pods are eaten like peas or roasted like nuts. The flowers are cooked to taste like mushrooms or prepared with green peas and potato. The roots are shredded and used as condiment. The leaves are cooked like spinach or commonly dried and crushed into powder used in soups and sauces. In Bangladesh, the crop is made into varieties of curry by mixing with coconut and mustard and poppy seeds. In the Philippines, the leaves are often added to broth to make soup or an ingredient of Tinola a traditional chicken dish with green papaya or another secondary vegetable. Now, the leaves are used in making polvoron candy, cake, or as bio-fuel and as moringa oil.

PAKO
(*Athyrium esculentum*)

Reference:

<http://rubbahslippahsinitaly.blogspot.com/2006/05/hoio-hawaii-edible-fern.html>



COMMON/ LOCAL NAMES: Ilocano – Pako (edible); Hawaii – Ho’io; English – Ostrich Fern or Fiddle head

CLASSIFICATION. Family Aspidiaceae

GENERAL DESCRIPTION OF STRUCTURE. Ostrich Fern looks like a big feather growing out of the ground. The fiddleheads of the ferns are small sprouts that curl up

tightly at the tops. Eventually, the fiddlehead will unravel into more identifiable feather-looking plants.

This large, unbranched, curved feathery fern, 2 to 6 feet tall resembles the ostrich's tail, with 1 central stem per frond, and toothed (serrated) leaflets.

The emerging fern resembles the curved narrow and of a violin, with a stout base tapering upward. A papery, scaly sheath wraps this hairless, emerald – green vegetable, which varies in height as it grows.

The leaves of ferns are called Fronds. There are two types of fronds, one that is sterile that are dark green and “plume like” and another that is fertile, which is dark brown and resembles dark brown feathers.

DISTRIBUTION AND ADAPTABILITY. Ferns grow at lower parts of the region where rain collects and sometimes forms a stream, in rich and moist partial shades along river and in swamps in the surrounding suburbs and countryside.

VARIETIES: *Pteris pensylvanica*, Ostrich Fern, *Athyrium esculentum*, edible pako

PROPAGATION AND REPRODUCTION. Ferns reproduce by spore formation and they grow in clumps. They grow in rich moist areas along rivers and swamps in the countryside. They produce fiddleheads the whole year round. They usually cut most of adult fronds several inches from the ground after harvest for easier appearance of the next fiddleheads.

QUALITIES AND NUTRITIONAL VALUE. Ostrich fern fiddleheads and the common edible fern provide lots of vitamins A and niacin, some vitamin C, the minerals potassium, phosphorous, magnesium, and iron, and the trace minerals, manganese, zinc, and copper.

FOOD PREPARATIONS. While still tightly curled and under 15cm 16 inches), the fern is good in salad or as asparagus. It has a native delicate flavor when blanched with tomatoes, onions seasoned with soy sauce to taste a simple Fern Shoot Salad. It can be incorporated with dried shiitake mushrooms to put a Japanese influence to come out with yamaimo soba or mixed with some sweet prawns thrown in during the stir-frying process to produce a one-dish meal.

To clean the fern shoot, carefully rinse and remove dirt and any fine, downy fuzz. Break or cut into 1 inch pieces, discarding any tough sections. Rub, steam, simmer, or sauté for 5 to 10 minutes. Serve with a sauce or they'll be somewhat dry.

The young fern fronds can also be cooked with fish sinigang.

PARDA

(*Lablab purpureus L.*)

References:

Plants in the Philippines SEC UP
PROSEA LEAFLET
<http://cipav.org.co/lrrd>



COMMON / LOCAL NAMES. Bataw Banglaw, Bat-au (Bisaya); Batau (Bikol); Parda (Ilocano), Bulay (Tagalog); Bule (Pampango); Itab (Ifugao, Bontoc); Patda, Baktaw (Pangasinan); Hyacinth bean (English)

CLASSIFICATION. Family Leguminosae

DIFFERENT NAMES USED FOR LABLAB PURPUREUS. Dolichos lablab (previous classification), Dolichos bean, Country bean, Lablab vulgaris, Hierba de Conejo

GENERAL DESCRIPTION OF STRUCTURE. Lablab is a vigorously or climbing and twining herbaceous plant. Stems are trailing to upright reaching to 3 m in length and are robust. Leaves are large and trifoliate, with the leaflets having a broad ovate-rhomboid shape measuring 7 to 15 cm long. The dorsal side of the leaf is smooth with the underside being hairy.

The flowers are in clusters (raceme) along an erect inflorescence stalk. Each flower is short 1-2 cm wide, and white to purple in color. The purple-margined pods, eaten as vegetables, are flattened and elongated with a prominent beak, about 7 cm long and 2 cm wide. The seed have a white caruncle extending about one-third of the circumference.

DISTRIBUTION. The wild forms are believed to have originated in India, were introduced into Africa from South East Asia. Seeds from Egypt were planted in Australian Gardens, now widely used as forage.

Lablab has been widely distributed to many tropical and subtropical countries South and Central America, East and West Indies, Asia, China and the Philippines. It can be found all over the Philippines particularly in the Ilocos and Cordillera.

ADAPTABILITY AND OTHER QUALITIES. It is a legume well suited to most tropical environments as it is adaptable to a wide range of rainfall, temperatures ranging from 18° to 30° C and is fairly tolerant to high temperatures. It reduces growth below 20°C leaves fall at minus 2°C but can survive frost for a limited period. It is drought hardy and has been grown in arid, semi-arid and humid regions with rainfalls between 200 to 2500 mm. it needs 10-20 mm precipitation during germination. It can be found throughout the tropics and subtropics ranging from 30° S to 30° N latitude. It is normally grown from sea level up to elevations of between 1800 and 2100 m.

PRODUCTION AND PROPAGATION. Propagation is by seeds. The pods are harvested in about 3 months after planting. Only small scale farmers engage in lablab production. About 2000-4000 kg pods are harvested / ha or about 450 kg seeds from about 16, 400 planted or broadcasted seeds / ha. Forage yield can reach about 25-40 tons / ha.

CARE AND MANAGEMENT. Lablab grows in a wide range of soil types, from deep sands to heavy black clays and can tolerate pH ranges of 5 to 7.5. it can survive short periods of flooding thus grows well in alluvial plane but needs free drainage as it

does not tolerate water logging. Soil fertility is important thus phosphate fertilizers may need to be applied at planting.

Inoculants are good for the seeds before they are planted. Pre-emergence herbicides are advisable to control grasses before planting. Molybdenized superphosphate (250-500 kg / ha) is advisable including some potash for soil with low fertility.

In India, animal manure, frequent irrigation and trellis are applied. It is planted as cover crop together with sorghum and cotton. It serves as ground cover when frequently cut in orchards. It yields good quality compost. It serves also as animal forage mixed with sorghum.

PESTS AND DISEASES. Only a few cause serious losses. In fact, lablab is virtually free from pests and diseases. The insect (*Diabrotica* spp.) can cause severe attacks during dry conditions. However lablab is resistant to the insects, continuing to grow vigorously in their presence. The gram caterpillar, plume moth, and pod borers can be driven by spraying fiery pepper or siling labuyo. Weevils and anthracnose could be sprayed with zineb or captan. Leaf spots and molds could be treated with Bordeaux mixture.

HARVEST AND POSTHARVEST. Pods are harvested every after 3-4 days. In collecting seeds for planting, gather mature pods before they break. Cut the plant several inches from the ground, let them dry for a few days before threshing. Harvesting pods when dry lessens weevil attack. Dry the seeds and store in safe container with sand cover. Young pods can last for 21 days at 0-2°C with 80-90% humidity. Fresh seeds can last for 7 days in the same condition.

PROSPECTS. Though lablab has the capability of being an outstanding resource for agricultural systems in the tropics, much has to be done to achieve its full potential as source of human food.

NUTRITIONAL CONTENTS. Per 100 g of pods are contained 10 g carbohydrates, 2 g fiber, 4.5 g protein, 0.1 g oil, 82.4 g moisture, and 1260 kJ energy (average). Per 100g of dried leaves is contained 155 mg iron and per 100 g of dried seeds contain 21-29 g protein.

Whole plant crude protein – 10 to 22% Seed plant crude protein – 23 to 28%

Leaf plant crude protein – 14.3 to 38.5% Whole plant crude fiber – 28%

Stem plant crude protein – 7 to 20.1%

However, some forms of lablab grains have been found to contain cyanogenic glucosides which decrease palatability.

USES: FOOD AND PREPARATION. The young pods are boiled as salad or mixed in curries. The young seeds can be boiled or roasted. The young leaves or tops and flowers can be boiled as salad or mixed in the local dinengdeng (pinakbet). The dried seeds can be cooked alone, prepared into bean cake or sprouted like mungbean. It can be fed as a good quality hay, preserved as silage for animals. It is used advantageously as a cover crop and green measure.

PIKAW

Reference:

Local folks
Plants of the Philippines SEC UP
PROSEA, PCARRD-DOST, EC
Leaflets
<http://www.mixph.com/2007/food-products.html>



LOCAL NAME. Pikaw (Ilokano, Tinggian)

CLASSIFICATION: Araceae

GENERAL DESCRIPTION OF STRUCTURE. It is a herbaceous aroid. It has an underground fleshy stem or corm that extends to a large cylindrical stalk, and wide ovate leaves. The leaves are cuneate-based and acute-apexed. Clusters of naked female flowers are in a compact mass on the basal part of a fleshy stalk (spadix) give rise to berries. On the same stalk are the male and neutral flowers protected by a hood, the spathe. The fruits are in triangular tube containing the berries inside.

DISTRIBUTION AND ADAPTABILITY. Pikaw is documented in the highland municipalities of Abra like Boliney, Sallapadan Lacub, Malibcong, Daguisman and Bucloc along river systems and streams at higher altitudes. It anchors its roots in between and among rocks and well adapted to sandy clay soil with good drainage and high organic matter.

QUALITIES AND NUTRITIONAL VALUES. The plant contains a sap that causes skin irritations or itchiness found concentrated in the flowers and which gives a permanent black stain to clothes. Corms are not gathered by local folks as they are organs for plant horizontal growth and food reservoir for the plant.

The phytochemical analysis results show the plant contains gums, mucilages, glycosides, carbohydrates, reducing sugars, tannins and derivatives, proteins and derivatives, flavonoids, deoxysugars, unsaturated sterols and triterpenes, polyphenolic compounds.

FOOD USE AND PREPARATION. The young leaves and stalks are the edible portions leaving the corms for further growth. These parts are hashed and bundled piled into the cooking pot. They are treated with fish sauce, onions, garlic, vinegar, and ginger and sometimes with coconut milk, topped with meat, sardines, or dried fish. It is best not to disturb/stir pot while cooking so the calcium oxalate crystals in the sap will be thoroughly cooked.

SABIDUKONG

(*Psophocarpus tetragonolobus* L.)

References:

PROSEA Leaflets

Plants in the Philippines, UP SEC



COMMON / LOCAL NAMES: Sigarilyas (Tagalog), Puro- pagulong (Bicol), Segadilla (Bisaya), Pallang (Ilocano), Parlang (Pangasinan), Winged bean (English).

CLASSIFICATION. Family Leguminosae

GENERAL DESCRIPTION OF STRUCTURE. The winged bean is a perennial vine which is usually planted annually. It has trifoliate, alternate leaves, with irregular perfect flowers, producing dehiscent pods with wings. It produces tubers.

DISTRIBUTION. It can be grown in almost all tropical and sub- tropical areas in the whole world. Found in all municipalities in Abra.

REPRODUCTION AND PROPAGATION. It can be reproduced by seeds. In Burma, tubers are planted at the edge of rice paddies and harvested when seeds mature. In Papua New Guinea, it is the most important plant found in the mountains from June to December. It can be intercropped with camote. It can be grown in the backyard along fences climbing up to 3-7 m. It is planted at the onset of the rainy season.

ADAPTABILITY. It grows best between temperatures 18⁰C and 27⁰C. A lower temperature induces tuber formation. It requires 1,000 mm rain annually. It can tolerate different types of soils for as easily drained, with ph 5.5. In dry lands, irrigate during dry months. Overhead irrigation during dry season is best for this plant.

MANAGEMENT.

with Rhizobium in which case chemical fertilizer is not necessary. However, ammonium sulphate or urea, phosphorous and potassium at 2:1 ratio can be applied. It grows well also with mulching for producing tubers.

PESTS AND DISEASES. Ring spot and necrotic viruses may infect seeds making them unfit for planting. Bacterial wilt is also common in South East Asian. Control these cases by selecting more resistant or healthy seeds. False rust or orange gall is caused by molds. Dark leaf spot can be treated with benomyl spray once every 2 weeks. In Philippines, pod borer and orange gall are common.

HARVEST. Fresh fruits 4-5 inches in length are harvested as vegetable. Matured fruits need to be gathered before they open at the seams scattering the seeds. Harvest can be done 50-60 days from planting.

POST HARVEST. Fresh harvest fruits should be sold within 24 hours. Tubers can remain fresh until 2 months. Planting materials should be in cold and dry place can retain the germinability of the seeds. In tropical places with high humidity long storage is not advisable because germinability is lessened.

QUALITIES AND NUTRITIONAL VALUES. The young pods contain 1-3 % protein, and are rich in calcium, iron, and vitamin A. The leaves contain 5-7% protein, with vitamins A and C and minerals. Per 100g of the mature seeds are contained 32g Carbohydrates, 5g fiber, 33g protein, 16g fats, 11g moisture, and 1697kJ energy. It is as substantial as the soybean and as oily as peanut. It contains oleic and linoleic acids (67%), 29% of which is saturated. It contains tocopherol. It contains phosphorous, zinc and calcium, thiamine and riboflavin. The tubers contain 8-10% proteins, a few essential amino acids but rich in carbohydrates (30%), calcium and phosphorous.

FOOD PREPARATIONS. The young fruits, leaves, and flowers can be prepared as salad. The fruits can be mixed with other vegetables cooked with cocomilk and bagoong alamang. It can be steamed and treated with patis and calamansi. The tubers are eaten in Burma where they claim it to contain 56% carbohydrates and 24% protein supplement for bread making. The seeds are used as sources of oil and milk for preparing favorite foods of South East Asian like tofu and miso. The whole plant can be used as animal foods.

SALUYOT

(*Corchorus aestuans* L. / *acutangulus* Lam.)

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Volume 1 part 2 1963
Author: H. Wild
Plants of the Philippines , UP SEC



COMMON / LOCAL NAMES: Saluyot, pasau (Tagalog); Saluyot (Ilocano, Bicol, Pampango); Talabang (Bisaya)

CLASSIFICATION: Family Tiliaceae

GENERAL DESCRIPTION: Prostrate to ascending shrubby annual herb about 1 to 1.5 m high; stems pilose on one side and reddish. Leaves ovate to broadly ovate, 2-7.5 cm long, 1-4 cm wide, margins serrate or saw-toothed with a pair of basal setae (tails) 3-5 mm long, rounded at base acute or sub acute, with scattered pubescence mainly on veins and midrib; petioles 1-5 cm long, pilose on upper side; stipules 5-8 mm long, pilose ; Inflorescence of 1-3 flowered fascicles, yellow, arising on leaf axils; peduncles up to 2mm long, ciliate. Sepals 5, 3-4 mm long, 0.6- 0.8 mm wide, ciliate at basal margin.

Petals 5, oblanceolate, ciliate at base, 3-4 mm long, 0.8- 1 mm wide; stamens 10, 3mm long; ovary cylindrical, puberulous, 2mm long, 1mm wide. Capsule solitary or in 2s or 3s, squat, straight or slightly curved, 1-3 cm long, 0.4- 0.7 cm wide, splitting into 3

winged valves, smooth, ending in 3-5 spreading horns. Seeds somewhat angular, 1mm long, pitted, brownish- black.

Corchorus olitorius has beaked fruits elongated with 10 ribs splitting into valves at maturity. The valves have transverse partitions between the seeds. The edible leaves are slimy when cooked rich in iron calcium, and vitamins. The stem yields strong fibers.

Corchorus capularis or white jute has a round capsule and is a good source of strong fiber used as ropes and twines.

Corchorus aestuans or *acutangulus* has elongated capsules with 6-8 ribs and a 3-forked beak. The leaves are rougher and less slimy than *Corchorus olitorius*.

ADAPTABILITY, DISTRIBUTION AND CULTIVATION. Widely distributed in the tropics. Needs plain and alluvial soil and standing water. The suitable climate for growing jute (warm and wet climate) is offered by the monsoon climate during the monsoon season. Temperatures ranging 20°C to 40°C and relative humidity of 70%-80% are favorable for successful cultivation. Jute requires 5-8 cm of rainfall weekly with extra needed during the sowing period. Found in all municipalities in Abra.

Corchorus aestuans are found scattered in ordinary backyards or garden plots.

VARIETIES: *Corchorus aestuans* L. or *acutangulus* Lam.

Corchorus olitorius (tossa jute)

Corchorus capsularis (white jute)

CARE AND MANAGEMENT. It is a rain-fed crop with little need for fertilizer or pesticides. It can tolerate warm and wet climate with 20°C to 40°C temperature and a relative humidity of 70%-80% and can inhabit in varied soil types.

PROPAGATION AND REPRODUCTION. *Corchorus* is propagated by seeds. Sometimes the seeds are broadcast in the backyard or garden plots. Germination occurs at the onset of the rainy season.

HARVEST. Leaves are enjoyed for several months until flower bearing stage. The whole plant structures are uprooted before the fruits break to scatter the seeds. The seeds are gathered by shaking or brushing the plants against a support.

QUALITIES AND NUTRITIONAL VALUE. Jute leaves are consumed in various parts of the world. It is a popular vegetable in West Africa, Nigeria and Mali. It is made into a common mucilaginous or slimy soup or sauce in West African cooking traditions. It is a popular dish in the northern provinces of the Philippines as *saluyot*. The leaves are rich in beta-carotene, iron calcium, and vitamins C. the plant has an antioxidant activity with a significant α -tocopherol equivalent Vitamin E.

FOOD PREPARATION. *Corchorus olitorius* leaves are used as an ingredient in an okra slimy Arabian potherb called *molokhiya* which the Jewish people call Jew's mallow.

The leaves of *C. aestuans* are washed and cooked mixed with other vegetables such as bamboo shoot, string bean tops, spinach, ampalaya or malunggay leaves seasoned with bagoong, ginger and onions to taste and broiled fish as toppings.

The leaves can also be prepared solo seasoned with cane vinegar, peppermint, bagoong, ginger and onions and served as local paksiw.

OTHER USES. Corchorus is one of the cheapest natural fibers and is second only to cotton. It is used chiefly to make cloth, sacks and coarse cloth. Fibers are used alone or blended with other types of fibers to make twine or rope.

Diversified by products which can be cultivated from jute include uses in cosmetics, medicine, paints, and other products.

SAYSAY-OT

(Luffa cylindrical (Linn) M Roem)
(Wild form)



Reference:

Plants in the Philippines UP SEC

Synonyms: *Luffa aegyptica* Mill., *Luffa petola* Seringe, *Momordica cylisdrlica* Linn, *Momordica luffa* Linn.

COMMON/LOCAL NAMES. Kabatiti (Bontoc, Ilokano), Kabatitit-aso (Ilokano), patola (Bisaya, Bicol, Tagalog, patulang-wak (Tagalog), patula-amu (Sulu), salag-salag (Tagalog), tabau-tabau (Ilokano), tobobok (Tagalog), tabubok (Tagalog), pepinillo de San Gregorio (Spanish), sponge gourd, vegetable sponge, wash-rag sponge, gourd towel (English), patolang-bilog (Tagalog), kabatiti-atap (Ilokano) (wild form).

CLASSIFICATION. Family Cucurbitaceae

DESCRIPTION. Patolang bilog is commonly cultivated throughout the Philippines for its edible fruit. The fruit is “sweet” and larger than that of the very common, wild form, which is very bitter. The wild form occurs in thickets in settled areas throughout the Philippines. It is pantropic in cultivation.

This wild form, like the cultivated one, is a climbing, somewhat hairy or nearly smooth vine, reaching a length of 10 meters or more. The stems are 4-angled. The leaves are rounded-ovate to kidney-shaped, 10 to 20 cm across, shallowly 5 or 7 angled or lobed, denticulate scabrous, pointed-tipped, and deeply heart shaped at the base. The male flowers occur singly in the axils of the leaves on long-peduncled racemes and are crowded near the apex of the peduncle. The calyx is green and the lobes are ovate-lanceolate, being about 1cm long. The corolla is rotate, yellow, and 5-7 cm in diameter. The female flowers are solitary and peduncled. The fruit is oblong, cylindric, green 12 to 30 cm long, very narrowly winged, and smooth.

Waddell, quoting Arjun, describes the fruit of the wild form to be bitter and as violently cathartic and emetic.

The young leaves of the wild form, locally known as Saysay-ot, are the edible portions of the plant. The fruits are not edible because of this bitter taste.

DISTRIBUTION. It is found creeping or crawling on ground in open settled areas throughout the Philippines, or climbing along bamboo thickets in the forested areas. It is documented practically in all municipalities of Abra.

NUTRITIONAL CONTENTS.

FOOD USE AND PREPARATION. The young stem and leaves are the edible portions of the plant. They can be blanched, steamed or mixed with other vegetables and meat. They are perfectly served with fish sinigang.

OTHER USES. The fruit, since it is with a bitter taste, is harvested for its sponge used for scouring kitchen utensils or as exfoliators.

SIKSIKLAT

(*Entada parvifolia* Nerrel)

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Identification, classification and characterization of Indigenous vegetables in Abra, Under graduate thesis ASIST 2006

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COMMON / LOCAL NAMES. Siksiklat, Kuripattong (Ilocano)

CLASSIFICATION. Family: Leguminosae (Dept. of Botany U.P. Diliman)

DESCRIPTION. Large twining lianas, usually swollen from the base to under central part of a stem, and twisted up on tree; produce underground stems, with tuberous taproot; stem, hard woody vine; leaves 2 pairs pinnately compound ending in tendrils; flowers irregular; fruits, simple contorted hard pod; pods 40-50 cm long, 6-6.5 cm wide, exocarp usually exfoliating endocarp softly, both sutures rugose very prominent. Seed hard coated, orbicular or slight ovate, 3.4 cm long, 3.6 cm wide, 0.7 cm thick, falted black or purplish black; usually bulging in middle, about 1.0 cm thick; testa very polishing with numerous radiate lines; grooved very prominent on the margin; strophie convex, but very abruptly, hilum 0.7 cm x 0.4 cm in diameter, rim-aril traced, 0.4 cm long, no raphe. It belongs to family Leguminoceae.

DISTRIBUTION AND ADAPTABILITY. Found in Philippines (Abra, Zambales) Malaysia, India and Taiwan Taipei in the tropic. Grows in varied soil types and climate, in forests up to 1,000 m altitude, all year round. Documented in Lagangilang and also in other municipalities of Abra.

PRODUCTION. Siksiklat can be reproduced vegetatively. It generates new plants from a piece of stem or tuberous root from the parent. In less favorable climates they die back to their roots, or underground stems at the end of each growing season waiting for the onset of rainy season when it produces new shoots and leaves.

It can be propagated by seeds which sprout during rainy season. Dormancy ends when a crack or other opening develops in the seed coat. Flowers appear after 3-4 months then fruiting stage follows. At maturity, fruits split along the seams scattering the seeds around eventually waiting for the onset of the next rainy season.

It is wild but can be domesticated. Scratching is the fastest method of germinating the seeds. Though tolerant to extreme environmental conditions, watering may be favorable during the dry season and application of organic fertilizer.

No data available from formal farming results.

PROSPECTS. There is a great demand for low cost vegetables in the market. Farmers are grateful for low cost production as this crop demands meager fertilizer needs.

NUTRITIONAL CONTENTS. Contains sterols, flavonoids, alkaloids, glycosides, and tannins (U.N.P. Chem. Laboratory, Vigan City).

FOOD PREPARATION. The young stems and leaves are the edible portions of the plants. They can be cooked with mungbeans and meat in the local vegetable dish, half-boiled seasoned with tomatoes and salt to taste served as salad, or mixed with other green vegetables and bamboo shoot sautéed with fish sauce. It produces a very peculiar flavor inviting greater appetite.

VI. CONCLUSION

1. 7 of the indigenous vegetable species are legumes (*Canavalia sp.*, *Psophocarpus tetragonolobus*, *Clitoria ternatea*, *Lablab purpureus*, *Cajanus cajan*, *Entada parvifoila*, *Sesbania grandiflora*) and all others belong to Olacaceae, Moraceae, Aspidiaceae, Amaranthaceae, Tiliaceae, Araceae, Asclepiadaceae, Moringaceae, and Cucurbitaceae.
2. Based from the chemical analysis conducted and as surfed from web, indigenous plant species can be considered sources of the much needed nutrients for good health and nutrition and sources of other chemical substances potential for disease prevention as they also possess medicinal properties. .

3. The wild species can be domesticated and cultivated in backyard gardens or in small scale farming for household consumption as manifested in their wide range of adaptabilities.

VII. RECOMMENDATIONS

1. A more in depth characterization or research on improving varieties can be conducted for a more complete documentation.
2. Further investigations on utilization as food or medicine in order to maximize their significance as vegetables or medicinal species.
3. Farmers can engage on a larger scale production considering the low cost requirements of these species.
4. More intensive campaign or survey for more species as vegetable potentials.

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