

**RP 01475**

**Genetic Resources  
Progress Report - 34**

# **Pigeonpea Collection in Luzon, Philippines**

**April 1981**

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# Pigeonpea Collection in Luzon, Philippines

(8 April - 1 May 1981)

P. Ramanandan<sup>1</sup>

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## 1. INTRODUCTION AND OBJECTIVES

Pigeonpea is not one of the major field crops of the Philippines. Its cultivation is limited to small gardens around the house and field bunds. Most of the produce is consumed by the growers and hence seldom found in the market. Therefore, as in many other areas such as other SE Asian countries, E. Africa, Central America etc. the statistics of its production and importance appear to be grossly underestimated. However, our data, gathered from literature, herbaria, visitors, and personal communications with the agricultural scientists of the Philippines, indicated that the crop is cultivated throughout the country, practically in all provinces, but to a very limited extent. The Grain Legume Genetic Resources Consultants' Meeting (1978) identified SE Asia among the priority regions for the collection of pigeonpea. ICRISAT gene bank had only 13 accessions from the Philippines and 4 from Indonesia. Therefore, this region appeared under the immediate target of GRU's accelerated germplasm collections program. The main objective of this mission was to secure the maximum genetic variability available in the pigeonpea germplasm in Luzon and collect data on genetic diversity.

## 2. SUMMARY AND CONCLUSIONS

The mission was successful in capturing a fair representation of the genetic diversity available in the pigeonpea landraces of Luzon. In all, 83 samples were collected from 16 provinces of the island Luzon, with passport information and ethnobotanical data. In addition, Atylosia scarabaeoides, groundnut and cowpea (for IITA) were also collected.

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The pigeonpea collected show a wide range of variability in several agronomic traits, particularly in seed weight (100 seed weight = 4.62 g. to 21.05 ). However, it appears that there has been a strong selection by the cultivators in favour of large seed size and lighter seed coat color (Table). The present collection is judged to be an adequate representation of the area. In the second phase of this mission the rest of the Philippines, particularly Mindanao and Ilo Ilo islands will be covered.

### 3. PLANNING

#### 3. 1. Collecting area and time of collection

Pigeonpea is cultivated throughout the Philippines. Luzon and Mindanao are most important areas. Transport from island to island is very expensive, time-consuming, and is often difficult. Hence it was decided to cover the Philippines in two stages. The present mission was aimed to cover Luzon. The crop is mainly grown as a perennial. The month of April, is the proper time to collect ripe seeds from standing crop in most of the areas.

#### 3.2. Local assistance and logistic support

The plan for collection was done in consultation with Dr. R.M. Lantican, Director, Institute of Plant Breeding (IPB), University of Philippines and Dr. N.G. Mamicpic, Program Leader, National Plant Genetic Resources Laboratory, IPB. IPB decided to participate as they are now enhancing the collection and evaluation of local pulse germplasm. The Institute has a well-equipped gene bank with long term seed storage facilities. Dr. T.T. Chang of IRRI provided assistance in technical information and transport.

#### 3.3. Collecting team

P. Remanandan, Botanist (Pigeonpea), Genetic Resources Unit, ICRISAT  
William Sm. Cruzo, Associate Curator, Dept. of Life Services, University of Philippines at Los Banos.

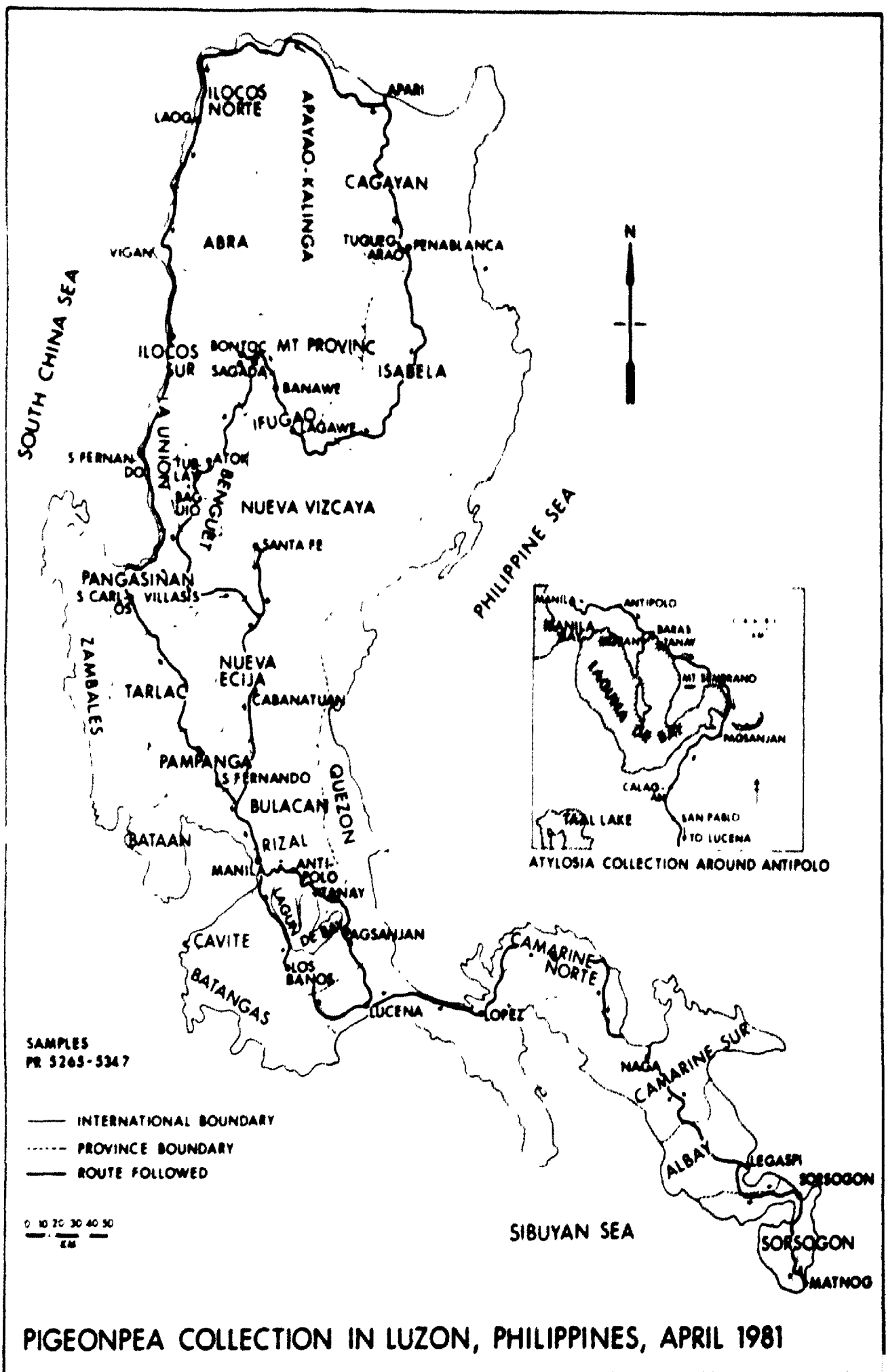
Isagani Del Mundo, Driver, IRRI.

### 3.4 Itinerary

08	April	Hyderabad - Delhi IC 440
09	April	Delhi - Manila KL 805
09	April	Manila - Los Baños
11	April	Los Baños - Manila - S. Fernando - S. Carlos - Baguio
12	April	Baguio - Tublay - Atok - Baguio
13	April	Baguio - Sabangan - Bontoc
14	April	Bontoc - Sagada - Bontoc - Mt. Polis - Banaue
15	April	Banaue - Lagawe - Kabagan - Penablanca - Tuguegarao
16	April	Tuguegarao - Laog
18	April	Laog - San Fernando - Dagupan City
19	April	Dagupan city - Viddasís - Santa Fe
20	April	Santa Fe - Aritao - Cabanatuan City
21	April	Cabanatuan City - Mariugalo - Manila
22	April	Manila - Antipolo - Boso Boso - Baras - Morong - Tanay - Pagsanjan - Culavan - San Pablo - Candelaria - Lucena
23	April	Lucena - Gumaca - Lopez - Naga City
24	April	Naga City - Legaspi - Sorsogon - Matnog - Sorsogon - Legaspi
25	April	Legaspi - Tabaco - Bula - Sorsogon - Bulan - Matnog - Legaspi
26	April	Legaspi - Naga City - Los Baños
27	April	Los Baños - Manila - Los Baños
29	April	Manila - Hong Kong, CX 900
30	April	Hong Kong - Bangkok CX 703 - Delhi AP 199
01	May	Delhi - Hyderabad IC 439

### 4. AT LOS BAÑOS

On arrival, my immediate task was to work out the details of the itinerary. I held discussions with Dr. Mamicpic and Mr. William Sm. Cruzo, and finalized all details. Later I met Dr. Ponciano A. Batugal, the director of the Philippines Council for Agriculture and Resources Research, International Projects Division. Dr. Batugal expressed keen interest in the utilization of pigeonpea genetic resources available. The Philippines council is planning to undertake



a project in collaboration with ICRISAT for trying pigeonpea in farming systems for marginal hilly areas of the arid parts of the Philippines. They are trying to identify the crops, which require minimum inputs, for introducing in new areas. Dr. Batugal thinks that pigeonpea has a lot of potential for introduction in these areas. I also gathered that pigeonpea is likely to be included in the new ambitious venture "Asia-Pacific Research and Technology Transfer for Fruits and Vegetables".

#### Visit to Rice Genetic Resources Laboratory (RGRL), IRRI

Due to my tight schedule I had only very limited time to visit IRRI, which I utilized to have a quick look at the Rice Genetic Resources Laboratory. My main interest was to study the system followed in maintaining data from germplasm collection data sheets to catalogue and how the numerous problems, encountered during the process, are tackled.

The RGRL has modern facilities for seed storage, laboratory, and office space. It includes laboratories for quality, cytology, milling, herbarium and a training room. There is also a record room, which maintains all records of the accessions in the form of computer printouts and tapes in the International Data Bank.

#### Computer Files

The Germplasm Bank Basic File contains all accessions arranged accession-wise with computerized passport information and morpho-agronomic data. In all, 50 descriptors are recorded which consist of 6 passport data and 44 morpho-agronomic characters. Among the latter 14 are grain character data and the remaining cover plant character data. Except for passport information, numerical values are used as codes.

In the alphabetical listing file, the accessions are arranged alphabetically by their names with the corresponding data of accessions. In yet another file the accessions are arranged by country of origin. Further, the accessions are arranged in numerical order (eg. 1867, 1891, 1899 etc).

### Card System

In addition to these computer files, a card system is also maintained. Important passport information such as accession name, number, source, origin, etc. is entered in the cards, with one card for each accession. The cards are arranged alphabetically on the basis of accession names. They are filed in cabinets like the index cards in a library. The cvs, which do not have names but have only numbers, are arranged according to their serial number (not Acc. No.) at the end of the cabinet. This system is particularly helpful in dealing with the problems of duplicates.

### Seed File

Mini reference samples of all accessions are stored in mini paper bags. They are arranged accessions number-wise. The fumigated seeds in paper bags are kept under room temperature in steel cabinets in the laboratory for immediate reference. This further helps in the identification of cvs and dealing with the problems of duplicates, an excellent system which we could adopt.

### Seed processing and storage

The entire seed transport within and outside IRRI, including the International Rice Testing Program, is handled by the Rice Genetic Resources Laboratory (RGRI). The seed processing area handles seeds for research, storage and distribution. The incoming seeds are cleaned, fumigated with Dowfume and dried to 6% moisture before they are moved to either a short term (ST) unfumigated storage area, a ST fumigated area, or a drying and canning area. This is a step before keeping in the medium-term (MT) or long-term (LT) storage rooms.

The ST rooms are maintained at 20°C and 45% RH, and seeds are stored in cloth or paper bags. Seeds remain viable for 2-5 years. They handle the day-to-day needs of IRRI and other cooperators.



The MT storage room, kept at 4°C and 45% RH, preserves seeds stored in hermetically sealed aluminium cans or in paper bags in large sealed glass containers placed in special racks designed for easy access. Seeds can remain viable for about 25 years. This storage area holds the IRRI working germplasm collection.

In the LT storage room, at -10°C and 30% RH, the seeds are stored in vacuum packed aluminium cans which are placed in the same type of racks used in the MT area. This is expected to conserve seeds for more than 75 years. The facility can accommodate 100,000 accessions. IRRI gene bank now contains about 60,000 rice accessions. Two samples of each accession are stored to protect against any possible loss. As further insurance against a major calamity, duplicate samples are furnished to regional and national genetic resources laboratories located elsewhere.

The design of the MT and LT storage rooms is a unique prefabricated insulated sandwich panel, room-within-a-room construction. In addition to linkage with the IRRI emergency generator, RGRL has its own 90 KW generator to serve the MT and LT storage rooms.

However, what struck me most was the limited number of technical staff in RGRL which handles a massive volume of rice genetic resources work. May be it is because they handle the germplasm of only one crop.

## 5. TRAVEL NOTES

We started the germplasm collecting tour on 11 April from Los Baños. The route followed is shown in the map. We passed through Rizal, Bulacan, Pampanga and Tarlac provinces. Rice, Sugarcane, Tobacco, Cotton, etc. are grown in this region. Rice fields were mostly fallow while sugarcane fields were at seedlings stage. The tobacco fields were very impressive. Tobacco is one of the biggest source of national revenue. Eastern, Western and Central Pangasinan and Western Tarlac had plenty of tobacco fields. At Pangasinan we collected pigeonpea from backyards and field bunds, most of which are indeterminate, moderately branching and late maturing cvs.

The road to Baguio, the summer capital of the country, passes through hill tracts. Natural vegetation has been denudated mainly due to shifting cultivation (Kaingin). However, some moderate vegetation still exists.

Pigeonpea was collected at Tublay and Atok, situated north of Baguio. The region is mostly hilly. Maize, vegetables like cabbage, winged beans, sweet peas, etc. are grown, all rainfed. Groundnut is grown, but seeds could not be secured. Rice is cultivated in the valleys. Passion fruit (Passiflora edulis, Sims.) is very common and Alnus maritima, Nutt. is grown as a wind break. Benguet Pine (Pinus khasya, Royle) is very common in the hills. P. insularis Endl. and Araucaria bidwillii, Hook. are also occasionally found.

The pigeonpea collected from this area showed considerable variability in seed color pattern and seed color. A striking feature noticed was the presence of a distinct strophiole in one of the collections. Apart from pigeonpea, my colleague collected several samples of winged bean and two primitive landraces of rice from tribal farmers.

From Baguio we proceeded towards north. Throughout the Benguet province we travelled through hilly area. The road was rough. The practice of shifting cultivation is prevalent here, with the result Pinus, considered as fire resistant, is the predominant tree seen. Hyoseymus, Eupatorium, Zantedeschia, etc. were also common.

At Sabangan, a village near Bontoc, we came across pigeonpea grown in gardens, rice bunds, and mountain slopes. Vast areas of forest are destroyed by fire. The vegetation of the steep slopes is burnt so that during rain the burnt organic matter is washed down to manure the rice fields situated in the valleys. Such slopes soon get eroded resulting in frequent landslips. Pine is the dominant tree here too. Other common plants include Mussaenda philippica, A. Rich., Macaranga tanarius Muell., Lantana camara Linu., Crotalaria sp., Xanthosoma sp., Cyathea (tree fern). In green valleys terrestrial orchids, fern like Hymenophyllum, Dipteris and various mosses species were found. The area is the native place of the famous Baguio Lilly (Lilium philippinense, Baker) which is among the vanishing flowers of mountains. We did not come across it, probably had vanished already.

On the way to Bontoc, on the banks of Chiko river, we saw the famous stone walled rice terraces of mountain province. The bunds of the rice fields are prepared out of river rocks with remarkable neatness. It covers an area of 400 sq. kms. and if the walls were placed end to end they would reach more than half way round the earth<sup>2</sup>. Those of Banaue, Hapa, and Hungduan area are among the oldest. Archaeological studies indicate that it took the Ifugaos more than 2000 years to build them. A single migrating people is believed to have carried the terrace culture from South China or Indo China across to Luzon and Southern Japan, and Southward to Java and the lesser Sunda islands. Remains indicate that the first migration was probably in the second millenium BC and carried only a material culture of polished stones, copper, and Bronze. A second migration in the latter part of the first millenium BC., brought also the use of iron, pottery and wooven cloath. The Banaue people represent the oldest native folk. Those of the Central Ifugao are the typical carriers of the terrace culture, and those of the Kiangnan district are the latest settlers into the region.

Long duration rice and many vegetables such as peas, beans, tomatoe, capsicum are grown in the alluvial soil terraces. Pigeonpea is grown here and there on mountain slopes and rarely on rice bunds. We secured the seeds from the farmers' houses. They showed remarkable uniformity in seed size, seed color and color pattern. It appears that the farmers had been selecting the cvs for white and bold seeds. It is natural as pigeonpea is mostly used as a vegetable in this area.

From this area we proceeded towards east and travelled through Nueva Vizcaya and Isabela provinces. Vast areas of grass lands, evergreen pine forests and Tectona forests were seen. In the Isabela province plenty of tobacco, maize, and rice are grown. Tobacco industry is one of the biggest sources of revenue for the country. Maize is often intercropped with groundnut. Maize is consumed as grits and also used for livestock and poultry feeds. The crop is grown throughout the island. However, in recent years sorghum has been introduced as a substitute for maize for feed grain. Area planted to sorghum is very small, but it is gaining popularity and it was learnt that its demand is high

<sup>2</sup>Philippine Historical Committee 1940.

in Mindanao. Not much pigeonpea is grown here. However, we did come across small groups at random spots and could secure seeds.

We travelled along the northern coastal region of Cagayan, Apayao-Kalinga, Ilocos Norte provinces. The coastal area is fertile. A variety of crops like coconut, rice, mango, jack fruit (Artocarpus integra) and cotton were found in plenty. From Ilocos Norte and Ilocos Sur we could collect plenty of pigeonpeas with considerable genetic variability particularly in seed size, seed color, and seed color pattern. One cultivar was found to have conspicuous strophiole. Insect damage was heavy in the bold seeded types. In Ilocos Norte apart from rice and coconut, maize, groundnut, cowpea, cassava, and cotton are grown in fertile alluvial soil, pigeonpea however is confined to gardens and bunds.

From the northern region we travelled down towards south along the coast. The coconuts in this region have exceptionally large nuts. Other crops grown include rice, maize, tobacco, garlic, cowpea, cotton, vegetables and tropical fruit trees. Groundnut is grown in Ilocos Norte. Pigeonpea collected from Ilocos Norte and Ilocos Sur showed considerable variation in seed size, seed color pattern, main seed color and possibly to insect susceptibility. Bold seeded cvs, as in other location, appeared highly susceptible compared to small seeded ones. One cultivar showed a distinct strophiole.

In the La Union province, tobacco, cotton, cassava, rice, coconut and tropical fruit trees are grown while pigeonpea is restricted to gardens. Cassava occupies a large area. In the Pangasinan province groundnut and onion are grown in large areas. Pigeonpea collected from the central province Nueva Ecija showed considerable variation in seed size, ranging from small seeded to bold seeded types.

From this central area we proceeded to south. Hills of this region are highly eroded resulting in frequent land slips. Vast fields of rice and onion are found here, irrigated from river. Rice fields were at various

stages from transplantation to post-harvest operations. Central Luzon is among the major rice growing areas of the Philippines. In this area we came across highly impressive rice fields with mechanised farming. Besides rice, coconut, banana, papaya etc. are also grown here. We terminated the first phase of the trip at Manila. My counterpart in collection, Mr. William Sm Cruzo departed at this stage as planned. I went ahead the latter part of the tour with the driver, Mr. I. Del Mundo, who helped in areas where language was a problem.

From Manila we undertook a special trip to certain nearby specific locations from where Atylosia volubilis and A. scarabaeoides were reported earlier by previous explorers. The time was not proper to collect A. volubilis at fruiting stage. So the main objective was to locate it, secure herbarium specimens and attempt to collect A. scarabaeoides at fruiting stage. The main area - Antipolo - from where these were reported has been highly urbanised and most of the habitats of the species had been destroyed. However we made an intensive search for them and found that A. scarabaeoides still exists but to a very limited extent. Seeds and specimens were secured. Some other Cajaniinae in vegetative stage were also collected but could not identify them, as flowers and fruits were not available. Probably A. volubilis too still exists here and could be collected in January-February at fruiting stage.

#### Bicol region

Bicol consists of six provinces Camarines Norte, Camarines Sur, Albay, Sorsogon Masbate, and Catanduanes that make up the south-east part of Luzon island. The latter two are separate islands and hence could not be visited, as the time did not permit. Pigeonpea has not been reported much from this area, but from my travel experiences of Luzon I expected the crop here too. In fact the crop was found right up to the southern tip of Luzon - Matnog and we collected representative samples from all the provinces. The landraces varied in several morphoagronomic characters such as branching pattern, flower color, seed weight, seed color pattern

and main seed color. A cultivar with very small seed size (100 seed weight 4.6 g.) has been collected from the southern tip of Quezon, adjoining Bicol.

The major crops of this area are coconut, rice and abaca. Coconut grow in abundance almost every where. The nut production per tree is low due to poor management. However, some of the most impressive cvs , which yield heavily but with normal nut size, can be seen here. The wealth of variability available in this crop is most impressive. Coconut is the prize crop of the Philippines and movement of its germplasm outside the country is prohibited. However, the Coconut Authority of Philippines does cooperate with other nations in coconut germplasm exchange for mutual benefit.

The low land area surrounding Naga city is considered as the rice bowl of Bicol. Beyond Naga city, down south, intensive cultivation is practised, practically every inch of land is cultivated. Abaca (Manila Hemp, Musa textilis) is abundant, often cultivated as an under crop in coconut plantations. Allbay province is the centre of Abaca cottage industries. From Abaca fibre mats, hats, bags, slippers, fabrics, ropes etc. are made. Abaca paper is extremely strong and hard wearing. The Japanese yen is made from it. Another fibre yielding indigenous crop of this area is "Caragomoy". Its fibres are woven into sleeping mats, bags etc. We went up to the southern coast of Luzon. Sorsogon is the southern most province. Pigeonpea could be collected from home gardens. Most of the cvs. grown in this area have medium size seeds. Sorsogon province has plenty of "Anahaw", the leaves of which are woven into fans. It also makes excellent roofing material.



1. The vegetation on the mountain slopes is burnt, so that during rains the organic matter is washed down to manure the rice fields in the valleys, resulting in erosion of natural flora.

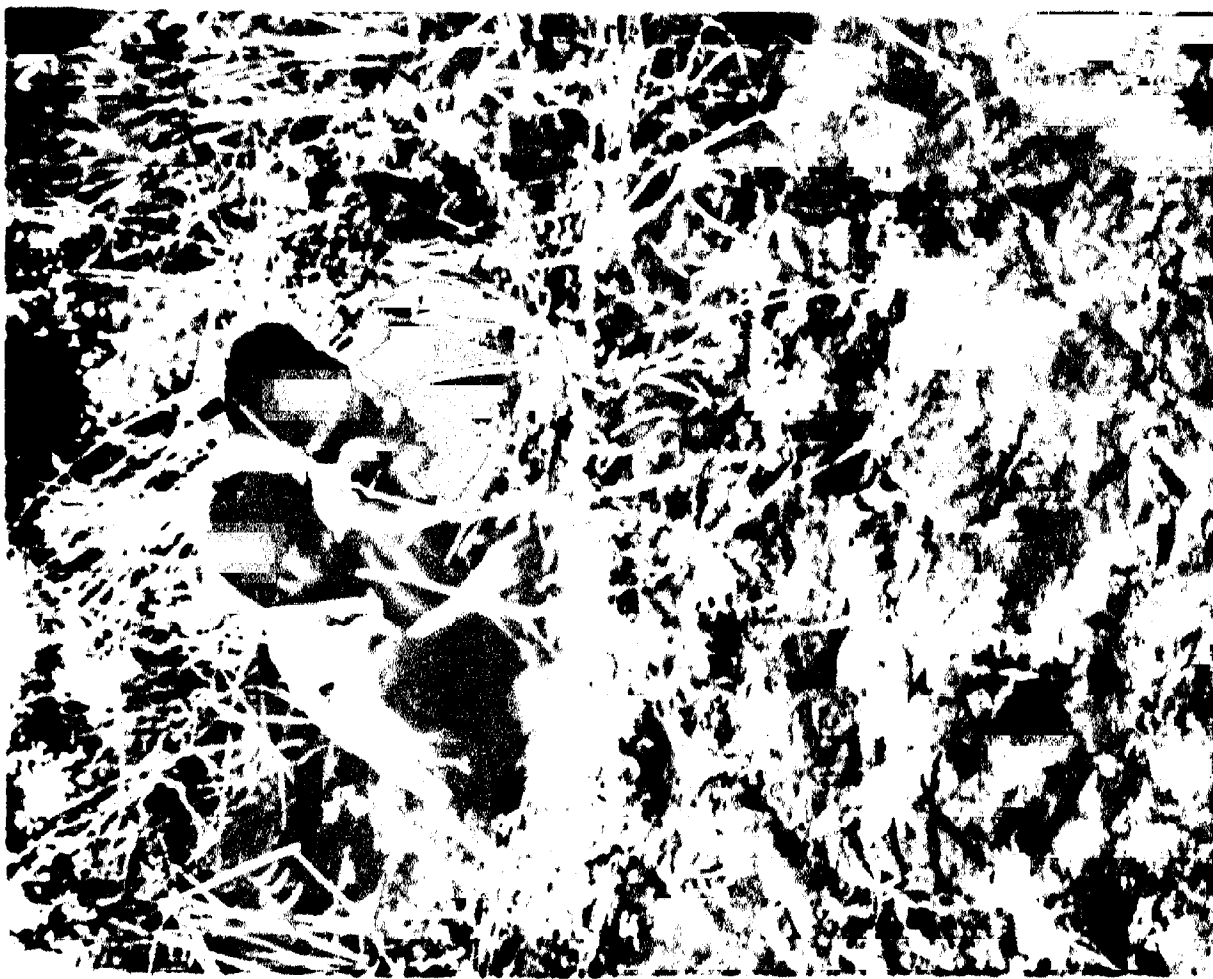
2. Figeorpea is not a field crop, but grown all over Philippines in the homesteads, on field bunds, etc.

3. Over the years there has been a strong selection by farmers in favour of bold, round, and white seeds.





4. *Pigeonpea* is often maintained as a perennial in backyards. Almost the entire produce is consumed by the grower as vegetable.



5. Local boys offering a helping hand in collecting *Atylosia*.



## 6. HANDLING OF COLLECTED MATERIAL

The collected samples were threshed, dried and thoroughly cleaned and transferred from muslin bags to fresh paper bags with naphthaline balls. The samples were divided into two parts and, as usual, one part was left with the cooperating party - Institute of Plant Breeding, University of Philippines at Los Baños. The herbarium specimens were thoroughly dried. With the assistance of Institute of Plant Breeding, the material was sent to the Directorate of Plant Protection, Quarantine and Storage for treatment and subsequent issue of phytosanitary certificate. The seeds were fumigated with Methyl bromide for 4 hours at 30 °C and herbarium specimens were wide dressed with Dieldrin. The phytosanitary certificate was obtained and the samples were brought along and handed over to our quarantine unit for onward transmission to the Indian Quarantine Authority. A major part of this material has been cleared and are now in our PEOIA.

## 7. FUTURE COLLECTION IN THE PHILIPPINES

The main island, Luzon has adequately been covered in the present mission. Mindanao and Ilo Ilo are the important areas which need to be collected. It has been reported that the Visayan settlers in Mindanao, particularly the Ilongos, have popularised the pigeonpea in Cotabato and Davao<sup>3</sup>. The crop is now grown in Glan, General Santos, Kidapawan and Midsayap in cotabato, and is one of the most profitable legumes of the Philippines. This area can be collected only by a separate mission as Mindanao is situated far away from Luzon.

Mindanao is not connected by international air route, but covered by local flights from Manila. The bookings can be done at Manila. IPB, University of Philippines needs to be approached again for a possible cooperation and joint venture and arranging transport from local government.

<sup>3</sup> Philippine Free Press January 8, 1966.

## 8. ACKNOWLEDGEMENTS

Dr. T.T. Chang, Geneticist and Leader, Genetic Resources, IRRI arranged transport and provided excellent local assistance. Director R.M. Lantican, IPB, University of the Philippines at Las Bañon and Dr. Noel G. Mamicipic, Program Leader, National Plant Genetic Resources Laboratory, IPB guided the collection mission and one of the staff of IPB, Mr. William Sm. Gruzo participated in the collection

## GERMPLASM COLLECTED IN LUZON, PHILIPPINES, APRIL, 1981

PR No.	Location	Alt. (m)	Province	Seed color Pattern	Main seed color	100 seed weight (g)	Remarks
1	2	3	4	5	6	7	8
5263	Sison	-	Pangasinan	S	GW	10.15	
5265	Tublay	1000	Benguet	S	GW	21.05	
5266	Atok	1500	Benguet	S	YW	17.72	
5267	Atok	1500	Benguet	M	B	14.13	
5268	Atok	1500	Benguet	M	GO	15.19	
5269	Atok	1500	Benguet	M+S	GW	16.27	Strophiole present
5270-1	Baguio, Loakai	1350	Benguet	M	B	11.56	Strophiole in some
5270-2	Baguio Loakai	1350	Benguet	M+S	YW	16.97	
5271	Sabangan, Pingad	1450	Mt. Province	P	YW	16.75	
5272	Bontoc	-	Mt. Province	P	YW	18.15	
5280	Awan, Banaue	950	Ifugao	P	YW	20.49	
5281	Awan, Banaue	950	Ifugao	P	GW	12.31	
5282-1	Cudog, Lagawe	600	Ifugao	P	YW	20.57	
5282-2	Cudog, Lagawe	600	Ifugao	P	YW	19.27	
5283	Durlagan	500	Ifugao	P	YW	17.21	
5284	Nayon, Lanut	300	Ifugao	P	YW	19.46	
5285	Santiago	100	Isabela	P	YW	19.76	
5289	Penablanca	90	Isabela	P	GO	7.30	
5293	Lalafugan, Lalu	40	Cagayan	P	GO	8.01	

Contd..

1	2	3	4	5	6	7	8
5294	Malaram, Allacapan	-	Cagayan	S	GW	20.41	
5295-1	Bangui	15	Ilocos Norte	S	YW	11.40	Strophiole in some
5295-2	Bangui	15	Ilocos Norte	P	GB	9.19	
5296	Parang Sarat, Laog	10	Ilocos Norte	S	YW	12.88	
5298-1	Sinabaan, Bantay	Zero	Ilocos Sur	S	YW	11.43	Heavy insect damage
5298-2	Sinabaan, Bantay	Zero	Ilocos Sur	P	GO	6.05	No insect damage
5299-1	Nanguneg East, Narvacan	-	Ilocos Sur	P	GW	10.52	
5299-2	Nanguneg East Narvacan	-	Ilocos Sur	S	YW	11.77	
5299-3	Nangybeg East Narvacan	-	Ilocos Sur	P	GB	8.94	
5300	Sanistaban, Santiago	5	Ilocos Sur	S	GO	16.66	
5301	Catayagan	-	Ilocos Sur	P	GO	11.01	
5302-1	Tampugo, Tagudin	-	Ilocos Sur	S	GO	14.04	
5302-2	Tampugo, Tagudin	-	Ilocos Sur	P	GW	14.50	
5302-3	Tampugo, Tagudin	-	Ilocos Sur	M+S	GW	12.91	
5302-4	Tampugo, Tagudin	-	Ilocos Sur	P	GW	8.47	
5304-1	Bauang, San Fernando	-	La Union	S	GW	11.71	
5304-2	Bauang, San Fernando	-	La Union	P	B	10.06	

Contd...

1	2	3	4	5	6	7	8
5305	Poblacion Norte, Caba	-	La Union	S	YW	16.13	
5306	Binlag, Calasiao	Zero	Pangasinan	P	YO	7.66	
5307	Kawan Norte, Malasique	Zero	"	P	GO	13.32	
5308	Larig-Larig, Malasique	60	Pangasinan	S	GW	12.54	
5309-1	Unsad, Villasia	60	Pangasinan	P	GO	7.23	
5309-2	" "	60	"	S	GW	10.0	
5310	San Pedro East, Rosales	50	Pangasinan	P	YO	6.84	Impressive cv.
5311	Rizal street, Umingan	100	"	P	GO	9.17	
5315	Dupex del Norte	350	Nueva Ecija	P	YW	17.37	
5316	Malasin, Dupex del Norte	350	"	M	GO	14.25	
5320	Binav, Dupex del Sur	340	"	S	YW	20.08	Vegetable type
5321	Binay, Dupex del Sur	340	"	P	YO	7.85	
5322-1	Binay, Dupex del Sur	340	"	P	GO	18.71	Vegetable type
5322-2	Rinay, Dupex del Sur	340	"	M	GP	11.38	
5322-3	Binay, Dupex del Sur	340	Nueva Vizcaya	S	YW	16.55	
5322-4	Binay, Dupex del Sur	340	"	P	YO	9.94	
5325	Old Boso Boso, Antipolo	150	Rizal	P	GO	8.66	
5326	Baras	170	Rizal	P	YW	8.05	

Contd...

1	2	3	4	5	6	7	8
5329	San Antonio-2, San Pablo	80	Laguna	P	YO	12.92	
5330	Kawayan	-	Quezon	P	GW	7.51	
5334	Agakhakim, Gumaca	-	Quezon	P	GW	9.17	
5335	Agakhakim, Gumaca	-	"	P	B	15.0	
5336	Santa Maria	Zero	"	P	B	9.11	
5337	Bagong Silang	Zero	"	P	B	10.29	
5338	" "	Zero	"	P	GW	4.62	No insect damage
5339	Malatap, Labo	60	Camarine Norte	P	GW	8.19	
5340	"	60	Camarine Norte	M	GP	6.33	
5341-1	Salvacion, Daraga	120	Albay	S	YW	9.38	
5341-2	" "	120	"	P	B	10.59	
5341-3	" "	120	"	P	GO	15.41	
5342	Sisigon, Matnog	40	Sorsogon	P	GW	9.74	
5343-1	" "	40	"	P	B	7.48	
5343-2	" "	40	"	P	YO	9.35	
5344	Casini, Irosin	50	Sorsogon	S	GW	6.49	
5345	Tulay, Na hupa	-	Camarine Norte	P	GW	5.59	Small seed
5346	San Pablo	110	Laguna	P	GW	7.63	
5347	"	110	"	M	GP	6.00	

Contd...

IPB No.	2	3	4	5	6	7	8
16	IPB, University of Philippines, Laguna			P	B	6.37	IPB Collection
279	- do -			M	GP	10.75	"
291	- do -			P	YW	7.56	"
295	- do -			P	B	6.33	"
296	- do -			M+S	GW	7.4	"
297-1	- do -			P+M	B	5.68	"
297-2	- do -			S	GW	5.60	"
298	- do -			M	GP	6.61	"
299-1	- do -			P	B	5.60	"
299-2	- do -			S	GW	5.53	"
273	- do -			-	-	-	Cowpea

### Expansion of codes

Column 5 : M = Mottled, P = Plain, S = Speckled

Column 6 : B = Brown, GB = Greyed orange, GW = Greyed white,

YW = Yellow white, GB = Greyed brown, GP = Greyed purple

YO = Yellow orange

(According to RHS colour charts)

OTHER CROPS COLLECTED

PR No.	Location	Altitude	Province	Crop
5287	Santiago	100	Isabela	Groundnut
5288	Canayan	100	"	"
5290	Tuguegarao	50	"	"
5291	Alkala	50	Cagayan	"
5291-1	"	50	"	"
5312	Umingan	100	Pangasinan	"
5314	Don Montano	-	"	"
5331	Lucena	Zero	Quezon	"
5332	"	Zero	"	"
5333	"	Zero	"	"
5273	Bontoc	-	Mt. Province	Cowpea
5286	Santiago	100	Isabela	"
5292	Camalaniagan	50	Cagayan	"

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