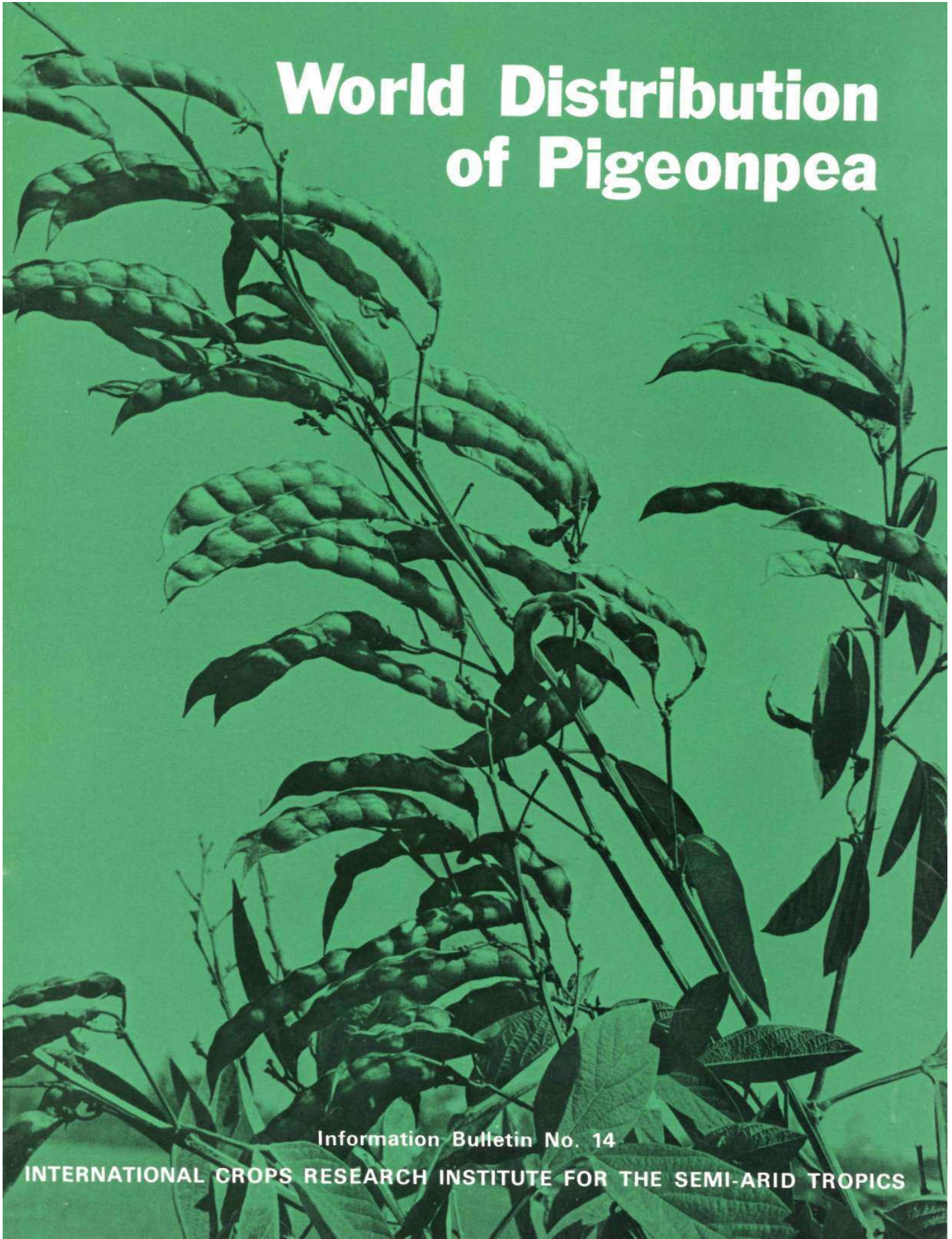
# World Distribution of Pigeonpea



Information Bulletin No. 14

INTERNATIONAL CROPS RESEARCH INSTITUTE FOR THE SEMI-ARID TROPICS

# World Distribution of Pigeonpea

Based on herbarium study, literature, and statistics, with data on the late-1982 status of ICRISAT's world germplasm collection

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## Abstract

Van der Maesen, L.J.G. 1983. World distribution of pigeonpea. Information Bulletin No. 14. Patancheru A.P., India: International Crops Research Institute for the Semi-Arid Tropics.

Pigeonpea (*Cajanus cajan* (L.) Millsp.) is an important grain legume in the semi-arid tropics. Apart from India, where the largest crop areas occur, and some other producing countries, statistics are either unavailable or tend to underestimate the importance of pigeonpea. The plants are often intercropped, or grown as hedges or single plants near houses where they contribute to the protein diet. This bulletin describes the distribution of pigeonpea as revealed by herbarium data and presents maps of the localities where pigeonpea is found. The information is intended for plant collectors, other scientists, and decision makers. Some pertinent information on cultivation methods and production has been included. The 1982 status of germplasm available from the areas of occurrence has been summarized

## Résumé

Van der Maesen, L.J.G. 1983. World distribution of pigeonpea. (**La répartition mondiale du pois d'Angole.**) Information Bulletin No. 14. Patancheru, A.P., India: International Crops Research Institute for the Semi-Arid Tropics.

Le pois d'Angole (*Cajanus cajan* (L.) Millsp.) est une importante légumineuse à graine des zones tropicales semi-arides. Exception faite de l'Inde, où se trouve les plus grandes superficies cultivées, et quelques autres pays, on ne dispose pas de statistiques ou encore celles qui sont disponibles ont tendance à sous-estimer l'importance du pois d'Angole. Les plantes se retrouvent souvent dans une association culturale, comme haies ou en petit nombre près des habitations; mais ils fournissent néanmoins des protéines nécessaires au régime alimentaire. Ce bulletin porte sur la répartition du pois d'Angole. Sa réalisation a été possible grâce à une étude des herbiers importants. Il contient des cartes géographiques indiquant les emplacements où l'on trouve le pois d'Angole. Cette information devrait servir aux personnes qui collectent des plantes et d'autres chercheurs scientifiques, ainsi qu'aux responsables qui prennent les décisions en matière agricole.

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## Introduction

During the preparation of a taxonomical revision of the genus *Cajanus* (including its wild relatives in *Atylosia*), the geographical origins of the pigeonpea (*Cajanus cajan* (L.) Millsp.) specimens in the world's herbarium collections were mapped. The distribution of the pigeonpea is much clearer from these numerous reference specimens than from production statistics. Pigeonpea, although locally very important as a protein-rich constituent of the diet, is not a major pulse crop except in India and East Africa. FAO crop statistics (before 1975) do not include production data from countries with less than 1000 ha, and some individual pigeonpea-growing countries may not report pigeonpea production at all. Others may combine pigeonpea statistics with those of other pulses. FAO discontinued the separate publicaton of pigeonpea statistics in the Production Yearbook after 1975. The latest information published is for 1974, but data are nevertheless available for consultation. Accordingly statistics for 1980 (courtesy FAO) are quoted in Tables 1 -*A.* The maps in this bulletin have been prepared primarily for use by plant collectors. In the taxonomical revision there was no place for a full citation of specimens, because of space limitations. Location and phenological data are therefore summarized in this publication

## Method

Information given on herbarium labels, available in herbarium institutions (Appendix 1), was scrutinized. Unfortunately older specimens seldom include precise information, and often bear obsolete location names. Information on recently collected specimens is more useful. The locations were ascertained from an array of gazetteers and maps, in particular the mid-century editions of the *Times Atlas* All named locations that could be found were plotted on base maps to indicate the range of occurrence. Other place names could not be ascertained. A set of appendices arranged by country (Appendices 2-4) was prepared to provide more complete information. Where possible, administrative subdivisions, with the most recent names, have been added. Geographical coordinates that could not be ascertained from a single uniform source, have been omitted. Many locations for specimens collected in colonial days were difficult to ascertain (e.g., Zaire), and some errors may have arisen where more than one place with the same name exist. (Should readers identify such errors, submission of corrections to the Leader, Genetics Resources Unit, ICRISAT, is solicited.)

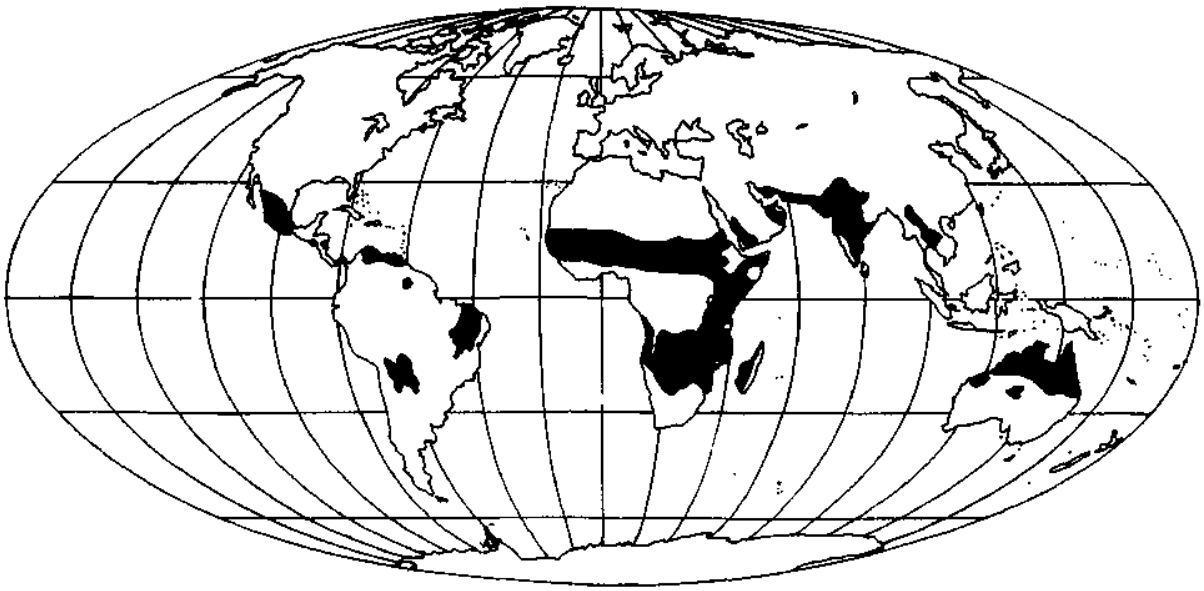
The name of the collector and the date have been included for reference purposes. Physical and political barriers and differences in interests have clearly influenced the pattern of collection, so the collections have not been made in a uniform way. The dates of collection stated suggest what chances there may be of finding pigeonpea at the indicated locations. Many botanical collectors failed to pay further attention when they recorded the well-known pigeonpea as a possible escape from cultivation. This means that the number of specimens of noncultivated pigeonpeas in the herbaria probably does not indicate the true extent of their occurrence. Where herbarium specimens were not available from certain areas or countries, distribution data were taken from published floras. For Kenya, seed collection locations were inserted, since these were available and herbarium specimens were scarce.

Some authorities postulate an African origin for pigeonpea. However, I concur with the opinion that the pigeonpea is of ancient introduction into Africa. It is the Indian subcontinent that is the home of the cultivated pigeonpea it was carried to Africa, even before 2000 B.C. (see Van der Maesen, 1980, in: Miscellaneous Papers 19, Agric. Univ , Wageningen). The putative progenitor, *Atylosia cajanifolia* Haines, and many related species also occur in India. From Africa, pigeonpea was brought to Central and South America, where its distribution is now widespread, especially on several Caribbean islands. This happened at the time of the conquests of America, after 1492 The specimens collected are never stated to be truly wild. The true wild state of pigeonpea has not been established. In some records collectors have noted that a specimen has apparently escaped from or is a relict of cultivation.

## Distribution

### Africa

Pigeonpea is widely distributed in Africa (Map 2). Yield of dry seeds averages 400-570 kg/ha Cultivated pigeonpeas are often grown in small plots or as single plants, hedges, etc., for vegetable (or fodder) purposes. In East Africa, from where useful statistical data are available, pigeonpea is grown as a sole crop or is mixed or intercropped with maize, cowpea, sorghum, etc. In Zaire, pigeonpea is cropped on a field scale. In northern Nigeria, green pods are commonly sold in local markets. Relatively few African accessions of pigeonpea are available in the world germplasm collection of pigeonpea now maintained at ICRISAT (Table 1). Only in Kenya and Tanzania have pigeonpeas been widely collected. Of 117 accessions collected there in 1976, 61 were admitted through quarantine into India. Missions from the International Institute of Tropical Agriculture, Nigeria, secured six pigeonpea accessions in Sierra Leone and seven from the Ivory Coast in 1977, amongst other accessions, and duplicates of these will be for-



*Map. 1 The Semi-Arid Tropics* (*shown in black*).

Table 1. Pigeonpeas from Africa in the ICRISAT collection.

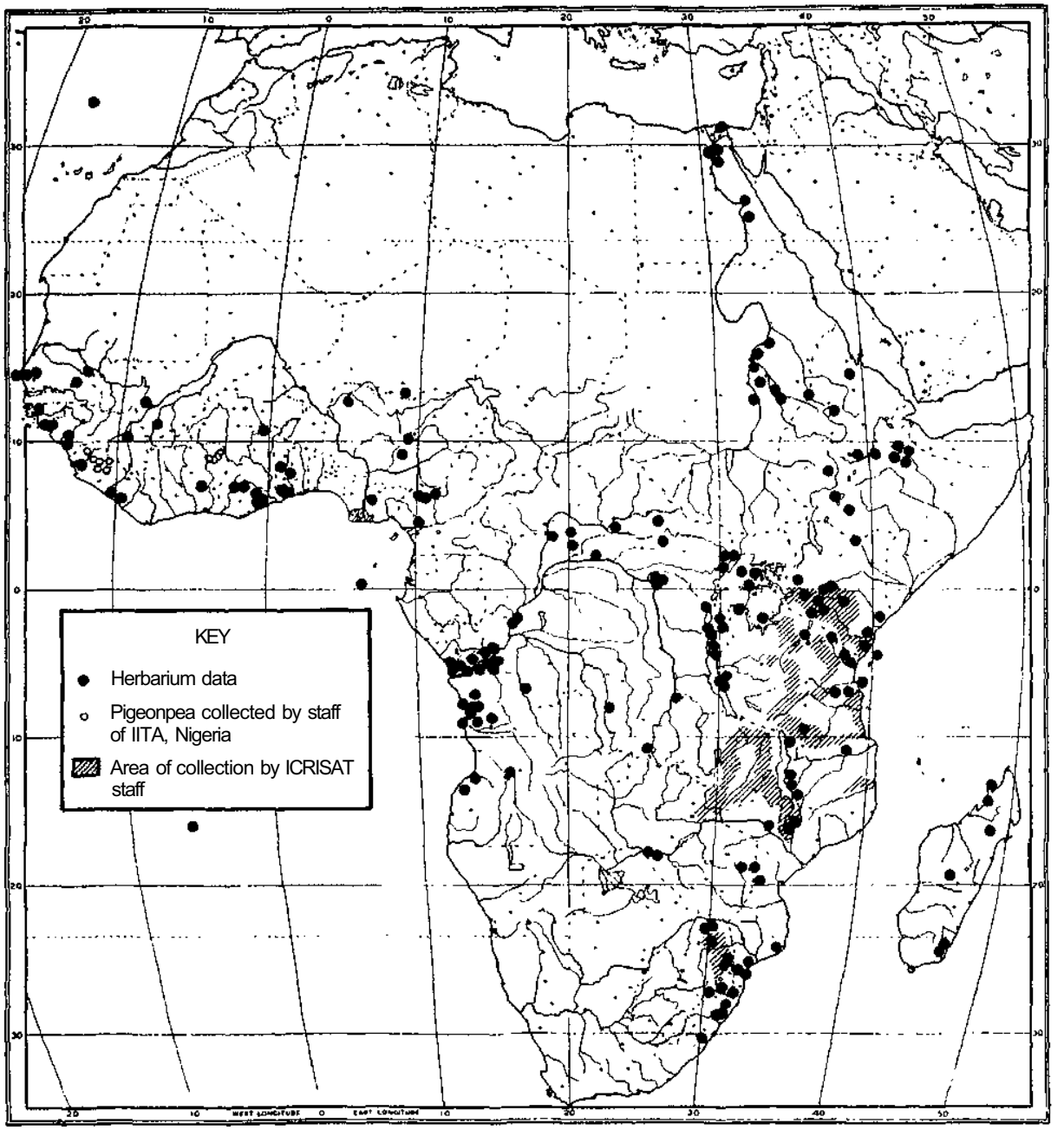
| Country | Production area ('000 ha) | Source of statistics | Accessions (late 1982) |
|---|---|---|---|
| Ghana | a | a | 2 |
| Kenya | 1152b | 1974/75 Statistical Abstracts, Kenya | 64 |
| Madagascar | a | a | 1 |
| Malawi | 110 | 1980 FAO data file | 20 |
| Nigeria | a | a | 27 |
| Senegambia | a | a | 10 |
| Tanzania | 33 | 1980 FAO data file | 167 |
| Uganda | 113 | 1980 FAO data file | 0 |
| Zambia | a | *a* | 20 |

a. Not available
*b.* Mixed crop.

warded to ICRISAT also. In 1978 many more were collected by IITA. In 1979 and 1980 ICRISAT secured a number of pigeonpea samples from Tanzania, Zambia, and Malawi. Pigeonpea has great potential in semi-arid areas (see Map 1), and in arid areas of Africa and Central America. Collection of pigeonpeas in Africa is important, because that continent is a secondary area of diversity, and can provide valuable material for plant breeding programs at ICRISAT and elsewhere. Some flower and stem colors found in Africa are absent or very rare in Indian accessions. Useful characters, such as the plant's surprising survival on dry red soils in Kenya, may be valuable in developing improved cultivars.

The list of herbarium specimens examined from Africa is given in Appendix 2. Locations for Kenya were complemented with germplasm location data. (For locations of germplasm collected in Zambia, Tanzania, and South Africa see ICRISAT's Genetic Resources Unit Progress Report 2,38, and 43 respectively.) As can be seen from Map 2 and Appendix 2, pigeonpeas occur in almost all countries in Africa except for those with desert and Mediterranean climates. In the Nile delta, and along the Nile in upper Egypt and Sudan, their occurrence is apparently rare, more so now than in the past. Old reports of apparently wild pigeonpeas in upper Egypt induced a number of authors to decide in favor of an African origin of the crop. Not all material from Madagascar lodged at the Paris Herbarium was seen, so pigeonpea is probably more common there than listed. Pigeonpea in Africa tends to occur within the entire tropical zone, rather than within the semi-arid tropics only.

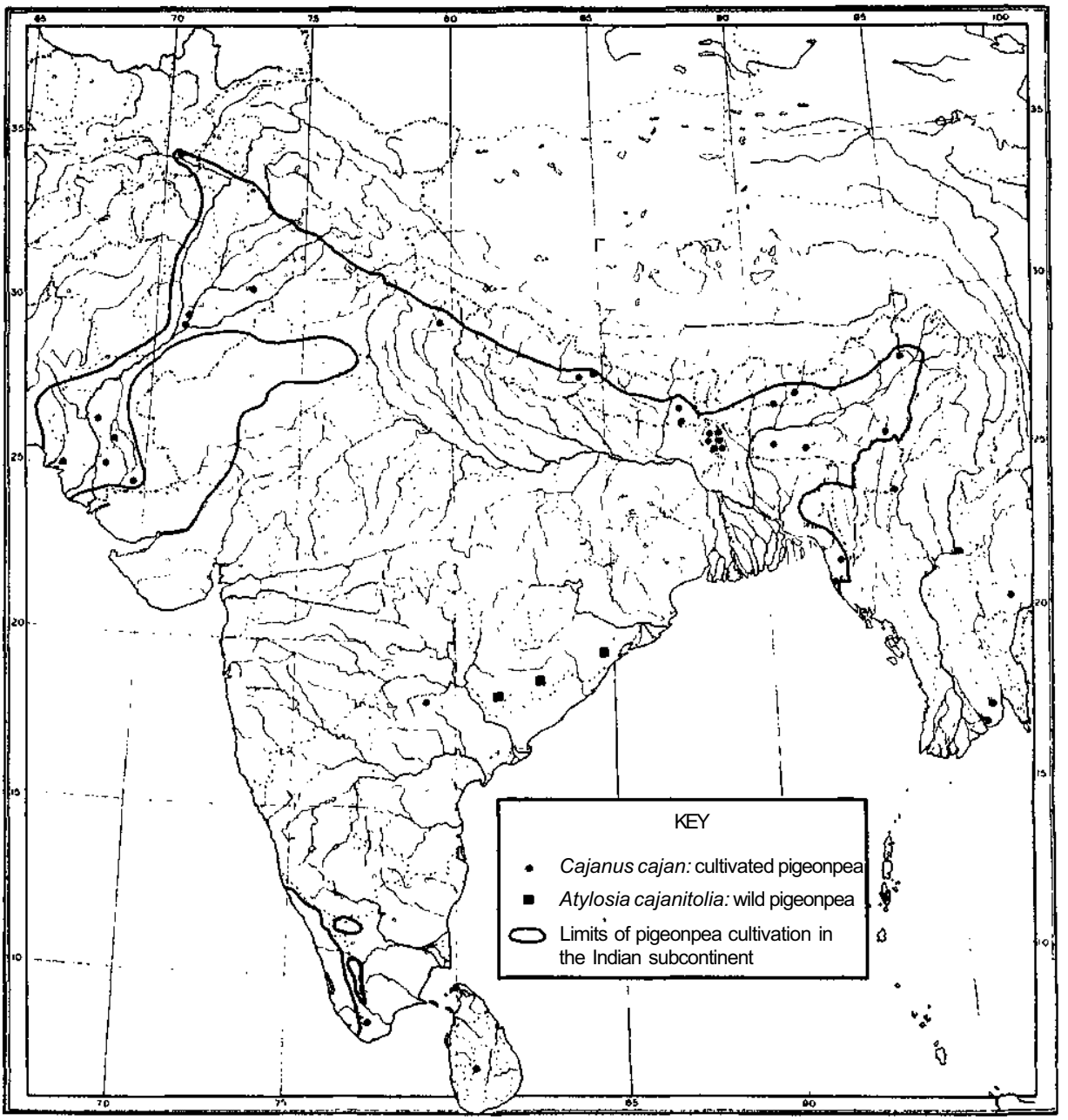
In summary, pigeonpea is reported from 37 African countries at altitudes ranging from sea level to 2050 m. Flowers and fruits can be found throughout most of the year, but normally harvesting is done in dry seasons only. In East Africa the main crop is harvested in August. Pigeonpea that is grown as a vegetable is harvested over longer periods.




*Map 2. Locations where pigeonpea has been collected in Africa.*

### Asia and Oceania

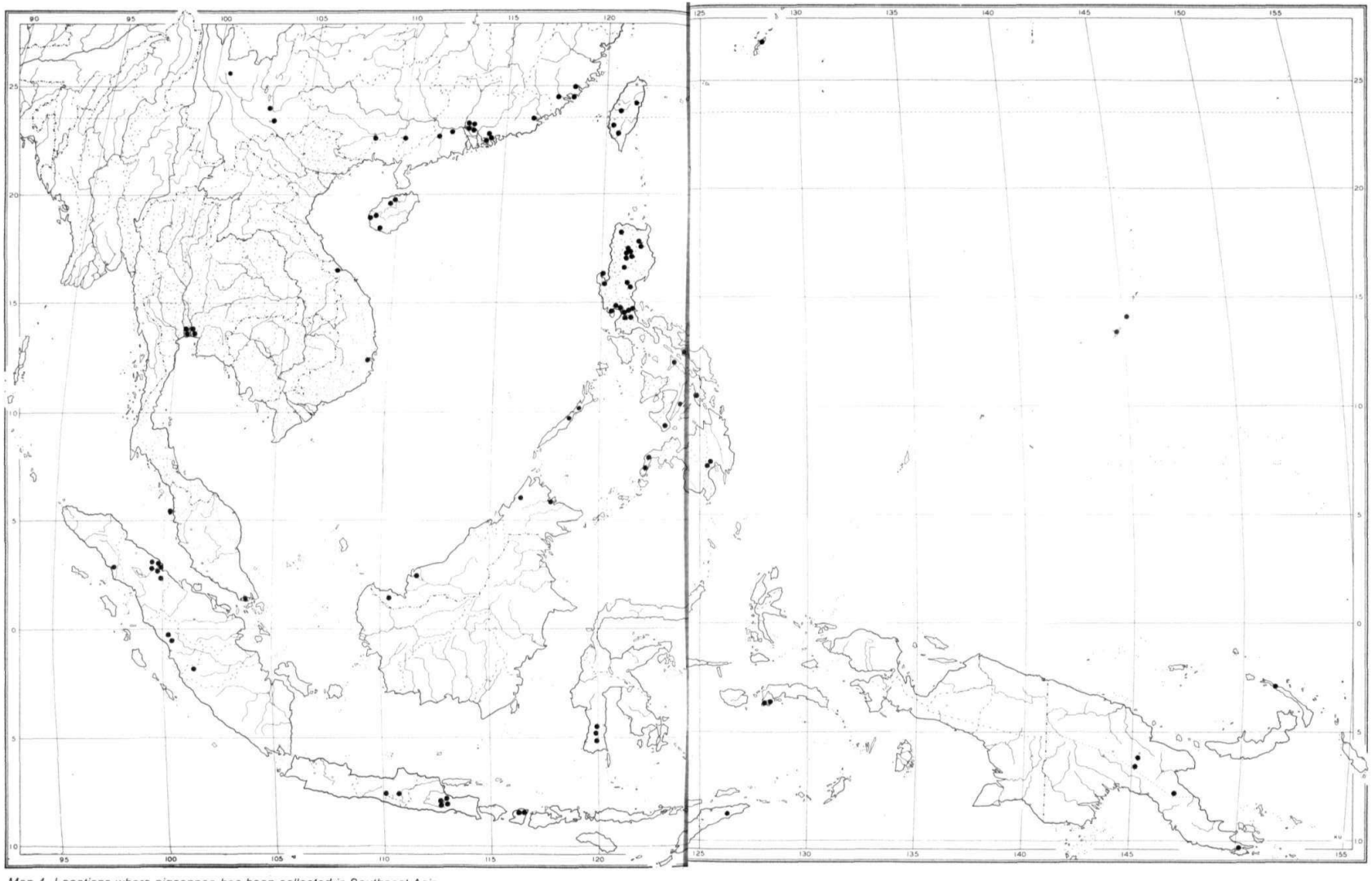
Asia is the continent where pigeonpea is most widely distributed (Maps 3,4 Table 2) and India is the country where the largest hectarages are grown (Table 3). Average dry seed yields range from 350 to 725 kg/ha. For germplasm purposes, pigeonpeas have been quite adequately collected from India (Regional Pulse Improvement Program, Indian Agricultural Research Institute, ICRISAT). There are not many pigeonpea




*Map 3. Locations where pigeonpea has been collected in South Asia.*

accessions in the ICRISAT collection from other Asian countries, where the crop is of less importance. ICRISAT missions have visited Nepal, Bangladesh, Thailand, the Philippines, Sri Lanka, and Burma (Genetic Resources Unit Progress Reports 5, 6, 15, 21, 23, and 34).

In the Indian subcontinent pigeonpeas are mainly consumed as dhal (dry split peas) and are an important source of protein for the majority of families. In other, countries their use as a vegetable (fresh peas) is considerable. The use of young pods as a vegetable has been reported from Indonesia and Thailand.




*Map 4. Locations where pigeonpea has been collected in Southeast Asia.*

In India, pigeonpea is mainly grown as an intercrop with sorghum, pearl millet, cotton, and numerous other crops. Only about 10-20% of the crop is grown as a sole crop. In intercrops the number of rows of other crops grown with each row of pigeonpea varies from two for cereals to 8-20 for cotton and groundnuts. Sometimes pigeonpeas are grown merely as a hedge, bordering plots of cassava (in Kerala) or rice (in Tamil Nadu), etc.

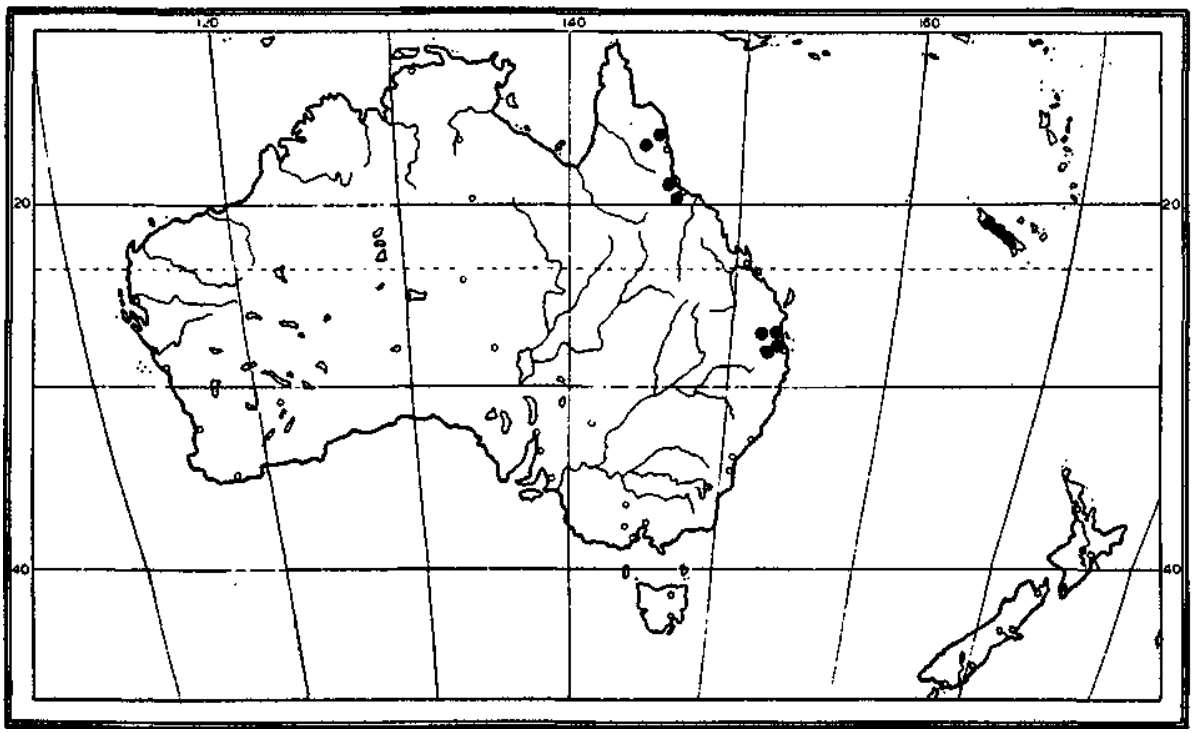
In Australia (Map 5) pigeonpeas, introduced for the first time about a century ago, have been grown as a fodder crop and are now promoted as a possible grain crop for export. In Hawaii the interest in pigeonpea for green manure and fodder, apparent from literature before the second World War, has dwindled. The crop was used in rotation with pineapples. Pigeonpeas have also been introduced into many other Pacific islands. They presumably are eaten as a vegetable, or as a dry pulse where Indian culinary influence exists. In Fiji pigeonpea was first introduced from North America; later Indian cultivars were imported.

The herbarium specimens examined from Asia and Oceania are listed in Appendix 3. From India only a few unusual locations or materials are included, since in the other areas (see also Table 3) the pigeonpea is very or fairly common. Maps 3, 4, and 5 show the crop's geographical distribution. It would require a more detailed environmental study to correlate pigeonpea distribution with climate and population density. On Java pigeonpea is more common than indicated, because not all speci-

**Table 2. Pigeonpeas from Asia and Oceania in the ICRISAT collection.**

| Country | Production area ('000 ha) | Source of statistics | Accessions (late 1982) |
|---|---|---|---|
| Australia | a | a | 47 |
| Bangladesh | 4 | 1980 FAO data file | 57 |
| Burma | 50 | 1980 FAO data file | 64 |
| India | 2666 | 1980 Agric Situation in India 35(9) 748 | 9025 |
| Indonesia | a | a | 4 |
| Malaysia | a | a | *a* |
| Nepal | *a* | *a* | 116 |
| Pakistan | 3 | 1980 FAO data file | 15 |
| Philippines | a | a | 37 |
| Sri Lanka | a | a | 70 |
| Taiwan | *a* | *a* | 3 |
| Thailand | *a* | *a* | 20 |
| USSR | *a* | *a* | *2* |

a. Not available




*Map* 5. *Locatidns where pigeonpea has been collected in Oceania.*

**Table 3. Pigeonpeas from India in the ICRISAT collection.**

| State | Production area ('000 ha) | Accessions (late 1982) |
|---|---|---|
| Andhra Pradesh | 193.0 | 2404 |
| Assam | 6.0 | 112 |
| Bihar | B4.8 | 651 |
| Delhi | a | 111 |
| Goa | a | 1 |
| Gujarat | 153.0 | 125 |
| Haryana | 6.6 | 3 |
| Himachal Pradesh | 0.4 | 4 |
| Karnalaka | 308 3 | 275 |
| Kerala | 3.0 | 31 |
| Madhya Pradesh | 477.3 | 732 |
| Maharashtra | 662.6 | 552 |
| Meghalaya | 0.7 | 2 |
| Orissa | 79 7 | 214 |
| Punjab | 7.7 | 31 |
| Rajasthan | 281 | 39 |
| Sikkim | a | 4 |
| Tamil Nadu | 90.0 | 348 |
| Tripura | 06 | 0 |
| Uttar Pradesh | 542 8 | 2009 |
| West Bengal | 187 | 137 |
| Unknown | | 608 |
| ICRISAT developed lines | | 632 |
| | 2665 5 | 9025 |

Source Agricultural Situation in India 35(9) 748(1980) Final estimate for 1979-80.

a Small areas.

mens (in Leiden and Bogor) have been listed. East Java and the Lesser Sunda Islands are not very humid and here potential for the crop seems considerable Kalimantan (Borneo) and West Irian (New Guinea) are not very populated and are very humid, which explains the absence of the plant. In Australia pigeonpea is still an exprimental crop, but earlier introductions have escaped and are spreading, in one case rapidly. In Bangladesh, Nepal, Burma, and Thailand pigeonpeas are more common than is suggested by the maps and the herbarium data, as confirmed on recent germplasm collection missions of ICRISAT in 1979 and 1980 (see Genetic Resources Unit Progress Reports 5,6,15,21, 23).

In summary, pigeonpea is reported from 28 countries in Asia and Oceania at altitudes up to 1800 m. Close to the equator, flowers and fruits can be seen throughout the year, but, for example in Indonesia, August is a month during which dry seeds can be collected. In the Indian subcontinent harvests commence in October (central India) to reach a peak in January, while in north India harvests last from March until May. In Thailand, Burma, and the Philippines flowering occurs between December and April.

## America

Pigeonpea is a post-Columbus introduction into Central and South America. During the European conquest of the New World after 1492, several new crops were exchanged—including pigeonpea. Well-known in Africa, the crop was brought in by Europeans and Africans and was established in many Caribbean islands and semi-arid mainland regions of Central and South America (Map 6).

Pigeonpea is eaten mainly as a vegetable, either fresh of canned. Reported yields average 540-2200 kg/ha (based on dry and fresh seed weights, the latter probably accounting for the high yields achieved). The canning industry is important in Puerto Rico and the Dominican Republic, because millions of dollars' worth of canned pigeonpea is exported each year. The USA is an important customer,

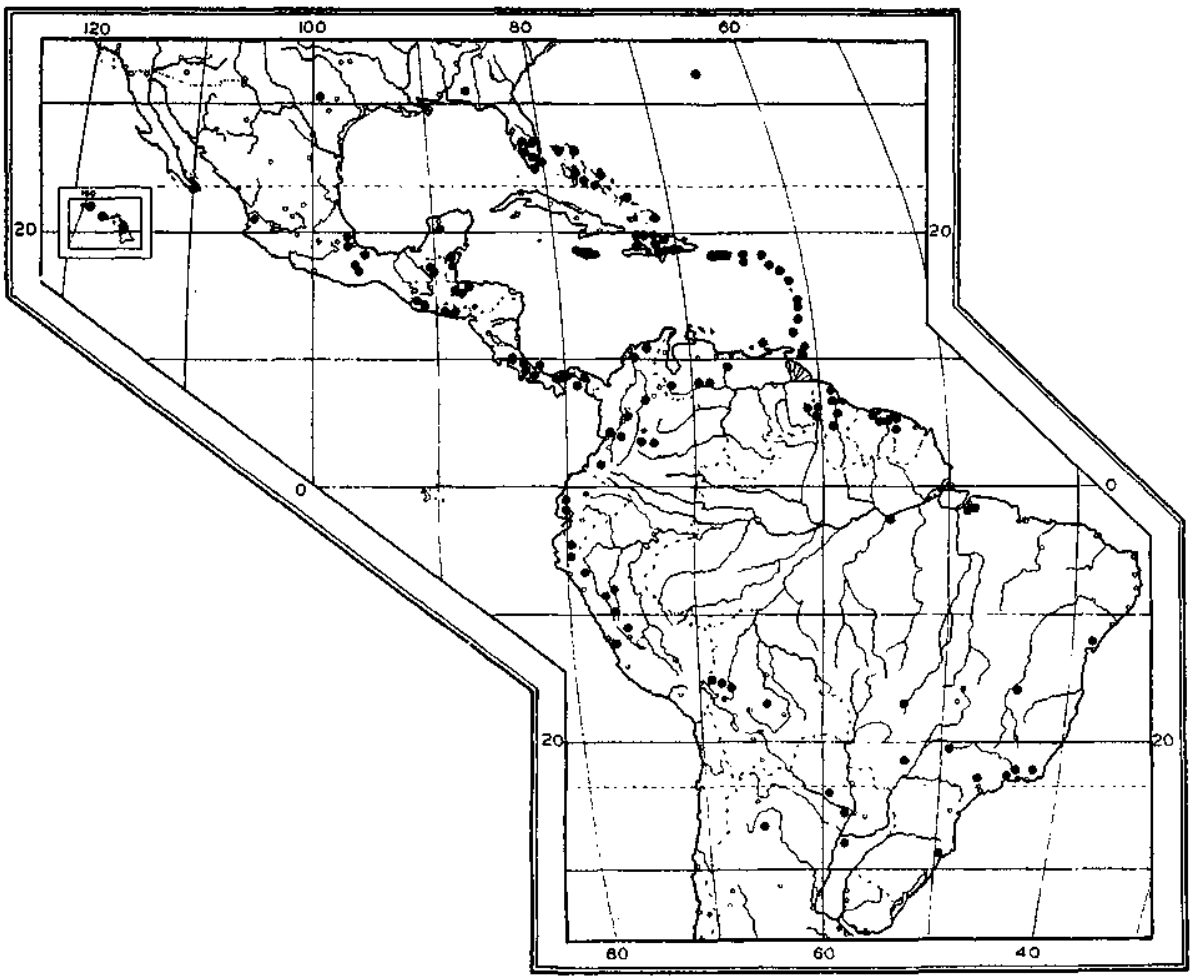
Local adaptation has no doubt been achieved in this area, and therefore the collection of germplasm for use in breeding programs both in the Americas and elsewhere would be beneficial. In smaller areas—for instance, on the islands, where the crop is grown commercially—local landraces are likely to be replaced with improved cultivars. Conservation of genetic resources is therefore warranted. Table 4 gives the hectarage information that is available, with the number of accessions held in the world collection at ICRISAT Center

Table 4. Pigeonpeas from North and South America in the ICRISAT collection.

| Country | Production area ('000 ha) | Source of statistics | Accessions (late 1982) |
|---|---|---|---|
| Brazil | a | a | 7 |
| Colombia | a | a | 5 |
| Dominican Republic | 19 | 1980 FAO data file | 6 |
| Grenada | 1 | a | *a* |
| Guadeloupe | a | *a* | *A* |
| Guyana | a | *a* | *7* |
| Haiti | 9 | 1980 FAO data file | *a* |
| Jamaica | 3 | 1982 CARDI *b* | 18 |
| Martinique | *a* | *a* | 1 |
| Mexico | *a* | *a* | 2 |
| Panama | 2 | 1980 FAO data file | a |
| Peru | 2 | a | 5 |
| Puerto Rico | 8 | 1980 FAO data file | 45 |
| Trinidad | 2 | 1980 FAO data file | 22 |
| USA | *a* | *a* | 3 |
| Venezuela | 10 | *a* | 15 |

*a* Not available

*b.* Caribbean Research and Development Institute. (Personaf communication)




*Map 6. Locations where pigeonpea has been collected in North and South America.*

Appendix 4 lists the herbarium specimens studied from North and South America. The distribution can be seen on Map 6. Cultivation in the New World is particularly concentrated in the West Indies. In Mexico pigeonpeas are found in more humid rather than semi-arid tropical areas. Pigeonpeas are understandably absent from the Amazon region. From the semi-arid tropics of Brazil hardly any specimens were available, but from southern Brazilian states more were present in the herbaria. In Venezuela and the Andes pigeonpeas are found up to 3000 m, although the highest elevation (from Peru) documented in the herbarium specimens was only 2300 m.

In summary, pigeonpea is reported from 37 countries in the Americas at altitudes up to 2300 m. February to April is the main harvest season for the vegetable crop in the Caribbean, for instance in the Dominican Republic and Haiti. In most areas flowers and fruits can be seen on perennial plants throughout the greater part of the year.

## Conclusion

Production statistics grossly underestimate the importance of pigeonpea. Tables 1 -4 list the available crop statistics. Appendices 2-4 list the distribution data from herbarium sources, in a few cases supplemented by germplasm collection data. The maps illustrate the locations where cultivated and noncultivated pigeonpea has been collected. These locations occur within the semi-arid and the humid tropics. However, as is

shown on the distribution maps, it is clear that those countries with extensive and therefore successful cultivation (India, Kenya, Uganda, Tanzania, Malawi) are all located in the semi-arid tropics. Here, and in the more humid tropics with a distinct dry season, lie the potential areas for expansion. The crop's absence from areas with a low population density is evident.

It is difficult to produce reliable production statistics because pigeonpea is often grown as a home garden crop or to mark field boundaries. This information bulletin attempts to overcome this problem by presenting data that are based on a study of herbarium specimens. In most areas genetic erosion may not yet be imminent in this crop; but the ICRISAT Genetic Resources Unit is following up the information in this bulletin with appropriate collection efforts to adequately sample the genetic diversity still available in pigeonpea.

**Acknowledgments**

It is with gratitude that I acknowledge the cooperation of Directors, Curators, and staff members of the herbarium institutions listed in Appendix 1. From most of these herbaria specimens of *Cajanus* were sent on loan to Wageningen, the Netherlands, where I undertook the major part of the revision work on *Cajanus* and *Atylosia.* Visits to other herbaria permitted me to study the material conserved there. I am particularly grateful to Prof Dr. H.C.D. de Wit (Laboratory of Plant Taxonomy and Plant Geography, University of Agriculture, Wageningen, the Netherlands) and my colleagues in ICRISAT for helpful criticism and support. The map outlines are derived from the Goode Base Map Series, prepared by Henry M. Leppard, Department of Geography, University of Chicago, USA.

## APPENDIX 1. Herbarium institutions that provided *Cajanus cajan* material studied (prefixed by conventional abbreviations).

A - Arnold Arboretum, Cambridge, Mass., DSA
AD - State Herbarium of South Australia, Adelaide, Australia
ASSAM - Botanical Survey of India, Eastern Circle, Shillong, India
B - Botanischer Garten und Botanisches Museum, Berlin-Dahlem, Federal Republic of Germany
BLAT - Blatter Herbarium, St. Xavier's College, Bombay, India
BM - British Museum (Natural History), London, UK
BR - National Botanic Garden, Bruxelles, Belgium
BRI - Queensland Herbarium, Indooroopilly, Brisbane, Australia
BSD - Botanical Survey of India, Northern Circle, Dehra Dun, India
BSI - Botanical Survey of India, Western Circle, Poona, India
C - Botanical Museum and Herbarium, Copenhagen, Denmark
CAHP - College of Agriculture, University of the Philippines, Laguna, the Philippines
CAL - Botanical Survey of India, Central National Herbarium, Calcutta, India
CANB - Herbarium Australiense, CSIRO, Canberra, Australia
COI - Botanical Institute, University of Coimbra, Portugal
DD - Forest Research Institute, Dehra Dun, India
DNA - Herbarium, Northern Territory, Darwin, Australia
E - Royal Botanic Garden, Edinburgh, UK
EA - East African Herbarium, Nairobi, Kenya
PHI - Forest Herbarium Ibadan, Nigeria
FI - Herbarium Universitatis Florentinae, Firenze, Italy
G - Conservatoire et Jardin Botaniques, Geneva, Switzerland
HY - Botanical Department Herbarium, Osmania University, Hyderabad, India
JCB - St. Joseph's College, Bangalore, India
K - The Herbarium, Royal Botanic Garden, Kew, Richmond, UK
KUH - Department of Botany, Karachi University Herbarium, Pakistan
L - Rijksherbarium, Leiden, the Netherlands
LWG - National Botanic Research Institute, Lucknow, India
MEL - National Herbarium of Victoria, Royal Botanic Gardens, South Yarra, Melbourne, Australia
MGM - Manas Gangotri University, Mysore, India
MH - Botanical Survey of India, Southern Circle (Madras Herbarium), Coimbatore, India
NT - Herbarium of the Northern Territory, Alice Springs, Australia
OXF - Fielding-Druce Herbarium, Department of Botany, Oxford, OK

| | |
|---|---|
| p | - Laboratoire de Phanerogamie, Musee National d'Histoire Naturelle, Paris, Prance |
| PAN | - Department of Botany, Panjab University, Chandigarh, India |
| PERTH | - State Herbarium of Western Australia, Perth, Australia |
| PNH | - Philippine National Herbarium, National Museum, Manila, the Philippines |
| PRE | - National Herbarium, Botanical Research Institute, Pretoria, South Africa |
| PUN | - Department of Botany, Punjabi University, Patiala, India |
| RAW | - National Herbarium of Pakistan (Stewart Herbarium), Rawalpindi, Pakistan |
| TAI | - The Herbarium, Department of Botany, National Taiwan University, Taipei, Taiwan |
| D | - Institute for Systematic Botany, Utrecht, the Netherlands |
| US | - US National Herbarium, Smithsonian Institution, Washington D.C., USA |
| W | - Naturhistorisches Museum, Vienna, Austria |
| WAG | - Laboratory for Plant Taxonomy and Plant Geography, Wageningen, the Netherlands |

NOTES TO APPENDICES 2-4:

F1/Fr = flowering/fruiting, the stage of the plant present on a herbarium sheet.

Collector = name of collector and his number (or absence thereof).

do = same location or collector's name as in the previous entry.

obs. = field observation.

coll. indig. = local collector.

## APPENDIX 2. List of herbarium specimens examined from Africa.

| Location | District/Region | Province/State | Collector | Date | F1/Fr | Altitude(m) |
|---|---|---|---|---|---|---|
| ANGOLA | | | | | | |
| | | Luanda | Boss 36755 | Aug 1937 | x x | |
| Sa da Bandeira | | Huila | Henriques 1165 | Sep 1967 | x | |
| | | Cabinda | Montemo 146 | Jun 1959 | x x | |
| Huarobo, 13 km to Nova Lisboa | | | Moreno 416 | Jan 1972 | x | |
| Quicabo | | Luanda | Portugal Aranjo 77 | Jul 1959 | x x | 300 |
| Quizambilo, Dande | | Luanda | do 74 | Jun 1959 | x x | 300 |
| Malanje | | Malanje | Rensch 393 | Jan 1880 | x | |
| Ganda | | Benguela | Teixeira 6984 | Oct 1963 | x | 1730 |
| Quicuxe | | Luanda | Welwitsch 2227 | Mar 1854 | x x | |
| Scolo, sange, Irombeta | | Golungo Alto | Welwitsch 2228 | Sep 1857 | | |
| BURUNDI | | | | | | |
| Gitega | | | Baudet 306 | Dec 1972 | x | 1700 |
| Kitete | | | Elskens 110 | Nov 1922 | x | |
| Bujumbura | Bujumbura | | Lewalle 6410 | Jan 1972 | x x | 900 |
| Missumba | Bujumbura | | do 53 21 | Mar 1971 | x | 1100 |
| Ruziba | Bujumbura | | do 4375 | Jan 1970 | x x | 900 |
| Uvira Road | | | do 63 86 | Dec 1971 | x | 780 |
| Bujumbura | Bujumbura | | Niyongere 6 | Jun 1968 | x x | 800 |
| Giharo Mosso | Ruyigi | | Reekmans 2700 | Sep 1973 | x x | 1300 |
| Bubanza | | | do 34 86 | | x x | 1000 |
| Burusi-Minago | | | do 597 | May 1971 | x x | 1000 |
| Rumonge | | | do 5063 | May 1976 | x x | 850 |
| Usumbura to Uvira | Bujumbura | | Symoens 2250 | Feb 1956 | x | 780 |
| CAMEROON | | | | | | |
| Japoma, nr Douala | | Littoral | Dang 472 | Apr 1970 | x | |
| Bebeketti | Bamenda | Nord-ouest | Johnstone 133 | May 1931 | | |
| Lassin, 35 km NNW of Kumbo | | Nord-ouest | Mbenkumno 40 3 | Jul 1973 | x | |
| Ngomo, nr Nkambe | | Nord-ouest | Satabie 70 | Nov 1974 | x x | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **CONGO-BRAZZAVILLE** | | | | | | | |
| Moutampa, on Linzolo Rd | | | Bouquet 169 | Jun | 1964 | x | |
| Brazzaville | | Djoue | Chollon | | 1888 | x | x |
| do | | do | Coomally | Dec | 1903 | x | x |
| Nr Boko-Songho | | Niari Bouenza | de Nere 1468 | Jul | 1963 | x | x |
| **EGYPT** | | | | | | | |
| Cairo Gardens | | | Bove 334, 336 | | 1836 | x | x |
| Giza | | | Douglas Simpson | Jan | 1923 | x | x |
| Kile valley | Upper Egypt | | Kotschy 1013 | | | x | x |
| Korosko | Lower Nubia | | Letourneux 251 | Mar | 1881 | x | x |
| Cairo | | | Poire 835 | Jul | | x | |
| Etsu | | | Sieber | | | x | x |
| Damietta | | | do | | | | |
| Luxor | | | Vierkapper | Apr | 1914 | x | x |
| **ETHIOPIA** | | | | | | | |
| Hamarea, w of Harar | | Harar | Tadesse Ebba 517 | Aug | 1967 | x | 1800 |
| Juika | | Gamo Gofa | Fukui 309, etc. | Oct | 1973 | x | 1400 |
| | | Harar | Hummel 89 | Apr | 1943 | | |
| Hirna, w of Dire Dawa | Chercher | Harar | Meyer 87 33 | Nov | 1964 | x | x |
| Nr Kinzela, Lake Tana | | Bagemder | Pichi Sermolli 639 | Nov | 1937 | x | |
| Nr Matamma | Gallabat | Bagerader | Schweinfurth 1744 | Jul | 1865 | x | x |
| Jimma | | Kefa | Siegenthaler 27 | Jun | 1958 | x | |
| Alemaya | | Harar | Westphal 706 | Jul | 1967 | x | x 2050 |
| Nazareth to Asella | | Shoa | do 1527 | Aug | 1967 | x | x 1560 |
| Gidole to Konso | | Gamo gofa | do 3215 | Mar | 1968 | | 1700 |
| Harar gardens | | Harar | do 3512 | Mar | 1968 | | 1700 |
| Konso-Arba Minch | Konso | Sidamo | de Wilde 430 | Mar | 1971 | x | x 1250 |
| **GHANA** | | | | | | | |
| Aburi | | Ashanti Region | Chevalier 13884 | Jul | 1905 | x | x |
| Kumasi | | Upper Region | Endjol 531 | Jun | 1971 | x | |
| Zowse Hill, Bawku | | | Enti & Hall | Nov | 1966 | | x |
| Sessedum | | | Kitson | Jan | 1916 | | x |

GUINEA BISSAU

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Bambaduica-Ponta Ingles | | | Alves Pereira 2542 | Dec 1961 | x | x | |
| Bissau, Pussube | | | Esp>. Santo 1025 | Nov 1937 | x | x | |

IVORY COAST

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Adiopodoume | | Sud | Frahm Leliveld 38 | Nov 1954 | x | | |
| Do, Lamto Savana | | Sud | Henri 113 | May 1964 | | x | |
| 7 km E of Bouake | | Centre | W de Wilde 61 | May 1963 | x | x | |
| Koutouba | | Est | Eastwood 527, 569 | Nov 1977 | x | x | |
| 59 km Bouna-Koutouba | | Est | do, 544 | do | x | x | |
| 46 km Koutouba-Dabakata | | Est | do, 548, 549, 576 | do | x | x | |
| 67 km Koutouba-Dabakata | | Est | do, 552 | do | x | x | |

KENYA

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Kitale | Trans Nzoia | Rift Valley | Bogdan 3866 | Nov 1953 | x | x | |
| Nr Koru | Kisumu | Nyanza | Crochewit 485 | Aug 1957 | x | | 1350 |
| Nairobi Stream Village | Nairobi | Central | French | Jul 1954 | x | | |
| Hoyale | | North Eastern | Gillett 13736 | Aug 1952 | x | x | |
| Kilifi, Bornani | Kilifi | Coast | Gisau | | | | |
| Nalnai, Silver Sands | Kilifi? | Coast | Hacker 129 | | | | |
| Kodera, Got Kolundo | | | Kokwara 2024 | Aug 1967 | x | | |
| Hachakos to Kilala | Hachakos | Eastern | vd Maesen 2376 | Jul 1976 | x | x | 1500 |
| Kimutwa | do | do | do 2377 | do | x | x | 1500 |
| E of Kimutwa | do | do | do 2378-2384 | do | x | x | 1500 |
| Wanzau | do | do | do 2385 | do | x | x | 1300 |
| Kavindu | do | do | do 2386-2387 | do | x | x | 1300 |
| Kiou, nr Sultan Hamud | do | do | do 2388-2389 | do | x | x | 1350 |
| Sultan Hamud | do | do | do 2391-2394 | do | x | x | 1100 |
| Sultan Bamud to Wathini | do | do | do 2395-2398 | do | x | x | 1300 |
| Kyambeke to Kilungu | do | do | do 2399 | do | x | x | 1300 |
| Muangini to Kilungu | do | do | do 2400-2404 | do | x | x | 1200 |
| Emali | do | do | do 2405 | do | x | x | 1200 |
| Ithanzu to Kathonzweni | do | do | do 2406 | do | x | x | 1200 |
| 30 km N of Hunters Lodge | do | do | do 2407-2409 | do | x | x | 1200 |
| N of Kathonzweni | do | do | do 2410 | do | x | x | 1200 |
| Nr Hakueni | do | do | do 2412-2413 | do | x | x | 1000 |
| Nr Katangini | do | do | do 2414 | do | x | x | 1000 |
| Ngungi-Kibaoni | do | do | do 2415 | do | x | x | 1060 |
| Miu to Kilala | do | do | do 2418-2419 | do | x | x | 1130 |
| Ukia, nr Kilala | do | do | do 2420 | do | x | x | 1100 |
| Majani to Nziu | do | do | do 2421-2432 | do | x | x | 1100 |
| Nr Mwatate | Taita | Coastal | do 2434-2436 | do | x | x | 600 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Embo to Wundanyi | do | do | do 2437 | do | x | x | |
| Embo to Wundanyi | do | do | do 2438 | do | x | x | 1100 |
| Wundanyi | do | do | do 2439-2441 | do | x | x | 1200 |
| Muatapa Res. Sta. | Kilifi | do | do 2442 | do | x | x | 50 |
| Mombasa | Kilifi | Coastal | do 2442-2445 | do | x | x | 0-100 |
| Nr Diana | Kwale | do | do 2446-2449 | do | x | x | 0-100 |
| S of Ramisi | do | do | do 2450 | do | x | x | 0-100 |
| Waa | do | do | do 2451 | do | x | x | 0-100 |
| Vipingo | Kilifi | do | do 2452 | do | x | x | 0-100 |
| Tezo | do | do | do 2453-2454 | do | x | x | 0-100 |
| Mtito Andei to Kibwezi | Machakos | Eastern | do 2455-2458 | do | x | x | 700 |
| Tkutha | Kitui | do | do 2459 | do | x | x | 800 |
| Tkutha to Mutomo | do | do | do 2460-2461 | do | x | x | 800 |
| Tkanga | do | do | do 2462 | do | x | x | 800 |
| Nr Mosa | do | do | do 2462 | do | x | x | 900 |
| Kisasi | do | do | do 2464-2467 | do | x | x | 1000 |
| Chuluni | do | do | do 2470 | do | x | x | 1000 |
| Kyambuswa, Matinyani | do | do | do 2471-2472 | do | x | x | |
| Kitui to Embu, 51 km | Machakos | do | do 2473 | do | x | x | 1100 |
| Kitui to Embu, 43 km | do | do | do 2475 | do | x | x | 1100 |
| Uvea to Tebere | Kirinyaga | Central | do 2476-2477 | do | x | x | 1100 |
| Kabarattha to Thika | Muranga | Central | do 2478-2479 | do | | x | 1100 |
| Angogo-Awasi | Kisumu | Nyanza | do 2480-2482 | Aug 1976 | x | x | 1250 |
| Paponditi to Kusa | do | do | do 2483 | do | x | x | 1200 |
| Rendu bay | Homa Bay | do | do 2483 | do | x | x | 1200 |
| Kisii | Kisii | do | do 2485 | do | x | x | 1500 |
| Kisumu | Kisumu | do | do 2486-2495 | do | x | x | 1200 |
| Kisumu to Kibos | do | do | do 2496 | do | x | x | 1200 |
| Kibos to Miwani | do | do | do 2497 | do | x | x | 1200 |
| Ani Sugar Est. | do | do | do 2480 | do | x | x | 1200 |
| Kibigori | do | do | do 2499-2500 | do | x | x | 1200 |
| Chemelil | do | do | do 2501-2504 | do | x | x | 1200 |
| Mahanga, Ebwali | Kakamega | Western | do 2505 | do | x | x | 1500 |
| Nr Kisumu, Kisian | Kisumu | Nyanza | do 2506-2508 | do | x | x | |
| Nr Shero | do | do | do 2509-2510 | do | x | x | |
| Musuu, Kamba | Machakos | Eastern | Mwangangi 861 | May 1968 | x | x | 1890 |
| Bernhard Est., Nairobi | Nairobi | Central | Nattrass 871 | Mar 1952 | x | x | 500 |
| Njoro-Elburgon | Nahuru | Rift Valley | D. Polhill 76 | Dec 1976 | x | x | 2400 |
| Rabai Hills nr Mombasa | | Coastal | Taylor | Jul 1885 | x | | |
| Chugoria, Ht. Kenya | Meru | Eastern | White 1097 | Aug 1949 | x | x | |
| Mombasa to Lanu & Witu | Kilifi | Coastal | Whyte | 1902 | x | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **LIBERIA** | | | | | | | |
| Grand Bassa, Fishtown | | | Dinklage 1839 | Oct 1897 | x | | 10 |
| Monrovia | | | do 2938 | Nov 1923 | x | x | 10 |
| **MADAGASCAR** | | | | | | | |
| | Central | | Baron 572 | Oct? 1881 | x | x | |
| Cambohorano | | | Decary 8035 | Jun 1930 | x | | |
| Befotaka | | | do 4811 | Aug 1926 | | x | |
| Tarafangana | | | Frenee 104 | 1920 | x | x | |
| | Nossi-Be | | Hildebrandt 3303 | Jun 1879 | | x | |
| Hellville | Nossi-Be | | Paulay | Jul 1887 | x | | |
| Ile St. Marie | | | Paulay | Jun 1887 | | | |
| Fort Dauphin | | | Scott-Elliot 2925 | Jun | x | | |
| Fort Dauphin | | | Seligson 658 | Jun 1968 | x | | |
| **MADEIRA** | | | | | | | |
| Maravillas | | | Lippold | Jun 1837 | x | | |
| **MALAWI** | | | | | | | |
| Blantyre | Shire Highlands | Southern | Buchanan | Aug 1877 | x | x | |
| Mt. Mulanje | | do | Whyte 155 | 1891 | x | | |
| Msuraba | | | Webb | Jul 1896 | x | | |
| **MALI** | | | | | | | |
| Kayes region | | | IITA Exploration Report | | | | |
| **MAURITIUS** | | | | | | | |
| Mauritius | | | Bojer 87 | Mar 1830 | x | x | |
| do | | | Decaisne | 1889 | | | |
| do | | | Sieber 237 | | x | x | |
| Rodrigues Isl. | | | Balfour | Aug? 1874 | x | | |
| **MOZAMBIQUE** | | | | | | | |
| Pr. dos Maotas | | Maputo | Barbosa 202 | Jul 1947 | | | |
| | Polana | do | | Sep 1919 | x | | |
| Nr Mutamba | Inhambane | Imhambane | Edwards V4225 | May 1971 | x | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Vila Pery | | Vila Pery | Esselen | | | x | x | |
| M'Bueca-Nigoho | | Niassa | Gomes 1534 | Jul | 1933 | x | x | |
| Inhaca Island | | Lourenco Marques | Mogg 27320 | Jul | 1957 | x | x | 0-100 |
| do, Imbowini (Bonga) | | do | do 27659 | Sep | 1957 | | x | 0-150 |
| Maniguemque | | Save | Pedro 1483 | Jul | 1947 | x | x | |
| Maniamba, L. Niassa | Metangula | Niassa | do 3870 | May | 1948 | | x | |
| Malema | | Niassa | do 4347 | Jun | 1948 | | x | |
| | Qutimane | | Sim 20559 | | 1908 | | | 100 |
| Vila Cabral | | Niassa | Torre 273 | Jun | 1934 | x | | |
| Tete to Iobue | | Tete | do 2850 | Jun | 1941 | x | x | |
| Nhamausi | | Zambezia | do 3523 | Sep | 1941 | x | x | |
| Nr Dombe | | Vila Pery | do 4358 | Jun | 1942 | x | x | |
| NIGERIA | | | | | | | | |
| Invoye-Djabata path | Egbado | Abeokuta (W) | Akpati 33758 | Jan | 1958 | x | | |
| Sokoto | | North Western | Lely 109 | | 1919 | x | | |
| Zaria | Samaru | North Central | Macaulay | Nov | 1968 | x | x | |
| Calabar | | south Eastern | Maitland | Oct | 1911 | x | x | |
| Naraguta | Jos | Eastern | Olorunfani | Nov | 1967 | x | x | |
| | Awaka | | Thomas 68 | | 1911 | x | | |
| SAN TOME | | | | | | | | |
| Pantufo | San Tome | | Monod 12286 | Sep | 1956 | x | | |
| SENEGAMBIA | | | | | | | | |
| Dakar, Hgor | Cap Vert | | Adam 9265 | Oct | 1952 | | | |
| Thies-Diourbel, Kaolak | | | Berhaut 421 | Jan | 1948 | x | x | |
| Tambacounda | Oriental | | do 2446 | Nov | 1951 | x | x | |
| Nganobil, nr Cap Vert | Cap Vert | | do 7503 | Oct | 1968 | x | x | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **SEYCHELLES** | | | | | | | |
| Mabe, Reservoir Road | | | Osborne-Day 113 | Aug 1936 | x | x | 280 |
| **SIERRA LEONE** | | | | | | | |
| Kailahun | Luawa | | Sharma 11-279 | Nov 1977 | | x | |
| Dodo Kortuma | do | | do 11-356 | do | | x | |
| do | | | do 11-433 | do | | x | |
| Joru | Gaura | | do 13-559 | do | | x | |
| Gbendembu | Gbendumbu | | do 33-743 | do | | x | |
| Matotoka | Tana | | do 32-756 | do | | x | |
| Yomi Kana | | | Thomas 5155 | Nov 1914 | | | 100 |
| **SOUTH AFRICA** | | | | | | | |
| Natal Coast | | Natal | Gerstriet 4300 | Aug 1942 | x | x | |
| Zululand | | do | do 4308 | do | | x | x |
| Nr Duiwelskloof, Letaba | Modjadji Res. | Transvaal | Krigre 216 | Jun 1938 | x | | |
| Soutpansberg | | Transvaal | McCullam | Sep 1926 | x | x | |
| lower Tugela | | Natal | Pentz, A 10323 | Apr 1944 | x | | |
| Nr Ndumu | Ingwavumu | Natal | Pooley 543 | May 1969 | | x | |
| Dsutu floodplain | do, Guenland | do | Pooley 1347 | May 1971 | x | | |
| Komatipoort | Barberton | Transvaal | Skut | Jan 1920 | x | | |
| Makane's Drift | Maputa | Natal | Stephen 852 | Jun 1972 | x | | |
| Shelley Beach area | Port Shepstone | do | Strey 7661 | Sep 1967 | x | x | |
| Nelspruit, | Barberton | Transvaal | Wilhelm | Sep 1908 | x | x | |
| | Piet Retief | do | von Wissel | Nov 1943 | x | x | |
| **ST. HELENA** | | | | | | | |
| | | | Roxburgh | | x | | |
| **SUDAN** | | | | | | | |
| Gezira | | Blue Nile | Bos 1427 | Mar 1963 | | x | |
| Kankan | | | Chevalier 576 | Sep 1899 | x | | |
| Khartoum | Khartoum | | Cienkowsky 34 | Feb 1848 | x | x | |
| Sennar | | Blue Nile | Kotschy 266 | 1837 | x | x | |
| Khartoum | Khartoum | | do 339 | Mar 1840 | x | x | |
| Grujeschab | Sennar | Blue Nile | do 350 | Mar 1841 | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **SWAZILAND** | | | | | | | | |
| 16 km W of Gollel | Hatikulu | | Comptor 28888 | Jun | 1959 | x | | |
| **TANZANIA** | | | | | | | | |
| Narangu | Kilimanjaro | Arusha | Bally 12020 | | 1934 | | | 1060 |
| Amani | | | Braun 1362a | Aug | 1908 | x | | 1050 |
| Kyaka, Kagera Riv. | | | Brown 19 | Jul | 1944 | x | | |
| Ukerewe Isl. | Lake Victoria | Mwanza | Conrads 5237 | Jan | 1928 | x | x | |
| do | do | do | do 13441 | Jun | 1921 | x | x | |
| Kitandu | | | Desuso 13 | Aug | 1958 | x | x | 950 |
| S. Crater Rim | Ngorongoro | Arusha | Gilbert 3009 | | 1968 | x | x | 540 |
| Nr Lumbila, L. Niassa | | Ruvuma | Gilli 207 | Aug | 1958 | | | |
| Bulwa | Usambara | Tanga | Salim bin Hamisi | Aug | 1929 | x | x | |
| Dar es Salaam | | Coast | Hansen 347 | Jul | 1971 | x | x | |
| Mahali Mts | Mpanda | Holoholo | Jefford 2616 | Sep | 1958 | | x | 900 |
| Kasoie | Mpanda | Holoholo | Kakeya 5 | Jun | 1971 | x | x | 800 |
| Hutai | | | Kibuka 911 | Jul | 1945 | x | x | |
| Olamda, Olambya | | | Leedal 2027 | Aug | 1974 | x | x | 1600 |
| | Kwembago | | Magogo 28 | Jul | 1971 | x | x | |
| Tendaguru | | | Migeod 202 | May | 1926 | x | | |
| Mahali Mts | Mpanda | Holoholo | Mishida 5 | | 1971 | | | 750-900 |
| do | do | do | Newbould 2424 | Sep | 1958 | x | x | 900 |
| Zanzibar | | Zanzibar | Ossent | Aug | 1945 | x | | |
| Barooda | | | Oza 14815 | Feb | 1971 | x | x | |
| Kitivo Forest Reserve | | | Sangiwa 79 | Sep | 1955 | x | | 1500 |
| Kilimansondo | Masasi | Mtwara | Semsei 2183 | Aug | 1947 | x | | |
| Ruhudje River | Massagati | | Schlieben 1093 | Jun | 1931 | x | | |
| Nr Lake Niassa | Kyimbila | | Stolz 1572 | | 1975 | x | x | |
| Morogoro, 25 km out | | Morogoro | Tweedie 1595A | Jul | 1958 | x | x | 500 |
| Zanzibar | | Zanzibar | Taylor 61 | Sep | 1929 | x | | |
| **TOGO** | | | | | | | | |
| Nr Mono River | | | Davidson 40 | Oct | 1965 | x | | 50 |
| Blista | | | Kersting 266A | Jan | 1906 | x | x | |
| Nr Lome | | | Warnecke 31 | 1900-02 | | x | | |
| **UGANDA** | | | | | | | | |
| Mityanda (Mityana) | | | Downer | | 1921 | x | | |
| Highlands | | | Greenway 1828 | Apr | 1932 | x | x | 1600 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Bwamba-Nkorankoge | | | Loeffler 91 | Jun | 1968 | | 1000 |
| Yllo, Entebbe to Butiaba | | | Mearns 2628 | Dec | 1909 | x x | 650 |
| Kampala | | | Snowden 1803 | Oct | 1930 | x x | |
| ZAIRE | | | | | | | |
| Kivurro road, Motadi | | | Anonymous | Mar | 1932 | x | |
| Irumu | | | Bequaert 2882 | Mar | 1914 | x x | |
| Ishwa, Lac Albert | | Haut-Zaire | Bredo 1306, etc. | Sep | 1934 | x x | |
| Mahagi Port | | do | do 1663 | do | | x | |
| Kimuenza | | | Cartier 117 | Aug | 1956 | x | 500 |
| Gimbi to Seke, Banza | | | Compere 211 | Sep | 1959 | x x | |
| Eala(Elila?) | | | Corbisier 1044,etc. | Apr | 1931 | x | |
| do | | | do 1767 | Nov | 1933 | x x | |
| Mvuazi (Thysville) | | Central | Devred 267 | Jul | 1948 | x x | |
| Bas Uele (Riv.) | | | Dewulf 810 | Jan | 1935 | x x | |
| Mvuazi (Thysville) | | | Delhaye 459 | Apr | 1959 | x | |
| Iundi Lutete, | Luozi | Central | Fersson 76 | Jun | 1967 | x | |
| Kitobola | | | Flamigny 453 | Aug | 1911 | x x | |
| Asok | | | do 8123 | Sep | 1948 | x | |
| Tukpwo | | | Gerard 902 | | | x x | |
| Nioka, col. Obo | Lac Albert | Haut-Zaire | Germain 4086 | Jul | 1945 | x x | 1700 |
| Diagba to Basape | | Haut-Zaire | do 4470 | Dec | 1945 | x x | |
| Muyumba? | | | Gilbert 365 | | 1932 | x | |
| Kisantu | | Central | Gilbert 1900 | | | | |
| Ganda Lundi | Mayumbe | | Goossens 1035 | Jul | 1917 | x x | 350 |
| Nr Kisali, Ivemba Valley | | | do 1429 | Aug | 1919 | x x | 300 |
| Lisala | Bangalu | Equateur | do 4666 | Mar | 1924 | x | |
| Stanleyville, Kisangani | | Haut-Zaire | Hens, B 30 | Jul | 1888 | x x | 300 |
| Kaffulo | | | Homble | Sep | | | |
| Kinyesse | | | EH, M Laurent | Oct | 1903 | x | |
| Kisangani (Stanleyville) | | Haut-Zaire | do | Mar | 1904 | x | |
| Emerbil | | | J Laurent 987 | May | 1948 | x | |
| Bolobo | | Kasai | M Laurent 619 | Apr | 1909 | x x | |
| Libenge to Congo | | Equateur | Lebrun 1638 | Nov | 1930 | x x | |
| Buto (Buta?) | | | do 2632 | Apr | 1931 | x | |
| Nadaka, Lukundu | L Edward, Kivu | Kivu | Hendricx 3817 | Jan | 1946 | x | |
| Bushumba | | | do 4033, 4349 | | | | |
| Kapanga | | Shaba | Overlaet 1215 | Apr | 1215 | x | |
| Kisangani area | | | Robijns 1427 | Jan | 1926 | x | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Zafie | | | Scops 64 | | x | | 950 |
| Mushara Est., Rutshuru | Muhanga | | Spitaels 332 | Dec 1951 | x | x | 1700 |
| Mont Rona, Ngote-Golu | | | Taton 11991 | Oct 1951 | x | x | |
| Himamu | (Katanga) | Shaba | Quarre 1884 | Aug 1929 | x | x | |
| Lubumbashi | | Shaba | do 4215 | Mar 1939 | x | | |
| Karawa | | | do 1978 | | x | x | |
| Kisandu | Kwango | | Vanderijst 73 | Jul 1906 | x | x | |
| Lazaret St. f. | | | do | 1908 | x | x | |
| Lemfu | Kisantu | | do | Apr 1911 | x | | |
| Kinshasa | | | do 11802 | Apr 1922 | x | x | |
| Zona Basa | | | do 24956 | Aug 1930 | x | x | |
| Natadi | | | do 25872 | Oct 1930 | | x | |
| Tsanga? | | | do 26994 | Oct 1930 | x | x | |
| Pako | | | do 30625 | May 1932 | | x | |
| Mayombe, Kangu | | | Wellens 404 | Jul 1923 | x | | |
| Matadi | | Central | Dacremont 219 | Fl. Congo Beige | | | 1954 |
| Buta | Forest Central | | Lebrun 3632 | do | | | |
| ZIMBABWE | | | | | | | |
| New Golf Course | Harare? | | Chase 229 | May 1946 | x | x | |
| Umtali ex Muwushu | | | Corby 1924 | May 1967 | x | | |

## APPENDIX 3. List of herbarium specimens examined from Asia and Oceania.

| Location | District/Region | Province/State | Collector | Date | Fl/Fr | Altitude(m) |
|---|---|---|---|---|---|---|
| AFGHANISTAN | | | | | | |
| Nr Jalalabad | | Nangarhar | vd Maesen obs. | Aug 1977 | x | ±600 |
| AUSTRALIA | | | | | | |
| Redland Bay | | Queensland | CPO 11380 | May 1951 | x x | |
| Mt. Fox, Kelly Gdn | | do | Clemens | Oct 1949 | x x | |
| Nr Tully | | do | do | Jan 1950 | | |
| Mareeba | | do | Davidson 39967 | 1966 | | |
| Beerburrum | | do | do | do | | |
| Nambour | Moreton | do | Greening, N P 50 | Jun 1961 | x x | |
| Kamerungs, nr Cairns | | do | Evirist 5108 | May 1952 | x x | |
| Ingham | | do | Myatt | Apr 1965 | x | |
| Nambour | | do | Straatmans 211 | Jun 1959 | x x | |
| BANGLADESH | | | | | | |
| Kurishkool | Cox's Bazar | Chittagong | Sinclair 3865 | Dec 1944 | x x | |
| Hill Tracts | | do | King 240 | 1886 | x | |
| Kamalasene? | Chittagong | Chittagong | Gamble 7784 | Mar 1880 | x | |
| BHUTAN | | | | | | |
| 26° 30' N, 91° 30' E | | Tongsa | Kingdon 6429 | Feb 1925 | x x | |
| Gaylegphug | | do | Deb 101 | Nov 1964 | | 270 |
| BURMA | | | | | | |
| Shan Mts Terai | | Shan State | Collett 73 | Feb 1888 | x x | 1000 |
| Rangoon | | Rangoon Division | Dickason 5590 | Apr 1932 | x | |
| Kau-ngai Valley | | Kachin State? | Forrest 12141 | Feb 1914 | x x | 1000 |
| S. Shan | | Shan State | MacGregor 1148 | Jan 1910 | x x | 1330 |
| Pegu | | Pegu Division | McLelland | Feb 1854 | | |
| Mandalay | | Mandalay Div. | White 378 | Feb 1951 | x x | |
| Tamu | Upper Chindwin | Sagaing Division | Meebold 7535 | Dec 1907 | x | |

CAROLINE ISLANDS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Nr Colonia | | Ponape | Glassmar 2914 | Aug | 1949 | x | x | 0 |

CHINA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Seh-Feng Dar Shan | S. Nanning | Kwangsi | Hing 8166 | Oct | 1928 | x | | 400 |
| Fukien | | Fukien | Chung 1058 | | | x | | |
| White Cloud Hill | Changchow | do | do 1125 | Mar | 1923 | x | | |
| Yuanshan | Changchow | do | do | do | | x | | |
| Swatow | | Kwangtung | Dalziel | May | 1901 | x | | |
| | | Yunnan | Delavay 2096 | | 1889 | x | x | |
| My-leang-pa | Nr Kiao-Kio | do | Ducloux 3769 | Jan | 1906 | x | | |
| N.E. Sikiang | | do | Feng 600 | Mar | 1939 | x | | |
| S kan-ngai Valley | | do | Forrest 9597 | Feb | 1913 | x | | |
| Kanton Res. St. | | Kwangtung | Gatersleben, L 1041 | | 1958 | - | | |
| Kanton | | do | Hance | | 1874 | x | | |
| Tali, nr Hwangdjiaping | Yidiatshwang | Yunnan | Handel-Mazzetti | May | 1915 | x | x | 1700 |
| Tchor Shu-tan | | | Henry | Dec | | x | x | |
| Sjemen W Mts | | Yunnan | do 10357 A | | | x | | 1300 |
| Hanpan | Red River Valley | do | do 10357 B | | | x | x | 800 |
| Fukwing | | | Krone | Sep | | x | | |
| Yung-yun | Wung-yuen | Kwangtung | Lau 622 | Nov | 1932 | x | x | |
| Nr I Kap Shan | Tan | Hainan | do 1065 | Feb | 1933 | x | x | |
| Kanton | Wung-yuen | Kwangtung | do 2489 | Oct | 1933 | x | x | |
| Nr Ka Chik Shan | Chang-Kiang | Hainan | do 3089 | Jan | 1934 | x | | |
| Sam Mowatt | Kan-en | do | do 3551 | Mar | 1934 | x | x | |
| Fong Ngau Po | Kan-en | do | do 5155 | Jan | 1935 | x | | |
| Nr Yeung Lam | Yai-hsien | do | do 6311 | May | 1935 | | | |
| Pak Shik Ling, Ku Tung | Ching Mai | do | Lei 361 | Feb | 1933 | x | | |
| do | do | do | do 522 | Apr | 1933 | | x | |
| Rocks nr Mong-koa | | | Leveille | Mar | | | | 900 |
| Romytcheou | Tarao, Kiao Jay | | do 3708 | Nov | 1911 | x | x | |
| Kanton vicinity | | Kwangtung | Levine 9, 462 | | | | | |
| Honam Isl. | | do | do 268 | Oct | 1917 | | x | |
| Five Finger Mt | Hop Lo Tsun | Hainan | McClure 8355 | Dec | 1921 | x | x | |
| Nam Kong RR Sta | Kanton | Kwangtung | McClume 2316 | Mar | 1922 | x | | |
| Mong-Kou | Ha | Hainan | Maire | Mar | 1910 | x | x | 500 |
| Nam Shan Ling | Yaichow | do | Tso 23005 | Jan | 1933 | x | | 70 |
| Takole, Huaning | | Yunnan | Tsiang 16191 | Mar | 1939 | x | | |
| Chu Kan | Yun Fou | | Wuang 542 | Jan | 1928 | | x | 100 |
| Sie Lung, Loting | | Kwangtung | Ying 1151 | Sep | 1928 | x | | |
| | Sunyi | do | do 2736 | Jun | 1929 | x | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **CHRISTMAS ISLANDS** | | | | | | | | |
| Settlement | | | Andrews 100 | | | x | | |
| **FIJI ISLANDS** | | | | | | | | |
| Rewa, Mission | | | Seemann 115 | | 1860 | x | x | |
| **FRENCH POLYNESIA** | | | | | | | | |
| SW of Roruru | Gamber Isl. | Mangareva Isls | St. John 14502 | Mar | 1934 | x | | |
| N of Fatuna | Raiatea Isl. | Society Isls | Moore 635 | | 1907 | x | | |
| **HONG KONG** | | | | | | | | |
| Robinson Road | | | | Dec | 1866 | x | | |
| Kowloon | | | Lamont | | 1874 | x | x | |
| Sukinpo | | | Lau 64 | Jan | 1957 | x | x | |
| Chung Chi | | | Hu 9367 | Jan | 1970 | | x | |
| INDIA (only specimens from some outlying locations) | | | | | | | | |
| Jisi | Naga Hills | Nagaland | Bor 2873 | Mar | 1935 | x | | 1300 |
| Kangla tongbi | | Manipur | Bullock 862 | Dec | 1945 | x | | |
| Sialsuk to Aizal | Lushai Hills | | Deb 30839 | Jan | 1963 | x | | |
| Umsaw | | Meghalaya | Deka 21664 | Apr | 1943 | x | x | |
| Banunpokree | | Sikkim | Gamble 2222 | Jan | 1873 | x | x | |
| Mahendragiri | Kanyakumari | Tamil Nadu | Gamble 14160 | Mar | 1884 | x | x | 1500 |
| Cadellganj | S. Andaman | Andamans | King's Collector | Dec | 1892 | x | x | |
| | Garo Hills | Meghalaya | Mann | Apr | 1876 | x | | |
| | Khasi Hills | do | do 249, 423 | Apr | 1877 | x | | 1000 |
| N Lakhimpur | Lakhimpur | Assam | Panigrahi | Mar | 1962 | | x | |
| W of Tuting | Siang F.D. | Arunachal P. | Rao 17355 | Nov | 1958 | x | x | |
| Nichuguard | Naga Hills | Nagaland | Rupchand 47 21 | Feb | 1951 | x | x | |
| Sangareddi[a] | Medak | Andhra Pradesh | Sofee | | 1936 | | | |
| Ganai | Gharwal | Uttar Pradesh | Strachey | | | | x | 1000 |
| Baghola Forest | | Orissa | Subba Rao 30020 | Dec | 1962 | x | x | 930 |
| E of Kohima | Kohima | Nagaland | Ward 11128 | Mar | 1938 | x | x | 1300 |

Other specimens from all other states in India except Kashmir and Tripura.

a. Obcordate mutant.

INDONESIA

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Trumon | Sigleng | Sumatra Aceh | Abdat 161 | Aug 1941 | x | x | |
| Citajan | | Java | Bakhuizen 1656 | Aug 1922 | | x | 100 |
| Asahan River | | Sumatra Utara | Burtlett 238 | 1918 | x | x | |
| Lumban Ria, Asahan | | do | Boeea 7328 | Feb 1934 | x | x | |
| Aer Djoman, Asahan | | do | do 8230 | Jul 1935 | x | x | |
| Adian Rindang, Asahan | | do | do 8511, 8708 | Nov 1935 | x | x | |
| Tor Matutung, Asahan | | do | do 9545 | Jul 1936 | x | x | 1792 |
| Nr Tomuan Dolok, Asahan | | do | do 10041 | Aug 1936 | x | x | 1000 |
| G. Tengger | | E Java | Buysman 17 | Nov 1907 | x | | 1200 |
| Nr Nongkojajar | | do | do 73 | Jul 1907 | x | | |
| G. Talang | | Sumatra, Jambi | Bunnemeyer 5337 | Oct 1918 | x | x | 1500 |
| G. Benthain | | SW Sulawesi | do 12136 | Jun 1921 | x | | 1600 |
| Raselo | | do | do 12584 | do | x | | 900 |
| G. Saleyer | Sulawesi | | Docters 1789 | Mar 1913 | x | | 400 |
| Amboina | | Maluku | Dolleschal | | x | x | |
| Swela, nr Pringabaya | Lombok | W Nusa Tenggara | Elbert 1996 | | x | x | 500 |
| G. Rinjani | do | do | do 1996 | Jun 1909 | x | x | |
| Surakarta | | C. Java | Horsfield 100 | | x | x | |
| Bukittingi | | Sumatra Barat | Jacobson 2195 | | x | x | 920 |
| Semongkrong | | | Jeswiet 1951 | May 1925 | x | x | |
| Nr Hagelang | | C Java | Junghuhn 65 | Feb | x | x | |
| Djujo-Sul | | Java? | do 128 | | x | | |
| Bodo Gendro | | E Java | Mousset 66 | Aug 1911 | x | x | 1000 |
| Ambon | | Maluku | Robinson 551 | Aug 1931 | x | x | |
| Sahdarang Agong | Sumatra | | do 2450 | May 1914 | x | x | |
| Nunbaun | Timor | E Nusa Tenggara | Talakha 58 | Aug 1929 | x | x | |
| Nr Rantau Parapat, Bila | E Coast | Sumatra Utara | Toroes 1822 | Apr 1932 | | x | |

JAPAN

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Ako, Kilmane | | Hijogo, Honshu | Matuda-Eizi | Jan 1917 | | x | |
| Okinawa | | Ryukyu | Naito | Mar 1927 | x | | |

LAOS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Laos | | | Dussaud | 1913 | x | x | |
| Moulu-prey | | | Harmand 267 | 1876 | x | | |
| Xieng-Khouang | | | Spire in Gagnepain, F1. Indochine 1916 | | | | |
| Kheng-trap | | | do | | | | |
| Muong-you | | | do | | | | |

MALAYSIA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Sarawak | Borneo | Beccari 3893 | | 1865 | x | x | |
| Kuching & vicinity | do | do | Clemens 20577 | | 1929 | x | x | |
| Malacca | | Malay Penins. | Griffith 1715 | | 1861? | x | x | |
| Tanah merah, Sandakan | Sabah | Borneo | Lupang 2318 | Aug | 1932 | x | x | 6 |
| Tambato, Tambunan | | do | Puasa 3864 | Feb | 1934 | x | x | 400 |
| Penang | Penang | Malay Penins. | Wallich 5571 | | | | | |

MARIANA ISLANDS

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Shinaparu | | Rota | Horaha 3044 | Jun | 1946 | x | x | 170 |
| | | Guam | McGregor 370 | Oct | 1911 | x | | |

NEPAL

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Pheligsanku | | | Dobremez 651 | Nov | 1970 | x | | 650 |
| Kathgara-Ramgali | | E. | Kanai 1567 | Dec | 1963 | x | x | |
| Bharomdin-Tharpu | | E. | Hara 1564 | Nov | 1963 | | x | |
| Rangi Pani-Ghorwa | | E. | do 1566 | Dec | 1963 | | x | |
| Tatopani, N of Beni | | | do 612 | May | 1954 | x | x | 1330 |
| Baglung | | | Stainton 9212 | Oct | 1954 | | x | |

NEW CALEDONIA

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Kanala | | | McGillivray 28 | Aug | 1858 | x | | |
| Thio | | | Grumov | Sep | 1884 | x | | |
| Poya | | | McKee 4639 | May | 1956 | x | x | 50 |
| Aten | Upper Kamendo:na | | do 5128 | Aug | 1956 | | | 600 |
| Nr Dumbea | | | Webster 14586 | Aug | 1968 | x | x | |

PAKISTAN (cf. Ali, S.I., 1977, Flora of W. Pakistan, vol. 100)

| | | | | | |
|---|---|---|---|---|---|
| Hyderabad to TM Khan | Hyderabad | Sind | Abedin 3825 | | |
| Sanghar to Mirpur Khas | Sanghar | Sind | Abedin 4012 | | |
| Alipur to Sukhur | Muzaffazgarh | Punjab | Abedin 9736 | | |
| Darshano Ghano | Karachi | Sind | Abrar Hussain | Mar | 1970 |
| Naokot to Diplo | Ghar Pakar | Sind | Ali 4320 | | |
| Nawabshah | Nawabshah | Sind | Jafri 3842 | | |
| (Lyallpur) | Faisalabad | Punjab | Alvi | Oct | 1956 |
| Dhamyal | Rawalpindi | Punjab | Khosla | | |
| Alipur-Muzaffargarh | Muzaffargarh | Punjab | Qaiser 3616 | | |
| Dhader | Kalat | Baluchistan | Qaiser 4320 | | |
| (Lyallpur) Agr. Coll. | Faisalabad | Punjab | Alvi | Oct | 1956 |
| Zaffarwal | Sialkot | Punjab | Stewart | Dec | 1917 |
| Nazimabad | Nazimabad | Sind | Zamir | Jan | 1957 |

PAPDA NEW GUINEA

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Biniguni Camp | Gwariu Riv. | Milne Bay | Brass 238861 | Aug 1953 | x | x | 200 |
| Patmilak | Kavieng | New Ireland | Coode 40124 | Jan 1969 | | x | 100 |
| Titabuba | Las | Morobe | Kairo 24402 | Jul 1971 | x | x | 600 |
| Nr Akuna | | E.Highlands | Dunstone 12020 | Jul 1963 | x | | 1600 |
| S of Goroko, Asaro Riv. | Goroka | do | Pullen 619 | Oct 1966 | x | x | 1600 |
| Noreikora Valley | Kainantu | do | Wheeler 5888 | Oct 1966 | x | x | 1730 |

PHILIPPINES

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Caronsi, nr Penablanca | Cagayan | Luzon | Addizu 70 | May 1917 | x | | |
| | Lepanto | do | Bona 2-177 | Aug 1912 | x | | |
| Lamao River | Bataan | do | Borden 2337 | Dec 1904 | x | x | |
| Mt Mariveles, Lamao Riv. | | do | do 24037 | do | x | | |
| Nt Banaue, Amganad | Mount Prov. | do | Conklin 888 | Aug 1961 | x | x | |
| Ifugao, Banaue | Mount Prov. | do | do 832 | Dec 1962 | | | 1330 |
| Quezon City | Rizal | do | Dizen 25 | Oct 1950 | x | | |
| Damaguek, Cuernos Mts | Negros | Negros Oriental | Elmer 10118 | May 1908 | x | x | |
| Mt Bulusan | Sorsogon | Luzon | do 15511 | Dec 1915 | | | |
| Mt Kakiling | Laguna | Luzon | Fortes 4 | Feb 1949 | x | x | 100 |
| Baraki, Palawan | | | Fox 90 | Dec 1950 | x | | 170 |
| Lalinapan | Zamboanga N | Mindanao | Frade 24 | Apr 1954 | x | | 1000 |
| Nipaan | do | do | do 433 | Nov 1957 | x | | |
| Bago Oshiro, Davao | | do | Gachalia 21 | Feb 1955 | x | | |
| Laguna Bay | | Luzon | Lanceros 29 | Jun 1955 | x | | |
| Laguna College | | do | Hernaez 2015 | Apr 1967 | x | | |
| Clartilla | Rizal | do | Loher 5952 | Mar 1906 | x | | |
| Los Banos | Laguna | do | Holman 85 | May 1911 | x | x | |
| Bulaca, Paradise Farm | | | Hoskins | Feb 1963 | | x | 100 |
| Guinaang | Bontoc | | Makulia 319 | Apr 1971 | | x | |
| Alaminos, Alo Isl. | Pangasinan | Luzon | Martinez 7 | Apr 1960 | x | x | |
| Cebu City | Buhisan | | PNH 92017 | Dec 1962 | x | x | |
| Nagbasalan | Ilocos Norte | Luzon | Menor | Feb 1955 | x | x | |
| Tuguegarao | Cagayan | Luzon | Merrill 191 | Jun 1902 | x | x | |
| Gulian Isl. | | | do 452 | Dec 1902 | x | | |
| Masbate Isl. | | | do 3055 | Aug 1903 | x | x | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Antipolo | Rizal | Luzon | do 256 | Jan | 1914 | x x | |
| Caronsi nr Penablanca | Cagayan | do | do 70 | May | 1917 | x | |
| Antipolo | Rizal | do | Ramos 2170 | Jan | 1907 | x x | |
| | Benguet | do | do | Dec | 1908 | x | |
| | Bulacan | do | do 2019 | Dec | 1914 | x | |
| Rd to Asin | Mount Prov. | do | Steiner 1682 | Dec | 1958 | x | 1500 |
| Mt Yagaw, E slope | Mansalay | E Mindoro | Sulit 57 | Dec | 1952 | x | |
| San Carlos | Pangasinan | | Tumandong 2797 | Oct | 1950 | | |
| Otucan | Mount Prov. | Luzon | Vanoverbergh | Jan | 1911 | x | 1000 |
| | Bontoc | do | do 120 | Sep | 1914 | x | |
| Cardiz | | do | Vidal 1247, 1251 | | 1884 | x x | |
| Davao | | Mindanao | DeVore 119 | Apr | 1903 | x x | |
| Leyte | | | Wenzel 1391 | Jan | 1915 | x x | |
| PITCAIRN ISLAND | | | | | | | |
| Adamstown | | | St.John 14997 | Jun | 1934 | x | 70 |
| SRI LANKA | | | | | | | |
| Ceylon (species type) | | | Hermann 279 | ca | 1717 | x x | |
| Nr Peradenya | Kandy | Central | Rudd 3323 | Apr | 1970 | x | |
| Kaddugannawa | do | do | vd Maesen 4020 | Feb | 1980 | x x | |
| Pallekelle | do | do | do 4021 | do | | x x | |
| Polgolla, nr Kandy | do | do | do 4038 | do | | x x | |
| Poromandula, nr Rikilasgada | Nuwara Eliya | do | do 4048 | do | | x x | |
| Mudunagadde, S of Kandy | Kandy | do | do 4054 | do | | x x | |
| Kabatagasdigiliya | Anuradhapura | N Central | do 4078 | do | | x x | |
| 6 km N of Yakalla | do | do | do 4089 | do | | x x | |
| Dambulla | Matale | Central | do 4105 | do | | x x | |
| Malwanegama, SE of Talawa | Anuradhapura | N Central | do 4117 | do | | x x | |
| Yannativillu | Puttalam | Western | do 4132 | do | | x x | |
| Kiri Oya, E of Nauya | Matale | Central | do 4133 | do | | x x | |
| Bibile-Mahiyangana | Badulla | Uva | do 4158 | do | | x x | |
| Sangilipama (Ramboda) | Nuwara Eliya | Central | do 4162 | do | | x x | |
| 3 km NW Bandarawela | Badulla | Uva | do 4182 | do | | x x | |
| Murikandy | Jaffna | Northern | do 4185 | do | | x x | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **TAIWAN** | | | | | | | | |
| Nanputo Hill | | Amoy | Chung 5186 | Sep | 1926 | | | |
| do | | do | do 5727 | Apr | 1923 | x | | |
| Chingshui-Kou | Nanton Hsien | Taichung | Huang 747 | Feb | 1959 | | x | |
| do | do | do | do 1844 | Dec | 1960 | x | x | |
| Tandaiska | | | Price 1067 | | 1912 | x | x | 1330 |
| Taroko, Dansui forest | | | Suzuki 9915 | Dec | 1931 | x | x | |
| Kagi | | Kiayi | Wilson 9895 | Feb | 1918 | x | x | |
| **THAILAND** | | | | | | | | |
| Ban Kawng He | | | Kerr 2911 | Feb | 1913 | x | x | |
| Bangkok | | Bangkok | do | Mar | 1920 | x | x | |
| do | | | Marcan 694 | Mar | 1922 | x | x | |
| do | | | Zimmermann 58 | | 1899 | x | x | |
| Doi Sootep | | Chiang Mai | Hosseus in Gaignepain, F1. Indochine | | | | | 1916 |
| **VIETNAM** | | | | | | | | |
| Saigon Hort.Bot. | | | Pierre 2089 | Mar | 1871 | x | x | |
| Cochinchina | | | Thorel 229 | ca | 1866 | x | | |
| | | Nin-binh | Bon in Gagnepain, F1. Indochine | | | | | 1916 |
| Hue and vicinity | | | Eberhardt | do | | | | |
| Nha Tcang | | | Robinson | do | | | | |

## APPENDIX 4. List of herbarium specimens examined from America.

| Location | District/Region | Province/State | Collector | Date | F1/Fr | Altitude(m) |
|---|---|---|---|---|---|---|
| ANTIGUA | | | | | | |
| Long Lane | | | Box 1114 | Sep 1937 | x x | |
| Antigua | | | Pere Duss 22 | Dec 1902 | x x | |
| 2 km N of Bolans | Shekerley Mts | | Wilbur 7262 | Jul 1964 | | |
| ARGENTINA | | | | | | |
| Tucuman Capital | | Tucuman | Castillon 3734 | Sep 1915 | x | |
| Clorinda | Pilcomayo | Formosa | Morel 1086 | Aug 1946 | x | |
| Cuyaba Riv. | La Plata | | Page | 1888 | x | |
| Est. Sta Teresa | Mburcucuya | Corrientes | Petersen 2757 | Aug 1954 | x x | |
| BAHAMA ISLANDS | | | | | | |
| Dead Man's Reef | | Grand Bahama | | | x | |
| Wilson Bay | | Cat Island | Byrne 148 | Jun 1966 | x x | |
| Nr Nassau | | | Curtiss 62 | Feb 1903 | x x | |
| Marsh Harbour | Coastal Coppice | Great Abaco | Samuel Dale | 1726 | x | |
| Hummingbird Cay | | Exuma Isls | Nickerson 773 | Apr 1968 | x x | |
| Pineland, Deep Creek | Long Cays | Andros Isl. | Small 8555 | Jan 1910 | x x | |
| Near Andros Hill | | Andros Isl. | Wight 50 | Jan 1905 | x x | |
| Abraham Bay | | Mayaguana Isl. | Wilson 7514 | Dec 1907 | x | |
| Harvest Cay | | Exuma Isls | do 7896 | Dec 1907 | x | |
| 25 km S of Andros Town | | Andros Isl. | Yale Dawson 26656 | Mar 1966 | x x | |
| BARBADOS | | | | | | |
| BELIZE | | | | | | |
| Belize River Bridge | Belize | | Dwyer 11286 | Jun 1973 | | x |
| Manabee Lagoon | | | Peck 245 | Dec 1905 | x | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **BERMUDA ISLANDS** | | | | | | | | |
| Nr Hamilton | | Bermuda | Collins 433 | Dec | 1915 | x | | |
| | | St. Davids Isl. | Moseley | | 1873 | x | x | |
| **BOLIVIA** | | | | | | | | |
| Polo Poly, nr Coroico | N Yungas | La Paz | Buchtien 221 | Nov | 1912 | x | x | 1100 |
| San Carlos, nr Magui | | Santa Cruz | do 1805 | Aug | 1907 | x | | 750 |
| Charopampa, Mapin | | Pando | do 1804 | Nov | 1907 | | | 570 |
| Milluguaya | N Yungas | La Paz | do 4595 | Dec | 1917 | | | 1200 |
| Huarutomo-Campolican | | | Cardenas 5681 | Aug | 1954 | x | | 800 |
| Mapiri (Riv.) | | Pando | Rusby 2360 | May | 1886 | x | | 1600 |
| Rurrenabaque | | Beni | White 870 | Jul | 1921 | x | x | |
| **BRAZIL** | | | | | | | | |
| I.A.N. Belem | | Para | Archer 8019 | Dec | 1942 | x | x | |
| Petropolis | | Rio de Janeiro | Ball | Jul | 1882 | | | 1000 |
| Belem, nr Euna | | Para | Barbosa 31 | Sep | 1942 | x | | |
| Salvador (Bahia) | | Bahia | Blanchet 187 | | | x | x | |
| Michabeller? | | | do | | 1820 | x | | |
| Nr Rio de Janeiro | | Rio de Janeiro | Cambeseoles | Jul | 1767 | | x | |
| Campinas | | Sao Paulo | Campos Movaes 252 | | 1900 | x | | |
| Porto Dom Pedro II | | | Dusen 10103 | Aug | 1910 | x | x | |
| Rio de Janeiro | | Rio de Janeiro | Dusen 21 | Oct | 1901 | x | | |
| Assu region | | Maranhao | Froes 38 | Apr | 1933 | x | x | |
| Pedro Periera | | Sao Paulo? | Hohl 2963 | | | | | |
| 96 km S of Xavantina | Rio Aragudia | Mato Groso | Irwin17368 | Jun | 1966 | x | x | 800 |
| Caiponia to Fatau | | Goias | do 18003 | Jun | 1966 | x | x | 900 |
| Faz. de Aguada | Morro das Pocas | Minas Gerais | Mexia 5318 | Nov | 1930 | | | 700 |
| Cantagallo | | Rio de Janeiro | Peckol: 168 | | 1820 | x | x | |
| Paluveiras | | | Preston | | 1872 | x | | |
| Tijucca | | | Schwarz 1 | | | x | x | |
| Rio de Janeiro | | Rio de Janeiro | Sellow L383 | Nov | 1907 | x | x | |
| I.A.N. Belem | | Para | Silva 151 | Mar | 1944 | x | | |
| Nr Santarem | | Para | Spruce | Nov | 1849 | x | x | |
| Tubarao | | Santa Catarina | Ule 1421 | Mar | 1890 | x | x | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **COLOMBIA** | | | | | | | |
| Poponte | | | Allen 889 | Dec 1924 | x | | 50 |
| Cundinoruna | | Narino | Anon. 348 | Jul 1930 | x | | |
| Bello | | Antioguia | Archer 426 | Jul 1930 | x | x | 1500 |
| Falan | Calamonte | Tolima | Barriga 3378 | Dec 1939 | | x | 1120 |
| Bueneventura | | Valle del Cauca | Cook 62 | May 1926 | x | | |
| Amaza | | Antioguia | Daniel 1484 | Nov 1937 | | x | |
| Piojo, Barranguilla | | Atlantico | Elias 687 | Jan 1929 | x | | 400 |
| Barranguilla | | do | do 802, 687 | Dec 1929 | x | | |
| La Mesa, El Guyabal | Cerro de Macute | Cundinamarca | Fernandez 1325 | | | | 1400 |
| Chichankanab | | | Gaumer 1309 | | x | x | |
| Toliroa | | Tolima | Lehmann 8660 | | x | x | 100 |
| San Martin | | Meta | Hermann 11184 | Feb 1944 | x | x | |
| Pto Wilches-Pto Santos | | Santander | Killip 14886 | Nov 1926 | x | x | 110 |
| Barranguilla | | Atlantico | Paul 14 | 1925 | x | | |
| Santa Marta | | Magdalena | Smith 260 | Sep 1898 | x | x | 760 |
| El Tambo | | Cauca | Sneidern 2296 | Oct 1939 | x | x | 1700 |
| Hac. Vista Nieve | Santa Marta | Magdalena | Viereck | Dec 1922 | x | x | |
| **COSTA RICA** | | | | | | | |
| Nr Golfito | | | Burger 4697 | Jan 1967 | | x | 200 |
| San Francisco | de Guadalupe | | Conduz 9799 | Oct 1895 | x | | |
| Sta Maria de Dota | | | Pittier 2329 | Apr 1890 | x | x | 1300 |
| Nr San Jose | | | Porsch 832 | May 1930 | x | | |
| Jimenez | Santa Clara | Limon | Smith 4795 | Apr 1894 | | x | 200 |
| Carmen Station | | Limon | Standley 48376 | Feb 1926 | x | x | 30 |
| Zent | | | United Fruit | | x | x | |
| **CUBA** | | | | | | | |
| Sierra Maestra | | | Clemente 3225 | Dec 1943 | x | x | 900 |
| | | Santa Clara | Combs 511 | Aug 1895 | x | x | |
| Santiago de las Vegas | | Havana | von Hermann 382 | Dec 1907 | x | x | |
| Soledad, Cienfuegos | | Santa Clara | Jack 4746 | Mar 1932 | | x | |
| Cafetal Chimborasso | | | Otto 171 | | x | | |
| Above Mantanzas | | | Rugel 139 | Jan 1849 | x | | |
| Nr San Domingo | | | Rutten 192 | Mar 1933 | x | x | 100 |
| **DOMINICA** | | | | | | | |
| Old Imperial Rd | | | Hodge 1299 | Feb 1940 | x | x | 400 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **DOMINICAN REPUBLIC** | | | | | | | |
| Ramfis, nr Colonia | | Santo Domingo | Allard 14061 | Dec 1945 | x | | 400 |
| Nr Trujillo | | | Heldring-Talma | | x | x | |
| Paradis, nr Barahona | | | Krug 2667 | | x | | 100 |
| Azua | | | Rose 3920 | Mar 1913 | x | x | |
| La Leonor | Sabaneta | Montecristi | Valeur 207 | Dec 1930 | x | x | 600 |
| | Moncion | Montecristi | Valeur 207 | Sep 1929 | x | | |
| Santo Domingo | | Santo Domingo | Wright | Feb 1871 | x | x | |
| **EL SALVADOR** | | | | | | | |
| San Salvador | | | Calderon 529 | 1922 | x | x | |
| Nr San Salvador | | | Standley 19347 | Dec 1921 | | | 750 |
| **ECUADOR** | | | | | | | |
| Litoral de Guayaquil | | | Lehman 4567 | Sep | x | x | |
| Daule | | Guayas | Fagerlind 365 | Sep 1952 | x | x | |
| **FRENCH ANTILLES** | | | | | | | |
| St. Pierre | | Martinique | Hahn 208 | Dec 1867 | x | x | |
| St. Pierre | | Martinique | Duss 26 | | | x | |
| | | Guadeloupe | Duchassning | | x | | |
| San Francisco | | Guadeloupe | Tonduz 9799 | Jul 1896 | x | x | |
| **FRENCH GUYANA** | | | | | | | |
| Karouany | | | Sagot | 1898 | | | |
| Maroni Riv. | | | Wachenheim | Dec 1924 | x | | |
| **GRENADA ISLANDS** | | | | | | | |
| New Grenada | | Grenada Isl. | Triana 6686 | Jun 1852 | x | | 460 |
| Belmont, St. Georges | | do | Broadway | Mar 1905 | x | x | |
| | | Beguia Isl. | Fairchild 2743 | Feb 1932 | x | x | |

GUATEMALA

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Nr La Libertad | | Peten | Aquilar 95 | Aug 1937 | | x | |
| San Tomas | | | Friedrichsthal 75 | Dec?1841 | x | | |
| Santa Rosa | | Santa Rosa | Heyde, Lux 39 | Nov 1892 | x | | 1000 |
| Retalhulen | | Retalhulen | Kellerman 6431 | Jan 1907 | x | x | 237 |
| La Libertad | | Peten | Lundell 2317 | Apr 1933 | x | | |
| do | | do | do 3386 | May 1933 | | x | |
| Los Diamantes | | Esquintla | Seler 2519 | May 1896 | x | x | |
| Nr Quirigua | | Izabal | Standley 23994 | May 1922 | | | 225 |
| | | Alta Verapaz | Tuchheim 909 | Jan 1904 | | | |

GUYANA

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Upper Hazaruni Riv. | | | de la Cruz 2127 | Sep 1922 | | | |
| Waramuri Mission | Pomeroon | Moruka Riv. | do 2502, 2591 | Oct 1922 | x | | |
| Kamakusa | | Mazaruni Riv. | do 2772 | Nov 1922 | x | x | |
| Pomeroon Riv. | Pomeroon | | do 2907 | Jan 1923 | x | | |
| Waini | northwest | | do 3624 | Apr 1923 | x | | |
| Kaietur Falls | | Potaro Riv. | do 4403 | Oct 1923 | x | | |
| Rockstone | | | Gleason 835 | Jul 1921 | x | | |
| Vreedenhoop | Georgetown | Demerara Riv. | Hitchcock 16710 | | x | x | |
| Coastlands | | | Jenman 5861 | Jan 1890 | x | x | |
| Pakaraima Mts | Imbaimada | Upper Maz. Riv. | Maguire 32650 | Nov 1951 | x | | |

HAITI

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Port Nargol, Bayeux | Massif du Nord | | Ekman 2678 | Nov 1924 | x | x | |
| Nr Anse a Galets | Gonave Isl. | | Leonard 3143 | Mar 1920 | x | x | |
| Nr Etroite | do | | do 3332 | do | x | x | |
| St. Michel de l'Atalaye | | Nord | do 8527 | Jan 1926 | x | x | 350 |
| Nr Port de Paix | | | do 11158 | Dec 1928 | x | | |
| Port au Prince | | | Hunnewell 19009 | Jan 1949 | x | x | |
| Jacmel | | Sud | Xavier | 1896 | | x | |

HONDURAS

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Tela, Lancetilla Vail. | | Atlantica | Standley | 1928 | | | To 600 |
| E.A.P. Zamorano | | Morazan | Williams 9126 | Oct 1946 | x | x | 800 |
| Nr Aqua Azal, Lake Yojoa | | Cortes | Williams 11362 | Dec 1946 | x | x | 630 |

JAMAICA

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Rodnor | Blue Mountains | | Davis | May 1926 | x | x | 1080 |
| Resource | | | Harris 6603 | Nov 1896 | x | | |
| Portland, Seaman's Vall. | John Crow Mts | Clarendon | Maxon 106 | Feb 1920 | x | x | 300 |
| Below Irish Town | | | Yuncker 17702 | Dec 1957 | x | x | 700 |

MEXICO

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Etla Valley | Oaxaca | | Alvarez 742 | Sep 1895 | x | | |
| Oriyaba | | | Botteri 932 | | x | | |
| Mahbenchauk, Tenejapa | | Chiapas | Breedlove 11728 | Aug 1965 | | x | 1100 |
| Kulaktik, Tenejapa | | do | do 12866 | Oct 1965 | x | x | 1830 |
| do | | | do 14569 | Jul 1966 | x | x | |
| La Palma, Catemaco | | Vera Cruz | Calderon 1802 | Dec 1968 | x | x | 120 |
| Guatla Gutierrez | | Chipas | Collins 154 | Jan 1907 | x | x | |
| Col. Nueva, Oaxaca | Centro | Oaxaca | Conzaffi 4779 | Jul 1932 | x | | 1600 |
| Xalatre | | | Galeotti | | x | | |
| Cordillera | | Vera Cruz | do 3323 | Jun 1840 | x | | |
| Chichankanab | | Yucatan | Gaumer 2263 | | x | | |
| S. Kandabonot | | do | do 23625 | Mar 1917 | x | | |
| | | Michoacan | Langlasse 981 | Mar 1899 | x | x | 1000 |
| | | Guerrero | do | do | x | x | |
| Nr Tuxtepec | | Oaxaca | Hernandez 99 | Dec 1943 | x | | |
| Coalcoman | | Michoacan | Hinton 12741 | Dec 1938 | | x | 1000 |
| San Jose del Cabo | | Baja California | Nelson 7391 | Jan 1906 | x | x | 20 |
| Tepic | | Nayarit | Palmer 1861 | Jan 1892 | x | x | |
| Baranca de Senampa | | Vera Cruz | Purpus | Nov 1806 | x | | |
| Zacuapan | | Vera Cruz | Purpus 8006 | Nov 1807 | x | | |
| Lanteja | Merida | Yucatan | Schott 880 | Aug 1865 | | | |

MONTSERRAT ISLAND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Montserrat | | | Shafer 144 | Jan 1907 | x | x | |

NETHERLANDS ANTILLES

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Booby Hill | | Saba | Arnoldo 791 | Aug 1947 | | x | |
| | | Curagao | Aschenberg | | x | | |
| | | Saba | Boldingh 1696 | Jul 1906 | | x | |
| Groot St. Joris | | Curacao | Cunan 384 | Mar 1907 | x | x | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | St. Eustatius | von Grol 210 H | | x | | |
| The Bottom | | Saba | Stoffers 2907 | 1953 | | x | |
| **PANAMA** | | | | | | | |
| Sabanas, nr Chepo | | | Hunter 70 | Jan 1935 | x | | 30 |
| | | Taboga Isl. | Celestine 120 | Nov 1912 | x | x | |
| Bahia Honda | | | Elmore H 12 | Mar 1939 | x | x | |
| Samboa | | Canal Zone | Herbert 0 27 | Apr 1921 | x | x | |
| Changuinola | Changuinola Riv. | | Lewis 422 | Dec 1966 | x | x | |
| Cocle, Valle de Anton | | | do 2589 | Dec 1967 | x | | 500 |
| | | Taboga Isl. | Mcbride 2814 | Feb 1923 | x | x | |
| Sosa Hill, Balboa | | Canal Zone | Standley 25223 | Dec 1923 | x | | |
| Nr Fort Randolph | | do | do 28738 | do | | x | |
| Bocas del Toro | | Colon Isl. | Wedel 42 | Feb 1940 | x | | |
| **PARAGUAY** | | | | | | | |
| La Plata River | | | Palmer | 1853 | x | x | |
| **PERU** | | | | | | | |
| W Shapaja, Rio Huallaga | San Martin | San Martin | Belshaw 3204 | Aug 1937 | x | | 300 |
| Pena Negra | Iquitos | Loreto | Croal 18661 | Aug 1972 | x | | |
| Quimiri, La Merced | Tarma | Junin | Ferreyra 3712 | Jun 1948 | x | x | |
| Olmos to Jaen | Lambayeque | Lambayeque | Hutchinson 3450 | Jan 1964 | x | x | |
| Huanuco | | Huanuco | Macbride 2055 | May 1922 | x | x | 2300 |
| Muena-Cano | Iquitos | Loreto | Mexia 6505 | Feb 1932 | x | x | |
| Chosica, nr Lima | | Lima | Rutten 892 | Jul 1921 | | | 1000 |
| Santa Cruz | | Cajamarca | Sonkup 4841 | Aug 1961 | x | | |
| Along Rio Nanay | | Loreto | Williams 1284 | Sep?1929 | x | x | |
| Alto Rio Itaya | | do | do 3278 | Sep 1929 | x | x | 145 |
| Lower Rio Huallaga | | do | do 4295 | Oct 1929 | x | x | |
| Alto Rio Huallaga | San Martin | Loreto | do 6694 | Dec 1929 | | | To 900 |
| **PUERTO RICO** | | | | | | | |
| Bayamon | | | Goll | Nov 1899 | x | x | |
| San Anton | | | do 167-170 | do | x | x | |
| Guyama Road | | | do 580, 581 | do | x | | |
| Catano | | | do 970 | Dec 1899 | x | x | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Martin Pena | | | Heller 379 | Jan 1899 | x | x | |
| Nr Hayaguez | | | do 4454 | Jan 1900 | x | x | 170 |
| Ponce | | | Prey 39 | Jan 1903 | x | x | |
| San German | | | Sargent 126 | Jun 1935 | | x | |
| Les Marias | | Vieques Isl. | Shafer 2709 | Feb 1914 | | x | |
| Maricao | Mt Montoso | | Sintenis 224 | Nov 1884 | x | x | |
| Mayaguez | | | do | do | x | x | |
| Perchas, Lares | | | do 6016 | do | x | x | |
| Espino, Lares | | | do 6016 | Jan 1887 | | x | |
| Martin Pefta | | | Stevenson 277 | Nov 1913 | x | x | |
| Pueblo Viejo | | | do 2572 | Feb 1915 | x | x | |
| Rio Piedras | | | Underwood 229 | Jun 1901 | | x | |
| Nr Hotel Conquistador | | | Wagner 436 | Dec 1963 | x | x | |
| Luguillo Mts | | | Wilson 276 | Jul 1902 | x | x | |
| ST. CROIX | | | | | | | |
| Midland | | | Ricksecker 25 | Jan 1897 | x | x | |
| Bassin | | | do 318 | Mar 1896 | x | | |
| Kingland | | | Thompson 1088 | Dewc 1925 | x | | |
| ST. THOMAS | | | | | | | |
| Canaan | | | Eggers 211 | Dec 1880 | x | x | |
| | | | Morrow 68 | Mar 1921 | x | x | |
| SURINAM | | | | | | | |
| Nr Paramaribo | | | Coll. indig. | 1910 | x | x | |
| Paramaribo | Cultuurtuin | | Doesburgh 51 | Mar 1960 | x | x | |
| Calcutta | Saramacca | | Reyenga 476 | Sep 1962 | x | x | |
| Nr Goddo | Surinam Riv. | | Tresking 502 | Nov 1908 | x | x | |
| Tafelberg, GMD Camp | Saramacca | | Kramer 3049 | Nov 1961 | x | x | 300 |
| Nr Albina | Marowijne Riv. | | Versteeg 535 | Jul 1904 | x | x | |
| do | do | | Went 440 | Oct 1902 | | x | |
| Paramaribo | | | Wullschlagel 113 | | x | | |
| TRINIDAD AND TOBAGO | | | | | | | |
| | | Tobago | Broadway | Dec 1908 | x | x | |
| Scarborough | | do | do 3443 | Feb 1910 | x | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Montpelier | | do | do | Dec 1911 | x | | |
| Point Fortin | | Trinidad | do | Dec 1932 | | | |
| Arima to Blanchisseuse | | do | Rilg 70 | May 1924 | x | x | 500 |
| **TURKS AND CAICOS ISLANDS** | | | | | | | |
| Pine Cay | | | Gillis 11824 | Feb 1973 | x | x | |
| **UNITED STATES OF AMERICA** | | | | | | | |
| S. Florida | | Florida | Curtiss | | | x | |
| C. Texas | | Texas | Dana 1252 | | x | | |
| Homeland | Dade County | Florida | McFarlin 4658 | Jan 1931 | x | x | |
| | Polk County | do | Holton | Feb 1967 | x | x | |
| | | Alabama | Mohr | Mar 1882 | x | | |
| L. Matecumbe Key | Monroe County | Florida | Moldenke 626 | Feb 1930 | | | |
| Sugar Loaf Key | | do | Pollard 39 | Mar 1890 | x | x | |
| Coral Gables | Dade County | do | Popenoe 958 | Nov 1969 | x | | |
| No Name Key | | do | Simpson 420 | Dec 1891 | x | x | |
| Everglade Keys, Timms | Dade County | do | Small 7277 | Jan 1916 | | x | |
| Nr Fort Myers | Lee County | do | Standley 19038 | Dec 1919 | | | |
| Halawa | | Hawaii | Faurie 731 | Jun 1909 | | x | |
| Nr Linue | Kauai Isl | do | do 770 | Dec 1909 | x | x | |
| Kakuku | Oahu Isl | do | Hitchcock 13887 | Jun 1916 | x | x | |
| **VENEZUELA** | | | | | | | |
| Caracas | | Caracas | Birschel | | x | | |
| Seboruco to La Fria | | Tachira | Breteler 4913 | Dec 1965 | x | x | 700 |
| Caracas | | Caracas | Feudler 303 | | x | x | 1000 |
| El Valle | Margarita Isl | | Miller 139 | Mar 1901 | x | | |
| Sacupana | Lower Orinoco | | Rusby 189 | May 1896 | x | x | |
| Santa Catalina | do | | do 191 | do | x | x | |
| Cotiza | | | Williams 9970 | Mar 1938 | x | x | 930 |

ICRISAT

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