

INTRODUCTION

The International Board for Plant Genetic Resources (IBPGR) is funding the collection of wild *Musa* species and cultivated diploid bananas in Papua New Guinea. This is a joint project with the Queensland Department of Primary Industries (QDPI) who are providing facilities for the tissue culturing and disease screening in quarantine of the collected germplasm. The collecting work in PNG is being carried out with the help and co-operation of the PNG Department of Agriculture and Livestock (DAL).

The collected banana germplasm, once deemed free of disease by QDPI plant pathologists, will be released from quarantine and sent to the in-vitro laboratory of the International Network for the Improvement of Banana and Plantain (INIBAP) for distribution to interested banana improvement programmes world wide.

Duplicate plants of all the collected material are also being planted in the PNG National Banana Germplasm Collection located at Laloki Agricultural Research Station.

This report gives details of the material collected during the third collecting mission. Further background information on this project is given in reports covering the first and second collecting missions which took place in 1988. (Jones, 1988; Sharrock, 1988; Tezenas du Montcel, 1988 and Sharrock, Daniells and Kambuou, 1988).

Participants in Third Collecting Mission

Miss Suzanne Sharrock: IBPGR Intern. Responsible for organizing the mission, collecting the germplasm and carrying out the tissue culturing in Australia.

Dr. David Jones: QDPI Senior Plant Pathologist. Responsible for assessing the banana disease situation at the collecting sites.

Miss Janet Banag: Rural Development Technician - Banana Research D.A.L. Laloki Agricultural Research Station. Accompanied the team to Oro Province giving advice on PNG banana cultivars.

The internal arrangements for this mission were made by Mrs R. Kambuou of D.A.L., Laloki Agricultural Research Station. The Department of Primary Industries (D.P.I.) provided transport in each province visited and local D.P.I. officers assisted in the collecting work. A map indicating the germplasm collecting sites covered during this and previous missions is presented in Appendix 1 and the itinerary is given in Appendix 2.

We appreciate the help given by these D.A.L. and D.P.I. staff during this mission and gratefully acknowledge the co-operation of farmers in freely providing banana suckers from their gardens.

Method of Collecting Germplasm

Two or three suckers per cultivar accession were collected. These were carefully cleaned to ensure all damaged outer layers of tissue were removed and left to dry for 1-2 days. The suckers were then wrapped in newspaper and stored until sent back to Australia for tissue culturing, usually 1-2 weeks after being collected.

Germplasm of the wild species was collected as seed wherever possible. This was kept inside the fruit and returned to Australia where embryo cultures were initiated from fresh seed extracted from ripe fruit. Excess seeds were dried for further storage.

GERMPLASM COLLECTING SITES

1. Oro Province

a. *Cultivars*

Oil palm plantations cover large areas of this province and this is an important cash crop. The major food crops however are bananas, taro and sweet potatoes, which are grown in mixed gardens with a variety of other vegetables.

Many different types of bananas are maintained. Vigorous triploid clones are planted around the houses while diploid types are grown in food gardens, which may be located some distance from the houses. Many of these diploid cultivars resemble the plantain sub-group with long fingers and variable degeneration of the male axis. However, male flowers are generally cream in colour. Some of the diploids are the same as those found in the Madang area, while others seem to be unique to this province.

No Fe'i cultivars were seen, but two cultivars which may have originated from a *Musa acuminata* x *Australimusa* hybrid were collected. These both had erect bunches but the male buds hung down vertically. The bracts were somewhat shiny, one being green and the other purple.

The triploid bananas seen in Oro province included the cultivars Kalapua, Yawa, Cavendish, Red, Green Red, Gros Michel, and Pisang Jaribuaya.

A total of 19 cultivars were collected, of which 15 were probably AA diploids. Full details of these accessions are given in Appendix 3.

Two unknown bananas were also collected in Oro province. Both of these bore a superficial resemblance to *Musa acuminata* ssp. *banksii* but were paler in colour and more waxy than is typical for the wild species. In both cases, the fruit were poorly filled and contained a few unripe seeds. The male flowers produced pollen.

In the first case (PNG 248) there were no suckers but the male bud was collected instead. Unfortunately, this did not establish in tissue culture. Suckers from the other plant (PNG 253) were collected and successfully established in culture. It is possible that these plants originated from a cross between *M. acuminata* ssp. *banksii* and a diploid cultivar.

b. *Wild Species*

Four wild species were found in Oro Province. *Musa halbisiana* was the least common and was found in areas of grassland isolated from the other species. Seed was collected and, although it was later found that most of the seed were empty or only partially filled, embryo cultures have been successfully initiated.

The other species found in this area were *M. acuminata* ssp. *banksii*, *M. schizocarpa* and *M. maclayi* ssp. *maclayi* var. *maclayi*. All these grew in similar locations and were frequently found growing together.

Some variation appeared to exist in *M. schizocarpa* with some plants having paler coloured fruits in relatively lax bunches which apparently did not split open when mature. Simmonds (1956) noted such variation but concluded that these plants were merely an immature form of the species.

Collections were made from both these types of *M. schizocarpa* and they will later be grown together under uniform conditions to assess the degree of variation.

Both green and purple bracted forms of *M. acuminata* ssp. *banksii* were collected as well as hybrids of both of these with *M. schizocarpa*. These hybrids are quite distinctive with their fruit blackened by freckle disease (*Guignardia musae*).

A total of 13 accessions were collected from these four wild species.

c. Diseases

Cordana (*Cordana musae*) was the most noticeable leaf spot in Oro province and was particularly severe on leaves weakened by other diseases. *Cordana* lesions often surrounded those of black cross (*Phyllocora musicola*) and black Sigatoka (*Mycosphaerella fijiensis*). *Cordana musae* was evidently gaining entry to the leaf through tissue damaged by other pathogens.

Black Sigatoka was severe in places on AAA cultivars such as Gros Michel, Dwarf Cavendish and Green Red. However, the disease was generally at a very low level or absent on other genome types. Most material collected was free of black Sigatoka symptoms.

Black cross and freckle were common and widespread. The latter was prevalent on plants of the ABB genome. Speckle (*Ramichloridium musae*) was observed in sheltered locations on occasions.

Information on leaf diseases found on wild bananas is summarized below:-

<i>M. acuminata</i> ssp. <i>banksii</i> (yellow-green bracts)	-	<i>Cordana</i> , black cross, freckle (mild), speckle.
<i>M. acuminata</i> ssp. <i>banksii</i> (purple bracts)	-	Only freckle usually (however, PNG 255 seen with black Sigatoka and <i>Cordana</i>).
<i>M. schizocarpa</i>	-	Freckle, speckle
<i>M. acuminata</i> ssp. <i>banksii</i> x <i>M. schizocarpa</i>	-	Freckle (severe on leaves and fruit), <i>Cordana</i> .
<i>M. balbisiana</i>	-	<i>Cordana</i> , black cross.
<i>M. maclayi</i> ssp. <i>maclayi</i>	-	unknown speckle on old leaves.

2. Southern Highlands

a. Cultivars

Sweet potato is the staple food crop in this province, as in the rest of the highlands of Papua New Guinea. Bananas are also widely grown and are cultivated up to 2000 m but variability decreases above about 1500 m. Most of the cultivars grown are AAB triploids and the local practise of covering the bunches and cutting off the male bud makes varietal identification difficult.

Many of the varieties are similar in type to those grown in the Eastern and Western Highlands (Sharrock, Daniells, Kambuou, 1988). A few varieties, such as cv. Tul (PNG 259) are highly prized and a bunch can fetch up to 10 Kina (US \$13.00) in the local markets.

A total of 13 cultivars were collected in this province of which 11 were probably AAB triploids and 2 were AA diploids.

b. Wild Species

The only wild species seen in the Southern Highlands was *M. ingens* which is found on forested slopes around Mendi.

c. Diseases

The two most widespread diseases seen were Malayan leaf spot (*Haplobasidium musae*) and black Sigatoka. The former was exceptionally severe on cv. Mala (PNG 257) at Mendi causing extensive leaf necrosis. Symptoms were noticeable beginning on the second or third fully unfurled leaf. Other cultivars were less seriously affected. The pathogen is reported to favour areas with high rainfall and cool temperatures. In Malaysia, the disease occurs between 1372 and 1525 m (Firman, 1971). The environmental conditions in the Southern Highlands would, therefore, seem suited to the development of Malayan leaf spot.

Black Sigatoka seemed much more in evidence than in the Oro Province and may be a reflection of the types of cultivars grown. Freckle was also common, but not Cordana or black cross.

Cultivar Tul, a popular banana in the Province, was always seen with distorted leaves, which tended to roll upwards and inwards. Leaf veins were also prominent and a slight chlorotic streaking was observed on young leaves in some instances. A virus pathogen was strongly suspected but could not be proven. As the symptoms are not typical of known virus diseases of banana, it is possible that they may be genetic in origin. Cultivar Tul (PNG 259) was collected despite reservations on its health status. However, it did not establish in tissue culture.

No leaf diseases were observed on *M. ingens*.

3. Western Province

a. *Cultivars*

Collecting was carried out in the Kiunga-Ningerum area where bananas are an important food crop.

Gardens in this area are made by clearing the bush which is left unburnt before planting. Many varieties of diploid cooking bananas are planted with taro, sweet potato and other vegetables in the food gardens. Triploid cultivars such as Cavendish, Kalapua and Yawa are planted around the houses.

The diploid varieties are less plantain-like than those diploids found in areas such as East New Britain. They have smaller fingers, which are curved upwards in contrast to the long pendant fingers of the plantain-like diploids. The male buds are generally purple and not degenerating while the male flowers are cream, many with pollen.

One Fe'i variety was collected in this area as well as a true Horn plantain. A total of 11 cultivars were collected of which 7 were AA diploids.

b. *Wild Species*

The only wild species found was *M. accuminata* ssp. *banksii*. This was common along the roadside and both green and purple bracted types were collected.

c. *Diseases*

Freckle was the most obvious leaf disease on Daru Island in the Torres Strait where ABB cultivars are grown predominantly. Symptoms were also seen on fruit of Kalapua (ABB) at the local market. Black Sigatoka was only observed on one unidentified AAB cultivar. Mysore, another AAB type which is widely grown, appeared free of symptoms.

In the Kiunga area of Western Province, black Sigatoka, freckle, black cross and Cordana diseases were commonly observed. Black Sigatoka was severe on cv. Dwarf Cavendish growing at the DPI station at Somongos, but most local cultivars growing nearby showed few or no symptoms. Freckle was found on the Fe'i banana cv. Skai (PNG 274) at Ningerum.

4. Gulf Province

a. *Cultivars*

In the coastal areas, sago and fish provide the staple diet, but bananas become important in the inland areas.

Bunch covers made varietal identification difficult but 6 cultivars were collected. None of these were plantain-like and most were tall and slender with erect leaves. The fruit generally curved upwards and male buds were predominantly purple.

b. Wild Species

Two wild species found in this area were *M. schizocarpa* and *M. maclayi* ssp. *maclayi* var *maclayi* both of which were collected. *M. acuminata* ssp. *banksii* was not seen although Argent (1976) reports it as present here.

c. Diseases

Black Sigatoka, freckle, black cross and Cordana were seen on bananas beside the road inland from Kerema. Black Sigatoka did not appear serious except on AAA cultivars such as Giant Cavendish. Leaf curl symptoms very similar to those seen on cv. Tul in the Southern Highlands were found on cv. Kwonta (PNG 286) and cv. Adina (PNG 287) at Murua. Extreme care should be taken when screening these cultivars in quarantine.

Diseases seen on wild bananas in the Western and Gulf Provinces are as follows:-

<i>M. acuminata</i> ssp. <i>banksii</i> (yellow-green bracts)	-	black Sigatoka (severe), freckle, Cordana
<i>M. acuminata</i> ssp. <i>banksii</i> (purple bracts)	-	black Sigatoka (mild)
<i>M. schizocarpa</i>	-	Cordana
<i>M. maclayi</i>	-	no leaf spots

SUMMARY

A total of 68 accessions were collected during this mission. These have been tentatively classified as:

Cultivars:	AA	- 28 accessions
	AAB	- 17 accessions
	ABB	- 1 accession
	AAT	- 2 accessions
	Fe'i	- 1 accession
	Unknown	- 2 accessions
	Total	- 51 accessions
Wild Species:		
	<i>Musa acuminata</i> ssp. <i>banksii</i>	- 6 accessions
	<i>M. schizocarpa</i>	- 5 accessions
	<i>M. maclayi</i> ssp. <i>maclayi</i> var <i>maclayi</i>	- 3 accessions
	<i>M. balbisiana</i>	- 1 accession
	<i>M. acuminata</i> ssp. <i>banksii</i> x <i>M. schizocarpa</i>	- 2 accessions
	Total	- 17 accessions

Of these 68 accessions, seven did not establish in tissue culture.

BLACK SIGATOKA

As has been observed during previous banana collection missions to PNG, cultivars growing in food gardens generally have very low levels of black Sigatoka disease. However, there are some cultivars which are badly affected and disease levels on known susceptible Cavendish types at most locations are usually high. This indicates that there may be quite high levels of field resistance to black Sigatoka in much of the material grown in PNG. An alternative interpretation is that spaced plantings of mixed cultivars with varying levels of resistance may reduce the overall disease incidence in gardens.

If resistance is common, and screening trials of collected cultivars would be necessary to confirm this, it could be attributed to selection for disease resistant cultivars over many years by the local people. The PNG-Solomon Islands region is believed by some to be the centre of origin of black Sigatoka (Stover, 1978) and it is highly likely that the disease has been present in the region for a considerable period of time. There is no firm evidence that yellow Sigatoka (*Mycosphaerella musicola*), the disease which black Sigatoka is known to have replaced in other countries, ever existed in PNG. Therefore, black Sigatoka may always have been present and exerting selection pressure as the predominant leaf spot.

On the first mission, symptoms of black Sigatoka disease were not seen on *M. acuminata* ssp. *banksii*. In one locality in East Sepik Province, *M. acuminata* ssp. *banksii* was growing in very close proximity to cultivated bananas, some with black Sigatoka. From this and other observations, it was thought that *M. acuminata* ssp. *banksii* may have high field resistance to black Sigatoka. However, on this mission, *M. acuminata* ssp. *banksii* (PNG 276) with severe symptoms of black Sigatoka was seen in the Western Province. Black Sigatoka was also found on *M. acuminata* ssp. *banksii* (PNG 255) in the Northern Province. It is possible, as *M. acuminata* ssp. *banksii* is a heterogenous wild banana, that resistance to black Sigatoka may vary. Vakili (1968) found that some accessions of *M. acuminata* ssp. *banksii* were resistant to yellow Sigatoka while others were susceptible. Alternatively, *M. acuminata* ssp. *banksii* may be susceptible and escape infection in some instances. Glasshouse and field screening tests using the material collected in PNG should clarify the situation.

Black Sigatoka symptoms have not been seen on *M. balbisiana*, *M. schizocarpa*, *M. acuminata* ssp. *banksii* x *M. schizocarpa*, *M. ingens*, *M. boman* or *M. maclayi* and they are generally thought to be resistant. However, it would be interesting to challenge these species and hybrid in glasshouse and field screening tests.

LALOKI BANANA COLLECTION

While in PNG, the opportunity was taken to reassess clones in the PNGBF banana collection at the Laloki Research Station near Port Moresby for resistance to black Sigatoka disease. The collection was in the process of being relocated in a new, flood-free site. Disease levels in the old collection were higher than in February 1988 when the material was first assessed. All accessions in the ABB genome were resistant to black Sigatoka. A number of clones in the AA, AAA and AAB genome groups, which showed high levels of resistance, were collected for further evaluation in a QDPI/DSIR/ACIAR banana improvement project. These were:-

Number	Name	Genome
NBA 14		(AA)
NBC 20		(AA)
NBB 20		(AAA)
OBb 4	Manop	(AAA)
OBb 15	Migea Arizi	(AAA)
NBH 10	Tomnam	(AB/AAB?)
OBY 3	Barkol	(AAB)

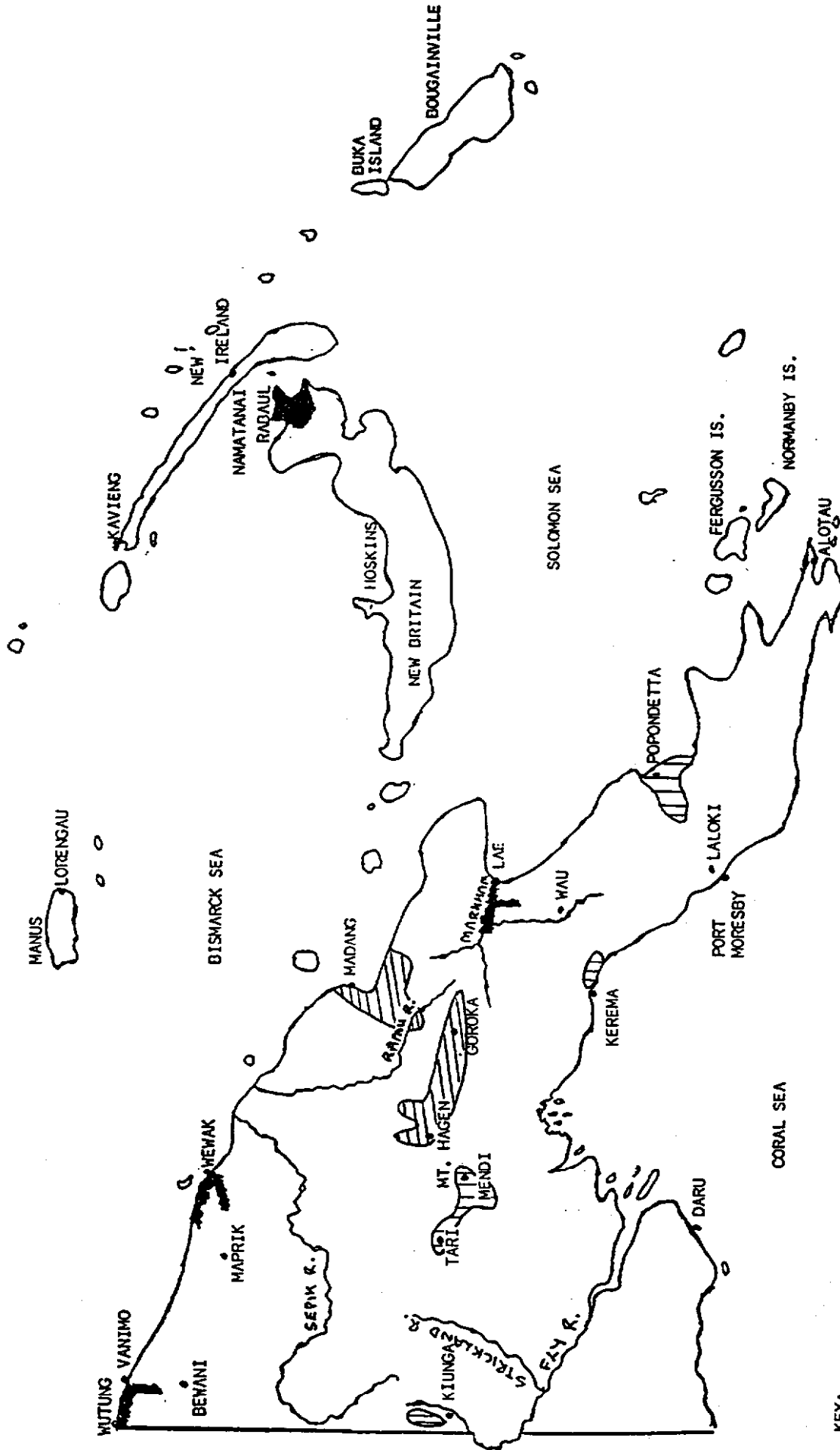
Pisang Mas (OBV 16 Kirun) was again noted as being highly resistant to black Sigatoka. However, this clone was seriously affected by a leaf pathogen believed to be Cladosporium musae.

REFERENCES

- Argent, G.C.G., 1976. The wild bananas of Papua New Guinea. Notes of the Royal Botanical Gardens Edinburgh. 35: 77-114.
- Firman, I.D., 1971. Banana leaf spot caused by Haplobasidium musae. PANS 17: 315-317.
- Jones, D.R., 1988. Report on an IBPGR banana germplasm collecting mission to PNG, February/March 1988. QDPI Internal Report.
- Sharrock, S.L., 1988. Report on banana germplasm collecting mission to PNG 27 February to 22 March 1988. IBPGR Internal Report.
- Sharrock, S.L., Daniells, J.W., Kambuou, R., 1988. Report on second IBPGR/ODPI banana germplasm collecting mission to Papua New Guinea. IBPGR Internal Report.
- Shepherd, K., Ferreira, F.R., 1984. The PNG Biological Foundation's banana collection at Laloki, Port Moresby, Papua New Guinea. IBPGR/SEAN 8(4): 28-34.
- Simmonds, N.W., 1956. Botanical results of the banana collecting expedition 1954-55. Kew Bulletin 11: 463-489.
- Stover, R.H., 1978. Distribution and probable origin of Mycosphaerella fijiensis in Southeast Asia. Tropical Agriculture (Trinidad) 55: 65-68.
- Stover, R.H., and Simmonds, N.W., 1987. Bananas. London. Longmans.
- Tezenas du Montcel, H., 1988. Rapport de mission en Papouasie Nouvelle Guinee du 22.02 au 24.03 1988. Internal report for INIBAP and CIRAD/IRFA.
- Vakili, N.G., 1968. Response of Musa acuminata species and edible cultivars to infection by Mycosphaerella musicola. Tropical Agriculture (Trinidad) 45: 13-22.

PAPUA NEW GUINEA

BANANA GERmplasm COLLECTING SITES



KEY:

- = 1st Mission
- ▨ = 2nd Mission
- ▩ = 3rd Mission

APPENDIX 2

ITINERARY

15.2.89	Brisbane - Port Moresby
16.2.89 - 18.2.89	Port Moresby - (Laloki Banana Collection)
19.2.89	Port Moresby - Popondetta
20.2.89 - 23.2.89	Oro Province - (Collecting Germplasm)
24.2.89	Popondetta - Port Moresby
25.2.89	Port Moresby
26.2.89	Port Moresby - Mendi
27.2.89 - 2.3.89	Southern Highlands - (Collecting Germplasm)
3.3.89	Mendi - Port Moresby
4.3.89	Port Moresby - Daru
6.3.89	Daru - Kiunga
7.3.89 - 8.3.89	Kiunga - (Collecting germplasm)
9.3.89	Kiunga - Kerema
10.3.89 - 11.3.89	Kerema - (Collecting germplasm)
11.3.89	Kerema - Port Moresby
12.3.89	Port Moresby - Brisbane

Appendix 3

Details of Accessions Collected

Acc No.	Geotype	Local Name	Language Group	Location	Use ¹	Disease ² Present	Main Characteristics	Photo No.
PNG 222	<i>M. maclayi</i> sp. <i>maclayi</i> var. <i>maclayi</i>	-	-	Pusa Hambo Oro Province	W		Erect bunch, ♂ bud green, intricate. Fingers v. short, orange when ripe. Typical cf. Argent (1976).	1/1-1/4
PNG 223	<i>M. schizocarpa</i>	-	-	Pusa Hambo Oro Province	W	C	Typical cf. Argent (1976). Fruit dark green, bottle-necked. Some blotching on mature pseudostem.	1/5
PNG 224	AA	Hova	Orokaiva	Koipa Oro Province	C	C, BC, F	Fruit curved upwards, lax. Persistent bracts and neutral flowers. ♂ bud purple/yellow. ♂ flower cream. = Goaub (PNG 160)?	1/7
PNG 225	AA	Patupi	Orokaiva	Koipa Oro Province	C	C, BC	Extensive black blotches. Leaf margins red. Bunch sub-horizontal, fruit pointing upwards. ♂ bud purple.	1/10, 1/13
PNG 226	AA	Septi	Orokaiva	Koipa Oro Province	C	BC, C BS-res	Long, sub-horizontal fingers. ♂ bud green. With pollen. = Maleb (PNG 159)?	1/8, 1/9
PNG 227	AAB?	Tango	Orokaiva	Koipa Oro Province	C	C, BS, F	Red midrib and leaf margin. Fingers curved upwards, pointed apex. ♂ bud purple. ♀ fertile.	1/11
PNG 228	AA	Isori	Orokaiva	Koipa Oro Province	C	C, F, BS-res	Yellow, sub-horizontal fruit. Persistent neutral flowers. ♂ bud purple.	1/6
PNG 229	AAT?	Karoina	Orokaiva	Koipa Oro Province	C	C, F, S	Tall plant with shiny green pseudostem. Bunch erect/horizontal. ♂ bud pendant. Fruit straight with rounded apex. ♂ bracts shiny purple. = Sar (PNG 166)?	1/12 2/4
*PNG 230	AAB?	Segorey	Orokaiva	Koipa Oro Province	C	C, BC	Extensive blotching, long fingers, pointing upwards. Persistent bracts. ♂ bud purple/yellow. ♂ flower cream, many abnormal flowers.	1/15

Acc No.	Genotype	Local Name	Language Group	Location	Use ¹	Disease ² Present	Main Characteristics	Photo No.
PNG 231	AA	Sasa	Orokaiva	Koipa Oro Province	C	C	Small thin fingers, pointing upwards. Persistent neutral flowers. ♂ bud purple. ♂ flower cream.	1/14
PNG 232	M. schizocarpa	-	-	Koipa Oro Province	W	F	Typical M. schizocarpa. Mature fruit splitting open. cf. Argent (1976).	1/16
PNG 233	M.a. bantail	-	-	Koipa Oro Province	W	C, F - slight	Typical. ♂ bud green. Good bunch, but with many empty or partially-filled seeds.	1/17
PNG 234	M.a. bantail	-	-	Ononda Oro Province	W	C, S	Typical. ♂ bud green. Growing with M. schizocarpa.	1/21
PNG 235	M.a. bantail x M. schizocarpa	-	-	Ononda Oro Province	W	C, F - severe	Characteristics intermediate between parents. Fruit blackened and poorly filled.	1/22
PNG 236	AAT?	Umbubu	Ewage	Konaga Oro Province	C	C	Shiny green pseudostem. Bunch almost vertical. Fruit small and angular. ♂ bud pendant, somewhat imbricate. ♂ bracts green.	2/2
PNG 237	AA	Meinje	Ewage	Embi Oro Province	D	F, BS - res	Small, slender plant. Pseudostem yellow with red leaf margins. Fat fruit with long pedicels and pointed tips. ♂ bud purple.	2/5
PNG 238	M. balbisiana	-	-	Oro Bay	W	BC, C	Typical. Short fat fruit, full of seed but many empty or only partially filled.	2/6 2/7
*PNG 239	AAB	Somani	Ewage	Pongani Oro Province	C	C	Only one hand. No ♂ axis. True horn plantain.	2/15
*PNG 240	AA	Pait	Ewage	Pongani Oro Province	C	C	Suckers inhibited. 2 hands of long pendant fruit. ♂ bud purple.	2/15

Acc No.	Genotype	Local Name	Language Group	Location	Use ¹	Disease ² Present	Main Characteristics	Photo No.
PNG 241	ABB	Bengani	Ewage	Pongani Oro Province	C	C, F	Very tall and robust. Bunch horizontal. Short angular fingers. ♂ bud purple. = Kalapua.	2/17
PNG 242	AA	Jaruda	Ewage	Pongani Oro Province	C	C	Much red pigmentation on plant and fruit. Fingers small, thin, pointing upwards. ♂ bud purple. ♂ flower cream with red ovary = Manameg Red (PNG 161)	2/18
PNG 243	AA	Maka	Ewage	Pongani Oro Province	C	C	Small plant. Fruit small curved sub-horizontal. Orange flesh. ♂ bud yellow/purple. ♂ flower cream.	2/19
PNG 244	AA?	? (Pongani)		Pongani Oro Province	C	C, BC	Small slender plant, red margins and midrib. ♂ bud purple. Introduced from Highlands.	2/20
PNG 245	M. schizocarpa	-	-	Banderi Oro Province	W	-	Bunch somewhat lax and fruit paler coloured than typical M. schizocarpa. Fruit apparently not splitting open when mature. Many seeds partially empty.	2/21
PNG 246	M. schizocarpa	-	-	Banderi Oro Province	W	-	As PNG 245 Suckers collected.	2/22
PNG 247	M.a. banksii x M. schizocarpa	-	-	Sangara Oro Province	W	F	Characteristics intermediate between parents. Fruit blackened and poorly filled. ♂ bud purple.	2/23 2/24 2/25
*PNG 248	?	-	-	Igora Plantation Oro Province	W	F	Waxy pseudostem, some blotching. Fruit similar to M.a. banksii but poorly filled. Few seeds and some pollen. ♂ bud green. Possibly hybrid - M.a. banksii X?	2/27
PNG 249	AA	Buka	Orotaiva	Sisireta Oro Province	C	C, BC	Small, slender plant. Fruit plantain-like, long pendant, angular. ♂ bud green and degenerating.	2/28

Acc No.	Genotype	Local Name	Language Group	Location	Use ¹	Disease ² Present	Main Characteristics	Photo No.
PNG 250	AA	Jongo	Orolaiva	Sisireta Oro Province	C	C, BC	Small plant. Bunch horizontal, fruit small, rounded, pointing upwards. ♂ bud purple.	2/29
PNG 251	M.a. banksii	-	-	Ombisusu Oro Province	W	C, BC	Typical. ♂ bud green/purple.	2/30
PNG 252	M. macleyi ssp. macleyi var. macleyi	-	-	Ombisusu Oro Province	W		Typical. cf. Argent (1976)	No photo
PNG 253	7	-	-	Onato Plantation Oro Province	W	F	Pseudostem paler coloured than M.a. banksii. Fruit bottle-necked, poorly filled. ♂ bud green with purple edge to bracts. Few seeds with pollen. Possibly hybrid - M.a. banksii X?	2/31
PNG 254	AA	? (Onato)	-	Onato Plantation Oro Province	C	C, CB	Red pigmentation on pseudostem, margins and midribs. Good bunch of long pendant fruit. Persistent neutral flowers. ♂ bud purple. ♂ flowers cream with pollen.	2/32
PNG 255	M.a. banksii	-	-	Ambogo Oro Province	W	C, BS	Typical. ♂ bud purple.	2/33 2/34
PNG 256	AA	Foropora	Lower Mendi	Mendi Southern Highlands	D, C	MLS, BS	Small, slender, red margins and midribs. Bunch sub-horizontal. Fruit small, shiny, rounded, pointing upwards. ♂ bud purple. ♂ flower cream.	3/13
PNG 257	AA	Mala	Lower Mendi	Mendi Southern Highlands	C	MLS- severe, BS- res	Small, erect leaves. Bunch sub-horizontal, fruit small. ♂ bud yellow/purple.	3/12
PNG 258	AAB	Honul	Lower Mendi	Mendi Southern Highlands	C	F, MLS	Tall, robust. Good bunch of large, rounded fingers. ♂ bud purple.	3/16

Acc No.	Genotype	Local Name	Language Group	Location	Use ¹	Diseases ² Present	Main Characteristics	Photo No.
*PNG 259	AAB	Tul	Lower Mendi	Mendi - Det Road	C	BS, Virus?	Tall, very erect leaves. Extensive brown blotching. Fruit long, curved upwards. ♂ bud green. Highly prized in Southern Highlands	3/18 3/19
PNG 260	AAB	Kimbeem	Lower Mendi	Lai Valley Southern Highlands	C	MLS	Tall, fruit rounded, shiny, curved upwards. Some persistent neutral flowers. ♂ bud purple. Very common in this area.	3/19 3/20
PNG 261	AAB?	Wissen	Lower Mendi	Lai Valley Southern Highlands	C	MLS, BS	Tall, long green peduncle. Bunch covered. ♂ bud green/purple. Leaves drooping	3/21
PNG 262	AAB	Kwince	Lower Mendi	Mendi	C	No information	Robust, good suckering. Bunch covered. Persistent bracts. ♂ bud purple. imbricate.	No photo
PNG 263	AAB?	Tunay	Lower Mendi	Paroma Southern Highlands	C, D	F, BS	Tall, slender plant. Inhibited suckering. Extensive red pigmentation. ♂ flower orange with red ovary. With pollen.	No photo
PNG 264	AAB?	Hogolo	Huli	Tari Southern Highlands	C	BS, MLS	3 hands, rounded fruit, pointing upwards. Some persistent neutral flowers. ♂ bud green. ♂ flower cream, with pollen. Important in local ceremonies.	4/3
PNG 265	AAB	Tigua	Huli	Tari Southern Highlands	D, C	BS	Tall, robust, long purple peduncle. Rounded, horizontal fruit. ♂ bud purple. Some abnormal ♂ flowers, with pollen.	4/4
PNG 266	AAB?	Meko	Huli	Tari Southern Highlands	D, C	MLS, BS-res	Tall, robust, reduced blotching. Fruit pointing upwards. good bunch. ♂ bud yellow/purple. = Ambini (PNG 194)?	4/7
PNG 267	AAB?	Gebi	Huli	Tari Southern Highlands	C	MLS, F	Good bunch, fruit pointing upwards, neutral flowers persistent. ♂ bud green.	4/5

Acc No.	Genotype	Local Name	Language Group	Location	Use ¹	Diseases ² Present	Main Characteristics	Photo No.
PNG 268	AAB	Kundubu	Huli	Hiwanda Southern Highlands	C	F	Good bunch of small, angular, bottle-necked fruit. ♂ bud purple. ♂ flower cream with little pollen.	4/6
PNG 269	M.s. banksii	-	-	Kiunga Western Province	W	F, C	Typical. ♂ bud purple.	4/21
PNG 270	AAB?	Wisu	Akum	Somongos Western Province	C	F	Tall, robust. Good bunch of small rounded fingers, curved upwards. ♂ bud purple, rounded tip.	4/22 4/24 4/25
*PNG 271	AAB?	Amaray	Akum	Somongos Western Province	C	BC, C	Tall, robust. Good bunch of long fingers, pointing upwards. ♂ bud purple with green stripes.	4/23
PNG 272	AAB	Saeke	Akum	Somongos Western Province	C	F, BS	One hand only. No ♂ axis. True horn plantation.	No photo
PNG 273	AA	Kwosiata	Akum	Somongos Western Province	C	BS	Small, slender. Good suckering. Extensive red-brown blotches, pale pseudostem. No bunch present.	4/26
PNG 274	Fo1	Skai	Akum	Ningerum Western Province	C, D	C, F	Bright shiny green pseudostem, red sep. Erect bunch. ♂ bud purple, shiny. Orange flesh.	No photo
PNG 275	AA	Awondakte	Akum	Ningerum Western Province	C	BS	Small, red pigmentation on petioles. Bunch sub-horizontal. Fruit long, bottle-necked, pointing upwards. ♂ bud purple.	4/29
PNG 276	M.s. banksii	-	-	Ok Mart Western Province	W	BS	Typical. ♂ bud green	4/30

Acc No.	Geotype	Local Name	Language Group	Location	Use ¹	Disease ² Present	Main Characteristics	Photo No.
PNG 277	AA	Himone	Alitum	Somongos Western Province	C	BC, C	Small, slender. Bunch horizontal, fruit long, bottle-necked, pointing upwards. ♂ bud purple. ♂ flower cream.	4/31
PNG 278	AA	Grupaul	Alitum	Somongos Western Province	C, D	BC, C	Small, pale pseudostem, red margins and midribs. Bunch sub-horizontal, fruit pointing up, persistent neutral flowers. ♂ bud purple. ♂ flower cream.	4/32
*PNG 279	AA	Kalyone	Alitum	Somongos Western Province	C	BS-res	Small plant. Bunch sub-horizontal, fruit straight, pointed tips. ♂ bud purple. ♂ flower cream, abundant pollen.	4/33
PNG 280	AA	Wilago	Alitum	Somongos Western Province	C	BC, C, BS-res	Extensive black blotching on pseudostem. Irregular, long fingers, pointing upwards. Some persistent neutral flowers. ♂ bud purple. ♂ flower cream, abundant pollen.	4/34
PNG 281	AA	Odra	Alitum	Somongos Western Province	C	F, BS-res	Small plant, fruit straight, pointed tips, bunch sub-horizontal. ♂ bud purple/green. ♂ flower cream. No pollen.	4/35
PNG 282	M. schizocarpa	-	-	Epo Estate Gulf Province	W	C	M. schizocarpa, but fruit apparently not splitting open when mature. Many poorly developed fruit and few seeds.	5/15 5/16
PNG 283	M. macloyi ssp. macloyi var. macloyi	-	-	Epo Estate Gulf Province	W	-	Typical. Seeds smaller than those collected in Oro Province.	5/17
PNG 284	AA	Igua	Kamea	Murua Gulf Province	C	BC, C, BS - res.	Extensive dark brown blotches. Lax bunch, fruit curved upwards. ♂ bud purple.	5/18
PNG 285	AA	Palta	Kamea	Murua Gulf Province	D	C	Slender, red petioles. Long straight fingers.	5/19

Acc No.	Genotype	Local Name	Language Group	Location	Use ¹	Disease ² Present	Main Characteristics	Photo No.
PNG 286	AA	Kwonia	Kamea	Murua Gulf Province	C	BC, C, Virus?	Long fingers, curled upwards. Persistent bracts. ♂bud purple.	Lax bunch. 5/20
PNG 287	AA?	Adina	Kamea	Murua Gulf Province	C	BC, C, Virus?	Extensive dark brown blotches. long fingers, pointing upwards. ♂bud purple, slightly rounded.	Good bunch, 5/21
PNG 288	AA	Tainga	Kamea	Murua Gulf Province	C	BC, C, F	Small and slender. Fruit sub-horizontal, curved upwards.	5/22
PNG 289	AA	Molina	Kamea	Murua Gulf Province	C	C, F	Small, slender. Fruit sub-horizontal, straight. Bunch lax. No ♂bud.	No photo

KEY:

1. Use: D = Dessert, C - Cooking, W = Wild
2. Diseases Present: BS = Black Sigatoka, BS-res = Black Sigatoka present but only on older leaves-indication of resistance, BC = Black Cross, C = Cordana, F = Freckle, S = Speckle, MLS = Malayan Leaf Spot.

• = Did not establish in tissue culture