

Rotuma - breadfruit survey and characterisation report



project

Rotuma – Breadfruit survey and characterisation report

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*prepared
by*

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Contents

1	Introduction	3
2	Breadfruit survey.....	4
3	Breadfruit marcotting training.....	5
4	Breadfruit flour processing training	6
5	Rotuman breadfruit varieties characterisation	7
6	Conclusion.....	Error! Bookmark not defined.

1 Introduction

Breadfruit is also grown as a traditional crop for Rotuma Island. A total of 7 breadfruit varieties were characterised during this trip with Ulu Samoa or Balekana ni Samoa variety grown mostly in all parts of the island.

This report covers activities in the March, 2019 Rotuma breadfruit survey and characterisation trip including:

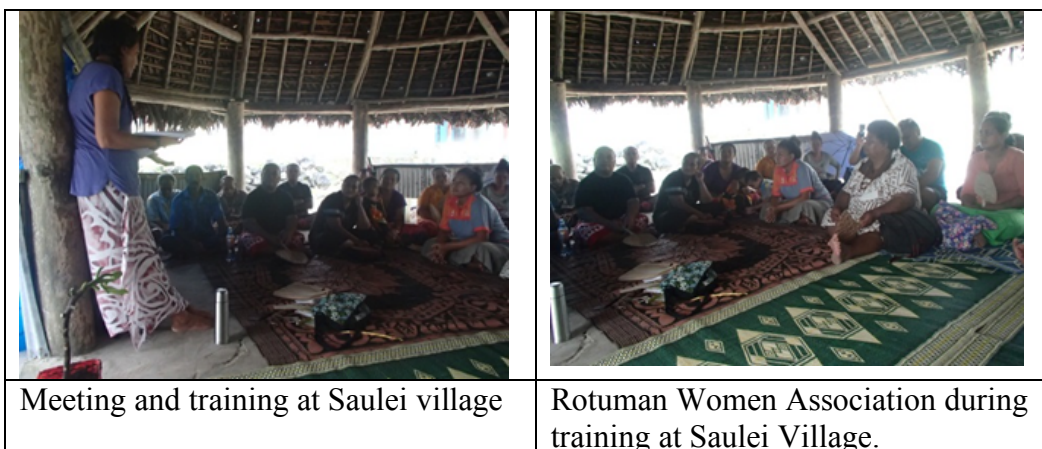
- Rotuma breadfruit survey
- Breadfruit marcotting training
- Breadfruit flour processing training
- Rotuma breadfruit varieties characterisation.

The amount of breadfruit being wasted in Rotuma year after year has also indicated that value adding of this product is highly regarded to all villagers and communities. Training on breadfruit flour processing, marcotting, breadfruit characterisation was done on villagers in Saulei, Malhaha, Pepejei, Itumuta and Motusa village.

From this training individual will be able to process breadfruit flour for home consumption and reduce risk of waiting for the boat to arrive. Breadfruit, if grown properly can provide for Food security and climate change purposes in the island. Reducing high risk of NCD breadfruit is a gluten free product and is much healthier than other root crops such as Taro, cassava etc.

Furthermore, is the learning experience from individuals about marcotting which can be used by farmers in the island to propagate breadfruit that can produce fruit as early as 2 years. If a variety is about to extinct in the island and is not producing any suckers for new planting, a farmer can use this practice to propagate more planting material.

The characterisation of the 7 breadfruit varieties that were identified during this survey would help individual to understand more about the different breadfruit varieties grown in Rotuma Island. The different leaf sizes, leaf length, fruit size, fruit weight, fruit shape, seeded or seedless varieties etc. are some of the characteristics that would differentiate each particular breadfruit from the other.



2 Breadfruit survey

The breadfruit survey was done around the island along with the Rotuman Women Association group. Soil in Rotuma is very rich in humus and organic material and is suitable for planting any root crops and fruit trees such as breadfruit. Agroforestry system is practised in mostly all villagers around the island. With family members be the one who will be cultivating and planting on their given share of land. Within this agroforestry we have 2 – 5 breadfruit trees grown in each farm land while the rest of the farming areas are planted with taro, cassava, yams, yaqona, banana, kumala etc.

A common variety that is grown all around the island is the Ulu Samoa or Balekana ni Samoa (common name used in Fiji). This variety fruits four times in a year and mostly fruits are seen on most branches all throughout the year. It is a very common variety in Fiji and also around the Pacific. In Samoa, they call this variety the Ma’afala which can be propagated through root suckers, marcotting / air layering and tissue culture.

However there are 6 other varieties that were identified grown in other parts of the islands by which its fruits and leaves were collected for characterisation.

So far we have a total of 7 varieties of breadfruit grown in Rotuma Island, 3 of this varieties are also found in Fiji. There may be some other varieties grown on the islands but due to lack of time we can only collect 7 varieties. A simplified characterisation sheet of the 7 varieties that was collected in Rotuma is attached at the characterisation section of this report.



Agroforestry system is mainly practised in all farming areas in Rotuma.









A common variety that is grown around the island is the Ulu Samoa or Balekana ni Samoa.

3 Breadfruit marcotting training

Marcotting or air layering is not a new method of propagation. It has been used for centuries and is being practiced around the world by farmers to propagate matured stems of any fruit trees for new planting material. In Rotuma, the steps of marcotting were introduced to villagers around the Island so they can be familiarised with the process and steps of marcotting. From these training individuals will be able to propagate their own planting material for extending their breadfruit orchard in their own backyard or farming areas.

Steps of breadfruit marcotting:

		
<p>1. A mature, healthy stem is identified for marcotting. Only practise marcott to a branch after harvest.</p>	<p>2. Remove 3-5cm of outer bark / skin of the branch.</p>	<p>3. Cover the wound with peat moss soil, top soil, and sterilised soil using a clear plastic to conserve soil from falling off.</p>
		
<p>4. Once the roots a visible from the clear plastic you can remove the branch from the mother plant using a pruning saw or a cutter.</p>	<p>5. Leaves should be pruned to reduce transpiration in the nursery. Remove plastic covering the wound and plant the stem inside a pot plant containing soil medium.</p>	<p>6. After 2 months your tree is ready to be taken outside the nursery. Hardening for 1 -2 weeks outside the nursery and then planted in the field after that.</p>

4 Breadfruit flour processing training

About 90% of breadfruit is being wasted all year around during fruiting season in the island and also around the pacific island countries. Individual should be able to realise that breadfruit act as a food security and it is gluten free. 1/3of the population in Fiji depends on imported rice and wheat all year around.

Countries that are growing rice and wheat are being affected by unfavourable weather condition like heavy rain, flood, hurricane, cyclone, drought and typhoon. This change in weather condition has hindered the production of rice and wheat thus, causing the price of rice and flour to increase in years to come.

This will leave us with no choice but to go back to our traditional crops for food security and survival. Breadfruit is a traditional crop that has been growing in our very own backyard for many years. The resiliency of this traditional crop to unfavourable weather condition has enabled this crop to be the only crop choice to replace rice and wheat for food security, health and survival.

The steps of making gluten free breadfruit flour are listed below:

		
<p>A mature fruit is selected. Outer skin and the inner peduncle are removed leaving only the white flesh for processing.</p>	<p>Breadfruit flesh is being sliced to make it easier for drying. Slices can be dried using an electric drier or solar.</p>	<p>After drying, the slices are taken for grinding the slices into smaller particles. Use a sieve to remove bigger particle, leaving you only the flour for packaging.</p>
		
<p>Baking using breadfruit flour.</p>	<p>Packaging in air tight bags and sold to local communities for home consumption.</p>	<p>Cupcakes baked from gluten free breadfruit flour.</p>

5 Rotuman breadfruit varieties characterisation

INFORMATION SHEET

Accession number: ROT 01	Local name: Ulu Pulpul
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LOCATION		
Country: Rotuma, Fiji Islands	Province: Malhaha	Island: Rotuma Island
Location: Paphaua village	Site: Grown beside the cemetery at Malhaha	
Geocode (GPS):	Elevation:	

CLASSIFICATION	
Scientific Name	<i>Artocarpus altilis</i>
Common crop name	Ulu Pulpul
Local name of the cultivar	Ulu Pulpul
Significance of this local name	none
Biological status	Traditional cultivar
Habitat, associated plants	Grown with an ulu fiti breadfruit
Origin	Unknown

DESCRIPTION	
Mature Fruits	The fruit shape is round (Length =14cm, width at midpoint = 13cm, weight is = 1-2kg) with a peduncle of 8cm of length. The skin is yellow, sand papery . The flesh is white with less latex . The split fruit does not contain seeds .
Leaf	Green, glossy , flexible with no lobes . The leaf margin is wavy . There are fewer hairs on upper veins.
Ethno-botany	

COLLECTING DATA	
Collecting institute	Leje Rotuma
Collecting people	Kaitu, Monifa, Rupeti
Photographs	Leaves, Mature fruit, split fruit, fruit skin texture, tree, fruits on tree
Collecting samples	None
Collecting date	15/03/19
Nursery planting date	none
Label in the field.	ROT 01
Field planting date	unavailable

Ulu Pulpul
Rotuma Island, Malhaha Province



Picture of tree



Mature fruit



Fruits with leaves characteristics



Split mature fruit



Fruit skin texture



Peduncle insertion.

INFORMATION SHEET

Accession number: ROT 02	Local name: Ulu Formarori
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LOCATION		
Country: Rotuma, Fiji Island	Province: Malhaha	Island: Rotuma
Location: Paphaua village	Site: Grown inside Jioje Fereti's resident.	
Geocode (GPS):	Elevation:	

CLASSIFICATION	
Scientific Name	<i>Artocarpus altilis</i>
Common crop name	Ulu Formarori
Local name of the cultivar	Ulu Formarori
Significance of this local name	Smooth skin, best variety to make desert
Biological status	Traditional cultivar
Habitat, associated plants	Grown with other breadfruit varieties
Origin	Unknown

DESCRIPTION	
Mature Fruits	The fruit shape is round (Length =14cm, width at midpoint = 13cm, weight is = 1-2kg) with a peduncle of 10cm of length. The skin is yellow, smooth when mature. The flesh is yellow with less latex . The split fruit does contain 2 -3 seeds .
Leaf	Green, glossy , flexible with 6 - 8 lobes, not deeply dissected , and with a narrow but no overlapping spacing between lobes. The leaf margin is wavy . There are many long hairs on upper veins.
Ethno-botany	

COLLECTING DATA	
Collecting institute	Leje Rotuma
Collecting people	Kaitu, Monifa, Rupeti
Photographs	Leaves, Mature fruit, split fruit, fruit skin texture, tree, fruits on tree
Collecting samples	None
Collecting date	15/04/19
Nursery planting date	15/04/19
Label in the field.	ROT 01
Field planting date	unknown

Ulu Formarori
Rotuma Island, Malhaha Province



Picture of tree with owner



Mature fruit



Male and female flower



Split mature fruit



Fruit skin texture



Mature leaf and fruit

INFORMATION SHEET

Accession number: ROT 03	Local name: Ulu Saulei
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LOCATION		
Country: Rotuma, Fiji Islands	Province: Juju	Island: Rotuma Island
Location: saulei village		Site: Grown beside other breadfruit varieties
Geocode (GPS):		Elevation:

CLASSIFICATION	
Scientific Name	<i>Artocarpus altilis</i>
Common crop name	Ulu Saulei
Local name of the cultivar	Uto Saulei
Significance of this local name	Local variety and only found in Saulei village
Biological status	Traditional cultivar
Habitat, associated plants	Grown with other breadfruit variety
Origin	Unknown

DESCRIPTION	
Mature Fruits	The fruit shape is oblong (Length =20cm, width at midpoint = 13cm, weight is = 2 -3kg) with a peduncle of 8cm of length. The skin is yellow, smooth . The flesh is yellow with no latex . The split fruit does contain 1 -2 seeds.
Leaf	Green, glossy , flexible with 3 – 6 lobes, not deeply dissected , and with a shallow but no overlapping spacing between lobes. The leaf margin is wavy . There are many long hairs on upper veins.
Ethno-botany	

COLLECTING DATA	
Collecting institute	Leje Rotuma
Collecting people	Kaitu, Monifa, Rupeti
Photographs	Leaves, Mature fruit, split fruit, fruit skin texture, tree, fruits on tree
Collecting samples	None
Collecting date	15/03/19
Nursery planting date	none
Label in the field.	ROT 03
Field planting date	unavailable

Ulu Saulei Rotuma Island, Juju Province



Picture of tree



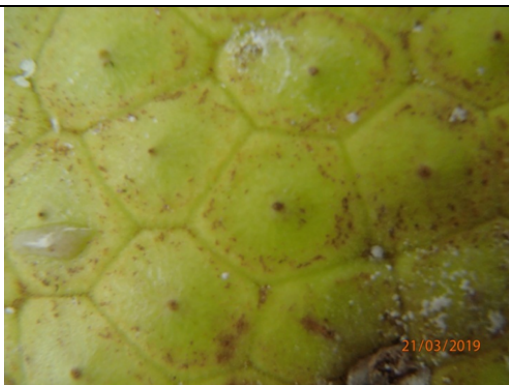
Mature fruit with leaves



Seed insertion and flesh color



Split mature fruit



Fruit skin texture



Mature leaf

INFORMATION SHEET

Accession number: ROT 04	Local name: Ulu Fiti
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LOCATION		
Country: Rotuma, Fiji Island	Province: Itu tiu	Island: Rotuma Island
Location: Motusa village	Site: Grown beside other breadfruit varieties	
Geocode (GPS):	Elevation:	

CLASSIFICATION	
Scientific Name	<i>Artocarpus altilis</i>
Common crop name	Ulu Fiti
Local name of the cultivar	Ulu Fiti
Significance of this local name	Local variety
Biological status	Traditional cultivar
Habitat, associated plants	Grown with other breadfruit variety
Origin	Unknown

DESCRIPTION	
Mature Fruits	The fruit shape is oblong (Length =20cm, width at midpoint = 13cm, weight is = 3 -4kg) with a peduncle of 10cm of length. The skin is yellow, smooth . The flesh is white with heavy latex . The split fruit does not contain any seeds .
Leaf	Green, glossy , flexible with 6 -8 lobes, not deeply dissected , and with a shallow but overlapping spacing between lobes. The leaf margin is wavy . There are many long hairs on upper veins.
Ethno-botany	

COLLECTING DATA	
Collecting institute	Leje Rotuma
Collecting people	Kaitu, Monifa, Rupeti
Photographs	Leaves, Mature fruit, split fruit, fruit skin texture, tree, fruits on tree
Collecting samples	None
Collecting date	15/03/19
Nursery planting date	15/03/19
Label in the field.	ROT 04
Field planting date	None

Ulu Fiti
Rotuma Island, Itutiu Province



Picture of tree



Mature fruit



Mature fruit and leaves



Split mature fruit



Fruit skin texture



Mature leaf

INFORMATION SHEET

Accession number: ROT 05	Local name: Ulu Samoa
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LOCATION		
Country: Rotuma Fiji Islands	Province: Itutiu	Island: Rotuma Island
Location: Motusa Village	Site: Grown beside other breadfruit varieties	
Geocode (GPS):	Elevation:	

CLASSIFICATION	
Scientific Name	<i>Artocarpus altilis</i>
Common crop name	Ulu Samoa
Local name of the cultivar	Ulu Samoa
Significance of this local name	Breadfruit from Samoa, Balekana ni Samoa, Ma'afala
Biological status	Traditional cultivar
Habitat, associated plants	Grown with other breadfruit variety
Origin	Unknown

DESCRIPTION	
Mature Fruits	The fruit shape is round (Length =10cm, width at midpoint = 8cm, weight is = 500g - 1kg) with a peduncle of 5cm of length. The skin is yellow, smooth . The flesh is yellow with less latex . The split fruit does not contain seeds .
Leaf	Green, glossy , flexible with 8-10 lobes, deeply dissected , and with a shallow and overlapping spacing between lobes. The leaf margin is wavy . There are many long hairs on upper veins.
Ethno-botany	

COLLECTING DATA	
Collecting institute	Leje Rotuma
Collecting people	Kaitu
Photographs	Leaves, Mature fruit, split fruit, fruit skin texture, tree, fruits on tree
Collecting samples	None
Collecting date	15/03/19
Nursery planting date	none
Label in the field.	ROT 05
Field planting date	Not available

Ulu Samoa
Rotuma Island, Itutiu Province



Picture of tree



Mature fruit



Mature leaves and fruit



Split mature fruit



Fruit skin texture



Mature leaf

INFORMATION SHEET

Accession number: ROT 06	Local name: Ulu Rotuma
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LOCATION		
Country: Rotuma, Fiji Islands	Province: Itutiu	Island: Rotuma Island
Location: Motusa Village	Site: Grown beside other breadfruit varieties	
Geocode (GPS):	Elevation:	

CLASSIFICATION	
Scientific Name	<i>Artocarpus altilis</i>
Common crop name	Ulu Rotuma
Local name of the cultivar	Ulu Rotuma
Significance of this local name	Local variety
Biological status	Traditional cultivar
Habitat, associated plants	Grown with other breadfruit variety
Origin	Unknown

DESCRIPTION	
Mature Fruits	The fruit shape is round (Length =18cm, width at midpoint = 13cm, weight is = 2 -3kg) with a peduncle of 8cm of length. The skin is yellow, smooth . The flesh is white with less latex . The split fruit does not contain seeds .
Leaf	Green, glossy , flexible with 9-10 lobes, deeply dissected , and with a wide but no overlapping spacing between lobes. The leaf margin is wavy . There are many long hairs on upper veins.
Ethno-botany	

COLLECTING DATA	
Collecting institute	Leje Rotuma
Collecting people	Kaitu
Photographs	Leaves, Mature fruit, split fruit, fruit skin texture, tree, fruits on tree
Collecting samples	None
Collecting date	15/03/19
Nursery planting date	none
Label in the field.	ROT 06
Field planting date	None

Ulu Fiti Rotuma Island, Itutiu Province



Picture of tree with owner



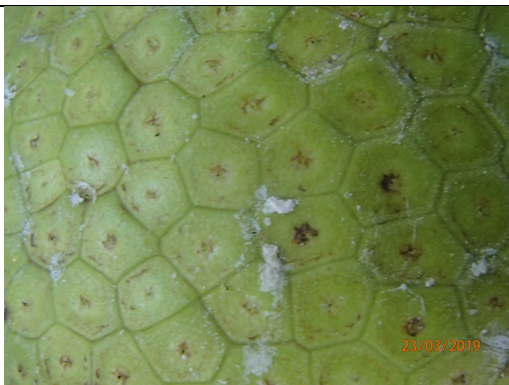
Mature fruit



Peduncle insertion



Split mature fruit



Fruit skin texture



Mature leaf and fruit

- The 7th variety was not been able to be characterised due to the fruit being small and immature in size. This is a very common variety because the mature branches are being removed and soaked under sea water for weeks. After soaking the skin or outer layer of the branches are being removed to make fishing net in Rotuma. A very old traditional method used amongst the Rotuman people to catch fish for home consumption in the olden days.

6 Conclusion

This trip was a success with a close collaboration with Leje Rotuma and the people of Rotuma. Working closely with the Rotuman Women Association was the key in sharing information to individual who are all connected to this traditional crop the breadfruit trees.

The training that was done to villagers about flour processing, marcotting and characterisation will be a big boost to the villagers of Rotuma.

In terms of food security, the people of Rotuma are well secured with the diversity of root crops and fruit trees. This training will help individual to maximise the use of fruit in terms of value adding of breadfruit into flour, chips and baking.

The documentation of the different varieties we have in Rotuma will help individual understand more about the different varieties and also for farmers to start collecting those different varieties and planting them in their backyard, farms or schools through marcotting. This will help villagers in conserving the rich breadfruit germ-plasma collection we have in Rotuma.