

Harnessing the Unharnessed Potential of Minor Tropical Fruit Crops in Fiji Islands

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Fiji Islands

Introduction

- Fiji is made up of 300 islands, one-third of which are permanently inhabited.
- Economic activities are concentrated on the two largest islands, Viti Levu and Vanua Levu
- Both major island account for 87% of the entire land area and 90% of the total population
- Sugarcane which used to dominate agriculture, the sector now only contributes (0.9%)
- Now supplemented by other crops, Horticulture crops, livestock production and subsistence sector
- Fruits and vegetables had substantial unmet local demand, export opportunity and supplies into tourism sectors (Becker – 2011)
- Fiji has an added advantage in producing a wide variety of tropical fruits

- Fruit production has been recognized as a sustainably profitable enterprise in Fiji,
- Fruit production has great potential to generate employment in rural areas,
- Fruit production helpful in reducing migration of rural masses towards cities for the want of jobs.
- It is helpful in improving the quality of diet.
- A substantial areas in Fiji comes under dry Zone, particularly Ba, Nadroga and Ra province in Western side and Bua, Macuata province in Northern side of Fiji
- In these areas, rainfall is less than the average rainfall throughout the year
- Successful crop production in these areas depends on stored soil water and rain water harvesting in addition to rainfall

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- In these areas, physical constraints like:
 - low and erratic rainfall,
 - high temperature,
 - high wind velocity,
 - low fertility,
 - poor soil structure,
 - salinity of soil and ground water are the deterrents to assured crop production (Anonymous, 2009).

Consideration for sustainable production

- Avoidance or adaptive mechanisms against drought e.g. deep root system as in ber, , jamun, etc.
- Summer dormancy as in ber, mulberry, custard apple for tolerance to high temperature or attainment of summer dormancy after pollination and fertilization as in Aonla fruits.
- High water holding capacity in leaf cells.
- Maximum vegetative and reproductive growth of plant coinciding with the Rain period eg. Ber, custard apple.
- Amenability of the plants for such coincidence by cultural manipulations through flowering treatments e.g., Pomegranate, acid lime, sweet orange, guava.(Mishra et. al, 2016)
- Guava are very hardy and can tolerate to wide range of climate, including very low temperatures, although they thrive better under and require approximately 4-6 month of warm weather for fruit to develop and mature successfully (Samson, 1986). Guava is very suitable for growing in dry part of Fiji.

- Most of the underutilized fruit crops of the dry tropics are often available only in the local markets and are practically unknown in other parts of the world.
- Today, consumers are becoming increasingly conscious of the health and nutritional importance of their food basket.
- These fruits can grow under adverse conditions and are also known for their therapeutic and nutritive value and can satisfy the demands of the health-conscious consumers.
- Hence, there is a need to intensify research efforts in diversification and popularization of such underutilized fruit crops.

Fruit species found growing in dry rain fed areas of country have been found to yield satisfactorily under stressful agro-climatic conditions owing to their tolerance capacity for abiotic stresses. The plants belonging to this group are hardy and grow well even in fragile soil and climate.

Crops	: Bael
Common name	: Bael
Botanical Name	: <i>Aegle marmelos</i>
Family	: Rutaceae
Origin	: India



Crops	: Ber
Common name	: Ber
Botanical Name	: <i>Ziziphus mauritiana</i>
Family	: Rhamnaceae
Origin	: Indo - china



Crops	: Custard apple
Common name	: Sweet Sop
Botanical Name	: <i>Anona squamosa</i>
Family	: Anonaceae
Origin	: South america



Therapeutic value	Value Addition
<ul style="list-style-type: none"> Used for the cure of diarrhoea, dysentery & other stomach ailments. 	Sharbat, squash, murabba, jam
<ul style="list-style-type: none"> Fruits are effective in relieving chest pain & vomiting sensation. Catechin, caffeic acid, epicatechin, ferulic acid, rutin, p-hydroxybenzoic acid and chlorogenic acid present in fruit. 	Murabba, candy, dehydrated ber
<ul style="list-style-type: none"> The ripe fruits rich in tannins, which is dried, pulverized and employed against diarrhoea and dysentery. Contains considerable amount of Vitamins and minerals 	Jam, beverages, ice cream, sop puree, soursop sorbet

Crops	: Nandau (Pacific lychee)
Common name	: Dawa
Botanical Name	: <i>Pometia pinnata</i>
Family	: Sapindaceae
Origin	: Asia pacific



Crops	: Mulberry
Common name	: Mulberry
Botanical Name	: <i>Morus spp.</i>
Family	: Moraceae
Origin	: China



Crops	: Tamarind
Common name	: Imli
Botanical Name	: <i>Tamarindus indica</i>
Family	: Caesalpiaceae
Origin	: India



Therapeutic value	Value Addition
<ul style="list-style-type: none"> Masticated bark is applied on burns 	Eaten fresh as a snack, in salad
<ul style="list-style-type: none"> Resveratrol an antioxidant found in mulberries, helps to promote heart health and overall vitality. 	Juice, squash, syrup
<ul style="list-style-type: none"> Contains tannins, saponins, sesquiterpenes and alkaloids In Ayurveda, it is used for gastric or digestion problems, and in cardio protective activity Decoction used for treatment of stomach disorders, general pain, jaundice, yellow fever and as blood tonic. Used as skin cleanser and in malarial fever. 	Juice concentrate, pulp powder, jam syrup, candy, tamarind kernel powder

Crops	: Custard apple
Common name	: Sour sop
Botanical Name	: <i>Anona muricata</i>
Family	: Anonaceae
Origin	: South america



Crops	: Jamun
Common name	: Jambolan or java plum
Botanical Name	: <i>Syzygium cuminii</i>
Family	: Myrtaceae
Origin	: India



Crops	: Kavika
Common name	: Malay apple
Botanical Name	: <i>Syzygium malaccense</i>
Family	: Myrtaceae
Origin	: Malaysia



Therapeutic value	Value Addition
<ul style="list-style-type: none"> The ripe fruits rich in tannins, which is dried, pulverized and employed against diarrhoea and dysentery. Contains considerable amount of Vitamins and minerals 	Jam, beverages, ice cream, sop puree, soursop sorbet
<ul style="list-style-type: none"> Fruit's syrup is useful for curing diarrhea. Seeds contain jambosin alkaloid, which reduces conversion of starch into sugars. Jamun fruits are used as an effective medicine against diabetes, heart and liver trouble. 	Squash, RTS, nectar, syrup, vinegar, cider
<ul style="list-style-type: none"> Kavika provides small amount of Vitamin C and some minerals 	Eaten fresh, salad and served as dessert

Crops	: Guava
Common name	: Guava
Botanical Name	: <i>Psidium guajava</i>
Family	: Myrtaceae
Origin	: Tropical america



Therapeutic value	Value Addition
<ul style="list-style-type: none"> Guava is excellent source of vitamin – C, It is good source of dietary fibre, carotene and Potassium The leaves of guava is used for curing diarrhoea. Guava fruit contains antioxidant factor and is known to control systolic blood pressure. 	Guava cake, Jam, Jellies and making juice.

Crops	: Passion fruit
Common name	: Passion fruit
Botanical Name	: <i>Passiflora edulis</i>
Family	: Passifloraceae
Origin	: South America



<ul style="list-style-type: none"> Source of dietary fibre more than lime, orange and mandarin 	Passion fruit syrup, sauce
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Crops	: Star apple
Common name	: Carambola
Botanical Name	: <i>Averrhoa carambola</i>
Family	: Oxaliaceae
Origin	: Malaysia and south east asia



<ul style="list-style-type: none"> Source of vitamin – C, dietary fibre and minerals 	Juice, jams, pickles
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Crops	: Jackfruit
Common name	: Kathal
Botanical Name	: <i>Artocarpus heterophyllus</i>
Family	: Moraceae
Origin	: India and Malaysia



Therapeutic value	Value Addition
<ul style="list-style-type: none"> Fruit is rich in Vit A, ascorbic acid and isoflavonoids. Strengthen immune system & protect against cancer. Aids in healthy digestion. Maintain a healthy eye, skin & control Asthma. Jackfruit has high sugar content than other fruit and yields 80kcal per 100g 	Canned pieces, nectar, pickle & chips

Crops	: Tarawau
Common name	: Tarawau
Botanical Name	: <i>Dracontomelom vitianse</i>
Family	: anacardiaceae
Origin	: Tropical Asia



<ul style="list-style-type: none"> It is an good source of potassium, calcium and other minerals. 	Commonly taken as snack
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Importance and scope

- Provides three basic necessities of resource poor farmers, i.e., food, fodder and fuel.
- Drought and poverty alleviation through assured production.
- Ensures livelihood as well as nutritional security.
- Improvement of soil health and thus sustainability.
- Reduced malnutrition through increased fruit availability.
- Improvement in the socio-economic life of farming families.

Therapeutic properties and value addition

- Underutilized indigenous fruits cannot only supply adequate amount of vitamins and minerals, but a wide variety of other elements that can contribute therapeutically to human health.
- Consumer awareness on the health promoting capacity of fruits in managing life-style diseases has been increased.
- There is also renewed interest in therapeutic knowledge of natural plant products.
- Value added products from such fruits are high in demand in national and international markets.

Conclusion

- Under fragile ecosystem of dry areas uncertainty in production is high thus mono-crop culture may not be advisable.
- Crop failures due to drought are common and often leading to great economic losses.
- Therefore, multi-crop combinations are suggested for these regions. Adoption of multitier cropping system can help to improve sustainability of degraded lands by addition of large biomass to the soil resulting in improved soil health.
- Fruit trees also help in reducing runoff and soil loss.
- They also help in improving the environment by sequestering CO₂ from the atmosphere.
- During young age of the orchard short statured crop like guava, acid lime, Papaya etc as filler crop
- Leguminous vegetables (cow pea, cluster bean)/ pigeon pea, maize/ seed spices (cumin, fennel, methi)/medicinal & aromatic plants can be raised as inter crop.

Thank You