Native Tendernut Cultivars of Coconut (*Cocos nucifera L.*) from India

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Introduction

Coconut, *Cocos nucifera* L., is an important crop of the tropics. It is a monotypic species under the genus *Cocos* with no known wild/ domesticated relatives. It is a diploid species with a chromosome number of 2n=32. The primary product of coconut is copra from which oil is extracted. In India, coconut is grown in an area of 19.32 lakh hectares with an annual production of 12147.6 million nuts in the year 2003-04. The national productivity is about 6285 nuts/ha. In addition to oil, coconut is also cultivated for two other natural products tendernut and toddy. Toddy is the fermented liquid product obtained by tapping unopened inflorescence. Tendernut is the 7-8 months old nut harvested for the water and soft edible endosperm. Tendernut water is considered as health drink and possesses many medicinal properties. There is a steady growing market for tendernut water all over the world as it is the most preferred natural soft drink. Developing varieties for tendernut purpose has been one of the breeding objectives in recent times. Central Plantation Crops Research Institute (CPCRI) has released Chowghat Orange Dwarf (COD) as a variety for tendernut harvest after evaluating 46 cultivars (Dhamodaran *et al.*1993).

Coconut can be broadly classified into two groups, the Talls and the Dwarfs. Tall palms, referred as var. typica, are the most commonly planted cultivars for commercial production of copra and oil. The copra content is usually above 150g per nut and oil content varies from 66 to 70 percent. Dwarf palms, referred as var. nana (Griff.) Nar, are preferred for tendernut purpose. They are of shorter stature, 8-10m in height and begin bearing about the fourth year after planting. The plant bears fully from the ninth year onwards. The copra in dwarf palms ranges from 90-120g per nut and the oil content is about 65 percent. Hence they are not preferred for copra. The dwarfs are presumed to have originated from talls either through mutation (Menon and Pandalai, 1958) or by inbreeding (Swaminathan and Nambiar, 1961).

There are certain localities in India known for tendernut cultivars. Mostly these are dwarf types but a few tall types are also seen. They are observed as a scattered population, occurring in one or two numbers in a garden. These tendernut cultivars are valued much in the locality for the taste and medicinal value of the water. COD and Chowghat Green Dwarf (CGD) were identified from Chavakkad area in Kerala. Gangabondam comes from Andhra Pradesh. Sevvalanir is a precious material from Pondicherry having great healing powers and used in the treatment of jaundice and cholera. The high altitude area of Tumkur in Karnataka is known for Chittagangapani and Uddhagangapani. Another popular tendernut cultivar from

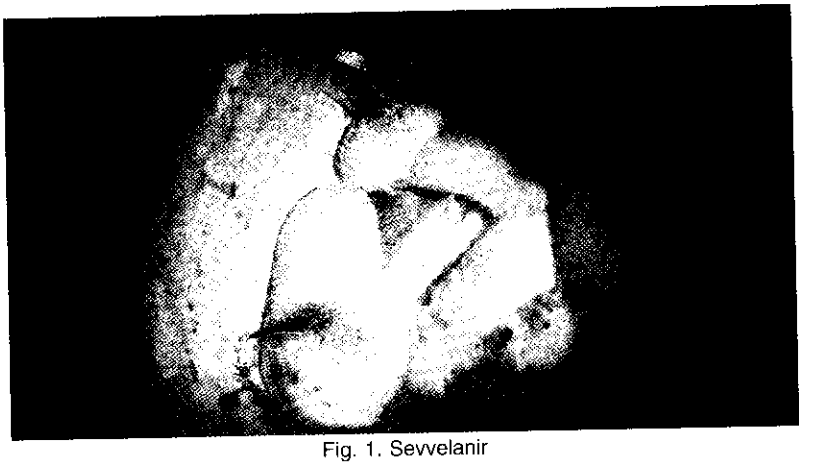

Fig. 1. Sevvelanir

CPCRI, Kasaragod

Karnataka is Kenthali, which bears orange fruit and has a premium market. Among the exotic dwarf cultivars that can be used for tendernut purpose, Malayan Yellow Dwarf, Malayan Orange Dwarf and Malayan Green Dwarf are found in certain pockets.

It is estimated that 10-15 percent of coconuts produced in India is consumed as the tendernut.

Properties of Tender Coconut Water

The liquid endosperm or the tendernut water is very nutritious with a caloric value of 17.4 per 100gm. According to Ayurveda, the traditional medical science, tendernut is unctuous and sweet which will increas semen, promote digestion and will clear the urinary path. Many medicinal properties are attributed to tendernut water. Tendernut water is used as oral rehydration; used for treating mal-nourishment, intestinal disturbances, urinary infections, kidney and urethral stones and cholera. It keeps the body cool and is used a tonic for the old and sick.

Tendernut Cultivars

In the prehistoric times men used coconut for water. Coconut developed as a crop for copra and oil only in the 19th century (Child 1974). Origin of dwarf from tall and its utility as a cultivar for tendernut water could have helped in the establishment of such dwarfs in many coconut growing areas of the world. Dwarfs originated independently in different localities. The predominantly cross pollinating talls on mutation to dwarfs become largely self pollinating. This has resulted in the fixation of fruit colour in dwarf types. Hence the dwarf cultivars are known by the name of the place from where they were first identified and also from the colour of the fruit.

The cultivars grown in India for tendernut purpose described here are Chowghat Orange Dwarf (COD), Chowghat Green Dwarf (CGD) Gangabondam Green Dwarf (GBGD), Kenthali Orange Dwarf (KTOD), Chitta Gangapani, Uddha Gangapani and Sevvelanir. Morphological and tendernut characters are given in the table 1 and table 2, respectively.

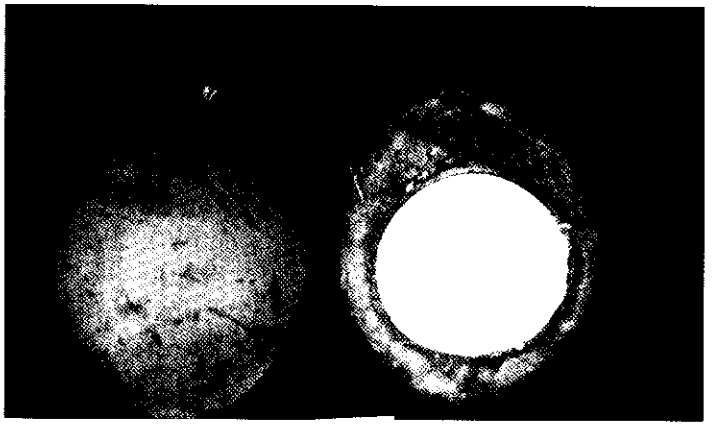

Fig. 4. COD

Table 1. Morphological traits

Cultivar	Habit	No. of leaves	Leaf length (cm)	Leaf scars/m	Inflore-scence Length (cm)	Spikelet length (cm)
Chitta Gangapani	Dwarf	30	380	27	93	36
Uddha Gangapani	Semitall	28	282	21	88	53
Sevvelanir	Tall	30	430	12	110	32
COD	Dwarf	22	441	45	66	32
CGD	Dwarf	28	405	56	60	31
GBGD	Dwarf	26	401	46	65	34
Kenthali	Dwarf	30	483	53	73	32

Table 2. Tendernut characters

Cultivar	Sweetness (water)	Sweetness (endosperm)	Quantity of water (ml)	Total sugars (%)
Chittagangapani	Very good	Good	450	6.0
Uddhagangapani	Very good	Very good	370	6.8
Sevvelanir	Very good	Good	300	6.0
COD	Very good	Very good	350	7.0
CGD	Very good	Very good	190	4.8
GBGD	Good	Good	270	5.6
KTOD	Good	Good	206	6.3

Chowghat Orange Dwarf (COD)

This indigenous dwarf cultivar is found sparsely cultivated through out the West Coast of India particularly in the Chavakkad area of Thrissur District in Kerala. The palms have a characteristic orange colour on the leaf petioles, spadicles and nuts. This cultivar commences flowering in about four years after planting with an average yield of 63 nuts per palm per year. The tender nut water of this cultivar is sweet with a total sugar

content of 7g/100ml and has high nut water content ranging between 320 ml and 360 ml. This cultivar has been released for tendernut purpose (*Fig.4*).

Chowghat Green Dwarf (CGD)

This cultivar is also known as "Pathinettampatta" in Kerala as well as in Tamil Nadu because the inflorescence emergence is generally from 18th leaf axil. The nuts, leaves and the petioles are dark green in colour. The nuts are smaller and possess prominent beak when fully matured. This is an early bearer and starts bearing by third or fourth year. The mean annual yield is 77 nuts per palm. Though this cultivar has only about 200ml tendernut water, the water is very sweet in taste. More over, it is an important cultivar for root (wilt) disease affected area because of its tolerance to the disease.

Gangabondam Green Dwarf (GBGD)

This dwarf cultivar is from East Godavari district in Andhra Pradesh. The nuts are medium sized and papaya shaped. This cultivar starts bearing by third or fourth year after planting. The mean annual yield is 68 nuts/palm. Nuts of this cultivar are green in colour. The water is very sweet in taste.

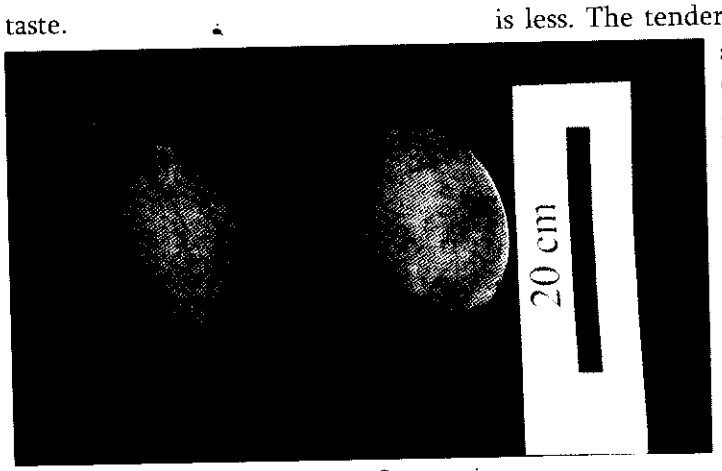

Fig. 2. Chitta Gangapani

Sevvelanir

This is a tall cultivar found in Pondicherry. Only a few palms occur scattered in the area. Tendernut water of this cultivar is considered as medicinally very important. The water is used in the treatment of jaundice. This cultivar is identified by the pink colour of freshly cut tendernut husk. The nuts are green in colour and water is sweet in taste. The mean annual yield is 45–50 nuts/palm. (*Fig. 1*)

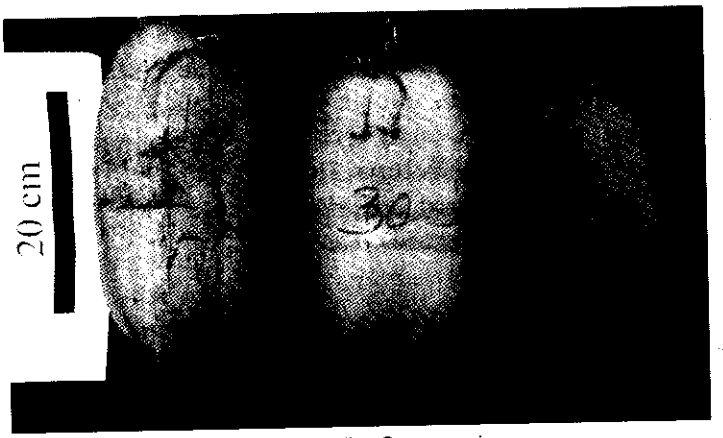

Fig. 3. Uddha Gangapani

Chitta Gangapani and Uddha Gangapani

Arsikere and Tiptur area in Karnataka is 2700 feet above sea level. The region is known for ball copra of highest quality that fetches premium price in the market. Two rare and historically renowned tendernut cultivars are reported from this area. They are the Chitta Gangapani and Uddha Gangapani (*Fig.2 and 3*). Chitta Gangapani is a dwarf type with green medium-sized round fruits. The nut inside is also round. The husk content is less. The tender nut water is very sweet to taste. Only one or two palms are found in a few gardens. This cultivar is on verge of extinction due to the non availability of seed nuts. The other, known as Uddha Gangapani, is a semi-tall type bearing large, green, oblong fruits. The nut inside is round and small. The tender nut water is sweet to taste. Interestingly, both these tendernut cultivars are unsuitable for ball copra production.

Kenthali (KTOD)

This is a dwarf tendernut cultivar from Karnataka which is having high medicinal value and exclusively preferred for traditional treatment of jaundice and chicken pox. The fruits of this cultivar are deep orange in colour. The palm flowers in about five to six years. Average annual yield is 50 nuts/palm.

These tendernut cultivars are highly localised in distribution, perhaps with the exception of the released cultivar COD. There has been no attempt to popularise these cultivars. Spread of these cultivars in the respective geographical areas has been limited by the scarcity of planting material. Continuous harvest of tendernut leads to non-availability of seednut. Harvest of tendernut over the years is slowly pushing these cultivars to extinction. Some of these cultivars are already proved to contain valuable genes like tolerance to Root (wilt) disease (CGD), medicinal properties for treatment of jaundice (Sevvalanir, KTOD) and tolerance to eriophyd mite

(COD). Concerted efforts are required to conserve these cultivars and also to identify such cultivars from other areas in view of their importance. There is a need to popularise and propagate these cultivars because of the increasing demand for tendernut as a preferred soft drink. It is suggested that the cultivars can be propagated by establishing community nurseries in the localities where these cultivars are found. Once the importance of the cultivars are known and availability of planting material is assured farmers will not hesitate to plant these cultivars.

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Coconut Recipes

Green Gram Thoren/Kanji Payar Thoren

Ingredients:

1.	Green gram (Cheru payar)	:	1 cup
2.	Grated coconut	:	1 cup
3.	Pepper corns	:	6
4.	Cumin seed	:	1 pinch
5.	Turmeric powder	:	¼ tsp.
6.	Garlic flakes	:	3
7.	Button onion	:	1
8.	Green chilli	:	1
9.	Salt	:	to taste
10.	Oil	:	2 dsp.
11.	Mustard	:	½ tsp.
12.	Rice	:	2 tsp.
13.	Large onion chopped	:	2 dsp.
14.	Dry chilli, cut into 3	:	1
15.	Curry leaves	:	few

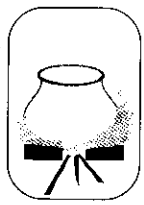
Method of preparation

The green gram may be roasted for two minutes before cooking. This prevent it from getting mashed while cooking. If it is roasted too much it may reduce the taste.

Wash and clean the gram and cook in 3 cups of boiling water. Cook it covered. When it starts to boil, keep it half-open and cook till water is almost absorbed.

Grind together pepper, cumin seed and turmeric powder. Crush garlic, onion, green chillies and grated coconut. Mix the masala together.

Before all the water evaporates, keep the masala in the centre of the cooked gram and cover it with some of the gram. When steam comes, stir it gently and let it get dry without getting mashed. Add salt and mix well.



Heat oil and temper the seasonings from 11-15 and saute the prepared thoren in it.

Bean Leaf of Pumpkin Leaf Thoren

Ingredients:

1.	Bean leaf or Pumpkin leaf finely shredded	:	3 cups
2.	Dry chilli	:	1
3.	Cumin seed	:	1 pinch
4.	Button onions	:	2
5.	Grated coconut	:	1 cup
6.	Oil	:	2 dsp.
7.	Mustard	:	½ tsp.
8.	Rice	:	2 tsp.
9.	Large onion chopped	:	2 dsp.
10.	Dry chilli broken into 4	:	1
11.	Salt	:	as required

Method of preparation

Steam cook the leaves for 5 minutes. Coarsely grind the chilli, cumin seed, button onion and crush the grated coconut and mix the salt, altogether thoroughly.

Fry mustard and rice in hot oil. Add onion and dry chilli pieces and saute. Add the ground ingredients and fry for a little while. Add the leaf and stir gently till water is absorbed. Serve hot.

Spinach leaves can also be cooked in a similar way.

- Coconut Recipes around the World