# New Caledonian Coconut Cultivars

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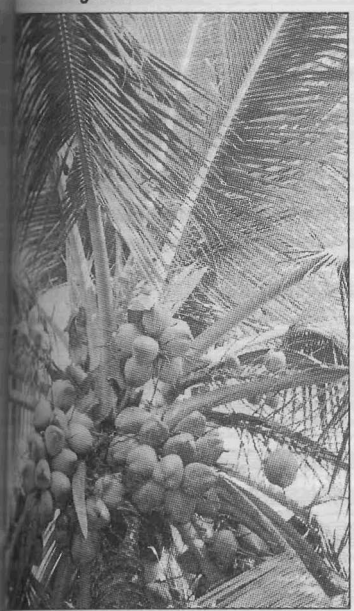
## Introduction

present coconut germplasm sitory at Central Plantation esearch Institute (Kasaragod) accessions including 120-150 ous accessions. The exotic ms are from 22 countries and igenous types represent the coconut cultivars grown in coconut growing states/union ries of the country.

Fig. 1. Nufella



Crown

Coconut cultivars in the germplasm holdings of 15 coconut producing countries, including India are registered in the Coconut Genetic Resources Database (CGRD) of COGENT (International Coconut Genetic Resources Network) under IPGRI (International Plant Genetic Resources Institute).

A recent inventory of coconut varieties that have been registered in CGRD under COGENT is 738 accessions (Santos, 1996). Boudouin (1996) listed the available information on the international movement of coconut accessions in the COGENT. It traces the known routes taken by the cultivars from their place of origin of their present locations. In the CGRD of Indian germplasm, nearly 242 accessions have been registered and the passport data of these accessions have been completed. Characterization data of 74 accessions have been entered in the CGRD. Among the Indian coconut germplasm accessions, as listed by Boudouin, (1996), there are five New Caledonian cultivars which were introduced to CPCRI, Kasaragod, Kerala during 1968. There is another type-New Caledonian Tall in the CGRD, listed against Saraoutou, introduced in 1986.

Menon and Pandalai (1958) listed 10 varieties of coconut indigenous to New Caledonia Islands. However, they are different from those maintained now at Kasaragod.

An attempt has been made to describe the cultivars indigenous to New Caledonia Islands, which are available only in Indian coconut germplasm repository.

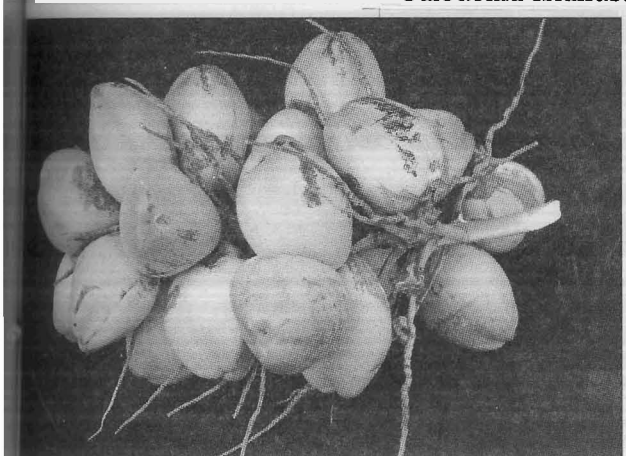
### Maintenance and observations recorded

The material consists of four cultivars viz., Nufella, Nugili, Nuqeawen and Nuwehung. The cultivars were introduced to India in 1968 and 4 palms each in 4 cultivars are being maintained.

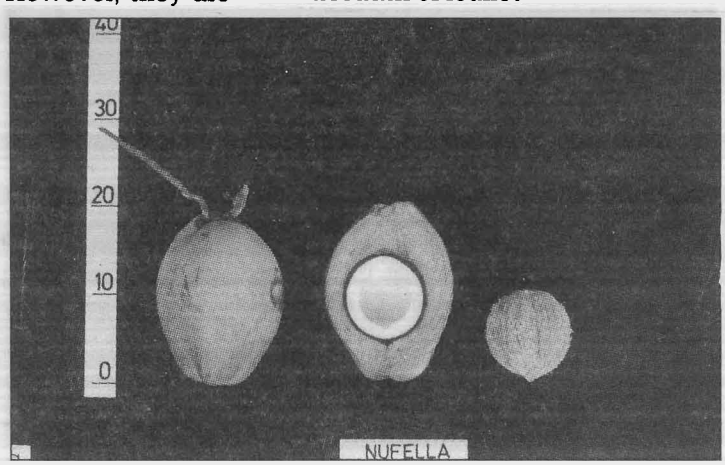
The following characters were recorded in adult palm.

### Vegetative Characters

- ***Trunk***
- Trunk diameter (50 cm above ground)
- Trunk internode length (average of 10 internodes)
- Trunk height (ground level to base of the oldest fruit)
- ***Leaf***
  - number per palm
  - petiole length
  - rachis length
  - number of leaflets (on one side)
  - length of leaflet
  - breadth of leaflet



Bunch




Fruit, T. S. of fruit and nut

- *Inflorescence*
  - number per palm per year
  - length
  - stalk length
  - number of female flowers per inflorescence
  - duration of male phase
  - duration of female phase
  - gap between male and female phase
  - intra and inter spadix overlapping

**Fruit Component Analysis (FCA)**

The principal characters recorded were the fruit and nut characters. Mature fruits were chosen in which colour of most of the fruits changes from green to brown. Four nuts per palm were taken for the analysis.

Seven month old nuts were taken for tender nut water/meat analysis. Total sugar content was determined by phenol-sulphuric acid method of Dubois *et al.* (1951) and expressed in g/100ml

The following characters were recorded.

- Shape of fruit
- Colour of fruit
- Fruit weight
- Husk weight
- Shell weight
- Meat weight
- Percentage of husk to fruit (Calculated values)
- Percentage of shell to nut (Calculated values)
- Percentage of meat to nut (Calculated vlaues)
- Organoleptic test of tend water and meat

**Results**

In the present study 28 char were considered for evaluati New Caledonian coconut cu (*Figs. 1-4*). For almost all the cha showed low CV percent indicat all the palms in the cultivars a or less homozygous in nature.

The height and girth of th was maximum in Nugili (75.6 86.6 cm respectively). Internod was 52.2 cm in Nuqeawen to in Nufella (*Table 1*).

**Fig. 2. Nugili**

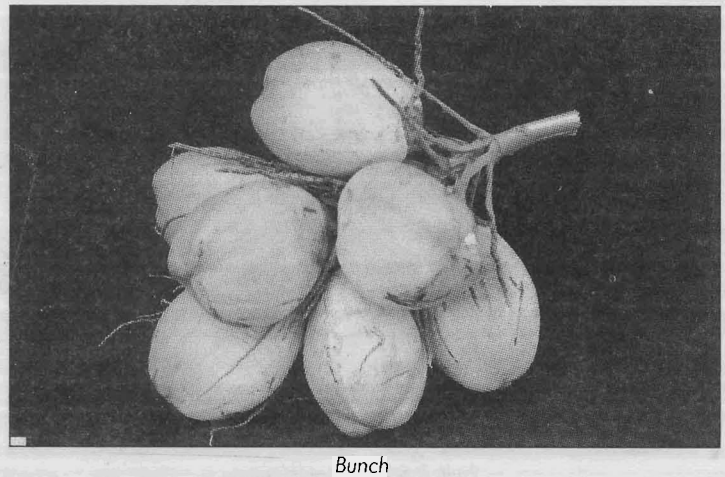
Crown

***Table 1. Stem characters***

| Cultivar | Height (cm) | Girth (cm) | Internode length (cm) |
|---|---|---|---|
| Nufella | 639.0 | 82.0 | 57.2 |
| Nugili | 756.6 | 86.6 | 56.3 |
| Nuqeawen | 684.3 | 83.3 | 52.5 |
| Nuwehung | 588.0 | 86.3 | 56.0 |
| Gen. mean | 666.96 | 84.52 | 55.50 |
| C.V. (%) | 10.72 | 2.66 | 3.72 |

***Table 2. Leaf characters***

| Cultivars | No. of leaves on the crown | Length of petiole (cm) | Length of leaflet bearing portion (cm) | No. of leaflets (on one side) | Length of leaflet (cm) |
|---|---|---|---|---|---|
| Nufella | 32.2 | 126.8 | 365.0 | 91.8 | 111.2 |
| Nugili | 37.0 | 130.6 | 394.4 | 96.6 | 116.3 |
| Nuqeawen | 36.0 | 125.8 | 424.3 | 102.5 | 121.8 |
| Nuwehung | 41.0 | 143.3 | 403.5 | 100.5 | 118.3 |
| Gen. Mean | 36.55 | 131.63 | 396.80 | 97.85 | 116.90 |
| C.V. (%) | 9.13 | 8.11 | 8.46 | 6.28 | 8.66 |



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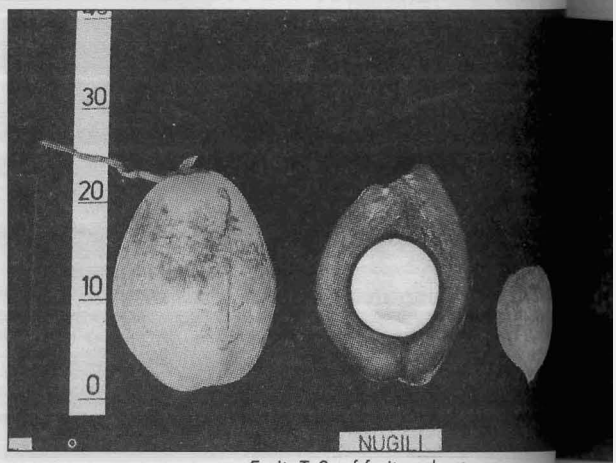



Fruit, T. S. of fruit and nut

**Table 3. Inflorescence characters and breeding behaviour details**

| Cultivars | Age at flowering (months) | No. of inflo-resence per year | Length of inflo-resence (cm) | Length of peduncle (cm) | Mean no. of female flowers/ inflo. | No. of spikelets/ inflo-rescence | Setting % | Duration of male phase (days) | Duration of female phase (days) | Gap between male & female phases | Inter spadix overlapping | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Days | % |
| Nufella | 100.7 | 11.7 | 96.0 | 52.4 | 27.4 | 43.0 | 26.7 | 18.5 | 4.8 | 2.0 | 4.5 | 34.3 |
| Nugili | 98.7 | 11.0 | 98.7 | 57.7 | 26.4 | 43.4 | 28.7 | 18.9 | 4.5 | 2.1 | 4.8 | 52.4 |
| Nuqeawen | 85.8 | 11.0 | 101.3 | 56.3 | 26.3 | 44.0 | 25.6 | 18.9 | 4.7 | 2.4 | 5.6 | 51.8 |
| Nuwehung | 98.6 | 12.0 | 99.5 | 60.8 | 24.3 | 43.8 | 25.5 | 19.4 | 4.9 | 3.0 | 4.8 | 56.9 |
| Mean | 94.95 | 11.43 | 98.88 | 56.80 | 26.10 | 43.55 | 26.67 | 18.94 | 4.72 | 2.38 | 4.93 | 50.10 |
| CV (%) | 7.01 | 8.14 | 7.22 | 11.03 | 31.44 | 7.01 | 5.58 | 9.55 | 33.01 | 33.38 | 37.21 | 53.69 |

number of leaves on the crown from 32.2 in Nufella to 41.0 in ...ung. The latter cultivar had ...etiole length (143.3 cm). Rachis ... number of leaflets, length and breadth of the leaflets were high in Nuqeawen (*Table 2*).

The cultivar produced 11 to 12 inflorescences per year. The length of the inflorescence was more in Nuqeawen (101.3 cm) while the length of stalk was higher in Nuwehung (60.8 cm). The number of female flowers per inflorescence varied from 24.3 in Nuwehung to 27.4 in Nufella.

Breeding behaviour studies in the cultivars revealed that the duration of female phase was minimum (18.5 days) in Nufella and maximum (19.4 days) in Newehung. The duration of the female phase was 4.5 to 4.9 days. The gap between the two phase was 2 days in Nufella and 3 days in Nequeawen (*Table 3*).

The palms were found to be indirectly self - pollinating as inter spadix overlapping was observed in all these 4 cultivars. The inter - spadix overlapping (i.e., overlapping of female and male phase of succeeding inflorescences) was found and varied from 4.5 to 4.8 days with 34.3 to 56.9 percent of inflorescences showed inter spadix overlapping (*Table 3*).

The fruits were medium sized and oval in shape with greenish yellow in colour. The fruit weight varied from 580.3 g to 667.3 g (*Table 4*). The weight of meat and shell were maximum in Nuqeawen (233 g to 115.3 g respectively). The fruits of these cultivars had medium husk proportion which varied from 38.2 to 41.6. According to Harrie's (1978) classifcation, these palms fall into "*Niu Vai*' type (domesticated ones) because the fruits of these cultivars were more or less medium sized with more meat and less husk and shell.

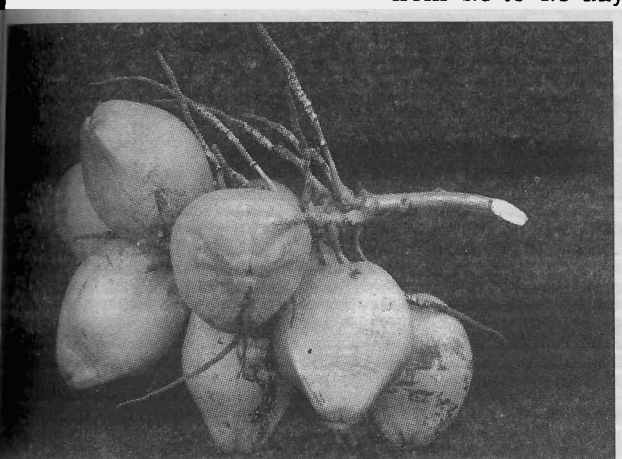
Tender nut water of Nuwehung was sweet, while the total sugar content was highest in Nufella (5.7 g/100ml). The annual mean nut yield varied from 41.4 in Nufella to 70.1 in Nugili (*Table 4*).

**Fig. 3. Nuqeawen**

Crown

## Conclusion

The New Caledonian cultivars maintained in the germplasm repository at Kasaragod had intermediate values between talls and



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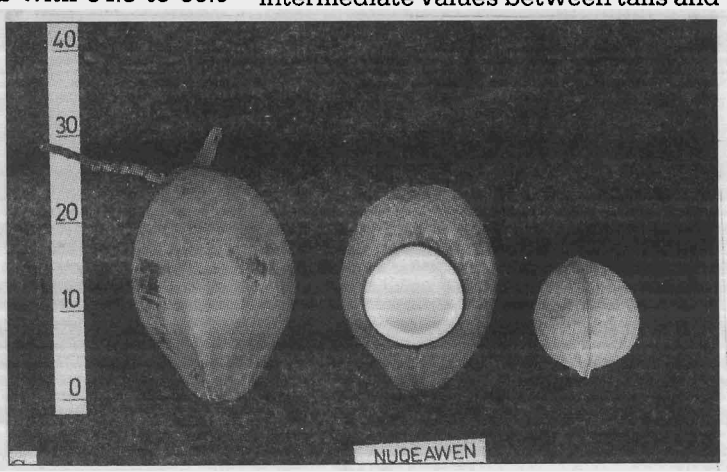


Fruit, T. S. of fruit and nut

**Table 4. Fruit characters**

| Cultivars | Wt. of Fruit (gm) | Wt.of husk (gm) | Wt. of nut (gm) | % of husk to whole fruit wt. | Wt. of meat (gm) | % of meat to nut | Wt. of shell (gm) | % of shell to nut | Shape of fruit | Color of fruit | Volume of water (ml) | Total sugar (g/100 ml) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nufella | 613.4 | 235.4 | 378.0 | 38.2 | 214.4 | 56.7 | 100.1 | 26.5 | Oval | Green | 170.0 | 5.7 |
| Nugili | 580.3 | 220.6 | 359.7 | 38.3 | 202.4 | 56.3 | 93.9 | 26.0 | ,, | ,, | 270.0 | 4.8 |
| Nuqeawen | 635.8 | 236.3 | 399.5 | 37.1 | 223.0 | 55.8 | 115.3 | 28.9 | ,, | ,, | 260.0 | 3.9 |
| Nuwehung | 667.3 | 279.8 | 387.5 | 41.6 | 215.0 | 56.3 | 99.6 | 25.7 | ,, | ,, | 250.0 | 3.7 |
| Gen. Mean | 624.2 | 243.03 | 381.18 | 38.80 | 213.6 | 56.28 | 102.23 | 26.78 | -- | -- | 237.5 | 4.5 |
| C.V. (%) | 5.88 | 10.51 | 4.41 | 5.01 | 4.06 | 0.67 | 8.96 | 5.43 | -- | -- | 19.26 | 20.28 |

dwarfs for all the charactes studied and fall into '*Nui Vai*' types of Harrie's (1978) classifcation.

Harries (1978) reported that each group of Pacific Ocean Islands appears to have one or two intermeidate forms and one or both of extreme type of '*Niu Kafa*' and '*Niu Vai*' types. The New Caledonian cultivars described in this paper might be intermediate types evolved through introgressing of talls and dwarfs in that Islands.

Based on the fruit component analysis in 70 cultivars, Ratnambal *et al.* (2000) observed that the four New Caledonian varieites were found to form one cluster with intermediate values between talls and dwarfs and these were nearer to Verikobbari Tall of Andhra Pradesh of India. In the dendrogram, these cultivars were placed far away from the popular tall cultivars of the world indicating that New Caledonian coconut cultivars might have originated later through inbreeding between talls and dwarfs.

**Fig. 4. Nuwehung**

Crown



Bunch




Fruit, T. S. of fruit and nut

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