

strong peduncle with complete overlapping of male and female phases making the palms autogamous. The fruits are attractive orange red in colour, medium sized, oval shaped with a pointed apical end. The dehusked nuts are also oval, medium sized with strong shell and thick kernel. The palms tend to bear in alternate years with an average bunch production of 10 per year. The average nut yield is 80 fruits per palm per year. The fruit weighs about 945 g, with a smaller percentage of husk to whole fruit weight (27.8%). The nut without the husk weighs about 657 g and produces nearly 220 g of copra per nut which is highest among the conserved orange dwarf accessions in the genebank.

**Cultivation Practices:** The palms of Cameroon Red Dwarf selection can be grown with the regular recommended package of practices with irrigation for sustained yield of nuts. It can be grown in all coconut growing regions for conservation and further utilization. It has good

potential for use as apparent in breeding programmes aiming for earliness, tender nut yield, copra yield and attractive coloured fruits.

## References

- CPCRI (2009) Annual Report 2008-2009, Central Plantation Crops Research Institute (CPCRI), Kasaragod, Kerala, India, 145p
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## 11. IND 414–Chowghat Yellow Dwarf (IC0598220; INGR13062), Distinct Dwarf Coconut (*Cocos nucifera*) Germplasm with Yellow Coloured Nuts and Erect Leaves

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Chowghat Yellow Dwarf is a unique indigenous yellow dwarf coconut line developed through selection from the original population of Chowghat Orange Dwarf conserved at National Gene Bank at CPCRI. The palms in the gene bank were developed through the *inter se* mated original mother palms available at CPCRI followed by progeny selection at CPCRI for nut colour. After evaluation of the progenies for inheritance of the trait, the selection was made for the unique trait of yellow fruits, rachis, flowers and petiole. As there are no indigenous yellow dwarf population exists in the mainland India, the selection is considered unique. Useful variety as a parent for crossing with selected tall to produce hybrids and hence of commercial value.

**Morpho-agronomic Traits:** Most yellow dwarf populations of the coconut growing regions of the world has been related to Malayan dwarfs which are

characterized with drooping leaves and straight spindle. The Chowghat Yellow Dwarf is observed as having erect leaves, large sized nuts with higher tender nut water, higher nut yields has excellent adaptability to the coconut growing environment in the country as it is a selection from the Chowghat Orange dwarf. The inheritance of the yellow colour traits is also confirmed as the *inter se* mated seedling progenies exhibited mostly seedlings with yellow coloured petiole and few with orange colour. The typical palms of this type could be selected based on the petiole colour.

The number of fruits per bunch was observed to range from 12 to 20. The palms belong to dwarf type of coconut with a stem girth of 55 cm at 1 m height and an average leaf length of 3.45 m at the age of 30. The bunch production in the selected palms are regular and ranged from 9 to 13 bunches per year after

commencement of flowering. The colour of the fruit is yellow, oval shape with a fruit length of 37cm and fruit breadth of 16.5cm. The tender nuts contained more sweet water ranging from 250 to 340ml per nut (Average 290ml) with average TSS of about 6.7° brix.

**Cultivation Practices:** The palms of Chowghat Yellow Dwarf can be grown with the regular recommended package of practices with summer irrigation for sustained

yield. It can be grown in all coconut growing regions for conservation and further utilization.

#### References

- CPCRI (2011) *Annual Report 2010-2011*, Central Plantation Crops Research Institute (CPCRI), Kasaragod, Kerala, India, 146p.
- Anonymous (2011) *CPCRI Research Highlights 2010-2011*, Central Plantation Crops Research Institute (CPCRI), Kasaragod, Kerala, p 1-2.

## 12. IND 221–Andaman Horned Cocos (IC0598221; INGR13063), a Coconut (*Cocos nucifera*) Germplasm with Distinct Character of Horny Nuts

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Horned cocos is a unique coconut type developed through selection from the original population collected from Andaman islands during 1999 and conserved at National Gene Bank at CPCRI research centre, Karnataka. The palms in the gene bank were developed through the nuts collected from the original mother palms available at natural coconut populations of South Andaman district followed by seedling selection at CPCRI. After evaluation of the said accession for inheritance of the trait, the selection was made for the unique trait of presence of multiple ovaries female flowers which results in horn like structures over the matured coconut fruits. The trait is unique and not present in any other accession in the gene bank. The extent of genetic diversity in the accession was evaluated using 14 highly polymorphic microsatellite markers. The observed heterozygosity was 0.19, while the observed heterozygosity was 0.25. This indicated a tendency towards inbreeding within the population. It had a fixation index (FST) of 0.25 indicating a high level of genetic differentiation. It comes handy as a marker in breeding programmes.

**Morpho-agronomic Traits:** Coconut produces female flowers with one ovary without any appendages over the set fruits. The candidate accession *viz.*, Horned cocos produces female flowers with three or more divided part of ovary (multiple ovaries) which result in the horn like appendages over the fruits making it unique. The inheritance of the traits is also confirmed as the second generation palms at the field genebank

of CPCRI also exhibited the trait. The original mother palms are identified with this unique trait among the natural coconut populations at South Andaman district collected during 1999. Subsequently the seedling progenies were planted and evaluated at National Field Gene Bank of coconut under CPCRI Research Centre, Kidu, Karnataka. Hence the performance is known at two locations i.e. Andaman and Karnataka

The number of fruits per bunch ranged from 10 to 21 in the initial years of flowering fruiting from 2009 to 2011. The palms belong to tall type of coconut with a stem girth of 85 cm at 1 m height and an average leaf length of 3.6 m at the age of nine. The bunch production is regular and ranged from 7 to 10 bunches per year after commencement of flowering. The setting percentage of fruit is about 30 percent. The colour of the fruit is green with oval shape. The husked fruit is round with a hard shell measuring an average of 4 mm thick. The cavity volume ranged from 120 to 140 ml.

**Cultivation Practices:** The palms of Horned cocos are normal in all other morphological traits similar to other coconut accessions. They can be grown with the regular recommended package of practices with summer irrigation for sustained yield. It can be grown in all coconut growing regions.

#### References

- CPCRI (2012) *Annual Report 2011-2012*, Central Plantation Crops Research Institute (CPCRI), Kasaragod, Kerala, India, 128p.