

## Genetic purity assessment of D x T hybrids in coconut with SSR markers

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### Abstract

**Assessment of genetic purity in coconut hybrids was done using molecular markers. A set of 50 hyperpolymorphic coconut SSR markers were utilized to characterize parental lines Chowghat Green Dwarf (CGD) and West Coast Tall (WCT) used for hybrid coconut production. A panel of 17 informative SSR markers capable of distinguishing these parental lines was identified and these markers were utilized in DxT hybrid seedling purity assessments in coconut nurseries.**

**Key words:** Coconut, hybrids, genetic purity, microsatellite markers

The success of hybrid coconut based farming depends on the timely production and adequate supply of genetically pure hybrid seedlings to the farmers. In the coconut root (wilt) disease affected tracts of Kerala, Chowghat Green Dwarf x West Coast Tall (CGD x WCT) hybrids have performed consistently well with a cumulative average yield of 84 nuts/palm for the past 10 years and showing tolerance to the disease [1].

The CGD x WCT hybrid seedlings are produced commercially by carrying out pollination on CGD mother palms located in farmers' plots. Pollen collected from disease-free WCT palms is used for pollination. A set of morphological descriptors are currently used for varietal identification, description and seed purity assessment. Petiole colour is the most widely used marker to select hybrid seedlings in the nursery stage. Selection of hybrids by petiole colour is reliable only if

the progenitors are homozygous for yellow, red or green petiole. Though widely adopted and practised, purity assessments based on morphology is often affected by environment, besides time and resources. Further, many of the varieties and hybrids are phenotypically less distinct than making morphology based distinction difficult. Identification of genuine CGD x WCT hybrids in the nursery stage is the most difficult task in hybrid production as both the progenitors are of the same petiole colour. Also, morphological traits are subjected to environmental effect further limiting their use. Therefore, an alternative technique that offers efficient, quick and reliable assessment of genetic purity is necessary.

The objectives of the present study were (i) to characterize CGD and WCT parental lines used for DxT hybrid coconut production using a set of hyperpolymorphic coconut SSR markers, (ii) to identify informative SSR markers capable of distinguishing the parental lines and (iii) to utilize the selected markers in hybrid seedling purity assessments.

The mother palms of WCT and CGD in the farmer's plots were selected, based on strict selection criteria [2]. Artificial pollination of CGD mother palms, with pollen of WCT, was carried out during January-March 2007 for the production of F<sub>1</sub> hybrid. The mature seed nuts were harvested during 2008, and sown in the nursery. The selected one-year-old hybrid seedlings were planted at CPCRI (RS) Kayamkulam at a spacing

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18.	CnCir 2	+	-
19.	CnCir C <sub>7</sub>	-	-
20.	CnCirH <sub>7</sub>	-	-
21.	CnCir73	+	-
22.	CnCir86	+	+
23.	CnCirH9	+	+
24.	CnCirE <sub>7</sub>	+	+
25.	CnCirG <sub>4</sub>	+	-
26.	CnCir56	+	-
27.	CNZ 32	-	-
28.	CNZ 17	+	+
29.	CNZ 21	+	+
30.	CNZ 29	-	-
31.	CNZ 13	+	+
32.	CNZ 26	+	-
33.	CNZ 31	-	-
34.	CNZ1	+	-
35.	CNZ4	+	+
36.	CNZ5	+	+
37.	CNZ2	+	+
38.	CNZ6	-	-
39.	CNZ10	+	+
40.	CAC 71	-	-
41.	CAC 72	-	-
42.	CAC 77	-	-
43.	CAC8	+	+
44.	CAC10	+	-
45.	CAC13	-	-
46.	CAC3	-	-
47.	CAC4	+	+
48.	CAC6	+	+
49.	CAC2	+	+
50.	CN1H2	+	+

17 microsatellites selected conclusively displayed the complementary banding patterns of both the parents (Fig. 1), confirming the role of microsatellites as a promising approach in purity monitoring of coconut hybrids. Selfed progenies possessed the banding patterns of only the maternal parent (CGD).

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