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Clonal progeny evaluation in Chinese Cassia (*Cinnamomum cassia*) - A preliminary study

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ABSTRACT

Chinese Cassia (*Cinnamomum cassia* Blume, indigenous to China, is an important tree spice introduced into India during the seventies from Singapore. The bark of Chinese cassia is valued both as a spice and medicine. The Indian Institute of Spices Research (IISR), Calicut, Kerala, India, has located 26 cassia trees during a survey in a private estate at Valparai (Coimbatore District) of the Anamalai Hills in Tamil Nadu. The germplasm conservatory of *Cinnamomum* of IISR is the only source of cassia germplasm available in India. These lines were evaluated for their quality and four elite cassia types were identified based on quality. They were further evaluated for their yield and yield attributing characters. Among the four elite lines, D1 has comparatively more number of branches [harvestable shoots (5.9 per plant)] than the rest. No significant difference was observed for yield of bark in the first harvest.

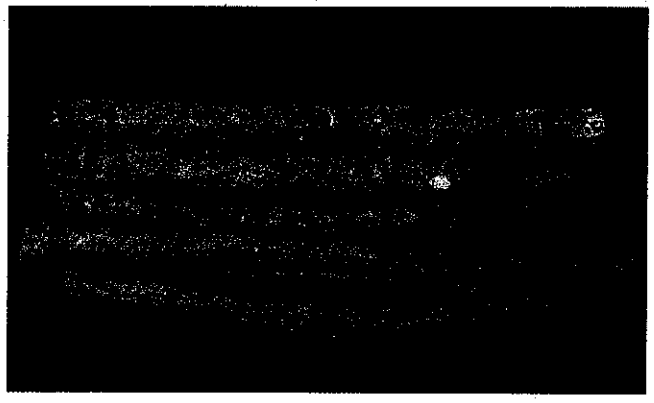
Key words: Chinese cassia, *Cinnamomum cassia*, progeny evaluation.

INTRODUCTION

Chinese Cassia (*Cinnamomum* cassia Blume) (Syn. *C. aromaticum* Nees) is commercially grown to a large extent in China. The dried inner bark is valued as a spice and medicine. Besides bark, cassia oil, cassia oleoresin and cassia buds are the important products of commerce obtained from this evergreen spice [2]. Cassia is valued both as a spice and medicine. Cassia has a tremendous potential in the spice industry in the manufacture of value added products. In India, no large scale cultivation of this tree spice exists at present. Indian consumers prefer, cassia to cinnamon, as a spice, for culinary purposes. At present, Indian demand for cassia is met by import. The Indian Institute of Spices Research (IISR), Calicut, Kerala, India, has located 26 cassia trees during a survey in a private estate at Valparai (Coimbatore District) of the Anamalai Hills in Tamil Nadu. The germplasm conservatory of *Cinnamomum* of IISR is the only source of cassia germplasm available in India and holds 25 accessions of cassia. Based on evaluation of these accessions for bark oil, bark oleoresin, bark cinnamaldehyde, leaf oil, leaf cinnamaldehyde and isoeugenol for chemical and flavour profiles, C1, D1 and D3 were selected for further multiplication and evaluation along with another accession, namely, A 2 which has a very high isoeugenol (12%) content [1]. Clonal progenies of these 4 elite lines were evaluated for various yield and yield attributing characters. This study deals with the progeny analysis of these 4 elite lines for morphological and yield characters.

MATERIALS AND METHODS

One year old rooted stem cuttings of the above 4 elite lines were planted at the Experimental Farm of Indian Institute of Spices Research at Peruvannamuzhi (Kerala, India) at 2 ½ m x 2 ½ m spacing with 5 replications and a plot size of 4 plants/elite line/replication following all cultural practices. Vegetative characters, namely, plant height, number of main shoots, number of branches, plant canopy and shoot thickness were recorded for 3 year old and 4 year old plants. The first coppicing and bark extraction was done 4 years after planting. At the time of coppicing, observations on number of harvested shoots and fresh and dry weight of the bark were also recorded.



Cassia bark

The removal of cassia bark was carried out during October, first by scrapping off the outer bitter epidermis with a blunt knife, followed by ringing the shoots at 30-60 cm intervals, and joining these rings with longitudinal cuts. With the help of a curved spatula, the bark was removed, shade dried and sun dried respectively for one day each and further shade dried for 3 - 4 days. The clonal progenies were evaluated for height (cm), number of main shoots, number of branches, plant canopy (max. width in cm) and thickness of the main shoots at chest height (cm) during third year and along with these traits, for number of harvestable (bark extractable) shoots, fresh weight (g) and dry weight (g) of bark during the fourth year.

Elite cassia D1

A field view of *Elite cassca* D1

Table-1. Performance of clonal progenies of cassia elite lines

Sl. No	Elite line no.	Height (cm)		No. of main shoots		No. of branches		Canopy (cm)		Thickness (cm)	
		Mean (3^{rd} year)	Mean (4^{th} year)	Mean (3^{rd} year)	Mean (4^{th} year)	Mean (3^{rd} year)	Mean (4^{th} year)	Mean (3^{rd} year)	Mean (4^{th} year)	Mean (3^{rd} year)	Mean (4^{th} year)
1	A_2	82.5	164.0	1.4	1.7	4.0	9.4	44.0	96.2	0.9	1.8
2	C_1	114.4	209.3	1.0	1.3	10.7	14.2	64.8	124.8	1.8	3.3
3	D_1	80.4	160.0	1.4	1.2	5.1	8.2	43.3	97.4	1.1	2.2
4	D_3	87.9	157.5	1.7	2.1	6.7	11.5	60.7	108.4	0.9	1.5
	CD at 5%	NS	NS	0.44	0.49	5.43	NS	NS	NS	0.56	1.4

Table-2. Performance of clonal progenies of cassia elite lines for yield characters (4th year after planting)

Elite line no.	No. of harvestable shoots	Fresh weight (g)	Dry weight (g)
A_2	4.2	137.6	37.0
C_1	5.1	409.6	109.2
D_1	5.9	462.6	123.9
D_3	3.5	240.2	71.1
CD at 5%	NS	NS	NS

RESULTS AND DISCUSSION

Significant differences were observed among the four elite lines for no. of branches, no. of main shoots and thickness (Table-1). Among the four elite lines, D1 has comparatively more number of harvestable shoots (5.9 per plant) than rest of the accessions (Table-2). No significant difference was observed for yield of bark in the first harvest. Yield would stabilize only 5 - 6 years after the first coppicing. Among the four elite lines, D1 was found to be superior based on the number of harvestable shoots. This is the first report on field evaluation of cassia. The results are only based on preliminary observation and would take another 5 - 6 years for obtaining stabilized yield.

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