

EVALUATION OF COLOCASIA (*COLOCASIA ESCULENTA*, (L) SCHOOT) TYPES IN KERALA

Being a crop with wide environmental adaptability, colocasia is cultivated in several parts of India with large climatic variations. A number of varietal types of this crop are thus under cultivation in the country, most of them evolved through human and natural selection. Attempts were also made to evolve new types through breeding at the Central Tuber Crops Research Institute (Anon. 1973). Having evolved from zones of wide climatic and soil differences, substantial location interactions of these types are to be expected. The yield performance of the types evolved at the Central Tuber Crops Research Institute was earlier evaluated at Trivandrum in Kerala (Anon. 1973) and C 9, C 73 and C 25 were identified as potential high yielders. The relatively high yields of varieties, 'Kovur', 'Khasibhugga' and 'Narkatia' were earlier reported from Andhra Pradesh and Bihar (Anon., 1979; Singh, 1983). The varieties, 'Sahasramukhi' and 'Panchumukhi' of Maharashtra, 'White Gouriya' of Bihar and 'Kakakacha', of Assam are popular high yielders. The present study was intended to compare the performance of promising varietal types of this crop in Kerala. The trials were conducted at the Coconut Research Station, Niiieswar and College of Horticulture, Vellanikkara under the All India Co-ordinated Project for Improvement of Tuber Crops.

The field experiments were conducted at two locations in Kerala. In the trial at Niiieswar, conducted during the monsoon season of 1978, a total of six varieties, three from CTCRI and three from Andhra Pradesh were used. At Trichur the trial was laid out in 1981 with a total of 10 varieties including all those of the trial at Niiieswar except C 25 and C 73 which were assessed as poor yielders at Niiieswar. The list of varieties compared at the two locations is given below.

The trials were laid out in randomised block design and replicated four times at Niiieswar and three times at Trichur. The plots were of size 3 m x 2.25 m. The seed corms were planted at a distance of 45 cm on ridges formed 60 cm apart. The soil of the experimental site at Niiieswar was red sandy loam of low fertility with a pH of 5.4. At Trichur the soil was sandy clay loam of medium fertility with a pH of 5.5.

The cropping season was May to November. The average rainfall at Niiieswar was 3304 mm distributed over 74 rainy days whereas those at Trichur were 2816 mm and 90 rainy days, respectively.

Farmyard manure was mixed over the ridges, before planting at the rate of 12 t/ha. A fertilizer dose of 80:50:100 kg/ha of N, P_2O_5 and K_2O , respectively, were added in two split doses—half N, full P and half K given within one week of sprouting of the corm and the remaining half given one month after.

The crop was harvested after six months. The weights of cormels and corms from each plots were recorded. The number of cormels per plant was recorded from three randomly selected plants.

Trial I Nileswar.

Sl. No.	Varieties	Source
1	C 25	CTCRI, Trivandrum
2	C 73	do
3	C 9	do
4	Khasibugga	Andhra Pradesh
5	Kovur	do
6	Narkatia	do

Trial II Trichur.

Sl. No.	Varieties	Source
1	C 9	CTCRI, Trivandrum
2	C 135	do
3	Khasibugga	Andhra Pradesh
4	Kovur	do
5	Narkatia	do
6	Sahasramukhi	Maharashtra
7	Panchumukhi	do
8	White Gauriya	Bihar
9	Kakakacha	Assam
10	Thamarakkannan	Kerala (local)

Data on total tuber yield and yield of cormels (Table 1) showed that there were conspicuous differences in the general yield levels at the two locations. The low yields at Nileswar are attributable to the lower fertility of red loam soil and also probably partly to climatic differences. A comparison based on yield of cormel, the commercially more important tuber component, would show that 'Khasibugga' was the highest yielder at Nileswar followed by 'Kovur' and then by C 9. The relative yields of the remaining three varieties were very low. Among the 10 varieties compared at Trichur, 'Panchmukhi' gave the highest cormel yield of 19.8 t/ha followed by the local variety, 'Thamarakkannan' (18.1 t/ha.) The performances of 'Khasibugga', 'Kovur' and C 9 were good at Trichur also, their yields being 17.7, 16.1 and 17.8 t/ha respectively. The yields of the other varieties were also more than 14 t/ha excepting 'Sahasramukhi' and C 135 which gave only 6.0 and 3.7 t/ha respectively. A ranking based on total tuberyield also will show that 'Khasibugga' was the highest yielder at Nileswar and 'Panchmukhi' is the best among the varieties compared at Trichur. As in the case of cormel yield, 'Panchmukhi' continued to be the only variety that has yielded more than the local variety at this location.

The mean number of cormels per plant at Nileswar ranged from 7.1 to 8.3 in the six varieties tested. The range in values between varieties at Trichur was much wider—from 2.5 in 'Sahasramukhi' to 24.8 in 'Khasibugga'. As it was in yield, the mean cormel number was much higher for the common varieties at Trichur.

Table 1
Yield, cormel-corm ratio and number of cormels per plant in colocasia

Varieties	Yield (t/ha)				Cormel/corm ratio		No. of cormels per plant		Total yield (t/ha)	
	Corm		Cormels		Nileswar	Trichur	Nileswar	Trichur	Nileswar	Trichur
	Nileswar	Trichur	Nileswar	Trichur						
1 C 25	1.74	—	6.1	—	3.5	—	7.4	—	7.84	—
2 Khasibugga	1.81	3.8	11.9	17.7	6.6	4.7	8.3	24.8	13.71	21.5
3 C 73	1.56	—	4.7	—	3.0	—	7.9	—	6.26	—
4 Kovur	3.03	5.88	10.2	16.1	3.4	2.7	8.2	15.4	13.23	21.98
5 C 9	2.3	4.37	9.6	17.8	4.2	4.1	7.1	23.5	11.9	22.17
6 Narkatia	1.9	5.42	5.7	16.9	3.0	3.1	7.3	21.2	7.6	22.32
7 C 135	—	1.05	—	3.7	—	3.5	—	8.7	—	4.75
8 Sahasramukhi	—	3.88	—	6.0	—	1.5	—	2.5	—	9.88
9 Panchumukhi	—	9.71	—	19.8	—	2.0	—	19.5	—	29.51
10 White gauriya	—	3.93	—	14.9	—	3.8	—	13.2	—	18.83
11 Kakakacha	—	6.4	—	16.0	—	2.5	—	9.4	—	22.40
12 Thamarakannan	—	7.67	—	18.1	—	2.4	—	19.8	—	25.77
C. D. (0.05)	0.7	0.6	0.9	1.0	—	—	NS	6.8	1.56	1.6
SEM +	0.23	0.2	0.3	0.34	—	—	0.44	2.3	0.52	0.5

Also, in general, the high yielding types gave high cormel number values also. It is also to be noted that the intervarietal differences in cormel number which were small and statistically non-significant at Nileswar were much wider and significant for the common varieties in the second location. As had been indicated earlier, there were probably strong environmental limitations for crop development at Nileswar and the effects were reflected in cormel number also. Even with these limitations, varietal differences in yield were still apparent, the restrictions in cormel number being compensated by the size of tubers. It appears, thus, that environmental restrictions on crop development in the first location were more in the early stages of cormel initiation and less in the later corm bulking stage. It should also mean that cormel size will act as the major yield component under similar environmental limitations and that cormel number would be the decisive component when such restrictions are removed. In order to assess the extent of involvement of these two yield components on deciding final cormel yield, simple correlation coefficients were worked out. The coefficient values were 0.97 and 0.96 for correlation between cormel number and yield and between cormel size and yield, respectively, for location 1. The comparable values were 0.96 and 0.99 for the second location, Trichur. These correlation coefficients were statistically significant.

The data presented by Kagbo, *et al.* (1979) also indicate a close positive contribution of cormel weight to total yield in all the varieties tried.

There were wide variations in cormel-corm weight ratio ranging from 3.01 to 6.6 at Nileswar and 1.5 to 4.7 at Trichur. For the varieties common in the two locations, the ratios tended to decrease with increase in location-induced increase in yield as in Khasibugga or to remain nearly the same as in C 9 and Narkatia. Varietal differences in the change in cormel proportion with yield level are also thus indicated.

സംഗ്രഹം

കേരളത്തിലെ കൃഷി അനുയോജ്യമായ ചേമ്പിനങ്ങൾ തിരഞ്ഞെടുക്കാനുള്ള ഉദ്ദേശത്തോടെ ഇൻഡ്യയിൽ പല സംസ്ഥാനങ്ങളിലും കൃഷി ചെയ്യാനുള്ള 12 ഇനങ്ങൾ നീലേശ്വരത്തും തൃശ്ശൂരിലും പരീക്ഷണാർത്ഥം കൃഷി ചെയ്യുകയുണ്ടായി. ഇവയിൽ ആന്ധ്ര പ്രദേശിൽ നിന്നുള്ള 'ഖസിബുഗ്ഗ' എന്ന ഇനം നീലേശ്വരത്തും, മഹാരാഷ്ട്രയിലെ 'പഞ്ചമുഖി' തൃശ്ശൂരിലും ഏറ്റവും rogyവിളവ് 30011 കണ്ടു. rasnsjസ്ഥലങ്ങളിലും നല്ലവിളവ് നൽകിയ 'ഖസിബുഗ്ഗ' എന്ന ഇനം കേരളത്തിലെ കൃഷിക്ക് ഏറ്റവും അനുയോജ്യമാണെന്ന് കണക്കാക്കാം.

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