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Estimates of corm and cormel yield variability in different colocasia (*Colocasia esculenta* L.) genotypes under Konkan region of Maharashtra

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Abstract
The yield performance of sixteen colocasia genotypes was assessed at Central Experiment Station, Wakawali, Dapoli (Maharashtra) during *kharif* season of the year, 2016. The coefficient of variation (C.V.) was maximum (19.34%) followed by total yield and corm yield. The maximum genotypic and phenotypic coefficients were observed for yield of cormels per plant (42.97% and 47.12%, respectively). High heritability (83.16%) was also observed for yield of cormels per plant.

Keywords: Colocasia, corm, cormel, heritability

Introduction
Colocasia (*Colocasia esculenta* L. Schott) serves as staple source of diet for people around the world. It is a tropical tuber crop belongs to the monocotyledonous family 'Araceae' (Henry, 2001). It has very high yield potential (30-40 tonnes/ha). It is grown throughout the tropics and subtropics for its tubers and locally known as "*Alu*".

Colocasia is the wealthy source of starch and major components of the diet *viz*., proteins, minerals and vitamins. The peeled tubers after pre-cooking and drying can be used in the preparation of soups, biscuits, breads and beverages. All parts of the plant including corm, cormels, rhizome, stalk, leaves and flowers are edible and contain abundant starch (Bose *et al*. 2003) [1].

The agro climatic conditions of the Konkan region of Maharashtra is favourable for tuber crop production, especially for colocasia. There is diversity in the colocasia types respect to herbage and tuber production. Hence, considering the potential of this crop the present investigation was carried out to evaluate different genotypes of colocasia for tuber yield and yield attributes under coastal ecosystem of Maharashtra.

Material and Methods
The research trial was carried out at the Central Experiment Station, Wakawali, Dapoli (Maharashtra) during *kharif* season of the year, 2016. Sixteen genotypes of colocasia were evaluated in randomized block design with three replications. The preparatory tillage operations were carried out and raised beds of 1.35 × 1.8 m size were prepared. Uniform sized and healthy cormels of every genotype was planted at 60 cm X 45 cm spacing. Fertilizers were applied @ 80kg N: 60 kg P: 60 kg K ha^{-1} along with FYM (10.00 t ha^{-1}). Full dose of P_2O_5 and FYM were applied before planting as basal dose. While, nitrogen and potassium were applied in two equal split doses at 30 and 60 after planting by pocketing method. Recommended intercultureal operations viz, weeding, plant protection were timely carried out. The corm and cormels were harvested at proper maturity stage. The number of cormels produced per plant was counted and the yield of corms and cormels were recorded. The data were analyzed for heritability (Burton and De Vane, (1953) and genetic advance (Johnson *et al*., 1955) [2, 3].

Result and Discussion
The mean values of the corm and cormels yield for the 16 genotypes of colocasia are presented in Table 1. Other components of variances viz. σ2g, σ2p, GCV, PCV, h2 and genetic Advance (%) also presented in Table 2.

The phenotypic expression of the corm and cormels yield of *colocasia* were measured and tabulated for calculating analysis of variance. ANOVA for yield traits of *colocasia* genotypes revealed that all the sixteen genotypes exhibited significant differences (Fig. 1 and 2).

The coefficient of variation (C.V.) was maximum (19.34%) followed by total yield and corm yield. Varma and Pranothkumar (1991) [6] and Sibyala (2013) [5] also reported the variation in the yield of coclocasia genotypes. The variation in the corm development might be associated with the genetic potential of that particular genotype and environmental effect.

The maximum genotypic and phenotypic coefficients were observed for yield of cormels per plant (42.97% and 47.12%, respectively) while these coefficients were lowest in corm yield per plant ((18.59% and 22.32%, respectively). It is revealed that the phenotypic coefficient of variation was higher than genotypic coefficient of variation for yield characters under study representing the influence of environment on the development of characters. The trend also implies that environment plays very important role in expression of different traits.

High heritability (83.16%) was observed for yield of cormels per plant, followed by total yield. High heritability estimates indicate the presence of large number of additive factors and hence these traits may be improved by selection. The genetic advance was highest (80.73%) for cormel yield indicating that the potential of cormel production varied among the genotypes. The results are analogous with Manvendra Singh (2017) [4]

The heritability is an important component for selection because high heritability indicates superiority of genotypes. Hence, characters viz. corm and cormel yield are considered as important components for the selected *colocasia* cultivars which can be effectively used in a crop improvement programme.

Table 1: Analysis of variance (mean sum of squares) for corm and cormel yield in Colocasia Genotypes

Sr. No.	Source of variation/ Characters	Replication	Treatments (Genotypes)	Error	S. Em±	C.D. (at 5%)	C. V. (%)
1.	Weight of mother corm (g/plant)	111.52	709.03	90.97	5.51	15.90	12.35
2.	Yield of cormels per plant(g)	1584.00	11599.68	733.32	15.63	45.16	19.34
3.	Total tuber yield per plant (Corm and cormels) (g)	2535.51	12558.75	806.26	16.39	47.35	13.07

Table 2: Estimates of mean, range, components of variance, heritability and genetic advance for corm and cormel yield in Colocasia genotypes

Sr. No.	Character	Mean	Range	GV	PV	GCV (%)	PCV (%)	h2	GA	GAM (%)
1.	Weight of mother corm (g/plant)	77.20	48.64 - 114.58	206.02	296.99	18.59	22.32	69.37	24.6	31.90
2.	Yield of cormels per plant(g)	140.05	54.38 - 338.94	3622.12	4355.44	42.97	47.12	83.16	113.1	80.73
3.	Total tuber yield per plant (Corm and cormels) (g)	217.25	108.44 – 416.96	3917.50	4723.76	28.81	31.64	82.93	117.4	54.05

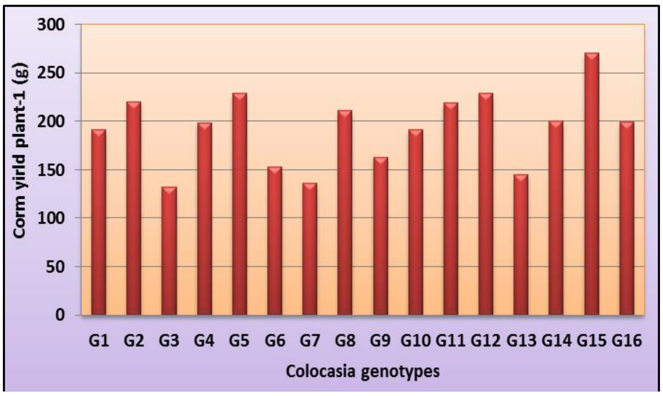

Fig 1: Corm yield in different genotypes of colocasia

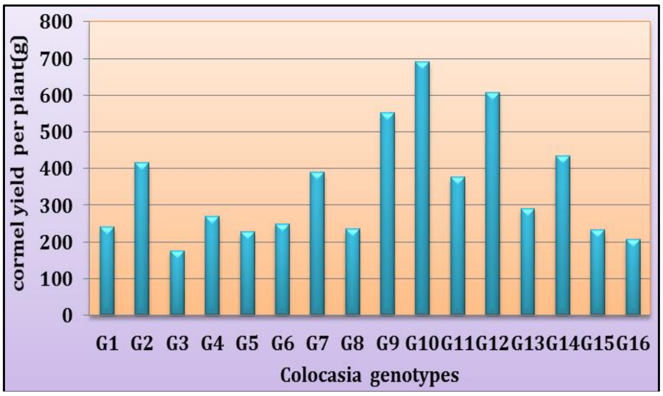

Fig 2: Cormel yield in different genotypes of colocasia

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