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Determination of moisture content in leaf, corms and Cormerls of different Colocasia genotypes

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Abstract
The research trial was carried out during the Kharif season of 2016 at "Central Experiment Station, Wakawali, Dist. Ratnagiri, Maharashtra to to estimate the moisture content in different genotypes of colocasia. The genotype NDB-22 recorded highest average corm weight (216.05 g) followed by Devkibai Walanga (183.39 g) and highest average cormel weight (49.14g) was observed in NDB-9 genotype. The highest leaf moisture content (91.37%) was observed in M-9-111 and it was at par with AC-20 (90.97%), Sree Pallavi (90.73%), Sawantwadi (90.23%), NDB-9 (90.23%), and M-12-429 (88.57%). While, the lowest moisture content was recorded in genotype BCC-11 (80.03%). The highest corm and cormel moisture content (83.50% and 80.43%, respectively) was recorded in NDB-22. There was non significant positive correlation (r = 0.251) between average weight of corm and moisture percentage and non significant negative correlation (r = -190) between the average weight of cormel and moisture content in cormel.

Keywords: Colocasia, moisture content, leaf, corm and cormels

Introduction
Colocasia (*Colocasia esculenta* L. Schott) *is* a tropical tuber crop belongs to the monocotyledonous family 'Araceae'. Colocasia is believed to have originated in South Central Asia, perhaps in Eastern India or Malaysia (Watt, 1989) [3]. Locally, it is known as '*alu'* and grown as tuber crop in Konkan region during *kharif* season. All parts of the plant including corm, cormels, rhizome, stalk, leaves and flowers are edible and contain abundant starch (Bose *et al*. 2003) [1]. Colocasia is a rich source of starch and reasonably good source of major components of the diet *viz*., proteins, minerals and vitamins.
As colocasia is consumed as leafy vegetable the moisture content in leaves is a influential factor for its lustre and shelf life. The moisture content in tuber (corm and cormels) is also important for dry matter estimates, storage. With this view the present investigation was undertaken to estimate the moisture content in different genotypes of colocasia under hot and humid climate of Konkan region.

Materials and Methods
The research trial was carried out during the Kharif season of 2016 at "Central Experiment Station, Wakawali, Dist. Ratnagiri, Maharashtra. The experiment was laid out in Randomized Block Design and 16 genotypes of colocasia were grown in three replications. Each plot was measured in 1.35 × 1.8 m consisted of three rows with 3 plants per row. Accordingly, 9 plants spaced at 60 × 45 cm apart, were accommodated per plot. The picking of leaves was carried as herbage for vegetable purpose. At maturity stage, the corms and cormels of each genotype were harvested and average weight of corms and cormels were caulcualted by taking sample weight or each plant. The moisture content in leaves, corms and cormels were analyzed by standard procedure. The data was statistically analyzed as per the following methods prescribed by Panse and Sukhatme (1985) [2].

Results and Discussion
The data on average weight of corm and cormel, moisture content in leaf, corm and cormels in different colocasia genotypes are presented in Table 1.

Average weight of corm and cormel
The data presented in Table 1 revealed that the colocasia genotypes differed significantly for the corm yield plant^{-1}. The genotype NDB-22 recorded highest average corm weight (216.05 g) followed by Devkibai Walanga (183.39 g), Khed Shiravali (183.05g).

The lowest weight corm (106.01 g) was recorded by M-12-429. The significantly highest average cormel weight (49.14g) was observed in NDB-9 genotype and it was followed by NDB-22 and BCC- 11 and lowest cormel weight was in Khopoli genotype. Similar variations were also reported by Chattopadhyay *et al.* (2006) [4] and Sibyala (2013) [5] in different colocasia genotypes.

The variability in the weight of corm and cormels in colocasia could be due to variation in dry matter accumulation, environment prevailed during the crop growth period and the genetic variation of the genotypes (Singh *et al*., 2003) [6].

Leaf Moisture

The moisture content in the leaves determines the appearance, keeping quality and also the yield of the crop, mostly in leafy vegetables.

The data presented in Table 1 showed that there was a significant difference among the colocasia genotypes for leaf moisture content. The highest leaf moisture content (91.37%) was observed in M-9-111 and it was at par with AC-20 (90.97%), Sree Pallavi (90.73%), Sawantwadi (90.23%), NDB-9 (90.23%), and M-12-429 (88.57%). While, the lowest moisture content was recorded in genotype BCC-11 (80.03%).

Chauhan (2016) [7] also observed the variations in moisture content in indigenous genotypes of water spinach. The results are in accordance with Temesgan *et al.* (2016) [8] who has also reported the variation in leaf moisture content in colocasia. The variation in the leaf moisture content might be due to difference in genetic makeup of specific genotype and its ability to perform in specific environment.

Corm moisture

Significant difference was observed among all the genotypes for moisture content in corm moisture (Table 1). The moisture content was varied from 65.83% to 83.50%. Highest corm moisture content (83.50%) was recorded in NDB-22 and it was at par with Sawantwadi (82.03%), Devkibai Walanga (81.57%) and Kelva (81.03%). Whereas, lowest moisture content (65.83%) was recorded in NDB-9 genotype.

Cormel moisture

Significant difference was observed among all the genotypes for moisture content in cormels (Table 1). The moisture content was varied from 64.30% to 80.43% and highest cormel moisture content was recorded by NDB-22 (80.43%) and it was at par with Sawantwadi (79.50%), Devki bai Walanga (79.37%), Talsure (78.63%), Kelva (78.60%) and AC-20 (78.03%). While, the lowest moisture content (64.30%) was recorded in NDB-9 genotype.

Onwueme (1978) [9] and Angami *et al.* (2015) [10] observed similar differences in different colocasia genotypes for tuber moisture.

The correlation between corm and cormel weight and their respective moisture content are presented in Table 2 and 3, respectively. From the correlation estimates it inferred that there was non significant positive correlation (r = 0.251) between average weight of corm and moisture percentage. However, the non significant negative correlation (r = -190) was observed between the average weight of cormel and moisture content in cormel. The varied moisture content in the corms and cormels might be due to genetic character of the specific genotype and also associated with the dry matter content in the corms and cormels.

The study indicates that the variation in moisture content in the leaves of different colocasia genotype is a way for further screening of genotypes for leafy vegetable purpose. The distinct moisture content in corms and cormels also exhibits the physiochemical property of a particular genotypes.

Table 1: Leaf, Corm and Cormel moisture content in different colocasia genotypes

Genotypes		Average weight of corm (g)	Average weight of cormel (g)	Leaf moisture (%)	Corm moisture (%)	Cormel moisture (%)
G_1	Sanjivini	152.99	24.16	82.17	71.27	69.17
G_2	NDB-9	176.31	49.41	90.23	65.83	64.30
G_3	M-12-429	106.01	17.55	88.57	70.27	67.57
G_4	Mahim	158.99	21.16	84.47	76.37	73.60
G_5	Devkibai Walanga	183.39	23.15	84.23	81.57	79.37
G_6	Sawantwadi	122.24	18.04	90.23	82.03	79.50
G_7	Muktakeshi	108.49	28.23	88.10	73.63	71.57
G_8	Kelva	168.72	25.05	84.47	81.03	78.60
G_9	BCC -11	130.39	32.08	80.03	77.00	75.37
G_{10}	M-9-111	152.96	21.66	91.37	74.20	71.47
G_{11}	Sree Pallavi	175.13	20.94	90.73	73.40	71.07
G_{12}	Khed Shiravali	183.05	18.57	84.70	79.27	77.47
G_{13}	Talsure	116.17	28.84	84.73	79.93	78.63
G_{14}	AC -20	160.17	25.33	90.97	80.70	78.03
G_{15}	NDB-22	216.05	40.99	81.70	83.50	80.43
G_{16}	Khopoli	159.35	13.70	85.60	76.80	75.03
	Mean	154.40	23.74	86.39	76.68	74.45
	SEm (±)	5.51	2.11	0.99	0.90	0.89
	CD (P=0.05)	15.90	6.39	2.84	2.60	2.56

Table 2: Correlation between weight of corm and moisture content

	Average weight of corm (g)	Corm moisture percentage
Average weight of corm (g)	1	
Corm moisture percentage	0.251	1

Table 3: Correlation between weight of cormel and moisture content

	Average weight of cormel (g)	Cormel moisture percentage
Average weight of cormel (g)	1	
Cormel moisture percentage	-0.190	1

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