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## Mean performance study of ridge gourd (*Luffa acutangula* (L.)) Genotypes based on some quantitative and qualitative characters

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**Abstract**

Ridge gourd [*Luffa acutangula* (L.)], is popularly known as Kalitori and also called as angled gourd, angled loofah, silky gourd and ribbed gourd, belongs to Cucurbitaceae family and has chromosome number  $2n = 26$ . Research work was carried out in Centurion University of Technology and Management, student research farm located at Bagusala, Gajapathi district, Odisha with twenty different genotypes in three replicated trails using randomized block design with plot size (4.5m<sup>2</sup>). In individual plot ten plant population was maintained, to study ten different characters as earliness, growth, yield, quality and yield attributing parameters. The studies revealed that earliness is dependent on the number of days taken for its first female flower. The genotype "12-Pata jhinga" showed earliest to open first female flower (40.67) and took minimum days (45.00) to harvest. The genotype "Arka Sujat" recorded maximum vine length (3.84m) and primary branches (7.40). Average fruit weight was recorded maximum in "Chithrala" (233.73g) and fruit length was recorded maximum in the genotype "Arka Sujat" (25.11cm). The genotype "Arka Sujat" was having more number of fruits per plant (11.93). Quality characters like rind thickness was maximum in "Chithrala" (6.45mm) and mean flesh thickness was recorded maximum in eluru local (5.25cm). Fruit Yield was maximum in the genotype "Arka Sujat" (1.00kg/plant). Based on this research work genotypes can be selected for further crop improvement programme.

**Keywords:** genotypes, earliness, growth, yield, quality, yield attributing characters

**1. Introduction**

Ridge gourd (*Luffa acutangula* L. Roxb.), popularly known as Kalitori and called as angled gourd, angled loofah, Chinese okra, silky gourd and ribbed gourd. Ridge gourd belongs to genus *Luffa* of *cucurbitaceae* and has chromosome number  $2n = 26$ . It is originated in India and cultivated in India, Indonesia, Malaysia, Myanmar, Philippines, Sri Lanka and Taiwan. It is one of the popular cucurbitaceous vegetable grown both as spring summer and rainy season crop. It is an annual, monoecious cross pollinating, running vine plants consisting of long taproot system, simple, sharply angled 5-lobed leaves and the fruits are dark green vegetable having white pulp with white seeds embedded in spongy flesh. Fruits vary in size and may be oblong or club-shaped. Cultivated species of ridge gourd are monoecious in Nature with different sex forms viz., androecious, gynoecious, gynomonocious, andromonoecious and hermaphrodite plants are also reported (Choudhary and Thakur, 1965) [2]. It is rich in vitamin A, C and Fe (Yawalkar, 1985) [1]. The genus derives from the product Loofah, which is used in bathing sponges, scrubber pads, door mats, pillows, and mattress and also for cleaning utensils. The present production and productivity of ridge gourd is not sufficient enough to meet the nutritional requirement of increasing population. The productivity of ridge gourd varies from season to season and region to region. Thus, there is a need to identify stable varieties which is suitable for particular season and location. The expression of yield is the outcome of interaction of several characters.

**2. Materials and Methods**

The field experiment was conducted during summer season in 2018 at Bagusala Farm (23°39' N latitude, 87°42' E longitude) of M. S. Swaminathan School of Agriculture, Centurion University of Technology and Management, Paralakhemundi, Gajapati district, Odisha under typical sub-humid and sub-tropical climatic conditions. During the period of experimentation, the maximum and minimum temperature ranged from 43 to 49°C and 15 to 18°C respectively. Crops received negligible rainfall during February to May in 2018. The soil of the experimental plot was sandy loam in texture, slightly acidic in reaction (pH 5.5-6.5). Twenty

different ridge gourd genotypes (T-1 Sweet-16, T-2 Arka sujat, T-3 Anamika-16, T-4 Jaipuri (Verito), T-5 Jaipuri (pandey), T-6 Parlakhemundi local, T-7 Ridge gourd 12 leaves, T-8 12 Pata Jhinja, T-9 Dharidar tori, T-10 Narasanapeta local, T-11 Barapathu, T-12 Saloni-5, T-13 Khuva, T-14 Dusseradhapuram Local, T-15 Pathapatnam Local, T-16 Rankani, T-17 Rasuru, T-18 West Godavari bio seeds, T-19 Eluru Local, T-20 Chithrala) were grown in Randomized Block Design with three replications. Spacing was maintained 1.25cm between the rows and 50cm between the plants. Plot size was maintained 3m in length and 1.5m in breadth. Soil was ploughed with mold board plough followed by rotavator. Farm yard manure (20t/ha) and Fertilizer N: P: K (125:100:50 kg/ha), was applied as basal dose. Weeding was done at 15-day intervals and surface flood irrigation was provided based on the moisture of the soil. In each plot 2 rows are there and a population of 10 plants maintained in a plot. Data were collected randomly from 5 plants for vine length (cm), Primary branches, Fruit length (cm), no of fruits/plant, Individual weight (g), Days to first female flower opening, Days to first harvest, Rind thickness (mm), flesh thickness (cm), and fruit yield kg/plot.

### 3. Results and Discussion

#### 3.1 Earliness parameters

##### 3.1.1 Days to first female flower opening

Days taken from the day of sowing to the anthesis of first female flower was recorded. Among The genotype “12-Pata Jhinga” showed earliness to open first female flower (40.67), and the genotype “Narsanapeta Local” took maximum days (54.93) for female flower appearance. The results are in agreement with the findings of Khatoon *et al.* (2016) [5], Karthik *et al.* (2017) [4] and Bhargava *et al.* (2017) [1].

##### 3.1.2. Days taken to first harvest

No of days taken from the day of sowing to first harvest was recorded as days taken to first harvest. The genotype “12-Pata Jhinga” took minimum days (45.00) to first harvest and the genotypes “Sweet-16”, “Narsanapeta Local” and “Dusseradhapuram Local” took maximum days (58.33) to first harvest. Similar findings were reported by Khatoon *et al.* (2016) [5], Bhargava *et al.* (2017) [1] and Rathore *et al.* (2017) [8].

#### 3.2 Growth, yield and yield attributing characters

##### 3.2.1 Vine length

Vine length was measured at last harvest with the help of meter scale by measuring from base to the growing tip of vine. The genotype “Arka Sujat” recorded maximum vine length (3.84 m) and minimum (2.73m) vine length was recorded in the genotype “Dusseradhapuram Local”. Similar results were obtained by Rabbani *et al.* (2012) [6], Khatoon *et al.* (2016) [5], Karthik *et al.* (2017) [4] and Ramesh *et al.* (2018) [7].

##### 3.2.2 Primary branches

No. of primary branches were counted at last harvest and the observations were recorded. Maximum number (7.40) of

primary branches were observed in the genotype “Arka Sujat” and minimum number (3.650) of primary branches was recorded in the genotype “Pathapatnam Local”. Similar results were obtained by Rabbani *et al.* (2012) [6], Bhargava *et al.* (2017) [1], and Karthik *et al.* (2017) [4].

##### 3.2.3 Fruit length

Length of fruit was measured for selected fruits and expressed in centimeters. Fruit length was recorded maximum (25.11 cm) in the genotype “Arka Sujat” and minimum (13.27) in the genotype “Barapathu” was recorded. The findings were supported by Rabbani *et al.* (2012) [6], Khatoon *et al.* (2016) [5], Bhargava *et al.* (2017) [1] and Karthik *et al.* (2017) [4].

##### 3.2.4 Average fruit weight

Individual fruit weight was recorded by weighing the fruits after harvest. Individual fruit weight was recorded maximum in “Chithrala” (233.73g) and minimum (47.47g) was recorded in the genotype “Narsanapeta Local”. Similar results were obtained by Rabbani *et al.* (2012) [6], Karthik *et al.* (2017) [4] and Bhargava *et al.* (2017) [1].

##### 3.2.5 Number of fruits per plant

Number of fruits per plant was recorded by tagging 5 plants and was recorded at every harvest. The genotype “Arka Sujat” was having more number of fruits per plant (11.93) and the genotype “Narsanapeta Local” is having minimum number (4.80) of fruits per plant. Similar results were reported by Hanumegowda K. (2011) [3], Saklesh (2016) [9] and Yadav *et al.* (2017) [10].

##### 3.2.6 Fruit yield per plant

The total weight of fruit obtained in each harvest was recorded from the five labeled plants and the mean value per plant was calculated and expressed in kg per plant. Fruit yield was maximum in the genotype “Arka Sujat” (1.00 kg/plant) and minimum in the genotype “Rasuru Local” (0.087kg/plant). Similar findings were obtained by Rabbani *et al.* (2012) [6], Karthik D *et al.* (2017) [4] and Bhargava *et al.* (2017) [1].

#### 3.3 Quality parameters

##### 3.3.1 Rind thickness

Fruit rind thickness was measured by using vernier calipers and expressed in millimeter. Rind thickness was maximum in “Chithrala” (6.45mm) and minimum (0.89) in the genotype “Arka Sujat”. Similar findings were reported by Hanumegowda K (2011) [3], Saklesh (2016) [9] and Ramesh *et al.* (2018) [7].

##### 3.3.2 Flesh thickness

Flesh thickness was measured and mean flesh thickness was recorded maximum in “Eluru local” (5.25cm) and minimum in the genotype “Dusseradhapuram Local” (3.73). Similar results were obtained by Hanumegowda K. (2011) [3], Saklesh (2016) [9] and Ramesh *et al.* (2018) [7].

**Table:** Mean performance study of 20 different genotypes on earliness, growth yield and yield attributing characters and quality parameters

Treatments	Vine length(m)	Primary branches	Fruit length	No. of fruits/plant	Average fruit weight	Days to 1st Female Flower opening	Days to 1 <sup>st</sup> harvest	Rind thickness	Flesh thickness	Yield kg/plant
T-1	3.42	4.47	15.67	8.00	142.05	53.93	58.33	3.16	4.84	0.54
T-2	3.84	7.40	25.11	11.93	187.40	49.47	53.33	0.89	4.13	1.00
T-3	2.86	4.60	21.20	7.50	114.40	53.00	56.67	4.74	3.87	0.36
T-4	2.94	4.73	18.21	6.56	147.03	46.40	50.00	3.07	4.49	0.47
T-5	3.29	4.87	18.92	6.73	140.17	50.93	55.00	4.05	4.55	0.39
T-6	3.09	4.27	19.77	7.43	158.83	44.87	48.33	3.95	4.58	0.57
T-7	2.82	5.00	19.11	6.73	151.51	47.07	50.00	4.16	4.25	0.61
T-8	3.18	5.73	19.02	9.56	167.30	40.67	45.00	5.46	4.42	0.91
T-9	2.86	4.20	14.13	7.40	82.27	49.80	53.33	5.91	4.91	0.32
T-10	2.79	3.73	15.13	4.80	47.47	54.93	58.33	4.08	3.84	0.26
T-11	2.81	3.93	13.27	7.36	60.10	42.20	46.67	4.52	4.03	0.24
T-12	3.64	4.27	21.63	8.30	137.20	46.07	50.00	3.94	4.00	0.47
T-13	3.62	4.07	18.14	7.73	194.01	44.40	48.33	4.21	4.67	0.40
T-14	2.73	3.87	15.07	6.73	60.33	54.27	58.33	3.63	3.73	0.23
T-15	2.75	3.65	15.67	8.20	65.60	52.73	56.67	5.88	3.76	0.28
T-16	3.14	4.33	17.93	7.63	229.40	45.67	50.00	2.55	4.63	0.44
T-17	3.00	4.47	17.27	6.56	127.93	53.07	56.67	4.28	4.14	0.19
T-18	3.63	4.20	22.42	7.20	179.10	50.53	55.00	3.79	4.18	0.31
T-19	3.61	5.42	17.03	8.16	188.80	42.07	46.67	5.03	5.25	0.81
T-20	3.27	4.03	23.64	8.76	233.73	47.20	50.00	6.45	5.08	0.68
C.D.	0.31	0.60	2.02	0.51	18.40	5.60	5.58	0.31	0.45	0.04
SE(m)	0.108	0.21	0.70	0.17	6.40	1.95	1.94	0.11	0.16	0.01
C.V.	5.91	7.86	6.60	4.02	7.88	6.96	6.42	4.51	6.15	5.01

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