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Research Note

Per se performance of monoecious cucumber land races

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Abstract
A study was conducted in the Department of Vegetable Science, Tamil Nadu Agricultural University, Coimbatore to assess the performance of 39 monoecious cucumber land races. Number of primary branches were more in the local type Vennamuthupatti local (7.33) and the number of male flowers per plant was minimum in Amaravathi local (38.33). The maximum number of female flowers per plant was recorded in Periyakullappatti local (33.67). Number of fruits per plant was highest in Sankagiri local(11.20). Fruit length ranged from 12.62cm (Musiri local) to 54.83cm (Amaravati local). The fruit girth was lowest in Upilipalayam local (13.2 cm) which produced a slender fruit. Musiri local recorded a high fruit weight (1.65 kg). The maximum yield of 14.77kg/ plant was registered in Sathur local.

Keywords
Cucumber, monoecious genotypes, evaluation, performance, plant and floral traits, yield

Cucumber (*Cucumis sativus* L.) is an important salad vegetable crop belongs to Cucurbitaceae family grown right from tropical to temperate regions in different parts of the world. Cucumber originated in India and became popular throughout the Egyptian and the Greek-Roman Empire (Renner *et al.,*2007). It ranks fourth after tomatoes, cabbage, onion in Asia. (Tatlioglu, 1993, Eifediyi and Remison, 2010). Soft and succulent, the vegetable crop is cherished and eaten in salads or sliced into stew in tropical regions. Its juice is often recommended as a source of silicon to improve the health and complexion of the skin (Duke, 1997). Cucumber is a very good source of vitamins A, C, K, B6, potassium, pantothenic acid, magnesium, phosphorus, copper and manganese, fibre, and antioxidants (Vimala *et al.,* 1999).

Cucumber has a wide usage. It helps in healing diseases of urinary bladder and kidney, digestive problems like heartburn, acidity, gastritis and ulcer (Garcia-Closes *et al.,* 2004). Many cultivars of cucumber exist with varying shapes, size, skin colours, texture, spines, seed content, crispiness, bitterness and water and nutrient content. Cucumber cultivars have a distinctive characteristics/ traits which makes them suitable for a particular environment or condition in terms of tolerances to drought, disease resistance, early maturity, high quality and yield.

With the increased awareness and improvement of living standards, people throughout the world have become more health conscious. Cucumbers with attractive fruit color, high total soluble solids content, crispy without bitterness, less or no seed, good taste with high nutritive value are preferred by the consumer. Accordingly breeding work has to be aimed for the high-yielding stable parthenocarpic gynoecious varieties/hybrids, along with the quality improvement. Hence assessment of the genetic base is necessary for the selection of suitable genotypes to develop a variety or hybrid.

The present investigations on evaluation of cucumber genotypes were carried out in the Department of Vegetable Science, Tamil Nadu Agricultural University, Coimbatore, India. The experimental material comprised land races of 39 monoecious cucumber genotypes (Table 1) collected from different parts of the country. The genotypes were raised in the field during March 2019 to assess their performance and the experiment was laid with two replications. Each genotype consist of ten plants in two rows per replication were raised. As per the recommended package of practice all the required inputs were applied and periodical inter cultural operations were carried out. Observations on marketable yield were recorded on five randomly selected plants in each genotype in all the

replications. Regular pickings from selected plants were made at green tender stage, weighed, added up and the average was taken to arrive the total yield per plant.

The performance was assessed and the genotypes were evaluated for the characters *viz.,* the number of primary branches per plant, the number of male flowers per plant, the number of female flowers per plant, days to first female flower opening, node at which 1st male and female flowers opens, fruit length (cm), fruit girth (cm), fruit weight per plant (kg), fruits per plant and yield per plant (kg). The recorded observations were statistically analysed and the values are presented in **Table 1.**

The study results showed that there was a wide variation among the genotypes for the studied characters. The variation in performance of cucumber cultivars could be as a result of environmental factors and genetic composition which has been widely documented by many researchers. Wide variations for different horticultural traits were earlier reported by Singh *et al.,* (2002), Verma (2003), Kumar (2008), Munshi *et al.,* (2007), Hanchinamani *et al.,* (2008), Kumar *et al.,* (2013), Ranjan *et al.,* 2015 and Bhagwat *et al.,* (2018) in cucumber.

Number of primary branches per plant were maximum in Vennamuthupatti local (7.33). Other genotypes recorded more number of primary branches were Uppiliyapuram local (7.00), Dharmapuri local (6.67), Orathanadu local (6.67), Amaravathi local (6.33), Rasipuram local (6.33), Kancheepuram local (6.33), Kuratachari local (6.33) and Sankagiri local (6.30). Similar estimates for this character in different cucumber genotypes were reported (Ranjan *et al.,* (2015) and Bhagwat *et al.,*(2018).

Number of male flowers per plant was minimum in Amaravathi local (38.33). Lesser number of male flowers per plant was also produced by the genotypes *viz*., Peratayur local (42.67), Gandharva kottai local (43.33), Kattur local (48.00), Thoothukudi local (49.67) and Iniyanur local (49.67). The maximum number of female flowers per plant was recorded in Periyakullappatti local (33.67) and Ponavaraiyakottai local (32.67). The other genotypes which produced more no. of female flowers per plant were Namanasamuthiram local (31.00), Thirupuvanam local (30.00) and Sankagiri local (29.80).

Earliness was measured as days to first female flower opening. The genotype Peratayur local (17.67) took minimum number of days to produce 1st female flower. The genotypes Paravai local (22.33 days) and Kuratachari local (22.67 days) were also recognized for their earliness. Similar estimates for earliness was also observed by in different genotypes of cucumber (Kumar *et al.,* 2017 and Saheb Pal *et al.,* 2017). The results are in line with the findings of Bhagwat *et al.,* 2018 in cucumber for appearance of first male flower at the earliest node, minimum number of days to appearance of first male and female flowers.

The nearest node at which 1st male flower appears was registered in Sempatti local (2.00), followed by the genotypes which produced 1st male flower in the 2.67th node were Gandharvakottai local, Ayyappatti local, Dharmapuri local, Namanasamuthiram loca,l Kuratachari local, Thoothukudi local and Sathur local.

The nearest node at which 1st female flower appears in Musiri local (2.00). The genotypes Vilavayal local (2.33), Sankagiri local (2.47), Iniyanur local (2.67), Kuratachari local (2.67) Kancheepuram local (3.00), Sathur local (3.00), and Sempatti local (3.00) were also recorded favourable values for this trait. Similar estimates for this character in different genotypes of cucumber were also found earlier by Kumar *et al.,* (2013), Kumar *et al.,* (2017),. Saheb Pal *et al.,* (2017) and Bhagwat *et al.,* (2018).

The fruit length ranged from 12.62cm (Musiri) to 54.83cm (Amaravati). Longer fruits were also recorded by the genotypes *viz*., Kancheepuram local (44.80), Sathyamangalam local (44.47) and Gandharvakottai local (44.40). These estimates are in accordance with (Golabadi *et al.,* 2012, Kumar *et al.,* 2017 and Saheb Pal *et al.,* 2017).

The fruit girth was varied from 13.20cm (Upilipalayam) to 27.30cm (Aiyapatti). Slender fruits were produced by Namanasamuthiram local(16.27cm), Kalakurichi local (16.33cm), Kuruvaikarankulam local (16.43cm) and Iniyanur local (16.73cm).

The fruit weight was ranged from 0.64 kg to 1.65 kg/plant. The minimum fruit weight of 0.64 kg /plant was recorded by the genotypes Orathanadu local and Thoothukudi local. The genotype Musiri local recorded high for the single fruit weight (1.65 kg).
The fruit weight was ranged from 0.64 kg (Orathanadu local and Thoothukudi local) to 1.65 kg/plant (Musiri local). For this character, similar estimates were also reported in different set of cucumber genotypes (Kumar *et al.,* 2017, Saheb Pal *et al.,* 2017 and Bhagwat *et al.,* 2018).

Number of fruits per plant was highest in the local type Sankagiri local (11.20) and the lowest in Aiyapatti local (3.33). More number of fruits/ plant was produced by the genotypes *viz.,* Sempatti local (10.6) Sathur local (10.4), Amaravathi local (9.67), Kalacheri local(9.40), Musiri local (9.00) and Periyakullapatti local (8.67). Similar trend of results for this trait was recorded by Shukla *et al.,* (2010), Kumar *et al.,* (2017) and Bhagwat *et al.,* (2018) in cucumber.
A range of 14.77kg to 2.56 kg /plant was observed for yield /plant. The maximum yield of 14.77kg/ plant was registered by Sathur local which was followed by Sempatti local (14.10 kg/ plant) and Sankagiri local (13.89 kg/ plant). The genotypes Periyakullapatti local (11.88 kg/ plant) and Ponavaraiyakottai local (10.01 kg/ plant) were also recognised as high yielders.

Table 1. Growth and yield performance of monoecious cucumber Mean performance of monoecious cucumber for growth and yield

S. No	Local Genotypes	No .of primary branches	No .of male flowers / plant	No .of female flowers / plant	Days to first female flower opening	Node @ 1st male flower open	Node @ 1st female flower open	Fruit length (cm)	Fruit girth (cm)	Single fruit weight (Kg)	No. of fruits/ plant	Yield/ plant (Kg)
1	Gandharva kottai local	4.67	43.33	19.67	31.67	2.67	4.33	44.40	26.10	0.67	5.00	3.35
2	Kattur local	5.33	48.00	18.33	32.33	3.00	5.33	35.30	23.43	0.67	5.67	3.80
3	Aiyapatti local	4.00	55.33	24.67	30.00	2.67	4.67	41.67	27.30	0.77	3.33	2.56
4	Sathyamangalam local	5.00	56.33	26.00	30.33	3.00	3.67	44.47	25.00	0.92	5.67	5.22
5	Paravai local	4.67	66.00	28.00	22.33	3.67	4.00	34.77	17.90	0.87	4.67	4.06
6	Amaravati local	6.33	**38.33**	27.00	28.33	3.33	4.67	54.83	26.17	0.76	9.67	7.35
7	Peratayur local	3.33	42.67	14.67	**17.67**	4.00	5.00	37.03	18.13	1.23	3.67	4.51
8	Iniyanur local	4.00	49.67	21.33	34.33	5.33	2.67	34.93	16.73	1.26	5.33	6.72
9	Udhayalur local	4.33	55.00	22.67	35.00	3.33	4.00	32.93	25.77	1.50	5.00	7.50
10	Rasipuram local	6.33	52.67	19.00	30.33	4.33	5.33	30.93	24.37	0.84	5.00	4.20
11	Peramangalam local	4.00	62.00	12.67	35.00	3.00	4.67	40.00	19.77	0.78	6.00	4.68
12	Melamaruvakadu local	4.67	64.67	25.33	29.67	3.67	3.33	29.80	20.77	0.66	4.00	2.64
13	Vilavayal local	4.67	65.67	18.00	29.00	3.00	2.33	37.07	20.13	0.70	6.67	4.67
14	Karatampatti local	4.67	63.00	19.33	30.00	5.67	4.33	40.43	20.93	1.23	5.33	8.15
15	Kuruvaikarankulam local	4.67	71.67	15.67	37.67	5.33	4.00	43.13	16.43	0.74	5.00	3.70
16	Kanjeepuram local	6.33	60.67	18.00	29.00	3.67	3.00	44.80	20.33	1.27	5.67	7.20
17	Dharmapuri local	6.67	69.00	16.67	33.33	2.67	4.67	41.00	20.97	1.31	3.67	4.81
18	Upilayapuram local	7.00	75.33	20.00	27.33	3.00	5.00	34.47	**13.20**	0.99	5.67	5.61
19	Namanasamuthiram local	5.00	72.67	31.00	35.00	2.67	5.00	36.93	16.27	1.50	5.00	7.50
20	Venamuthupatti local	**7.33**	56.33	16.67	32.67	4.00	4.67	37.80	24.67	1.27	5.67	7.20
21	Orathanadu local	6.67	63.67	14.33	27.33	3.00	6.00	33.60	19.87	0.64	4.67	2.99
22	Kuratachari local	6.33	64.67	17.67	22.67	2.67	2.67	37.87	21.13	0.74	6.67	4.94
23	Pattukottai local	6.00	53.33	20.00	38.00	3.33	4.67	44.00	25.27	1.22	5.67	6.92
24	Thoothukudi local	5.67	49.67	19.33	39.00	2.67	5.00	32.17	24.67	0.64	4.67	2.99
25	Kalakurichi local	5.67	77.00	28.67	32.00	3.00	5.00	44.43	16.33	1.23	5.67	6.97
26	Pondicherry local	4.67	66.33	28.00	33.33	3.33	4.33	32.47	21.10	0.98	4.67	4.58
27	Thirupuvanam local	5.00	75.33	30.00	35.33	3.00	4.33	34.87	18.10	1.45	6.00	8.70
28	Kodavasal local	5.00	71.67	28.67	40.00	4.00	3.00	36.00	23.37	1.45	5.00	7.25
29	Ponavaraiyakottai local	5.67	76.33	32.67	34.00	3.33	3.67	34.90	27.40	1.50	6.67	10.01
30	Thillaiyampuram local	4.00	61.67	22.67	37.00	3.67	3.33	31.60	21.90	1.44	5.67	8.16
32	Acc 927	6.00	75.67	26.67	37.00	3.33	4.33	36.10	23.37	0.85	5.00	4.25
33	Acc 928	4.33	66.00	24.67	34.00	3.67	4.00	34.40	19.87	1.40	6.00	8.40
34	Periyakullapatti local	4.00	62.67	**33.67**	38.67	3.67	3.00	43.10	21.87	1.37	8.67	11.88
35	Sankagiri local	6.30	89.40	29.80	38.40	3.33	2.47	42.02	18.33	1.24	**11.20**	13.89
36	Sathur local	5.20	85.80	26.40	37.40	2.67	3.00	40.42	19.21	1.42	10.40	**14.77**
37	Sempatti local	6.00	88.20	28.60	37.80	**2.00**	3.00	43.82	21.00	1.33	10.60	14.10
38	Musiri local	4.00	79.40	29.60	40.20	3.33	**2.00**	**12.62**	18.15	**1.65**	9.00	9.18
39	Kalacheri local	4.00	62.80	28.00	38.40	3.00	3.67	16.68	17.32	0.99	9.40	9.31
	CD	*1.24*	*9.73*	*2.17*	*2.83*	*0.93*	*1.34*	*5.32*	*1.05*	*0.86*	*2.56*	*2.20*

Based on floral, fruit and yield traits it was found that the genotypes *viz.*, Sankagiri local, Sempatti local, Sathur local, Amaravathi local and Periyakullapatti local were identified as the best performers. These results were similar to the results of Sharma *et al.,* (2000), Hamid *et al.,* (2002) and Bhagwat *et al.,*(2018) who studied the performance of various cucumber cultivars and identified their best performers based on the fruit and yield characters.

The present study result revealed that they were in harmony with the findings of Munshi and Acharya (2005) and Suchitra and Haribabu (2006) for growth parameters in bottle gourd, for yield and yield attributes were recorded by Kumar *et al.,* (2008), Mohd and Khan (2009), Hossain *et al.,* (2010), Reddy *et al.,* (2013) in musk melon, Basumatary *et al.,* (2014) in spine gourd, Janaranjani and Kanthaswamy (2015) in bottle gourd, Khan *et al.,* (2015), Ene *et al.,* (2016), Chinatu *et al.,* (2017), Pushpalatha *et al.,* (2017), Ahirwar and Singh (2018), Tyagi *et al.,* (2018) in bitter gourd and Bhagwat *et al.,* 2018 in cucumber .

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