

Original Research Article

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Performance of Different Parthenocarpic Cucumber (*Cucumis sativus* L.) Hybrids for Yield and Yield Attributing Traits under Shade Net House

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ABSTRACT

Keywords

Cucumber, Parthenocarpic, Shade net, Yield and yield attributes

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A field investigation was conducted to study the effect of shade net house on yield and yield attributes of parthenocarpic cucumber (*Cucumis sativus* L.) hybrids at vegetable research block, Department of Vegetable Science, College of Horticulture, Kolar during 2017-2018. The results indicated a significant difference in all the yield and yield attributing parameters studied. Among the hybrids, Defence recorded maximum fruit length (22.00 cm). Maximum flesh thickness (1.57 cm) and highest fruit diameter (4.22 cm) was found in the hybrid Sargon followed by Menfis (3.92 cm). The hybrid Alexios are better expressed their superiority over other hybrids in terms of average fruit weight (221.60 g), higher fruit yield per vine (7.70 kg), fruit yield per meter square (21.33 kg/m²) and fruit yield per hectare (220.06 t).

Introduction

Cucumber (*Cucumis sativus* L.) is an important member of the family Cucurbitaceae, with a chromosome number $2n = 14$, which comprises of 117 genera and 825 species in warmer parts of the world. Cucumber is truly versatile crop because of wide range of uses from salad to pickles and it is also a good source of vitamin B, C, carbohydrates, calcium, phosphorus, iodine and contains a total of 4-6 per cent of dry substances, approximately 2 per cent sugars, 1 per cent albuminous substances, 0.7 per cent

cellular tissue and 0.1 per cent fat (Rana, 2008). Protected cultivation being the most efficient means to overcome climatic diversity, has the potential of fulfilling the requirements of small growers as it can increase the yield manifolds and at the same time improve the quality of the produce significantly as per the demand of the market. In the recent times, the introduction of parthenocarpic hybrids in cucumber has revolutionized its cultivation under protected cultivation in India. The cultivars have also been key factor for getting maximum yield from protected condition. These can be grown

throughout the year in protected condition with partial shade, high humidity and moderate temperature but the research on evaluation and identification of suitable parthenocarpic hybrids under protected cultivation are needed. Keeping in view the above facts, the present experiment was carried out to find out the suitable parthenocarpic hybrids to get higher yield under shade net house condition.

Materials and Methods

The experiment was conducted under shade net house of 302.4 m² (325) at Department of Vegetable Science, College of Horticulture, Kolar during the year 2017-18. The experiment was laid out in Randomized Complete Block Design involving 18 parthenocarpic cucumber hybrids with three replications on raised beds having dimensions of 100x40x50 cm (width, height & distance between two beds) and plot size of about 3.6 m². The seedlings were raised on soilless media and healthy 18-20 days old seedlings transplanted in the experimental field at a spacing of 60 cm between rows and 60 cm between plants in paired row system. For yield characters, data were recorded on five randomly selected plants in each replication and fruit characters were noted from 10 random fruits from third harvest and observations were recorded on fruit length (cm), fruit diameter (cm), flesh thickness (cm), average fruit weight (g), number of fruits per vine, fruit yield per vine, fruit yield /m²(kg), fruit yield per hectare (t). The recorded data were statistically analyzed at 5 per cent level of significance by following the standard process as per Panse and Sukhatme (1985).

Results and Discussion

The fruit length is the most important desired marketable and commercial character in

parthenocarpic cucumber. The values of fruit length ranged from 11.07 cm to 22.00 cm. The highest fruit length of (22.00 cm) was observed in Defense followed by Borja (21.00 cm). While, the minimum fruit length was recorded in Shinefit (11.07 cm) (Table 1). Among different hybrids, significant variations in fruit length might be due to genetic nature, hormonal factor, vigour of the crop and it could be also due to favorable environmental conditions, which would have influenced availability of auxin to the developing ovary. These results are in accordance with the findings of Sujatha (2017); Kumar *et al.*, (2017); Pragathi (2014); Soleimani *et al.*, (2009) in cucumber. The fruit diameter was highest in Sargon (4.22 cm), while the lowest fruit diameter was recorded in Fadia (2.98 cm) (Table 1). A significant variation with respect to fruit diameter might be due to genetic nature of hybrid, hormonal factor and vigour of the crop which was similar to the findings of Hochmuth and Leon (1996); Kumar *et al.*, (2017) and Soleimani *et al.*, (2009) in cucumber.

Fruit size increases with increase in flesh thickness resulting into high fruit diameter and fruit weight. The flesh thickness shows significant differences among different hybrids. The hybrid Sargon (1.57cm) recorded maximum flesh thickness (Table 1). However, the minimum fruit flesh thickness was recorded in Apsara (1.12 cm). This could be due to inherent characteristics of hybrid. These results were in line with the findings of Kengar (2011). Fruit weight is one of the key yield components which are positively associated with yield. Hence, giving reliance on fruit weight would be useful for achieving fruitful results. In the present study, the maximum average fruit weight was recorded in the hybrid Alexios (221.60 g). Whereas, minimum average fruit weight was noticed in the hybrid Shinefit (78.27 g). The yield of hybrid directly influenced by average fruit

weight. The present findings are close conformity with the findings of Sujatha (2017); Pragathi (2014); Singh *et al.*, (2012); Kumar and Verma (2012); Parashar (2016) and Tiwari and Sharma (1999) in cucumber.

The number of fruits per vine is the most important yield attributing character which ultimately determines the productivity of the crop. In the present study all the parthenocarpic hybrids of cucumber significantly varied with respect to the fruit yield per vine. Among all the hybrids highest number of fruits were harvested from the hybrid Shinefit (37.90). However, least number of fruits was harvested from the hybrid Sunstar (24.87) (Table 2). This might

be due to ideal weather factors under protected condition, higher level of auxin and lower level of abscissic acid accumulation in gynocious varieties of cucumber and more accumulation of photosynthates in leaves and its mobility to developing fruits. This ultimately favoured more fruit set. These results were in accordance with the findings of Parashar *et al.*, (2016); Kumar *et al.*, (2017); Cardoso and Silva (2003); Sideman (2011). The data revealed that the maximum fruit yield per vine, fruit yield per meter square and fruit yield per hectare were significantly influenced by various cultivars having a range of 7.70 kg/vine, 21.33 kg/m² and 220.06 t/ha, respectively. The maximum values of these traits have been reported for hybrid Alexios.

Table.1 Fruit length (cm), fruit diameter (cm) and flesh thickness (cm) of parthenocarpic cucumber hybrids under shade net house

Sl. No.	Hybrids	Fruit length (cm)	Fruit diameter (cm)	Flesh thickness (cm)
1	Apsara	17.00	3.12	1.12
2	Deltastar	18.03	3.61	1.38
3	Borja	21.00	3.50	1.35
4	Defense	22.00	3.20	1.32
5	KUK-64	20.10	3.41	1.24
6	Shinefit	11.07	3.65	1.25
7	Valleystar	15.37	3.54	1.24
8	Sargon	17.07	4.22	1.57
9	Fadia	15.20	2.98	1.13
10	Silyon	16.50	3.31	1.33
11	Menfis	16.30	3.92	1.54
12	Kafka	15.63	3.25	1.25
13	Multistar	15.93	3.40	1.32
14	Alexios	20.80	3.91	1.56
15	Corinto	19.07	3.56	1.25
16	KUK-53	17.63	3.61	1.31
17	Sunstar	16.83	3.53	1.27
18	KPCH-1	16.43	3.43	1.23
Mean		17.44	3.51	1.31
S Em ±		0.37	0.06	0.04
CD (p = 0.05)		1.07	0.16	0.12
CV (%)		3.69	2.82	5.41

Table.2 Average fruit weight (g), number of fruits per vine, Fruit yield per vine (kg), fruit yield/m² (kg) and fruit yield/ha (t) of parthenocarpic cucumber hybrids under shade net house

Sl. No.	Hybrids	Average fruit weight (g)	Number of fruits per vine	Fruit yield per vine (kg)	Fruit yield/m ² (kg)	Fruit yield/ha (t)
1	Apsara	150.40	35.07	5.28	14.64	150.96
2	Deltastar	186.47	26.27	4.90	13.58	140.10
3	Borja	201.13	31.70	6.44	17.85	184.12
4	Defense	199.53	27.73	5.41	15.00	154.67
5	KUK-64	171.47	29.83	5.10	14.12	145.65
6	Shinefit	78.27	37.90	2.97	8.23	84.84
7	Valleystar	166.93	36.57	6.11	16.94	174.68
8	Sargon	220.67	32.40	7.15	19.81	204.36
9	Fadia	156.40	32.93	5.05	14.00	144.43
10	Silyon	163.93	33.33	5.42	15.02	154.89
11	Menfis	184.67	30.67	5.53	15.32	157.97
12	Kafka	155.97	31.83	4.93	13.67	141.02
13	Multistar	165.67	35.73	5.83	16.14	166.51
14	Alexios	221.60	34.90	7.70	21.33	220.06
15	Corinto	187.80	32.33	5.85	16.21	167.19
16	KUK-53	186.60	30.67	5.73	15.86	163.62
17	Sunstar	172.77	24.87	4.29	11.89	122.69
18	KPCH-1	147.47	28.67	4.24	11.74	121.14
Mean		173.21	31.88	5.44	15.08	155.49
S Em ±		12.40	0.59	0.39	1.12	11.56
CD (p =0.05)		35.63	1.70	1.11	3.22	33.23
CV (%)		12.40	3.22	13.74	12.88	12.88

It was due to major yield attributing characters such as number of fruits per vine, fruit length, fruit diameter and average fruit weight. It has been observed that the formation of photosynthates, their partitioning and distribution for the final sink were higher inside the shade net. The similar findings were reported by Sujatha (2017); Pragathi (2014); Hebbar *et al.*, (2012); Parashar (2016); Premalatha *et al.*, (2006) and Hochmuth and Leone (1996).

The results indicated a significant difference in all the yield and yield attributing parameters studied. The maximum average fruit weight was observed in the hybrid Alexios (221.60 g). However, with respect to fruit length, hybrid Defense (22.00 cm) was recorded highest fruit

length. Whereas, maximum fruit diameter was observed in the hybrid Sargon (4.22 cm). The hybrid Alexios are better expressed their superiority over other hybrids in terms of average fruit weight (221.60 g), higher fruit yield per vine (7.70 kg), fruit yield per meter square (21.33 kg/m²) and fruit yield per hectare (220.06 t).

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