Response of different panchagavya levels on yield attributes of bitter gourd (*Momordica charantia*L.*)*

ABSTRACT

The field experiment on response of different panchgvaya levels on yield atributes of bitter guard (*Momordica charantia* L.) was conducted at Horticulture Research Farm, Department of Horticulture, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology And Sciences, Prayagraj during January to July, 2023. The experiment was laid out in Factorial Randomized Block Design (FRBD) with three replications and eighteen treatment combination. The experiment consisted of two factors. Factor:1 hybrids as (TMBI-1309, TMBI-3346, VNR22) and Factor:2 Different concentration of Panchagavya Control (water spray), 1% spray of Panchagavya, 2% spray of Panchagavya, 3% spray of Panchagavya, 4% spray of Panchagavya, 5% spray of Panchagavya. TMBI-3346 was recorded significantly higher yield attributes of bitter gourd over other hybrids in parameters like fruit weight (99.91 g), fruit length (15.64 cm), number of fruits per plant (37.0), fruit yield per plant (3.73 kg) and fruit yield (331.42 q/ha). Among The different Panchagavya treatments, 5% spray of Panchagavya resulted in significantly better fruit weight (104.66 g), fruit length (15.92 cm), number of fruits per plant (37.2), fruit yield per plant (3.90 kg) and fruit yield (346.99 q/ha). The interaction effect of TMBI-3346 + 5% spray of panchagavya resulted in significantly higher yield parameters.

Keywords: *Bitter gourd hybrids, Panchagavya and Bitter gourd.*

Introduction

Bitter gourd (*Momordica charantia* L.), is an important vegetable crop and is grown for its immature tuberculate fruits which have a unique bitter taste. It belongs to the family “Cucurbitaceae”. It is also known as bitter melon, bitter cucumber, balsam-pear, bitter apple, or bitter squash. This vegetable is also called karela in India, nigauri in Japan, goya in Okinawa, ampalaya in the Philippines, and ku-gua throughout China. Momordica charantia likely originated in eastern India or southern China. Today, it is found growing in fields across Asia, though it has also become popular in the Caribbean and South America. There are several types of bitter gourd, but the two most common are Chinese bitter gourd and Indian bitter gourd. Fruits are considered to be a rich source of vitamins and minerals and it

contains 88 mg vitamin C per 100g.sBitter gourd is rich in a number of important antioxidants as well. In fact, half a cup of fresh bitter gourd accounts for about 93% of recommended daily intake of vitamin C. The younger the fruit, the more vitamin C it contains. Bitter gourd has been used as a folk remedy for tumors, asthma, skin infections, gastro intestinal problems.

Bitter gourd thrives in warm and humid climates, typically in temperatures required from 24°C to 30°C (75°F to 86°F). The ideal soil for its cultivation is well-drained loamy soil with a pH level around 6.0 to 7.0. As bitter gourd plants spread quite vigorously nutrient management becomes crucial for optimal yield. The use of organic and inorganic nutrients increased fruit length, diameter, weight, number and yield of bitter gourd and now a days more emphasis is given to nutrients of organic region, among which Panchagavya is a potential nutrient supplier.

Panchagavya is a term used in Ayurveda for fermented product made from five ingredients obtained from cow such as milk, urine, dung, curd and butter (Amalraj *et al.* 2011). In Sanskrit, all these five products are individually called "Gavya" and collectively termed as Panchagavya. The panchagavya is an efficient plant growth stimulant that enhances the biological efficiency of crops. It is used to activate soil and to protect the plants from diseases and also increase the nutritional quality of fruits and vegetables. It may be used as a foliar spray, as soil application along with irrigation water, seed or seedling treatment etc. Three per cent panchagavya is an ideal concentration for the foliar spray. Bio- chemical properties of panchagavya revealed that it possesses almost all the major nutrients like N, P, K and micro nutrients essential for plant and growth hormones like IAA and GA required for crop growth. Role of foliar applied panchagavya in production of many plantations crops has been well documented in India (Selvaraj, 2003). Panchagavya is a popular foliar nutrition prepared by organic growers of Tamil Nadu as an indigenous material and used widely for agricultural and horticultural crops (Swaminathan *et al.* 2007).

Material methods

The field experiment was conducted in the Department of Horticulture, Naini Agricultural Institute, Sam Higginbottom University of Agriculture, Technology And

Sciences, Prayagraj during January to July, 2023. The experiment was laid out in Factorial Randomized Block Design (FRBD) with three replications. The experiment consisted of two factors Factor A: (TMBI-1309, TMBI-3346, VNR-22) and six levels of Panchagavyaspray*i.e.*,(Factor B)0 %, 1 %, 2 %, 3 %, 4 %, 5 %**.** In each hill had one plant at a spacing of 150 cm x 75 cm.

Results and Discussion

The data on yield attributes of bitter gourd after application of Panchagavya was recorded and is presented in Table 1 and illustrated through Fig 1. Among the treatments with respect to the yield attributes of bitter gourd. Yield attributes of bitter gourd varies significantly between different hybrids and Panchgavyatreatments.Hybrid TMBI-3346 recorded significantly higher fruit weight (99.91 g), fruit length (15.6cm), number of fruits per plant (37.0), fruits yield per plant (3.73 kg) and fruit yield per hectare (331.42 q/ha) and the lower in TMBI-1309 hybrid of fruit weight (90.4g), fruit length (13.79cm), number of fruits per plant (31.3), fruits yield per plant(2.85 kg) and fruit yield per hectare (253.4 q/ha). Were recoded in hybrid TMBI-1309. Among the panchgavya treatments 5% spray result in the higher fruit weight (104.66 g), fruit length (15.92 cm), number of fruits per plant (37.2), fruit yield per plant (3.90 kg),and fruit yield per hectare (346.99 q/ha) while lower fruit weight (83.5g), fruit length (13.09cm), number of fruits per plant (30.2), fruits yield per plant(2.52kg) and fruit yield per hectare (224.41q/ha).were recorded in 5 % spray of Panchagavya.

The interaction effect of hybrids and Panchgavya levels resulted in significantly difference among the treatments. higher fruit weight of (110.27 g) was reported in hybrids TMBI-3346 with 5% Panchgavya spray which was found to be at par with treatment combination VNR-22 + 4% Panchgavya spray (102.5 g) and VNR-22 + 5% Panchgavya spray (103.7 g), while as lower weight of(80.67 g) was reported in TMBI-1309 with 0% Panchgavya spray. and higher fruit length of (16.96 cm) was reported in hybrids TMBI-3346 with 5% Panchgavya spray which was found to be at par with treatment combination TMBI 3346 + 4% Panchgavya spray (16.71 cm) and TMBI-3346 + 3% Panchgavya spray (16.01 cm) and VNR-22 + 5% Panchgavya spray (15.78 cm) and VNR-22 + 4% Panchgavya spray (15.53.cm) while as lower fruit length of (12.55 cm) was reported in TMBI-1309 with 0% Panchgavya spray. and higher number of fruit per plant (40.5) was reported in hybrids TMBI-3346 with 5% Panchgavya spray which was found to be at par with treatment combination TMBI 3346 + 4% Panchgavya spray (39.8) and TMBI-3346 + 3% Panchgavya spray (39.1)

and VNR-22 + 5% Panchgavya spray (37.1) and VNR-22 + 4% Panchgavya spray (37.5) while as lesser number of fruit per plant (27.4) was reported in TMBI-1309 with 0% Panchgavya spray. and higher yield per plant (4.46 kg) was reported in hybrids TMBI-3346 with 5% Panchgavya spray which was found to be at par with treatment combination TMBI 3346 + 4% Panchgavya spray (4.31 kg) and TMBI-3346 + 3% Panchgavya spray (4.05 kg) and VNR-22 + 5% Panchgavya spray (3.85 kg) and VNR-22 + 4% Panchgavya spray (3.79) while as lesser yiled per plant (2.21 kg) was reported in TMBI-1309 with 0% Panchgavya spray. and higher yield quintal per hactare (396.66 q/ha) was reported in hybrids TMBI-3346 with 5% Panchgavya spray which was found to be at par with treatment combination TMBI 3346 + 4% Panchgavya spray (383.28 q/ha) and TMBI-3346 + 3% Panchgavya spray (359.93 q/ha) and VNR-22 + 5% Panchgavya spray (341.92 q/ha) and VNR-22 + 4% Panchgavya spray (336.9 q/ha) while as lesser yiled per plant (196.69) was reported in TMBI-1309 with 0% Panchgavya spray.

Significantly more number of fruits per plant was recorded with 5% spray of Panchagavya which might be due to presence of auxin and kinetin in Panchagavya which upon application might have favoured the plants to produce more number of fruits per plantSignificant and longer vine was recorded with the application of 5% spray Panchagavya which may be due to its optimum concentration as it contains auxin which leads to apical dominance and gibberellic acid that leads to cell elongation and cell division resulting in increased vin length These findings are in close conformity with those of Gore and Sreenivasa (2011)in tomato (*Lycopersicon esculentum* L. Mill.) Sivakumar (2014), Swain *et al.* (2015) in chilli (*Capsicum annum* L.) cv. Kuchinda local. Significant and higher fruit yield was recorded with application of 5% spray of Panchagavya which might be due to microbes present in Panchagavya that produces growth hormones which may cause increase in fruit weight, number of fruits/plant. These findings are in close conformity with those of Boraiah*et al.* (2017) and Suchitra *et al.* (2017). In capsicum (*Capsicum annum* L. *var grossum*).and .and Abelmoschus esculentus L.

Table: 1 Effect of panchagavya on fruit of different hybrids of bitter gourd

	Fruit weight (g)				Fruit length (cm)				Number of fruits per plant			
Treatment	**TMBI-1309**	**TMBI-3346**	**VNR-22 (check)**	**Mean**	**TMBI-1309**	**TMBI-3346**	**VNR-22 (check)**	**Mean**	**TMBI-1309**	**TMBI-3346**	**VNR-22 (check)**	**Mean**
Water control	80.67	87.49	82.48	83.55	12.55	13.80	12.92	13.09	27.4	32.5	30.6	30.2
1% PG	82.65	91.54	88.74	87.64	12.96	14.69	14.21	13.95	28.9	34.0	32.9	32.0
2% PG	88.74	98.18	92.82	93.25	13.71	15.64	14.54	14.63	30.8	36.3	34.0	33.7
3% PG	92.31	103.62	98.75	98.23	13.94	16.01	15.26	15.07	32.7	39.1	36.5	36.1
4% PG	97.98	108.37	102.49	102.95	14.60	16.71	15.53	15.61	33.9	39.8	37.0	36.9
5% PG	99.99	110.27	103.71	104.66	15.01	16.96	15.78	15.92	34.0	40.5	37.1	37.2
Mean	90.39	99.91	94.83		13.79	15.64	14.71		31.3	37.0	34.7	
Factors	**F Test**	**SE(d)**	**$CD_{0.05}$**		**F Test**	**SE(d)**	**$CD_{0.05}$**		**F Test**	**SE(d)**	**$CDS_{0.05}$**	
Factor H	S	1.739	3.669		S	0.344	0.726		S	0.839	1.770	
Factor B PG	S	2.459	5.188		S	0.487	1.027		S	1.186	2.503	
H x PG	S	4.259	8.986		S	0.843	1.778		S	2.055	4.336	

: PG = Panchgavya H = Hybrids

Table: 2 Effect of panchagavya on yield of different hybrids of bitter gourd

	Yield per plant (kg)				Yield (q/ha)			
Treatment	**TMBI-1309**	**TMBI-3346**	**VNR-22 (check)**	**Mean**	**TMBI-1309**	**TMBI-3346**	**VNR-22 (check)**	**Mean**
Water control	2.21	2.84	2.52	2.52	196.69	252.55	224.00	224.41
1% PG	2.39	3.12	2.92	2.81	212.62	277.12	259.45	249.73
2% PG	2.76	3.59	3.18	3.18	244.87	318.97	282.91	282.25
3% PG	3.02	4.05	3.60	3.56	268.15	359.93	320.08	316.05
4% PG	3.33	4.31	3.79	3.81	295.62	383.28	336.90	338.60
5% PG	3.40	4.46	3.85	3.90	302.40	396.66	341.92	346.99
Mean	2.85	3.73	3.31		253.39	331.42	294.21	
Factors	**F Test**	**SE(d)**	**$CD_{0.05}$**		**F Test**	**SE(d)**	**$CD_{0.05}$**	
Factor H	S	0.134	0.283		S	11.902	25.112	
Factor B PG	S	0.189	0.400		S	16.832	35.513	
H x PG	S	0.328	0.692		S	29.155	61.511	

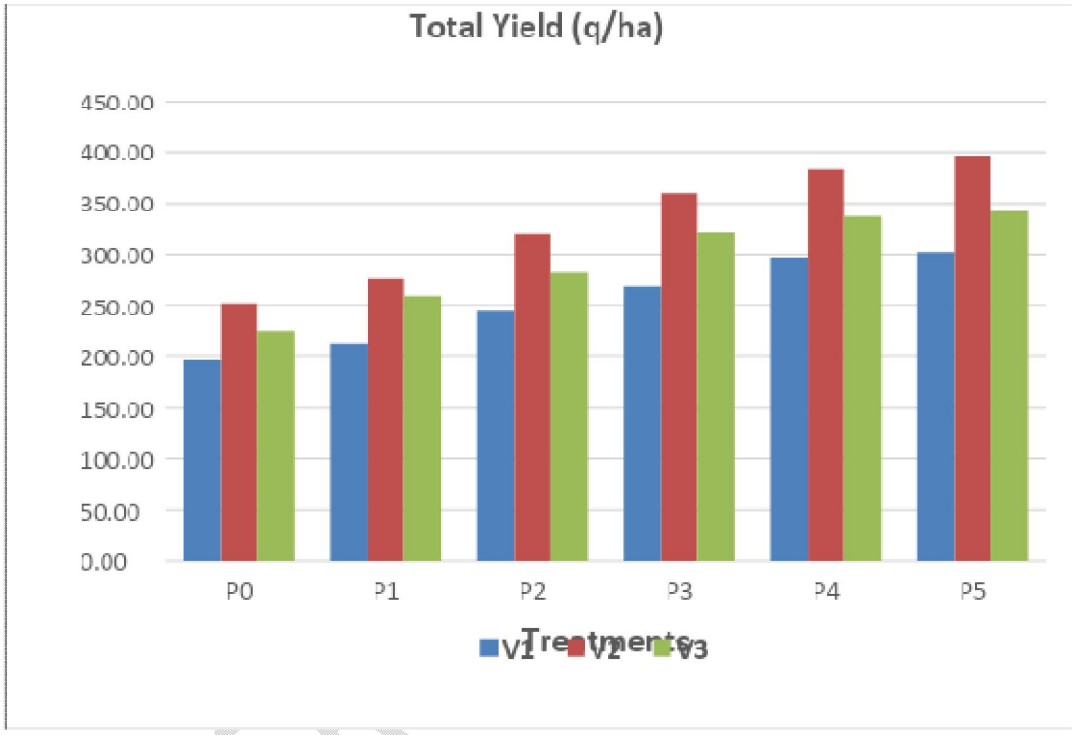

Fig. 1 Effect of panchagavya on yield (q/ha) of different hybrids of bitter gourd

Conclusion

Based on the results of the present investigation entitled “Response of Different Panchagavya Levels on Yield Attributes of Bitter Gourd (*Momordica charantia* L.)" it is concluded that among the different treatment combination of hybrids and Panchagavya levels TMBI-3346 + 5% spray of Panchagavya Performed significantly better in yield attributes of bitter gourd.

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