



Growth assessment of tinda gourd (*Praecitrullus fistulosu*) germplasms

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ABSTRACT

A field experiment was conducted to identify growth pattern and morphological traits of 16 varietal lines of Tinda gourd specie (*Praecitrullus fistulosus*) germplasms. The field experiment was conducted in olericulture area of Institute of Horticultural Sciences, University of Agriculture, Faisalabad. One local variety as check with fifteen genotypes of Tinda gourd was grown in Olericulture field. Flat beds technique as growing medium was applied in field for seeds to germinate. Data on germination percentage, days to flowering, male flower ratio, female flower ratio, length of vine in (cm) and tendrils which were taken as phenotypically. Data were analyzed statistically by using method ANOVA and their means were compared by using SE techniques. The maximum Germination percentage ($G_{\%}$), DTF (days to flowering), MF (male flower), FF (female flower) and LV (length of vine) were recorded was L_0 (94.00), L_0 (54.33), L_{11} (110.33), L_{11} (14.33) and L_0 (55.33) and the minimum were recorded was L_4 (74.00), L_{11} (35), L_3 (80), L_7 (9) and L_1 (46) cm respectively. Treatments showed different results according to regarding parameters while tendrils were present and coiled.

KEYWORDS: *Praecitrullus fistulosus* analysis germination, flowering, male and female flower ratio, length of vine and tendrils

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INTRODUCTION

Tindagourd (*Praecitrullus fistulosus*) is the member of cucurbitaceae family and it is one of the unique and important summer annual vegetable grown almost wide range of Indo-Pakistan. It is palatable and good in taste recommended by chefs and medical doctors so it is considered as Dilpasand. Plants of cucurbitaceae family are herbaceous and climbing annuals which include seven hundred species and about ninety genera that have additional characters which are having tendrils typically in coiled shape and five angled semi hard stems [1].

Tinda gourd mainly cultivated and grown in the plain areas where sea level approximately altitude of one thousand meter, where they required sunny warm conditions of in between 25 to 30°C at day light. In night it requires 18°C but gains less in cooler climate and humidified areas of coast level. In east India the growing season of Tinda is either in dry season from February to April and also in rainy season on monsoon mid of June to end of July. The roots of Tinda required light sandy soils where it penetrates easily in depth. More fertile to less fertile is suitable for early open end of the vegetative cover [2].

Unisexual flowers are somewhat action morphic always. Prolonged and short epigenous zone perianth that carries 3 to 6 calyx lobes and 3 to 6 petals in amount and 3 to 6 lobed corollas are present. Androecium which are highly variable if consisted of five basically connate stamens which are distinct and frequently twisted, less in amount and folded. Compound and pistil carpels are carrying gynoecium at style branches with one lobed style attached to stigma with some carpels in it, and ovary with having one locule which carries 2 to 5 placental ovules with many ovules or may be three locules in placental axil point [3].

It sounds good when we achieved level of significant of gene diversity is remain preserved and easily available to growers. It helps in achieving high yield of crops and neglected Tinda and other vegetable food crops which are not used either on country and in worldwide research programs which are known as minor and neglected vegetable crops [4].

The real achievements are considered in this research are on the base of this field experiment, the morphological and taxonomic characters were to determine the amount of diversion within

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Tinda (*Praecitrullus fistulosus*) specie cultivars and to observe the degree of diversion which are related to potential of cultivars are to observe the current status of its morphology by using statistical techniques.

MATERIAL AND METHODS

The field research was conducted in the Olericulture field of Institute of Horticultural Sciences, University of Agriculture, Faisalabad during 2017 session. The site situated in Faisalabad Pakistan was elevated at 186 m above the sea level. The lines were planted on beds and starts at early April month in 2017. Ten seeds were sown on each single bed. No chemical treatment was used before seed sowing. The layout of crop was done by ploughing and planking before sowing and FYM recommended dose were mixed in it. Sixteen varieties with one check included were used as material by using randomized block design RCBD and three replications. The seed material was obtained from NARC, Islamabad. Each bed contains 10 plants and bed size was 15 × 5 ft where Plant to Plant distances were maintained at 1.5ft and Bed to Bed were maintained at 2ft respectively. First irrigation was done immediately after sowing of seeds. Hoeing and weeding were done at 14 to 15 days of interval when the soil in moist slightly. Recommended NPK fertilizer was mixed in soil before sowing. Canal water is used to irrigate the Tinda beds two times in a week due to raise in temperature. Intercultural practice is done to avoid competition between weeds and vines. Three plants per lines were marked for data recording and recorded data were observed and compiled after taking their mean averages. Data on Germination percentage, days to flowering, male flower ratio, female flower ratio, length of vine in cm and tendrils were subjected to statistical analysis using the STATISTIX statistical software (Version 8.1) and the mean values were compared using least significant difference (LSD) multiple range test P:0.5% [5].

RESULTS AND DISCUSSIONS

All influencing factors are directly involved on lines of tinda gourd germplasm which include sowing date of Tinda seeds, cultural practices during research period, environmental factors that are faced, genetic diversity of a Tinda lines when compared and their modification, available nutrients in soil and nature and habitat of plants [6-7]. 75 percent of NPK which is recommended dose and FYM in included in soil to enhance growth parameters. A similar major improvement in growth parameters due to addition of fertilizers and recommended dose has been reported by [8] in cucurbits, [9] and in tinda gourds and [10] in cucurbits vines.

The presenting data in Table 1 indicate that maximum germination percentage for Tinda lines was observed in local check variety L_0 which is (94.00) percent when compared to other genotypes lines. There was a clear significant difference in lines or germination percentage. Between them, the variety L_4 showed 74% germination percentage which is closely followed by line L_6 (76.66) and line L_{11} (77.66) percent. Similar results were concluded by [11] in muskmelon, in which he stated that late

Table 1: Growth assessment of tinda gourd (*Praecitrullus fistulosus*) germplasm

Lines	G%	DTF	MF	FM	LV (cm)
L_0	94.00 a	54.33 a	99.00 bc	11.33 ab	55.33 a
L_1	81.33 efg	38.33 fg	98.67 bc	11.33 ab	46.33 f
L_2	86.33 bcd	42.66 de	88.00 defg	10.00 b	50.33 cd
L_3	77.33 ghi	45.00 cd	80.67 g	12.66 ab	47.66 ef
L_4	74.00 i	39.66 ef	82.33 g	12.33 ab	51.33 bc
L_5	80.66 efgh	47.33 bc	90.33 cdefg	10.00 b	48.33 def
L_6	76.66 hi	42.66 de	84.33 fg	10.00 b	54.00 a
L_7	87.00 bc	49.33 b	94.00 bcdef	9.00 b	51.33 bc
L_8	81.00 efg	38.00 fg	101.33 ab	12.66 ab	53.33 ab
L_9	82.33 def	50.00 b	96.00 bcde	11.66 ab	50.00 cde
L_{10}	79.33 fgh	39.66 ef	90.00 cdefg	11.66 ab	48.33 def
L_{11}	77.66 ghi	35.33 g	110.33 a	14.33 a	51.33 bc
L_{12}	89.33 b	47.66 bc	97.67 bcd	12.66 ab	47.66 ef
L_{13}	90.00 ab	44.33 cd	94.33 bcdef	9.33 b	48.66 def
L_{14}	79.66 fgh	43.00 de	96.33 bcde	10.33 b	49.66 cde
L_{15}	84.00 cde	46.66 bc	87.00 efg	9.33 b	50.00 cde
LSD	4.06	3.64	10.51	3.88	2.38

G%= Germination percentage, DTF=Days to flowering, MF=Male flower, FM=Female flower, LV=Length of vine

sowing will require minimum number of days for germination in muskmelon due to raise in temperature.

The maximum days required by line to flowering were noted down in local check variety which is L_0 (54.33) days when compared to other genotype lines. There was a significant difference in lines for days to flowering. All them, the variety L_{11} showed up 35 days to flower which is closely followed by line L_1 (38.33) and line L_8 (38.00). Similar findings were also observed by [11] in muskmelon.

The maximum male flower amount during whole time were observed in L_{11} (110.33) when compared to other genotype lines and the local variety L_0 (99.00) which is used as check. There was a noticeable difference in male flowering lines. Among them, the line L_3 showed 80 total male flower ratios closely followed by L_4 (82.33) in whole period. The appearance of first male flowers had occurred in the main stem or primary branch itself, even before pinching and shedding itself, hence this practice had not had any much effect of first male flowers quantity and appearance. This result is in conformity with the results reported by [12] in bitter gourd.

The maximum female flowers of lines were recorded in line L_{11} (14.33) when compared to other genotype lines and local variety used as check L_0 (11.33). There were a much significant differences in female flowering lines. Among them, the line L_7 showed total 9 female flower ratios closely followed by line L_{13} (9.33) and line L_{15} (9.33). By higher rate of photosynthesis and accumulation of photosynthates due to it fact of a greater number of leaves, leaf area and efficiencies might had made this higher numbers of female flowers production. This is in conformity with the results reported by [13].

The maximum length of vine of Tinda gourd was observed in local check variety L_0 (55.33) and in L_6 (54.00) when compared to other genotypes. There was a significant difference in vine

length for lines. Among them, the line L₁ showed 46 cm in length closely followed by line L₃ (47.66) and line L₁₂ (47.66). The decrease in vine length could probably be due to decrease in microbial population and activity and not easy availability of macro and micronutrients by application of NPK [14-15]. Earlier report [16] in bottle gourd and in pumpkins are in support with this findings.

Tendrils are lateral and extra axillary leaves which are thread like in nature and spirally coiled a constant organ present on vines of cucurbitaceae. The only genus where tendrils are absent is known as Ecballium. Tendrils are not available in earlier and in young seedlings of cucurbits because it arises after 4th to 7th nodal stage after seedling grows [17]. In recorded lines of tinda gourd germplasms, the tendrils are mainly present and coiled shaped in all of its genotypes.

CONCLUSION

Through these growth parameters, the amount of diversity within Tinda (*Praecitrullus fistulosus*) cultivars were observed clearly and the degree of accessions differentiation were detected.

REFERENCES

1. Kader AA. Pre- and postharvest factors affecting fresh produce quality, nutritional value, and implications for human health. Proceedings of the international congress food production and the quality of life, sassari, Italy, September, 2002;1:109-119.
2. Sultana S. Indigenous knowledge of folk herbal medicines by the women of district Chakwal, Pakistan. Ethnobotanical Leaflets. 2006;1:26.
3. Akwaowo EU, Ndon BA, Etuk EU. Minerals and anti nutrients in fluted pumpkin (*Telfairia occidentalis* Hook f.), Food Chem. 2000;70:235-240.
4. Rasul MG, Hiramatsu M, Okubo H. 2007. Genetic relatedness (diversity) and cultivar identification by randomly amplified polymorphic DNA (RAPD) markers in teasle gourd (*Momordica dioica* Roxb.). Sci. Hortic. 111:271–279.
5. Steel RGD, Torrie JH. Principles and Procedure of Statistics. McGraw Hill Book Co., Inc. Singapore, 1997;173–177.
6. Bhunia SR, Chauhan BS, Yadav BS, Bhati AS. Effect of phosphorus, irrigation and rhizobium on productivity, water use and nutrient uptake in fenugreek (*Trigonellafoenum-graecum*). Indian J. Agron. 2006;51:239-241.
7. Kumar S, Singh D, Nepalia V. Performance of fenugreek (*Trigonellafoenum-graecum*) varieties at various fertilizer levels and biofertilizer inoculations. Indian J. Agric. Res. 2002;79:80-83.
8. Chattoo A, Singh KDN, Prasad M. Effect of organic manures and biofertilizers on growth and yield of garlic. Indian J. Agric. Sci. 2007;82(1):31-34.
9. Chettri M, Thapa U. Effect of biofertilizers and plant growth promoting bacteria on growth attributes and tuber yield of potato (*Solanum tuberosum* L.) Haryana J. Hort. Sci. 2006;35(122):143-145.
10. Zayed MS. Improvement of growth and nutritional quality of Moringa oleifera using different biofertilizers. Annu. Agric. Sci. 2012;57(1):53-62.
11. Farooq MM. Effect of different time of sowing on the yield and quality of muskmelon under agro-climatic conditions of Dera Ismail Khan. M.Sc. Thesis, Department of Horticulture, Faculty of Agriculture, Gomal University, DI Khan, Pakistan. 1992.
12. Rasco OA, Castillo SP. Flowering patterns and vine pruning effects in bitter melon. Philippine Agriculturist. 1990;73(4):311-322.
13. Singh BM. Effect of pruning, spacing and fertilizer levels on flowering, fruiting, yield and quality of muskmelon. Haryana J. Hort. Sci. 1982;12(1):64-68.
14. Azarmi R, Fivheh PS, Satari MR. Effect of vermicompost on growth, yield and nutritional status of tomato (*Lycopersiconesculentum*). Pak. J. Biol. Sci. 2008;11(140):1797-1802.
15. Ekinici M, Dursun A. Effects of different mulch materials on plant growth, some quality parameters and yield in melon (*Cucumis melo* L.) cultivars in high altitude environmental condition. Pak. J. Bot. 2009;41(4):1891-1901.
16. Hamid RB, Maral M, Nesa H. Effects of vermicompost application and nitrogen fertilizer rates on fruit yield and several attributes of eggplant (*Solanum melongena* L.) in Iran. World Appl. Sci. J., 2011;15(2):175-178.
17. Singh S.P. Biodiversity in shape, size and colour of flowers and fruits of cucurbits. Biodiversity, Breeding, and Production in Uttar Pradesh. 2013;pp. 1-108.