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CHARACTERIZATION OF CHERRY TOMATO (*Solanum lycopersicum* L. var. *cerasiforme*) GERMPLASMS FOR HORTICULTURAL TRAITS IN WEST GARO HILLS, MEGHALAYA

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ABSTRACT

An experiment was carried out at demonstration unit, Biotech KISAN Hub, Tura to evaluate fifteen germplasm lines of cherry tomato for its superiority during the year 2023. The experiment was carried out using a randomized block design having three replications. The experimental material consisted of a total of 15 germplasms of cherry tomato which were collected from different parts of West Garo Hills district of Meghalaya, India. The germplasm lines were evaluated for 22 traits *viz;* thickness of stem (cm), height of the plant (cm), number of primary branches plant^{-1}, number of secondary branches plant^{-1}, days to 50% flowering, number of flower clusters plant^{-1}, number of flowers in a flower cluster, days to first fruit set, number of fruits in a cluster, number of fruits plant^{-1}, days to first fruit maturity, days to first fruit harvest, number of locules fruit^{-1}, length of fruit (cm), breadth of fruit (cm), weight of fruit (g), 1000 seed weight (g), length of peduncle (cm), thickness of pericarp (mm), days to last fruit harvest, yield (g) plant^{-1}. The analysis of variance indicated significant variation for all the characters under study. Based on the findings of this research, germplasm MLG-4, MLG-8 and MLG-3 were found superior for growth and other yield related characters. Therefore, these germplasms could be considered useful in further breeding programme for improvement of fruit yield and other fruit characters ultimately towards yield in cherry tomato.

(Key Words: Cherry tomato, germplasm, morphological, selection, traits)

INTRODUCTION

Tomato (*Solanum lycopersicum* L.) belongs to the family Solanaceae having about 90 genera and divided into two sub families, solanoideae and cestroidaea. The genus lycopersicon under the sub family solanoidae has the genome, 2n=2x=24, the basic chromosome being x=12.

In the sub-solanoidae, the genus Lycopersicon belongs to the largest tribe, Solaneae which includes 18 genera, the largest being Solanum and the smallest, lycopersicon, the two closely related genera (Swarup,2014). According to Rick *et al*. (1976) all the species of tomato are native of Western South America. Cherry tomato botanically known as *Solanum lycopersicum* (L).var. *Cerasiforme* is regarded as a botanical variety of the cultivated tomato. Cherry tomato considered to be the probable ancestor of all cultivated tomatoes as per Ramya *et al*. (2016). Both, the modern tomato (*Solanum lycopersicon* L.) and cherry tomato [*Solanum lycopersicon* (L). *var. Cerasiforme*] which can be easily intercrossed as stated by Swarup (2014). Cherry tomato is a popular, summer season, table purpose tomato with smaller fruit size with a bright red color similar to a cherry which is having an excellent taste which have been reported by Charlo *et al.* (2007) in his study of production of cherry tomato under protected cultivation carried out with different types of pruning and spacing. Cherry tomatoes are classified into determinate and indeterminate based on their growing habit. Considering the popularity of the crop, its potentiality and prospect, there is an urgent need for proper improvement of this crop so as to develop superior varieties over conventional varieties which will be well suitable for the specific region as well as specific purpose. Therefore, it is necessary to find out the prospects and potential of cherry tomatoes and steps have to be taken to improve the crop by evaluating the cultivated species for its different desirable traits under various agro-climatic conditions. This will also aid in obtaining and recording a thorough information regarding the amount of genetic variability existing in that region for the various important characters. The evaluation of different morphological characters and their association are very much important for better understanding of the nature and the extent of variability present in different genotypes. More the diversity in germplasm lines provides greater opportunities for selection of desired types. In West Garo Hills region of Meghalaya, there are several land races and germplasm of cherry tomato available with a considerable

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extend of variability with respect to various morphological traits and are grown and maintained by local farmers by their own indigenous methods. Therefore, in order to characterize and identify the potential germplasm of cherry tomato from this region the present investigation was undertaken with an objective to assess the morphological characters of cherry tomato germplasm lines in West Garo Hills, Meghalaya.

MATERIALS AND METHODS

The field experiment of the investigation entitled "Characterization of cherry tomato (*Solanum lycopersicon* L. var. *cerasiformae*) germplasm for horticultural traits in West Garo Hills, Meghalaya" was carried out during the year 2023 at demonstration unit of Biotech KISAN Hub, Tura, West Garo hills, Meghalaya. The experimental material comprised of a total of 15 germplasm lines of cherry tomato which were collected from different parts of West Garo Hills District of Meghalaya, India. The experiment was arranged out in a randomized block design with three replications. The seeds were sown on 3rd February, 2023. The spacing between the rows was kept 60 cm while within the row it was 60 cm. The fruits were first harvested on 25th April, 2023 and last harvesting was done on 15th May, 2023. All the recommended cultural practices by Indian Council of Agricultural Research were adopted for proper growth of the crop during the crop growing period. Observations were recorded according to NBPGR descriptor for cherry tomato. Data were recorded on five plants which were randomly selected with respect to individual character like thickness of stem (cm) which was measured at fruiting stage using measuring tape, height of the plant (cm) measured as average of 5-10 random plants from the ground level to the tip of the main stem just before last harvest, total number of primary branches plant^{-1} and it was recorded as average of five randomly selected plants at the end of flowering stage. Total number of secondary branches plant^{-1} was also recorded as average of five randomly selected plants at the end of flowering stage, days to 50% flowering of the plants in field was observed as number of days from transplanting date to the date when at least 50% of the plants showed flower open , total number of flower clusters in a plant was recorded as average of same 5-10 plants at flowering stage, total number of flowers in a flower cluster was recorded as average of 5 random clusters at flowering stage, number of days taken to first fruit set was counted as number of days from the date of transplanting to date of first fruit set, total number of fruits in a cluster was recorded as average of 5 random clusters at marketable stage, total number of fruits plant^{-1} was recorded as average of 5-10 plants at near maturity stage, days taken to first fruit maturity was recorded as number of days from the date of transplanting to date of plant attaining physical maturity (turning stage), days taken to first fruit harvesting was recorded as number of days from the date of transplanting to the date of first fruit harvest at breaker stage (80% maturity), total number of locules fruit^{-1} was recorded as average of 5-10 random fruits at near maturity stage, length of the fruit (cm) after harvesting was measured from stem end to blossom end, to one decimal place, at maturity with the help of Vernier calipers, breadth of fruit (cm) after harvesting was measured at the largest diameter of cross sectioned fruits to one decimal place, at maturity with the Vernier calipers and scale, weight of fruit (g) was recorded as average weight of 5-10 fruits at near maturity stage, total number of seeds fruit^{-1} was recorded by observing five matured fruits which were selected from the germplasm lines, 1000 seed weight (g) was observed by extracting the seeds for measuring fresh weight and then these were sun dried and the hundred dried seeds were then weighed, length of peduncle (cm) was recorded as average of 5-10 random fruits at marketable stage, thickness of pericarp (mm) was recorded as average of 5-10 fruits from an equatorial section of the fruit using Vernier calipers at near maturity stage, days taken to last fruit harvest was recorded as number of days from date of sowing/ transplanting to the date of last marketable fruit harvest and total yield of fruits in a plant (g) was recorded as average of cumulative yield of all pickings in same 5-10 selected plants at near maturity stage.

Statistical analysis of the data was completed using the mean values of genotypes for horticultural traits. The mean values of germplasm lines in each replication were used for analysis. The data were analyzed as per randomized block design or RBD (Panse and Sukhatme, 1957).

RESULTS AND DISCUSSION

The statistical analysis of the data showed substantial differences among the germplasm lines for all the quantitative characters under study. It clearly indicated that there was a sufficient variability for each trait among the genotypes selected for the study. The observations were recorded on five plants from each treatment in all the replications for yield of fruits and its related characters were taken under consideration for calculating the mean performance of the germplasm lines [Table 1(a), 1(b) and 1(c)].

Stem thickness (cm)

Stem thickness (cm) was found significantly highest in germplasm MLG-15 (1.33) and MLG-13 (1.27). Next to these, Germplasm lines MLG-9 (1.17), MLG-6 (1.13), MLG-7 (1.03), MLG-12 (1.03), MLG-2 (0.97) and MLG-1 (0.93) were also found significantly moderate in stem thickness (cm). MLG-14 (0.77), MLG-8 (0.77), MLG-10 (0.80), MLG-3 (0.80), MLG-5 (0.87), MLG-4 (0.87), and MLG-11(0.90), recorded significantly lowest for the character stem thickness (cm). In similar line, Kanneh *et al.*(2017) reported stem girth in the range of 2.91cm to 5.64 cm in cherry tomato and stem thickness in the range of 6.75 cm to 9.9 cm in tomato, respectively. In the present experiment, significant differences in stem thickness might be due to the genetic constitution of genotypes, soil fertility, congenial environmental condition and site of location.

Number of primary branches plant^{-1}

The number of primary branches plant^{-1} was recorded significantly highest in germplasm MLG-1 (13.66) followed by germplasms MLG-15 (12.33), MLG-5 (11.66), MLG-13 (11.33) and MLG-14 (11.33) whereas, it was found significantly lowest in germplasm MLG-3 (6.33) followed by MLG-12 (7.33), MLG-4 (7.33), MLG-7 (7.66), MLG-10 (7.66), MLG-2 (7.66), MLG-9 (8.00), MLG-8 (8.00), MLG-6 (8.00), and MLG-11 (8.66) respectively. In previous studies by Renuka *et al.* (2014) and Hassan *et al.* (2017) also reported in their study that the range of number of primary branches plant^{-1} was recorded from 4.67 to 13.67 and 5.7 to 12.7 in cherry tomato, respectively**.** Thokchom *et al.* (2024) reported number of primary branches in Indian mustard in the range of 3.55-7.37. The variation in the number of primary branches might be due to the genetic makeup of the germplasm lines.

Number of secondary branches plant^{-1}

The number of secondary branches plant^{-1} was observed significantly maximum in germplasm MLG-1 (29.33) followed by MLG-5 (28.66), MLG-15 (27.00) and MLG-14 (26.66), MLG-13 (26.33) and MLG-11 (22.66) and significantly minimum was recorded in germplasm MLG-3 (17.33) followed by MLG-12 (17.66), MLG-4 (18.00), MLG-9 (18.33), MLG-10 (18.66), MLG-8 (19.00), MLG-2 (19.00), MLG-7 (20.00), MLG-6 (20.00), MLG-11 (22.66) and MLG-13 (26.33). Kumar *et al.* (2014) reported number of secondary branches in the range of 9.20 to 45.87 in cherry tomato. Dhongade *et al.* (2019) assessed mutant of mustard varieties and found the range of number of branches from 4.27-6.4 at harvesting stage. Thokchom *et al.* (2024) also reported number of secondary branches in Indian mustard in the range of 3.55-6.39. The differences in the observation might be due to genetic makeup of the plants and environmental conditions.

Days to 50% flowering

It was found that germplasm MLG-8 took 42.66 days to produce 50% flowers which was longest among all the germplasms, meanwhile the shortest days to produce 50% flowering was found in germplasm MLG-11 which was 33.66 days. From the table1(b), it is clear that the character days to 50% flowering was observed significantly highest in germplasm MLG-8 followed by germplasms MLG-10 and MLG-6. It was also found significantly moderate in germplasms MLG-1, MLG-2, MLG-3, MLG-7, MLG-9, MLG-5, MLG-15 and MLG-4. Whereas, it was found significantly lowest in germplasm MLG-11 followed by MLG-12, MLG-14 and MLG-13. Kumar *et al.* (2014) observed the days to 50% flowering in cherry tomato in the range of 25.67 -39.67 days. Thokchom *et al.* (2024) also reported the days to 50% flowering in Indian mustard in the range of 53.33-72 days. In the present experiment the significant difference in flowering might be due to genetic make-up of the plants and earliness of plants. Prema *et al*. (2011) stated that it also might be due to their advance ability to keep available assimilates to the apex during the sensitive development phase before flower initiation.

Fruit count cluster^{-1}

The fruit count cluster^{-1} was observed significantly maximum in germplasm line MLG-10 (6.00) followed by MLG-1 (5.80), MLG-3 (5.80), MLG-5 (5.80) and MLG-4 (5.70). Germplasms MLG-11 (5.60), MLG-15 (5.60), MLG-9 (5.40), MLG-14 (5.40), MLG-8 (5.30), MLG-12 (5.30), MLG-2 (5.20) and MLG-13 (5.20) were found significantly moderate whereas, germplasms MLG-6 (4.60) and MLG-7 (4.00) were found significantly lowest in fruit count cluster^{-1}. Krishnamoorthy *et al.* (2016) reported highest of 5.13 number of fruit count cluster^{-1} in cherry tomato. In this present experiment, a significant variation among the germplasm lines pertaining to fruit count cluster^{-1} might be because of inherited potential of the germplasm lines retorting to available nutrients and other growing conditions.

Days to first fruit set

The parameter number of days to first fruit set ranged from 41 days (MLG-12 and MLG-11) to 50.33 days (MLG-8) and it was noted significantly highest in germplasms MLG-8 (50.33), MLG-10 (49.66), MLG-6 (48.66) and MLG-1 (48.33). While, germplasm lines *viz;* MLG-7 (47.00), MLG-9 (46.66), MLG-5 (46.00), MLG-2 (45.66), MLG-3 (44.33), MLG-4 (44.33) and MLG-15 (44.33) were found significantly moderate for days to first fruit harvest. Germplasms MLG-13 (43.66), MLG- 14 (42.00), MLG-11 (41.00) and MLG-12 (41.00) found significantly lowest in days to first fruit set. Prashanth (2003) reported a similar range from 25.00 to 41.00 days in cherry tomato with an average of 34.78 days. Kumar (2014) also reported a range of 30.67 to 40.33 days with an average of 35.22 days in cherry tomato. The early fruit setting might be due to high rate of anther dehiscence, higher viability of pollen and well response of germplasm to surrounding environmental conditions.

Number of flowers cluster^{-1}

Total number of flowers cluster^{-1} was noted significantly maximum in germplasms MLG-3 (5.80), MLG-5 (5.70), MLG-4 (5.60) and MLG-11 (5.40). It was also noted significantly moderate in germplasms MLG-12 (5.40), MLG-15 (5.40), MLG-14 (5.30), MLG-10 (5.20), MLG-13 (5.20), MLG-2 (5.00), MLG-8 (4.80), MLG-1 (4.80), MLG-9 (4.70) and found significantly minimum in germplasms MLG-7 (4.30) and MLG-6 (4.40). Kumar (2014) also reported similar finding regarding number of flowers cluster^{-1} in cherry tomato with a range from 4.47 to 8.93. The significant differences in this character among the germplasm lines might be because of their inherent genetic potentiality for producing flowers.

Number of clusters plant^{-1}

The number of clusters plant^{-1} was recorded significantly maximum in germplasms MLG-5 (32.00) and MLG-1 (30.33). Next to these germplasm lines MLG-15, MLG-14, MLG-13, MLG-4, MLG-2, MLG-9, MLG-12, MLG-3, MLG-8 and MLG-10 were also found significantly moderate in number of clusters plant^{-1}. Germplasms MLG-6, MLG-7 and MLG-11 recorded significantly minimum number of clusters plant^{-1}. In the present experiment, significant differences in

the number of clusters plant^{-1} might be due to the source of collection, location and genetic makeup of germplasm lines.

Fruit count plant^{-1}

For the parameter fruit count plant^{-1}, it was recorded significantly highest in germplasm MLG-5 (182.40) followed by significantly moderate in germplasms MLG-15 (145.87), MLG-1 (145.53), MLG-14 (139.55), MLG-4 (137.93), MLG-3 (135.27), MLG-13 (131.73), MLG-12 (127.60), MLG-2 (121.60), MLG-11 (119.20), MLG-10 (114.47), MLG-9 (111.20) and MLG-8 (107.20). While, significantly lowest fruit count was observed in germplasms MLG-6 (87.93) and MLG-7 (90.30). In earlier experiments, Kumar (2014) reported range of 42.60 to 238.27 in number of fruits in cherry tomato while, Aguire and Cabrera (2011) reported an average of 96.1 fruit count plant^{-1} in cherry tomato. Singh *et al.* (2025)noted number of tubers plant^{-1} of 750.33 g in potato. In this present study, significant differences in fruit count plant^{-1} might be due to genetic constitution of genotypes, their source of collection and location site.

Days to first fruit maturity

Ripening of the fruits started from 72.33 days (MLG-6) to 84.66 days (MLG-1). The days to fruit maturity was recorded significantly delayed in germplasms MLG-1 (84.66) and MLG-4 (84.66). Germplasms MLG-2 (81.66), MLG-7 (80.66), MLG-9 (80.00), MLG-8 (79.66), MLG-3 (79.00), MLG-10 (77.66), MLG-14 (77.66), MLG-15 (76.66), MLG-5 (75.33), MLG-11 (74.33) and MLG-12 (74.30) were found moderately delayed to first fruit maturity and early maturity was recorded in germplasm MLG-6 (72.33). Kumar (2014) stated that 72 to 79.67 days required for first fruit maturity with an average of 76.69 days in cherry tomato. The significant variation among the germplasm lines with respect to the number of days taken to fruit maturity might be due to genetic makeup of germplasm and environmental condition.

Days to first fruit harvest

From Table 1(b) it is clear that days to first fruit harvest was found significantly delayed in germplasms MLG- 4 (91.33), MLG-1 (91.00) and MLG-7 (87.66) and found significantly and moderately delayed in germplasms MLG-2, MLG-8, MLG-14, MLH-3, MLG-13, MLG-15, MLG-10 and MLG-5. It was found significantly earlier in germplasms MLG-6, MLG-9 and MLG-12. Kumar (2014) noted the range of 83.67 to 87.67 days to first fruit harvest. Early harvest of the crop in this present study might be because of response of genotype to the amiable growing conditions and early flowering habit and delayed fruit harvest might be due to late flowering in the plants. It could also be attributed due to inherent genetic potential of germplasm.

Fruit length (cm)

For the parameter fruit length, it was found significantly maximum in germplasms MLG-8 (2.03 cm) and MLG-6 (2.00). It was found significantly moderate in germplasms MLG-7 (1.80), MLG-5 (1.76), MLG-10 (1.76), MLG-9 (1.73), MLG-1, (1.66) and MLG-3 (1.66). But significantly lowest fruit length was found in germplasms MLG-15 (1.36), MLG-11 (1.43), MLG-2 (1.43), MLG-12 (1.50), MLG-13 (1.53), MLG-14 (1.56) and MLG- 4 (1.56). In the initial study, Sarkar *et al.*(2018) reported a range of 2.1 cm to 3.7 cm in fruit length cherry tomato. Increase in fruit length might be due to the genetic character of germplasms and it might be also be due to more buildup of carbohydrates owing to greater rate of photosynthesis which caused the fruit to increase in length.

Fruit breadth (cm)

Fruit breadth (cm) was recorded significantly highest in germplasms MLG-8 (2.06), MLG-6 (2.03), MLG-7 (2.03) and MLG-9 (1.96) while, significantly moderate fruit breadth was recorded in germplasms MLG-5 (1.83), MLG-10 (1.76), MLG-3 (1.73) and MLG-14 (1.70). The germplasms MLG-1 (1.63), MLG4 (1.63), MLG-12 (1.63), MLG-11 (1.53), MLG-15 (1.53), MLG-13 (1.50) and MLG-2 (1.46) found significantly lowest in fruit breadth. Earlier, Sarkar *et al.* (2018) reported fruit width in the range of 2.26 cm to 3.39 cm in cherry tomato.

Fruit weight (g)

Fruit weight was recorded significantly highest in germplasms MLG-8 (8.19), MLG-9 (7.97) and MLG-4 (7.70) and fruit weight was found significantly moderate in germplasms MLG-6 (6.40), MLG-3 (6.39), MLG-7 (6.04) and MLG-2 (5.67). But fruit weight was recorded significantly lowest in germplasms MLG-15 (4.29), MLG-11 (4.14), MLG-14 (3.74), MLG-5 (3.58), MLG-12 (3.31), MLG-10 (3.10), MLG-1 (3.07) and MLG-13 (2.95). In previous work of Sarkar *et al.*(2018) also reported fruit weight of cherry tomato in the range of 5.5g to 15g. The significant variation in average fruit weight might be due to genetic make-up of germplasm lines and inverse relationship existing between average fruit weight and fruit count plant^{-1}.

Peduncle length (cm)

Peduncle length (cm) was recorded significantly maximum in germplasm MLG-11 (4.50) and found significantly moderate in germplasms MLG-9 (4.10), MLG-2 (3.80), MLG-12 (3.80), MLG-1 (3.60), MLG-13 (3.60), MLG-6 (3.60), MLG-3 (3.30), MLG-14 (3.20), MLG-15 (3.10), MLG-10 (2.90) and MLG-7 (2.80). It was found significantly minimum in germplasms MLG-8 (2.40), MLG-5 (2.50) and MLG-4 (2.60). Variation in the finding might be due to genetic makeup of the germplasm lines and prevailing environmental conditions.

Pericarp thickness (mm)

The observation recorded for the character thickness of pericarp ranged from 0.84 mm (MLG-5) to 2.64 mm (MLG-13). It was recorded significantly highest in germplasms MLG-13, MLG-12, MLG-9 and MLG-14 followed by significantly moderate in germplasms MLG-10, MLG-15, MLG-11, MLG-1, MLG-3, MLG-6, MLG-8, MLG-7, MLG-2 and MLG-4. Pericarp thickness (mm) was found significantly lowest in MLG-5 (0.84 mm).

In past research, Renuka *et al.*(2014) reported pericarp thickness in the range of 0.20 mm to 0.67 mm in cherry tomato. According to Kumar (2014) least thickness of pericarp of some germplasm lines can be because of their genetic character of particular small fruited tomato genotypes. In the present study, the significant differences in pericarp thickness might be due to genetic constitution of germplasm.

Number of locules fruit^{-1}

Number of locules fruit^{-1} recorded in the range of 2.00 (MLG-10) to 4.00 (MLG-12) and it was found significantly highest in germplasms MLG- 12 (4.00), MLG-4 (3.66), MLG-9 (3.66), MLG-5 (3.33), MLG-6 (3.33), MLG-14 (3.33) and MLG-8 (3.33) while, rest of the germplasm lines MLG-11, MLG-13, MLG-15, MLG-1, MLG-2, MLG-3, MLG-7 and MLG-10 were found significantly lowest in number of locules fruit^{-1}. In previous research, Kumar *et al.*(2014) reported range from 2.00 to 3.80 in number of locules fruit^{-1}, in their evaluation of cherry tomato for yield and quality characters. The significant differences of locules number fruit^{-1} exist among the germplasms of the present investigations might be due to genetic make-up of germplasms.

Seed count fruit^{-1}

Seed count fruit^{-1} was found significantly maximum in germplasms MLG-6 (86.66), MLG-15 (86.66), MLG-8 (80.66), MLG-11 (80.66) and MLG-12 (80.66) and it was found significantly moderate in germplasms MLG-9, MLG-7, MLG-3, MLG-14, MLG-10 and MLG-1. But germplasms MLG-2, MLG-5, MLG-13, MLG-4 and MLG-1 found to be significantly minimum in seed count fruit^{-1}.Sarkar *et al.*(2018) reported in the previous studies that total seed count fruit^{-1} ranged from 35.5 to 82.00 in cherry tomato. In the present experiment, the significant differences in seed count fruit^{-1} might be because of genetic makeup of the germplasm lines.

1000 seed weight (g)

Thousand seed weight (g) was found significantly highest in germplasms MLG-10 (2.07), MLG-7 (1.96) and MLG-5 (1.80) and it was found significantly lowest in germplasms MLG-9 (1.76), MLG-6 (1.65), MLG-1 (1.62), MLG-8 (1.59), MLG-4 (1.54), MLG-3 (1.52), MLG- 11 (1.51), MLG-12 (1.51), MLG-2 (1.50), MLG-14 (1.48), MLG-15 (1.41) and MLG-13 (1.40).Thokchom *et al.* (2024) also reported 1000 seed weight in Indian mustard in the range of 2.26-5.13g. The light weight of seeds of the genotypes might be because of genetic composition of the species *cerasiforme* (Kumar *et al.*, 2014).

Plant height (cm)

Plant height (cm) at final harvest stage was found significantly maximum in germplasms MLG-1 (111.83) and MLG-5 (110.33) and found significantly moderate in germplasms MLG-15 (91.33), MLG-14 (89.30), MLG-13 (87.30) and MLG-7 (77.00). The germplasm lines MLG-6 (74.00), MLG-12 (73.66), MLg-8 (73.66), MLG-2 (73.33), MLG-11 (71.66), MLG-4 (70.66), MLG-9 (70.06), MLG-10 (69.26) and MLG-3 (68.00) found to be significantly lowest in plant height.In earlier research by, Kumar *et al.* (2014) also reported a range of 40.13 cm to 168.47 cm in plant height of cherry tomato. Dhongade *et al*. (2019) also reported a range of 156.07cm-195.07 cm of plant height in their assessment of mustard mutants. Thokchom *et al.* (2024) reported plant height in the range of 103.36 cm – 172.26 cm in Indian mustard. Singh *et al.*(2025) noted maximum plant height at 30 DAS (27.00 cm) in potato. The significant differences in the present study among the different germplasm in regard to plant height might be due to genetic variation existing in genotypes, availability of soil nutrients and environmental conditions.

Days to last fruit harvest

Days to last fruit harvest was found significantly highest in germplasms MLG-4 (126.66), MLG-12 (122.33) and MLG-13 (121.66) and it was also found moderately significant in germplasms MLG-3 (121.33), MLG-8 (120.66, MLG-11 (119.33), MLG-7 (117.66), MLG-9 (116.33) and MLG-15 (115.00). Days to last fruit harvest was found significantly lowest in germplasms MLG-14 (112.66), MLG-6 (112.33), MLG-5 (112.00), MLG-10 (111.00) and MLG-2 (109.66).

Kumar *et al.*(2014) also reported in their findings the range of 110 to 120.33 in cherry tomato. The significant differences in the number of days to last fruit harvest might be due to genetic constitution of germplasm, flowering habits, and environmental conditions.

Yield (g) plant $^{-1}$

Yield (g) plant^{-1} was recorded significantly maximum in germplasm MLG-4 (1062.06) and it was also found significantly moderate in germplasms MLG-9 (886.26), MLG-8 (877.96), MLG-3 (864.37), MLG-2 (689.47), MLG-5 (652.99), MLG-15 (625.78), MLG-6 (562.75), MLG-7 (545.41) and MLG-14 (521.91). However, significantly lowest yield (g) plant^{-1} was recorded in germplasms MLG-11 (493.48), MLG-1 (446.77), MLG-12 (422.35), MLG-13 (388.60), and MLG-10 (354.85).

In previous research, by Sarkar *et al.* (2018) range of fruit yield plant^{-1} was recorded from 620 g to 1350 g in cherry tomato. In another finding reported by Behera *et al*.(2019) it was recorded that yield of tomato was found highest (1260 kg ha^{-1}) using ridge furrow system of irrigation along with organic mulching. Ram *et al*.(2023) also reported highest seed yield of 1415 kg ha^{-1} in cowpea variety GC-5 and stover yield of 2414 kg ha^{-1} in cowpea variety GC-6. The significant variation with respect to fruit yield (g) plant^{-1} can be because of genetic factor, growing conditions and different geographic locations of germplasm collection point. Higher yield in the germplasms of this study might be because of several reasons like, early flowering, having a greater number of fruit clusters plant^{-1}, a greater number of leaves, higher weight of fruits which in turn help in increasing the activity of photosynthesis and finally resulted in producing higher yield in a plant.

The ANOVA showed that the mean sum of square among the different treatments were significant for all the characters under study. In line with the experimental findings

from the present research, on the basis of yield and yield attributing traits like number of fruit count plant^{-1}, fruit weight (g), fruit length (cm), fruit breadth (cm), days to first fruit harvest, superior germplasms were identified. Such germplasms were MLG-4, MLG-8 and MLG-3. Hence, these germplasms could be considered as a useful source of suitable germplasm line in breeding programme for further improvement of fruit yield and other characters in cherry tomato.

Table 1(a). Mean values of different horticultural traits of cherry tomato germplasm lines

Treatments/ Germplasms	ST (cm)	NPB	NSB	DFF	FCPC	DFFS	NFPC	NCPP
MLG-1	0.93	13.66	29.33	41.33	5.80	48.33	4.80	30.33
MLG-2	0.97	7.66	19.00	40.66	5.20	45.66	5.00	24.33
MLG-3	0.80	6.33	17.33	40.00	5.80	44.33	5.80	23.33
MLG-4	0.87	7.33	18.00	37.33	5.70	44.33	5.60	24.66
MLG-5	0.87	11.66	28.66	39.00	5.80	46.00	5.70	32.00
MLG-6	1.13	8.00	20.00	41.66	4.60	48.66	4.40	20.00
MLG-7	1.03	7.66	20.00	40.00	4.00	47.00	4.30	21.00
MLG-8	0.77	8.00	19.00	42.66	5.30	50.33	4.80	22.33
MLG-9	1.17	8.00	18.33	39.66	5.40	46.66	4.70	23.66
MLG10	0.80	7.66	18.66	42.33	6.00	49.66	5.20	22.00
MLG-11	0.90	8.66	22.66	33.66	5.60	41.00	5.60	21.33
MLG-12	1.03	7.33	17.66	34.00	5.30	41.00	5.40	23.66
MLG-13	1.27	11.33	26.33	36.00	5.20	43.66	5.20	25.33
MLG-14	0.77	11.33	26.66	34.66	5.40	42.00	5.30	26.33
MLG-15	1.33	12.33	27.00	37.33	5.60	44.33	5.40	26.66
Sem	**0.05**	**0.99**	**2.96**	**0.79**	**0.11**	**0.76**	**0.11**	**0.63**
CD (5%)	**0.15**	**2.97**	**8.88**	**2.37**	**0.33**	**2.28**	**0.33**	**1.89**
Range (min)	**0.77**	**6.33**	**17.33**	**33.66**	**4.00**	**41.00**	**4.30**	**20.00**
Range (max)	**1.33**	**13.66**	**29.33**	**42.66**	**6.00**	**50.33**	**5.80**	**32.00**

ST-Stem thickness; **NPPB**- Number of primary branches; **NSB**- Number of secondary branches; **DFF**- Days to 50% flowering; **NFPC**- Number of flower cluster^{-1}; **DFFS**- Days to first fruit set; **FCPC**- Fruit count cluster^{-1}; **NCPP**- Number of clusters plant^{-1}, **CD**- Critical difference

Table 1(b). Mean values of different horticultural traits of cherry tomato germplasm lines

Treatments/ Germplasms	FCPP	DFFM	DFFH	FL (cm)	FB (cm)	FW (g)	PL (cm)	PT (mm)
MLG-1	145.53	84.66	91.00	1.66	1.63	3.07	3.60	1.78
MLG-2	121.60	81.66	87.33	1.43	1.46	5.67	3.80	1.30
MLG-3	135.27	79.00	85.33	1.66	1.73	6.39	3.30	1.72
MLG-4	137.93	84.66	91.33	1.56	1.63	7.70	2.60	1.23
MLG-5	182.40	75.33	83.66	1.76	1.83	3.58	2.50	0.84
MLG-6	87.93	72.33	79.00	2.00	2.03	6.40	3.60	1.55
MLG-7	90.30	80.66	87.66	1.80	2.03	6.04	2.80	1.48
MLG-8	107.20	79.66	87.33	2.03	2.06	8.19	2.40	1.51
MLG-9	111.20	80.00	81.66	1.73	1.96	7.97	4.10	2.54
MLG-10	114.47	77.66	84.00	1.76	1.76	3.10	2.90	2.18
MLG-11	119.20	74.33	83.00	1.43	1.53	4.14	4.50	1.87
MLG-12	127.60	74.30	82.33	1.50	1.63	3.31	3.80	2.55
MLG-13	131.73	77.33	84.66	1.53	1.50	2.95	3.60	2.64
MLG-14	139.55	77.66	86.00	1.56	1.70	3.74	3.20	2.50
MLG-15	145.87	76.66	84.33	1.36	1.53	4.29	3.10	1.95
Sem	**3.24**	**0.59**	**1.25**	**0.07**	**0.06**	**0.43**	**0.11**	**0.07**
CD (5%)	**9.72**	**1.77**	**3.75**	**0.21**	**0.18**	**1.29**	**0.33**	**0.21**
Range (min)	**87.93**	**72.33**	**79.00**	**1.36**	**1.46**	**2.95**	**2.4**	**0.84**
Range (max)	**182.40**	**84.66**	**91.33**	**2.03**	**2.06**	**8.19**	**4.5**	**2.64**

FCPP-Fruit count per plant; **DFFM**-Days to first fruit maturity; **DFFH**-Days to first fruit harvest; **FL**-Fruit length, **FW**-Fruit weight; **PL**- Peduncle length; **PT**-Pericarp thickness; **CD**- Critical difference

Table 1(c). Mean values of different horticultural traits of cherry tomato germplasm lines

Treatment/ Germplasm	LNF	SPF	TSW (g)	PH (cm)	DLFH	Y (g) PP
MLG-1	2.66	64.33	1.62	111.83	114.66	446.77
MLG-2	2.66	57.33	1.50	73.33	109.66	689.47
MLG-3	2.66	69.66	1.52	68.00	121.33	864.37
MLG-4	3.66	64.00	1.54	70.66	126.66	1062.06
MLG-5	3.33	61.33	1.80	110.33	112.00	652.99
MLG-6	3.33	86.66	1.65	74.00	112.33	562.75
MLG-7	2.33	72.66	1.96	77.00	117.66	545.41
MLG-8	3.33	80.66	1.59	73.66	120.66	877.96
MLG-9	3.66	74.66	1.76	70.06	116.33	886.26
MLG-10	2.00	65.66	2.07	69.26	111.00	354.85
MLG-11	3.00	80.66	1.51	71.66	119.33	493.48
MLG-12	4.00	80.66	1.51	73.66	122.33	422.35
MLG-13	3.00	62.00	1.40	87.30	121.66	388.60
MLG-14	3.33	66.33	1.48	89.30	112.66	521.91
MLG-15	3.00	86.66	1.41	91.33	115.00	625.78
Sem	**0.35**	**2.50**	**0.11**	**2.43**	**1.74**	**46.12**
CD (5%)	**1.05**	**7.50**	**0.33**	**7.29**	**5.22**	**138.36**
Range (min)	**2.00**	**57.33**	**1.40**	**68.00**	**109.66**	**354.85**
Range (max)	**4.00**	**86.66**	**2.07**	**111.83**	**126.66**	**1062.06**

LNF- Locule number fruit^{-1}, **SPF**- seed count fruit^{-1}; **TSW-** Thousand seed weight; **PH**- Pant height: **DLFH**- Days to last fruit harvest; **Y (g) PP-** Yield (g) plant^{-1}; **CD**- Critical difference

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