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# Agro-Morphological Evaluation of Cherry Tomato (*Solanum lycopersicum* L. var. *cerasiforme*) Genotypes

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**ABSTRACT**

In 2019, an evaluation of fifteen native cherry tomato genotypes revealed significant agro-morphological diversity, with seven genotypes identified as superior for breeding programs to enhance fruit yield and related traits. The genetic diversity of fifteen native genotypes of cherry tomatoes was assessed using three replications and a random block design utilizing agro-morphological traits. A significant variation in the agro-morphological traits was found under the study. For each of the traits under study, higher estimates of PCV than GCV were recorded. FYP and FW exhibited the highest GCV and PCV values. For PT, PH, NCPP, FYP, FW, NFRPC, and NSF, applicable amount of heritability including genetic advancement were noted. These findings suggest that simple selection can be crucial in enhancing these traits. The current investigation's mean performance for yield and its contributing features determined the superiority of seven genotypes: T2, T3, T4, T5, T6, T8, and T9. Hence, these genotypes could be helpful in breeding programmes aimed at increasing cherry tomato fruit yield and other qualities associated with fruit yield.

**Key words**: Cherry tomato, Agro-Morphology, Variability, Correlation, Meghalaya

## 1. INTRODUCTION

Cherry tomato (*Solanum lycopersicum* L. var. *cerasiforme*), is discerned to be a type of cultivated tomato and is a probable primogenitor of all tomato cultivars (Najeema *et al*., 2018). It is a well-demanded, kitchen-table-purpose fruit with miniature-sized berries as fruits with a bright vermilion-red color akin-to a cherry and having a flavourful taste (Charlo *et al.,* 2007). The market demand of cherry tomato has increased in recent years, which can be attributed to their pleasing appearance, recognition of their superior quality and flavour (Swarup 2014). The reason for its worldwide high demand recently is because of its favorable intrinsic features of possessing vitamins (A and C), sugars, flavour and less in calories and also ability to bear fruit at adverse climatic conditions (Ramya *et al*., 2016). High content of antioxidant and phytochemical compounds in cherry tomato fruit is also beneficial to human health (Rosales *et al*., 2011). Considering the demand and potentiality of cherry tomato as a crop, there is a necessity for improvement in the ways for tolerance of the plant towards various stresses as a means to develop superior varieties well acclimatized to specific environmental conditions as well as specific end use (Prema *et al*., 2011). Assessment of plants provides information on variability which enables the identification of superior genotypes for conservation and utilization on crop breeding for improvement (Ivin and Anbuselvam 2021). To improve productivity, profitability, desirability, sustainability, and to strengthen the food and nutritional security of the population pressure, a successful crop improvement program must have access to and availability of different germplasm (Venkadaswaran *et al*., 2018). The Northeastern region of India, especially Meghalaya is rich in uncountable numbers of land races and indigenous germplasm of cherry tomato. The present research work was undertaken to select the superior genotypes in cherry tomato from Meghalaya to explore the genetic potential for crop improvement.

## 2. MATERIALS AND METHODS

The experimental material encompasses a total of 15 cherry tomato genotypes (T1: Rongkhon; T2: Chandigre; T3: Chasingre; T4: Sangsanggre; T5: Chibragre; T6: Ampati; T7: Dallu; T8: Damalgre; T9: Oragitok; T10: Chandigre; T11: Chandmari; T12: Asanang; T13: Garobadha; T14: Rongram; T15: Amingdarangsagre) acquired from various parts of Garo Hills district of Meghalaya, India. The sources of collection of cherry tomato genotypes are given in Table No. 1.

**Table 1. Sources of collection of cherry tomato genotypes**

| Accessions No. | Collection point | | |
|---|---|---|---|
| | Latitude | Longitude | Altitude |
| T1 | 25°39’54”N | 90°18’05”E | 608m |
| T2 | 25°35’40”N | 90°13’43”E | 484m |
| T3 | 25°34’57”N | 90°13’43”E | 359m |
| T4 | 25°34’26”N | 90°14’46”E | 391m |
| T5 | 25°25’57”N | 90°13’10”E | 213m |
| T6 | 25°32’19”N | 90°13’47”E | 334m |
| T7 | 25°33’23”N | 90°12’02”E | 202m |
| T8 | 25°31’17”N | 90°13’16”E | 369m |
| T9 | 25°31’00”N | 90°13’27”E | 413m |
| T10 | 25°35’50”N | 90°11’48”E | 276m |
| T11 | 25°30’47”N | 90°11’26”E | 247m |
| T12 | 25°31’19”N | 90°11’56”E | 243m |
| T13 | 25°50’42”N | 90°16’25”E | 172m |
| T14 | 25°42’30”N | 90°01’41”E | 147m |
| T15 | 25°52’39”N | 90°01’27”E | 143m |

In March 2019, the genetic diversity of fifteen native genotypes of cherry tomatoes was assessed using three replications and a random block design utilizing agro-morphological traits. The indigenous germplasm-lines of cherry tomato were evaluated for 47 agro-morphological traits. Out of 47 agro-morphological traits studied, 22 traits were quantitative and 26 traits were qualitative in nature. NBPGR, New Delhi descriptors were utilized as the basic for accounting the observations taken during the study. Quantitative traits recorded were as follows: ST-Stem thickness; NPPB- Number of primary branches; NSB- Number of secondary branches; DFF- Days to 50% flowering; NFPC- Number of first flower/cluster; DFFS- Days to first fruit set; NFRPC- Number of fruit/cluster; NCPP- Number of cluster/plant; NFPP- Number of fruit/plant; DFFM- Days to first fruit maturity; DFFH- Days to first fruit harvest; FL- Fruit length; FB- Fruit breadth; FW- Fruit weight; PL- Peduncle length; PT- Pericarp thickness; LNF- Locule number/fruit: NSF- Number of seeds/fruit; SW- 1000 seed weight; PH- Pant height; DLFH- Days to last fruit harvest; FYP- Fruit yield/plant. Appropriate statistical methods were used to analyze the collected data *viz.* analysis of variance (Panse and Sukatme, 1954); genetic advance (GA), heritability ($h^2$) in the broad sense, and phenotypic coefficients of variation (PCV) and genotypic coefficients of variation (GCV) [Genres software (GENRES, 1994); the correlation coefficient using the SPSS program.

## 3. RESULTS AND DISCUSSION

Considerable differences were observed across all 15 cherry genotypes for 22 agro-morphological quantitative traits, indicating sufficient variability for every trait examined. Substantial variation was observed for all traits across the genotypes of cherry tomatoes used in this investigation. Table No. 2 displays the mean values for different quantitative agro-morphological traits for 15 native cherry tomato germplasm.

**Table 2. Mean vales of 22 different agro-morphological traits of Cherry tomato genotypes**

| TREATMENT | ST | NPB | NSB | DFF | NFPC | DFFS | NFRPC | NCPP | NFPP | DFFM | DFFH |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.93 | 13.66 | 29.33 | 41.33 | 5.80 | 48.33 | 4.80 | 30.33 | 145.53 | 84.66 | 91.00 |
| 2 | 0.97 | 7.66 | 19.00 | 40.66 | 5.20 | 45.66 | 5.00 | 24.33 | 121.60 | 81.66 | 87.33 |
| 3 | 0.80 | 6.33 | 17.33 | 40.00 | 5.80 | 44.33 | 5.80 | 23.33 | 135.27 | 79.00 | 85.33 |
| 4 | 0.87 | 7.33 | 18.00 | 37.33 | 5.70 | 44.33 | 5.60 | 24.66 | 137.93 | 84.66 | 91.33 |
| 5 | 0.87 | 11.66 | 28.66 | 39.00 | 5.80 | 46.00 | 5.70 | 32.00 | 182.40 | 75.33 | 83.66 |
| 6 | 1.13 | 8.00 | 20.00 | 41.66 | 4.60 | 48.66 | 4.40 | 20.00 | 87.93 | 72.33 | 79.00 |
| 7 | 1.03 | 7.66 | 20.00 | 40.00 | 4.00 | 47.00 | 4.30 | 21.00 | 90.30 | 80.66 | 87.66 |
| 8 | 0.77 | 8.00 | 19.00 | 42.66 | 5.30 | 50.33 | 4.80 | 22.33 | 107.20 | 79.66 | 87.33 |
| 9 | 1.17 | 8.00 | 18.33 | 39.66 | 5.40 | 46.66 | 4.70 | 23.66 | 111.20 | 80.00 | 81.66 |
| 10 | 0.80 | 7.66 | 18.66 | 42.33 | 6.00 | 49.66 | 5.20 | 22.00 | 114.47 | 77.66 | 84.00 |
| 11 | 0.90 | 8.66 | 22.66 | 33.66 | 5.60 | 41.00 | 5.60 | 21.33 | 119.20 | 74.33 | 83.00 |
| 12 | 1.03 | 7.33 | 17.66 | 34.00 | 5.30 | 41.00 | 5.40 | 23.66 | 127.60 | 74.30 | 82.33 |
| 13 | 1.27 | 11.33 | 26.33 | 36.00 | 5.20 | 43.66 | 5.20 | 25.33 | 131.73 | 77.33 | 84.66 |
| 14 | 0.77 | 11.33 | 26.66 | 34.66 | 5.40 | 42.00 | 5.30 | 26.33 | 139.55 | 77.66 | 86.00 |
| 15 | 1.33 | 12.33 | 27.00 | 37.33 | 5.60 | 44.33 | 5.40 | 26.66 | 145.87 | 76.66 | 84.33 |
| CV (%) | 9.71 | 18.78 | 23.40 | 3.54 | 3.53 | 2.92 | 3.76 | 4.47 | 4.45 | 1.31 | 2.55 |
| CD (5%) | 0.15 | 2.86 | 8.57 | 2.29 | 0.32 | 2.22 | 0.32 | 1.83 | 9.39 | 1.72 | 3.63 |
| TREATMENT | FL | FB | FW | PL | PT | LNF | NSF | SW | PH | DLFH | FYP |
| 1 | 1.66 | 1.63 | 3.07 | 3.60 | 1.78 | 2.66 | 64.33 | 1.62 | 111.83 | 114.66 | 406.92 |
| 2 | 1.43 | 1.46 | 5.67 | 3.80 | 1.30 | 2.66 | 57.33 | 1.50 | 73.33 | 109.66 | 627.58 |
| 3 | 1.66 | 1.73 | 6.39 | 3.30 | 1.72 | 2.66 | 69.66 | 1.52 | 68.00 | 121.33 | 872.26 |
| 4 | 1.56 | 1.63 | 7.70 | 2.60 | 1.23 | 3.66 | 64.00 | 1.54 | 70.66 | 126.66 | 1101.64 |
| 5 | 1.76 | 1.83 | 3.58 | 2.50 | 0.84 | 3.33 | 61.33 | 1.80 | 110.33 | 112.00 | 652.99 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **6** | 2.00 | 2.03 | 6.40 | 3.60 | 1.55 | 3.33 | 86.66 | 1.65 | 74.00 | 112.33 | 624.46 |
| **7** | 1.80 | 2.03 | 6.04 | 2.80 | 1.48 | 2.33 | 72.66 | 1.96 | 77.00 | 117.66 | 487.18 |
| **8** | 2.03 | 2.06 | 8.19 | 2.40 | 1.51 | 3.33 | 80.66 | 1.59 | 73.66 | 120.66 | 973.55 |
| **9** | 1.73 | 1.96 | 7.97 | 4.10 | 2.54 | 3.66 | 74.66 | 1.76 | 70.06 | 116.33 | 886.26 |
| **10** | 1.76 | 1.76 | 3.10 | 2.90 | 2.18 | 2.00 | 65.66 | 2.07 | 69.26 | 111.00 | 341.12 |
| **11** | 1.43 | 1.53 | 4.14 | 4.50 | 1.87 | 3.00 | 80.66 | 1.51 | 71.66 | 119.33 | 460.13 |
| **12** | 1.50 | 1.63 | 3.31 | 3.80 | 2.55 | 4.00 | 80.66 | 1.51 | 73.66 | 122.33 | 369.80 |
| **13** | 1.53 | 1.50 | 2.95 | 3.60 | 2.64 | 3.00 | 62.00 | 1.40 | 87.30 | 121.66 | 412.10 |
| **14** | 1.56 | 1.70 | 3.74 | 3.20 | 2.50 | 3.33 | 66.33 | 1.48 | 89.30 | 112.66 | 521.91 |
| **15** | 1.36 | 1.53 | 4.29 | 3.10 | 1.95 | 3.00 | 86.66 | 1.41 | 91.33 | 115.00 | 601.36 |
| **CV (%)** | 7.79 | 6.86 | 14.61 | 5.82 | 7.08 | 20.00 | 6.05 | 12.13 | 5.23 | 2.58 | 12.82 |
| **CD (5%)** | 0.21 | 0.19 | 1.24 | 0.32 | 0.21 | 1.02 | 7.25 | 0.32 | 7.05 | 5.05 | 133.58 |

Where,

**ST**-Stem thickness; **NPPB**- Number of primary branches; **NSB**- Number of secondary branches; **DFF**- Days to 50% flowering; **NFPC**- Number of first flower per cluster; **DFFS**- Days to first fruit set; **NFRPC**- Number of fruit per cluster; **NCPP**- Number of cluster per plant; **NFPP**- Number of fruit per plant; **DFFM**- Days to first fruit maturity; **DFFH**- Days to first fruit harvest; **FL**- Fruit length; **FB**- Fruit breadth; **FW**- Fruit weight; **PL**- Peduncle length; **PT**- Pericarp thickness; **LNF**- Locule number per fruit: **NSF**- Number of seeds per fruit; **SW**- 1000 seed weight; **PH**- Plant height; **DLFH**- Days to last fruit harvest; **FYP**- Fruit yield per plant.

The genotype T1 manifested the maximum PH (91.33cm) coupled with maximum NPPB (13.66) and NSB (29.33). The genotype T13 was found to have the widest ST (1.27cm). The genotype T11 was found to have less DFF (33.66) and DFFS (41.00). The minimum DFFM (72.33) and DFFH (79) were revealed by genotypes T6 and the maximum DLFH was found in genotype T4 (126.66 days). Highest NFPC (6.00) was reported in T10. Highest NFRPC (5.8) and highest NFPP (179.06) were found in T3 and T1 respectively. The maximum FL (2.03cm), FB (2.06cm) and FW (8.19g) was noticed in genotype T8. The genotype T11 was found to have the highest PL (4.50cm) and the genotype T13 was found with highest PT (2.64mm). The highest NSF (86.66) was noted in genotype T15 and the highest FYP was manifested by genotype T4 (1101.64g). Sarkar *et al.* (2018) also reported the similar results in cherry tomato.

**Table 3. Estimation of different genetic parameters for 22 agro-morphological traits in cherry tomato**

| Characters | PCV (%) | GCV (%) | $H^2$ (b) (%) | GA (%) |
|---|---|---|---|---|
| ST | 20.22 | 17.73 | 76.91 | 32.04 |
| NPB | 29.14 | 22.28 | 58.46 | 35.10 |
| NSB | 27.75 | 14.86 | 28.73 | 16.41 |
| DFF | 8.32 | 7.53 | 81.87 | 14.04 |
| NFPC | 7.70 | 6.85 | 78.98 | 12.54 |
| DFFS | 6.93 | 6.28 | 82.16 | 11.73 |
| NFRPC | 9.36 | 8.57 | 83.80 | 16.17 |
| NCPP | 14.09 | 13.36 | 89.90 | 26.11 |
| NFPP | 18.37 | 17.82 | 94.11 | 35.62 |
| DFFM | 4.73 | 4.55 | 92.30 | 9.01 |
| DFFH | 4.43 | 3.62 | 66.85 | 6.11 |
| FL | 13.56 | 11.09 | 66.97 | 18.71 |

| | | | | |
|---|---|---|---|---|
| FB | 13.10 | 11.16 | 72.56 | 19.59 |
| FW | 39.16 | 36.33 | 86.08 | 69.18 |
| PL | 19.08 | 18.17 | 90.69 | 35.65 |
| NSPFF | 14.29 | 12.94 | 82.03 | 24.16 |
| LNPF | 23.95 | 13.18 | 30.29 | 14.95 |
| SW | 15.60 | 9.81 | 39.52 | 12.71 |
| PT | 30.34 | 29.50 | 94.54 | 59.10 |
| PH | 18.13 | 17.36 | 91.65 | 34.24 |
| DLFH | 4.75 | 3.98 | 70.34 | 6.89 |
| FYP | 38.89 | 36.72 | 89.13 | 71.43 |

Quantitative traits *viz.* FW (39.16%) and FYP (36.66%) exhibited higher estimates of PCV and GCV respectively (Table No. 3). Kausal *et al.* (2017) reported higher PCV than GCV values for similar traits in tomato. In the present study, medium to high range of heritability values ($h^2b$) were observed. Highest heritability values were recorded for PT (94.54%) followed by NFPP (93.16%), DFFM (92.30%), PL (90.69%), DLFH (91.00%), NCPP (89.90%), FYP (89.54%), FW (86.08%) and DFFS (82.16%). FYP recorded highest genetic advance (71.43%). Applicable amount of heritability including genetic advance was exhibited by PT (94.54% and 59.10), PH (91.65% and 34.24), PL (90.69% and 35.10), NCPP (89.90% and 26.11), FYP (89.13% and 71.43) and FW (86.08% and 69.18), indicating ample scope for betterment through simple selection. Ramya *et al.* (2016) also reported similar results. Heritability, genetic advance and genotypic coefficient plays an important role for effective selection in crop improvement programme for a trait (Nasit *et al.*, 2009).

**Table 4. Genotypic and phenotypic correlation coefficients among different agro-morphological traits of cherry tomato genotypes**

| CHARACTERS | | ST | NPB | NSB | DFF | NFPC | DFFS | NFRPC | NCPP | NFPP | DFFM | DFFH | FL | FB | FW | PL | NSPF | LNPF | SW | PT | PH | DLFH | FYPP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ST | G | 1.00 | 0.29 | 0.18 | -0.16 | -0.44** | -0.11 | -0.28 | -0.02 | -0.13 | -0.24 | -0.44** | -0.30* | -0.21 | -0.11 | 0.39** | 0.41** | 0.22 | -0.29 | 0.35* | 0.08 | 0.01 | -0.22 |
| | P | 1.00 | 0.22 | 0.20 | -0.18 | -0.36* | -0.14 | -0.23 | -0.03 | -0.13 | -0.21 | -0.28 | -0.22 | -0.08 | -0.06 | 0.30* | 0.25 | 0.09 | -0.20 | 0.29 | 0.09 | -0.00 | -0.16 |
| NPB | G | | 1.00 | 1.00** | -0.20 | 0.23 | -0.07 | 0.07 | 0.86** | 0.67** | 0.02 | 0.13 | -0.30* | -0.38** | -0.68** | -0.03 | -0.18 | 0.03 | -0.37* | 0.10 | 0.20** | -0.40** | -0.46** |
| | P | | 1.00 | 0.92** | -0.13 | 0.29 | -0.03 | 0.01 | 0.66** | 0.50** | 0.06 | 0.24 | -0.17 | -0.23 | -0.47** | -0.06 | -0.12 | -0.09 | -0.13 | 0.09 | 0.78** | -0.19 | -0.32* |
| NSB | G | | | 1.00 | -0.33* | 0.21 | -0.20 | 0.17 | 1.00** | 0.86** | -0.13 | 0.02 | -0.36* | -0.50** | -0.89** | -0.05 | -0.23 | 0.015 | -0.40** | -0.01 | 1.00** | -0.50** | -0.59** |
| | P | | | 1.00 | -0.14 | 0.27 | -0.05 | 0.04 | 0.55** | 0.43** | 0.00 | 0.24 | -0.13 | -0.15 | -0.42** | -0.06 | -0.18 | -0.13 | -0.10 | 0.02 | 0.68** | -0.19 | -0.30* |
| DFF | G | | | | 1.00 | -0.08 | 0.96** | -0.60** | -0.09 | -0.33* | 0.31* | 0.15 | 0.76** | 0.63** | 0.42** | -0.42** | -0.10 | -0.65** | 0.73** | -0.47** | -0.03 | -0.42** | 0.29 |
| | P | | | | 1.00 | -0.05 | 0.93** | -0.45** | -0.11 | -0.30* | 0.31* | 0.13 | 0.62** | 0.44** | 0.36* | -0.35* | -0.10 | -0.29 | 0.36* | -0.38* | 0.00 | -0.32* | 0.22 |
| NFPC | G | | | | | 1.00 | -0.11 | 0.76** | 0.56** | 0.75** | 0.27 | 0.33* | -0.38** | -0.45** | -0.31* | -0.16 | -0.37* | -0.30* | 0.08 | -0.01 | 0.27 | -0.00 | 0.04 |
| | P | | | | | 1.00 | -0.08 | 0.62** | 0.44** | 0.62** | 0.22 | 0.27 | -0.24 | -0.34* | -0.30* | -0.17 | -0.30* | -0.04 | 0.01 | -0.01 | 0.22 | 0.08 | -0.02 |
| DFFS | G | | | | | | 1.00 | -0.69** | -0.08 | -0.37* | 0.28 | 0.12 | 0.86** | 0.72** | 0.37* | -.48** | -0.01 | -0.54** | 0.80** | -0.38** | 0.05 | -0.38** | 0.22 |
| | P | | | | | | 1.00 | -0.54** | -0.10 | -0.33* | 0.27 | 0.12 | 0.65** | 0.50** | 0.30* | -0.39** | -0.04 | -0.26 | 0.40** | -0.30* | 0.06 | -0.32* | 0.14 |
| NFRPC | G | | | | | | | 1.00 | 0.35* | 0.71** | -0.12 | 0.06 | -0.68** | -0.68** | -0.31* | -0.02 | -0.18 | 0.13 | -0.52** | 0.03 | 0.01 | 0.32* | 0.07 |
| | P | | | | | | | 1.00 | 0.25 | 0.67** | -0.11 | 0.08 | -0.48** | -0.56** | -0.27 | 0.02 | -0.17 | 0.19 | -0.35* | 0.03 | 0.02 | 0.34* | 0.07 |
| NCPP | G | | | | | | | | 1.00 | 0.91** | 0.25 | 0.39** | -0.27 | -0.36* | -.46** | -0.23 | 0.52** | 0.21 | -0.24 | -0.18 | 0.92** | -0.21 | -0.13 |
| | P | | | | | | | | 1.00 | 0.89** | 0.22 | 0.26 | -0.24 | -0.29 | -.41** | -0.21 | 0.42** | 0.03 | -0.09 | -0.16 | 0.83** | -0.20 | -0.09 |
| NFPP | G | | | | | | | | | 1.00 | 0.11 | 0.29 | -0.48** | -0.55** | -.48** | -0.21 | 0.46** | 0.29 | -.39** | -0.15 | 0.69** | -0.03 | -0.05 |
| | P | | | | | | | | | 1.00 | 0.09 | 0.22 | -0.40** | -0.46** | -0.44** | -0.18 | -.39** | 0.12 | -0.23 | -0.13 | 0.65** | 0.01 | -0.03 |
| DFFM | G | | | | | | | | | | 1.00 | 0.93** | -0.07 | -0.11 | 0.33* | -0.26 | -.57** | -0.30* | 0.09 | -0.23 | 0.09 | 0.20 | 0.41** |
| | P | | | | | | | | | | 1.00 | 0.83** | -0.03 | -0.07 | 0.31* | -0.24 | 0.49** | -0.14 | 0.02 | -0.21 | 0.08 | 0.17 | 0.38* |
| DFFH | G | | | | | | | | | | | 1.00 | -0.23 | -0.29 | 0.09 | -.44** | 0.58** | -0.28 | -0.08 | -0.36* | 0.24 | 0.30* | 0.26 |
| | P | | | | | | | | | | | 1.00 | -0.03 | -0.15 | 0.12 | -0.38* | 0.45** | -0.20 | -0.08 | -0.29 | 0.24 | 0.22 | 0.25 |
| FL | G | | | | | | | | | | | | 1.00 | 0.98** | 0.45** | -0.46** | 0.22 | -0.03 | 0.78** | -0.31* | -0.08 | -0.14 | 0.28 |
| | P | | | | | | | | | | | | 1.00 | 0.82** | 0.43** | -.40** | 0.12 | -0.05 | 0.34* | -0.25 | -0.04 | -0.07 | 0.28 |
| FB | G | | | | | | | | | | | | | 1.00 | 0.56** | -0.41** | 0.39** | 0.13 | 0.83** | -0.24 | -0.18 | -0.08 | 0.33* |
| | P | | | | | | | | | | | | | 1.00 | 0.54** | -0.35* | 0.25 | 0.01 | 0.37* | -0.17 | -0.13 | -0.08 | 0.35* |
| FW | G | | | | | | | | | | | | | | 1.00 | -0.20 | 0.27 | 0.38* | 0.13 | -0.35* | -.58** | 0.36* | 0.91** |
| | P | | | | | | | | | | | | | | 1.00 | 0.18 | 0.10 | -0.19 | 0.47** | -0.19 | -0.06 | -0.33* | 0.18 |
| PL | G | | | | | | | | | | | | | | | 1.00 | 0.19 | 0.14 | -.46** | 0.50** | -0.20 | -0.05 | -0.37* |
| | P | | | | | | | | | | | | | | | 1.00 | 0.18 | 0.10 | -0.19 | 0.47** | -0.19 | -0.06 | -0.33* |
| NSPF | G | | | | | | | | | | | | | | | | 1.00 | 0.45** | -0.19 | 0.19 | -0.32* | 0.19 | 0.06 |
| | P | | | | | | | | | | | | | | | | 1.00 | 0.18 | -0.05 | 0.15 | -0.27 | 0.11 | 0.04 |
| LNPF | G | | | | | | | | | | | | | | | | | 1.00 | -.73** | 0.19 | -0.02 | 0.45** | 0.52** |
| | P | | | | | | | | | | | | | | | | | 1.00 | -0.25 | 0.10 | -0.04 | 0.39** | 0.25 |
| SW | G | | | | | | | | | | | | | | | | | | 1.00 | -0.21 | -0.05 | -0.45** | -0.18 |
| | P | | | | | | | | | | | | | | | | | | 1.00 | -0.21 | -0.08 | -0.26 | -0.09 |
| PT | G | | | | | | | | | | | | | | | | | | | 1.00 | -0.19 | 0.13 | -0.41** |
| | P | | | | | | | | | | | | | | | | | | | 1.00 | -0.16 | 0.11 | -0.38* |
| PH | G | | | | | | | | | | | | | | | | | | | | 1.00 | -0.35* | -0.37* |
| | P | | | | | | | | | | | | | | | | | | | | 1.00 | -0.28 | -0.29* |
| DLFH | G | | | | | | | | | | | | | | | | | | | | | 1.00 | 0.46** |
| | P | | | | | | | | | | | | | | | | | | | | | 1.00 | 0.34* |
| FYPP | G | | | | | | | | | | | | | | | | | | | | | | 1.00 |
| | P | | | | | | | | | | | | | | | | | | | | | | 1.00 |

At phenotypic levels, FYP was significantly positively correlated with DFFM (0.376), DLFH (0.343), FB (0.348) and highly significantly positively correlated with FW (0.862) (Table No. 4). At genotypic level, FYP was significantly positively correlated with FB (0.331) and was highly significantly positively correlated with DFFM (0.414), FW (0.909), LNF (0.518), DLFH (0.459). A similar observation in cherry tomato was also reported by Omprasad *et al.*, (2018).

## 4. CONCLUSION

Considerable variances were observed across all 15 cherry genotypes for 22 quantitative agro-morphological traits, indicating enough diversity for every trait examined. The genotypes T11 had the earliest DFF (33.66) and the earliest DFFS (41.00); the genotypes T6 had the lowest DFFM (72.33) and the highest DFFH (79); the genotype T4 had the longest DLFH (126.66 days). Highest NFPC (6.00) was observed in T10. The genotype T1 was found to have the most NFPP (179.06), whereas the genotype T3 had the highest NFRPC (5.8). The maximum FL (2.03cm), FB (2.06cm) and FW (8.19g) was noticed in genotype T8. Quantitative traits *viz.* FW (39.16%) and FYP (36.66%) exhibited high PCV and GCV respectively. There was plenty of scope for improvement through simple selection, as evidenced by the applicable amount of heritability and genetic advance for various quantitative traits [PT (94.54% and 59.10), PH (91.65% and 34.24), PL (90.69% and 35.10), NCPP (89.90% and 26.11), FYP (89.13% and 71.43), and FW (86.08% and 69.18)]. Applicable amount of heritability including genetic advance was observed for PT, PH, NCPP, FYP, FW, NFRPC and NSF indicating that simple selection may be an effective breeding method for improvement of these traits. On the basis of mean performance for agro-morphological traits (FYP, FW, NFPP etc) from the present investigation 7 genotypes *viz.* T2, T3, T4, T5, T6, T8 and T9 were found superior. Hence, these genotypes could be considered as a useful source in breeding programme for improvement of fruit yield and other fruit yield attributing traits in cherry tomato.

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