***Table S1***. Effects of variety (V), environment (E) and repetition (R) expressed as percentages of total sums of squares type III. Analysis of variance (ANOVA-Duncan) was executed to show significant differences (P < 0.05).

|  |  |  |  |
| --- | --- | --- | --- |
|  | V (%) | E (%) | R (%) |
| Juiciness (g·100g-1 FW water) | 99.53\* | 0.42 | 0.05 |
| SSC  | 97.90\* | 1.97\* | 0.13 |
| pH | 94.30\* | 5.66\* | 0.03 |
| Firmness (N) | 75.40\* | 16.72\* | 7.87 |
| Carotenoids (µg·g-1 FW\*) | 99.84\* | 0.06 | 0.11 |
| Ascorbic Acid (mg·100g-1 FW\*) | 99.75\* | 0.23 | 0.02 |
| Total sugars (mg·g-1 DW\*) | 99.22\* | 0.33 | 0.45 |

\* denotes P < 0.05

***Table S2.*** Mean values for juiciness, soluble solids content (SSC), firmness and pH in the main Spanish melon landraces grouped by Ward’s cluster tree classes and harvested on three consecutive years abcd

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Class** | ***Juiciness (g•100g-1 FW water)*** | ***SSC*** | ***Firmness (N)*** | ***pH*** |
| *Year 1* | *Year 2* | *Year 3* | *Year 1* | *Year 2* | *Year 3* | *Year 1* | *Year 2* | *Year 3* | *Year 1* | *Year 2* | *Year 3* |
| ***1*** | 87.1Aa | 90.1AB | 90.4B | 11.1Aa | 12.1Aa | 11.6Aa | 62.9Aa | 39.2Ba | 32.9Ba | 5.5Aa | 5.6Aa | 5.6Aa |
| ***2*** | 92.9Ab | 93.4A | 92.8A | 14.3Ab | 15.5Ab | 15.2Ab | 48.5Aa | 36.0Aa | 37.2Aa | 5.5Aa | 5.9Bb | 5.9Bb |
| ***3*** | 88.8Aab | 91.0A | 81.0B | 11.1Aa | 12.1Ba | 10.7Aa | 20.8Ab | 20.6Aa | - | 5.0Ab | 5.1Ac | 5.1Ac |
| ***4*** | - | 75.2A | 72.7A | - | 10.1Aa | 9.0Ac | - | 115.1Ab | 166.9Ab |  | 6.4Ad | 6.2Ad |
|  | ***Juiciness (g•100g-1 FW water)*** | ***SSC*** | ***Firmness (N)*** | ***pH*** |
| ***Class (C)*** | \*\*\* |  \*\*\* |  \*\*\* | \*\*\* |
| ***Year (Y)*** | NS (0.567) | \* | \*\*\* |  \*\* |
| ***C x Y***  | \* | NS (0.445) | NS (0.059) | NS (0.209) |

a Within each column, values with the same lower case letter are not significantly different across market classes (Duncan: P = 0.05).

b Within each row, values with the same capital letter are not significantly different across years (Duncan: P = 0.05).

c *P*-value: NS = not significantly different; \* denotes *P* < 0.05; \*\* denotes *P* < 0.01; \*\*\* denotes *P* < 0.001.

d Class 1: accessions 2,5,6,8,10,12,17; Class 2: accessions 3,9,11,13,25,26,27; Class 3: accession 4; Class 4: accession 16***Table S3.*** Mean values for carotenoids, ascorbic acid and total sugars content in the main Spanish melon landraces grouped by Ward’s cluster tree classes and harvested on three consecutive years abcd

|  |  |  |  |
| --- | --- | --- | --- |
| **Class** | ***Carotenoids (µg•g-1 FW)*** | ***Ascorbic Acid (mg•100g-1 FW)***  | ***Total sugars (mg•g-1 DW)*** |
| *Year 1* | *Year 2* | *Year 3* | *Year 1* | *Year 2* | *Year 3* | *Year 1* | *Year 2* | *Year 3* |
| ***1*** | 0.12Aa | 0.13Aa | 0.13Aa | 32.4Aa | 34.7Ba | 33.8ABa | 494.3Aa | 538.2Aa | 546.3Aa |
| ***2*** | 0.38Ab | 0.36Ab | 0.43Ab | 43.1Ab | 42.9Ab | 42.2Ab | 736.3Ab | 772.9Ab | 770.0Ab |
| ***3*** | 1.41Ac | 2.39Ac | 2.37Ac | 40.1Ab | 39.8Ab | 41.6Ab | 524.5Aa | 552.2Aa | 470.5Aa |
| ***4*** |  | 0.02Ad | 0.03Ad |  | 8.8Ac | 6.3Bc |  | 286.4Ac | 232.4Ac |
|  | ***Carotenoids (µg•g-1 FW)*** | ***Ascorbic Acid (mg•100g-1 FW)*** | ***Total sugars (mg•g-1 DW)*** |
| ***Class (C)*** | \*\*\* | \*\*\* | \*\*\* |
| ***Year (Y)*** | NS (0.204) | \* | NS (0.172) |
| ***C x Y***  | NS (0.723) | \*\* | NS (0.490) |

a Within each column, values with the same lower case letter are not significantly different across market classes (Duncan: P = 0.05).

b Within each row, values with the same capital letter are not significantly different across years (Duncan: P = 0.05).

c *P*-value: NS = not significantly different; \* denotes *P* < 0.05; \*\* denotes *P* < 0.01; \*\*\* denotes *P* < 0.001.

d Class 1: accessions 2,5,6,8,10,12,17; Class 2: accessions 3,9,11,13,25,26,27; Class 3: accession 4; Class 4: accession 16

***Table S4*.** Correlation coefficients between the first three principal components (Fi) and physico-chemical and nutritional characters.

|  |  |  |  |
| --- | --- | --- | --- |
| Axes | F1 | F2 | F3 |
| Cumulative contribution | 55,58% | 72,91% | 88,29% |
| Juiciness  | 0.914 | -0.004 | -0.222 |
| SSC | 0.780 | 0.433 | 0.323 |
| pH | -0.260 | 0.876 | -0.219 |
| Carotenoids  | -0.592 | -0.018 | 0.753 |
| Ascorbic Acid  | 0.751 | -0.361 | 0.288 |
| Total sugars  | 0.829 | 0.331 | 0.409 |
| Firmness  | -0.881 | 0.136 | 0.244 |
| \* FW = Fresh Weight, DW= Dry Weight |