Supplementary Materials

Fruit quality characterization of new sweet cherry cultivars as a good source of bioactive phenolic compounds with antioxidant and neuroprotective potential

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Figure S1. (A) Fruit weight; (B) fruit diameter; and (C) kernel weight of the different cultivars.
Figure S2. Color parameters of the different cultivars: (A) $a^*$; (B) $b^*$; (C) $L^*$; (D) chroma; (E) hue angle; (F) DA index.
Figure S3. Other chemical-physical properties of the different cultivars: (A) total soluble solids; (B) titratable acidity; and (C) pH.
**Figure S4.** Results of the GC analysis of organic acids in the different cultivars: (A) malic acid; (B) quinic acid; (C) succinic acid; and (D) total acids by GC.
Figure S5. Results of the GC analysis of sugars in the different cultivars: (A) glucose; (B) fructose; (C) sorbitol; and (D) total sugars by GC.
Figure S6. (A) Total Anthocyanin Index (TAI); and (B) Total Phenolic Acid Index (TPAI) in sweet cherry cultivars. Data are the mean ± SE of four biological replicates. Different letters indicate statistical significance (p < 0.05).
Figure S7. Effect of different concentrations of cherry extracts on SH-SY5Y cell viability as measured by the MTT assay. Each bar represents the mean ± SEM of at least three independent experiments. Data were analyzed by one-way ANOVA followed by Dunnett’s test.
Table S1. Correlations (Pearson’s and p) among fruit quality traits in cherry cultivars.

| Fruit trait         | Fruit size | Fruit weight | Cherry DA Index | Durofel | Firmness | Soluble solids (Brix) | Fruit pH | Titratable acidity | L*     | a*     |
|---------------------|------------|--------------|-----------------|---------|----------|-----------------------|----------|--------------------|--------|--------|
| Fruit size          | 1.0000     |              |                 |         |          |                       |          |                    |        |        |
|                     | p=---      |              |                 |         |          |                       |          |                    |        |        |
| Fruit weight        | 0.9652     | 1.0000       |                 |         |          |                       |          |                    |        |        |
|                     | p=0.000    | p=---        |                 |         |          |                       |          |                    |        |        |
| Cherry DA Index     | 0.2122     | 0.1595       | 1.0000          |         |          |                       |          |                    |        |        |
|                     | p=0.189    | p=0.325      | p=---           |         |          |                       |          |                    |        |        |
| Durofel             | 0.6744     | 0.6507       | 0.3117          | 1.0000  |          |                       |          |                    |        |        |
|                     | p=0.000    | p=0.000      | p=0.050         | p=---   |          |                       |          |                    |        |        |
| Firmness            | 0.1093     | 0.0147       | 0.1953          | 0.6207  | 1.0000   |                       |          |                    |        |        |
|                     | p=0.502    | p=0.928      | p=0.227         | p=---   | p=---    |                       |          |                    |        |        |
| Soluble solids (Brix) | 0.4811   | 0.3870       | 0.7396          | 0.5632  | 0.4487   | 1.0000                |          |                    |        |        |
|                     | p=0.002    | p=0.014      | p=0.000         | p=0.000 | p=0.004  | p=---                 |          |                    |        |        |
| Fruit pH            | -0.5112    | -0.5839      | 0.2255          | -0.4646 | -0.0749  | 0.0712                | 1.0000   |                    |        |        |
|                     | p=0.001    | p=0.000      | p=0.162         | p=0.003 | p=0.000  | p=0.000               | p=0.000  | p=---              |        |        |
| Fruit acidity       | 0.7007     | 0.6595       | 0.2389          | 0.5460  | -0.0466  | 0.5273                | -0.3779  | 1.0000             |        |        |
|                     | p=0.000    | p=0.000      | p=0.138         | p=0.000 | p=0.000  | p=0.000               | p=0.000  | p=0.016            | p=---  |        |
| L*                  | -0.1946    | -0.0884      | -0.8111         | -0.1441 | -0.1626  | -0.6909               | -0.3937  | -0.2527           | 1.0000 |        |
|                     | p=0.229    | p=0.588      | p=0.000         | p=0.375 | p=0.316  | p=0.000               | p=0.000  | p=0.012            | p=---  | p=1.16 |
| a*                  | -0.1897    | -0.1057      | -0.9022         | -0.1605 | -0.1240  | -0.7655               | -0.2964  | -0.2736           | 0.9305 | 1.0000 |
|                     | p=0.241    | p=0.516      | p=0.000         | p=0.322 | p=0.446  | p=0.000               | p=0.000  | p=0.088            | p=0.000| p=0.000|
| b*                  | -0.4507    | -0.3788      | -0.8226         | -0.2989 | -0.0711  | -0.7318               | 0.0095   | -0.4756           | 0.8599 | 0.9227 |
|                     | p=0.004    | p=0.016      | p=0.000         | p=0.061 | p=0.663  | p=0.000               | p=0.954  | p=0.002            | p=0.000| p=0.000|
| Chroma              | -0.2076    | -0.1239      | -0.9012         | -0.1706 | -0.1223  | -0.7671               | -0.2789  | -0.2871           | 0.9308 | 0.9997 |
|                     | p=0.199    | p=0.446      | p=0.293         | p=0.452 | p=0.081  | p=0.072               | p=0.000  | p=0.000            | p=0.000| p=0.000|
| Hue angle           | -0.7371    | -0.7272      | -0.3429         | -0.5338 | 0.0320   | -0.3644               | 0.6082   | -0.7271           | 0.3191 | 0.3505 |
|                     | p=0.000    | p=0.000      | p=0.030         | p=0.000 | p=0.844  | p=0.021               | p=0.000  | p=0.000            | p=0.045| p=0.000|
| Kernel weight       | 0.7764     | 0.7958       | 0.3168          | 0.6527  | 0.0534   | 0.4480                | -0.4913  | 0.5312            | -0.0221| -1.1408|
|                     | p=0.000    | p=0.000      | p=0.046         | p=0.000 | p=0.743  | p=0.004               | p=0.001  | p=0.000            | p=0.892| p=0.390|
Table S2. Correlation (Pearson’s and p) among fruit pH, fruit acidity, succinic acid, malic acid, quinic acid and total acid content in cherry cultivars.

| Trait                      | Fruit pH | Fruit acidity | Succinic acid | Malic acid | Quinic acid | Total acids by GC |
|----------------------------|----------|---------------|---------------|------------|-------------|-------------------|
| Fruit pH                   | 1.0000   |               |               |            |             |                   |
| Fruit acidity              | -0.3779  | 1.0000        |               |            |             |                   |
| Succinic acid              | 0.2919   | 0.0358        | 1.0000        |            |             |                   |
| Malic acid                 | -0.3835  | 0.8643        | 0.1233        | 1.0000     |             |                   |
| Quinic acid                | 0.0817   | 0.4494        | 0.5321        | 0.6455     | 1.0000      |                   |
| Total acids by GC          | -0.3510  | 0.8540        | 0.2020        | 0.9967     | 0.6886      |                   |
Table S3. Correlation (Pearson’s and p) among fructose, glucose, sorbitol, other sugars, total sugars, and soluble solids (Brix) in cherry cultivars.

| Trait               | Fructose | Glucose | Sorbitol | Other sugars | Total sugars | Soluble solids (Brix) |
|---------------------|----------|---------|----------|--------------|--------------|-----------------------|
| Fructose            | 1.0000   |         |          |              |              |                       |
| Glucose             |          | 0.9769  |          |              |              |                       |
| Sorbitol            |          |         | 0.6804   |              |              |                       |
| Other sugars        |          |         |          | 0.5826       |              |                       |
| Total sugars        |          |         |          |              | 0.9763       |                       |
| Soluble solids (Brix)|         |         |          |              | 0.4106       |                       |

Values are shown as Pearson’s correlation coefficient and p-value.
Table S4. Correlation (Pearson’s and p) among anthocyanin levels, AA, and color parameters in cherry cultivars.

| Trait                  | Cyanidin Glucoside | Cyanidin Rutinoside | Peonidin Glucoside | Peonidin Rutinoside | TAI   | ORAC | L*  | a*  | b*  | Chroma | Hue angle |
|------------------------|--------------------|--------------------|--------------------|--------------------|-------|------|-----|-----|-----|--------|-----------|
| Cyanidin Glucoside     | 1.0000             |                    |                    |                    |       |      |     |     |     |        |           |
| p=---                  |                    |                    |                    |                    |       |      |     |     |     |        |           |
| Cyanidin Rutinoside    | 0.0551             | 1.0000             |                    |                    |       |      |     |     |     |        |           |
| p=0.736               | p=---              |                    |                    |                    |       |      |     |     |     |        |           |
| Peonidin Glucoside     | 0.9390             | 0.0341             | 1.0000             |                    |       |      |     |     |     |        |           |
| p=0.000               | p=0.835            | p=---              |                    |                    |       |      |     |     |     |        |           |
| Peonidin Rutinoside    | -0.3839            | 0.5323             | -0.3525            | 1.0000             |       |      |     |     |     |        |           |
| p=0.014               | p=0.000            | p=0.026            | p=---              |                    |       |      |     |     |     |        |           |
| TAI                    | 0.3295             | 0.9595             | 0.2942             | 0.4336             | 1.0000|      |     |     |     |        |           |
| p=0.039               | p=0.000            | p=0.065            | p=0.005            | p=---              |       |      |     |     |     |        |           |
| ORAC                   | 0.5033             | 0.4603             | 0.5313             | 0.0382             | 0.5738| 1.0000|     |     |     |        |           |
| p=0.001               | p=0.003            | p=0.000            | p=0.815            | p=0.000            | p=--- |        |     |     |     |        |           |
| L*                     | -0.1749            | -0.5046            | -0.1216            | -0.3456            | -0.5344| -0.1978| 1.0000|     |     |        |           |
| p=0.280               | p=0.001            | p=0.455            | p=0.029            | p=0.000            | p=0.221| p=--- |        |     |     |        |           |
| a*                     | -0.2357            | -0.4133            | -0.1936            | -0.3818            | -0.4727| -0.1443| 0.9305| 1.0000|     |        |           |
| p=0.143               | p=0.000            | p=0.231            | p=0.015            | p=0.002            | p=0.375| p=0.001| p=--- |        |     |        |           |
| b*                     | 0.0447             | -0.2732            | 0.0725             | -0.3857            | -0.2603| 0.0943| 0.8599| 0.9227| 1.0000|        |           |
| p=0.784               | p=0.088            | p=0.657            | p=0.014            | p=0.105            | p=0.563| p=0.000| p=0.000| p=--- |        |        |           |
| Chroma                 | -0.2183            | -0.4071            | -0.1769            | -0.3839            | -0.4620| -0.1294| 0.9308| 0.9997| 0.9318| 1.0000|        |
| p=0.176               | p=0.009            | p=0.275            | p=0.014            | p=0.003            | p=0.426| p=0.000| p=0.000| p=0.000| p=--- |        |           |
| Hue angle              | 0.5989             | 0.0131             | 0.5957             | -0.3054            | 0.1742| 0.4627| 0.3191| 0.3505| 0.6678| 0.3719| 1.0000|
| p=0.000               | p=0.936            | p=0.000            | p=0.055            | p=0.282            | p=0.003| p=0.045| p=0.027| p=0.000| p=0.018| p=--- |        |