

**Table S1.** Physico-chemical characteristics of *Opuntia stricta* var. *Dillenii* fruits from Canary Islands.

| Physicochemical characteristics | <i>Opuntia dillenii</i> whole fruit |
|---------------------------------|-------------------------------------|
| Apical caliber (cm)             | 6.10 ± 0.60                         |
| Equatorial caliber (cm)         | 3,96 ± 0,14                         |
| Fruit Weight (g)                | 54,35 ± 6,82                        |
| % Peel                          | 14.26 ± 0,79                        |
| % Pulp                          | 52,94 ± 1,13                        |
| % Seeds                         | 32,80 ± 0,46                        |
| pH                              | 3,55 ± 0,08                         |
| Soluble solids (°Brix)          | 10,80 ± 0,30                        |
| Titrateable acidity (%)         | 1,58 ± 0,10                         |
| Moisture (%)                    | 81,83 ± 4,09                        |
| Color pulp (CIELAB)             |                                     |
| L*                              | 30,92 ± 1,39                        |
| a*                              | 4,477 ± 3,26                        |
| b*                              | -7,46 ± 0,51                        |
| Color peel (CIELAB)             |                                     |
| L*                              | 29,03 ± 0,67                        |
| a*                              | 4,07 ± 0,69                         |
| b*                              | -8,09 ± 0,91                        |

Result were expressed as mean ± standard deviation (n=2).

**Table S2.** Individual betalain and phenolic compound content (mg/100g fresh weight) in *Opuntia stricta* var. *Dillenii* fruit tissues (peel, pulp and whole fruit), jam production products (intermediate juice and jam) and by-product (bagasse)

| Compound                               | Tissues                     |                            |                             |                           |                           |                           |                          |
|--|-----------------------------|----------------------------|-----------------------------|---------------------------|---------------------------|---------------------------|--------------------------|
|  | Fresh whole fruit (FWF)     | Fresh Peel (PE)            | Fresh Pulp (PU)             | Frozen whole fruit (FRWF) | Bagasse By-product (BA)   | Fresh pressed Juice (JU)  | Jam (JA)                 |
| <b>BETALAINS</b>                       |                             |                            |                             |                           |                           |                           |                          |
| 15,17-bidecarboxy-betanin              | -                           | -                          | -                           | 5.05 ± 0.27 <sup>a</sup>  | .                         | .                         | .                        |
| Betanin                                | 87.28 ± 0.96 <sup>d</sup>   | 83.12 ± 4.16 <sup>c</sup>  | 146.36 ± 2.08 <sup>e</sup>  | 20.82 ± 0.70 <sup>b</sup> | 11.21 ± 0.18 <sup>a</sup> | 18.77 ± 0.02 <sup>b</sup> | -                        |
| 17-decarboxy-betanin                   | 1.18 ± 0.06 <sup>a</sup>    | n.d.                       | n.d.                        | n.d.                      | 2.44 ± 0.12 <sup>b</sup>  | 3.26 ± 0.16 <sup>c</sup>  | -                        |
| Cyclo-dopa-5-O-β-glucoside             | -                           | -                          | -                           | -                         | -                         | -                         | 0.57 ± 0.01 <sup>a</sup> |
| Cyclo-dopa-5-O-α-glucoside (isomer)    | -                           | -                          | -                           | -                         | -                         | -                         | 0.06 ± 0.00 <sup>a</sup> |
| Isobetanin                             | 42.78 ± 0.04 <sup>e</sup>   | 25.31 ± 1.27 <sup>c</sup>  | 100.77 ± 1.48 <sup>f</sup>  | 31.42 ± 0.09 <sup>d</sup> | 9.78 ± 0.16 <sup>a</sup>  | 16.88 ± 0.01 <sup>b</sup> | -                        |
| 17-decarboxy-isobetanin                | -                           | -                          | -                           | -                         | 2.05 ± 0.05 <sup>a</sup>  | 2.71 ± 0.02 <sup>b</sup>  | -                        |
| Betanidin                              | 1.15 ± 0.11 <sup>a</sup>    | 4.32 ± 0.22 <sup>a</sup>   | 1.70 ± 0.09 <sup>a</sup>    | -                         | 0.24 ± 0.01 <sup>a</sup>  | 0.45 ± 0.01 <sup>a</sup>  | -                        |
| 6'-O-sinapoyl-O-gompherin              | 1.59 ± 0.02 <sup>d</sup>    | 2.01 ± 0.16 <sup>e</sup>   | 2.81 ± 0.14 <sup>e</sup>    | 0.89 ± 0.16 <sup>c</sup>  | 0.21 ± 0.00 <sup>a</sup>  | 0.45 ± 0.02 <sup>b</sup>  | -                        |
| 2'-O-apiosyl-4-O-phyllactin            | 45.86 ± 5.73 <sup>d</sup>   | 35.17 ± 1.76 <sup>d</sup>  | 110.06 ± 5.50 <sup>e</sup>  | 15.45 ± 0.04 <sup>c</sup> | 8.83 ± 0.08 <sup>b</sup>  | 11.75 ± 0.40 <sup>b</sup> | 0.51 ± 0.03 <sup>a</sup> |
| 5''-O-E-sinapoyl-2'-apyosil-phyllactin | 16.09 ± 0.70 <sup>d</sup>   | 14.69 ± 0.73 <sup>c</sup>  | 26.50 ± 1.32 <sup>e</sup>   | 4.21 ± 0.26 <sup>b</sup>  | n.d.                      | 2.30 ± 0.07 <sup>a</sup>  | 0.53 ± 0.03 <sup>a</sup> |
| 17-Descarboxy-neobetanin               | 0.39 ± 0.03 <sup>a</sup>    | -                          | -                           | -                         | -                         | -                         | -                        |
| Neobetanin                             | 17.17 ± 0.70 <sup>e</sup>   | 6.85 ± 0.34 <sup>b</sup>   | 56.57 ± 0.29 <sup>f</sup>   | 10.78 ± 0.01 <sup>a</sup> | 8.71 ± 0.19 <sup>c</sup>  | 9.74 ± 0.27 <sup>d</sup>  | -                        |
| Neobetanin isomer I                    | -                           | -                          | n.d.                        | -                         | -                         | -                         | -                        |
| Neobetanin isomer III                  | 1.16 ± 0.06 <sup>c</sup>    | -                          | -                           | 0.35 ± 0.02 <sup>b</sup>  | 0.27 ± 0.04 <sup>a</sup>  | 0.44 ± 0.00 <sup>c</sup>  | -                        |
| Neobetanin isomer III                  | 0.96 ± 0.05 <sup>c</sup>    | -                          | -                           | 0.71 ± 0.04 <sup>c</sup>  | 0.41 ± 0.05 <sup>a</sup>  | 0.69 ± 0.06 <sup>b</sup>  | -                        |
| 15R/15S-Betanidin                      | 0.27 ± 0.01 <sup>b</sup>    | 0.36 ± 0.02 <sup>c</sup>   | -                           | 0.09 ± 0.00 <sup>a</sup>  | n.d.                      | n.d.                      | -                        |
| <b>Total betalains</b>                 | 212.91 ± 10.65 <sup>b</sup> | 171.83 ± 8.59 <sup>b</sup> | 444.77 ± 22.84 <sup>c</sup> | 89.77 ± 4.49 <sup>a</sup> | 44.14 ± 2.21 <sup>a</sup> | 67.45 ± 3.37 <sup>a</sup> | 1.67 ± 0.08 <sup>a</sup> |
| <b>PHENOLICS ACIDS</b>                 |                             |                            |                             |                           |                           |                           |                          |
| Gallic acid derivative                 | 0.60 ± 0.10 <sup>c</sup>    | -                          | -                           | 0.38 ± 0.01 <sup>b</sup>  | 0.48 ± 0.00 <sup>c</sup>  | 0.47 ± 0.02 <sup>c</sup>  | 0.02 ± 0.00 <sup>a</sup> |

|  |                             |                             |                            |                           |                           |                            |                           |
|--|-----------------------------|-----------------------------|----------------------------|---------------------------|---------------------------|----------------------------|---------------------------|
| Piscidic acid  | 56.21 ± 0.30 <sup>c</sup>   | 101.00 ± 5.04 <sup>e</sup>  | 39.52 ± 0.65 <sup>a</sup>  | 59.67 ± 0.37 <sup>c</sup> | 47.85 ± 0.27 <sup>b</sup> | 60.74 ± 0.70 <sup>d</sup>  | 38.71 ± 2.13 <sup>a</sup> |
| Piscidic acid isomer I   | 79.65 ± 3.66 <sup>b</sup>   | 65.12 ± 3.26 <sup>a</sup>   | n.d.                       | -                         | 6.38 ± 0.41 <sup>a</sup>  | 93.62 ± 1.58 <sup>c</sup>  | n.d.                      |
| Piscidic acid isomer II  | 72.54 ± 1.54 <sup>d</sup>   | 62.96 ± 3.15 <sup>d</sup>   | 79.43 ± 2.01 <sup>e</sup>  | 12.23 ± 0.19 <sup>c</sup> | 13.38 ± 0.37 <sup>b</sup> | 14.92 ± 0.12 <sup>b</sup>  | 10.43 ± 0.66 <sup>a</sup> |
| Piscidic acid derivative I                                       | -                           | 38.90 ± 1.92 <sup>b</sup>   | -                          | 4.00 ± 0.21 <sup>a</sup>  | -                         | -                          | n.d.                      |
| Ferulic acid   | 0.33 ± 0.01 <sup>a</sup>    | 0.23 ± 0.01 <sup>b</sup>    | -                          | -                         | -                         | -                          | -                         |
| Ferulic acid derivative I  | 0.52 ± 0.03 <sup>a</sup>    | -                           | -                          | -                         | -                         | -                          | -                         |
| Ferulic acid derivative II                                       | 0.56 ± 0.07 <sup>a</sup>    | -                           | -                          | -                         | -                         | -                          | -                         |
| Ferulic acid derivative III                                      | 0.78 ± 0.04 <sup>a</sup>    | -                           | -                          | 0.79 ± 0.04 <sup>a</sup>  | -                         | -                          | -                         |
| Protocatechuic acid derivative I                                 | 4.90 ± 0.45 <sup>a</sup>    | -                           | 12.88 ± 0.61 <sup>b</sup>  | -                         | -                         | -                          | -                         |
| Protocatechuic acid derivative II                                | 0.23 ± 0.01 <sup>a</sup>    | -                           | -                          | -                         | -                         | -                          | -                         |
| Quinic acid  | 7.81 ± 0.69 <sup>a</sup>    | -                           | -                          | 10.37 ± 0.19 <sup>c</sup> | 11.21 ± 0.19 <sup>b</sup> | -                          | -                         |
| Gallic acid  | 0.53 ± 0.00 <sup>b</sup>    | 0.26 ± 0.01 <sup>a</sup>    | -                          | -                         | 1.34 ± 0.04 <sup>d</sup>  | 1.25 ± 0.01 <sup>c</sup>   | -                         |
| p-hydroxybenzoic acid  | 0.44 ± 0.04 <sup>a</sup>    | -                           | -                          | -                         | -                         | -                          | -                         |
| 4-Hydroxybenzoic acid 4-O-glucoside                              | 1.60 ± 0.14 <sup>b</sup>    | -                           | -                          | -                         | -                         | -                          | t.r.                      |
| 4-Hydroxybenzoic acid 4-O-glucoside isomer                       | 1.20 ± 0.09 <sup>a</sup>    | 2.26 ± 0.11 <sup>b</sup>    | -                          | -                         | t.r.                      | -                          | -                         |
| Eucomic acid   | 5.21 ± 0.31 <sup>b</sup>    | 2.69 ± 0.13 <sup>a</sup>    | 14.61 ± 0.56 <sup>c</sup>  | -                         | -                         | -                          | -                         |
| Eucomic acid derivative I  | 1.26 ± 0.37 <sup>a</sup>    | -                           | 5.37 ± 0.53 <sup>b</sup>   | -                         | -                         | -                          | -                         |
| Eucomic acid isomer I  | 0.49 ± 0.04 <sup>a</sup>    | -                           | -                          | 2.76 ± 0.09 <sup>d</sup>  | 1.98 ± 0.07 <sup>c</sup>  | -                          | 1.46 ± 0.03 <sup>b</sup>  |
| Eucomic acid isomer II   | 2.45 ± 0.24 <sup>a</sup>    | -                           | -                          | -                         | -                         | -                          | -                         |
| p-coumaric acid  | 0.43 ± 0.07 <sup>a</sup>    | -                           | -                          | -                         | -                         | -                          | -                         |
| p-coumaric acid derivative                                       | 0.52 ± 0.16 <sup>a</sup>    | -                           | -                          | -                         | -                         | -                          | -                         |
| <b>Total Phenolic acids</b>                                      | 238.26 ± 11.91 <sup>f</sup> | 273.42 ± 13.67 <sup>g</sup> | 151.80 ± 7.59 <sup>d</sup> | 90.20 ± 4.51 <sup>c</sup> | 82.62 ± 4.31 <sup>b</sup> | 182.21 ± 9.11 <sup>e</sup> | 50.62 ± 2.53 <sup>a</sup> |
| <b>FLAVONOIDS</b>  |                             |                             |                            |                           |                           |                            |                           |
| Quercetin glycoside(QG1) - Quercetin hexosyl pentosyl rhamnoside | 1.02 ± 0.01 <sup>c</sup>    | 1.31 ± 0.07 <sup>d</sup>    | -                          | 9.11 ± 0.17 <sup>e</sup>  | 1.54 ± 0.03 <sup>d</sup>  | 0.69 ± 0.00 <sup>b</sup>   | 0.12 ± 0.00 <sup>a</sup>  |
| Quercetin glycoside(QG2) - Quercetin hexose pentoside            | 0.11 ± 0.01 <sup>a</sup>    | -                           | -                          | 1.19 ± 0.06 <sup>b</sup>  | -                         | -                          | -                         |

|   |                             |                             |                            |                            |                           |                            |                           |
|---|-----------------------------|-----------------------------|----------------------------|----------------------------|---------------------------|----------------------------|---------------------------|
| Quercetin-3-O-rhamnosyl-rutinoside (QG3)        | 0.69 ± 0.03 <sup>a</sup>    | -                           | -                          | -                          | -                         | -                          | -                         |
| Myricetin                                       | n.d.                        | -                           | -                          | -                          | -                         | -                          | -                         |
| Myricitrin (myricetin 3-rhamnoside)             | 0.10 ± 0.04 <sup>a</sup>    | -                           | -                          | -                          | -                         | -                          | -                         |
| Isorhamnetin glucoxyl-rhamnosyl-rhamnoside(IG1) | 0.40 ± 0.02 <sup>d</sup>    | 0.46 ± 0.02 <sup>e</sup>    | 0.20 ± 0.01 <sup>c</sup>   | 0.42 ± 0.01 <sup>d</sup>   | t.r.                      | 0.10 ± 0.00 <sup>b</sup>   | 0.02 ± 0.00 <sup>a</sup>  |
| Isorhamnetin glucoxyl-rhamnosyl-pentoside(IG2)  | 5.01 ± 0.0 <sup>e</sup>     | 5.62 ± 0.28 <sup>f</sup>    | 0.59 ± 0.03 <sup>a</sup>   | 1.45 ± 0.06 <sup>b</sup>   | 3.01 ± 0.15 <sup>d</sup>  | 2.22 ± 0.03 <sup>c</sup>   | 1.34 ± 0.00 <sup>b</sup>  |
| <b>Total Flavonoids</b>                         | 7.33 ± 0.3 <sup>e</sup>     | 7.39 ± 0.23 <sup>e</sup>    | 0.79 ± 0.04 <sup>a</sup>   | 12.17 ± 0.61 <sup>d</sup>  | 4.55 ± 0.23 <sup>c</sup>  | 3.01 ± 0.06 <sup>b</sup>   | 1.47 ± 0.07 <sup>a</sup>  |
| <b>ELLAGIC ACIDS</b>                            |                             |                             |                            |                            |                           |                            |                           |
| Ellagic acid                                    | 2.44 ± 0.17 <sup>b</sup>    | 2.03 ± 0.10 <sup>a</sup>    | -                          | 2.54 ± 0.29 <sup>a</sup>   | n.d.                      | 2.10 ± 0.02 <sup>a</sup>   |                           |
| Ellagic acid derivative I                       | 3.36 ± 0.27 <sup>a</sup>    | -                           | -                          | t.r.                       | -                         | -                          | -                         |
| Ellagic acid rhamnoside                         | t.r.                        | -                           | -                          | -                          | -                         | -                          | -                         |
| <b>Total Ellagic acids</b>                      | 5.80 ± 0.29 <sup>c</sup>    | 2.03 ± 0.10 <sup>b</sup>    | t.r.                       | 2.54 ± 0.29 <sup>a</sup>   | t.r.                      | 2.10 ± 0.02 <sup>b</sup>   | t.r.                      |
| <b>Total phenolic compounds</b>                 | 251.38 ± 12.57 <sup>f</sup> | 282.84 ± 14.14 <sup>g</sup> | 152.60 ± 7.63 <sup>d</sup> | 104.91 ± 5.24 <sup>c</sup> | 87.17 ± 4.35 <sup>b</sup> | 187.32 ± 9.37 <sup>e</sup> | 52.09 ± 2.60 <sup>a</sup> |

Results were expressed as mean ± standard deviation (n = 4). This came from obtaining at least two independent extracts (n = 2) and performing the determinations of each two times (n = 2). Superscript letters indicate statistically significant differences ( $p \leq 0.05$ ) between tissues, products and by-products. 1 Expressed as mg/100g fresh weight.

Abbreviations: n.d.: not detected. T.r.: trazes.

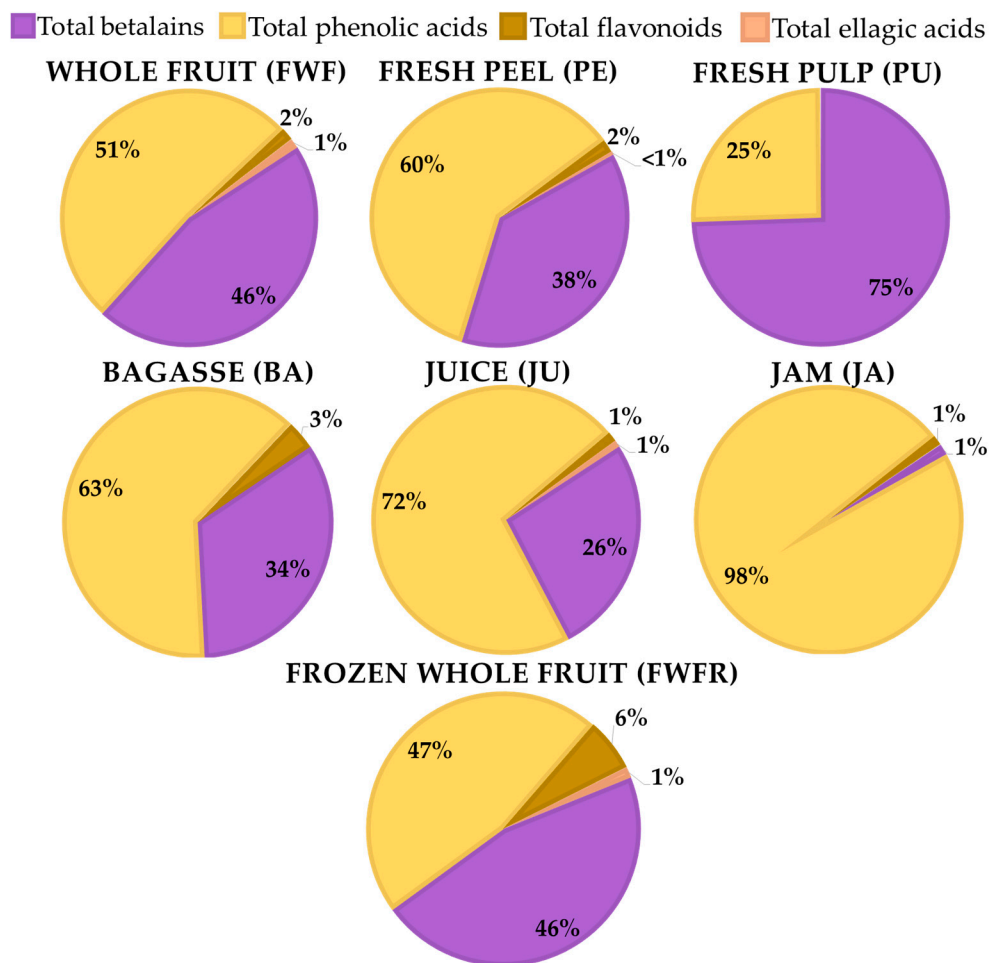
**Table S3.** Stability of the most abundant betalain and phenolic compounds in *Opuntia stricta* var. *Dillenii* fruit tissues (peel, pulp and whole fruit), jam production products (intermediate juice and jam) and by-product (bagasse) during *in vitro* gastro-intestinal static digestion

| Compound                          | <i>in vitro</i><br>digestión phase | Fresh whole<br>fruit (FWF)  | Fresh Peel (PE)              | Fresh Pulp (PU)              | Bagasse<br>By-product<br>(BA) | Fresh pressed<br>Juice (JU) | Jam (JA)                  |
|-----------------------------------|------------------------------------|-----------------------------|------------------------------|------------------------------|-------------------------------|-----------------------------|---------------------------|
| <b>BETALAINS</b>                  |                                    |                             |                              |                              |                               |                             |                           |
| Betanin                           | Control                            | 87.28 ± 0.96 <sup>d</sup>   | 83.12 ± 4.16 <sup>Bc</sup>   | 146.36 ± 2.08 <sup>e</sup>   | 11.21 ± 0.18 <sup>a</sup>     | 18.77 ± 0.02 <sup>b</sup>   | -                         |
|                                   | Oral                               | 61.19 ± 3.11 <sup>Bc</sup>  | 126.09 ± 6.30 <sup>Ce</sup>  | 74.04 ± 3.84 <sup>Bd</sup>   | 3.62 ± 0.18 <sup>Ba</sup>     | 16.79 ± 0.31 <sup>Bb</sup>  | -                         |
|                                   | Gastric                            | 65.60 ± 0.04 <sup>Bc</sup>  | 78.13 ± 1.40 <sup>Bd</sup>   | 83.88 ± 0.80 <sup>Ce</sup>   | 5.59 ± 0.09 <sup>Ca</sup>     | 18.09 ± 0.40 <sup>Cb</sup>  | -                         |
|                                   | Intestinal                         | 19.57 ± 1.34 <sup>Ac</sup>  | 35.39 ± 2.79 <sup>Ad</sup>   | 33.59 ± 0.46 <sup>Ad</sup>   | 2.13 ± 0.16 <sup>Aab</sup>    | 5.36 ± 0.42 <sup>Ab</sup>   | -                         |
| Isobetanin                        | Control                            | 42.78 ± 0.04 <sup>d</sup>   | 25.31 ± 1.27 <sup>Bc</sup>   | 100.77 ± 1.48 <sup>e</sup>   | 9.78 ± 0.16 <sup>a</sup>      | 16.88 ± 0.01 <sup>b</sup>   | -                         |
|                                   | Oral                               | 30.40 ± 1.58 <sup>Bc</sup>  | 42.09 ± 2.10 <sup>Cd</sup>   | 53.45 ± 2.81 <sup>Be</sup>   | 3.28 ± 0.18 <sup>Ba</sup>     | 15.36 ± 0.26 <sup>Ab</sup>  | -                         |
|                                   | Gastric                            | 32.85 ± 0.08 <sup>Bd</sup>  | 26.35 ± 0.83 <sup>Bc</sup>   | 60.84 ± .071 <sup>Be</sup>   | 5.09 ± 0.11 <sup>Ca</sup>     | 16.41 ± 0.34 <sup>Cb</sup>  | -                         |
|                                   | Intestinal                         | 9.78 ± 0.75 <sup>Ac</sup>   | 11.56 ± 0.42 <sup>Ad</sup>   | 23.79 ± 0.41 <sup>Ae</sup>   | 1.81 ± 0.15 <sup>Aa</sup>     | 4.46 ± 0.41 <sup>Ab</sup>   | -                         |
| Betanidin                         | Control                            | 1.15 ± 0.11 <sup>Ba</sup>   | 4.32 ± 0.22 <sup>Da</sup>    | 1.70 ± 0.09 <sup>Ca</sup>    | 0.24 ± 0.01 <sup>Da</sup>     | 0.45 ± 0.01 <sup>Ba</sup>   | -                         |
|                                   | Oral                               | 1.78 ± 0.18 <sup>Cd</sup>   | 3.59 ± 0.28 <sup>Ce</sup>    | 1.44 ± 0.08 <sup>Bc</sup>    | 0.07 ± 0.00 <sup>Ba</sup>     | 0.49 ± 0.00 <sup>Cb</sup>   | -                         |
|                                   | Gastric                            | 1.80 ± 0.06 <sup>Cd</sup>   | 2.00 ± 0.01 <sup>Be</sup>    | 1.56 ± 0.00 <sup>BCc</sup>   | 0.11 ± 0.00 <sup>Ca</sup>     | 0.50 ± 0.11 <sup>Cb</sup>   | -                         |
|                                   | Intestinal                         | 0.54 ± 0.04 <sup>Ac</sup>   | 0.94 ± 0.04 <sup>Ad</sup>    | 0.62 ± 0.01 <sup>Ac</sup>    | 0.02 ± 0.00 <sup>Aa</sup>     | 0.12 ± 0.01 <sup>Ab</sup>   | -                         |
| 2'-O-apiosyl-4-O-<br>phyllocactin | Control                            | 45.86 ± 5.73 <sup>Dc</sup>  | 35.17 ± 1.76 <sup>Cc</sup>   | 110.06 ± 5.50 <sup>Dd</sup>  | 8.83 ± 0.08 <sup>Db</sup>     | 11.75 ± 0.40 <sup>Ab</sup>  | 0.51 ± 0.03 <sup>Ca</sup> |
|                                   | Oral                               | 29.52 ± 1.59 <sup>Bc</sup>  | 52.55 ± 2.63 <sup>Dd</sup>   | 51.73 ± 2.19 <sup>Bd</sup>   | 2.74 ± 0.05 <sup>Ba</sup>     | 12.16 ± 0.17 <sup>Ab</sup>  | 0.05 ± 0.01 <sup>Aa</sup> |
|                                   | Gastric                            | 29.30 ± 1.03 <sup>Bd</sup>  | 31.86 ± 0.17 <sup>Be</sup>   | 55.96 ± 0.45 <sup>Cf</sup>   | 3.04 ± 0.15 <sup>Cb</sup>     | 11.83 ± 0.07 <sup>Ac</sup>  | 0.08 ± 0.00 <sup>Ba</sup> |
|                                   | Intestinal                         | 9.25 ± 0.70 <sup>Ac</sup>   | 14.53 ± 0.27 <sup>Ad</sup>   | 6.60 ± 0.33 <sup>Ab</sup>    | 1.94 ± 0.05 <sup>Aa</sup>     | n.d.                        | n.d.                      |
| Neobetanin                        | Control                            | 17.17 ± 0.70 <sup>Cc</sup>  | 6.85 ± 0.34 <sup>Ba</sup>    | 56.57 ± 0.29 <sup>Cd</sup>   | 8.71 ± 0.19 <sup>Db</sup>     | 9.74 ± 0.27 <sup>Cb</sup>   | -                         |
|                                   | Oral                               | 11.63 ± 1.13 <sup>Bc</sup>  | 8.01 ± 0.40 <sup>DBc</sup>   | 35.02 ± 3.49 <sup>Bd</sup>   | 3.59 ± 0.22 <sup>Ba</sup>     | 10.76 ± 0.04 <sup>Dc</sup>  | -                         |
|                                   | Gastric                            | 17.15 ± 0.97 <sup>Cc</sup>  | 7.69 ± 0.38 <sup>Cb</sup>    | 35.30 ± 2.33 <sup>Bd</sup>   | 4.24 ± 0.18 <sup>Ca</sup>     | 9.23 ± 0.06 <sup>Bb</sup>   | -                         |
|                                   | Intestinal                         | 1.30 ± 0.30 <sup>Aa</sup>   | 1.59 ± 0.08 <sup>Aa</sup>    | 14.83 ± 1.56 <sup>Ab</sup>   | 0.27 ± 0.01 <sup>Aa</sup>     | 0.70 ± 0.03 <sup>Aa</sup>   | -                         |
| <b>Total of major</b>             | Control                            | 194.23 ± 9.71 <sup>De</sup> | 154.76 ± 7.74 <sup>Bd</sup>  | 415.46 ± 20.77 <sup>Df</sup> | 38.76 ± 1.94 <sup>Cb</sup>    | 57.59 ± 2.88 <sup>Cc</sup>  | 0.51 ± 0.03 <sup>Aa</sup> |
|                                   | Oral                               | 134.53 ± 6.73 <sup>Cd</sup> | 232.33 ± 11.62 <sup>Cf</sup> | 215.69 ± 10.78 <sup>Be</sup> | 13.29 ± 0.66 <sup>Bb</sup>    | 55.56 ± 2.78 <sup>Bc</sup>  | 0.05 ± 0.00 <sup>Aa</sup> |

|   |            |                             |                             |                              |                             |                             |                             |
|---|------------|-----------------------------|-----------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|
| <b>betalains</b>  | Gastric    | 100.66 ± 5.03 <sup>Bd</sup> | 146.03 ± 7.30 <sup>Be</sup> | 237.54 ± 11.88 <sup>Cf</sup> | 18.07 ± 0.90 <sup>Bb</sup>  | 56.06 ± 2.80 <sup>Bc</sup>  | 0.08 ± 0.00 <sup>Aa</sup>   |
|   | Intestinal | 40.44 ± 2.02 <sup>Ad</sup>  | 64.01 ± 3.20 <sup>Ae</sup>  | 79.43 ± 3.97 <sup>Af</sup>   | 6.18 ± 0.31 <sup>Ab</sup>   | 10.64 ± 0.53 <sup>Ac</sup>  | 0.00 <sup>Aa</sup>          |
| <b>PHENOLICS ACIDS</b>                                  |            |                             |                             |                              |                             |                             |                             |
| Piscidic acid   | Control    | 56.21 ± 0.30 <sup>Cc</sup>  | 101.00 ± 5.04 <sup>Ce</sup> | 39.52 ± 0.65 <sup>Ca</sup>   | 47.85 ± 0.27 <sup>Db</sup>  | 60.74 ± 0.70 <sup>Cd</sup>  | 38.71 ± 2.13 <sup>Ca</sup>  |
|   | Oral       | 39.38 ± 1.75 <sup>Bc</sup>  | 113.04 ± 5.65 <sup>Dd</sup> | 28.45 ± 0.24 <sup>Ba</sup>   | 21.24 ± 0.54 <sup>Bb</sup>  | 23.56 ± 0.46 <sup>Ab</sup>  | 28.97 ± 0.78 <sup>ABa</sup> |
|   | Gastric    | 45.82 ± 4.64 <sup>Bc</sup>  | 76.02 ± 2.41 <sup>Bc</sup>  | 7.65 ± 0.42 <sup>Ba</sup>    | 25.40 ± 0.68 <sup>Cb</sup>  | 28.01 ± 0.21 <sup>Bb</sup>  | 12.85 ± 0.30 <sup>Ba</sup>  |
|   | Intestinal | 34.35 ± 1.72 <sup>ABd</sup> | 41.12 ± 2.81 <sup>Ae</sup>  | 2.93 ± 0.09 <sup>Aab</sup>   | 0.97 ± 0.03 <sup>Aa</sup>   | 26.83 ± 0.77 <sup>Bc</sup>  | 7.02 ± 1.10 <sup>Ab</sup>   |
| <b>FLAVONOIDS</b>                                       |            |                             |                             |                              |                             |                             |                             |
| Quercetin   | Control    | 1.02 ± 0.01 <sup>Dc</sup>   | 1.31 ± 0.07 <sup>Ae</sup>   | -                            | 1.54 ± 0.03 <sup>Ad</sup>   | 0.69 ± 0.00 <sup>Cb</sup>   | 0.12 ± 0.00 <sup>Ba</sup>   |
| glycoside(QG1) -  | Oral       | 1.08 ± 0.01 <sup>Cb</sup>   | 2.08 ± 0.40 <sup>Bc</sup>   | -                            | n.d.                        | 0.44 ± 0.00 <sup>Ba</sup>   | 0.01 ± 0.00 <sup>Aa</sup>   |
| Quercetin hexosyl                                       | Gastric    | 0.92 ± 0.00 <sup>Bc</sup>   | 1.13 ± 0.02 <sup>Ad</sup>   | -                            | n.d.                        | 0.47 ± 0.00 <sup>Bb</sup>   | 0.02 ± 0.00 <sup>Aa</sup>   |
| pentosyl rhamnoside                                     | Intestinal | 0.29 ± 0.03 <sup>Ab</sup>   | 0.70 ± 0.07 <sup>Ac</sup>   | -                            | n.d.                        | 0.31 ± 0.01 <sup>Ab</sup>   | 0.01 ± 0.00 <sup>Aa</sup>   |
| Isorhamnetin glucoxyl-<br>rhamnosyl-<br>rhamnoside(IG1) | Control    | 0.40 ± 0.02 <sup>Dd</sup>   | 0.46 ± 0.02 <sup>Be</sup>   | 0.20 ± 0.01 <sup>Ac</sup>    | -                           | 0.10 ± 0.00 <sup>Cb</sup>   | 0.02 ± 0.00 <sup>Ba</sup>   |
|   | Oral       | 0.32 ± 0.02 <sup>Cb</sup>   | 0.77 ± 0.05 <sup>Cc</sup>   | n.d.                         | -                           | 0.07 ± 0.01 <sup>Ba</sup>   | 0.00 ± 0.00 <sup>Aa</sup>   |
|   | Gastric    | 0.26 ± 0.02 <sup>Bc</sup>   | 0.37 ± 0.00 <sup>Bd</sup>   | n.d.                         | -                           | 0.10 ± 0.00 <sup>Cb</sup>   | 0.00 ± 0.00 <sup>Aa</sup>   |
|   | Intestinal | 0.06 ± 0.00 <sup>Aa</sup>   | 0.14 ± 0.00 <sup>Ab</sup>   | n.d.                         | -                           | 0.03 ± 0.00 <sup>Aa</sup>   | n.d.                        |
| Isorhamnetin glucoxyl-<br>rhamnosyl-<br>pentoside(IG2)  | Control    | 5.01 ± 0.03 <sup>Ce</sup>   | 5.62 ± 1.77 <sup>Ae</sup>   | 0.59 ± 0.03 <sup>Ca</sup>    | 3.01 ± 0.15 <sup>Dd</sup>   | 2.22 ± 0.03 <sup>BCbc</sup> | 1.34 ± 0.00 <sup>Bab</sup>  |
|   | Oral       | 3.75 ± 0.37 <sup>Bb</sup>   | 9.68 ± 0.91 <sup>Bc</sup>   | 0.40 ± 0.08 <sup>Ba</sup>    | 1.07 ± 0.00 <sup>Bab</sup>  | 2.10 ± 0.11 <sup>Bab</sup>  | 0.01 ± 0.00 <sup>Aa</sup>   |
|   | Gastric    | 3.74 ± 0.11 <sup>Be</sup>   | 5.96 ± 0.05 <sup>Af</sup>   | 0.41 ± 0.03 <sup>Db</sup>    | 1.69 ± 0.02 <sup>Cc</sup>   | 2.42 ± 0.04 <sup>Cd</sup>   | 0.02 ± 0.00 <sup>Aa</sup>   |
|   | Intestinal | 1.00 ± 0.06 <sup>Ae</sup>   | 2.32 ± 0.06 <sup>Af</sup>   | 0.22 ± 0.03 <sup>Ab</sup>    | 0.56 ± 0.03 <sup>Ac</sup>   | 0.81 ± 0.01 <sup>Ad</sup>   | 0.01 ± 0.00 <sup>Aa</sup>   |
| <b>Total of major<br/>Flavonoids</b>                    | Control    | 6.43 ± 0.32 <sup>De</sup>   | 7.38 ± 0.37 <sup>Cf</sup>   | 0.79 ± 0.04 <sup>Aa</sup>    | 4.55 ± 0.23 <sup>Dd</sup>   | 3.01 ± 0.15 <sup>Cc</sup>   | 1.47 ± 0.07 <sup>Bab</sup>  |
|   | Oral       | 5.15 ± 0.26 <sup>Cd</sup>   | 12.53 ± 0.63 <sup>De</sup>  | 0.40 ± 0.02 <sup>Aa</sup>    | 1.07 ± 0.05 <sup>Bb</sup>   | 2.61 ± 0.13 <sup>Bc</sup>   | 0.03 ± 0.00 <sup>Aa</sup>   |
|   | Gastric    | 4.92 ± 0.25 <sup>Be</sup>   | 7.19 ± 0.36 <sup>Bf</sup>   | 0.81 ± 0.04 <sup>Ab</sup>    | 1.69 ± 0.08 <sup>Cc</sup>   | 2.99 ± 0.15 <sup>Cd</sup>   | 0.04 ± 0.00 <sup>Aa</sup>   |
|   | Intestinal | 1.35 ± 0.07 <sup>Ae</sup>   | 3.17 ± 0.16 <sup>Af</sup>   | 0.22 ± 0.01 <sup>Ab</sup>    | 0.56 ± 0.03 <sup>Ac</sup>   | 1.15 ± 0.06 <sup>Ad</sup>   | 0.02 ± 0.00 <sup>Aa</sup>   |
| <b>Total of major<br/>phenolic compounds</b>            | Control    | 62.64 ± 3.13 <sup>Dab</sup> | 108.39 ± 5.42 <sup>Ce</sup> | 40.31 ± 2.02 <sup>Da</sup>   | 52.40 ± 2.62 <sup>Dab</sup> | 63.76 ± 3.19 <sup>Dab</sup> | 40.81 ± 2.01 <sup>Da</sup>  |
|   | Oral       | 44.96 ± 2.25 <sup>Bd</sup>  | 125.57 ± 6.28 <sup>De</sup> | 8.85 ± 0.44 <sup>Cs</sup>    | 22.30 ± 1.12 <sup>Bb</sup>  | 26.17 ± 1.31 <sup>Ac</sup>  | 8.99 ± 0.45 <sup>Bd</sup>   |

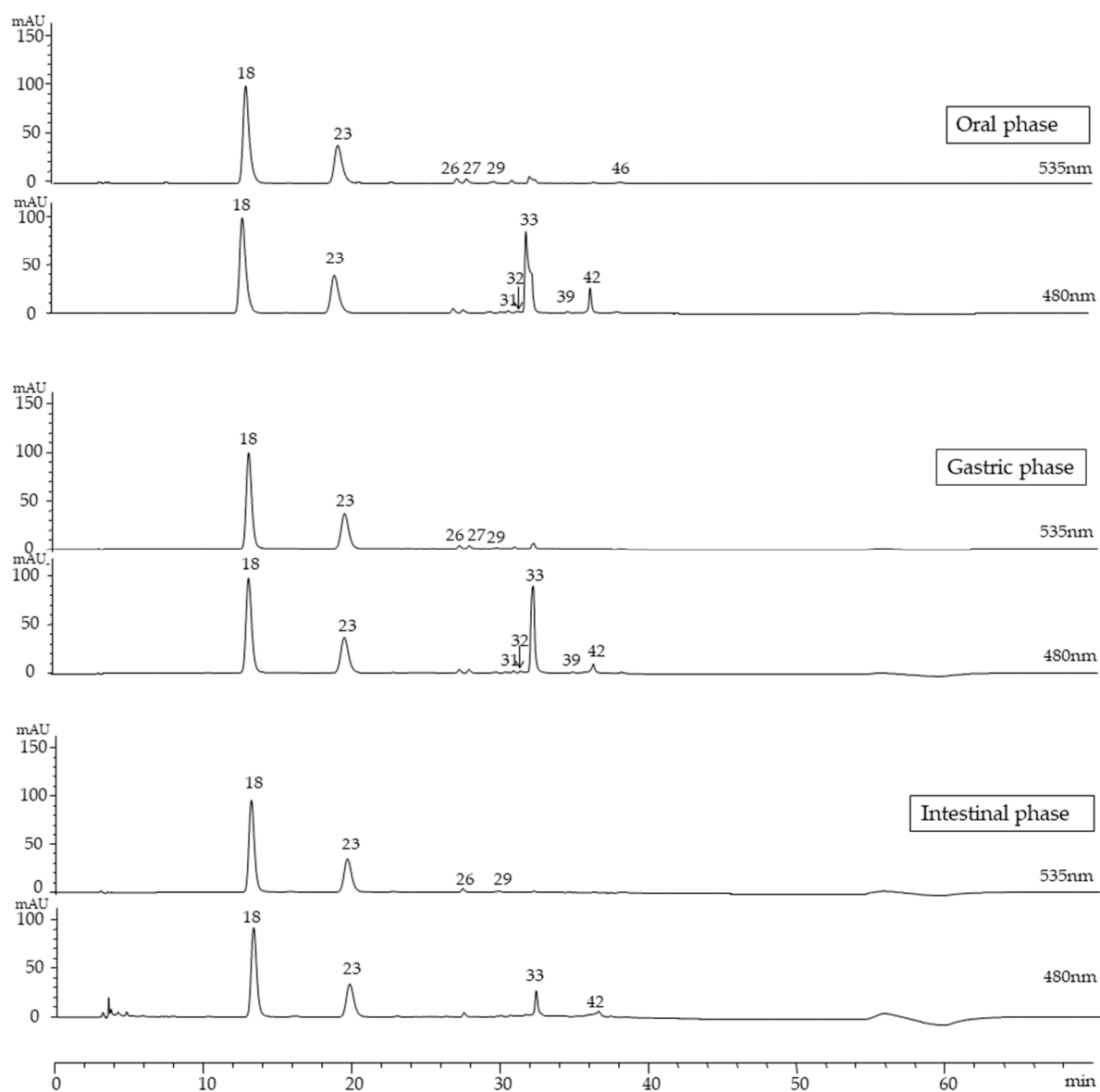
|            |                            |                            |                           |                            |                            |                            |
|------------|----------------------------|----------------------------|---------------------------|----------------------------|----------------------------|----------------------------|
| Gastric    | 50.73 ± 2.54 <sup>Ce</sup> | 83.21 ± 4.16 <sup>Bf</sup> | 8.45 ± 0.42 <sup>Bs</sup> | 27.09 ± 1.35 <sup>Cd</sup> | 31.00 ± 1.55 <sup>Cc</sup> | 12.89 ± 0.64 <sup>Cb</sup> |
| Intestinal | 35.70 ± 1.79 <sup>Ae</sup> | 44.28 ± 2.21 <sup>Af</sup> | 3.16 ± 0.16 <sup>Ab</sup> | 1.53 ± 0.08 <sup>Aa</sup>  | 27.98 ± 1.40 <sup>Bd</sup> | 7.04 ± 0.35 <sup>Ac</sup>  |

Results were expressed as mean ± standard deviation (n = 4). This came from obtaining at least two independent extracts (n = 2) and performing the determinations of each two times (n = 2). Superscript capital letters indicate statistically significant differences ( $p \leq 0.05$ ) between digestion phases. Superscript small letters indicate statistically significant differences ( $p \leq 0.05$ ) between tissues, products and by-products. 1 Expressed as mg/100g fresh weight. Abbreviations: n.d.: not detected.

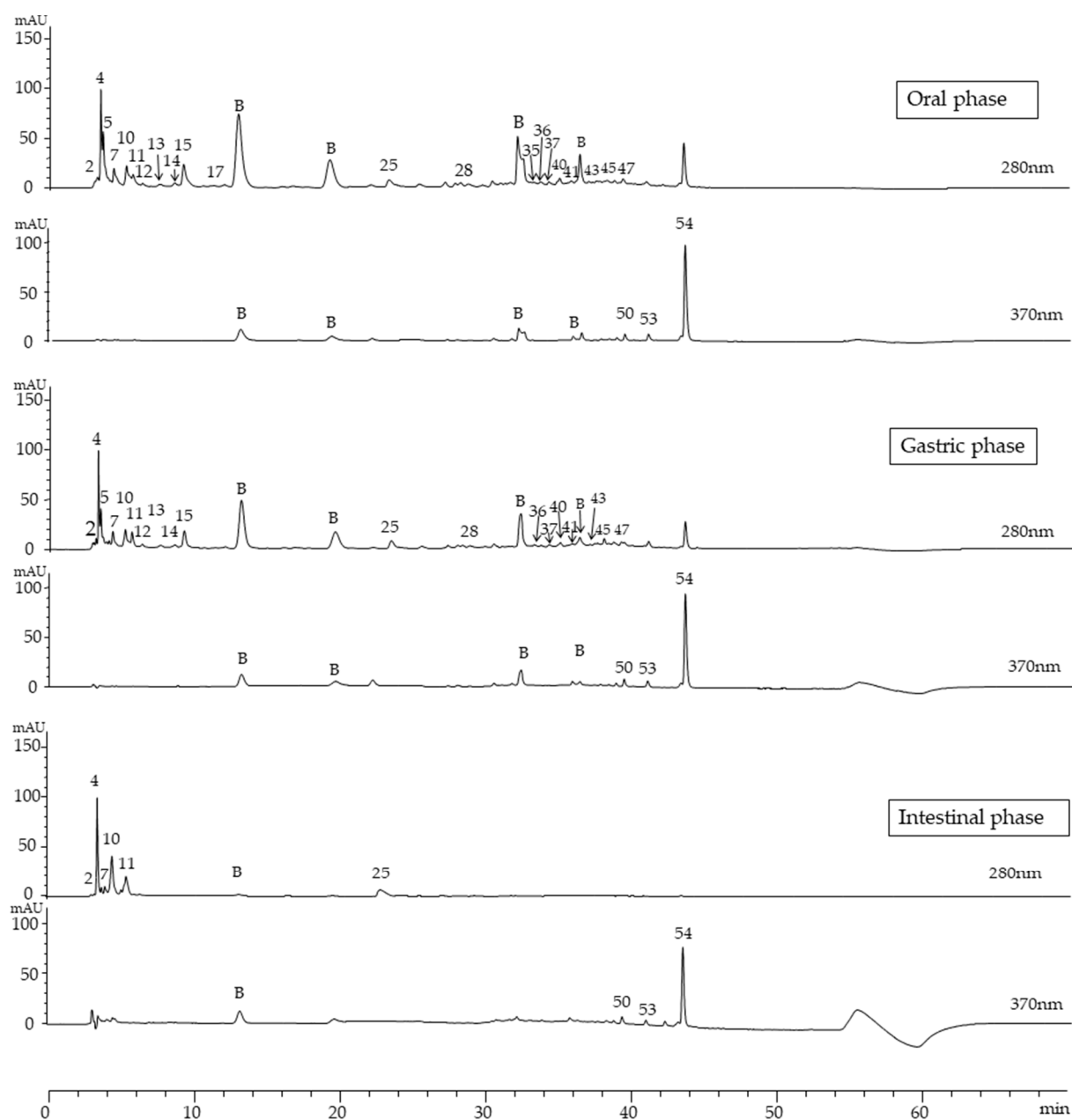


**Figure S1.** Betalains, phenolic acids and flavonoids distribution (%) from *Opuntia stricta* var. *Dillenii* fruit tissues (peel, pulp and whole fruit). jam production products (intermediate juice and jam) and by-product (bagasse).





**Figure S2.** HPLC-DAD chromatograms of betalains compounds recorded at 535 and 480 nm, betacyanins and betaxanthins, respectively, obtained from *Opuntia stricta* var. *Dillenii* whole fruit after in vitro static gastro-intestinal digestion. <sup>1</sup>Numbers correspond to the identified compounds indicated in Table 1.



**Figure S3.** HPLC-DAD chromatograms of phenolic compounds recorded at 280 and 370 nm, phenolic acids and flavonoids, respectively, obtained from *Opuntia stricta* var. *Dillenii* whole fruit after in vitro static gastro-intestinal digestion. <sup>1</sup>Numbers correspond to the identified compounds indicated in Table 1.