**Appendix B**

**Table B.1**. Phenolics determined in Algerian hawthorn flowers and fruit.

|  |  |  |
| --- | --- | --- |
| **Peak nr** | **Abs (nm)** | **Phenolic compound** |
| 1 | 280 | PA1 |
| 2 | 280 | PA2 |
| 3 | 320 | Neo-chlorogenic acid |
| 4 | 280 and 320 | PA3 + HC1 \* |
| 5 | 520 | Cyanidin der. |
| 6 | 280 | Dimer B2 |
| 7 | 320 | Chlorogenic acid |
| 8 | 280 | PA4 |
| 9 | 280 | Epicatechin |
| 10 | 320 | HC2 |
| 11 | 350 | Flavonol A |
| 12 | 280 and 320 | PA5 + Vitexin der. A \* |
| 13 | 280 and 320 | PA6 + Vitexin der. B \* |
| 14 | 350 | Rutin der. |
| 15 | 350 | Hyperoside |
| 16 | 350 | Isoquercitrin |
| 17 | 320 | HC3 |
| 18 | 280 | PA7 |
| 19 | 350 | Flavonol B |
| 20 | 280 | PA8 |

PA: procyanidin. HC: hydroxycinnamic acid. Der.: derivative.

\* The peak consisted of a mixture of procyanidins and other phenolics, that were separately quantified at 280 and 320 nm, subtracting the contribution of the latter to PAs.

**Table B.2:** Procyanidin (PA) contents of flowers and fruits extracts of Algerian hawthorn (mg/100g DW).

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Epicat.**a | **Dimer B2**b | PA1c | PA2d | PA3e | PA4f | PA5g | PA6h | PA7i | PA8j | Total PAs |
| **Flower (Fl)** | |  |  |  |  |  |  |  |  |  |  |  |
| **Fl1** |  | 7.4 ± 0.1 | 11.1 ± 1.9 | 30.0 ± 1.5 | 7.8 ± 1.5 | 74.5 ± 0.3 | 41.4 ± 1.0 | 51.3 ± 16.8 | n.d. | 402.6 ± 1.9 | 161.5 ± 15.7 | 787.5 ± 30.7 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Fl2** |  | 1.4 ± 0.0 | n.d. | n.d. | 66.8 ± 5.1 | n.d. | 18.7 ± 1.0 | 34.7 ± 2.9 | n.d. | 41.3 ± 2.7 | n.d. | 162.8 ± 6.3 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Fl3** |  | 7.2 ± 1.0 | 15.4 ± 6.8 | n.d. | 30.1 ± 6.2 | 180.7 ± 13.9 | 57.2 ± 2.5 | 212.3 ± 8.0 | n.d. | 192.8 ± 100.0 | n.d. | 695.5 ± 95.1 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Fl4** |  | 1.4 ± 0.1 | n.d. | n.d. | 27.5 ± 3.1 | 10.3 ± 0.9 | 19.8 ± 0.9 | 34.2 ± 1.5 | n.d. | 14.2 ± 6.0 | n.d. | 107.3 ± 0.5 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Fruit (Fr)** | |  |  |  |  |  |  |  |  |  |  |  |
| **Fr1** |  | 204.2 ± 48.5 | 241.0 ± 49.3 | 30.9 ± 4.6 | 22.7 ± 4.0 | 40.4 ± 14.8 | 29.5 ± 8.4 | 56.6 ± 13.8 | 13.7 ± 3.0 | n.d. | n.d. | 639.1 ± 146.4 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Fr2** |  | 194.0 ± 24.5 | 270.7 ± 61.9 | 21.9 ± 5.9 | 26.1 ± 3.1 | 45.0 ± 2.2 | 36.7 ± 12.4 | 74.2 ± 12.9 | 15.9 ± 2.9 | n.d. | n.d. | 684.4 ± 121.5 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Fr3** |  | 198.5 ± 0.2 | 303.5 ± 9.8 | 28.2 ± 0.0 | 34.6 ± 0.8 | 39.6 ± 1.0 | 34.2 ± 0.2 | 75.6 ± 2.1 | 16.5 ± 0.3 | n.d. | n.d. | 730.7 ± 8.3 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Fr4** |  | 170.6 ± 2.2 | 222.2 ± 6 | 24.8 ± 0.4 | 46.6 ± 1.0 | 39.4 ± 2.8 | 32.7 ± 2.9 | 74.6 ± 5.3 | 15.3 ± 1.1 | n.d. | n.d. | 626.2 ± 7.4 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Flowers average** | |  |  |  |  |  |  |  |  |  |  |  |
|  |  | 4.3 ± 3.4 | 6.6 ± 7.8 | 7.5 ± 15.0 | 33.1 ± 24.6 | 66.4 ± 83.0 | 34.3 ± 18.5 | 83.1 ± 86.5 | n.d. | 162.7 ± 178.2 | 40.4 ± 80.7 | 438.3 ± 352.9 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Fruits average** | |  |  |  |  |  |  |  |  |  |  |  |
|  |  | 191.8 ± 14.8 | 259.3 ± 35.6 | 26.4 ± 3.9 | 32.5 ± 10.6 | 41.1 ± 2.6 | 33.3 ± 3.0 | 70.3 ± 9.1 | 15.3 ± 1.2 | n.d. | n.d. | 670.1 ± 47.5 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Fl vs Fr** | | \* | \* | \* | ns | ns | ns | ns | - | - | - | \* |

a epicatechin, peak nr 9. b peak nr 6. c peak nr 1. d  peak nr 2. e peak nr 4. f peak nr 8. g peak nr 12. h peak nr 13. i peak nr 18. j peak nr 20

Asterisks indicate significant differences between averaged flowers and fruits, (P < 0.05; ns: not statistically different).

**Table B.3:** Hydroxycinnamic acid (HC) contents of flowers and fruits extracts of Algerian hawthorn (mg/100g DW).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Neo-CGAa** | **CGAb** | HC1c | HC2d | HC3e | **Total HCs** |
| **Flower (Fl)** |  |  |  |  |  |  |  |
| **Fl1** |  | 137.2 ± 4.7 | 393.8 ± 2.7 | n.d. | 6.4 ± 0.1 | 33.2 ± 3.6 | 570.7 ± 5.6 |
|  |  |  |  |  |  |  |  |
| **Fl2** |  | 21.7 ± 2.9 | 39.6 ± 0.3 | n.d. | 0.9 ± 0.1 | 3.3 ± 0.4 | 65.6 ± 3.0 |
|  |  |  |  |  |  |  |  |
| **Fl3** |  | 350.2 ± 3.3 | 479.8 ± 0.3 | n.d. | 15.4 ± 1.4 | 82.6 ± 0.9 | 928.0 ± 3.0 |
|  |  |  |  |  |  |  |  |
| **Fl4** |  | 23.5 ± 1.0 | 39.7 ± 0.8 | n.d. | 1.0 ± 0.1 | 2.6 ± 1.0 | 66.9 ± 0.9 |
|  |  |  |  |  |  |  |  |
| **Fruit (Fr)** |  |  |  |  |  |  |  |
| **Fr1** |  | 37.0 ± 10.8 | 45.1 ± 12.4 | 3.6 ± 0.9 | n.d. | n.d. | 85.7 ± 24.1 |
|  |  |  |  |  |  |  |  |
| **Fr2** |  | 49.4 ± 12.7 | 30.4 ± 6.7 | 4.6 ± 1.0 | n.d. | n.d. | 84.3 ± 20.4 |
|  |  |  |  |  |  |  |  |
| **Fr3** |  | 33.6 ± 2.6 | 33.5 ± 0.1 | 3.2 ± 0.2 | n.d. | n.d. | 70.3 ± 2.5 |
|  |  |  |  |  |  |  |  |
| **Fr4** |  | 42.9 ± 0.7 | 30.4 ± 0.9 | 4.5 ± 0.4 | n.d. | n.d. | 77.8 ± 1.2 |
|  |  |  |  |  |  |  |  |
| **Flowers average** | |  |  |  |  |  |  |
|  |  | 133.2 ± 154.5 | 238.2 ± 231.9 | n.d. | 5.9 ± 6.8 | 30.5 ± 37.6 | 407.8 ± 420.5 |
|  |  |  |  |  |  |  |  |
| **Fruits average** | |  |  |  |  |  |  |
|  |  | 40.7 ± 6.9 | 34.9 ± 7.0 | 4.0 ± 0.7 | n.d. | n.d. | 79.6 ± 7.1 |
|  |  |  |  |  |  |  |  |
| **Fl vs Fr** | | \* | \* | - | - | - | \* |

a neo-chlorogenic acid, peak nr 3. b chlorogenic acid, peak nr 7. c peak nr 4. d peak nr 10. e peak nr 17

Asterisks indicate significant differences between averaged flowers and fruits, ( P < 0.05; ns: not statistically different).

**Table B.4:** Vitexin and anthocyanincontents of flowers and fruits extracts of Algerian hawthorn (mg/100g DW).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | **Vitexin der. Aa** | **Vitexin der. B b** | **Total Vitexins** | **Anthoc.c** |
| **Flower (Fl)** |  |  |  |  |  |
| **Fl1** |  | 36.0 ± 0.4 | 372.6 ± 6.4 | 408.6 ± 6.8 | n.d. |
|  |  |  |  |  |  |
| **Fl2** |  | 21.9 ± 2.0 | 145.3 ± 3.5 | 167.2 ± 5.6 | n.d. |
|  |  |  |  |  |  |
| **Fl3** |  | 72.1 ± 1.3 | 318.7 ± 0.6 | 390.8 ± 1.9 | n.d. |
|  |  |  |  |  |  |
| **Fl4** |  | 15.7 ± 0.7 | 105.2 ± 8.2 | 120.9 ± 7.5 | n.d. |
|  |  |  |  |  |  |
| **Fruit (Fr)** |  |  |  |  |  |
| **Fr1** |  | n.d. | 4.3 ± 1.1 | 4.3 ± 1.1 | 21.8 ± 4.5 |
|  |  |  |  |  |  |
| **Fr2** |  | 2.0 ± 0.8 | 3.4 ± 0.7 | 5.4 ± 1.5 | 9.2 ± 2.5 |
|  |  |  |  |  |  |
| **Fr3** |  | 1.5 ± 0.1 | 3.2 ± 0.2 | 4.7 ± 0.3 | 35.0 ± 0.3 |
|  |  |  |  |  |  |
| **Fr4** |  | 1.9 ± 0.5 | 3.5 ± 0.0 | 5.3 ± 0.5 | 19.6 ± 1.2 |
|  |  |  |  |  |  |
| **Flowers average** | |  |  |  |  |
|  |  | 36.4 ± 25.3 | 235.5 ± 130.2 | 271.9 ± 149.0 | n.d. |
|  |  |  |  |  |  |
| **Fruits average** | |  |  |  |  |
|  |  | 1.3 ± 0.9 | 3.6 ± 0.5 | 4.9 ± 0.6 | 21.4 ± 10.6 |
|  |  |  |  |  |  |
| **Fl vs Fr** | | \* | \* | \* | - |

a vitexin derivative A, peak nr 12. b vitexin derivative B, peak nr 13. c antocyanin (cyanidin derivative), peak nr 5.

Asterisk indicates significant differences between averaged flowers and fruits (P < 0.05; ns: not statistically different).

**Table B.5:** Flavonol and total phenols contents of flowers and fruits extracts of Algerian hawthorn (mg/100g DW).

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Flavonol A** | **Rut. der.b** | **Hyper.c** | **Isoquerc.d** | **Flavonol B** | **Total Flavonols** | **Total Polyphenols** |
| **Flower (Fl)** |  |  |  |  |  |  |  |  |
| **Fl1** |  | 82.6 ± 2.2 | 55.9 ± 1.9 | 394.7 ± 7.7 | 189.0 ± 4.6 | 74.6 ± 18.8 | 796.8 ± 30.8 | 2563.6 ± 1.4 |
|  |  |  |  |  |  |  |  |  |
| **Fl2** |  | 12.0 ± 0.2 | 13.1 ± 0.5 | 61.6 ± 1.1 | 26.3 ± 0.4 | 22.7 ± 3.5 | 135.8 ± 2.7 | 531.4 ± 12.2 |
|  |  |  |  |  |  |  |  |  |
| **Fl3** |  | 89.1 ± 2.5 | 157.0 ± 11.2 | 581.9 ± 12.2 | 279.3 ± 2.7 | 172.3 ± 0.0 | 1279.6 ± 4.1 | 3294.0 ± 92.1 |
|  |  |  |  |  |  |  |  |  |
| **Fl4** |  | 7.7 ± 0.9 | 7.2 ± 0.9 | 56.4 ± 4.6 | 19.9 ± 3.1 | 25.3 ± 0.1 | 116.6 ± 9.7 | 411.7 ± 2.6 |
|  |  |  |  |  |  |  |  |  |
| **Fruit (Fr)** |  |  |  |  |  |  |  |  |
| **Fr1** |  | n.d. | 8.7 ± 1.3 | 48.8 ± 12.1 | 19.2 ± 3.3 | n.d. | 76.7 ± 16.8 | 827.5 ± 192.9 |
|  |  |  |  |  |  |  |  |  |
| **Fr2** |  | n.d. | 10.4 ± 2.4 | 61.5 ±11.5 | 29.7 ± 7.1 | n.d. | 101.5 ± 21.1 | 884.9 ± 167.0 |
|  |  |  |  |  |  |  |  |  |
| **Fr3** |  | n.d. | 7.0 ± 1.0 | 36.3 ± 0.2 | 23.8 ± 1.4 | n.d. | 67.1 ± 2.1 | 907.8 ± 13.5 |
|  |  |  |  |  |  |  |  |  |
| **Fr4** |  | n.d. | 6.0 ± 0.5 | 83.6 ± 0.7 | 36.9 ± 1.9 | n.d. | 126.4 ± 0.7 | 855.3 ± 7.7 |
|  |  |  |  |  |  |  |  |  |
| **Flowers average** | |  |  |  |  |  |  |  |
|  |  | 47.9 ± 44.0 | 58.3 ± 69.3 | 273.7 ± 259.4 | 128.6 ± 127.3 | 73.7 ± 69.9 | 582.2 ± 562.3 | 1700.2 ± 1450.5 |
|  |  |  |  |  |  |  |  |  |
| **Fruits average** | |  |  |  |  |  |  |  |
|  |  | n.d. | 8.0 ± 1.9 | 57.5 ± 20.2 | 27.4 ± 7.6 | n.d. | 92.9 ± 26.6 | 868.9 ± 34.9 |
|  |  |  |  |  |  |  |  |  |
| **Fl vs Fr** | | - | \* | \* | \* | - | \* | \* |

a peak nr 11. b rutin derivative, peak nr 14. c hyperoside, peak nr 15. d isoquercitrin, peak nr 16. e peak nr 19.

Asterisk indicates significant differences between averaged flowers and fruits (P < 0.05; ns: not statistically different).