## Supporting information

**Action of polyphenols in bone formation**

**The impact of polyphenols in chondrocyte growth and survival: a preliminary report**

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**Chromatographic methods to assess the composition of plant extracts.** Polyphenols and other polar compounds (e.g., organic acids or simple phenols) were characterised using high-performance liquid chromatography (HPLC) in a suitable apparatus equipped with a C18 reverse phase column coupled to mass spectrometry (MS) utilising an electrospray ionisation source (ESI). In particular, *Aspalathus linearis* (Family *Fabaceae*; rooibos leaves) was characterised utilising a time-of-flight (TOF) and an ion trap (IT) as mass spectrometers (1). To analyse *Lippia citriodora* (Family *Verbenaceae*; lemon verbena leaves), we employed capillary electrophoresis coupled to an ESI-TOF/IT-MS platform (2). *Olea europaea* (Family *Oleaceae*; olive) leaves were characterised utilising a quadrupole-TOF as mass spectrometer (HPLC-ESI-QTOF-MS) (3). *Vitis vinifera* (Family *Vitaceae*; grape) seeds were analysed using an HPLC system coupled to a photodiode-array detector (4). For *Citrus aurantium* (Family *Rutaceae*; bitter orange), the characterisation was conducted using a diode-array detector (DAD) (5). Finally, the phenolic and other polar compoundsfrom *Hibiscus sabdariffa* (Family *Malvaceae*; karkade) were characterised utilising an HPLC-ESI-DAD-IT-MS (6) and quantitated with an HPLC-ESI-DAD-TOF-MS (7); the concentrated polyphenolic extract of *Hibiscus sabdariffa* was prepared as described (8).

**Table S1.** Qualitative composition of phenolic compounds in the assayed plant extracts

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Aspalathus***  ***linearis*** | ***Citrus***  ***aurantium*** | ***Lippia***  ***citriodora*** | ***Olea europaea***  **leaves** | ***Vitis vinifera***  **seeds** |
| Aspalaninin  Aspalathin  Carlinoside (and derivatives)  Esculin  Iso-orientin  Isovitexin  Luteolin (and glycoside derivatives)  Nothofagin  Orientin  Patuletin-7-glucoside  Quercetin (and glycoside derivatives)  Secoisolariciresinol  Vicenin-2 | Catechin  Chlorogenic acid  Cinnamic acid (and derivatives)  Epicatechin  Ferulic acid  Gallic acid  Hydroxybenzoic acid  Naringin  *p*-Coumaric acid  Rosmarinic acid  Rutin  Syringic acid  Tyrosol  Vanillic acid | Acacetin-7-diglucuronide  Apigenin-7-diglucuronide  Campneoside I  Chrysoeriol-7-diglucuronide  Cistanoside F  Eukovoside  Forsythoside A  Gardoside  Luteolin-7-diglucuronide  Martinoside  Theveside  Verbascoside (and derivatives) | 7-epiloganin  Apigenin (and glycoside derivatives)  Elenolic acid derivatives  Hydroxybenzoic acid  Hydroxytyrosol  Ligstroside  Lucidumoside C  Luteolin (and glycoside derivatives)  Oleoside (and derivatives)  Oleuropein (and derivatives)  Rutin  Vanillin  Verbascoside | Caffeic acid  Catechin  Chlorogenic acid  Epicatechin  Epicatechin-gallate  Gallic acid  *p*-Coumaric acid  Procyanidin B1  Procyanidin B2  Procyanidin B3  Procyanidin B4  Protocatechuic acid  Quercetin  Rutin  Syringic acid  *t*-piceatannol  *t*-resveratrol  Vanillic acid |

|  |  |  |
| --- | --- | --- |
| Compound | *Hibiscus sabdariffa* | Polyphenolic extract of *Hibiscus sabdariffa* |
| Hydroxycitric acid | 0.8288 | - |
| Hibiscicus acid | 3.1122 | 1.2813 |
| Delphinidin-3-*O*-sambubioside | 0.2701 | 2.0732 |
| Cyanidin-3-*O*-sambubioside | 0.1939 | 0.8714 |
| Chlorogenic acid | 0.572 | 1.0647 |
| Hibiscus acid dimethyl ester | - | 0.0530 |
| Methyl digallate | - | 0.0280 |
| Myricetin-3-*O*-arabinogalactose | 0.0057 | 0.0476 |
| Coumaroylquinic acid | - | 0.0077 |
| Quercetin-3-*O*-sambubioside | 0.0304 | 0.0767 |
| Quercetin-3-*O*-rutinoside | 0.0495 | 0.0495 |
| 5-*O*-Caffeoylshikimic acid | 0.0172 | 0.0353 |
| Kaempferol-3-*O*-sambubioside | - | 0.0112 |
| Quercetin-3-*O*-glucoside | 0.0144 | 0.0307 |
| Kaempferol-3-*O*-rutinoside | 0.0092 | 0.0219 |
| Methyl epigallocatechin | - | 0.0031 |
| Myricetin | - | 0.0477 |
| *N*-feruloyltyramine | 0.0099 | 0.0087 |
| Prodelphinidin B3 | 0.1839 | 0.0033 |
| Quercetin | 0.0121 | 0.0580 |

**Table S2**. Phenolic compounds characterised in *Hibiscus sabdariffa* and its polyphenolic extract. The values indicate the concentration (in g/mL) of each compound in the culture medium. To provide the same total amount of compounds, we added 100 g/mL of the *Hibiscus sabdariffa* extract or 10 g/mL of the polyphenolic extract of *Hibiscus sabdariffa*.

**Additional references**

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