

Differences between Grape extract, Grape Pomace and Grape seed

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Aim of the study

Evaluation of the differences of antioxidant potential and antiradical efficiency of Grape extract (GE), Grape pomace (GP) and Grape seed (GS).

Composition and antioxidant activity evaluation of GE and GP:

Material and methods : In order to measure the antioxidant efficiency of GE and GP, a first assay was conducted by Chamorro et al. (2012), using the DPPH method as proposed by Brand-Williams et al. (1995). Results are reported in the table below.

	GE	GP	Ratio
Gallic Acid	336	5.74	59
Gallocatechin	5.1	0.028	182
Epigallocatechin	14.09	0.075	188
Catechin	823	2.96	278
Epicatechin	648	2.03	319
Procyanidin B1	903	4.63	195
Procyanidin B2	530	2.62	202
Epicatechin O-gallate	157	0.029	5414
Antioxidant activity	3299	16.5	200

Evaluation of GE, GP and GS antioxidant efficiency:

Material and methods : Determination of the efficient concentration of the products (EC₅₀) using a wide range of concentrations (0,1g/l to 10g/l) of products in acidified water (aw) and in aqueous ethanol (ae). EC₅₀ was calculated using the following equation:

$$EC50\left(\frac{mg_{product}}{l}\right) = \frac{EC50\left(\frac{mg_{product}}{g_{DPPH}}\right) * \left(\frac{g_{DPPH}}{10 ml EtOH}\right)}{l_{product\ solution\ added\ to\ the\ DPPH}}$$

Determination of the time of reaction T_{EC50} at the efficient concentration of the tested products, corresponding to the time in minutes needed to reduce 50% of the initial DPPH concentration.

Determination of the antiradical efficiency of the products : ARE (Popovici et al. 2010)

$$ARE = \frac{1}{EC50\left(\frac{mg_{product}}{g_{DPPH}}\right) * T_{EC50}\ (min)}$$

Results:

	EC ₅₀	T _{EC50}	ARE*10 ⁻⁶	Ratio GE/Product
GS (ae)	600	15.08	110	12.4
GS (aw)	1 600	14.48	43	31.6
GP (ae)	2 400	19.76	21	65.0
GP (aw)	11 900	19.11	4.4	310.2
GE (ae)	100	7.33	1364	

Discussion and conclusion

At an equal given concentration, GE antioxidant activity is 200 times higher than the GP one. Moreover, the antiradical efficiency of GE is higher than GP and GS respectively ranging from 12.4 (ae) to 31.6 (aw) times and from 65.0 (ae) to 310.2 (aw) times.

The best efficiency of the antiradical activity in GE could be justified by the presence of polyphenols in free form compared with polyphenols bounded or linked to other structures in the case of GP and GS. Polyphenols may behave differently in mixture when they occur individually.

The better antioxidant capacity and antiradical efficiency of GE, linked with its higher concentrations in active compounds, evidence the fact that it seems to be a better source of active antioxidants than GP or GS.

References

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