



The functional potential of the Saharan wild olive related to their bioactive compound contents and biological activities

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Introduction

- Natural compounds have been proven as antioxidant and acetylcholinesterase (AChE) inhibitor sources [1]. The drugs approved so far for Alzheimer disease (AD) therapy act by inhibiting the AChE [2].
- Olea europaea subsp. laperrinei* (Batt. & Trab.) Cif. (Fig. 1) is a tree located principally in the southern Sahara of Algeria, which is called "Aleo". It has traditionally been used as diuretic, antipyretic and hypotensive [3].
- In this work, the antioxidant and AChE inhibitory activities of two extracts prepared from *O. europaea subsp. laperrinei* were evaluated. Moreover, the total phenolic, flavonoid and tannin contents were measured, highlighting the correlation between these bioactive compounds and biological activities.

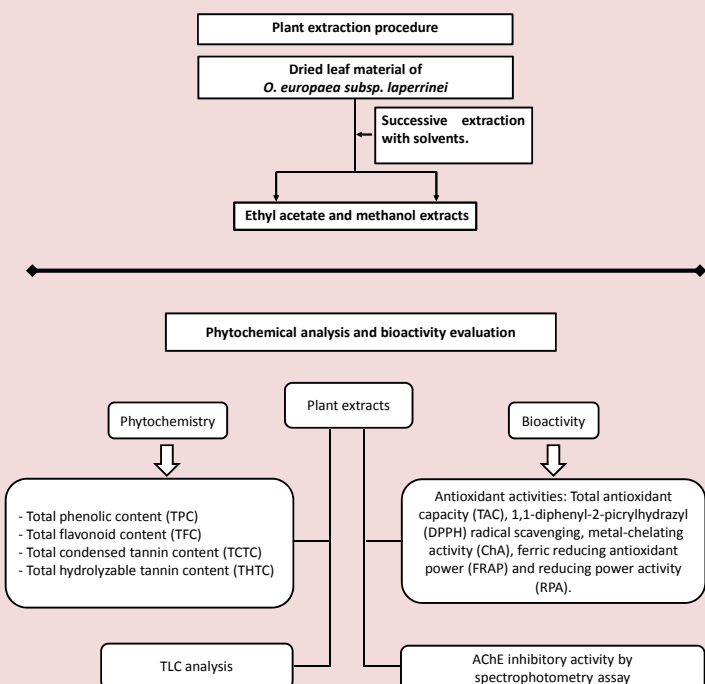


Fig. 1: Image of *O. europaea subsp. laperrinei* (Batt. & Trab.) Cif.

Objectives

- The objective of this work was to identify new natural sources of enzyme inhibition, might be functional in therapy of AD and also sources of natural antioxidants.

Methods



Results

Table 1: Results of the analysis of phenolic compounds in the plant extracts.

Extracts	Phenolic acids	Flavonoids	Anthraquinones
Ethyl acetate	Caffeic acid	Kaempferol Naringin Quercetin Isoquercitrin Hyperoside	Chrysophanol
Methanol	Caffeic acid	Isoquercitrin Hyperoside Rutin	-

Table 2: Extract yield and bioactive compound contents of *O. europaea subsp. laperrinei* extracts.

Extracts	Yield (%)	TPC (mg GAE/g DE) ^A	TFC (mg CE/g DE) ^A	TCTC (mg CE/g DE) ^A	THTC (mg TAE/g DE) ^A
Ethyl acetate	10.28	390.14±19.71 ^a	478.16±9.47 ^a	2.62±0.24 ^a	202.54±8.56 ^a
Methanol	36.70	259.28±2.85 ^b	200.41±5.59 ^b	3.81±0.16 ^b	64.99±1.13 ^b

^A Standard error of the mean of three assays.

^{a-b} Differences within columns (samples not connected by the same letter are statistically different at $p < 0.05$ as determined by Tukey and Student-Newman-Keul's multiple range tests).

Table 3: Antioxidant and AChE inhibitory activities of *O. europaea subsp. laperrinei* extracts.

Extracts or standards	TAC (mg AAE/g DE) ^B	DPPH (µg/mL) ^{B,C}	ChA (µg/mL) ^{B,C}	FRAP (µg/mL) ^{B,D}	RPA (µg/mL) ^{B,E}	AChE (µg/mL) ^{B,C}
Ethyl acetate	780.82±16.00 ^a	13.79±0.18 ^a	4263.09±1500.06 ^a	253.33±7.50 ^a	71.74±0.54 ^a	510.33±21.58 ^a
Methanol	478.92±11.35 ^b	36.72±0.48 ^a	> 5000	256.92±31.72 ^a	84.64±1.06 ^b	902.35±8.65 ^b
Ascorbic acid ^A	n.t.	3.96±0.00 ^b	n.t.	30.22±0.05 ^b	n.t.	n.t.
Quercetin ^A	n.t.	4.09±0.15 ^b	n.t.	21.00±0.20 ^b	n.t.	n.t.
BHT ^A	n.t.	24.39±0.38 ^a	n.t.	54.38±0.48 ^c	n.t.	n.t.
Trolox ^A	n.t.	6.72±0.05 ^b	n.t.	110.10±1.75 ^d	n.t.	n.t.
EDTA ^A	n.t.	n.t.	3.92±0.03 ^b	n.t.	n.t.	n.t.
Gаланthamine ^A	n.t.	n.t.	n.t.	n.t.	n.t.	0.29±0.00 ^c

^A Compounds used as positive control.

^B Standard error of the mean of three assays.

^C Concentration that shows 50% activity.

^D The effective concentration at which the absorbance is 0.5 for FRAP.

^E The results are expressed as CAE1 value, which means the concentration of antioxidant in the reactive system having a ferric-TPTZ reducing ability equivalent to that of 1 mM FeSO₄.

^{a-d} Differences within columns (samples not connected by the same letter are statistically different at $p < 0.05$ as determined by Tukey and Student-Newman-Keul's multiple range tests). n.t.: not tested.

Conclusion

- The extracts exhibited antioxidant and enzymatic inhibition properties and had high levels of total phenolics, flavonoids and tannins, thus suggesting that they should be further explored as a source of bioactive compounds with application in, for example, the food and pharmaceutical industries.

References

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