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Phenolic Compounds and Bioactive Properties of *Clematis cirrhosa* L. (Ranunculaceae): The Pharmacological Potential of an Underexploited Herb

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Introduction

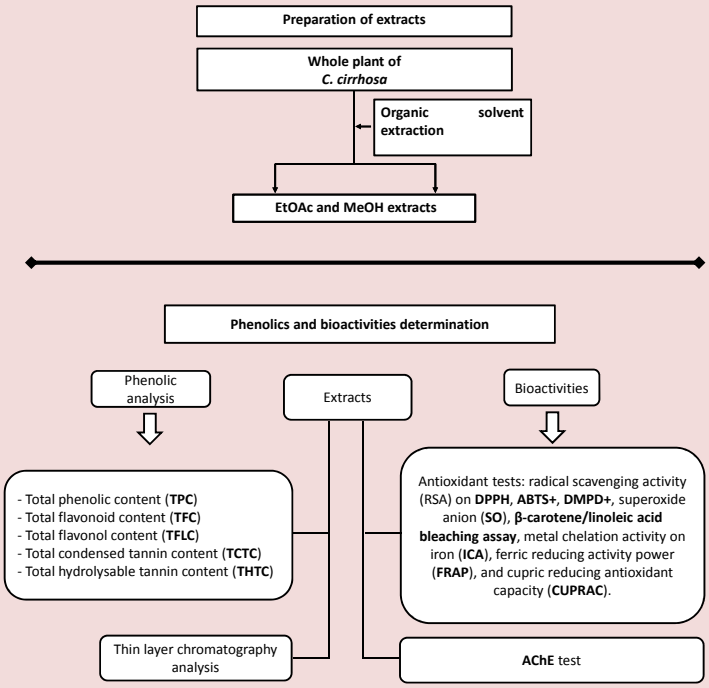
- Plant extracts are excellent antioxidant agents and acetylcholinesterase (AChE) inhibitors **[1]**. Inhibitors of AChE are used to treat cholinergic diseases **[2]**. Antioxidants have health benefits, and are used in food industries **[1]**.
- *Clematis cirrhosa* L. is an Algerian medicinal herb used to treat burns, joint aches, rheumatism pain, and sexual dysfunction and as a diuretic agent **[3,4,5,6]**.
- Antioxidant, and AChE inhibitory effects of extracts obtained from *C. cirrhosa* were studied. Phenolic levels, and compositions were also determined in order to prove its possible use as source of bioactive compounds.

Fig. 1: Picture of *C. cirrhosa* L.

Objectives

- The objective of the present work was to estimate phenolics, and to evaluate antioxidant and anti-acetylcholinesterase effects of extracts of *C. cirrhosa*.

Methods



Results

Table 1: Results of chromatographic analysis of phenolics in extracts.

Extract	Phenolic acids	Flavonoids	Anthraquinones
EtOAc	Caffeic acid Chlorogenic acid	Kaempferol-3,7-*O*-dirhamnoside	Chrysophanol
MeOH	-	Kaempferol-3,7-*O*-dirhamnoside	Chrysophanol Emodin

Table 2: Extract yield, and phenolic contents of *C. cirrhosa* extracts.

Extract	Yield (%)	TPC (mg GAE/g DE)	TFC (mg CE/g DE)	TFLC (mg QE/g DE)	TCTC (mg CE/g DE)	THTC (mg TAE/g DE)
EtOAc	1.47	96.13±2.52	44.90±2.08	16.05±0.07	3.15±0.14	585.21±5.72
MeOH	11.66	99.98±2.53	24.62±0.53	22.12±0.39	6.22±0.55	85.54±2.14

SEM of n=3.

Table 3: Antioxidant activities of *C. cirrhosa* extracts. Results are expressed as EC50 values (µgmL-1).

Extract/standard	DPPH	ABTS	DMPD	SO	ICA	FRAP	CUPRAC
EtOAc	122.34±4.93	300.41±4.98	1632.85±5.93	2661.61±4.47	3009.52±7.07	318.84±8.81	477.90±1.17
MeOH	95.06±1.29	179.48±6.94	2208.89±23.43	3058.16±8.53	721.13±8.26	436.05±8.23	263.96±1.14
Ascorbic acid*	3.95±0.00	63.70±2.52	45.96±0.19	885.00±1.01	n.t.	30.22±0.05	215.68±0.06
Quercetin*	4.09±0.15	7.22±0.05	214.86±0.35	101.86±0.10	n.t.	21.00±0.20	28.73±0.06
BHT*	24.39±0.38	16.85±0.40	373.03±3.02	101.80±0.09	n.t.	54.38±0.48	56.16±0.25
Trolox*	6.72±0.05	26.33±0.73	52.26±0.20	244.41±0.26	n.t.	110.10±1.75	117.94±0.11
EDTA*	n.t.	n.t.	n.t.	n.t.	3.92±0.00	n.t.	n.t.

*Standards; n.t.: not tested. SEM of n=3.

Table 4: Anti-acetylcholinesterase (AChE) activity of *C. cirrhosa* extracts. Results are expressed as IC50 values (µgmL-1).

Extract/standard	AChE
EtOAc	533.73±3.75
MeOH	710.96±6.21
Galanthamine*	0.29±0.00

*Standard. SEM of n=3.

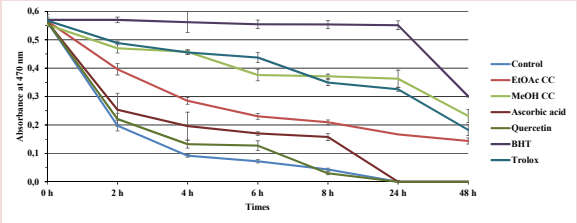


Fig. 2: Results of β-carotene/linoleic acid bleaching assay. SEM of n=3.

Conclusion

- This work provided a fundamental reference for the research of polyphenols in *C. cirrhosa* with bioactivities. *C. cirrhosa* could be further explored as a source of bioactive compounds.

References

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