

Short Communication

Phytochemical and Antioxidant study of *Malva sylvestris* from the west of Algeria

Ouldyeroukarima, Righi S, Belhocine A, Mekness A, Meddah B and Tirtouil A

Laboratory of Bioconversion; Microbiological Engineering and Safety, University of Mascara –Algeria

Accepted 02 August, 2021

Our work aims at studying medicinal and aromatic plants very well by the local population. It is called *Malva sylvestris*. The phytochemical tests, which had been done while studying these plants permitted to us to detect different families of the chemical compounds existing in both of these plant's leaves, and the evaluation in vitro antioxidant activity of phenolic extracts by using the 2,2- diphenyl-2-picrylhydrazyl radical.

Keywords: *Malva sylvestris*, antioxidant, phenolic extract, phytochemical tests.

INTRODUCTION

This study focuses on the phytochemical study of *Malva sylvestris*, which is biennial, but it can possibly be perennial by underground buds. (Belouad A., 1998.).

Malva sylvestris is a polymorphic plant, and over time the tender leaves are eaten by insects and snails, which gives the whole plant a neglected aspect (Fletcher, 2007).

The flowering of the *Malva sylvestris* occurs between May - June and September (Grover et al; 2002). The large mauve is a hairy plant. It may have a simple pubescence or simple hairs or hairs almost all starred or a mixed pubescence, with simple and starry hairs.

It measures from 30 cm to 1m 50 in length. It is a plant with a raised upright, sometimes briefly lying at base and then straightened; it can also remain lying, radiating from the central foot. (Mahmoudi Y., 1987).

EXPERIMENTAL

Plant Material

Malva sylvestris, Malvaceae family, was obtained from his natural habitats; this plant studied was collected in March 2017 in the region of Mascara (Algeria). Botanical identification of this species was carried out according to African flowering plants database and by local experts.

Polyphenols extraction

The plant materials was dried at ambient temperature and stored in a dry place prior to use.

The plant was washed well with water, dried at room temperature in the dark, and then ground in an electric grinder to give a coarse powder. In this study, samples were extracted by decoction (10%), maceration with methanol (8%) and by extraction with solvents of increasing polarity (Dichloromethan and methanol/soxhlet) methods.

*Corresponding Author's Email : mhanine11@yahoo.fr

Phytochemical screening by colometer method

All plant extract were tested for the presence of different families of compounds according to Method previously described :

A1kaloids

Evaporate 20ml of ethanol solution to dryness. Add 5 ml of 2N HCl to the residue and heat in a water bath. Strain the mixture and divide the filtrate into two equal parts. Treat the first with a few drops of Mayer's reagent and the second with Wagner's reagent. Observation: turbidity or precipitation.

Flavonoids

Treat 5 ml of alcoholic extract with a few drops of concentrated HCl and 0.5 g of magnesium turnings.

Tannins

1 ml of alcoholic solution, add 2 ml of water and 2-3 drops of diluted solution of FeCl₃. A positive test is revealed by the appearance of a blue color - black, green or blue - green and a precipitate. According to thee tannins are catechism, gallic or ellagic.

Anthracénosides

Treat 8 ml of the ethereal solution by extractive reagent Borträger. A positive test is revealed by the appearance of a color ranging from bright orange - red to purple - purple.

Anthocyanosides

Metering the acidic aqueous solution with NaOH. If there is a color change depending on the pH, the presence of anthocyanins was confirmed. 3 the water turns red.- PH, pH 6, the water turns- 4 blue.

Coumarins

Evaporate 5 ml of the ethereal extract solution. Dissolve the residue in 1 to 2 ml of warm water. Divide the volume into two parts. Take half as a control and add volume to another volume of 0.5 ml of NH₄OH (10%). Putting two spots on filter paper and examined under UV light fluorescence intensity indicates the presence of coumarins. (Wang et al., 2006).

Sterols and steroids

Evaporate the alcoholic extract equivalent to 10 ml and then dissolving the resulting residue in 0.5 ml of acetic

anhydride and 0.5 ml of chloroform. Treat the filtrate with Liebermann's reagent Burcharddt. If a solution is blue - green appears, it indicates the presence of glycosides.

Antioxidant activity assays

DPPH scavenging assay

The hydrogen atom donation ability of chemical compounds in leaves and stems was measured on the basis to scavenge the 2,2-diphenyl-1-picrylhydrazil free radical . Fifty microliter of various concentrations of the extracts in methanol were added to 1950 μ l of a 0.025 g/l methanol solution DPPH. After a 30-min incubation period at room temperature, the absorbance was read against a blank at 515 nm. DPPH free radical scavenging activity in percentage (%) was calculated using the following formula: DPPH scavenging activity (%) = (A_{blank} - A_{sample}/A_{blank}). 100

Where: A blank is the absorbance of the control reaction (containing all reagents except the test compound), A_{sample} is the absorbance of the test compound.

Extract concentration providing 50% inhibition (EC₅₀) was calculated from the graph plotted of inhibition percentage against extract concentrations. The ascorbic acid methanol solution was used as positive control. (Maataoui et al., 2006)

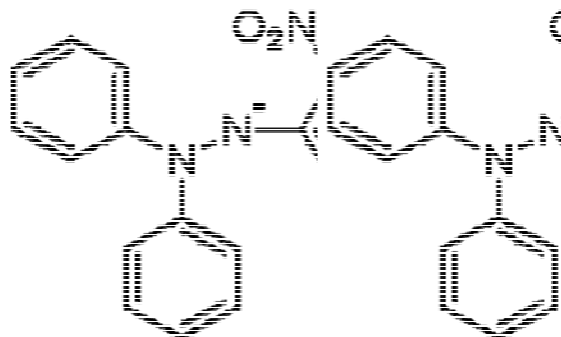


Figure: Structure chimique de DPPH

RESULTS AND DISCUSSION

The results obtained are shown in table

The experimental results listed in Tables 1, show that tannins, flavonoids are present in the leaves of Malvasylvestrisin varying quantities and the total absence of coumarins, sterols steroids, alkaloids and anthracyanosides in leaves of our plant studied.

M. sylvestrisleaves revealed very strong antioxidant properties including radical-scavenging activity (EC₅₀ = 0.43 mg/mL), and lipid peroxidation inhibition in liposomes

Table 1: Tests carried out on different phytochemical extract

The leaves of <i>Malva sylvestris</i>		
	Methanol	Results finals
Flavonoids	+++	Presence
Alkaloids	-	
Tannins	+-	
Anthracénosides	-	
Coumarins	-	
Sterols and steroids	-	

(0.04 mg/mL) and brain cells homogenates (0.09 mg/mL). This part of the plant is also the richest in nutraceuticals such as powerful antioxidants (flavonoids, carotenoids, and tocopherols), unsaturated fatty acids (e.g. α -linolenic acid), and minerals measured in ash content. (Seyed Mehdi et al; 2010)

CONCLUSION

Malva sylvestris is an edible plant that is consumed as a herbal supplement for its antiulcer and colon cleansing properties in traditional Persian medicine, thus appear to be rich plant secondary metabolites. These beneficial effects provide evidences that this plant can be suggested for patients with this disease to improve their health condition or to reduce adverse effects of their medication.

ACKNOWLEDGEMENT

The authors wish to thank all the individuals and institutions who made this survey possible

REFERENCES

- Belouad A (1998). *Plantes médicinales en Algérie*. Office des publications nationale ; Algérie : 273.
- Grover JK, Yadav S, Vats V (2002). Medicinal plants of India with anti-diabetic potential. *J. of Ethnopharmacol.*; 81:81-100.
- Maataoui BS, Hmyene A, Hilali S (2006). Activites anti-radicalaires d'extraits de jus de fruits du figuier de barbarie (*Opuntia ficus indica*). *Lebanese Science Journal*. 7: 3-8.
- Maisuthisakul, P., Pasuk, S., Ritthiruangdej, P. (2008) Relationship between antioxidant properties and chemical composition of some Thai plants. *J Food Composition and Analysis*. 21: 229-240
- Mahmoudi Y (1987). *La thérapeutique par les plantes communes en Algérie*. Blida, Edition ANES Palais du livre ; 01 : 105.
- Seyed MR, Gholamreza ZG, Ghader G (2010). Bioactivity of *Malva Sylvestris* L., a Medicinal Plant from Iran. *Iran J Basic Med Sci* 2010; 13:133-138.
- Wang L, Waller CL (2006). Recent advances in extraction of nutraceuticals from plants, *Trends in Food Science and Technology* . p 300 – 312