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DPPH Screening in Mentha and Guggul Plant Different Extract

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Abstract: ***Free radicals are extremely reactive atoms or molecules that have one or more unpaired electrons on their outer orbital and have the potential to harm biological cells. The human body naturally creates antioxidants to combat free radicals, but because oxidative stress and aging cause more free radicals to develop, an exogenous antioxidant is required. The Plantae family has a lot of potential as a source of exogenous antioxidants because it is the largest family in the plant world. The goal of this study was to ascertain the antioxidant properties of the aqueous and ethanol extracts of mentha and guggul leaves, respectively. The DPPH technique was used to measure antioxidant activity, and the findings were noted for further study.***

Keywords: Herbal plant, Mentha, Guggul, Antioxidant, Solvent, DPPH.

1. INTRODUCTION

Since antiquity, people have made use of plants or plant components that have medical benefits. Most individuals use only herbal remedies, according to the most recent estimate from the World Health Organisation, which is above 80%. These therapeutic plants have a wide range of phytoconstituents. flavonoids, Alkaloids, saponins & steroids other chemical substances that have antioxidant, anti-inflammatory, antibacterial, analgesic & other pharmacological properties on the human body have been identified via phytochemical studies of medicinal plants. With one or more unpaired electrons on their outer orbital, free radicals are exceptionally reactive atoms or compounds. They are capable of damaging bodily cells. In order to combat free radicals, the human body naturally creates antioxidants. However, due to oxidative stress, aging, and other factors, the production of free radicals has risen [1]. The antioxidant assay has been widely used for assessing antioxidant activity because it can handle a large number of samples in a short amount of time and is sensitive enough to detect active components at low conc. DPPH is an organic biochemical compound, and its name is often abbreviated as DPPH. It is a crystalline powder with a black color that is made up of stable free-radical molecules [2]. antioxidant radicals would be scavenged and the absorbance would

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decrease when they came into contact with a proton-donor material like an antioxidant. As a result, the DPPH radicals were frequently utilized to research the radical-scavenging capabilities of various natural substances [3–4].

Guggul is a member of the kingdom of Plantae, which is found in Pakistan and India. An endangered species, guggul is only found in a restricted area of the planet [5–6]. While some plants have complex, distinctive leaves with unpleasant scents, Mentha is a genus that belongs to the Lamiaceae family. Its plants are among the most fragrant and are found in a variety of locations worldwide [7]. The taxonomy of mentha, which has roughly 42 species, 12-15 hybrids, and hundreds of subspecies and cultivars, is extremely complex [8].

Perennial plants in this genus are used to make essential oils, mostly in the India, USA, China & Iran [9]. Mentha species' fresh and dried plant components are often utilized in the industry as ingredients in confections, flavorings, medications, cosmetics, and other products [10–11]. Previous studies showed that plant extracts in aqueous and methanolic forms had antioxidant activity using the DPPH scavenging technique [12–13]. The current study's objective was to assess and contrast the in vitro antioxidant properties of Guggul and Mentha Piperita plant leaves based on their ability to scavenge DPPH radicals. It will be useful in upcoming study and demonstrate the value of solvents in Guggul and Mentha Piperita plant leaves.

Sample Prepration

We bought fresh Mentha piperita and Guggul plants from a Bhopal-area nursery. Specific leafs were taken off the stem, washed in plane water, and dried for 9 -10 days in the shade. The dry samples were ground to a fine powder using a mortar and pestle. The solvent is taken out of the powdered substance using a process called wet extraction [14].

Chemicals

For this investigation has used 0.1 Mm solution of DPPH in methanol was prepared and Butylated Hydroxy Toluene.

Procedure for DPPH

DPPH radical scavenging ability of the extracts. As a standard solution with a concentration of one mg per ml, the ethanolic extracts were created. A methanolic DPPH solution was treated with an equal amount (.1 mM) of extracts at various doses. At 517 nm, the abs of the reaction mixture was measured after 30 minutes of room temperature incubation. BHT was used as a standard control. If free radicals are removed, DPPH degrades into a yellow hue [15]. To show free radical scavenging activity, this characteristic is employed in the experiment.

2. RESULTS AND DISCUSSION

The stable nitrogen-centered free radical known as DPPH can take an electron or a hydrogen radical to transform into a stable magnetic molecule [16]. When used radicals interact with appropriate reducing agents, the number of electrons spent, which is determined spectrophotometrically at 517 nm, results in a stoichiometric loss of color. Strongly scavenged DPPH radicals should be extracted. The concentration of ethanolic and aqueous leaf extracts

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of chosen plants (50,100,150,200,250 g/mL) rose with an increase in the radical scavenging activity of DPPH. The standard was applied and contrasted with the both extracts.
The quantity of antioxidants present in the reaction mixture directly correlates to the change in color of sodium nitroprusside. It was discovered that the scavenging was dose-dependent. As a result, extract has been proven to be an antioxidant. The number of antioxidants in the reaction mixture directly correlates to the change in DPPH-color. The herb piperita the sample's lowest absorbance in the aqueous extract was 0.207 in 250 gram per ml combined. Meanwhile, the maximal absorbance was 0.236 in 50 gram per ml, and the scavenging activity was 27.11% higher. Extract of ethanol was discovered. The same plant was used in a different solvent, ethanolic extract, with a lowest sample absorbance of 0.202 in 250 g/ml and negative effects on scavenging activity. Was 28.17 percent. While the highest absorbance was 0.232 in 50 g/ml and the scavenging activity was in the same range (18.31%), these results are all listed in table and graph number 1. The active maximal free radical scavenging activity of the second Guggul plant extract used in this investigation was 47.89%, and the absorbance was 0.148 in the same 250 g/ml cons. The least amount of absorbance in the same solvent extract was 0.182 in 50 g/ml conc. Scavenging activity in this context was 35.91%. In discovery of ethanol extract, the same plant was used in ethanolic extract, which had a scavenging activity of 52.82 percent and a minimum sample absorbance of 0.134 in 250 g/ml. Maximum absorbance of 0.171 in 50 gram per ml and scavenging activity of 39.79% were both noted in table no. 1 & graph no. 2.

Table No-1 DPPH activity of both plant extracts.

Plant	Conc.	Aqueous extract		Ethanolic extract	
		Absorbance of sample	Scavenging Activity (%)	Absorbance of sample	Scavenging Activity (%)
Mentha Piperita	50	0.236	16.90	0.232	18.31
	100	0.225	20.78	0.224	21.13
	150	0.223	21.48	0.212	26.05
	200	0.219	22.89	0.204	28.17
	250	0.207	27.11	0.202	28.87
Guggul	50	0.182	35.91	0.171	39.79
	100	0.174	38.73	0.164	42.25
	150	0.166	41.55	0.152	46.48
	200	0.152	46.48	0.142	50.00

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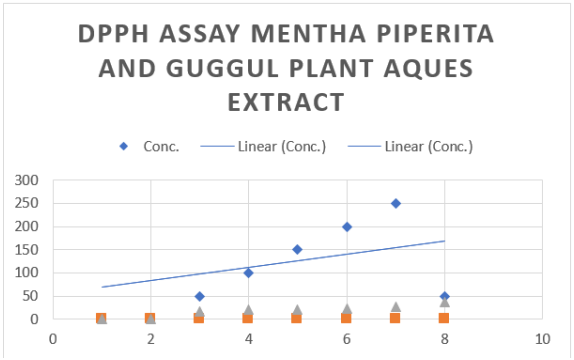
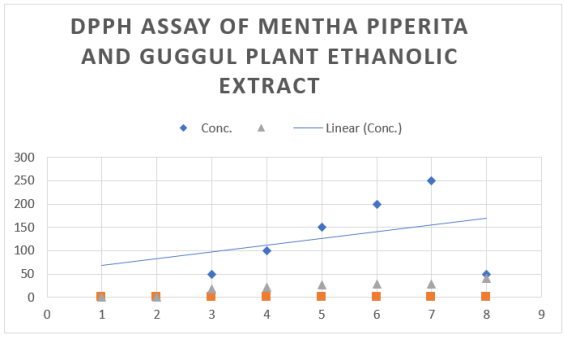
	250	0.148	47.89	0.134	52.82



Graph 1: DPPH scavenging effects on aqueous extract of both plants.



Graph 1: DPPH scavenging effects on Ethanolic extract of both plant leaves.

By using the DPPH radical technique, this study found that the leaves of the Mentha Piperita and Guggul plants had superior antioxidant capacity. This plant thus has antioxidant activity.

3. CONCLUSION

The study's findings demonstrated that the ethanolic extract of Guggul plant leaves had the highest DPPH scavenging activity, at 52.82 percent in 250 concentrations, compared to the ethanolic extract of Mentha Piperita, which had a scavenging activity of 28.87 percent in the same 250 concentrations. The plant extract we discovered has antioxidant qualities. The results of the current study also suggested that Mentha Piperita and Guggul leaves' ethanolic and aqueous extracts might be a probable herbal induction of antioxidants and that they might be more effective as a beneficial agent in halting or delaying oxidative stress-related degenerative diseases. Before the products of this plant may be commercialized, more investigation is required.

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