International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 05 May 2024
DOI: 10.47191/ijcsrr/V7-i5-73, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

Analysis of Antioxidant Activity from *Mentha arvensis* Extracts by DPPH Method

Rashmi Bariya[1], Roshni Adiyecha[2*], Himanshu Pandya[3]
[1,2] Department of Botany, Indian Institute of Teacher Education, Gandhinagar
[3] Departments of Biochemistry and Forensic Science, Gujarat University Ahmedabad, Gujarat- 380009, India

ABSTRACT: The present study was focused on antioxidant activity of *Mentha arvensis* L. Antioxidant activity was determine from different solvent extracts of *Mentha arvensis* L. The Ethanol extract show highest 86.98 % DPPH scavenging activity than other solvent extract. The screening tests also were performed for the presence of secondary metabolites such as alkaloids, flavonoids, terpenoids, phenols, steroids, saponins and tannins in the extracts. It is concluded that the ethanolic extract has potential bioactive compounds.

KEYWORDS: Phytochemical, DDPH, Solvent, Ascorbic acid, *Mentha arvensis* L.

1. INTRODUCTION

Natural products are known to play an important role in drug discovery. *Mentha arvensis* L. Essential oils obtained from natural sources are important raw materials in the perfumes and flavour industry. In Indian folk medicine numerous plant products are used in the regulation of human fertility. Antioxidants are active molecules that can fight and destroy excess free radicals and repair oxidative damage in biomolecules. Oxidation, a chemical reaction that transfers electrons from a substance to an oxidizing agent, produces free radicals and initiates chain reactions that may damage cells. Antioxidants terminate these chain reactions by removing free radical intermediates, inhibit other oxidation reactions, or enhance the endogenous antioxidant defences of the organism. They act by being oxidized themselves and are often reducing agents such as thiols, ascorbic acid, phenols, flavonoids, vitamins, caratenoids, terpenoids rich in antioxidant activity (Madsen and Bertelsen, 1995; Cai and Sun, 2003). These antioxidants may be natural (ascorbic acid and tocopherols) as well as synthetic molecules as propyl gallate [PG], tertiary butylhdroquinone [TBHQ], butylated hydroxyanisole [BHA] and butylated hydroxytoluene [BHT] thus they can be synthesize in the body.

1.1 Free Radicals

Atoms or molecules which unpaired electrons and highly reactive molecule now for stabilise itself it will take an electron from a stable molecule. On the loss of an electron, this stable molecule becomes damaged and produces free radical and destructive chain reaction occurs. Even if the free radical regains its electron from a stable molecule it does not revert to its original form and function (Halliwell *et al*., 1992). Free radicals are also known as reactive oxygen species (ROS) or reactive nitrogen species (RNS) and majority of them are ROS (Halliwell and Gutteridge, 2000).

The scavenging reaction between (DPPH) and an antioxidant (H-A) can be written as:

(DPPH) + (H-A) — DPPH-H + (A)
(Purple) (Yellow)

DPPH is characterized as stable free radical by desirable quality of the delocalization of the spare electron, where the molecule as a whole, so that the molecule do not dimerise, as would be the case with most other free radicals. The delocalization gives rise to the deep violet colour, characterized by an absorption band (517 nm). When a solution of DPPH is mixed with a substance of H donor, it gets reduced into nonradical state (yellow colour).

2. MATERIAL AND METHODS

The radical scavenging ability of *Mentha arvensis* extracts was tested on the basis of the radical scavenging effect on the DPPH free radical. The *Mentha arvensis* extracts (10-160 µg/ml) were prepared in methanol. In clean and labelled test tubes, 2 mL of DPPH

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 05 May 2024
DOI: 10.47191/ijcsrr/V7-i5-73, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

solution (0.002% in methanol) was mixed with 2 ml of various concentrations of extract/ standards sample separately. The tubes were incubated at room temperature in dark for 30 minutes and the optical density was measured at 517 nm using UV-Vis Spectrophotometer. The absorbance of the DPPH control was also noted. The scavenging activity of the sample was calculated using the formula: Scavenging activity (%) = [(A –B) / A] x 100, where A is absorbance of control and B is absorbance of sample combination (Kekuda *et al*., 2010).

3. RESULTS AND DISCUSSION

DPPH Radical scavenging activity was determined from different solvents extracts of *Mentha arvensis* L. The experiments were performed in triplicates and mean of antioxidant activity of each of the plant extracts and standard (ascorbic acid) were determined. DPPH scavenging activity was found between different solvent extracts studied, ranging from 54.08 % to 86.47 %. Ethanolic extracts possessed the highest DPPH scavenging activity (86.98 % inhibition of the DPPH radical) followed by methanol 86.47%, ethyl acetate 60.69%, petroleum ether 56.92% and hexane 54.08% respectively. As earlier reported by Subash, 2014, maximum scavenging activity of ethanolic extract 92.62% followed by acetone extract 73.77%, petroleum ether extract 49.18%, chloroform extract 54.09%, aequeous extract 89.34% from *Mentha arvensis* L. and Moraes-de-Souza, 2007 DPPH scavenging activity was 88.61% exhibited from fresh herbal infusions of mint.

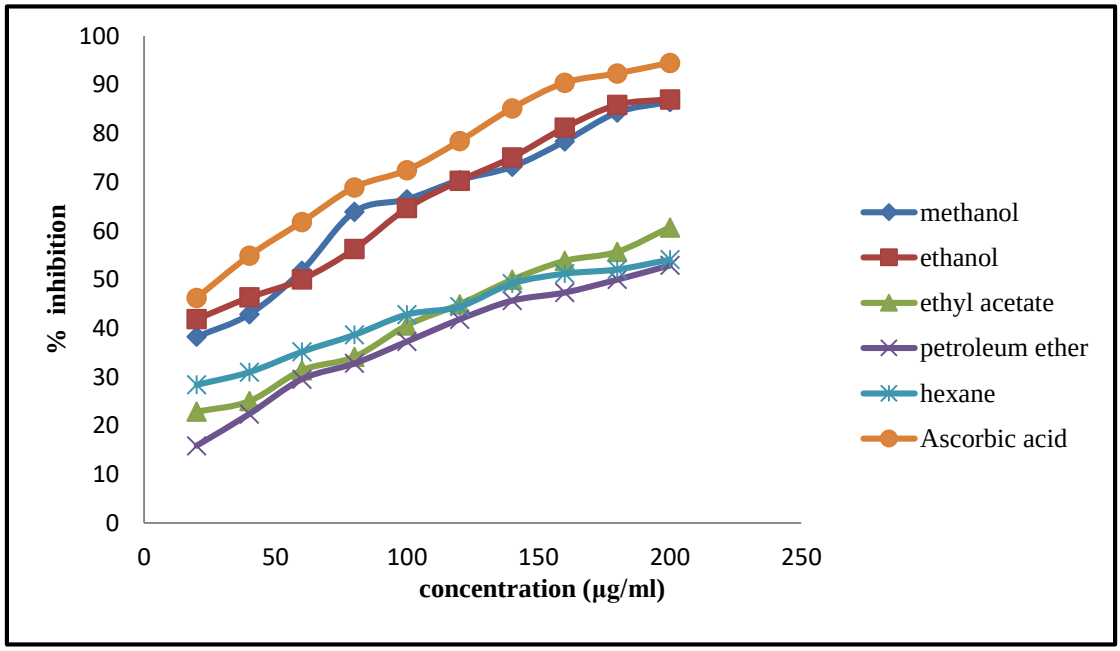

Figure I: Antioxidant activity of different solvents extracts of *in vitro* produced plants.

4. CONCLUSION

This wide range of antioxidant activity may be attributable to the wide variety of bioactive compounds, such as phenolics, flavonols, carotenoids, and tannins, present in the plants. Methanol and ethanol extracts were found with diverse secondary metabolites (flavanoids, glycoside, phenol, terpenoids, alkaloids) due to highest number of various metabolites compounds its also contribute to the high antioxidant properties.

REFERENCES

1. Vaya J, Avriam M (2001) `Nutritional antioxidants: mechanisms of action, activities and medical applications'. *Current Medical Chemistry-Immunology Endocrine and Metabolic Agents*, 1(1): 99-117.
2. Kekuda PTR , Praveen Kumar SV, Vinayaka KS, Sudharshan SJ, Mallikarjun N, Swathi D (2011) Studies on Antibacterial, Anthelmintic and Antioxidant activities of a Macrolichen *Parmotrema pseudotinctorum* (des. Abb.) Hale (Parmeliaceae) from Bhadra wildlife sanctuary, Karnataka. *International Journal of PharmTech Research*, 2(2):1207-1214

International Journal of Current Science Research and Review
ISSN: 2581-8341
Volume 07 Issue 05 May 2024
DOI: 10.47191/ijcsrr/V7-i5-73, Impact Factor: 7.943
IJCSRR @ 2024
www.ijcsrr.org

3. Halliwell B (1996) Oxidative stress, nutrition and health. Experimental strategies for optimization of nutritional antioxidant intake in humans. *Free Radical Research*, 25: 1-32.
4. Halliwell B, Cross CE and Gutteridge JMC (1992) Free radicals, antioxidants and human disease: where are we now? *J. Lab. Clin. Med*. 119: 598 – 620.
5. Madsen HL and Bertelsen G (1995) Spices as antioxidants. *Trends Food Science and Technology*, 6: 271-277.
6. Cai YZ and Sun M (2003) Antioxidant activity of betalins from plants of the Amaranthacea. *Journal of Agriculture and Food Chemistry*., 51: 2288-2294.

Cite this Article: ***Rashmi Bariya, Roshni Adiyecha, Himanshu Pandya (2024). Analysis of Antioxidant Activity from Mentha arvensis Extracts by DPPH Method. International Journal of Current Science Research and Review, 7(5), 3136-3138***