



ANTIOXIDANT EVALUATION OF PIMENTA DIOICA LEAVES EXTRACT

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ABSTRACT

An ethnobotanical study was conducted to gather information on the medicinal plant *Pimenta dioica*. For *Pimenta dioica*, phytochemical testing and DPPH activities were done. The phytoconstituents content and free radical scavenging activity were greater in the leaves of *Pimenta dioica*. These results demonstrate the plant's significant antioxidant activity.

KEYWORDS: Ethnobotanical study, Cold maceration, *Pimenta dioica*, Phytochemical, DPPH activity.

INTRODUCTION

Our ancestors used plants as medicine, a procedure that probably began with some trial and error. There are 2500 plant species in India, of which 100 are often used as sources of medicine by traditional healers.^[1] Use of ethnobotanical data in research on medicinal plants has received a lot of interest recently in several areas of the scientific community.^[2] Lately, plants have been crucial for the development of new pharmacologically active chemicals, and many of today's most popular medications have either been directly or indirectly derived from plants.^[3] The world's various tribal peoples and ethnic races have each evolved their own culture, traditions, religious practises, folk melodies, and other practises. Several cultivated and wild plants are important to tribal societies, and this link has persisted from generation to generation. Consequently, a study has been done where traditional healers are predominate. The tree *Pimenta dioica* (L.) Merr., also known as *Eugenia pimenta* D.C., *Myrtus pimento* L., *Pimenta officinalis* Lindl., and *Pimenta vulgaris* Lindl., is a species of tropical evergreen rain forest tree indigenous to central America. The leaves and fruits of *Pimenta dioica* are used for its essential oil, which is used in cosmetics, meat canning, fragrance, and other food-related businesses. Allspice essential oils provide a variety of medicinal benefits, including anaesthetic, analgesic, antibacterial, antioxidant, antiseptic, acaricidal, carminative, muscle relaxant, rubefacient, stimulant, and tonic. The digestive system, including cramps, flatulence, indigestion, and nausea, can benefit from pimento oil. The current study's objective is to evaluate *Pimenta dioica*, an ethnomedicinal plant, for its antioxidant capacity.

MATERIALS AND METHODS

Reagents and chemicals

2,2-diphenyl-1-picrylhydrazyl (DPPH), methanol, ascorbic acid, potassium phosphate buffer-ph6.6 (dihydrogen phosphate, sodium hydroxide), potassium ferricyanide, trichloroacetic acid, ferric chloride.

Cold Maceration

Crude material of plant (leaves) was extracted by using cold maceration method; plant samples were collected, washed, and dried properly. Dried powders of plant sample were extracted with petroleum ether and methanol and allow standing for 4-5 days each. The extract of the plant was filtered to remove all unextractable matter. Extract was transferred to beaker and evaporated; excessive moisture was removed and extract was collected in an air tight container. Extraction yield of all extracts were calculated.[Table 1].^[4]

Qualitative phytochemical analysis of plant extract

Following standard methods by Kokate, 1986 the *Pimento Dioica* extract obtained was subjected to the preliminary phytochemical analysis. The extract was screened to spot the presence or absence of many active constituents like carbohydrates, glycosides, phenolic compounds, alkaloids, flavonoids, saponins, fats or fixed oils, protein, amino acid and tannins.^[4]

Activity (In-vitro Anti-oxidant Activity)

DPPH Radical Scavenging Activity

a) Preparation of DPPH reagent

0.1mM solution of 2,2-Diphenyl-1-picrylhydrazyl (DPPH) in methanol was prepared.

b) Preparation of Sample/Standard

Freshly 1 mg/ml methanol solution of extracts of standard *Pimento dioica* was prepared. 1 mg of extracts/standard was taken with methanol to make 1mg/ml stock solution. Different volume of extracts/standard (20 – 100µl) was taken from stock solution in a set of test tubes and methanol was added to make the volume to 1 ml. To this, 2 ml of 0.1mM DPPH reagent was added and mixed thoroughly and absorbance was recorded at 517 nm after 30 minutes incubation in dark at room temperature.

C) Preparation of control

For control, Take 3 ml of 0.1mM DPPH solution and incubated for 30 min at room temperature in dark condition. Absorbance of the control was taken against methanol (as blank) at 517 nm.^[5,7]

Percentage antioxidant activity of sample/standard was calculated by using formula:

$$\% \text{ Inhibition} = \left[\frac{\text{Ab of control} - \text{Ab of sample}}{\text{Ab of control}} \times 100 \right]$$

RESULTS**Table 1: Percentage yield of *Pimento dioica* extract.**

S. No	Solvent	Color of extract	Weight of Plant Material (gms)	Weight of extract (gms)	% Yield
1	Petroleum ether	Dark Green	100.21	0.425	0.424
2	Methanol	Green	96.17	4.08	4.24

Phytochemical Analysis of *Pimento dioica* extract**Phytochemical Analysis****Table 2: Qualitative Phytochemical Analysis.**

Phytoconstituents		Extracts	
		Pet. Ether	Methanol
Alkaloids	Mayer	+++	+
	Dragendoff	+++	+
Flavonoids	Lead acetate	-	-
	Ferric chloride	+++	+++
Carbohydrates	Molish	+++	+++
	Bendict	-	+
Glycosides	Killer-lini	++	++++
Steroids	Salkowskis	-	+++
	Liebermanburchard	+++	+++
Protein and amino acids	Ninhydrin	++++	+++
	Biuret	-	-
Phenolic compounds and tannins	Ferric chloride	-	-
	Gelatin	+++	+
	Lead acetate	++++	+
Terpenoids	Trim hill	-	-
	Liebermann-burchard	+++	+++
Saponins	Foam test	+++	-
	Mercuric chloride	+++	++

Note :-+++ Very large quantity, +++ large quantity, ++small quantity, - absent

Anti-oxidant activity**DPPH assay****Table 3: DPPH activity of Ascorbic acid.**

Ascorbic acid		
Concentration (µg/ml)	Absorbance (nm)	% Inhibition
20	0.447	46.97
40	0.353	58.12
60	0.235	72.12
80	0.137	83.74
100	0.069	91.81
Control	0.843	
IC50	24.34	

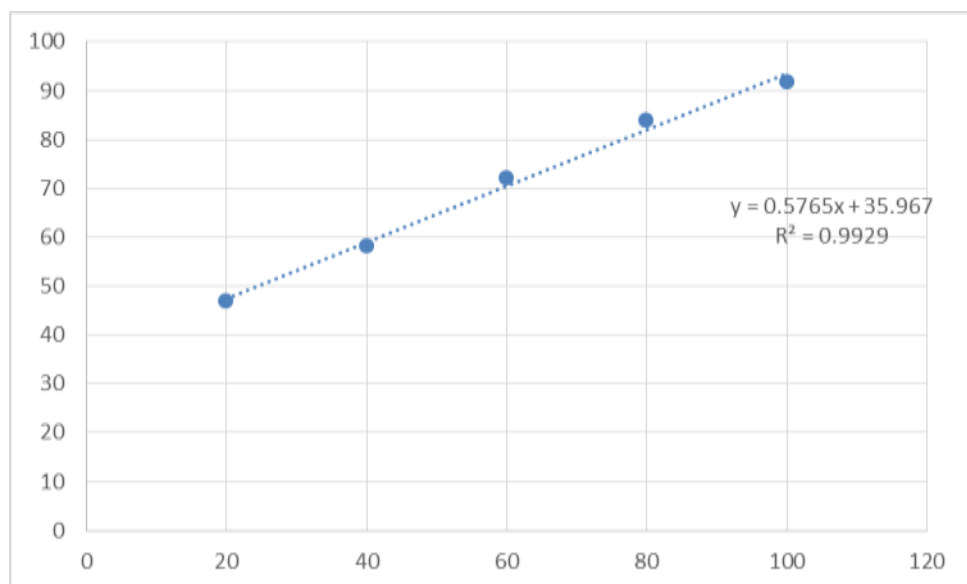


Fig 1: Graph represents the Percentage Inhibition Vs Concentration of ascorbic acid.

Table 4: DPPH activity of *Pimenta dioica* extract.

<i>Pimenta dioica</i> extract		
Concentration (µg/ml)	Absorbance (nm)	% Inhibition
20	0.524	43.2900433
40	0.433	53.1385281
60	0.319	65.4761905
80	0.25	72.9437229
100	0.141	84.7402597
Control	0.924	
IC50	93.4568	

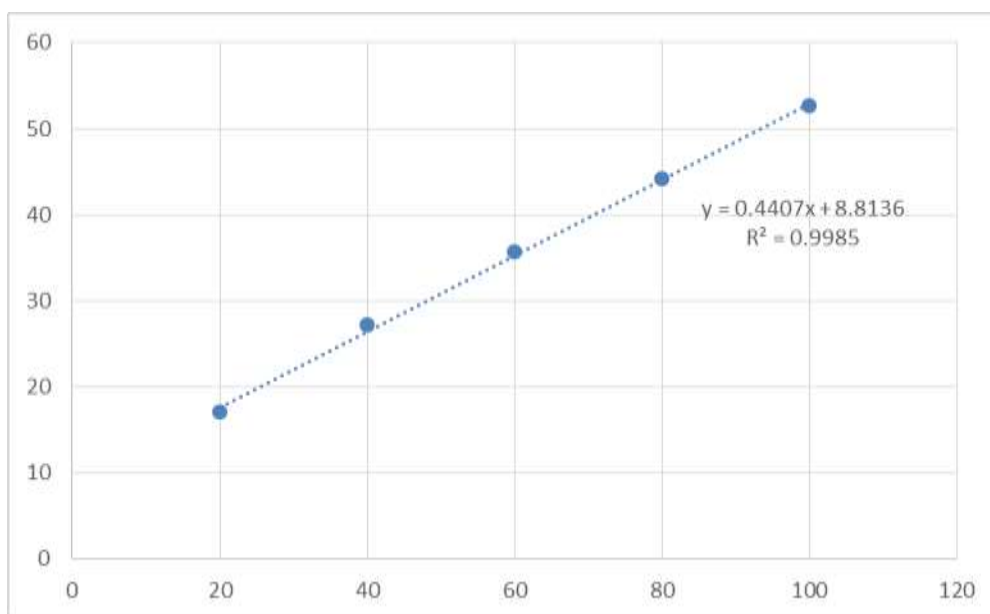


Fig. 2: Graph represents the Percentage Inhibition Vs Concentration of extract.

CONCLUSION

The tribal people use a variety of native herbs in their daily lives and in day-to-day remedies for a number of serious illnesses. The native inhabitants were well versed with the utilization of plants of their surroundings. So this study will be helpful for research and pharmaceutical

industries to find out the other uses of plant which will be helpful to the modern health care system of India. The plant extractive study could be an answer to the people seeking for better therapeutic agents from natural source it is believed to be more efficient with little or no side effects when compared to the commonly used synthetic

chemotherapeutic agents. The present study verified the traditional use of *Pimenta dioica* for human ailments such as rich source of phytochemicals and antioxidants. Thus, this plant can be utilized by an alternative source of useful drug.

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