ANTIOXIDANT AND ANTI-INFLAMMATORY ACTIVITY OF *Andrographis paniculata* FROM DIFFERENT LOCATION

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ABSTRACT

Some plants are considered as an important source of nutrition and as a result of that they are recommended for these therapeutic values. The phytochemical investigation revealed the presence of secondary metabolites. The secondary metabolites are an important source of chemotherapeutic agent, but are also lead compounds for synthetic modification and optimization on of biological activity. Inflammatory response occur when the tissue are injured by bacteria, trauma, heat or any cause. The damaged cell release the chemicals including histamine, bradykinin, prostaglandins. The chemical cause blood vessel to leak fluid into the tissues causing swelling, redness etc. *Andrographis paniculata* is one of the most effective medicinal plants against the inflammation and oxidation. The antioxidant activity of *Andrographis paniculata* was analysed by H_2o_2 scavenging assay and anti-inflammatory property was analysed by HRBC method.

KEYWORDS: Phytochemical, Secondary metabolites, chemotherapeutic agent, anti-inflammation, antioxidant, Andrographis paniculata, HRBC method, H_2O_2 scavenging assay,

INTRODUCTION

Treatment with medicinal plant is considered very safe as there is no or minimal side effect. These remedies are in sync with nature. Some plants are considered as an important source of nutrition and as a result of that they are recommended for these therapeutic value. Healing with medicinal plants is an old treatment method as old as mankind itself. Awareness of medicinal plants' usage is a result of the many years of struggles against diseases and man learned to pursue drugs in barks, seeds, fruits, and other parts of the plants. One of the biggest advantages of medicinal plant is cost-effectiveness make them a significant research focus for drug discovery. The phytochemical investigation revealed the presence of secondary metabolites. Inflammation is a response of vascularized tissue to infections and tissue damage and contributes to the beginning and progression of disease such as Alzheimer, type 2 diabetes, obesity, stroke and cancer. Inflammatory response occur when tissue are injured by bacteria, trauma, toxin, heat, or any cause. The damaged cell release the chemicals including histamine

bradykinin, prostaglandins. The chemical cause blood vessel to leak fluid into the tissue causing swelling (Saravanan et al., 2012).

Oxidants are reactive molecules that are produced both inside your body and the environment that can react with other cellular molecules in your body such as protein, DNA and lipids. Free radicals are oxygen-containing molecules with an uneven number of electrons. Free radicals can cause large chain chemical reactions in your body because they react so easily with other molecules. These reactions are called oxidation. Antioxidants such as thiols or ascorbic acid (Vitamin C) terminate these chain reactions. *Andrographis paniculata*, commonly known as creat or green chiretta, is an annual herbaceous plant in the family Acanthaceae, native to India and Sri Lanka (de las Heras,B. Sonsoles Hortelano,2009). So the work is aimed to evaluate the Anti-oxidant property and Anti-inflammatory property of *Andrographis paniculata* extract.

MATERIALS AND METHODS:

Collection and Extraction: Fresh Plant leaves of *Andrographis paniculata* collected from local areas Of Thirumudivakkam, Chennai and Arakonam. The plant samples were brought immediately to the laboratory, washed with running tap water and allowed to shade dry for 2 weeks. 200g of dry powder of *Andrographis paniculata* were collected. The plant sample of *Andrographis paniculata* was subjected to extraction by cold percolation. . Extraction was proceeded with solvents in the increasing order of polarity namely Hexane, Ethylacetate and Ethanol (Salih et al., 2014).

Phytochemical analysis: The Qualitative and quantitative test for the extraction was tested for carbohydrates, tannins, saponins, flavonoids, alkaloids, quinines, glycoside, cardiac glycosides, terpenoids, phenols, coumarins, phytosteroids, Phlobatannins, Anthraquinones (Park et al., 2013).

Antioxidant and Anti-inflammatory Property: The extracted samples were further analyzed for antioxidant property against the free radical H_2O_2 (Cynthia *et al*., 2020). The percentage inhibition of the radical using extract was calculated. Anti-inflammatory assay was performed using HRBC Method (Fernando & Soysa 2015).

RESULTS AND DISCUSSION

The plant extracts on various solvent resulted that 0.322 g of n-Hexane extract, 2.987g of ethyl acetate extract and 3.899 g of Ethanol extract were obtained from Chennai sample. 0.278g, 2.2g, 3.624g of the respective solvents was yielded from Arakonam sample. (Table 1)

Table 1: Yield obtained from extracts on various solvents from various locations.

Solvent	Chennai	Arakonam
n-hexane	0.322 g	0.278 g
Ethyl acetate	2.987g	2.200g
Ethanol	3.899 g	3.624 g

The qualitative Analysis of extracts from various locations:

The qualitative analysis of the samples from different location with different solvent extraction was evaluated and tabulated (Table 2). Ethanol extracts will be helpful for extracting the constituents from the source at larger manner compared to the other solvents. The presence of Carbohydrates, Tannins, Saponins, Flavonoids, Quinones, cardiac Glycosides and terpenoids (Fig 1).

Table 2: Qualitative Analysis of extracts from various locations

Parameter	Chennai			Arakonam		
Phytochemical	**n-hexane**	**Ethylacetate**	**ethanol**	**n-hexane**	**Ethylacetate**	**ethanol**
Carbohydrates	−	−	+	−	−	+
Tannins	+	+	+	+	+	+
Saponins	+	−	+	+	−	+
Flavonoids	−	−	+	−	−	+
Alkaloids	−	−	−	−	−	−
Quinones	−	−	+	−	−	+
Glycosides	−	−	−	−	−	−
Cardiac glycosides	−	−	+	−	−	+
Terpenoids	+	+	+	+	+	+

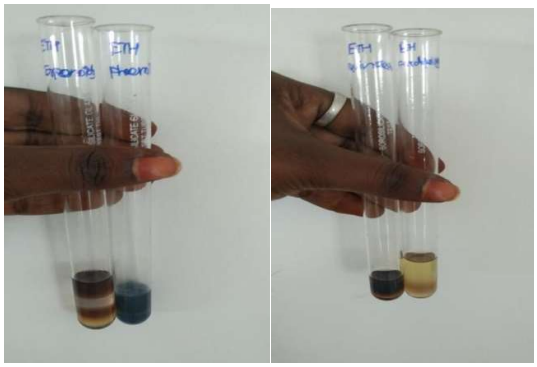

Fig 1: Qualitative phytochemical test in ethanol extraction

Quantitative analysis of the extracts of different location:

The quantitative analysis of the phytochemicals like quercetin, falvoniod, gallic acid and Phenol from ethanol extracts showing the maximum quantity. Flavonoid was observed 1.25 µg/µl was observed from ethanol extract. Phenol 1.3 µg/µl was estimated from ethanol extract. (Fig. 2-5)

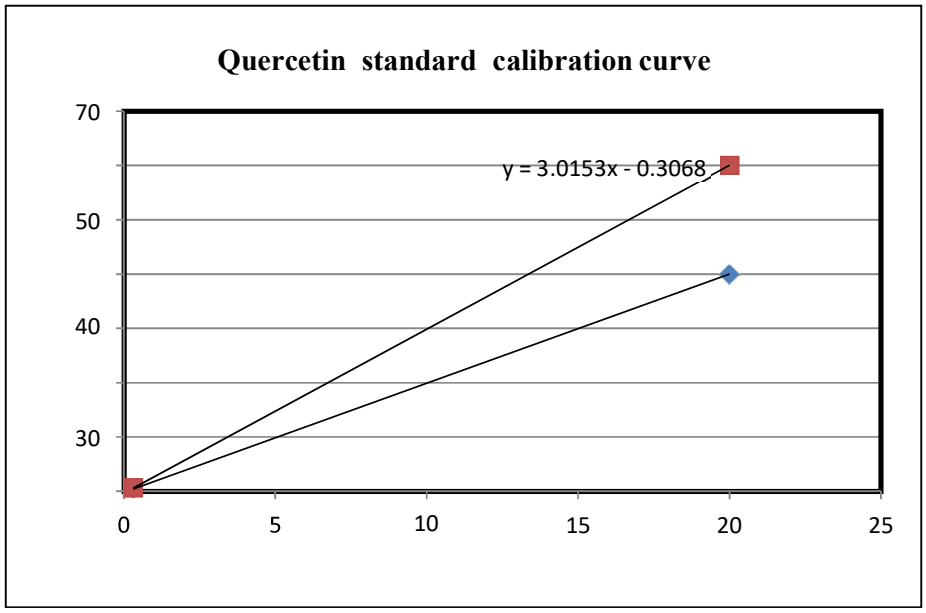

Fig 2: Quantitative estimation of quercetin at 510 nm

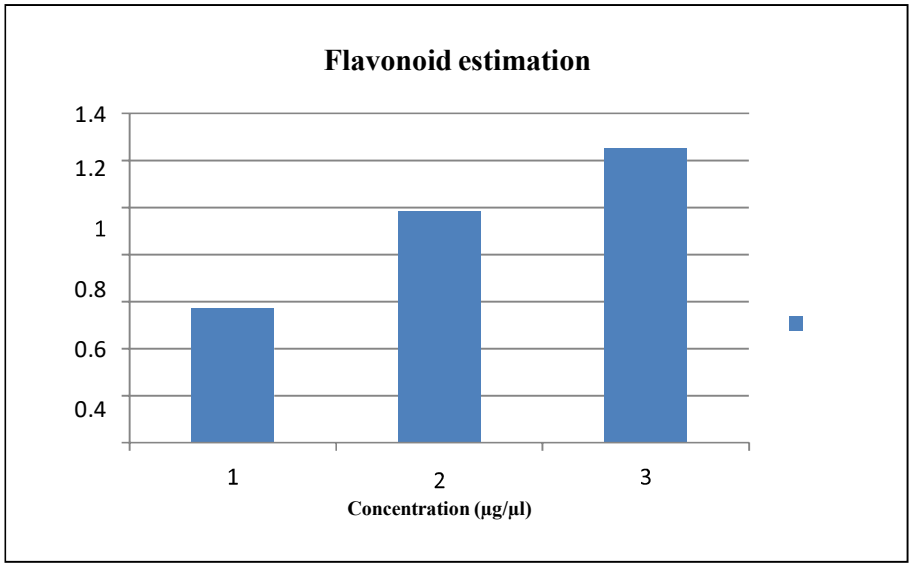

Fig 3: Quantitative estimation of flavonoid at 510 nm

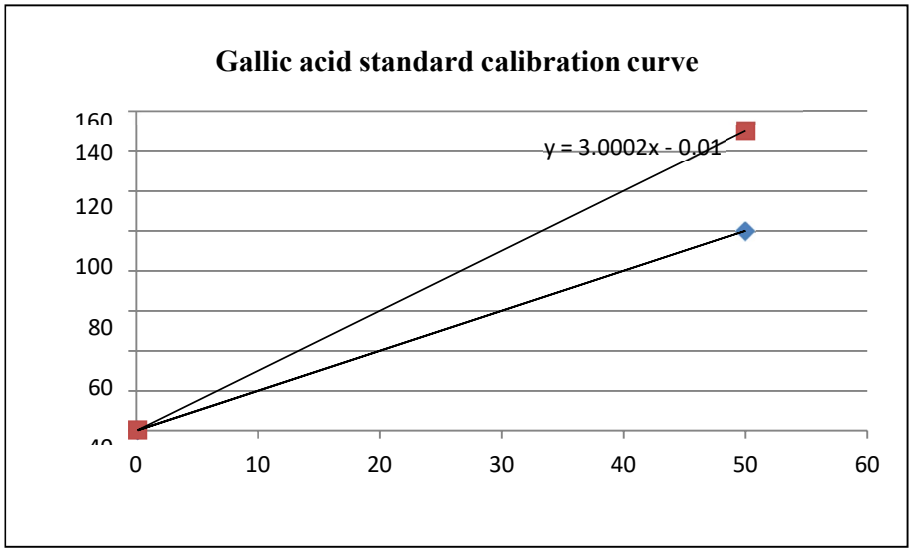

Fig 4: Quantitative estimation of Gallic acid at 765 nm

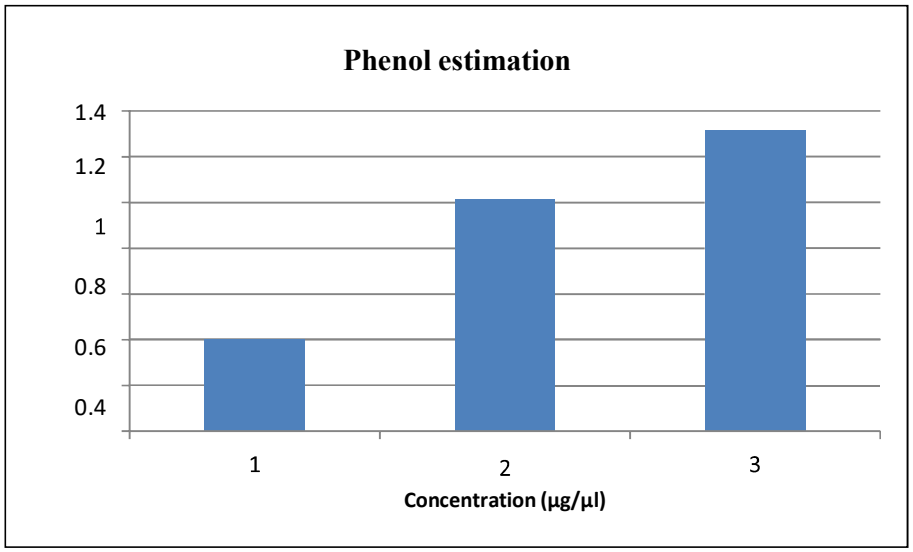

Fig 5: Quantitative estimation of Phenol at 765 nm

Analysis of Antioxidant and anti- inflammatory property:

The results depicts that the inhibition percentage increase with decrease in a concentration shows antioxidant property of *Andrographis paniculata* (Table 4, 5). From the result of the antioxidant property of the both samples of different extracts were analysed and it represents that there is no much changes in the sample from different location. Minor changes in the inhibition percentage may be due to the nature of the soil it has been cultivated. The result of anti-inflammatory property depicts the increase the percentage of haemolysis with decrease in concentration. From the table 6 the inhibition property from both the locations was compared. Only few differences could identify.

Table 3: Percentage of inhibition for Chennai sample

Percentage of inhibition for Chennai sample			
Concentration (µg/µl)	n-hexane (%)	Ethyl acetate (%)	Ethanol (%)
50	40.653	44.460	49.693
100	50.764	52.310	55.879
150	60.042	58.139	62.897

Table 4: Percentage of inhibition for Arakonam sample

Percentage of inhibition for Arakonam sample			
Concentration (µg/µl)	n-hexane (%)	Ethyl acetate (%)	Ethanol (%)
50	40.211	44.883	50.502
100	49.702	51.300	54.823
150	60.723	57.102	61.762

Table 5: Anti-inflammatory assay

Concentration (µg/µl)	Chennai	Arakonam
	10% haemolysis (%)	10% haemolysis (%)
50	75.61	73.02
100	72.31	70.31
150	66.94	62.34

In conclusion the sequential solvent extraction yielded varying yield in the three screened plants. This could be attributed to the huge variability in the phytochemical profile of the plants,The more yield was observed in ethylacetate and ethanol. Qualitative phytochemical analysis revealed that all solvent extracts of *Andrographis paniculata* were rich in Tannins, Terpenoid and phenol.The flavonoid and carbohydrate were only observed in ethanol extract of *Andrographis paniculata. Andrographis paniculata* possess both the anti-inflammatory and antioxidant property. The phytochemical investigation of *Andrographis paniculata* shows the presence of secondary metabolites such as terpenoid, flavonoids, saponin, phenol and tannins.Antioxidant activity of *Andrographis paniculata* was analysed by hydrogen peroxide scavenging assay.Anti-inflammatory activity of *Andrographis paniculata* HRBC method.

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