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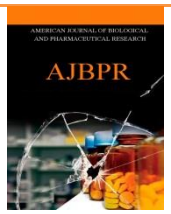

VARIATION OF THE ANTIOXIDANT ACTIVITY WITH THE EXTRACTION METHOD AND SOLVENT SELECTION IN ANACARDIUM

Ch. Madhava Reddy*, Ganesh Kumar Y, D Pranitha, D Phaneendra Pavan

Department of Pharmaceutical Sciences, Scient Institute of Pharmacy, Ibrahimpatnam, Hyderabad-501506, Telangana, India.

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ABSTRACT

In this study, the crude drug is extracted to give chemical constituents in higher quality. Anti-oxidant activity is most important when compared in different activities involved in the chemical constituents. The extracting techniques such as soxhlation & ultra sound are used to show benefits and finer. The other crucial step in this process is to select the suitable extraction. The different solvent ranges from higher non polar solvent to high polar solvent which undergoes extraction. The extracted solvents are selected on the extracting the crude drug chemical constituents. Anacardium is the plant from the family an acardiaceae and native to tropical region of the america. The medicinal properties are involved in this plant. This plant isolates the chemical constituents. The anti-oxidant activity is involved in this plant with flavonoids. This study was to monitor the effectiveness of the extraction method and anti-oxidant of solvents undergoes extraction from the plant. As we know that the plant leaves are very effective in treating diseases and the chemical constituents in them will determine the activity. The anacardium leaves were extracted with the solvents pet ether and water using different extraction methods, soxhlation, ultra sound assisted extraction and microwave assisted extraction. The extracts showed that the best method of extraction is the ultra sound assisted extraction and the solvent used for extraction is the water.

INTRODUCTION

In this study, the crude drug is extracted to give chemical constituents in higher quality. Anti oxidant activity is most important when compared in different activities involved in the chemical constituents. The extracting techniques such as soxhlation & ultra sound are used to show benefits and finer. The different methods which ranges from basic maceration to percolation may extract all the plant chemical constituents. The extraction method is selected depending on the extraction part used.

Corresponding Author

Ch. Madhava Reddy
Email:- rmadhav1987@gmail.com

So, depends on the use of extraction method, the chemical constituents contents are changed. The fine and more amount of chemical constituents are produced with different extraction methods. So, the drugs may be soft or sometimes brittle and harder were shown. The yield is formed from the part of the plant extracted with quality. The other crucial step in this process is to select the suitable extraction. The different solvent ranges from higher non polar solvent to high polar solvent which undergoes extraction. The extracted solvents are selected on the extracting the crude drug chemical constituents. The non polar solvents such as chloroform and benzene & polar solvents as ethanol, distilled water are involved in this method.

Anacardium is the plant from the family

anacardiaceae and native to tropical region of the america. The medicinal properties are involved in this plant. This plant isolates the chemical constituents. The anti oxidant activity is involved in this plant with flavonoids. This study was to monitor the effectiveness of the extraction method and anti-oxidant of solvents undergoes extraction from the plant.

METHODOLOGY

Herbal Material

Anacardium plant parts were procured from the collector from the local area and were dried properly under shade for about 7 days under shade and the dried leaves were collected and pulverized into a fine powder and this powder was used for extraction.

Methodology Variables

Totally three methods of extraction were used like soxhlation, ultra sound assisted extraction and the microwave assisted extraction. Soxhlation: In this method 5gm of the powder was packed into a bag and then fitted into a Soxhlet apparatus. The apparatus set up was done and the process of extraction was carried out for about 8 hrs with 2 solvents in 2 different setups. The extracts were collected and the product was filtered. The filtrate was subjected to drying to get a thick paste like extract.

Ultra sound assisted extraction: in this method, the powder was macerated with two solvents in three separate beakers and are placed in the ultrasound apparatus. The standards were set according to the reference [9]. The temperature in the ultrasound bath was maintained at 40^{o}c with a power of 70% at the frequency of the waves of 45KHz. The system was let to run for about half an hour. The resultant liquid is then filtered and then the filtrate was then subjected to evaporation and the resultant was a thick paste. Microwave assisted extraction: In this method, the powder was packed and macerated in different solvents in beakers and subjected to the microwave. The beakers are put in the microwave machine and the parameters were set [10]. The power was set to 400W and the temperature was set to 40 and the system was let to work for about 30min and the solution was filtered off. The filtrates were evaporated and the thick extract was collected and dried. The total phenols contents and flavonoids contents were determined in all the extracts using folin-ciocalteau method [11].

Screening for antioxidant potential

The antioxidant activity was measured in the H2O2method as per standard procedure [12]. The serial dilutions were made with the extracts and standard concentrations were prepared. The solutions were allowed to react with the hydrogen peroxide and then subjected to UV at 230 nanometer to measure the absorbance values. The measured absorbances were utilized to calculate the percentage of the free radical inhibition using a standard formula.

RESULTS & DISCUSSIONS

The plant materials are dried properly and extracted with solvents like Pet ether and Water. The extractive values were noted and tabulated in the table 1. The loss on drying of the leaves was measured as 8.3%which was acceptable by the standards of IP. These extracts were subsequently named and extracted in three methods. The percentage yields were calculated after weighing the drugs and extracts. The values were tabulated and the water extract showed a higher value than the pet ether extract. In the comparison of the extraction methods, Ultrasound extraction method was leading which gave the higher yield compared to other methods. Microwave took the next place and followed by soxhlation.

The phenol and flavonoid contents were measured and it was clear that the water extract gave highest contents when compared to the pet Ether extracts. In the extraction methods too it gave the similar results as the extract obtained from ultra sound gave the highest phenols content. The results were similar to the flavonoid content too which were also tabulated in table 1. The antioxidant activity of these various extracts was measured in the H_2O_2 method and the results were tabulated in the table 2. The extracts of the solvent Water in the method of ultrasound showed the highest inhibition of the free radicals and the least was with the extracts of the pet ether and using soxhlation. This is an indicative that the method of extraction is very important and the solvent of extraction played a very important role in the content of chemical constituents and the pharmacological activity too. The results showed that the ultra sound method was beneficial in extracting the soft drugs like leaves and the distilled water was effective in extracting the chemicals from the anacardium leaves.

Table 1. Yield, phenols and flavonoids in various extracts of anacardium

S. No	Extract	% yield	TPC	TFC
1	Ultrasound-Water	23.12	197.24±6.1	95.4±5.7
2	Soxhlet-Water	17.26	105.36±5.84	48.47±6.35
3	Microwave-Water	21.7	149.62±7.56	76.53±2.8
4	Soxhlet-Pet ether	16.59	68.2±5.67	41.21±5.4
5	Ultrasound-Pet ether	24.68	172.50±8.9	89.36±3.52
6	Microwave-Pet ether	19.73	100.11±6.28	55.62±4.20

Table 2: % Effect of Extraction method and solvent for extraction on the antioxidant activity of anacardium

S.No	Extracts	Concentrations (µg/ml)				
		20	40	60	80	100
1	Ultrasound-Water	40.6±0.67	52.4±0.93	75.23±0.72	90.5±0.84	99.36±1.02
2	Soxhlet-Water	29.24±0.84	40.56±0.56	59.22±1.5	73.63±4.9	78.71±0.97
3	Microwave-Water	38.41±0.73	51.02±2.17	70.1±0.84	85.4±1.44	93.2±2.39
4	Soxhlet-Pet ether	23.53±3.8	30.47±0.64	38.92±2.6	51.9±0.57	62.27±3.78
5	Ultrasound-Pet ether	39.82±0.92	52.1±3.28	70.18±0.59	86.74±0.65	94.50±2.3
6	Microwave-Pet ether	25.6±0.99	34.18±0.82	52.53±0.91	63.11±1.02	71.7±0.83
7	AA	41.78±2.4	53.61±4.1	74.82±3.0	87.23±0.93	96.5±0.70

CONCLUSION

As we know that the plant leaves are very effective in treating diseases and the chemical constituents in them will determine the activity. the anacardium leaves were extracted with the solvents pet ether and water using different extraction methods, soxhlation, ultra sound assisted extraction and microwave assisted extraction. the extracts showed that the best method of extraction is the ultra sound assisted extraction and the solvent used for extraction is the water.

CONFLICT OF INTEREST

Authors declared no conflict of interest.

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