BioGecko **Web of Science**
ISSN: 2230-5807 Vol 04 Issue 04 2015

Cleistanthus collinus' lignan extract was extracted using the optimal solvent, volume, and time.

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Abstract

In order to acquire and preserve herbarium specimens, Cleistanthus collinus need additional precautions for their protection. Aryl naphthalene is found in plants and has a wide range of physiological effects. A soxhlet extractor is being used to study the extraction of lignan-derived compounds from plants. Alcoholic extract and defated petroleum ether are efficient solvents because they are optimised for polarity. Extracting chemicals from plants requires a precise measurement of the solvent volume (1gm per 15 ml). Extraction time for each solvent must be determined.

Keywords: Cleistanthus collinus, Aryl Naphthalene, solid-liquid extraction, optimization and quantification of solvent volum

Introduction

In the past, the leaves of Cleistanthus collinus have been used for homicide or suicide. The leaf extract's influence on electrical and mechanical responses to nerve and muscle stimulation [1] has been studied because of the toxic consequences, which include muscular cramps and weakening. It is necessary to take great care while preparing a herbarium specimen and get it authenticated by the department of botany at RTM Nagpur University, Nagpur [2] Soxhlet assembly is a more traditional method for extracting chemicals from plants by leaching. Plant C. collinus has been shown to contain large amounts of aryl-naphthalene lingans, such as the plant's alcoholic extract and several other similar chemicals. For extraction, we utilise a solvent such as petrolium ether under unfortunate circumstances. Cell viability is reduced in vitro studies by Cleistanthin A and B, which causes DNA strand breaks in the cells. Anticancer properties of these cleistanthins have been shown in vitro and in vivo, raising the possibility that they might be used in the formulation of drugs to combat tumours. In order to determine the number of chemicals present in plant optimization for the efficient extraction of aryl naphthalene, and to quantify the solvent volume nodal segments as explants, the current research will be focused on

these two issues. Extraction from plant at constant temperature circumstances and in vitro conversion under anaerobic conditions are also determined by the research. [6, 7].

Fig 1: Herbarium specimen of Leaves of Cleistanthus collinus authenticate by RTM Nagpur University

Experimental Material and Methods

There are Cleistanthus collinus plants in Maharashtra, India. Isapur, post-pipla (D.B.) is a tiny town in the Nagpur district, vidarbha (Maharashtra), India, located near the town of Koradi, and the author validated from the Department of Botany, Rastrasant Tuukadoji Maharaj Nagpur University Nagpur (MH), India where a voucher specimen is 10057.

Methods

Extraction of compounds by using sox let extraction method. Solvent used with respective polarity, and their optimization.

Extraction Preparation Sample Solution

Aryl naphthalene chemicals were extracted from Cleistanthus collinus plant leaves. Crushing and grinding the shade-dried material at room temperature resulted in a fine powder.

2.3.2 Soxhlet Extraction of Leaves powder of C. Collinus:

2.3.2.1Preparation of dried powder from leaves of C.collinus

Once the powdered leaf sample of c. collinus was taken, the thimbles were filled with the appropriate amount of solvent, and the soxhlet apparatus was quickly plunged into the optimised extraction conditions. The extraction was then carried out for 1 to 15 hours with various concentrations of methanol (15 ml). It was distilled out of the remaining solvent after the extraction. The concentrated extract was naturally dried before being collected in a glass container with an amber tint. A total of 16.32 grammes of the methanolic extract were collected.

2.3.2.2 Optimization of extraction conditions:

The physical or chemical isolation of a solid is required for the extraction of a medication. Solid-liquid extraction is what it's termed when the plant material is extracted using solvents, which is the most prevalent method. Until recently, only the practitioner was responsible for gathering the plant, processing it, and preparing the extraction from it. Water, methanol, chloroform, dichloromethane ethyl acetate acetone, dry ether, acetone, toluene, and toluene are all suitable solvents. From 5 ml to 30 ml of extraction solvent may be measured. Determine the time span from one to fifteen hours. The leaf extract of a plant must be extracted in a consistent manner.

Result and discussion

Optimization of extractive values for various solvents

There is a fixed ratio between the concentrations of the compounds that are extracted and those that are returned throughout the extraction process. The value of this constant must be known before determining how long it will take to separate the leaf from the plant material. The specifics of the different solvents, the volume needed, and the extraction time were optimised in this study. Water, methanol, ethanol, dichloromethane, a methanol/dichloromethane combination, chloroform, ethyl acetate, toluene, and pet ether were among the solvents used.

Table 1: Optimization of extractive values for various solvents

S. No.	Solvent	% Extraction
1	Water	8.0
2	Methanol	23.5
3	Ethanol	17.7
4	Chloroform	12.4
5	Dichloromethane	14.9
6	Mixture of Methanol and Dichloromethane	18.5
7	Ethyl acetate	13.4
8	Acetone	7.2
9	Toluene	14.1
10	Pet. Ether	19.7

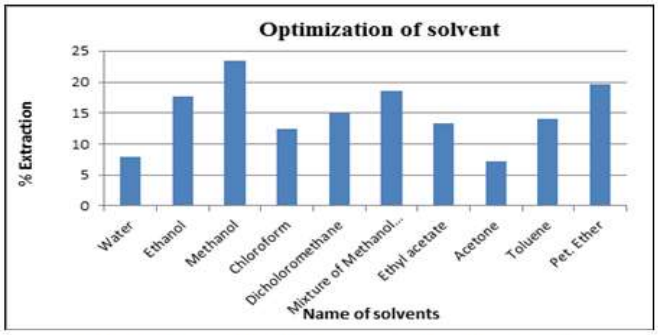

Fig 2: Optimization of extractive values for various solvents

Optimization of solvent volume

The extraction solvent volume was optimised in the following way. One gramme of the sample and one hour of exposure time were maintained constant, while the volume of the solvent was varied. It was originally retained at 10 ml, but in following studies, the volume was increased by 5ml. The volume fluctuated during the day. Table No. 2 shows the weight of extract at a fixed concentration.

Table 2: Optimization of solvent volume for extraction of *Cleistanthus collinus*

S.N.	Weight of leaves (gm)	Volume of solvent (ml)	% Extraction
1	1	5	13.23
2	1	10	20.12
3	1	15	24.30
4	1	20	24.73
5	1	25	24.91

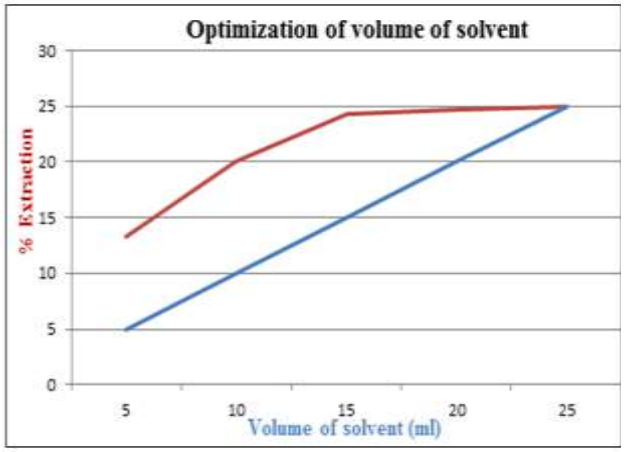

Fig 3: Optimization of solvent volume for extraction of *Cleistanthus collinus*

Determination of effective time for extraction:

Evaporation was carried out in accordance with the equilibrium time of 1, 2, 3, 4, 5, 6, 7, 8,10,12,15 hours by using the optimal volume and the weight of the powder (1.0 gramme). The point at which there was no more extraction was chosen as the optimal moment.

Table 3: Determination of effective time for extraction of *Cleistanthus collinus*

Obs. No.	Weight of leaves (gm)	Time (Hrs.)	% Extraction
1	1	1	12.23
2	1	2	17.36
3	1	3	20.76
4	1	4	22.34
5	1	5	23.81
6	**1**	**6**	**24.01**
7	1	8	24.34
8	1	10	24.73
9	1	12	24.81
10	1	15	24.93

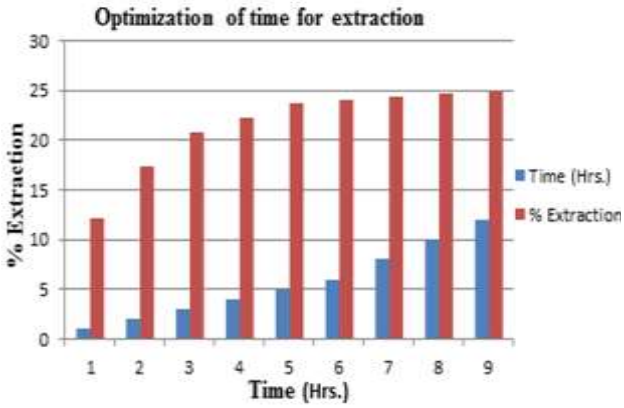

Fig 4: Determination of effective time for extraction of *Cleistanthus collinus*

Conclusion

Cleistanthus collinus plant leaves effectively yield aryl naphthalene chemicals. The optimization of several solvents for extraction chemicals, in which methanol extract shows 23.5 percent and pet. Ether shows 19.7 percent. At 15 ml, it is possible to accurately measure the solvent volume. Six hours is the maximum amount of time that may be used for extraction.

Acknowledgement

The author Rajdip Utane is gratefully acknowledges the funding support rendered by Department of science and Technology, New Delhi for the INSPIRE fellowship [IF140439]. Appreciably recognize to Dr. R.G. Atram,Director Institute of Science, Civil line, Nagpur.

References

1. Nandakumar NV, et al., Effect Of Cleistanthus Collinus Leaf Extract On Neuromuscular Function Of The Isolated Mouse Phrenic Nerve-Diaphragm, Toxlcon. 1989;27(11):1219-1228.
2. Soham Thombre Sujata Deo, RD Utane, Rahul Khubalkar, Modern Technique for Collection of Medicinal Plant Cleistanthus collinus and Preparation of Herbarium Specimen International Journal of Research inMedical and Basic Sciences, 3(6):44-51.
3. DKS Subrahmanyam, Mooney T, Raveendran R, Zachariah B. A Clinical And Laboratory Profile Of Cleistanthus Collinus Poisoning, JAPI, 2003, 51.
4. Parasuraman S, Raveendran R, Madhavrao C. Gc-Ms Analysis Of Leaf Extracts Of Cleistanthus Collinus Roxb. Euphorbiaceae, Int. J. Ph. Sci. 2009; 1(2):284-286.
5. Chandravathi J, Devi, Vasantha Kumar Pai K. Chemical Examination of Fruits of Cleistanthus collinus, Der Pharma Chemica. 2011; 3(6):160-164.
6. Elangomathavan R*, Nancy Beaulah S, Hariharan SP.Kalaivanan, Encapsulation of shoot tips and nodal segments of Cleistanthus collinus for short term storageand germplasm exchange, Int. J Curr. Res. Biol. Med. 2017; 2(1): 21-32.
7. Bharti Ahirwar, Dheeraj Ahirwar and Sanjay Lanjhiayana, Insecticidal activity of Cleistanthus collinus Roxb., Der Pharma Chemica. 2011; 3(1):49-52.