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COMPARATIVE EVALUATION OF NSAIDS AND PHYTOCHEMICAL OF MEDICINAL PLANTS

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INTRODUCTION

Find of this research involves phytochemicals screening [1] and the ethnic-medicinal values of selected leaves of medicinal plants were associated with different families of plant species found in the Batul district of Madhya Pradesh, India. Selected areas were rich for ethnic-medicinal plants, where information was collected through tribal people, who have long been known and used about various pharmacological impartments of plant leaves from species such as *Andrographis paniculata*[2], *Caesapinia pulcherrima*[3], *Withania somnifera*[4], are used as medicines to treat inflammation and other diseases. In synthesis of chemicals made from allopathic medicines, there is a risk of various types of side-effects of synthetic medicines, including NSAID, before deciding to take a drug medication, it is important to understand the risks and benefits of medicines to reduce the risk. There could be possibilities for many NSAIDs may have many risks, side effects include stomach problems such as bleeding, ulcer and stomach discomfort and fluid retention, including high blood pressure, swelling, kidney problems and heart problems. The plants leaves have medicinal value and many phytochemicals have been found in plants that all types of plants include phytochemicals like alkaloids, tannins, saponin steroids, terpenes and flavonoids etc. In the research was physical parameters such as pH, viscosity and UV absorption spectrum studied of medicinal plants leaves extracted phytochemical, it was a suitable criteria used for the species of different plant are used on conventional time which inspires biological activity such as anti-inflammatory objective for humans.[5]

MATERIALS AND METHODS

Experimental materials

Some expenditures of experimental material were purchased from the local market, hence the brand name unknown and chemical reagents were purchased by the standard companies such as acetone, chloroform, ethanol, methanol and petroleum ether was purchased from (Rankem with AR grade), benzene purchased from (Aldrich with LR grade), butanol purchased from (Hi-media), and standard NSAIDs such as diclofenac and ibuprofen was purchased from local medical stores and others equipment like that water bath, hot air oven, soxhlet, pH meter, viscometer, UV-Vis spectrophotometer used from institution laboratory.

Collection of Plant Samples

Selected medicinal plants were collected from the local forest area of Batul district of Madhya Pradesh. Plant leaves samples were collected according to the requirements in well-dehydrated plastic bags, which were used for the purpose of their phytochemical analysis, during the current investigation of selected plants species such as *Ap=Andrographis paniculata*, *Cp=Caesapinia pulcherrima*, *Ws=Withania somnifera* and (L)= Leaves.

Samples Preparation

The leave samples were used of selected plants and chopped into small pieces in 4-5 cm. in length and excessive parts like dust and micro-organisms were removed through washing with water and organic solvents several times and Samples were dried in air shade for 10 days, the material was protected from sunlight and the samples are crushed in powder form and for drying of good powder at moisture free in an oven at 50°C for 2-3 days to harvesting fine powder of leaves containing phytochemicals by using mortar and pestle.

Phytochemical Extraction

The material of the plants leaves was prepared for the extraction of phytochemicals, in which whatman filter paper 42 was used to formation thimbles. The above mentioned organic solvents were selected for the separation of phytochemical from plants leaves in which presence of various types of phytochemicals can be soluble in special solvent for maximum yield. Solvent

was filled in flask of soxhlet in approximately 250 ml and the filling plants material loaded thimble was placed inside the reservoir. According to the solvent used for vapour evaporation, the isomantle starts for heating, which was moving through the condenser. Condensate drip in the reservoir where the thimble was appearance gradually fills up with a hot solvent and collecting the desired compound. When the solvent level reaches the syphon return to begin before next the cycle, during each cycle, the desired compound was collected. After completing of three cycle's the solvents was recovered, about extraction to use organic solvents in a soxhlet tool the period up to 6 hours. the pre-occupation of each extract was separately for remove access solvents from samples by used water bath at different temperatures for dehydration and normal phytochemical material collected and it was kept in hot air oven at 50-60°C for overnight to dried in powder form.[6]

Comparative Analysis

Therefore, some physical standards parameters such as pH, viscosity and absorption spectra were applied for comparative studies of phytochemicals and standard NSAIDs. The process was such 100 mg powder of phytochemical from leaves extract well suspended in 100 ml distilled water and similar process for the NSAIDs medicines such as diclofenac and ibuprofen for each 100 mg dissolved in 100 ml distilled water, final quantity 1mg/ml w/v comparative analysis.[6]

pH

Hydrogen ion concentration measurement through calibrated pH meter, take 20ml solution of water soluble powder of extract phytochemicals and NSAIDs for sampling take in a beaker from 1 mg/ml (w/v).[6]

Viscosity

On the concern 10 ml from stock 1mg/ml (w/v) of samples filled in Ostwald viscometer tube was transfer time from one bulb to the other bulb was calculated the shifting time by the stopwatch and in the end, the viscosity was determined by following the equation.[6]

$$\eta = \eta_0 \left(\frac{t}{t_0} \times \frac{\rho}{\rho_0} \right) \quad \ldots\ldots 2$$

UV- Spectroscopy

The fundamental UV-visible absorbent property of liquid specimens was absorbent 1cm path length of liquid solvents at selected wavelengths. The wavelength was set used in the range of 300-500 nm for the absorption of samples was measured in the highest picks of samples and analysis of samples created a graph between absorbance (A) and wavelength (λ) maximum values.[6]

RESULTS AND DISCUSSIONS

pH analysis

Initial phytochemical components were given aspect and useful in detecting screening tests of bioactive principles as all organisms have pH values, including plant products, and subsequently may be drug discovery and development.[10,12] The selected plants abbreviations were denote that Plants specie: *Andrographis paniculata*, *Caesapinia pulcherrima*, *Withania somnifera (L)=Leaves.* In addition, synthetic drugs such as NSAIDs (Diclofenac and Ibuprofen) pH based on pharmacological active of chemical based synthesis.

The figure 1 has found that phytochemicals of leaves extract in chloroform of species *Withania somnifera* have been pH 6.23 highest values and lowest pH 4.92 with methanol based extract and species *Caesapinia pulcherrima* have been pH 6.09 highest values of benzene based extract and low pH 4.14 performance with methanol extract and also species *Andrographis paniculata* have been pH 6.07 highest values with benzene extract and low pH 4.97 with methanol based extract and comparative pH with standard anti-inflammatory medicine such as diclofenac have been pH 5.44 and Ibuprofen have been pH 5.63. Now the explanative pH values near of phytochemicals extract have butanol extracted phytochemicals from species have *Caesapinia pulcherrima* pH 5.44, *Withania somnifera* pH 5.48, chloroform extracted *Caesapinia pulcherrima* species have pH 5.64.

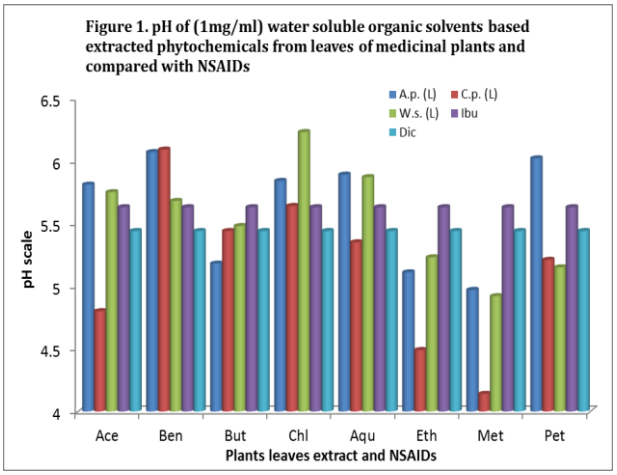
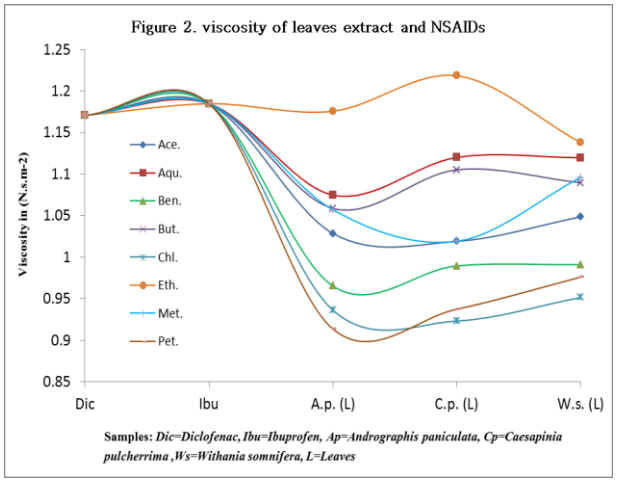


Figure 1. pH of (1mg/ml) water soluble organic solvents based extracted phytochemicals from leaves of medicinal plants and compared with NSAIDs

Viscosity analysis

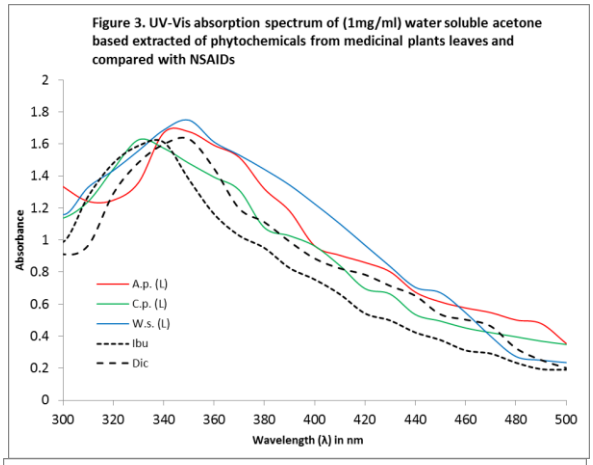
The viscosity of the solution was determined for aquatic dissolved of phytochemical and NSAIDs. It had enough solvents to change the temperature then change to other physiochemical properties of solvents where available differential particle size mentioned viscosity in high or low, Low viscosity solvents have low density and high diffusivity, which are easily dispersed in phytochemicals and NSAID for bioactive components.[10,12] The figure 2 has found comparative analysis of viscosity among phytochemicals and NSAIDs. Where was NSAIDs have been viscous nature Ibuprofen greater then Diclofenac such as 1.185 Nsm^{-2} > 1.171 Nsm^{-2} and was the water soluble phytochemicals of plants leave extracted in various organic solvents. In which near to NSAIDs and highest between plants extract, ethanol based extracted water soluble phytochemical have viscous values such kinds as 1.218 Nsm^{-2} > 1.175 Nsm^{-2} > 1.137 Nsm^{-2} of *Caesapinia pulcherrima*, *Andrographis paniculata*,

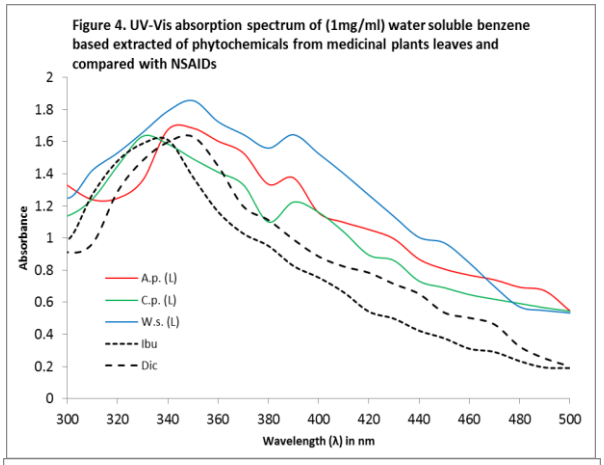
Withania somnifera and lowest with chloroform based extract have viscous values 0.951 Nsm^{-2} > 0.923 Nsm^{-2} of *Withania somnifera*, *Caesapinia pulcherrima* while petroleum ether based extract have viscous value >0.913 Nsm^{-2} of *Andrographis paniculata* plant species.

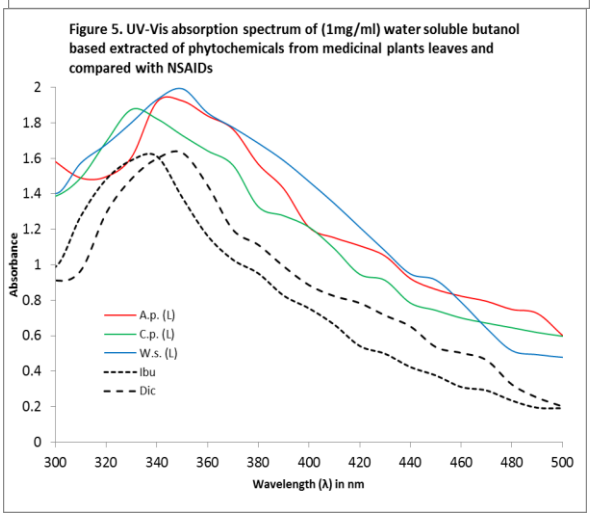


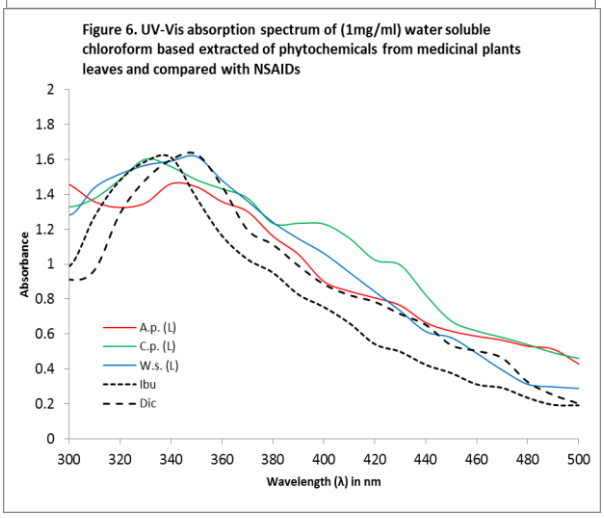
UV-Vis spectra analysis

UV-Vis absorption spectrum of (1mg/ml) water soluble, organic solvents based extracted of phytochemicals from medicinal plants leaves and compared with NSAIDs. The Various qualitative analysis throughout UV-Vis spectrum profile of plants leaves extracted phytochemicals in various selected organic solvents was estimation of qualitative and quantitative analysis through UV-Vis spectra to compared with NSAIDs standard medicine.[15] The selected samples was analysis at the range of wavelength 300nm to 500nm at 10nm steps of interval for all samples. Absorbance peaks was maximum found between 320nm to 360nm (λ) maximum values due to highest peaks of absorption given between 1.4 to 2.0. Comparative analysis of graphical presentation of UV-Vis spectra, details showed in figures 3 to 10.









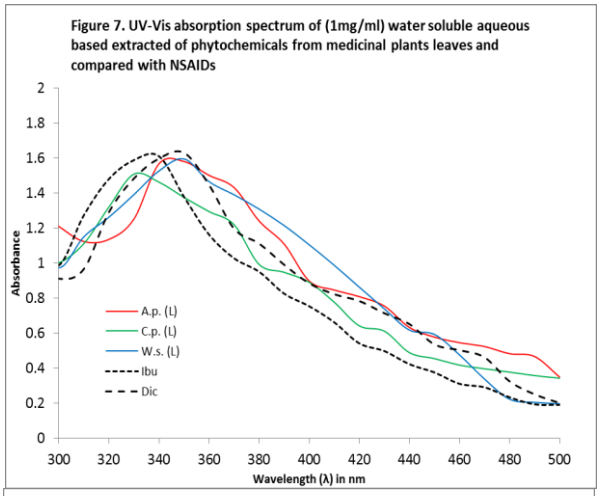


Figure 7. UV-Vis absorption spectrum of (1mg/ml) water soluble aqueous based extracted of phytochemicals from medicinal plants leaves and compared with NSAIDs

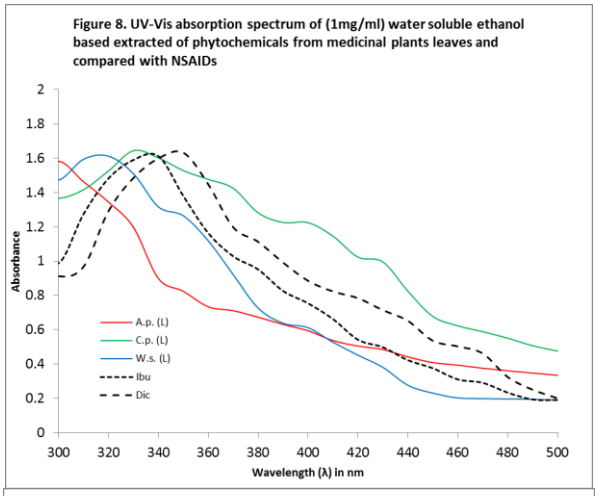


Figure 8. UV-Vis absorption spectrum of (1mg/ml) water soluble ethanol based extracted of phytochemicals from medicinal plants leaves and compared with NSAIDs

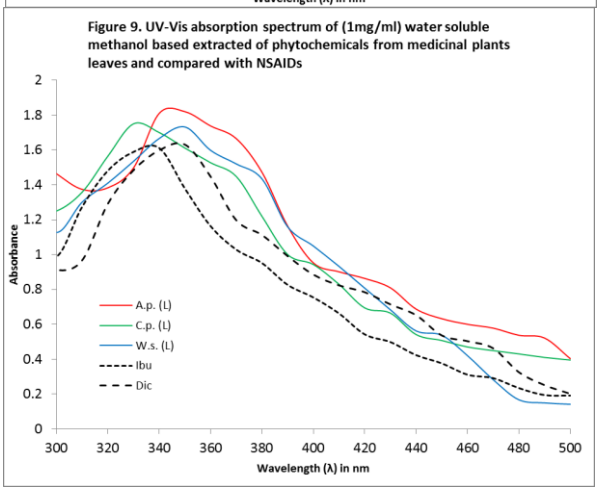


Figure 9. UV-Vis absorption spectrum of (1mg/ml) water soluble methanol based extracted of phytochemicals from medicinal plants leaves and compared with NSAIDs

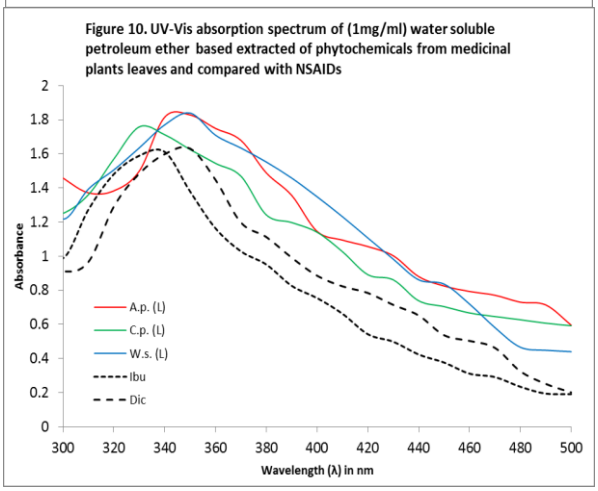


Figure 10. UV-Vis absorption spectrum of (1mg/ml) water soluble petroleum ether based extracted of phytochemicals from medicinal plants leaves and compared with NSAIDs

CONCLUSION

The plants leaves extracted phytochemicals in organic solvents used as an alternate of anti-inflammation drugs in proper quantities and much effectiveness compared to chemical synthesis drugs. Therefore, in the present study was focused on effective anti-inflammatory properties in leaves of plants species *Andrographis paniculata*, *Caesapinia pulcherrima*, *Withania somnifera*, etc. In order to know about the physical properties of standard therapy, similarly apply some physical parameters of temperature, pH, UV-Vis spectroscopy, viscosity and surface tension, similarly in the plants extracted phytochemicals and NSAIDs.

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