ETHANOLIC EXTRACT OF ANDROGRAPHIS PANICULATA AND IT’S SPECTRAL ANALYSIS (IR) WITH STUDY OF ANTIFUNGAL ACTIVITY

ETHANOLIC EXTRACT OF ANDROGRAPHIS PANICULATA AND IT’S SPECTRAL ANALYSIS (IR) WITH STUDY OF ANTIFUNGAL ACTIVITY

Bakyalakshmi. M*1, Senthil Kumar. K. L*2, Gokulan. P. D*3, Charumathi. S*4,
Charumathi. M*5

*1Sri Vijay Vidyalaya college of pharmacy, India.
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ABSTRACT

Andrographis paniculata is an herbaceous plant, which is commonly known as the King of Bitters. It acts as effective traditional medicine for various diseases. The ethanol extract of Andrographis paniculata leaves has bioactive compounds like steroids, phenol, terpenoid, alkaloids, saponins, flavonoids. The IR spectrum of the extraction sample contains the functional groups like alkene, aldehyde, amine salt, alcohol, and aliphatic primary amine. The extract shows the antifungal activity which provides the action against candida albicans and candida tropicalis.

Keywords: Andrographis paniculata, Ethanol extract, IR spectrum, Antifungal activity.

I. INTRODUCTION

Andrographis paniculata known as 'King of Bitters' and 'Kalmegh' belong to the Acanthaceae family, which is indigenous to South Asian countries and widely found in tropical/subtropical Asia and South East Asia (1). It acts as effective traditional medicine for various diseases. The optimal harvesting age of Andrographis paniculata reported to be in the range of 120-130 days after sowing (2). It is an annual and branched plant with lanceolate green leaves and 1-3 cm wide with margin and upper leaves often bractiform with short petiole it attains height of 60-70 cm (3). The three main diterpenoid lactones identified in A. paniculata leaves are Andrographolide, Neo-andrographolide, Deyoandrographolide (4). The leaves extract contains the alkaloids, glycosides, saponins, phenolic compounds, flavonoids, and terpenoids. The pharmacological activity of A. paniculata are antimicrobial, antipyretic, antifungal, hepatoprotective, antioxidant, anti-inflammatory, anti-diarrhoeal, antiviral (5), chronic hepatitis, upper respiratory infections, pharyngotonsillitis, lower urinary tract infections, rheumatoid arthritis, type 2 diabetes, inflammatory bowel disease. In late 2020, the Thai government approved the use of A. paniculata as medicine to treat early mild symptoms and reduce the severity of covid-19(6). According to WHO monograph, A. paniculata should not be used in pregnant or lactating women and those who have known allergy to plants of the Acanthaceae family.
II. MATERIAL AND METHOD

Collection of plant materials:
The Andrographis paniculata leaves are collected from our house and gardens.

Preparation of extracts:
The Andrographis paniculata leaves are collected and rinsed in running tap water and placed in newspaper or dry towel. And the leaves are dried for 1 week at normal room temperature. Then dried leaves are grinded as a coarse powder sample after it was weighed 50 gm taken into a filter bag and kept inside the thimble in Soxhlet apparatus. Then round bottom flask A re attached to it and kept in the heating mantle. After 500ml ethanol is poured inside in the presence of a sample and then a condenser is placed upon the Soxhlet apparatus with the help of wax. The temperature is maintained at 40° C for 12 hrs. Then extracts were evaporated using a rotary evaporator and the percentage yield was recorded. The dried extract was stored in an airtight container for further studies.

Phytochemicals screening:
Test for steroids:  
1 ml of extract was dissolved in a few drops of chloroform then 1 ml of acetic anhydride and 1 ml of glacial acetic acid were added and add a few drops of conc. H2so4 in the side of the test tube. Bluish-green colours are observed. It shows the presence of steroids.

Test for alkaloids:  
1 ml of extract and add 1 ml of Dragendorff's reagent. Orange-red precipitate is observed. It shows the presence of alkaloids.

Test for flavonoids:  
The extracts are treated with water and add sodium hydroxide. Yellow colour is observed. It shows the presence of flavonoids.

Test for saponins:  
The extract is mixed with distilled water in the test tube. Then it was shaken briskly and the formation of stable foam was observed. It shows the presence of saponins.

Test for phenolic compounds:  
1ml extract is taken and a few drops of ferric chloride solution are added. Greenish-black colour is observed. It shows the presence of phenol.

Test for terpenoids:  
The extract is taken and adds chloroform and conc. H2SO4 is added. Reddish-brown colour is observed. It shows the presence of terpenoids.

<table>
<thead>
<tr>
<th>Phytochemical compounds</th>
<th>Ethanol extracts</th>
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<tbody>
<tr>
<td>Steroids</td>
<td>+</td>
</tr>
<tr>
<td>Alkaloids</td>
<td>+</td>
</tr>
<tr>
<td>Flavonoids</td>
<td>+</td>
</tr>
<tr>
<td>Saponins</td>
<td>+</td>
</tr>
<tr>
<td>Phenolic compounds</td>
<td>+</td>
</tr>
<tr>
<td>Terpenoids</td>
<td>+</td>
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</tbody>
</table>
III. SPECTRAL ANALYSIS

The IR spectrum of analysis was done in Sri Vinayaga Mission college of pharmacy, Salem. The various peaks are obtained in the IR spectrum and measured by wavenumber cm⁻¹. They show the functional groups like alkene, aldehyde, amine salt, alcohol, and aliphatic primary amine.

Antifungal activity:

Fungus strains:
Stock culture Were maintained at 4°C. The different fungus strains such as candida albicans and candida tropicalis were isolated from potato dextrose agar.

Preparation of standard culture media for test organisms:
The strains of different fungus were inoculated in the 50ml nutrient broth and incubated at 27°C for 3-5 days.

Assay of Antifungal activity:
The antifungal activity of crude extract was determined by well diffusion method. MHA plates were prepared by 20 ml of molten media into sterile petri plates. After solidification of media, 20-25 ul suspension of fungal culture was swabbed uniformly. The sterile paper discs were dipped into required solvents then placed in agar plates. Then 10-50ul of leaves extract was poured into the well. After that, the plates were Incubated for 37°C for 24 hours. The zone of inhibition was measured from the edge of the well to the zone in mm.

IV. RESULT AND DISCUSSION

Agar well diffusion method has been used to determine the antifungal activity of the ethanolic extract against the candida tropicalis and candida albicans.

Table. 2

<table>
<thead>
<tr>
<th></th>
<th>Candida tropicalis</th>
<th>Candida albicans</th>
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</thead>
<tbody>
<tr>
<td>10ul</td>
<td>0.2 cm</td>
<td>0.3 cm</td>
</tr>
<tr>
<td>20ul</td>
<td>0.3 cm</td>
<td>0.4 cm</td>
</tr>
<tr>
<td>30ul</td>
<td>0.5 cm</td>
<td>0.7 cm</td>
</tr>
<tr>
<td>40ul</td>
<td>0.7 cm</td>
<td>0.8 cm</td>
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<tr>
<td>Standard- Fluconazole</td>
<td>1.0 cm</td>
<td>1.0 cm</td>
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</tbody>
</table>
V. CONCLUSION

The present study was provided information of Andrographis paniculata about their ethanolic extract confirming the presence of bioactive compounds like steroids, phenolic compounds, terpenoids, alkaloids, saponins and flavonoids with their functional groups like alkene, aldehyde, amine salt, alcohol, aliphatic primary amine are identified with the help of IR spectrum. Then the extract exhibited the antifungal activity against tested microorganisms like Candida albicans and Candida tropicalis.

VI. REFERENCE


