IN VITRO ANTIMICROBIAL ACTIVITY OF HIMALAYAN MEDICINAL PLANT SENECIO CHRYSANTHEMOIDES

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ABSTRACT
The antimicrobial activity of the all extracts of Senecio chrysanthemoides were studied against five (gram negative and gram positive bacteria) and three fungal stain. The results showed that the minimum inhibitory concentration (MIC) of Senecio chrysanthemoides extract was 50μg/ml against Salmonella entericatypm. The ethyle acetate extract of Senecio chrysanthemoides showed significant activity 19±1mm, 17±1mm and 13±1mm against E. coli, Salmonella entericatypm and Klebsiella pneumonia, against food poisoning bacteria and the order of the species based on total antibacterial activity is as follows: Escherichia coli > Salmonella entericatypm > Klebsiella pneumonia and phytochemical screening for the presence of glycosides, alkaloids, phenols and tannins.

KEYWORDS: Antibacterial, Antifungal and Phytochemical screening.

INTRODUCTION
India has great wealth of medicinal plants and their traditional uses. The use of traditional medicinal plants as a source for relief from illness. Herbal medicine is the oldest form of health care known to mankind. Herbs have been used by all cultures throughout the history and they constitute an integral part of the development of modern civilization. Medicinal and aromatic plants and their derived are rich in antibacterial compounds which could be an alternate way to combat bacterial diseases even against some bacteria which are becoming resistant to certain synthetic medicines. The genus Senecio belongs to the tribe Senecioneae, is the largest and most complex genus in the family Asteraceae, which includes more than 1000 species with a worldwide distribution. It is commonly found throughout the Himalayan region at an altitude of 3500-4000m tall glabrous thickherbs, leaves large reniform, petiole winged, heads yellow whole plants aromatic [Naithani, et al., 1984]. About 1000 species are found in world out of which only 43 species found in India [Gaur, et al., 1999]. The plants of this genus have been studied extensively because of the traditional medicinal. The leaves, stems and flowers are used mostly in folk medicine for the treatment of various ailments [E.Uzun, et al 2004].

The plants of the genus Senecio are used traditionally used for treatment of dysentery, conjunctivitis, infections, rheumatism, cancer, cough suppressant, asthma, bronchitis, eczema and inflammation. Senecio aryanensis is used in traditional Chinese medicine in northwestern China to treat dysentery, conjunctivitis and tumefaction [The Encyclopedia et al 1977]. In traditional medicine, the use of Senecio species for treatment of asthma, coughs, bronchitis, eczema and wound healing have also been reported [E.Burgueno et al 2006; A. A. Bolzan et al 2007; E.Uzun, et al 2004]. Senecio tenuifolius is poisonous to livestock, but the leaves of the plant are used topically as remedy for skin diseases to reduce swelling and pain [D. S. Bhakuni et al 1982].

1. MATERIALS AND METHODS
2.1 Plant Material
Whole plants of Senecio chrysanthemoides were collected from the Tunghath (Chopta), Rudraprayag Uttarakhand India in October 2014. The plant was identified from Department of Botany, HNB Garhwal University Srinagar Uttarakhand. A Voucher Specimen (GUH-3354) was deposited in the Department of Botany.

2.2 Preparation of plant Extract
The plant material was separated into its selected part air dried ground to moderately fine powder and soxhlet extracted with increasing polarity solvent (petroleum ether, chloroform, ethyl acetate, acetone, methanolic, ethanolic and water) [Lin J et al., 1999]. Each extract was evaporated to dryness under reduce pressure using...
rotary evaporator. The coarse powder of tuber were subjected to successive hot continuous extraction with various solvent each time before extracting with next solvent the powdered material will be air dried (weight of crude extract 500gm). The various concentrated extracts were stored in air tight container for further studies.

2.3 Media
Nutrient broth, Nutrient agar, Muller Hinton agar, Malt extract broth and Sabouraud dextrose agar, Alcohol, Hydrochloric acid, alcohol, and sulphuric acid, Distilled water etc all product of Himedia Laboratories Mumbai (India) were used in this study.

2.4 Bacterial Strains
Ten bacterial strains were used namely Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa, Klebsiella pneumoniae, salmonella entericatyphim. The bacterial strains were supplied by the Microbial Type Culture Collection and Gene Bank, Institute of Microbial Technology, Chandigarh, India, Customer no, 4351.

2.5 Fungal Strains
Three fungal strains were used namely Candida albicans, Aspergillus flavus and Aspergillus parasiticus, The fungal strains were supplied by the Microbial Type Culture Collection and Gene Bank, Institute of Microbial Technology, Chandigarh, India.

2.6 Antibacterial assay
The disc diffusion assay methods were used to determine the growth inhibition of bacteria by plant extracts [Iennette E.H. et al.,1985] Diluted bacterial culture (100μl) was spread over nutrient agar plates with a sterile glass L-rod. 10mg/ml and 50mg/ml of the each extracts were applied to each filter paper disc (Whatman No. 1, 5 mm diam.) and allowed to dry before being placed on the agar plate. Each extract was tested in triplicate (3 discs/ plate) and the plates were inoculated at 37°C for 24 h. After incubation, the diameter of inhibition zones was measured with a caliper.

2.7 Antifungal assay
The antifungal activity was tested by disc diffusion method [Taylor, et al., 1995; Espinel et al 2002]. The Sabouraud dextrose agar plates were each similarly seeded with each fungal strain The 24 hrs. both culture of each bacterium and 7 days inoculated fungus culture were used to seed sterile Sabouraud dextrose agar at 45°C respectively, and fungal plates were incubated at 25-28°C for 7 days after which diameter of zones of inhibition were measured. Each disc filled with extract.

2.8 Phytochemical analysis
The qualitative phytochemical properties of the dried powdered sample were determined using standard methods [Kokate et al., 2005].

### Table 1

<table>
<thead>
<tr>
<th>Bacterial Name</th>
<th>Genus /Species /Subspecies</th>
<th>MTCC (Code)</th>
<th>Erythromycin 10 Mg/ml</th>
<th>Petroleum ether Extract 10 Mg/ml</th>
<th>Ethyl acetate Extract 10 Mg/ml</th>
<th>Methanol Extract 10 Mg/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td>Klebsiella pneumonia</td>
<td>443</td>
<td>6</td>
<td>12</td>
<td>17</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Pseudomonas aeruginosa</td>
<td>854</td>
<td>13</td>
<td>-</td>
<td>9</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>432</td>
<td>8</td>
<td>10</td>
<td>19</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Salmonella entericyatym</td>
<td>1255</td>
<td>-</td>
<td>-</td>
<td>13</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>737</td>
<td>4</td>
<td>6</td>
<td>11</td>
<td>12</td>
<td>9</td>
</tr>
</tbody>
</table>

3.1 Antibacterial and antifungal activity
The ethye acetate extract of Senecio chrysanthemoides showed significant activity 19±1mm, 17±1mm and 13±1mm against E. coli, Salmonella entericatyphm and Klebsiella pneumonia against food poisoning bacteria and the order of the species based on total antibacterial activity is as follows: Escherichia coli.> Salmonella entericatyphm > Klebsiella pneumonia.

3.2 Phytochemical screening
The phytochemical screening of plant for the presence of glycosides, flavonoids, phenols and tannins, however alkaloids were minor or absent.

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Table 2 Fungal activities of three fungal strains against *Senecio chrysanthemoides* plant extract, Disc size, 5 mm, Inhibitory zone size ±1 mm, mm means (millimetres) and – indicate (NIZ) No inhibitory zone.

<table>
<thead>
<tr>
<th>Fungal Name /Species /Subspecies</th>
<th>Ketoconazole MTCC (Code)</th>
<th>Petroleum ether Extract 10 Mg/ml</th>
<th>Ethyl acetate Extract 10 Mg/ml</th>
<th>Methanol Extract 10 Mg/ml</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Aspergillus parasticus</em></td>
<td>7</td>
<td>6</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td><em>Aspergillus flavus</em></td>
<td>7</td>
<td>5</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td><em>Candida albicans</em></td>
<td>9</td>
<td>-</td>
<td>9</td>
<td>-</td>
</tr>
</tbody>
</table>

3. CONCLUSION

The present study results focused on antimicrobial activity and phytochemical screening of *Senecio chrysanthemoides* this investigation revealed that antimicrobial and antifungal activity against selected bacterial and fungal strains. Which encourage developing a novel broad spectrum antimicrobial formulation in future. Now our research will be directed to develop a broad spectrum antimicrobial herbal formulation with this plant. Even at low concentrations, these plant species contained potent antimicrobial and antifungal activity nearly equal to that of the commercial fungicide used as a positive control.

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REFERENCES


