ISSN 0976 – 3333

Available Online at www.ijpba.info.

International Journal of Pharmaceutical & Biological Archives 2011; 2(1):546-548

ORIGINAL RESEARCH ARTICLE

Study of *in-vitro* anti typhoid activity of various roots extracts of *Decalepis hamiltonii* (Wight & Arn.)

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Received 02 Jan 2011; Revised 23 Jan 2011; Accepted 28 Jan 2011

ABSTRACT

Decalepis hamiltonii is an endangered medicinal plant having various activities and used to treat number of ailments. The present study is an attempt to investigate the action of various extracts of *D. hamiltonii* tuberous roots against typhoid causing organisms. The powdered roots were extracted with various solvents viz., petroleum ether, chloroform, and ethyl acetate by Soxhlet extraction method and the extracts were tested on typhoid causing organisms. Among these, extracts of petroleum ether and chloroform showed a significant activity against *S. Typhi* (ATCC 14028), *S. paratyphi A* and *S. paratyphi B* respectively on comparison with Ciprofloxacin.

Key words: *Decalepis hamiltonii,* Petroleum ether extract, *Salmonella typhi, Salmonella paratyphi,* Ciprofloxacin.

Introduction

Decalepis hamiltonii (W. & A.) belonging to family *Asclepiadaceae,* an endemic and endangered medicinal plant [1]. The fresh roots of *D. hamiltonii* are available during monsoon in Southern parts of India and are generally dried and preserved for various food and pharmaceutical applications [2, 3]. Roots of *D. hamiltonii* have traditionally been used as demulcent, diaphoretic, diuretic and tonic. It is useful in the loss of appetite, skin diseases, diarrhoea, and nutritious disorders, as blood purifier [4, 5], in the treatment of epilepsy and central nervous system disorders [6]. Tuberous roots D. *hamiltonii contains* ellagic acid [7], mainly volatile oil (0.68 %) which contain 2-hydroxy-4-methoxy benzaldehyde (96 %), salicylaldehyde (0.018 %), benzaldehyde (0.017 %), methyl salicylate (0.044 %), benzyl alcohol (0.016%), 2-phenylethyl alcohol (0.081 %), ethyl salicylate (0.038 %), p-anisaldehyde (0.010 %) ,vanillin (0.45 %) [8], ketone, resinol, sterols, saponins, tannins [9] , inositol [10] , fatty acids [11] , α-amyrin, β- amyrin acetate, and lupeol [12]. But still no scientific and methodological investigation has so far been reported in literature regarding its action against typhoid fever. Therefore the present investigation has been designed to study the effect of various extracts of *D. hamiltonii* against typhoid causing organisms *viz., S. Typhi , S. paratyphi* A and *S. paratyphi* B.

Materials and Methods

Plant material and extraction*:* The roots of *D. hamiltonii* were collected from the herbal garden of Indian Institute of Horticultural Research, Bangalore. The roots were excised from the plants, washed in running tap water to remove adhered mud and sand then powdered and subjected to Soxhlet extraction by petroleum ether, chloroform, ethyl acetate, ethanol and water (maceration). All the extracts were concentrated in a rotary evaporator under reduced pressure and dried in a vacuum oven.

Bacteria cultures: Bacterial strains *viz., S. typhi, S. paratyphi A* and *S. paratyphi B* were sub cultured on nutrient agar followed by incubation at 37±1^{0}C for 24 hours and used for the study.

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Agar diffusion technique: Various extracts of *D. hamiltonii* roots were dissolved in Dimethyl Formamide (DMF) to get the concentration of 10 mg/ml. Ciprofloxacin was used as positive control and DMF was used as blank. Agar plates containing typhoid causing organisms were bored with the use of sterile borer of 6 mm radius. 1000 µg/well of plant extract and 100 µg/well of ciprofloxacin was added and incubated for 24hours at 37±1^{0}C.

Results and discussion

D.hamiltonii was tested for its antimicrobial activity against food borne pathogens responsible for food spoilage and human pathologies using standard antimicrobial assays. It exhibited strong antimicrobial activity against *Bacillus cereus*, *Bacillus megaterium*, *Candida albicans*, *Escherichia coli*, *Micrococcus luteus*, *Micrococcus roseus*, and *Staphylococcus aureus*[13]. The present study was carried out to detect the anti typhoid activity of *D. hamiltonii* against typhoid causing organisms such as *S. typhi*, *S. paratyphi A* and *S. paratyphi B* . The zone of inhibition developed on the petri dishes was recorded in millimetre. Among the different extracts of *D. hamiltonii* used (petroleum ether extract, chloroform extract, ethyl acetate extract, ethanolic extract, and water extract) against the bacteria, petroleum ether and chloroform extracts showed a significant activity against the organisms. Water extract does not respond to anti-typhoid activity. The results are shown in (**table 1 and figure 1, a, b and c**).

Table 1- Zone of inhibition of various extracts of *D.hamiltonii* root on typhoid causing organisms.

Sample	Zone of inhibition in mm		
	S. typhi	***S. paratyphi A***	***S. paratyphi B***
Ciprofloxacin	20	20	24
Petroleum ether extract	15	14	15
Chloroform extract	10	10	6
Ethyl acetate extract	7	6	5
Ethanolic extract	6	5	6

Fig 1: Effect of various extracts (1- petroleum ether extract, 2- chloroform extract, 3- ethyl acetate extract, 4- ethanolic extract, 5- water extract, B- blank, Cip – ciprofloxacin.) on a – *S. Typhi*, b – *S. Paratyphi A*, c- *S. Paratyphi B*

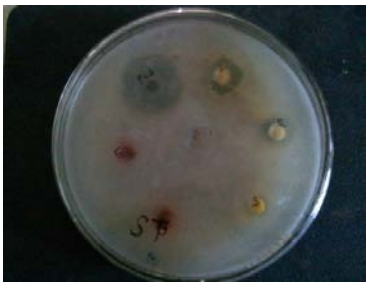


Fig a: *S.typhi*

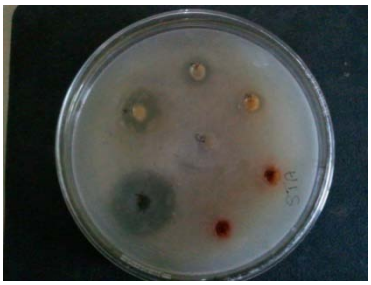


Fig b: *S.paratyphi A*

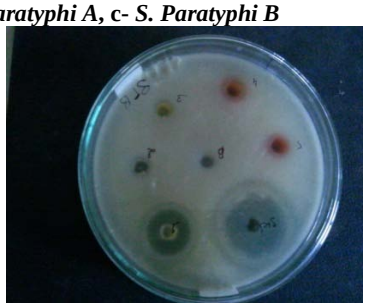
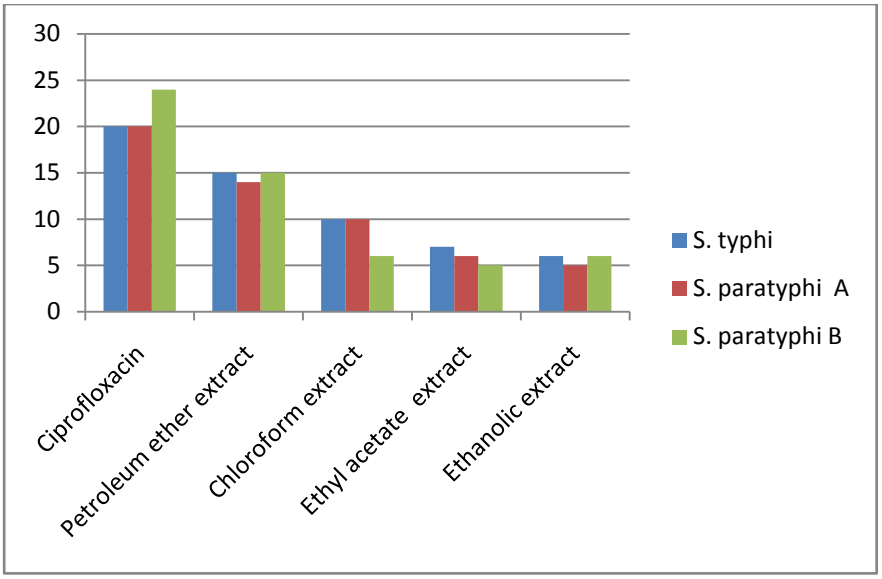


Fig c: *S.paratyphi B*

Figure 1 : Graphical comparison of in vitro anti-typhoid activity of different extracts of *D.hamiltonii* roots. X – Axis: various extracts and positive control. Y – Axis: Zone of inhibition in mm.



CONCLUSION:

Typhoid is a common bacterial disease caused by typhoid organisms. *D. hamiltonii* is an important medicinal plant used to cure number of ailments. The present study revealed the anti typhoid activity of *D. hamiltonii* and it would be a starting point for further research on isolation and characterization of potent anti typhoid agent from the roots of *D. hamiltonii*.

ACKNOWLEDGEMENT:

The authors are thankful to Dr. G Jagadeesh, Expert Pharmacologist and USFDA, USA. N M Ganesh Babu, Botanist, Foundation for Revitalization of Local Health Tradition (FRLHT) Bangalore, Mrs. Anitha.S. Lecturer, Department of Pharmacognosy, Government College of Pharmacy, Bangalore for their support and help.

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