

EVALUATION OF *IN VITRO* ANTI BACTERIAL ACTIVITY OF THE *BREYNIA PATENS* (ROXB.) BENTH. & *HOOK. F.* EXTRACTS

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ABSTRACT

The plants provide a source of inspiration for novel drug compounds, as plant derived medicines made large contributions to human health and well being. The Present investigation is about the antibacterial activity of *Breynia patens* (Roxb.) Benth. & Hook.f. against five bacterial strains using the disc diffusion agar method. The whole plant extracted with ethanol, chloroform, petroleum ether and Aqueous. The sensitivity order of the Methanol crude extracts was illustrated by the corresponding inhibition zone diameter to be *Salmonella paratyphii*(20±009mm zone of incubation) and followed by other bacterial strains. The results indicated that the plant extract exhibited antibacterial properties, thus justifying scientifically their traditional uses as medicinal plants.

Key word: antibacterial activity, *Breynia patens*, *Salmonella paratyphii*.

1. INTRODUCTION

World turned towards the herbal products which are ecofriendly. We are unaware of biomass produced by wild plants, Most of the plants are having antimicrobial property. Susceptibility to antibiotics is continuously increasing. This increase has been attributed to random use of broad-spectrum antibiotics. The increasing occurrence of antimicrobial resistance represents a worldwide major concern for both human and veterinary medicine (Delamare, 2007). Now a days, drug resistance to human pathogenic bacteria has been commonly and widely reported (Brinda *et al.*, 1981) and many scientists have been paid attention to herbal extracts for biologically active compounds from the medicinal plants, because of the side effect and the resistance of the pathogenic microorganism of synthetic drug (Essawi and Srour 2000). Still now, opposing to common belief, drugs from plants to occupy an important position in modern medicine. At least 130 drugs in single chemical entities from higher plants extract, or customized further synthetically (Newman, 2000). *Breynia patens* (Roxb.) Benth. & Hook. f. is a shrub up to 2m tall. It belongs to the family Euphorbiaceae. The plant bark and stem juice were used as the general tonic. The folklore used this plant because of the medicinal properties like Antipyretic, antitoxic, antismelling, and antipiruritic; also used for fever, headache, hemorrhage, mumps, puerperium, stomach pain; antiseptic for cuts and sores, bruises, syphilis, abscesses, suppurating sores, lactagogue.

Oxidative stress is believed to be a most important provider to the pathogenesis of a number of chronic diseases (Ames *et al.*, 1993; Abirami and Muthuswamy, 2013). This study was to evaluate the antibacterial activity of medicinal plant *Breynia patens* (Roxb.) Benth. & Hook. f. used in Ayurveda and traditional medicinal system for treatment. Therefore, extract of the following plant were tested for their potential activity against microbial pathogens.

2. MATERIALS AND METHODS

2.1. Preparation of plant extracts

Fresh plant material was washed under running tap water, air dried and powdered. About 50g of coarsely powdered plant materials (50g/250ml) were extracted in a soxhlet extractor for 8 to 10 hours, with ethanol, chloroform and petroleum ether. The extract obtained was then concentrated using vacuum evaporator and weighted. For stock solutions, 1mg/ml of extract was dissolved in ethanol.

2.2. Aqueous extraction

Ten grams of dried powder was extracted in distilled water for 6 h at slow heat. Every 2 h, it was filtered through 8 layers of muslin cloth and centrifuged at 5000 g for 15 min. The supernatant was collected. This process was repeated twice and after 6 h, the supernatant was concentrated to make the final volume one-fourth of the original volume. It

was then autoclaved at 121°C and 15 lbs pressure and then stored at 4 °C.

2.3. Bacterial Strains

The microbial strains are identified strains and were obtained from the department of microbiology, Bharathidasan university, trichirappalli, Tamilnadu, India. The studied bacterial strains were G- *E.coli*, *Proteus mirabilis* and G+ *Salmonella paratyphii*, *Streptococcus pyogenes* and *Euterococcus faccalis*

2.4. Media Preperation and Antibacterial Activity

The antimicrobial assay of whole plant was performed by methods of agar disc diffusion method (Parekh, 2005). Two colonies of a 24-hour plate culture of each organism were transferred aseptically into 10 ml nutrient broth in a test tube and mixed thoroughly using an electric shaker for uniform distribution. Petri dishes were plated with Nutrient agar medium were prepared according to the manufacturer’s manual and allowed for 30 minutes to solidify. The test organisms were then spread on the surface of the media using a sterile swap stick. The different solvent extracts of plants were (10mg/ml) was introduced on the disc (0.7cm) and then allowed to dry. Then the disc was impregnated on the agar plates and chloramphenicol used as reference drug for the bacteria. The plates were then incubated at 37° C for 24 h. Microbial growth was determined by measuring the diameter of zone of inhibition. The composition of NAM medium is given below.

Composition of Nutrient Agar Medium for bacterial culture

Composition	Quantity (g)
Peptone	5.0
Beef extract	3.0
Sodium chloride	5.0
Agar	15.0
Distilled water	1000 ml
pH	7

3. RESULTS AND DISCUSSION

Herbal medicines are a valuable and readily available resource for primary health care and complementary health care systems. A considerable scientific interest is exhibited nowadays to the antimicrobial screening of bioactive herbal extracts or constituents, due to their unique and complex biological potential (Niculae *et al.*, 2009). The present study revealed that *Breynia patens* extracts posses potential antibacterial activity in *Proteus mirabilis*, *E. coli*, *Salmonella paratyphii*, *Streptococcus pyogenes* and *Euterococcus faccalis* (Table 1). When

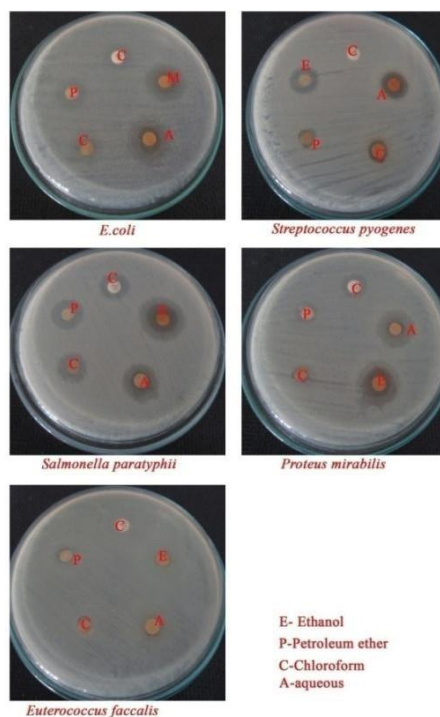
tested by the disc diffusion method, the methanol leaf extract showed significant activity against all the five bacterial strains. The highest antibacterial activity of 20 mm zone of the incubation in *Salmonella paratyphii* and least activity recorded in *Streptococcus pyogenes* measured 8mm. similarly Pandey and Verma (2013) reported Methanolic extract of *Euphorbia hirta* leaves showed maximum zone of inhibition against *E.coli*, *S.aureus* and *P.aeruginosa*. The other extracts also have some considerable activity against the bacterial species. The results summarized in fig.1 extracts from *Breynia patens* prevented the growth of all the tested microorganisms with an inhibition zone diameter variation depending on the extract, concentrations and the type of the bacterium

Table 1: Antibacterial Activity of *Breynia patens* extracts.

S. no	Bacteria	Control (mm)	PE (mm)	C (mm)	A (mm)	E (mm)
1	<i>E.coli</i>	17±002	5±002	6±03	10±012	11±005
2	<i>Proteus mirabilis</i>	24±001	-	4±07	12±008	18±021
3	<i>Salmonella paratyphii</i>	18±006	6±032	8±041	13±009	20±009
4	<i>Streptococcus pyogenes</i>	26±004	4±05	5±12	14±01	8±02
5	<i>Euterococcus faccalis</i>	18±002	5±06	7±012	8±013	12±013

PE-Petroleum ether; C- Chloroform; A-Aqueous; E-Ethanol

Fig. 1. Antibacterial Activity of *Breynia patens* extracts.



4. CONCLUSION

The result of Antibacterial susceptibility assay showed promising evidence for the antibacterial effect of, *Breynia patens* (Roxb.) Benth. & Hook. f. which have the wide spectrum of antimicrobial activity on the bacteria. It has various medicinal values and have been used since earliest time as a medicine for curing various diseases. It is now considered as a valuable source of several unique medicinal products against various diseases and also for the development of some industrial products.

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