

Antibacterial Activity on Leaves Extract of *Croton Sparsiflorious* and *Jatropha Gossipifolia*

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Abstract:- In this present study, various leaf extract like petroleum ether, chloroform, ethyl acetate and methanol extract of *Croton sparsiflorious* Morong. and *Jatropha gossipifolia* L. were evaluated for their antibacterial activities against five different pathogens like *Escherichia coli*, *Salmonella typhi*, *Staphylococcus aureus*, *Klebsiella pneumonia* and *Enterococcus faecalis* were used. Petroleum ether and chloroform extracts of both plants are exist less amount of antibacterial activity. No other extracts used in this study is so good as Methanol. Ethyl acetate is also existing better activity however, the activity is not so good as methanol.

Keywords:- Antibacterial, *Croton sparsiflorious* and *Jatropha gossipifolia*.

I. INTRODUCTION

Medicinal plants also play an important role in the lives of rural people, particularly in remote parts of developing countries with few health facilities. The herbs provide the standing material for the isolation or synthesis of conventional drugs. About 500 herbs are still employed within conventional medicines, although whole plants are rarely used (Prajapati *et al.*, 2003). Microbial pathogens are still major obstacles to human health, despite the marvelous progress in medicine. Their impact is particularly large in developing countries due to relative unavailability of medicines and appearance of widespread drug resistance (Gangwar and Ghosh, 2014 and Yadav *et al.*, 2014). In medicine, some species of Euphorbiaceae proved effective against genital herpes (HSV-2). Some species, despite their medicinal benefits, are facing the risk of becoming extinct. Current study, revealed the anti bacterial potentiality of commonly distributed medicinal plants like *Croton sparsiflorious* and *Jatropha gossipifolia* in, Thiruvarur District, Tamilnadu, India.

II. PLANT PROFILE

- **Biological source:** *Croton sparsiflorious* Morong.
- **Local name:** Ban Tulasi (Vettukkayapoondi).
- **Medicinal Uses:** The plant is used as antiseptic. The leaves, stems and seeds contain alkaloid. It is used to treat various illness effects.
- **Biological source:** *Jatropha gossipifolia* L.
- **Local names:** Kattamanak

- **Medicinal Uses:** The leaves are used on boils and carbuncles, eczema and itches. The Seeds cause insanity and act as an emetic. It is also grown as an ornamental plant. The leaves and the seeds are used as purgative. The stem-juice in nostrils to cure headache.
- **FAMILY:** Euphorbiaceae.

III. MATERIALS AND METHODS

A. Collection of plant materials

The healthy leaves of *Croton sparsiflorious* Morong. and *Jatropha gossipifolia* L. were collected from Edaannaval village, Thiruvarur district, Tamil Nadu, India. The leaves were shade dried or one week and powdered or the further studies.

B. Preparation of solvent extraction and bacterial strains

The powdered leaves were soaked in different solvents like petroleum ether, chloroform, ethyl acetate and methanol. The flasks were kept under shaker for 72 hours at room temperature. Bacterial strains *Escherichia coli* CCM 3988 *Salmonella typhi* CCM 3955 *Staphylococcus aureus* CCM 3987, *Klebsiella pneumoniae* 3953 and *Enterococcus faecalis* CCM 4224 were used.

C. Zone of inhibition determination by agar well diffusion assay

Antibacterial activities of the crude drug extracts were first screened for their zone of inhibition by agar well-diffusion method (Afolayan, 2003). Diameters of inhibition zone less than 7 mm were recorded as non-active (-), and as active (+), when the mean of inhibition zone was between 7 and 10 mm. (++) Described an inhibition diameter of more than 10 mm and less than 15 mm, (+++) an inhibition diameter between 15 and 20 mm and (++++) a diameter of more than 20 mm of growth inhibition (Kone *et al.*, 2004).

IV. RESULT

A. *Croton sparsiflorous* Morong.

The antimicrobial activity of petroleum ether, chloroform, ethyl acetate and methanol extract of *Croton sparsiflorous* Morong. were tested against five different bacteria. They are as follows *E. coli*, *Enterobacter faecalis*, *Klebsiella pneumoniae*, *Staphylococcus aureus* and *Salmonella typhi*.

Leaf (Concen.)	E. coli	S. typhi	S. aureus	K. pneumoniae	E. feacalis	P value (Signifi.)
2mg/1ml	10.9±0.6	09.8±0.2	13.0±0.4	12.3±0.9	12.2±0.4	0.0041
1mg/1ml	9.5±0.2	8.5±0.3	10.9±0.6	11.9±0.6	10.7±0.4	0.0741
0.5mg/1ml	7.8±0.7	6.6±0.8	09.4±0.7	09.7±0.4	08.0±0.7	0.0572
0.25mg/1ml	00±0.0	00±0.0	00±0.0	7.5±0.7	06.8±0.0	0.0053
Control (Streptomycin)	23.9±0.4	24.1±0.4	24.1±0.7	23.9±0.5	23.4±0.6	0.2509

Table 1. Anti-bacterial activity of Croton sparsiflorious - Petroleum ether extract

Leaf (Concen.)	E. coli	S. typhi	S. aureus	K. pneumoniae	E. feacalis	P value (Signifi.)
2mg/1ml	12.9±0.6	13.5±0.2	13.6±0.4	13.3±0.9	11.2±0.4	0.0041
1mg/1ml	10.7±0.2	10.2±0.3	10.9±0.6	11.9±0.6	10.3±1.6	0.0841
0.5mg/1ml	9.2±0.7	9.3±0.8	9.4±1.7	09.7±0.4	08.7±0.7	0.0672
0.25mg/1ml	6.6±0.0	7.0±0.0	6.7±0.9	7.3±0.7	06.8±0.8	0.0153
Control (Streptomycin)	23.9±0.4	24.1±0.4	24.1±1.7	23.9±0.5	23.4±0.6	0.2009

Table 2. Anti-bacterial activity of Croton bonplatianum–Chloroform extract

Leaf (Concen.)	E. coli	S. typhi	S. aureus	K. pneumoniae	E. feacalis	P value (Signifi.)
2mg/1ml	19.9±1.6	15.5±2.2	14.0±1.4	16.3±1.9	20.2±3.4	0.0041
1mg/1ml	16.7±1.4	13.2±1.3	11.9±1.6	13.9±0.6	17.7±1.4	0.0051
0.5mg/1ml	13.9±1.7	10.3±0.8	09.4±1.4	11.7±1.4	13.4±2.7	0.0042
0.25mg/1ml	09.3±2.0	08.2±0.0	06.7±1.3	09.3±0.7	10.3±1.3	0.0043
Control (Streptomycin)	24.9±0.4	24.4±0.4	23.9±0.7	24.2±0.5	24.4±0.4	0.1509

Table 3. Anti-bacterial activity of Croton Croton sparsiflorious –Ethyl acetate extract

Leaf (Concen.)	E. coli	S. typhi	S. aureus	K. pneumoniae	E. feacalis	P value (Signifi.)
2mg/1ml	22.9±1.6	23.5±1.2	17.9±2.4	18.3±1.9	23.2±1.4	0.0041
1mg/1ml	19.7±1.2	19.2±1.3	14.5±1.6	15.9±1.6	19.7±1.4	0.0541
0.5mg/1ml	15.7±1.7	15.3±1.8	11.4±1.7	13.7±1.4	15.6±1.7	0.0372
0.25mg/1ml	12.4±2.0	12.8±2.3	08.8±1.4	09.3±2.7	11.0±1.3	0.0153
Control (Streptomycin)	23.9±0.4	24.1±0.4	24.1±0.7	23.9±0.5	23.4±0.6	0.1509

Table 4. Anti-bacterial activity of Croton sparsiflorious –Methanol extract

➤ *Jatropha gossypifolia*

Leaf (Concen.)	E. coli	S. typhi	S. aureus	K. pneumoniae	E. feacalis	P value (Signifi.)
2mg/1ml	11.6±1.6	09.7±1.2	11.0±0.4	11.3±0.9	08.2±0.4	0.0241
1mg/1ml	09.5±1.2	08.2±0.3	08.9±0.6	10.9±0.6	07.7±0.4	0.0341
0.5mg/1ml	07.5±0.9	07.3±0.8	07.1±0.7	09.8±0.4	06.3±0.7	0.0472
0.25mg/1ml	06.2±1.1	06.7±1.1	06.3±0.3	07.3±0.7	00.0±0.0	0.0053
Control (Streptomycin)	23.9±0.4	24.1±0.4	24.1±0.7	23.9±0.5	23.4±0.6	0.1509

Table 5. Anti-bacterial activity of *Jatropha gossypifolia* – Petroleum ether extract

Leaf (Concen.)	E. coli	S. typhi	S. aureus	K. pneumoniae	E. feacalis	P value (Signifi.)
2mg/1ml	12.7±1.4	11.5±1.2	12.0±0.4	12.3±0.9	11.2±0.4	0.0041
1mg/1ml	10.7±1.2	09.2±1.3	10.2±0.6	11.9±0.6	09.7±0.4	0.0641
0.5mg/1ml	08.2±0.7	08.3±0.8	09.4±0.7	09.7±0.4	08.5±0.7	0.0772
0.25mg/1ml	06.5±1.0	07.1±1.2	07.7±0.8	07.3±0.7	07.7±0.5	0.4253
Control (Streptomycin)	23.9±0.4	24.1±0.4	24.1±0.7	23.9±0.5	23.4±0.6	0.1509

Table 6. Anti-bacterial activity of *Jatropha gossypifolia* – Chloroform extract

Leaf (Concen.)	E. coli	S. typhi	S. aureus	K. pneumoniae	E. feacalis	P value (Signifi.)
2mg/1ml	15.9±0.6	19.5±1.2	16.1±1.4	16.3±0.9	19.6±1.4	0.0241
1mg/1ml	13.7±0.2	16.9±1.3	14.9±1.2	14.9±1.2	17.4±1.2	0.0441
0.5mg/1ml	11.2±0.7	13.3±1.8	12.4±1.7	12.5±1.3	14.2±1.7	0.0472
0.25mg/1ml	09.5±0.0	11.3±1.2	10.5±1.0	09.3±1.2	12.3±1.2	0.0043
Control (Streptomycin)	23.9±0.4	24.1±0.4	24.1±0.7	23.9±0.5	23.4±0.6	0.1509

Table 7. Anti-bacterial activity of *Jatropha gossypifolia* – Ethyl acetate extract.

Leaf (Concen.)	E. coli	S. typhi	S. aureus	K. pneumoniae	E. feacalis	P value (Signifi.)
2mg/1ml	19.9±1.6	22.5±1.2	18.9±1.4	17.9±1.2	23.2±1.4	0.0241
1mg/1ml	16.7±1.2	18.2±0.9	15.7±1.4	15.7±1.3	19.7±1.2	0.0541
0.5mg/1ml	15.2±1.1	15.3±1.2	12.2±1.2	12.2±1.1	15.2±1.7	0.0472
0.25mg/1ml	13.2±1.3	12.8±1.1	10.2±1.1	09.2±1.3	13.1±0.9	0.0053
Control (Streptomycin)	23.9±0.4	24.1±0.4	24.1±0.7	23.9±0.5	23.4±0.6	0.1509

Table 8. Anti-bacterial activity of *Jatropha gossypifolia* – Methanol extract

Among the four extract methanol leaf extract of *Croton sparsiflorious* Morong. and *Jatropha gossypifolia* L. showed more inhibition rate than other three extract like petroleum ether, chloroform, ethyl acetate.

V. DISCUSSION

Antimicrobial studies have been carried out on large number of plants viz. Butea (Srivastava et al., 2002), Acacia (Mandel et al., 2005), Pedalium (Shukla and Khanuja, 2004), Ageratum (Moka et al., 2005 and Sharma and Kumar, 2006), Citrus (Bouamama et al., 2006), Ocimum (Farivar et al., 2006 and Prasannabalaji et al., 2012), Combretum (Angeh et al., 2007), Heracleum (Webster et al., 2008), Adhatoda (Dissanayake and Jayasinghe, 2013 and Dissanayake, 2015). The present investigation also focused on the screening of selected Euphorbiaceae plants for their biological activity using antibacterial studies. The plants were selected for screening for antimicrobial activity was based on the information secured from the survey of literature.

VI. CONCLUSION

The present study concluded that the anti microbial experiments proved the methanol leaf extract possess antimicrobial compounds against the selected bacteria.

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