



IN VITRO ANTIBACTERIAL ACTIVITY OF *ASPARAGUS RACEMOSUS*, *HEMIDESMUS INDICUS* AND *ASTERCANTHA LONGIFOLIA*
AGAINST URINARY PATHOGENS

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Abstract

Asparagus recemosus, *Hemidesmus indicus* and *Astercantha longifolia* were used as a medicinal plants traditionally to cure urinary tract infection. In our study, the clean catch urine specimens were collected from various hospitals and pathology laboratories in Chandrapur and Gadchiroli district and selected herbs were collected from selected areas of Chandrapur and Gadchiroli district of Maharashtra state. The antibacterial activity of methanol extract of *Asparagus recemosus*, *Hemidesmus indicus* and *Astercantha longifolia* were studied against the bacterial strains isolated from the urine specimen of the patients suffering from Urinary tract infection. The selected herbs shows significant antibacterial activity against the urinary pathogens isolated from patient. The present study gives new idea to doctors to treat the patient suffering from multidrug resistant urinary tract infection and prevent the patients from side effects of antibiotic and other synthetic chemotherapeutic agents.

Keywords:- Urinary tract infection, *Asparagus recemosus*, *Hemidesmus indicus*, *Astercantha longifolia*, Uropathogens, Antibacterial activity.

Introduction

Plants has been source of medicines from ancient time. Herbs used as medicine traditionally around the world and its medicinal properties are reported in traditional system of medicine such as Ayurveda, Unani and Sidhha (Sharma P.C,2005). Antibiotic resistance is a global problem in public health sector and antibiotics are responsible to develop multidrug resistant strains (Westh H 2003). Increase in resistance of antibiotics and other synthetic chemotherapeutic agents researchers needs to find the other agents such as medicinal plants as a antibacterial therapy and various herbs shows promising antibacterial activity(Wannisosorn B. 2005)

Asparagus recemosus in commonly known as Shatawari which belonging to family Lilaceae, includes 300 species around the world. The root shows wide range of medicinal properties and used in Urinary tract infection, gastric ulcers, Dyspepsia and nervous disorders(Goyal R. K .2005). It is also used as Antiseptic, antihelminthic and antidiarrhoeal (Dhiman A. K 2005)

Hemidesmus indicus (Linn) commonly known as Indian Sarsaparilla or Anantmoool belonging to family Asclepiadaceae. Root of *Hemidesmus indicus* is used against various diseases such as, urinary tract infection, Skin infections, Diarrhoea, Eye infection, fever, bronchitis, Rheumatism, gastric disorders,

Blood infections etc. (Ratha, M.2012) (Shriram S.2014).

Astercantha longifolia is commonly known as Talmalkhana which belonging to family Acanthaceae. Root of *Astercantha longifolia* is used against various diseases such as urinary tract infection, dysentery, pain, inflammation, oedema, gout, diuretic, diabetes etc. (Chopra RN,1956)(Christibai JEV. 2012).

Our aim to find out the antibacterial activity of *Asparagus recemosus*, *Hemidesmus indicus* and *Astercantha longifolia* against the urinary pathogens isolated from the patients suffering from urinary tract infection in Chandrapur and Gadchiroli district of Maharashtra state.

Materials and Methods

Collection and extraction of plant material :- The root of *Asparagus recemosus* were collected from forest area of Gadchiroli district, root of *Hemidesmus indicus* were collected from agriculture land of Gondpipari Taluka of Chandrapur district and root of *Astercantha longifolia* were collected from paddy field of Ganeshpipari vilage of Gondpipari taluka of Chandrapur District, Maharashtra state, India. The roots of plant material were dried and subjected to grinding to prepare fine powder and finally methanol extract was prepared.

Collection of Urine specimens and isolation and identification of organisms: -Total 100 clean catch urine specimens was collected from indoor and outdoor patients from various hospitals and pathology laboratories in Chandrapur area in sterile disposable containers in aseptic condition. The loopful of the sample are cultured on Nutrient agar plates. Isolated colonies are separately cultured on UTI isolation agar plates (Himedia).

Antibacterial Assay: - Antibacterial activity of methanol extract of *Asparagus resimosus*, *Hemidesmus indicus* and *Astercantha longifolia* (2 ug/ul and 1 ug/ul conc. in D.M.S.O.) , was done by agar well diffusion method on Muller Hinton agar plates against isolated urinary pathogens such as *E. Coli* , *Klebsiella species*, *Proteus species* and *Staphylococcus species*. (Parez. 1990). The standard antibiotic, Nitrofurantoin was used as positive control and the antibiotic assay was done by agar disc diffusion method by using Muller Hinton agar plates (Bauer et. al. 1966).

Result and Discussion

In our study 72 out of 100 urine samples were showed significant growth on culture medium and from which 7 urine samples showed mix infection. Total 79 colonies of isolates shows uropathogens such as *E. coli*, *Klebsiella species*, *Proteus species* and *Staphylococcus species* and these isolates were selected for antibacterial assay.

In various isolates ,methanol extract of 2 ug/ul conc. of *Asparagus racemosus* , *E. coli* show maximum zone of inhibition was 20 mm ,

Klebsiella species shows 17 mm , *Prtoeus species* shows 24 mm and *Staphylococcus species* shows 15 mm. At extract of 1ug/ul conc. , *E. coli* show maximum zone of inhibition was 18 mm , *klebsiella species* shows 15 mm , *Proteus species* shows 22 mm and *Staphylococcus species* shows 13 mm. Methanol extract of 2 ug/ul conc. of *Hemidesmus indicus* , *E. coli* show maximum zone of inhibition was 16 mm , *klebsiella species* shows 14 mm , *Prtoeus species* shows 12 mm and *Staphylococcus species* shows 18 mm. At extract of 1ug/ul conc. , *E. coli* show maximum zone of inhibition was 12 mm , *klebsiella species* shows 10 mm , *Proteus species* shows 10 mm and *Staphylococcus species* shows 14 mm. Methanol extract of 2 ug/ul conc. of *Astercantha longifolia* , *E. coli* show maximum zone of inhibition was 18 mm , *klebsiella species* shows 12 mm , *Prtoeus species* shows 14 mm and *Staphylococcus species* shows 20 mm. At extract of 1ug/ul conc. , *E. coli* show maximum zone of inhibition was 13 mm , *klebsiella species* shows 11 mm , *Proteus species* shows 12 mm and *Staphylococcus species* shows 17 mm. In our study, the methanol extract of *Asparagus racemosus* , *Hemidesmus indicus* and *Astercantha longifolia* shows significant antibacterial activity against uropathogens such as *E. Coli* , *Klebsiella species*, *Proteus species* and *Staphylococcus species*. Many researchers have reported that the *Asparagus resimosus* (Patel LS et al ,2013), *Hemidesmus indicus* (Priyadarsini, et al., 2014) and *Astercantha longifolia*. (Ashvini UH et. al.2014) show antibacterial properties.

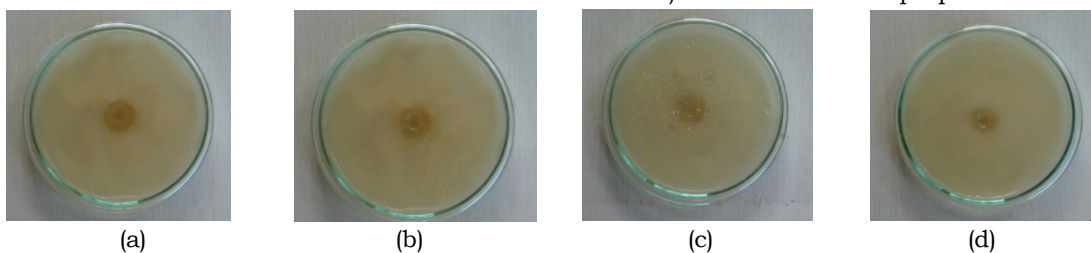


Figure 1 - In vitro antibacterial activity of root extract of *Asparagus racemosus* in uropathogens showing zone of clearance (a) *E. Coli* , (b) *Klebsiella Species* , (c) *Proteus species* and (d) *Staphylococcus species*.

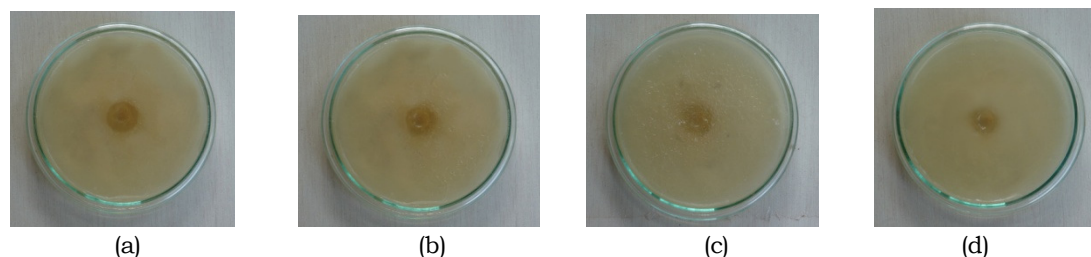


Figure 2 - In vitro antibacterial activity of root extract of *Hemidesmus indicus* in uropathogens showing zone of clearance (a) *E. Coli* , (b) *Klebsiella Species* , (c) *Proteus species* and (d) *Staphylococcus species*.

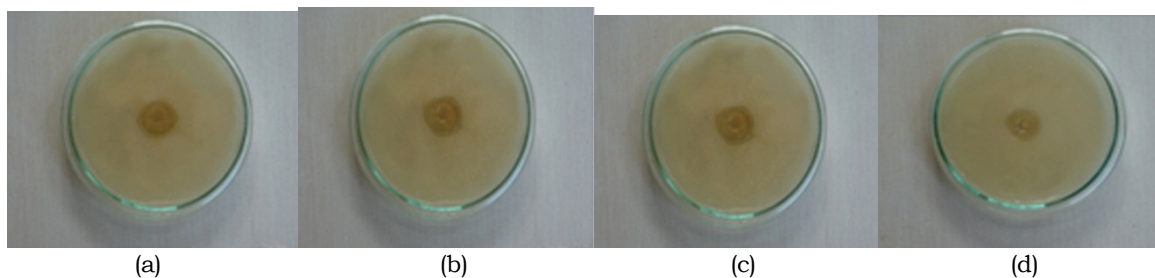


Figure 3 - In vitro antibacterial activity of root extract of *Astercantha longifolia* in uropathogens showing zone of clearance (a) *E. Coli* , (b) *Klebsiella Species* , (c) *Proteus species* and (d) *Staphylococcus species*.

Conclusion

The present study shows that the *Asparagus racemosus*, *Hemidesmus indicus* and *Astercantha longifolia* shows antibacterial activity against the uropathogens such as *E. Coli*, *Klebsiella species*, *Proteus species* and *Staphylococcus species*. Further the study helps to use these plant as antibacterial in urinary tract infection to cure the multidrug resistant urinary tract infection and prevent the patient from side effect due to use of synthetic chemotherapeutic agents.

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