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ANTI MICROBIAL ACTIVITY OF *ASCLEPIAS CURASSAVICA* FLOWER EXTRACT

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ABSTRACT

In recent years, infectious diseases are main cause for premature deaths caused by microbial etiologic agents. Many plants have been a source of medicine for these diseases. Here the flower extracts of *Asclepias curassavica* was suspected to have medicinal properties which can inhibit the growth of micro organisms. The comparative study of antifungal and antibacterial activity of *Asclepias curassavica* extracts was evaluated by using agar well diffusion method.The fungi *A.flavus* and *F. sporotrichiode* exhibited inhibitory activities. Among bacteria *E.coli, B.subtilis* and *S.aureus* were also inhibited by the flower extracts of *Asclepias curassavica.*This results show even the flower extract of *A.currasavica* has got the anti microbial activity.

Keywords:*Asclepias curassavica;A.flavus*; *F. sporotrichiode;B.subtilis;S.aureus*

No. of Tables: 4 **No. of Figures: 10** **No. of References: 10**

INTRODUCTION

Since time immemorial, plants have been the source of medicine throughout the world and still continue to occupy an important place in traditional as well as modern systems of medicine. From the beginning, combating disease has been an important aspect of interaction between human and natural environment. The largest proportion of the biodiversity of all ecosystems is used by rural folk community for human and veterinary healthcare. Each and every tribal community has their own system of traditional medicine and they utilize natural resources around their habitats for various medicinal purposes. This traditional knowledge is handed down orally from one generation to the other through trial and error methods Sinha(1996). One among them is *Asclepias curassavica* a species of an evergreen perennial plant in the milkweed family. *Asclepias curassavica* (Butterfly Weed) is used internally in the treatment of diarrhea, dysentery, chronic rheumatism, and as an expectorant. It has a specific action on the lungs, making it a valuable medicinal herb in all chest complaints and in the treatment of many lung diseases. A medicinal poultice of the roots is used in the treatment of swellings, bruises, wounds, and skin ulcers.

MATERIALS AND METHODS

Collection and preparation of plant material:

Asclepias curassavica plants were cultivated and the flowers were collected. The specimen sample was identified and authenticated by central National Herbarium, Howrah. (Voucher specimen number: CNH/31/2014/Tech.11/58).

Collection of organisms

Fusarium sporotrichiodes ,is collected from DFRL, Mysore and other four fungi like, *Aspergillus niger, A.flavus , Alternaria alternate, Phomopsis vexans, F.oxysporum Cladosporium cladosporoides* were obtained from the Department of Microbiology ,University of Mysore. *Bacillus subtilis, E.coli , Staphylococcus aureus* , were collected from the Department of Microbiology, University of Mysore and *Shigella flexheri, Salmonella typhimurium* collected from DFRL, Mysore.

Plant extraction

The collected flowers of *Asclepias cura-ssavica* were shade dried, powdered. The powdered flowers were sequentially extracted with petroleum ether, chloroform and ethanol according to increasing polarities, starting with the least polar solvent using the soxhlet apparatus. Chronological extraction procedure was adopted based on the fact that different polarity of solvents facilitates the removal of desirable compounds soluble in particular solvents Bazkinal *et al*., (2002). The extracts were air dried using the rotary evaporator.

Antifungal activity

The antifungal screening of the flower extracts were carried out by following the agar well diffusion method Irobi *et al*., (1994). The organisms collected were sub cultured. Two wells of 6mm diameter were prepared with the help of a sterile well puncher. The 12 hours culture broth was taken and swabbed over the plate using sterile cotton swabs to obtain a uniform lawn culture. 50mg/ml of the extract was constituted in distilled water and 10% DMSO for the gel as given in Ongsakul *et*

al., (2009). This concentration was introduced into each well and allowed to stand for 30 minutes at room temperature for the proper diffusion. Alongside the solvent control of 10% DMSO and drug positive control Nystatine of 5mg/ml were also set up. All the plates were prepared in triplets and incubated at 37c for 24 hours. After incubation diameters of the inhibition zones were measured and tabulated ,Kuladhaivel *et al*., (2011). The minimum inhibitory concentration (MIC) of the extracts were determined on the only susceptible organisms. This was investigated by varying the concentration of the extracts.

Antibacterial activity

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RESULT AND DISCUSSION

Previously it was reported that the *A.currasavica* leaf and root Hemavani & Thippeswamy, (2012) extracts found to have antimicrobial property but the antimicrobial activity of *A.currasavica* flower was not reported. Our results show even the flower extract of *A.currasavica* has got the anti microbial properties. Out of seven fungi the flower extract gave better results on fungi *Fusarium sporotrichiode and A.flavus* Whereas on other five fungi *Alternaria alternate, Phomopsis vexans, F.oxysporum , Aspergillus niger, Cladosporium cladosporoides* the flower extract did not show any result as it is shown in the table 1. *Fusarium sporotrichiode* causes Chronic ulcerative dermatitis in human Kano *et al*., (2010). In plants it causes Foliar Spots on Forage Corn E. A. Moya-Elizondo *et al*., (2013).Likewise when different concentration of the plant extracts are used the zone of inhibition is more vivid. The highest concentration i,e 75mg/ml has given comparatively good activity. *A.flavus* is a human pathogen, allergen and mycotoxin producer M. T. Hedayati *et al*., (2007). In plants it causes ear rot on corn. The MIC of the plant extract 75mg/ml gives better results in petroleum ether and chloroform extract where as ethanol shows zero inhibition (Table 2).When antifungal activity of *A.curassavica* flower extract were compared, *A. flavus* showed highest activity in compared to *F.sporotrichiode* (fig 1). Antibacterial activity is carried out on following five bacteria *Bacillus subtilis, E.coli, Staphylococcus aureus, Shigella-flexheri, Salmonella typhimurium* that are shown in table 3.Out of these *Bacillus*

subtilis, E.coli, Staphylococcus aureus were inhibited by the flower extract whereas other two were not inhibited (table 4).Here the *S.aureus* exhibited highest inhibitory zone in chloroform and ethonal extracts compared to *E.coli* and *B.subtilis*(fig.2).

These results shows the flower extracts of *A.curassavica* found to have antimicrobial activity. Our results support the use of this plant as traditional medicine for effective antimicrobial agents in the search of new drugs. The compounds which are responsible for inhibition of microbes are needed to be isolated and identified.

CONCLUSION

Table 1:*A.curassavica* flower extracts against Fungi species

Name of the organism	Petroleum ether extract	Chloroform extract	Ethanol extract
Aspergillus niger	-	-	-
A.flavus	+	+	-
Fussarium sporotrichiodes	+	+	+
F.oxysporum	-	-	-
Alternaria alternate	-	-	-
Phomopsis vexans	-	-	-
Cladosporium cladosporoides	-	-	-

Table 2: Determination of MIC of *A.curassavica* against Fungi species

Name of the organism	Petroleum ether extract		Chloroform extract		Ethanol extract	
	50mg/ml	75mg/ml	50mg/ml	75mg/ml	50mg/ml	75mg/ml
Aspergillus niger	-	-	-	-	-	-
A.flavus	0.7	0.9	0.4	0.5	-	-
Fusarium sporotrichiodes	0.3	0.5	0.2	0.3	0.3	0.5
F.oxysporum	-	-	-	-	-	-
Alternaria alternate	-	-	-	-	-	-
Phomopsis vexans	-	-	-	-	-	-
Cladosporium cladosporoides	-	-	-	-	-	-

Table 3:*A.curassavica* flower extracts against bacterial species

Name of the organism	Petrolium ether extract	Chloroform extract	Ethanol extract
Bacillus subtilis	-	+	-
E.coli	+	+	-
Staphylococcus aureus	-	+	+
Shigella flexheri	-	-	-
Salmonella typhimurium	-	-	-

Table 4: Determination of MIC of *A.curassavica* against Bacterial strains

Name of the organism	Petrolium ether extract		Chloroform extract		Ethanol extract	
	50mg/ml	75mg/ml	50mg/ml	75mg/ml	50mg/ml	75mg/ml
Bacillus subtilis	-	-	0.4	1.0	-	-
E.coli	0.9	1.0	1.0	1.2	-	-
Staphylococcus aureus	-	-	1.5	1.5	1.0	1.2
Shigella flexheri	-	-	-	-	-	-
Salmonella typhimurium	-	-	-	-	-	-

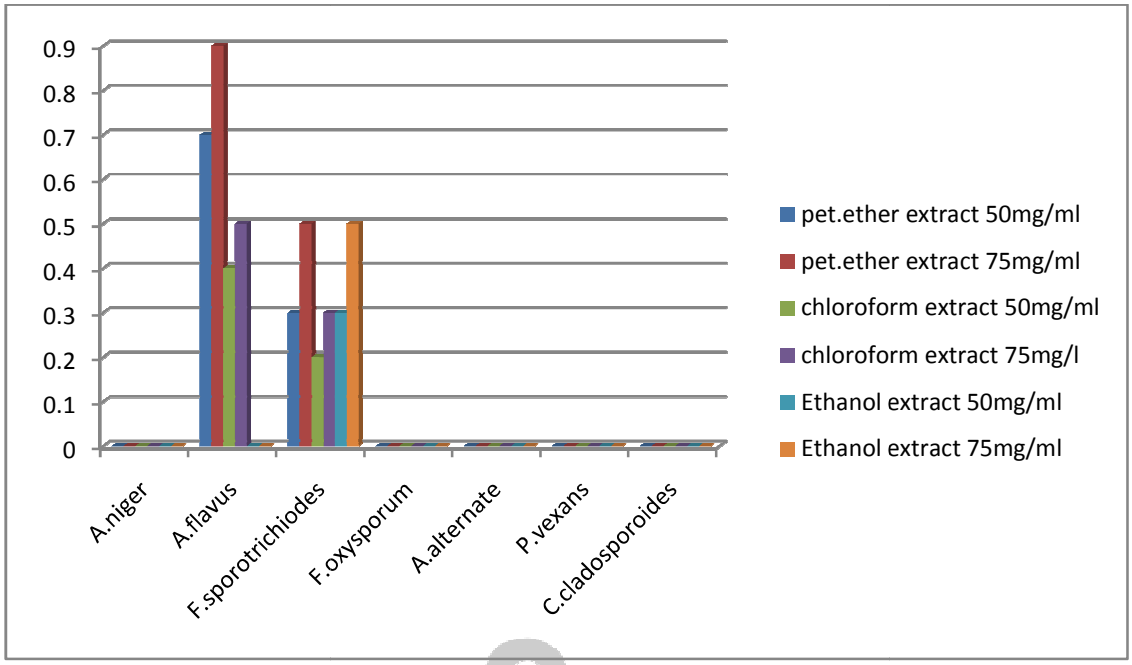

Fig1: *Shows the antifungal activity of A.curassavica flower extract against fungi species.*

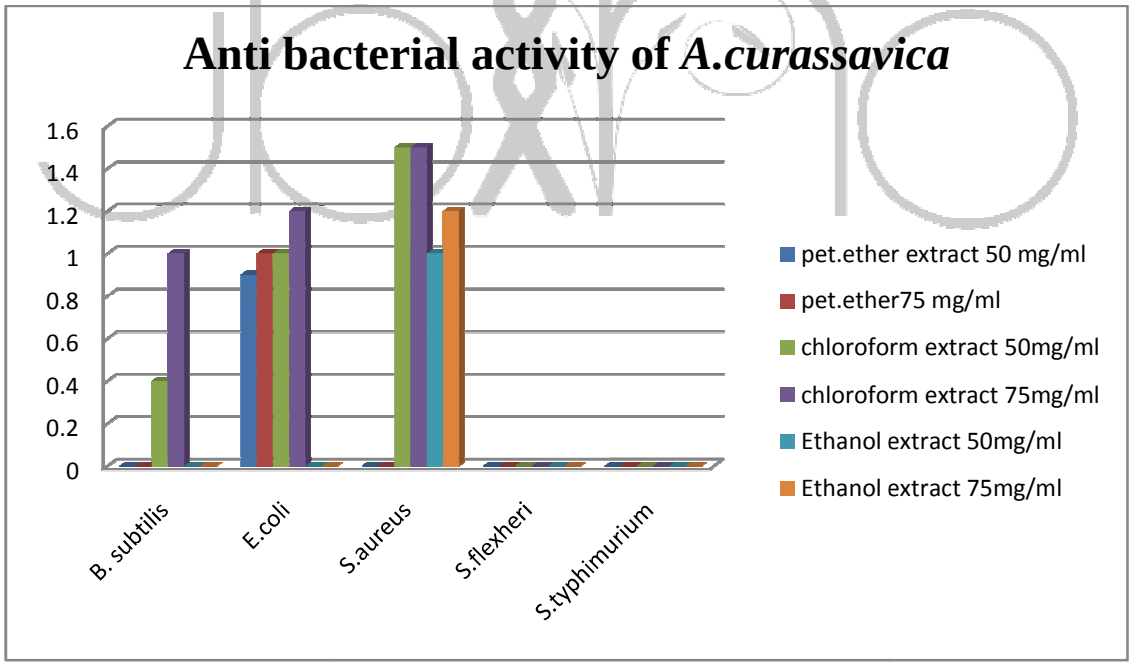

Fig2: *Shows the antibacterial activity of A.curassavica flower extract against bacterial species.*

Fig 3:*A.curassavica* chloroform extract showing inhibition *of A.flavus*

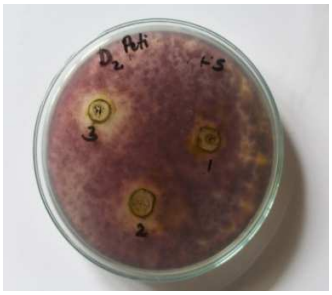

Fig 4:*A.curassavica* Petroleum ether extract showing inhibiton of *F.sporotrichiodes*

Fig 5:*A.curassavica* chloroform extract showing inhibition of *F. sporotrichiodes.*

Fig 6:*A.curassavica* petroleum ether extracts showing inhibition *of E.coli*

Fig 7:*A.curassavica* chloroform extracts showing inhibition of *E.coli*

Fig 8:*A.curassavica* chloroform exract showing inhibition of *B.subtilis*

Fig 9:*A.curassavica* ethanol extract showing inhibition of *S. aureus*

Fig 10:*A.curassavica* ethanol extract showing inhibition *of S. aureus*

REFERENCES

Bazykinal NI,Nikolaevski AN, Filippenkol TA, Kaloerova VG. Optimization of conditions for the Extraction of natural Antioxidants from Raw Plant Materials. *Pharm.chem*.36:46-49,2002.

Ethan Rubinstein, Marin H. Kollef, and Dilip Nathwani.Pneumonia Caused by Methicillin-Resistant *Staphylococcus aureus,* clinical infectious diseases, Volume 46, P *378-388,2008*

Hedayati,M. T, Pasqualotto' A. C, Warn P. A, BowyerP and Denning D. W. *Aspergillus flavus*: human pathogen, allergen and mycotoxin producer, *Microbiology* 153(**6**):1677-1692,2007

Hemavani. C and Thippeswamy. B. Evaluation of antimicrobial activity of root extract of *Asclepias curassavica*, Recent Research in Science and Technology 2012, 4(**1**): 40-43,2012

Irobi on, Moo-Young M, Anderson WA, Daramol So. Antimicrobial activity of the Bark of Bridelia *fermginea* (euphorbiaceae). Int.J.Pharmacog.,34:87-90,1994

Kulandhaivel, M, Sooraj. S. Nath, Nathiya. K and Palaniswamy .M .antifungal activity and phytochemical screening of *Anisochilus carnosus*(L) wall *Malalenca alternifolia* against opportunistic pathogen *Candida albicans*. J.J of Pharmaceutical and Biological Archives 201:2(6):668-1670.

Kano R, Maruyama H, Kubota M, Hasegawa A, Kamata H. Chronic ulcerative dermatitis caused by *Fusarium sporotrichioides*, International Society for Human and Animal Mycology 49(3):303-5,2010

Moya-Elizondo E. A ,Arismendi N, Montalva C, and Doussoulin H. First Report of *Fusarium sporotrichioides* Causing Foliar Spots on Forage Corn in Chile, APS Journal Volume 97, Number 8, Page 1113,2013

Ongsakul M, Jundarat A, Rojanaworant Antibacterial effect of crude Alcoholic and Aqueous extract of six medicinal plants against *S.aureus* and *E.coli*. *J. health Res*.,23(**30**):153-156,2009

Sinha R.K., Ethnobotany –the renaissance of traditional herbal medicine. In a Shree Publishers, Jaipur. India,1996.