Chemical and Process Engineering Research
ISSN 2224-7467 (Paper) ISSN 2225-0913 (Online)
Vol.18, 2014

ANTIBACTERIAL AND ANTIFUNGAL ACTIVITIES OF THE FLAVONOIDAL CONSTITUENTS AS-1 AND AS-2 ISOLATED FROM FLOWERS OF STRYCHNOS POTATORUM (LINN)

ALOK SAHAI* AND SHUBHA TIWARI**
Department of Chemistry Government Girls Post Graduate College of Excellence
SAGAR (M.P.) INDIA

ABSTRACT

Compounds AS-1 and AS-2 obtained from ethyl acetate and methanol soluble part of the concentrated ethanolic extract of flowers of Strychnos potatorum (Linn) were found to possess encouraging antibacterial and antifungal activities.

KEY WORDS

Strychnos potatorum Linn, flavonoidal constituents, antibacterial and antifungal activities.

INTRODUCTION

Strychnos potatorum Linn[1] is known as Nirmali in Hindi. and is also known as; Tetankottai, Katakamu and katakam. It occurs in various region of Deccan, along with Madhya Bharat region.

This plant is used as a local application in the treatment of lachrymation or copious watering of eyes, in dysentery and diabetes. The seeds on analysis gave moisture 8.26%,nitrogen 1.33%,total alkaloids 0.17% and ash 1.34%,sucrose (1-2%) and loganin have also been reported.

FUTURE SCOPE FOR THE PRESENT WORK

In the existing global scenario in the present day medicines, plants occupy a very significant place as raw material for some important drugs, synthetic drugs and antibiotics brought about a revolution in controlling different diseases, which are still remain unconquered.

EXPERIMENTAL

The ethyl acetate and methanol soluble parts of the concentrated ethanolic extract of flowers of Strychnos potatorum (Linn) were worked up by column chromatography to get two compounds AS-1 and AS-2 which were identified as; 5-Hydroxy-8,4'-dimethoxyflavanone-7-O-β-D-glucopyranoside (AS-1), and 5,7,3'4' tetrahydroxy flavone -3-O-β-D-galactopyranoside (AS-2).

The compound AS-1 and AS-2 were taken in aqueous medium (30mg/ml) separately. For assaying the antibacterial activity, Cups or well methods as described by Vincent and Vincent[2] were taken recourse to.

ANTIBACTERIAL ACTIVITY

CULTURE MEDIA

The nutrient agar medium used for antibacterial studies consisted of the following composition as below;

(i)	Agar	8 gm
(ii)	Beef extract	2.5 gm
(iii)	Pepton	2 gm
(iv)	Sodium chloride	2 gm
(v)	Distilled water	250 ml

STERILIZATION

The sub cultures, of organism were prepared, by sterilizing the medium and slants by autoclaving them at 15 1bs. pressure for over half an hour.

The petri dishes used for the antibacterial studies were sterilized by keeping them overnight in an electrically heated air oven at 110^0C.

PREPARATION OF AGAR PLATES

Spore suspension (4% v/v) of each organism was prepared and was mixed with sterilized nutrient agar medium (25ml), each of which were allowed to gel in already sterilized[3,4] petri dishes of (90 mm) diameter.

Cups/wells were made in agar plates and after an hour, (0.02ml) aqueous extract of each AS-1 and AS-2 were dispensed into the wells or Cups. Controls were run in the same way using 500 ppm solution of Acromycin. Thereafter the plates were incubated at 35 ± 2^0C, for 15 hours and their zones of inhibition measured which are recorded in the table –I below;

TABLE-1
ANTIBACTERICAL ACTIVITY OF THE FLAVONOIDAL CONSTITUETS AS-1 AND AS-2 ISOLATED FROM FLOWERS OF STRYCHNOS POTATORUM LINN

Diameter of growth of inhibition zone in (mm) including the diameter of well (10 mm)				
Organism		Different flavonoidal compund		
S.No		AS-1	AS-2	Control 500 ppm
1.	Bacillus anthraces	23	24	27
2.	Bacillus mycoides	21	22	25
3.	Bacillus subtilis	15	18	20
4.	Escherichia coli	16	19	26
5.	Proteus valgaris	19	19	23
6.	Pseudomonas aeruginosa	20	21	25
7.	Staphylococcus albus	14	20	24
8.	Salmonella paratyphi	16	19	22
9.	Vibrio cholerae	20	20	25
10.	Xanthomonas malvacearum	15	16	19

ANTIFUNGAL ACTIVITY

Each of the compound AS-1, and AS-2 (35 mg /ml) were taken in aqueous medium for the study of antifungal activitly. The antifungal activity[5] was estimated in terms of the inhibitory zones, which appeared around the filter paper discs.

CULTURE MEIDA

The Sabrouad's dextrose agar (SDA) medium was used during the experiment for maintaining the culture and also for assaying. The seed agar, consisted of Peptone (6.0gm), Dextrose., (25 gm), Agar (12 gms) and distilled water (300ml).

STERLLIZATION

The slants and the media for the preparation of sub-cultures of various organisms were; sterilized by autoclaving them at 10 1bs. pressure for 40 minutes. The Petri dishes used were first sterilized by keeping them for about 40 hours in an electrically heated air oven at 100^0C.

PREPARATION OF AGAR PLATES

This was done in the same way as was done for antibacterial activity.

STANDARD

The well known antifungal antibiotic Griseofulvin (1000 ppm.) was used as standard substance for study of the antifungal activity in the present investigation,.

DETERMINATION OF ANTIFUNGAL ACTIVITY

After incubation the zones were measured and the experiments were repeated in triplicate. Griseofulvin (1000 ppm.) as standard antifungal substance was used for comparing the antifungal activity. The observations are recorded in table no-2 below;

TABLE-2
ANTI FUNGAL ACTIVITY OF THE FLAVONOIDAL CONSTITUETS AS-1 AND AS-2 ISOLATED FROM FLOWERS OF STRYCHNOS POTATORUM LINN

DIAMETER OF GROWTH OF INHIBITION ZONE IN (mm) INCLUDING THE DIAMETER OF WELL (10 mm)				
Organism		**Different flavonoidal compound**		
S.No		**AS-1**	**AS-2**	**Control 1000 ppm**
1.	Aspergillus flavus	11	19	21
2.	Fusarium solani	10	17	20
3.	Chrysosporium tropicum	10	14	20
4.	Keratinomyces ajelloi	16	18	21
5.	Microsporum gypseum	11	16	20
6.	Penicillium liliacinum	10	13	47
7.	Rhizopus nodosus	09	16	22
8.	Verticillium lecanni	13	15	18

RESULT AND DISCUSSION

A perusal of the both observation tables I and II associated with antibacterial and antifungal activities of the different flavonoidal compounds AS-1 and AS-2 isolated from the flowers of Strychnos potatorum Linn, concludes that both AS-1 and AS-2 have encouraging antibacterial and antifungal activates against all the tested organism. Moderate activites were observed with AS-1 whereas AS-2 which occurs in the methanol extract had encouraging activity.

REFERENCE

1. R. N. Chopra, S.L. Nayar and I. C. Chopra, Glossary of Indian Medicinal plants C.S.I.R. Publication, p. 236, Reprinted (1980)
2. Vincent, J.G. & Vincent, H.W., (1944), Proc. Soc. Expt. Biol., 55. (1962).
3. C. Jasper, J.C. Maruzzella and P.A. Henry, J. Am. Pharm Assoc. 471, (1958).
4. Fawcentt, C.H., Spencer, D.M., Ann. Rev. Phytopath, 8. 403-418, (1970).
5. Loo, Y, H., Skell, P.S., Tomberry, H. H., John Enrlich, J. M. McGuire, Savage, G.M. and Sylvester, J.C. : Jour. Bact, Vol 50, 701-708, (1945).