



Studies on ethnomedicines and antibacterial activities of flower and fruit extract of *Martynia annua* L. from Kinwat forest

Shinde SR

Department of Botany, Baliram Patil Arts, Commerce and Science College Kinwat, Dist. Nanded (MS), 431 804
Email : nssurendra@rediffmail.com

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ABSTRACT

Ethnomedicinal survey of Kinwat forest has been conducted during 2016-2017. It has been found that *Martynia annua* plant species is used by local traditional practitioners in human health care on pneumonia in childrens particularly in infants. The present paper focused on ethnomedicinal use and the antibacterial activities of the plant against some human pathogenic bacteria.

Key words: Ethnomedicine, antibacterial activity, *M.annua*, Kinwat forest.

INTRODUCTION

Ethnobotany is a totally natural and traditional relationship and an interaction between man and his surroundings. It is direct relationship with plants and peoples. In general ethnobotany is a scientific relationship with aboriginal people and plant (Hershberger 1895).

Kinwat is tribal taluka place of Nanded district of Marathwada region of Maharashtra and is a unique forest area of the region. It is rich in vegetation, valleys, mountains with important traditional medicinal plants. The floristic survey of different ranges of Kinwat forest has been done earlier by various workers. (Zate, 1983; Naik, 1998; Chavan, 2002) with short ethnomedicinal notes. The ethnomedicinal plants of the area play an important role regarding health of residing peoples. The forest of study regions is rich in ethno-medico-botanical point of view because the traditional practitioners of the area are mostly belongs to tribal communities. These practitioners are using the local flora to cure the various health problems in the society and it indicates the significant medicinal potential of the flora against human diseases. Many reports of antibacterial activity of the plants extracts against pathogens are available (Gibbons, 2005). To considering all these facts the present topic has been undertaken for studies.

MATERIAL AND METHODS :

Ethno-medico-botany :

Ethnomedicobotanical survey of study region was conducted during the study. For the collection of ethnomedicinal information the traditional practitioners were interviewed by visiting their houses and also on field. Interviews, enquiries and cross questioning was conducted with the practitioners. A special questionnaire was made in proforma and it has been adopted for interview. This type of approach and communication skill yields valuable information about medicinal plants.

Preparation of extract :

The plant material in the form of flowers and fruits collected from the forest in August and December of 2016 during the different visits and brought to the laboratory. They were cut into small pieces and wash thoroughly with tap water to remove the contaminants and dried under shade for about 8-10 days separately. The dried materials can be grind into fine powder and store in airtight containers at room temperature till the extraction. The crude extracts will be prepared by extracting 10gm. of flower and fruit powder with 100ml of methyl alcohol by Soxhlet extractor for about 90-120 minutes separately. These extracts were used for antibacterial studies.

Antibacterial activity :

Antibacterial activities of flower and fruit extract of *M.annua L.* against human pathogenic bacteria were carried out during the work. The antibacterial activity of the extracts evaluated by cup plate agar diffusion method. (Collins, 1967 and Godkar, 1996) against tested bacteria. The bacteria grown on nutrient agar medium at pH 7.6. One percent concentrated extracts of flowers and fruits were prepared separately. The cups were made with the help of sterilized 8mm cork borer. The 0.1ml of extracts were poured in each cup of plates. The plates were incubated at 30°C for 24 hrs. The bacterial activity was measured in diameter of inhibition zone in mm. of the samples and compare it with control and standard drug streptomycin.

RESULT AND DISCUSSIONS :

Morphological description :

Large, climbing, annual herbs ; stem thick, softly pubescent; tendrils bifid. Leaves broadly ovate

orbicular, 10-40 cm across, cordate at base, angular or shortly trilobed, acute or shortly acuminate, softly white pubescent on both the surfaces; petioles 5-30 cm long, thick, biglandular at apex. Male flowers on long axillary peduncles. Calyx tube 2-3 cm long; sepals narrow. Petal white, obovate, 3-4 x 2-3cm, emarginated at apex, tomentose. Filaments 3-4 mm long; anthers 8-10mm long. Female peduncles shorter than the male. Calyx tube 2-3 mm long; ovary villous. Fruits clavate, 30-60 x 6-15cm, greenish-yellow turning brown. Seeds obovate- oblong, 7-20 mm long, white, truncate or bidentate at apex.

| | | |
|---------------------|---|----------------------|
| <i>Fls and frts</i> | - | September to January |
| <i>Exsiccata</i> | - | Kothari near Kinwat |

Ethnomedicinal importance of plant :

The ethnomedicinal use of the plant is recorded from local practitioners by taking interview and simple talk with them. The fruit is used as medicine.

Local use : A ripened fruit rubbed on a special stone and made into paste. The paste used to cure the pneumonia in childrens.

Recorded uses : The plant is used in boils, eczema, epilepsy, hairfall, itch, neckpain, scabies, sore thorat, tonsillitis, vet wounds (S.K. Jain. 2012) . The fruit is used as antiinflammatory and in scorpion sting. The roots are used in urinary disorders like dysuria etc. The leaves are used in epilepsy (K. Madhava Chetty *et.al.*-2008)

Antibacterial activities of flower and fruit extracts

In order to understand the antibacterial potential of methanolic extracts of flower and fruit of the plant tested against pathogenic bacteria as mentioned in table no. 1 and 2. For the screening of antibacterial nature of plant extracts, the experiments were conducted and result were obtained. The plant extracts were tested and bacterial growth measured in the form of inhibition zone noted in table 1 and 2.

As noted in table no. 1 the methanolic flower extract of plant showed highest inhibitory action against *B.subtilis* than standard drug i.e. streptomycin and is followed by *P. fluorescence* and *Staphylococcus aureus* nearly equal to the standard drug and proved its growth inhibition potential against test bacteria. The extract showed significant inhibition action against *Shigella dysentre*. It also showed considerable inhibitory activity against *E.coli* and *S.typhi*. The methanolic fruit extract action against test bacteria are noted in table no. 2. It shows the highest inhibitory

action against *B.subtilis* flowered by *Shigella dysentre* *E.coli* and *S. typhi*. It does not show any inhibitory action and *P.fluorescens*. It shows poor response against *E.coli* and *S. typhi*. It does not show any inhibitory action against *S.aureus*.



Fig. 1: Photographs

Table 1 : Antibacterial activity of Methanolic flower extract of *M.annua* L.

| Sr. No. | Name of Bacteria | Zone of Inhibition in (MM) | | |
|---------|--------------------------------|----------------------------|--------|---------------|
| | | Control D/W | Sample | Standard drug |
| 1 | <i>Escherichia Coli</i> | 00 mm | 17 mm | 25 mm |
| 2 | <i>Pseudomonas fluorescens</i> | 00 mm | 27 mm | 27 mm |
| 3 | <i>Bacillus subtilis</i> | 00 mm | 37 mm | 30 mm |
| 4 | <i>Staphylococcus aureus</i> | 00 mm | 24 mm | 26 mm |
| 5 | <i>Salmonella typhi</i> | 00 mm | 11 mm | 18 mm |
| 6 | <i>Shigella dysentre</i> | 00 mm | 12 mm | 08 mm |

Table 2 : Antibacterial activity of Methanolic fruit extract of *M.annua* L.

| Sr. No. | Name of Bacteria | Zone of Inhibition in (MM) | | |
|---------|--------------------------------|----------------------------|--------|---------------|
| | | Control D/W | Sample | Standard drug |
| 1 | <i>Escherichia Coli</i> | 00 mm | 17 mm | 24 mm |
| 2 | <i>Pseudomonas fluorescens</i> | 00 mm | 24 mm | 27 mm |
| 3 | <i>Bacillus subtilis</i> | 00 mm | 32 mm | 30 mm |
| 4 | <i>Staphylococcus aureus</i> | 00 mm | 00 mm | 25 mm |
| 5 | <i>Salmonella typhi</i> | 00 mm | 11 mm | 18 mm |
| 6 | <i>Shigella dysentre</i> | 00 mm | 12 mm | 10 mm |

CONCLUSIONS

The Kinwat forest has huge wealth of ethnomedicinally important plant including *M.annua* L. The *Martynia annua* is popularly used as ethnomedicine against pneumonia specially in childrens. The flowers and

fruits of this plant from Kinwat forest have the significant potential against tested bacteria as mentioned in table 1 and 2 hence there is a need to synthesize the pure form of drug to cure pneumonia and make it popularize for betterment of the society.

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