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Pharmacognostic study of *Suaeda fruticosa*

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ABSTRACT

***Introduction*:** *Suaeda fruticosa* is a leaf succulent obligate halophyte which produces large a numbers of seeds under salty environment which is widely distributed throughout saline xeric habitat of Pakistan. It is locally used as a fuel and soap.

Materials and Methods: Present study was carried out to record and report the phytotoxic, antibacterial and antifungal effect of *Suaeda fruticosa*; phytotoxic activity was carried on germination of *Cucumus sativus* and *Helianthus annus* similarly antibacterial and antifungal activities were also carried out in libratory by using of various strains of bacteria and fungi. This plant has inhibitory as well as antibacterial and antifungal effect.

Results: The results showed that the methanol extract of this plant gradually decreased the germination percentage, especially at higher concentration. The radicle and plumule length were also affected by different concentration. It is also studied that the effect of different concentration of shade dry leaf methanol extract of *Suaeda fruticosa* on bacterial and fungal strains (*Stroptococcus byogenes, Salmonella typhi, Aspergillus fumigates* and *Candida albicans)* for antibacterial and antifungal properties.

***Conclusion*:** It was concluded that extract of *Calligonum polygonoides* inhibit the germination and seedling growth of *Cucumus sativus* and *Brassica oleracea* due to its phytotoxic effect.

Key words: *Calligonum polygonoides, Brassica oleracea,* Phytotoxic

INTRODUCTION

Suaeda fruticosa is a perennial shrub belongs to family Chenopodiaceae. This is a leaf succulent obligate halophyte which produces large a numbers of seeds under salty environment. Seeds of these plants are a best source of high quality edible oil and leaves have the ability to remove large amount of salt from the saline soil. *Suaeda fruticosa* is a perennial shrub. It is the most common halophytes and ecologically grows in very alkaline, saline soil, sandy and loamy soil. It cannot grow in the shade but prefers moist saline soil. In Pakistan this plant is adapted species of the genus *Suaeda*. It grow on wide range of salty alluvial flats or area with clayey or sandy soils added to episodic water logging, on drier sites salts and coastal belts salts. It is commonly grow at high salinity levels and low organic matter; according to Raunkiaer classification this plant belongs to helophytes. *Suaeda fruticosa* is used as valuable source of antioxidant and anticancer. Locally this pant has been used for the treatment of wound. It is also used as laxative, diuretic and emetic. It is the best fodder of camel; commercially this plant ash is used as soda which is locally used in place of soap in previous ages. It is the best fuel used for cooking of different purposes (Chapman, 1947; Singh, 2005; Hameed *et al.*, 2012).

MATERIAL AND METHOD

The present study was conducted during 2012-14. *Suaeda fruticosa leaves* were collected from Bharat and Bada Mir Abas Manda area of District Bannu in Khyber Pakhtunkhwa Pakistan. All leaves were washed with distilled water to remove dust and other residues, than the leaves were dried under shade. The dried samples were than crushed to powder form by electric grinder. After that, leaf powders were soaked in 70% methanol for 72 hours at room temperature. The methanol extract was collected by use of Whatman filter number (Al-Zahrani and Al-Robai, 2007). Methanol and water was evaporated while extract was obtained. After extraction, stock

solution of .5g/50ml or 10mg/1ml was prepared, further dilute concentration of stock solution are (0mg/1ml, 5mg/1ml, 7mg/1ml, 10mg/1ml) were prepared, distilled water as the control treatment. Seed of *Cucumus sativus* and *Helianthus annu Cucumus sativus* were selected for this research. There are four replication, in each replica consist of three Petri dish. Three Petri-dishes were selected for each concentration; 15ml of each concentration were prepared. Added 5ml extract concentration to each Petri dish of replica. After drying blotter paper 7 seeds were grown in each petridish. Three petridish of 0mg/1ml was taken as a control of all these treatment *Cucumus sativus* and *Helianthus annu* were selected for this study. Statistical analysis of data was carried out by using SPSS and Excel soft ware. Comparison of mean was carried out by with the Duncan's multiple tests using SPSS.

RESULTS AND DISCUSSION

Phytotoxic Activity: In treatment of 10mg/1ml, germination percentage of seeds of *Cucumus sativus* were 73.91%, while germination percentage of 7mg/1ml, 5mg/1ml and control were 73.91 %, 82.60%, 100%, respectively similarly the germination percentage of *Cucumus sativus* seeds at control were 100% while germination of *Helianthus annu* treatments at concentration of control, 5mg/1ml, 7mg/1ml and 10mg/1ml were 100%, 39.13%, 28.69% and 21.73% respectively. Therefore**,** the greatest and least inhibitory effect of leaf extract on percentage of seed germination was belonged to *Helianthus annus* plant seeds. Effects of different concentration level of plant extract on *Cucumus sativus* and *Heliantus annus* seed germination. In all plants, the highest reduction in plumule length observed in 10mg/1ml treatment. Similar study was done on *Calligonum polgonoides* by Khan *et al.* (2017).

Anti-Bacterial Activity: An Anti-microbial activity was performed by disc diffusion method. Aseptic Dextrose potato liquid nutrients medium for bacteria were prepared and poured in

autoclave Petri plate up to a depth of 4mm. Bacteria strains *(Stroptococcus byogenes, Salmonella typhi*) were swabbed on Petri plate after solidification of the media, four wells were cut in the agar layer of each Petri plate with an aluminum bore. In each well equal amount of DMSO, tetra cycline and 5mg/1ml, 10mg/1ml concentrations were added**,** the leaf extract with a concentration of (5mg/1ml, 10mg/1ml) dissolved in DMSO were added; wells of tetracycline used as a control while DMSO as a standard . The plates were incubated for twenty four hrs at 37^{o}C. The area of inhibition was measured in mm. Bacteria growth were compare with tetracycline, in which 5mm inhibition in surrounding area occur; in *Calligonum polygonoides,* extract of (5mg/1ml and 10mg/ml) inhibition were 5mm and 10mm.

Anti-fungal Activity: Anti-fungal activity was performed by the same process as used in antibacterial study but the different was only media. Dissolved 6.2g (SDA) in 100ml distilled water, autoclave the SDA media along with test tube and kept the media for 24 hrs to solidifying. Prepared the solution of terbinofine as a positive control while DMSO was added as a negative control, weight the terbinofine and prepared stock solution of the concentration (5mg/1ml, 1omg/1ml) further solution (200microgram/1ml) of the extract and terbinofine by dissolving in 800 microgram, after 24hrs poured the extract and terbinofine in to media (100 micro liter) to each test tube and applied the fungal strain of *Aspergillus fumigatus* and *Candida albicans.* After one week the result showed that the, *Calligonum polygonoides* extract inhibit the growth of fungi strain; terbinofine inhibit the growth of fungi while maximum growth occur in DMSO test tube.

Conclusion: In general**,** it was concluded that extract of *Calligonum polygonoides* inhibit the germination and seedling growth of *Cucumus sativus* and *Brassica oleracea Abelmoschu* due to its phytotoxic effect, the extract of this xeric plant have fruitful biological activities as compare

to antibiotic, this plant will be soon come to endangered condition due to more use of the local community and lose of its habitat.

Availability of data: We have included all relevant data in the manuscript that were collected during the field survey.

Authors' contributions: Khan and Sultan designed this study and Khan also performed the research; Rashid critically analysis article and approved as final manuscript.

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