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## ANTIMICROBIAL AND PHYTOTOXIC ACTIVITIES OF FEW IMPORTANT XERIC PLANTS

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### ABSTRACT

The present study was conducted to record and report the biological activities of four selected xerophytes species of District Bannu. Phytotoxic effect of *Calligonum polygonoides*, *Sueda fruticosa*, *Peganum harmala* (L.) and *Rosa brunonii* was conducted by the germination of *Cucumis sativus*, *Brassica oleracea*, *Helianthus annuus* and *Abelmoschus esculentus* similarly antibacterial and antifungal activities were also carried out in laboratory by using of various strains of bacteria and fungal such as *Bacillus subtilis* and *Escherichia coli*, *Aspergillus niger* and *Aspergillus flavus*. All of the selected plants have inhibitory effect on bacteria growth. In this study the effect of different concentration (.5mg/ml, 10mg/ml) of shade dry leaf methanol extract of *Calligonum polygonoides*, *Sueda fruticosa*, *Peganum harmala* (L.) and *Rosa brunonii* on various strains of bacteria and fungi were investigated. The results showed that the methanol extract of *Calligonum polygonoides*, *Rosa brunonii* and *Peganum harmala* (L.) inhibit the growth of bacteria and fungi just like antibiotic but *Sueda fruticosa* have little inhibitory effect on *Bacterial* and fungal strain. Maximum growths of bacteria and fungi were occurred at positive control Petri dish (DMSO); growth were not observe at Petri plate of Tetracycline and Terbinofine test tube. Growth of bacteria and fungi was not observe in higher concentration *Rosa brunonii* and *Calligonum polygonoides* on various strains of bacteria and fungi.

**Keywords:** *Calligonum*, *Rosa brunonii*, Antimicrobial, Phytotoxic

### INTRODUCTION

***Calligonum polygonoides*:** This is a common plant of sand dunes in Southern Baluchistan and Trans-Indus plains, also found in certain area of Pakistan (District Bannu). The wood is chiefly used as fuel. The flowers are also eaten in Sindh; *Calligonum polygonoides* plant is commonly known as phog, it is locally known as Bananza; a small much branched leafless, shrub found sandy soil xeric condition (Sharma, 2006). It is usually 4-6 feet but occasionally may reach up 10 feet in height with a girth of 1-2 ft. leave very scanty sessile, minute linear caduceus, 7-15mm long; linear spatulate; stipules very short membranous, obliquely amplexicaul; flowers pink pedicellate, pedicel 3-8 mm long, slightly accrescent in fruit; perianth 2mm long, 2-3 mm broad cleft about two-third the way down; segments 5, obovate, thin, membranous, red with broad white margin: stamen

12, filament swollen, hairy and connate at the base; fruit densely clothed with branched bristles with dilated often confluent bases. It produces root suckers and is easily propagated by cutting and layering flowering period from April-Jun. This tree is also name orta in old Arabic poems so large number of people agrees that origin of Aorta for great human artery. It is very hardy and being capable of growing under adverse condition of soil and moisture. The *Calligonum polygonoides* is a dominant perennial shrub in active sand dunes and stabilize sand fields in most desert area. *Calligonum* genus belongs to family Polygonaceae with some 80 species distributed throughout Western Asia, Southern Europe and North Africa (Tao *et al.*, 2000). *Calligonum* (L.) is an ancient genus of the arid desert flora of North Africa, Iran, Iraq, Pakistan, Russia, Turkey, Palestine and Syria. *Calligonum* (L.) has been playing an important role in the stability of the natural and planting vegetation ecosystems of the desert of the Tunisia. The species belonging to this genus have great potential and importance because of

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providing different products and services, such as forage, traditional medicines, arresting desert encroachment and stabilizing sand dunes (Ocak *et al.*, 2004).

***Peganum harmala (L.):*** *Peganum harmala* (L.) is densely foliate perennial (flesh) much branched plant which grow up to 0.8 m tall; root perennial, roots of the plant is very deep reach up to 3-4 m, if the soil is very arid region; stem and branches annual; leaves 5.0-7.5 cm much divided, lobes or segment linear, short-pointed; stipule bristle like; flowers white, 1.2-1.8 cm in diam., white, solitary radial, bisexual, sessile or stalked in the axil of branches, sepals 3-5, linear, short-pointed, persistent, usually longer than the petal; petals 3-5, oblong, nearly equal, soon falling off; stamen 12-15 yellow in color, broad below, some without anther; capsule 6-8 mm in diam. depressed above, lobed, splitting in to 3 valves; ovary superior, ovule many, style at the base or tip; fruit capsule (berry, drupe). Seed many angled. Flowers occur at October.

***Suaeda fruticosa:*** *Suaeda fruticosa* plant is commonly known as Thoman in District Bannu (KPK) Pakistan. In Pakistan, it is the most common halophytes and ecologically most adaptable species of the genus *Suaeda*. It covers vast stretches of salty alluvial flats with clayey or sandy soils subjected to episodic water logging, on drier sites and coastal belts. It is an evergreen small much branched succulent shrub growing to 1 m; stem pale, glabrous; leaf scars prominent, raised; leaves alternate, 5-15 mm by 1-3 mm, linear-oblong or ellipsoid, obtuse, fleshy, half terete, floral-leaves small, sessile; flowers minute bisexual, 1-3 mm in the leaf axils, forming terminal interrupted spikes, bracteates and 2-bracteolate; bracts and bracteoles 1 mm long, membranous; perianth less than 3 mm long, 5-lobed, subglobose; segment equal, obtuse, incurved, concave; stamen 5; filament short, anthers large; ovary ovoid; style absent; stigmas 2-5, usually 3; utricle small, membranous, included in the perianth. It is in leaf 12-Jan. Flower occur from Jul- October, and the seeds ripen from Aug to October; pollinated by Wind, self. The plant is self-fertile. The species is extremely polymorphic. Greatest variability is apparent in growth form (prostrate, erect, climbing), shape and size of leaves may be (linear and almost needle-like, short and broadly cylindrical, oblong to almost circular)

length of internodes is variable (1-8 mm), diameter and orientation of inflorescence axes (delicate to very robust, straight to zigzag), and number of flowers in the axillary clusters (3, 5 etc. up to more than 30) (Verma *et al.*, 2011)

***Rosa brunonii:*** *Rosa brunonii* is a deciduous, smooth, tall-climbing perennial shrub, covered with scattered hooked prickles; imparipinnate leaves 7.5-15 cm; leaflets 3-7, 2.5-7.5 cm, ovate, nearly equal, toothed, short pointed and arranged opposite one another; stipules united to the leaf-stalk, glandular, awl-shaped; flowers 3-8-5.0 cm in diam., yellowish-white, fragrant, in large, branched, velvety, not prickly, clusters; bracts awl-shaped; calyx small, ovoid, lobed 5, 1.2 cm, lanceolate, often pinnately divided; petals numerous several whorls, inserted at disc, large spreading, circular, ovate with broad tip; Stamen numerous and in several whorls, inserted at dic; carpel numerous with several whorls, style united; projected far beyond the calyx tube; fruit 8mm in diam., almost round, dark brown, consisting of many long hairy achenes. This plant bears flower in late spring, which possess musk (Badshah *et al.*, 2013).

#### MATERIALS AND METHODS

The present study was conducted during 2013-14. *Calligonum polygonoides*, *Suaeda fruticosa* and *Rosa brunonii* leaves were collected from different area of District Bannu in Khyber Pakhtunkhwa Pakistan. All the collected leaves were washed with distilled water to clean them from dust and other residues, the leaves were then dried under shade. The dried leaves were then crushed to powder form by electric Grinder. After that, leaf powder was soaked in 70% methanol for 72 hours at room temperature. The methanol extract was collected by use of Whatman filter No (Ahmad *et al.*, 2005). Methanol and water were evaporated while the selected plants extract was obtained. After extraction, stock solution of 5mg/ml and 10mg/1ml was prepared, further dilute concentration of (200µm/1ml) from stock solution for fungi were also prepared but the stock solution (5mg/1ml, 10mg/1ml) for bacterial was used, DMSO and Antibiotic (Tetracycline for Bacteria and terbinafine for Fungi) were used as standard and control treatment.

**Phytotoxic Activity:** Fresh leaves of the three selected plants, each (400 grams) were dried and grind to powder form by electric grinder; after that

plant powder was soaked in 70% methanol for 3 days (72 hours) at room temperature. The methanol extract of the selected plant were then filtered by use of method followed by Whatman filter No.1 [6]. The methanol solvents were evaporated while the pure dry extract of the selected plant were obtained. After evaporation the extract of the selected plant, stock solution of .5g/50ml or 10mg/1ml was prepared, the stock solution was further dilute up to (0mg/1ml, 5mg/1ml, 7mg/1ml, 10mg/1ml); distilled water was used as a control treatment. The seeds of *Cucumis sativus*, *Helianthus annus*, *Abelmoschus esculentus* and *Brassica oleracea* plants were selected for phototoxic research. There are four replication; three petri plates were in each replica. Three Petri plate were selected for each concentration; each concentration was 15ml, from the 15ml concentration 5ml were added to each petri plate of replica, 7seeds were grown in each petriplate, after drying of the blotter paper. Three petridish of 0mg/1ml concentration was used as control treatment. Annual cultivated plants i.e *Cucumis sativus*, *Brassica oleracea* (*Brassicaceae*) *Helianthu annus* (*Asteraceae*) and *Abelmoschus esculentus* (*Malvaceae*) were grown for this biological activity. Simple average of statistical data analysis was carried out in the result. Comparison of mean of the different concentration was carried out

**Phytotoxic Activity of *Calligonium poygonoides*:**

The treatment of 70% methanolic extract showed that there was a great significant different of control with 5mg/ml, 7mg/ml and 10mg/1ml in *Cucumis sativus* but 10mg/1ml showed significant different with control and 5mg/1ml ( $P < 50$ ). The significance difference was not observed between 5mg/1ml and 7mg/1ml. The results showed that leaf extract of *Calligonum polygonoides* reduced germination percentage in *Cucumis sativus* while percentage germination of *Cucumis sativus*, treatments at concentration of control, 5mg/1ml, 7mg/1ml and 10mg/1ml were, 100% 39.13%, 28.69% and 21.73%. In seed germination of *Brassica oleracea* significant difference of control with other treatments such as (5mg/1ml, 7mg/ml, and 10mg/ml) were not observed, germination percentage of seeds of *Brassica oleracea* at (10mg/ml) were 73.91%, while germination percentage of 7mg/1ml, 5mg/1ml and control were 73.91 %, 82.60 and 100%, respectively similarly the germination percentage of *Brassica oleracea* seeds at control were 100%. Therefore, the greatest and least inhibitory effect of leaf extract on percentage of seed germination was belonged to *Cucumis sativus* plant seeds. Effect of different concentration level of plant extract on *Cucumis sativus*, *Brassica oleracea* seed germination were shown in Figure 1 and 2.

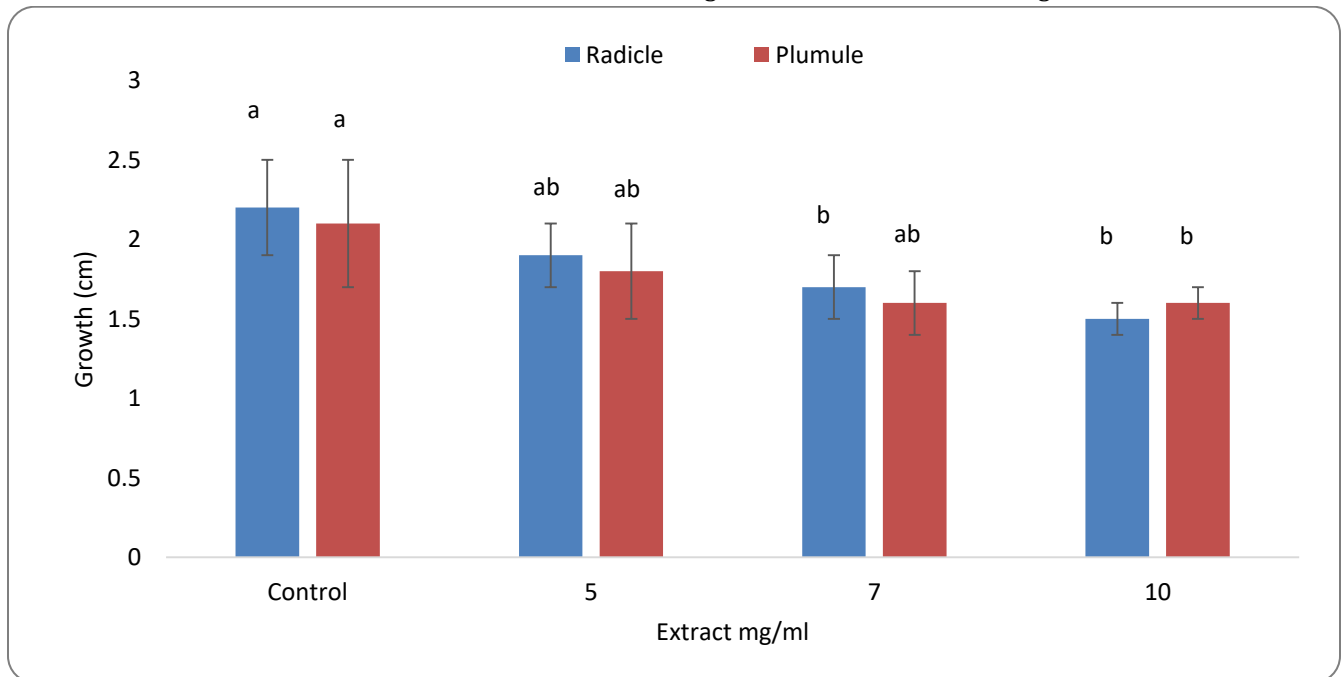


Figure 1. Effect of *Calligonium polygonoides* Extract on *Helianthus annus* Radicle and Plumule Growth. Letters shows significant difference among the treatments.

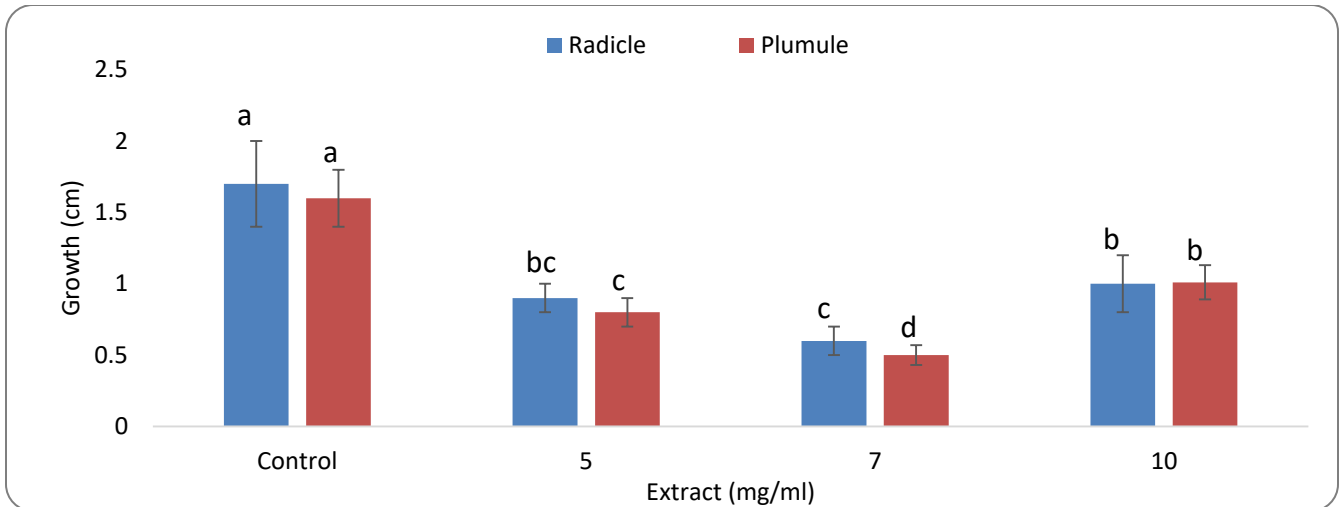


Figure 2. Effect of *Calligonium polygonoides* Extract on *Abelmoschus esculentus* Radicle and Plumule Growth. Letters shows significant difference among the treatments.

**Rosa brunonii:** The mean comparison of various concentration showed that there was no significant of control with 5mg/1ml in *Brassica oleracea* while the other two concentration (7mg/1ml and 10mg/1ml) showed significant different with control ( $P < 50$ ) similarly significant difference were also found between 5mg/1ml and 10mg/1ml ( $P < 50$ ). The results showed that increase of methanolic leaf extract concentration of *Rosa brunonii* reduced germination percentage in *Brassica oleracea*. In seed germination of *Abelmoschus esculentus* there was a significant different between control and other treatments ( $p < 0.05$ ) but there was no significant difference between (5mg/1ml) and (7mg/1ml) while significance different were also found between (5mg/1ml)

and (10mg/1ml). In the concentration of (10mg/1ml), germination percentage of cucumber was 10%, while germination percentage of (7mg/1ml, 5mg/1ml) and control were 30, 60 and 100%, respectively similarly the germination percentage of *Helianthus* seeds at control were 100% but at concentration of (5mg/1ml, 7mg/1ml, 10mg/1ml) were 30%, 25% and 20%. Therefore, the greatest percentage inhibitory effect was occur in cucumber but the least inhibitory effect of leaf extract on percentage of seed germination was reported in *Brassica oleracea* plant. Effect of different concentration level of *Rosa brunonii* plant extract on seed germination of *Brassica oleracea* and *Abelmoschus esculentus*, were shown in (Figure 3 and 4).

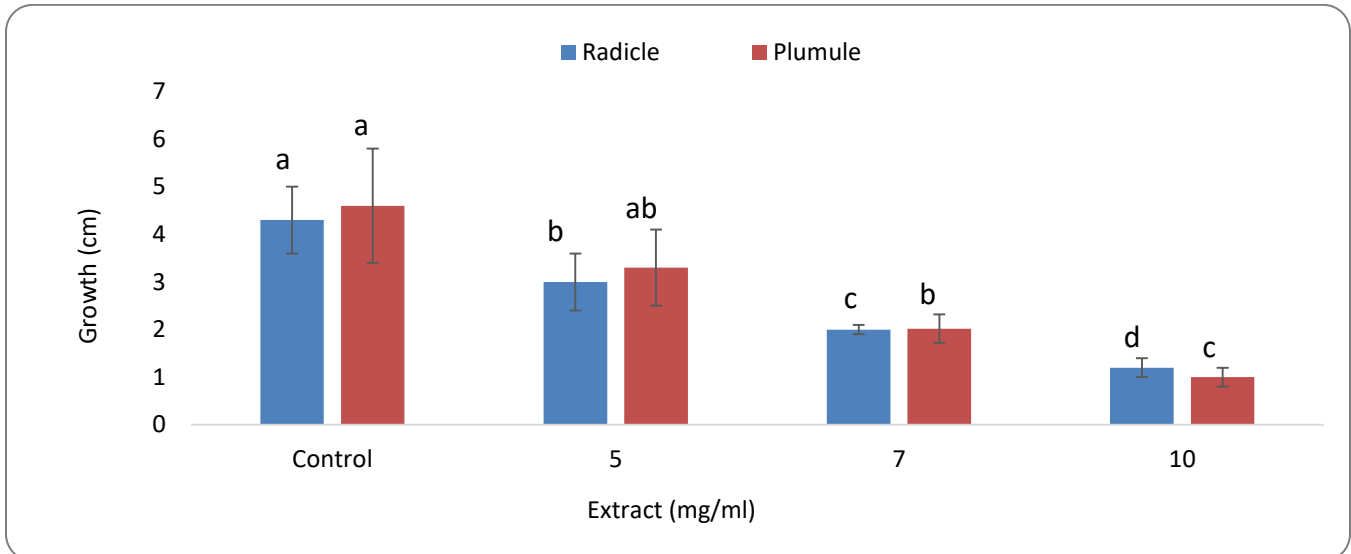


Figure 3. Effect of *Rosa brunonii* Extract on *Cucumis sativus* Radicle and Plumule Growth. Letters shows significant difference among the treatments.

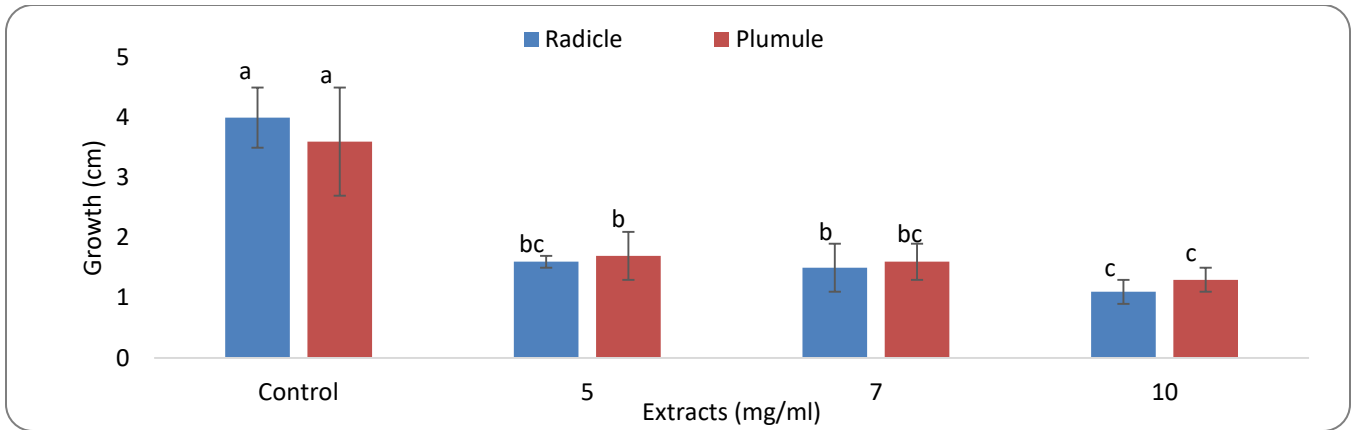


Figure 4. Effect of *Rosa brunonii* Extract on *Helianthus annuus* Radicle and Plumule Growth. Letters shows significant difference among the treatments.

**Phytotoxic activities of *Sueda fruticosa*:** The mean comparison result of the various concentration showed that significant difference occur between control and other concentration treatment such as (7mg/1ml and 10mg/1ml) on *Abelmoschus esculentus* and *Brassica oleracea* similarly 10mg/1ml concentration have significant different with control and 5mg/1ml ( $P < 50$ ) but significant different was not occur between (5mg/1ml and 7mg/1ml). These results showed that leaf 70% methanolic extract of *Sueda fruticosa* inhibit germination percentage in *Cucumis sativus*, *Helianthus annuus* plants. In *Cucumis sativus* there is no significant different between 7mg/1ml, and 10mg/1ml but significant different were occur among control, 5mg/1ml and 7mg/1ml on *Helianthus annuus* similarly significant different were also occur in the same amount of treatment in *Cucumis sativus*. In treatment of 10mg/1ml, germination percentage of seeds of *Cucumis sativus*, were 31.33%, while germination percentage

of 7mg/1ml, 5mg/1ml and control were 41.77 %, 65.27%, 100% ,respectively, the germination percentage of *Cucumis sativus* seeds at control were 100% while germination of *Helianthus annuus* treatments at concentration of control and other concentration (5mg/1ml, 7mg/1ml and 10mg/1ml) were, 100% 45.51%, % , 9.07% and 0%. Therefore, the greatest inhibitory and least inhibitory effect of leaf methanolic extracts of *Sueda fruticosa* on *Cucumis sativus*, *Helianthu annuus*. The inhebitory effect were maximum in seed germination of *Helianthu annuus* at concentration of 10mg/1ml which is 0% similarly least inhibitory effect of leaf extract on percentage of seed germination was belonged to *Cucumis sativus*, at concentration of 5mg/1ml is 65.27%. Effect of different concentration level of plant extract on *Cucumis sativus*, *Helianthu annuus*. Seed germination was shown in (Figure 5 and 6).

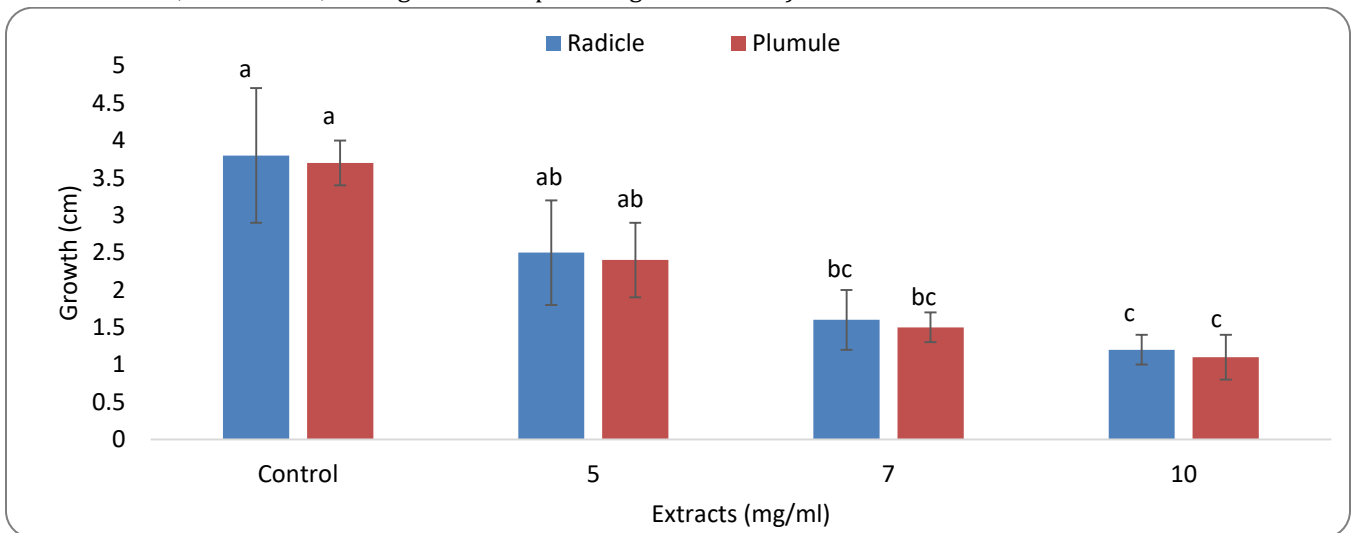


Figure 5. *Sueda fruticosa* Extract on *Abelmoschus esculentus* Radicle and Plumule Growth. Letters shows significant difference among the treatments.

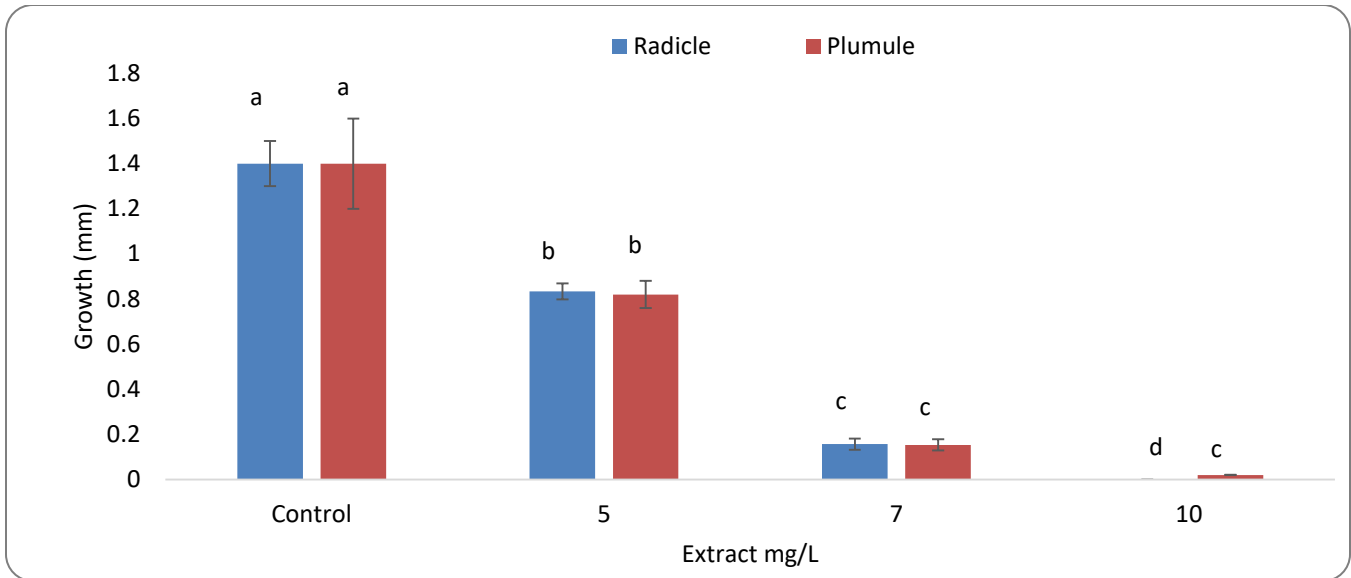


Figure 6. Effects of *Sueda fruticosa* extract on *Brassica oleracea* radicle and plumule Growth. Letters shows significant difference among the treatments.

**Anti-Bacterial Activity:** An Anti-bacterial activity was performed by using 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 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 (Antibiotic) and 5mg/1ml, 10mg/1ml concentrations were added, The leaf extract with a concentration of (5mg/1ml, 10mg/1ml) dissolved in DMSO than added; wells of tetracycline used as a control while DMSO as a standard. The plates were incubated for twenty four hrs at 37 °C. The area of inhibition and maximum inhibition was measured in mm. Bacteria growth were compare with tetracycline, where inhibition were 5mm in surrounding area; in *Calligonum polygonoides*, extract of (5mg/1ml) inhibition was for 5mm while in concentration of (10mg/1ml) the inhibition was up to 10mm while in case of *Sueda fruticosa* bacteria inhibition was up to 2-3mm and 3-4mm; in case of *Rosa brunonii* extract (5mg/1ml, 10mg/1ml) inhibition was up to 5mm and more than 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 6.2 g Sabouraud dextrose agar (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 terbinafine as a control while DMSO was added as a

standard, weight the terbinafine and prepared stock solution of the concentration(5mg/1ml, 10mg/1ml) further solution(200microgram/1ml) of the extract and terbinafine by dissolving in 800 microgram, After 24hrs poured the extract and terbinafine in to media (100 micro liter) to each test tube and applied the fungal strain of *Aspergillus fumigates* and *Candida albicans*. After one week the result showed that the , *Calligonum polygonoides* and *Rosa brunonii* extract have best inhibitory effect on the growth of fungi strain but *Sueda fruticosa* have less inhibitory effect on both species of fungi but the terbinafine inhibit the growth of fungi while maximum growth occur in DMSO test tube.

#### RESULTS

The present research was conducted to record and report the biological (phytotoxic, antibacterial and antifungal) activities of selected species of wild medicinal xerophytes of district Bannu.

**Phytotoxic Activity:** Phytotoxic activities of *Calligonum poygonoides* (polygonaceae), *Rosa brunonii* (Rosaceae) and *Sueda fruticosa* (Chenopodiaceae), 70% methanolic extract on germination of *Abelmoschus esculentus* (Malvaceae), *Helianthus annuus* (Asteraceae), *Cucumis sativus* (Cucurbitaceae) and *Brassica oleracea* (Brassicaceae). In the recent research study the phytotoxic effect of different concentration (0 mg/ml, 5mg/ml, 7mg/ml, 10mg/ml) of shaded dry leaf 70% methanol extract of *Calligonum polygonoides*, *Rosa brunonii*, and *Sueda fruticosa* on germination of *Abelmoschus esculentus*, *Helianthus annuus*, *Cucumis*

*sativus* and *Brassica oleracea* were studied. The results of this research study showed that the methanol extract gradually decreased the germination percentage, especially at higher concentration no germination and growth occur. The radicle and plumule germination and growth were different at different concentration. Maximum growths were occur at control petri dish; the growth become decreased as the concentration of extract increased; growth and germination become nil or minimum at higher concentration. It is also concluded that presence of methanolic extracts reduce or retard germination and growth in the field of *Abelmoschus esculentus*, *Helianthus annuus*, *Cucumis sativus* and *Brassica oleracea* plants.

**Percentage germination of *Calligonum poygonoides*:** The results showed that leaf extract of *Calligonum polygonoides* reduced germination percentage in *Abelmoschus esculentus* plants, while percentage germination of *Abelmoschus esculentus* treatments at concentration of control, 5mg/1ml, 7mg/1ml and 10mg/1ml were 100, 39.13, 28.69 and 21.73%. The germination percentage of seeds of *Helianthus annus* at (10mg/ml) were 73.91%, while germination percentage of 7mg/1ml, 5mg/1ml and control were 73.91, 82.60, 100%, respectively.

**Percentage of germination *Rosa brunonii*:** The results showed that increase of leaf methanolic extract concentration of *Rosa brunonii* reduced germination percentage and growth in cucumber plants. In the concentration of (10mg/1ml), germination percentage of seeds of cucumber were 10%, while germination percentage of (7mg/1ml, 5mg/1ml) and control were 30, 60 and 100%, respectively similarly the germination percentage of *Helianthus* seeds at control were 100% but at concentration of (5mg/1ml, 7mg/1ml, 10mg/1ml) were 30%, 25% and 20% .

**Percentage germination of *Sueda fruticosa*:** The results showed that 70% methanolic extract of *Sueda fruticosa* leaf inhibit germination percentage in *Abelmoschus esculentus* and *Brassica oleracea* plants. In treatment of 10mg/1ml, germination percentage of seeds of *Abelmoschus esculentus*, were 31.33%, while

germination percentage of 7, 5mg/1ml and control were 41.77, 65.27 and 100%, respectively, while germination of *Brassica oleracea* treatments at concentration of control and other concentration (5, 7 and 10mg/1ml) were, 100 45.51, 9.07 and 0%, respectively.

**(b) Anti-bacterial and Antifungal Activities:** The present result revealed the antibacterial activities of *Calligonum polygonoides*, *Rosa brunonii*, *Peganum harmala* (L.) and *Sueda fruticosa* extract against *Bacillus subtilis* and *Escherichia coli* similarly antifungal activities were also observed against two fungal strains (*Aspergillus niger* and *Aspergillus flavus*). The methanolic extract of these plants were especially effective as antibacterial and antifungal tools in the control of this strain of bacteria and fungi which protect us from illness and other undesirable microorganisms. The result also showed that the inhibitory value also change with change of concentrations. Effect of different concentration level of *Calligonum polygonoides* and *Sueda fruticosa* plants extract on Bacteria and Fungi were shown in Table (1-11). Application of leaf extract of *Calligonum polygonoides*, *Rosa brunonii*, *Peganum harmala* (L.) and *Sueda fruticosa* methanolic reduced or inhibit the growth of bacterial strain (*Bacillus subtilis* and *E. coli*) and Fungi strains (*Aspergillus niger* and *Aspergillus flavus*) which were shown in (Table 1-11). The result showed that methanol extract of dried leaves of *Calligonum polygonoides* had inhibitory effect on Bacteria strain and Fungi strains similar results also shown by methanolic extract of *Rosa brunonii*. The present result of *Peganum harmala* (L.) revealed the antibacterial activities of plant extract against this two strains of Bacteria (*Bacillus subtilis* and *Escherichia coli*) and also have antifungal activities against two fungal strains (*Aspergillus niger* and *Aspergillus flavus*), the result also show that methanolic extract of *Sueda fruticosa* have poor effect on Bacterial (*Bacillus subtilis* and *E.colli*) and Fungal strains (*Aspergillus niger* and *A. flavon*).

Table 1. Important Medicinal Xeric Plants Selected for Biological Activities

S.No.	Botanical name	Family	Local name
1	<i>Calligonum polygonoides</i>	Polygonaceae	Banza
2	<i>Peganum harmala</i> (L.)	Zygophyllaceae	Spelanii
3	<i>Rosa brunonii</i> ,	Rosaceae	Jangi gulap
4	<i>Sueda fruticosa</i>	Chenopodiaceae	Thomoon

Table 2. Important Plants on Which Phytotoxic Activities are conducted

S.No.	Botanical name	Family	Local name
1	<i>Abelmoschus esculentus</i>	Malvaceae	Bandi
2	<i>Brassica oleracea</i>	Brassicaceae	Molli
3	<i>Cucumis sativus</i>	Cucurbitaceae	Kadoo
4	<i>Helianthus annus</i>	Asteraceae	Sun flower

Table 3. Bacterial and Fungal Strains used in the Experiments

S.No	Bacterial Strains	Code number
1	<i>Bacillus subtilis</i>	ATCC No.2063
2	<i>Escherichia coli</i>	ATCC No.25922
Fungal Strains		
1	<i>Aspergillus niger</i>	ATCC No.545
2	<i>Aspergillus flavos</i>	ATCC No.610

Table 4. Anti-Bacterial (mm) Effect of *Calligonum polygonoides* Extract on Bacteria Strains

Bacteria Strain	Extract Concentration		DMSO	Tetracycline
	10mg/1ml	5mg/1ml		
<i>Bacillus subtilis</i>	8.1± 0.5	4.5±0.7	0.0±0.0	8.01±0.6
<i>Escherichia coli</i>	7.1±0.	3.5±0.3	0.0±0.0	7.01±0.5

Table 5. Anti-Bacterial Effect of *Sueda fruticosa* Extract

Bacteria Strain	Extract Concentration.		DMSO	Tetracycline
	10mg/1ml	5mg/1ml		
<i>Bacillus subtilis</i>	3.4±0.5	2.3±0.2	0.0±0.4	4.5±0.2
<i>Escherichiacolli</i>	3.1±0.3	1.3±0.5	0.0±0.3	7.5±0.5

Table 6. Anti-Bacterial Effect of *Rosa brunonii* Extract on Bacteria Strains

Bacteria Strain	Extract Concentration.		DMSO	Tetracycline
	10mg/1ml	5mg/1ml		
<i>Bacillus subtilis</i>	9.0±0.7	6.5±0.3	0.0±0.0	9.01±0.8
<i>Escherichia coli</i>	8.5±0.9	6.0±0.6	0.0±0.0	8.04±0.4

Table 7. Anti-Bacterial Effect of *Peganum harmala* (L.) Extracts on Bacteria Strains

Bacteria Strain	Extract Concentration.		DMSO	Tetracycline
	10mg/1ml	5mg/1ml		
<i>Bacillus subtilis</i>	10.0±1.3	5.0±0.6	0.0±0.0	10.01±0.8
<i>Escherichia coli</i>	10.0±1.1	5.0±0.4	0.0±0.0	10.02±0.5

Table 8. Anti-Fungal Effect of *Calligonum polygonoides* Extract on Strains of Fungi

Fungal strain	Extract concentration.200ug/1ml	DMSO.200ug/ml	Terbinafine.200ug/1ml
<i>Aspergillus niger</i>	11.0±0.5	0.0±0.4	9.0±0.2
<i>Aspergillus flavos</i>	12.5±0.8	0.0±0.7	9.0±0.6

Table 9. Anti-Fungal Effect of *Sueda fruticosa* Extract on Strains of Fungi

Fungal strain	Extract concentration.200ug/1ml	DMSO.200ug/ml	Terbinafine.200ug/1ml
<i>Aspergillus niger</i>	3.5±0.3	0.0±0.0	9.0±0.3
<i>Aspergillus flavos</i>	3.4±0.5	0.0±0.0	8.0±0.5

Table 10. Anti-Fungal Effect of *Peganum Harmala* (L.) Extract on Strains of Fungi

Fungal strain	Extract concentration.200ug/1ml	DMSO.200ug/ml	Terbinafine.200ug/1ml
<i>Aspergillus niger</i>	8.5±0.7	0.0±0.0	9.0±0.7
<i>Aspergillus flavos</i>	7.5±0.9	0.0±0.0	9.02±0.8

Table 11. Anti-Fungal Effect of *Rosa brunonii* Extract

Fungal strain	Extract concentration.200ug/1ml	DMSO.200ug/ml	Terbinafine.200ug/1ml
<i>Aspergillus niger</i>	3.5±0.1	0.0±0.0	8.5±0.5
<i>Aspergillus flavos</i>	2.5±0.3	0.0±0.0	9.0±0.3



## DISCUSSION

In ancient times, plants have been considering the source of drugs. Different plant extracts from folk medicinal plants have been tested to identify the source drugs. Ahmad *et al.*, (2005) reports that natural products of plant extract which may be either pure compound or standardized extract provide us a lot of opportunities for discoveries of new drugs. Garg *et al.*, (2011) reported the medicinal important of plant is due the presence different chemicals such as flavonoids, alkaloids, terpenoids and tannins, major function of steroids are to salt balance in plant body, control of metabolism as well as function and improvement of sexual organs. The present research revealed the antibacterial and antifungal activities of *Calligonum polygonoides*, *Peganum harmala* (L.), *Sueda frutiicosa* and *Rosa brunonii* extract against bacteria and fungi. The methanolic extract of these plants were especially effective as antibacterial tools in the control of such strain of bacteria which protect us from illness and other undesirable microorganism. The result showed that the inhibitory value change with change of concentrations. Effect of different concentration level of *Calligonum polygonoides*, *Peganum harmala* (L.), *Sueda fruticosa*, *Rosa brunonii* plants extract on Bacteria and Fungi were shown in (4-11). Application of leaf extract of *Calligonum polygonoide* reduced or inhibit the growth of bacterial strain (*Bacillus subtilis* and *E. coli*) and Fungi strains (*Aspergillus niger* and *A. flavon*) which were shown in (Table 1-11). The result showed that methanol extract of dried leaves of *polygonoidesmethanolic* had inhibitory effect on Bacteria strain and Fungi strains but the result also show that methanolic extract of *Sueda fruticosa* plant have less effect on Bacterial (*Bacillus subtilis* and *E. coli*) and Fungal Strains(*Aspergillus niger* and *A. flavon*). Our results were similar to report of Mateen *et al.*, (2011) studied plants inhibitory effect against bacterial strains were found. Similarly, Bauer and Staden (2006) studied the Antibacterial and Antifungal activity of many medicinal plants used venereal disease. Zain *et al.*, (2012) studied the antimicrobial activities of Saudi Arabian desert plants. In this study, *Alhagimaaurorum* Medic, *Chenopodium murale* (L.), *Tamarix aphylla* L.(Karst) showed significant antimicrobial activities against Gram negative and Gram positive bacteria, all the investigated plants extracts showed antifungal activities against *Aspergillus fumigatus*, *A.flavus* and *Penicillium chrysogenum*. Saini *et al.*, (2008) reported comparative

pharmacognostical and antimicrobial studies of *Acacia* species (Mimosaceae), in this exploration, a total of five species (*Acacia nilotica*, *A. tortilis*, *A. Senegal*, *A. catechu*, *A. jacquemontill*) were undertaken for ethnomedicinal and antimicrobial screening. During antimicrobial experiment *A. catechu* and *A. nilotica* showed highest inhibition against bacterial and fungal species. Kensa and Yasmin (2011) reported the phytochemical Screening and Anti-microbial activities of *Ricinus communis* (L.) In this study the *Ricinus communis* showed good inhibitory effect against the bacterial strains, the acetone and hexane extract of *Ricinuscommunis* have a good zone of inhibition while the ethanolic extract have antibacterial activity only at higher concentration. Sajid *et al.*, (2011) studied the phytochemical Screening and antimicrobial activity of *Fagonia cretica* plant extracts against *Staphylococcus aureus*, *Escheria coli*, *Pseudomonas aeruginosa*, *Bacillus subtilis*, *Staphylococcus epidermidis*. Shah *et al.*, (2015) studied *Cornus maccrophylla*, which have significant activity against the tested plant Lemna minor at different concentrations (10, 100, 10000 ug/ml). Ali *et al.*, (2015) investigated the antimicrobial activities of different solvents. Analysis of the data revealed that all the five extract from flower of *Plumeria obtusa* showed different ranges of anti-microbial activities. Rama and Vasantha (2012) reported phytochemical activities of chloroform,acetone and methanolic extracts of *Calotropis procera* flower against various pathogens. Sameera and Mandini (2015) investigated the antibacterial activities of *Ziziphus maritiana* Lam and *Ziziphus xylopyra* (Retz.) wild. *Ziziphus* species possess bioactive compound which are used as traditional medicine, present work aims to evaluate the anti-microbial activities [18]. Weeds are harmful to crops due to several factors such as competition for space, light and nutrients, organic chemicals are also from weeds to soil which effects growth of crops, *Cyperus rotundus* L. have Phytotoxic effect on *Eleusine coracanta* Gaerta. Hass *et al.*, (2007) study the effect of *Calotropis procera* leave on seed germination of some plants, the effect of dry leaf extraction of *Calotropis procera* plant on germination of Barely( *Hordeum vulgare* L.), Wheat (*Triticum aestivum* L.), Cucumber(*Cucumis satires* L.), Fengreek (*Trgonella foenum graecum* L.), and Allssana (*Alssana occidentalis* L.) was tested, the result showed that the germination delayed at higher concentration and the germination percentage decreased by increase

leaf extract concentration (Sharma *et al.*, 2011). Flavonoid from leaf extract of *Pongamia pinnata* and leaf and seed extract of *Vitex negundo* were screened against *Bacillus cereus*, *Escherichia coli*, *Mycobacterium smegmatis*, *Proteus vulgaris*, *Pseudomonas aeruginosa* and some other species of bacteria, result compared with some of inhibition produced by commercially available standard antibiotic. Bayoub *et al.*, (2010) search for substances which possess microbial activities, medicinal plants have been considered by some researcher which are frequently used in medicine for some infectious disease. The aim of the present study to verify the antimicrobial activity of ethanolic extract of the collected 13 plants, the result showed that the antimicrobial activities of plants are due to their chemical composition. Ayesha *et al.* (2011) studied the evaluation of anti-bacterial activities of *Cuscuta reflexa* and *Abutilon indicum*. Both mentioned plants species have antibacterial activities, concentration of the extract increase, inhibition increase. Syahmi *et al.*, (2010) studied the phytotoxic effect (Inhibitory effect) of *Calotropis procera* extract on germination, growth and seedling vigor of wheat. Yasin *et al.*, (2012) described that in ancient times, plants have been considering the source of drugs. Different plant extracts from folk medicinal plants have been tested to identify the source drugs; natural products of plant extract which may be either pure compound or standardized extract provide us a lot of opportunities for discoveries of new drugs (Tanveer *et al.*, 2010). The aqueous extract of *Euphorbia helioscopia* L. inhibits the germination percentage, seedling emergence and seedling vigor index in wheat, chickpea and lentil crops. Depend upon treatment and treatment mode (TxM) interactions, the minimum germination percentage (7.0%) were observed. Zain *et al.*, (2012) showed that the Saudi Arabian desert plants such as *Alhagi maurorum* Medic, *Chenopodium murale*, *Tamarix aphylla* L. (Karst) had significant antimicrobial activities against Gram negative and Gram positive bacteria. All the investigated plants extracts showed antifungal activities against *Aspergillus fumigates*, *A. flavus* and *Penicillium chrysogenum*. Ahmad *et al.*, (2005) showed that plants have been considering the source of drugs. Different plant extracts from folk medicinal plants have been tested to identify the source drugs; natural products of plant extract which may be either pure compound or standardized extract provide us a lot of opportunities for discoveries of new drugs. The result showed that

methanol extract of dried leaves of *Calligonum polygonoides*, *Rosa brunonii* and *Pegnum harmala* had inhibitory effect on Bacteria strain and Fungi strains but the result also show that methanolic extract of *Sueda fruticosa* plant have less effect on Bacterial (*Bacillus subtilis* and *Escherichia coli*) and Fungal strains (*Aspergillus niger* and *Aspergillus flavus*). Hemalatha *et al.*, (2013) Plant derived drugs have been an important source of various diseases, now a day's plant derived compound have received a considerable attention due to their pharmacological properties such as cytotoxic and anticancer effect. *Amaranthus viridis* is a medicinal plant which has some ethno pharmacological activities which has been discussed in this research. The result of this study was act as a basis for proper collection, identification and investigation of plant; these types of parameters which are reported could be useful in the preparation of herbal medicine in Pakistani pharmacopoeia. The aqueous extract of *Euphorbia helioscopia* L. inhibits the germination percentage, seedling emergence and seedling vigor index in wheat, chickpea and lentil crops. Depend upon treatment and treatment mode (TxM) interactions, the minimum germination percentage (7.0%) were observed

#### CONCLUSION

It was concluded that methanolic extract of *Calligonum polygonoides*, *Sueda fruticosa* and *Rosa brunonii* inhibit growth of Bacteria (*Bacillus subtilis* and *E. coli*) and Fungi Strains (*Aspergillus niger* and *A. flavus*) but *Sueda fruticosa* inhibition is less but the inhibitory effect of *Calligonum polygonoides* and *Rosa brunonii* was very strong.

#### REFERENCES

- Ahmad, M. M., M. A. Khan, and M. Zafar. 2005. Ethnobotanical Approaches for the treatment of diabetes by the local inhabitants of District Attock, Department of Botany, Arid University Rawalpindi, Pakistan.
- Ali, N., D. Ahmad, and J. Bakht. 2015. Antimicrobial activities of different solvent extracted sample from flower of medicinally important *Plumeria obtusa*.
- Al-Zahrani, H. S. and S. Al-Robai. 2007. Allelopathic effect of *Calotropis procera* leaves extract on seed germination of some plants. JKAU: Sci. 19: 115-126.
- Ayesha, M., Z. Khan, M. Ahmed, and M. Kashmiri. 2010. Chemotaxonomic value of Alkaloids in *Solanum nigrum* complex. Pak. J. Bot., 42(1): 653-660.

- Badshah, L., F. Hussain, and Z. Sher. 2013. Floristic inventory, ecological characteristic and Biological spectrum of rangeland, District Tank, Pakistan. Pak. J. Bot. 45(4): 1159-68.
- Bayoub, K., T. Baibai, D. Mountassif, A. Retmane and A. Soukri. 2010. Antibacterial activities of the crude ethanol extracts of medicinal plants against *Listeria monocytogenes* and some other pathogenic strains. Afr. J. Biotechnol. 9(27): 4251-4258.
- Garg, P., D. Gandhi, P. K. Pharmacognostic, A. Pandey, and V. J. Pharmacognostic. 2011. Phytochemical Evaluation of Stem of *Capparis decidua* (Forsk) Edgew. Ind. J. Nov. Drug del. 3(1): 3529-3536.
- Hemalatha, S., S. A. Allayie, and C. Elanchezian. 2013. Preliminary assessment of cytotoxic, effect of Naringi. Ameri. J. Phytopatho. 3: 21-29.
- Kensa, V. M. and S. S. Yasmin. 2011. The Phytochemical Screening and Anti-bacterial Activities on *Ricinus communis* L. 1(9): 167-173.
- Khan, M., S. Musharaf, M. Ibrar, and F. Hussain. 2011. Pharmacognostic evaluation of the *Amaranthus viridis* L. Res. in Pharma. Biotechnol. 3(1): 11-16.
- Mateen, A., K. Suresh, and P. Ahmed. 2011. Evaluation of Anti-bacterial activities of *Cuscuta reflexa* and *Abutilon indicum*. Int. J. Ph. Bio. Sci. 2(1): 0975-6299.
- Ocak, A., S. Alan, and E. Ataslar. 2004. Studied the morphological, anatomical and ecological Study on *Tulipa armena* Boiss. Var. *lycica*(Baker) Marais (Liliaceae). Turk. J. Bot. 1(1): 21-29.
- Ramaprabha, M. and K. Vasantha. 2012. Phytochemical and antibacterial activity of *Calotropis procera* (Ait.) R. Br. flowers. Int. j. Pha. Biol. 3(1): 1-6.
- Syahmi, A. R., M. S. Vijayarathna, S. Sasidharan, L. Latha, Y. P. Kwan, Y. L. Lau, and Y. Chen. 2010. Acute oral toxicity and brine shrimp lethality of *Elaeis guineensis* Jacq. (oil palm leaf) methanol extract. Molecules. 15(11): 8111-8121.
- Sameera, N. S. and B. P. Mandakini (2015). Investigations in to the antibacterial activity of *Ziziphus mauritiana* Lam. and *Ziziphus xylopyra* (Retz.) Willd. Intern. Food Res. J. 22(2): 849-853.
- Sharma, P. D. 2006. Ecology and environment, text book. formerly professor of botany, environmental microbiology and plant pathology Lab: University of Delhi. Delhi.
- Sharma, Veena, Pracheta, Paliwal R, Singh, Lokendra, Sharma, Vinay, and S.H. Sharma. (2011). Anticarcinogenic potential of *Euphorbia neriifolia* leaves against N-nitrosodiethylamine-induced nephrotoxicity in mice. J. Biochem. Cell Arch. 11(2): 393-398.
- Shah, H. S. M., S. M. M. Shah, Z. Ahmad, M. Yasen, R. Shah, A. Sadiq, S. Khan, and B. Khan. 2015. Phytochemical, in vitro antioxidant, total phenolic and phytotoxic activity of *Cornus macrophylla* Wall bark collected from the North-west of Pakistan.
- Sajid, B., E. Alia, K. Rizwana, S. Uzm, Alamgeer, and M. I. Hafiz. 2011. Phytochemical Screening and Antimicrobial activities of *Fagonia cretica* plant extracts against selected microbes. J. of phar. Res. 4(4): 962-63.
- Saini, M. L., R. Saini, S. Roy, and A. Kumar. 2008. Comparative Pharmacognostical and Antimicrobial, Studies of *Acacia* species (Mimosaceae). J. of Med. Pl. Research. 2(12): 378-386.
- Tanveer, A., A. Rehman, M. M. Javaid, R. N. Abbas, M. Sitan, A. U. H. Ahmad, M. S. Ibin-i- zamir, K. M. Chaudhary, and A. Aziz. 2010. Allelopathic potential of *Euphorbia helioscopia* L. against wheat (*Triticum aestivum* L.), chickpea (*Cicer arietinum* L.) and lentil (*Lens culinaris* Medic.). Turk. J. of Agric. 34(1): 75-81.
- Tao, L., J. Ren, Liu. 2000. Study on water-absorbing model of two *Calligonoum* species seeds. J. of Arid. land Res. Envi. 14(1): 89-91.
- Verma, P. D., R. D. Dangar, K. N. Shah, D. M. Gandhi, and B. N. Suhagia. 2011. Pharmacognostical Potential of *Capparis deciduas* (Edgew.). J. Appl. Phar. Sci. 1 (10): 06-11.
- Yasin, M., E. Safdar, and Z. Iqbal. 2012. The Phytotoxic effect of *Calotropis procera* extraction on germination and seeding vigor of wheat. Pak. J. of Weed Sci. Res. 18(3): 379-92.
- Zain, M. E., A. S. Awaad, M. R. Al-Quthman, R. M. El-Meligy. 2012. Antimicrobial Activities of Saudi Arabian Desert Plants, Phytopathol. 2(1): 106-113.