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Evaluated Allelopathic Potential of *Phragmites Australis L., Typha domensis L. Cenchrus ciliaris L.* plants extracts against Flowering Growth Parameters of *Oryza sativa L.*

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ABSTRACT

An experiment was conducted to evaluate the allelopathic potential of aqueous extract of *Phragmites australis* L., *Typha domensis L. Cenchrus ciliaris L.* plants in rice (*Oryza sativa L.*) cultivar flowering growth parameters. Extraction was done by cold water (at room temperature) and boiling water and prepared concentrations of (30%, 60%, 80% and 100%) as well as the control treatment (distilled water) aqueous extracts boiled water extracts of *Phragmites australis L., Typha domensis L. Cenchrus ciliaris L.*plants were increased in all flowering studied parameters, *Typha domensis L.* boiled water leaf extract gave the highest values for, flowering and productivity parameters compared to the other leaf extracts .It was noticed that growth parameters showed increased inhibition with increase in the concentration of all leaf extracts expect for 30% of. *Typha domensis L.* leaf extract by boiled water which increased the flowering parameters which was reflected in an increase in the productivity by 14.5% compared to the control. The results, revealed also that the treatment with the extracts of leaves affected in protein content of Oryza *sativa L*

KEY WORDS: allelopathy, rice (*Oryza sativa*), Phenolic acids, allelochemical, *Phragmites australis L., Typha domensis L, Cenchrus ciliaris L.*

1. INTRODUTION

The phenomenon allelopathy Greek word consisting of two syllables the first allelon means the mutual and the second pathos means harmful, and thus Aallelopathy means mutual harm, and Aallelopathy phenomenon of environmental occur existence of chemical compounds allelochemicals produced by the plant released to the environment o affect in the growth 0f plants between stimulation and inhibition the neighboring plants for him. The Molish is the first to term in 1937 allelopathy, and pointed him to the all biochemical interactions between stimulating or inhibition species of plants, including the microbiology (Rice, 1984). In 1974, the Rice Scientist he Definition of allelopathy that any direct harmful effect or indirectly for a specific plant in another plant, including microbiology through the production of chemical compounds released to the environment (Rice, 1974), then returned to refer again to the allelopathy means any direct or indirect harmful or beneficial effects for a particular plant, including the microbiology in the last plant through the production of chemical compounds is released into the environment (Wickens, 2001; Rice, 1984). Because of the importance of this subject and wider in recent years, benefitting from objects other than plants allelopathy neighborhoods microscopic, it was decided at the first World Congress of allelopathy which took place in Spain in 1996, the development of the definition allelopathy to include any process that includes in particular the secondary metabolites produced from plants and microbiology, viruses and fungi that affect biological system (Torres, 1996). They include chemical compounds called allelochemical including phenolic compounds and alkaloids and amino acids non-protein and steroids and other (Khan, 2015). Abdulrab (2016), was concluded that sorghum water extract sprayed at 1:3 significantly reduced weeds density, fresh and dry weeds weight and increased grains per spike, spike length and grain yield of wheat. Allelopathy effected by different mechanisms from direct and indirect mechanisms, and include mechanisms indirect, changes in soil properties, nutritional status, and changes in efficacy or microscopic harmful to developing neighborhoods communities in the soil. Direct mechanisms include the effects allelopathy compounds in various metabolic processes such as the impact on cellular structures, synthesis 0f hormones, and the cell membranes and permeability, and close the stomata and open, and construction of plant pigments, and photosynthesis Photosynthesis and biosynthesis 0f protein, respiration and synthesis 0f Leghaemoglobin, nitrogen fixation, the action of enzymes, tissue Close, relationship of the water plant, ions uptake and genetic material (Wickens, 2001; Rizvi, 1992). Toxic allelopathic compounds which released to the environment and effected in all growth parameters of different plants including flowering growth indicators have been supported by (Singh, 2005). Some crope and weed plants are able to release some exudates into the environment, suppressing the growth of plants of their own kind, other plants or weeds, this is called the allelopathic effect (Narwall and Willis, 2006). Scientists have stated that the growth of some plant species may be affected due to the allelopathic potential of different weed and crop plants (Rice, 1984). Thus the aim objective of the present study was to assess the allelopathic potential effects of *Phragmites australis* L., *Typha domensis L, Cenchrus ciliaris L.* in rice plants (*Oryza sativa L.*) cultivar flowering growth parameters.

2. MATERAL AND METHODS

Collection and diagnosis of samples: Plants collected under test contain of rice fields on the (papyrus) *Phragmites australis* L.,(reeds) *Typha domensis L, Cenchrus ciliaris L*. plants leaves, which leaves extracts will be used to study the evaluated allelopathic Potentials against rice plant and then cleaned and dried electric oven type (ELE), temperature (65) m. Then grind each plant sample separately by) electric grinder warring blander) and then sift the powder diameter sieve openings of 0.2 mm and save powder in paper bags until use. Seeds of rice collected from the Rice Research Station in MIshkhab. All sterilized seeds used textured chloride mercury concentration of 0.1% for ten minutes and then were washed distilled water. Local Rice (Oryza sativa L.cv. Amber 33) was used as a test cultivar.

The method of preparation of water extracts: Preparation of water extracts of *Phragmites australis* L., *Typha domensis L Cenchrus ciliaris L*. plants leaves. Plants leaves by the way (Bhatt, 1997). Dried pieces of thes plants, leaves were separated, weighed, and immersed in tap water at a ratio of 1:20 (w/v) at room temperature for 24 h. The water extracts of the Phragmites *australis L., Typha domensis L*, plants leaves obtained by filtering through 10 and 60-mesh sieves. The water extracts were individually bottled and tagged .Rice (Oryza staiva L.), plants were used to test the effect of allelopathic water extracts of *Phragmites australis L., Typhadomensis L, Cenchrus ciliaris L*. on flowering growth parameters.

Boiled aqueous extract. Aqueous extract of boiled leaves of plants attended steps using the previous method, by replacing the cold water boiled: field experiment was carried out in the rice research station in Mashkhab of the Center for IPA of Agricultural Research for the period from 15/6/2013 - 15/11/2002 in order to study the effect of water extracts of *Phragmites australis* L., *Typha domensis L, Cenchrus ciliaris L*. plants leaves It was selected area of the field with an area of 1440m and divided into panels divided into small plates 2 × 2 m², panels separated from each other's by lines width of 30 cm and has been initialized. Study the allelopathic effects of leaves water extracts *Phragmites australis* L *Typha domensis L. Cenchrus ciliaris L*. plants in rice (*Oryza sativa* L.) cultivar flowering growth parameters.

Concentrations splayed in (0, 30, 60, 80, 100) % prepared in addition to control sample (distilled water) and cold boiled extract of the leaves of plants to rice plants seedlings with a small hand sprayer at the beginning of the forest stage continued spraying process per week to the flowering stage and the beginning of the exit of spikes in this stage stopped the spraying process.

Studied flowering growth parameters: dry Weight for seeds, rate spike length (The rate of spike collected twenty-five spike and dried in to the oven), dry weight/spike. Weight, Productivity calculated. Then productivity is calculated after the harvest of one square meter and measured the weight of the .Seeds output of each repeater and then converted to kg / acre.Study the allelopathic effects of leaves water extracts *Phragmites australis L., Typha domensis L, Cenchrus ciliaris* L. plants in rice (*Oryza sativa L*.) cultivar protein content.

Took rice resulting from the treatment plant extracts plant leaves in concentrations (100 and 30) % in addition to the control and treatment of finely crushed. It estimated the total nitrogen for seeds way macro-Kjeldahl as stated in (Chapman and Pratt, 1961) has estimated the percentage of protein in the seeds concentrations of each transaction selected by multiplying the total amount of nitrogen for seeds in hard (6.25).

Statistical Analysis: The study experiments carried out in (Factorial experiment with completely randomized design). Results were analyzed using analysis of variance were then compared the differences between the use of averages less significant difference Least Significant Difference test L.S.D at the level of 0.05 (AL-rawi and Khalaf Allah, 1980)

3. RESULTS AND DISCUSION

Effect of aqueous extracts the *Phragmites australis, Typha domensis L., Cenchrus ciliaris L*. plants on the length of the spike of rice plants: The results in the table.1: the effect of the triple interaction between the extraction method and plants Species extract and concentrations in the length of the spike, increased significantly the boiled aqueous extract of the *Typha domensis* L .plants concentration of 30% by giving a higher value to the length of spikes compared with the control treatment, reaching (10.7, 10.5 cm), Respectively and the concentration of 60% boiled aqueous extract *Typha domensisL*. plants not significantly for the control treatment differs as it was (10.0 cm) and the results showed a decrease significantly in the rates of the length of spikes increase concentrations of all treatment, recorded the treatment of *Cenchrus ciliaris L*. cold aqueous extracts cold in concentration of 100% shorter length of spikes compared with the control treatment (4.9, 10.6) cm, respectively.

Table.1. Allelopathic effect of aqueous extracts the tested plants leaves rate length of the spike (cm) of rice plant

Extraction methods	**Cold water**			**Boiled water**		
Species of plants Concn. (%)	*Cenchrus*	*Typha*	*Phragmites*	*Cenchrus*	*Typha*	*Phragmites*
0	10.6	10.5	10.8	10.6	10.5	10.8
30	5.8	9	8.4	7.8	10.7	9.1
60	5.4	8.3	8.3	7.6	10.0	9.0
80	5.2	8.0	7.6	6.8	9.6	8.0
100	4.9	7.6	6.4	6.6	7.4	7.0
Average	4.66	8.7	8.3	7.9	9.9	8.8

L.S.D 0.05 =0.7

Effect of aqueous extracts the *Phragmites australis L., Typhadomensis L. Cenchrus ciliaris* L. Plants leaves on the average dry weight gm./ spike of the f rice plants: The results in table.2, refer to the effect of the triple interaction between the method of extraction plants *Phragmites australis* L., *Typha domensis L .Cenchrus ciliaris L.* and concentrations in the rate of dry weight of spikes. The results showed that the extract knew boiled *Typha domensis L.* in concentration of 30% was significantly higher than by giving it the highest rate of dry weight of spikes was (2.60 g) for the control treatment that gave (2.57 g) and a decrease to (2.04 g) at a concentration of 100% for the same treatment. And the lowest rate for the dry weight of spikes appeared in the treatment of *Cenchru sciliaris* L. boiled aqueous extract (0.9 g) in concentrations100%.

Table.2. Allelopathic effect for aqueous extracts of the tested plants leaves in the rate dry weight (gm/spike) of rice plant

Extraction methods	**Cold water**			**Boiled water**		
Species of plants Concn. (%)	*Cenchrus*	*Typha*	*Phragmites*	*Cenchrus*	*Typha*	*Phragmites*
0	2.45	2.57	2.59	2.45	2.57	2.59
30	2.16	2.14	2.31	1.66	2.60	2.22
60	2.14	2.12	2.17	1.42	2.53	2.12
80	1.77	1.96	1.77	1.03	2.43	2.10
100	1.38	1.30	1.10	0.9	2.04	1.60
Average	1.98	2.01	1.98	1.45	2.43	2.12

L.S.D 0.05=N.S

Effect of aqueous extracts the *Phragmites australis L., Typha domensis L. Cenchrus ciliarisL*. Leaves on the average Seeds / spike Weight of the rice plants: The data in table.3, revealed to the effect of interaction triangular extraction method and concentrations in the rate of the seeds weight/ spike. Plant extract showed and aqueous extracts the *Phragmites australis* L., *Typha domensis* L., *Cenchrus ciliaris* L. plants leaves of *Typha domensis* L. Significant effect in increasing the rate of seeds weight/ spike, it showed a concentration of 30% *Typha domensis* L. Boiled increase in the rate of seeds weight spike in total (2 g) compared to the control treatment (1.59 g). Concentrations of aqueous extract of the plant *Cenchrus ciliarisL*. cold also showed a decrease in the rates of seeds weight spike, reaching the lowest rate (1.45 g) at a concentration of 100% of the extract *Cenchrus ciliaris* L. cold compared with the control treatment (1.54 gm.)

Table.3. Allelopathic effect for aqueous extracts of the tested plants leaves in the average (Seeds / spike) Weight of rice plant.

Extraction methods	**Cold water**			**Boiled water**		
Species of plants Concn. (%)	*Cenchrus*	*Typha*	*Phragmites*	*Cenchrus*	*Typha*	*Phragmites*
0	1.54	1.59	1.60	1.54	1.59	1.60
30	1.45	1.57	1.53	1.54	2	1.50
60	1.45	1.48	1.44	1.45	1.55	1.42
80	0.66	1.33	1.46	0.97	1.50	1.25
100	1.45	1.13	1.33	0.70	1.20	0.72
Average	1.11	1.42	1.47	1.22	1.56	1.31

L.S.D=0.05=N.S

Effect of aqueous extracts the *Phragmites australis* L., *Typha domensis L. Cenchrus ciliaris* L. plants leaves in the Average of productivity (kg) of rice plant: The data regarding the average of productivity are presented in table.4, a perusal of the table revealed the interaction triangular and extraction method and concentrations in the average of productivity (kg / acre). The boiled aqueous extracts of the *Typha domensis* L significant effect high in seeds production for the rest of the other plant extracts average. As the highest value of production (429.4 kg / acre) in concentrations of 30% and an increase of 14.5% for the control treatment that gave (375.2 kg / acre) as well as the

concentration of 60% higher than in the yield of seeds average control treatment as it was (389.0 kg / acres) and an increase of 3.6 for the control treatment. The concentrations of the plant extract *Cenchrus ciliaris L*. cold a decrease significantly in the amount of seeds that yield 100% concentration *Cenchrus ciliaris L*. cold leaf extract has produced a lower rate .seeds totaled (230.0 kg / acre) and rate inhibition 43.6% compared with the control treatment.

Table.4. Allelopathic average for effect for aqueous extracts of the tested plants leaves in the Average of productivity (kg) of rice plant

Extraction methods	**Cold water**			**Boiled water**		
Species of plants Concn. (%)	*Cenchrus*	*Typha*	*Phragmites*	*Cenchrus*	*Typha*	*Phragmites*
0	369.4	375.2	378.0	369.4	375.2	378.0
30	240.2	34.6	277.2	245.4	429.4	356.8
60	236.3	336.0	275.0	249.0	389.0	346.4
80	220.7	315.5	270.2	241.0	350.9	334.0
100	208.0	300.0	252.1	230.0	320.0	315.3
Average	254.9	336.2	278.6	266.9	372.9	346.0

L.S.D 0.05= 9.8

Effect of aqueous extracts the *Phragmites australis* L., *Typha domensis* L. *Cenchrus ciliaris* L. plants leaves on the average protein content of the rice plants: From the results shown in table.5, the impact of the extraction method in the percentage of protein in the seed of rice as it was (11.10%) the effect of aqueous extract of boiled while it was (11.00%) in aqueous extract cold plants. The same table shows that the extract of the plant type significant effect on protein seeds of rice content and *Cenchrus ciliaris* L.plant extract gave less content of protein was (10.67%) and differed significantly from the impact of the extract reeds (11.57%), while the total (10.92%), the impact of the plant *Phragmites australis* L. extract. As well as the results shown in the table.5, the effect of the concentration of plant extracts in the percentage of protein in the seed of rice. The results show that increasing concentrations caused to a significant a decreased in the protein content of seeds as protein ratio decreased from (11.77%) in the control treatment to (10.85%) the effect of the concentration of 100%.As well as it can be seen from Table (5) the effect of interaction between the extraction method and extract Species of plants and concentration in the protein content in rice. As the results show that the plant extract known as the water boiled reeds caused to an increase in the percentage of protein as it was (11.71%), while the water gave *Phragmites australis* L. boiled extract (10.30%) and decreased the rate of protein impact of plant extract *Cenchrus ciliaris* L. cold to (10.03%). Khan (2015), evaluated allelopathic effect of leaf water extract of sorghum, eucalyptus, acacia, sunflower, tobacco, poplar and congress grass on weeds suppression in wheat Leaf water extracts of these plants significantly reduced weeds number, fresh and dry weeds weight and gave taller plant height, more number of tillers, higher number of grains per spike, increased 1000 grains weight, more biological yield and maximum seed weight of wheat. Sorghum, sunflower and congress grass leaf water extracts applied twice such as after 30 and 60 days of sowing reduced weeds and resulted in higher seed yield of wheat

Table.5. Allelopathic effect for aqueous extracts of the tested plants leaves in the average of protein content of rice plant

Extraction methods	**Cold water**			**Boiled water**		
Species of plants Concn. (%)	*Cenchrus*	*Typha*	*Phragmites*	*Cenchrus*	*Typha*	*Phragmites*
0	11.78	11.78	11.77	11.78	11.78	11.77
30	11.11	11.70	11.84	11.11	12.06	11.45
100	10.21	10.83	11.03	11.06	11.30	10.70
Average	10.03	11.33	11.54	11.31	11.71	10.50

L.S.D=0.05=0.29N.S

The results showed in tables.1, 2, 3, 4, 5, superiority extract boiled for cold in the values of flowering growth indicators, Due to the increase in the rate of vegetative growth indicators in the extraction with boiled water treatments. The results also show that the superiority of aqueous extract of the plant reeds largest number of leaves produced, which important play role increased leaf area and the efficiency of photosynthesis event compared with the rest of treatments, in addition to the nitrogen content in leaves reeds plant causes an increase in flowering growth indicators in a way indirectly by increasing the growth of leaves, compared with the rest of the plant species used in the experiment. As regards to concentrations, in general, it was observed that increasing concentrations of extracts has caused to an increase in the degree of inhibition in flowering growth indicators. The highest effect of inhibition at the concentrations of 100% for all extraction plant species and in two ways of extraction. Although allelopathy can adversely affect the growth of other plants or microbes, exudates of plants including rice can also have stimulating effects on the growth of other cultivars (Rector, 2008). There are mechanisms, such as oxidation by which plants are able to detoxify the effects of allele chemicals and hence, live together (Fitter, 2003). Similarly,

when subjected to plant pathogens, important cytoskeletal rearrangement in plant cells happens, usually resulting in exudation of proteins and or/natural productions through vesicles (Schulze-Lefert, 2004). It is not yet known, if the same vesicles or different vesicles mediate the production of resistance producing products (Field, 2006) extract Species of plant and concentrations of extracts in the percentage of protein, the results show that the concentration of 30% reeds has shown an increase in protein content compared with the control treatment. And fell to (11.3%) the effect of the extract concentration reeds (100%) and less protein content was (10.21%), the effect of concentration (100%) Tribe cool extract, compared to the control treatment (11.78%). The data show that the chemicals compounds contained in extracts have influenced the synthesis of proteins has been observed increase in protein seeds of rice concentration rate impact extract *Phragmites*, due to increased number of leaves / plant, which caused in an increase of photosynthesis efficiency and therefore reflected in the increased amount of protein in the leaves and then transporting to the seeds .These results are supported by Khan (2015), Arif (2015), Awan (2012), Shahid (2007), Hussain (2014), who recorded significant›increases in wheat dry weight with water extract obtained from different allelopathic crops. Also make sure these results that the phenols high concentrations can work on the inhibition of the biosynthesis of proteins such as P-cumaricacid, which inhibits amino acid tryptophan, as well as working to increase the effectiveness of (ABA) which works on the inhibition of the protein biosynthesis enzymes inhibition like Peptidase, Protease (Yang, 2002) this explains the lack of protein concentration effect of the treatment papyrus. Results obtained occurrence of variation in effects of plants tested different extraction methods confirmed that extracts tribe had an impact inhibitory higher, in most of the promoters were the effects of extracts vary in effectiveness from inhibition to stimulation based o concentrations, and on the response of tissues plant which refers to the presence of chemical compounds soluble in water and in organic solvents and are liberated to the environment, and that most of the compounds are phenolic acid shows her t Synergistic effect when they exist together and that aqueous extracts of. *Phragmites australis* L., *Typha domensis* L,*Cenchrus ciliaris* L plants papyrus and reeds contain chemical compounds different in nature and quality, and this explains clearly the effects inhibitory exhibited by water extracts of plant species tested against plant ricer. Research, referring to the existence of such chemical groups in plants (Khan,2015) the chemical statements, there is a difference in the quality and nature of the chemicals contained in the leaves of plants species in addition to the difference in quantity, this may be because the reason for this to genetic variations and the nature of the environment for plant lone this explains the difference in the inhibitory effect of extracts of plant species in the flowering growth of rice., we conclude there is a clear variation in the allelopathic effect of tested plant species extracts, and this disparity has shown a significant impact in flowering growth parameters growth of the rice, and this variation is due to the variation in allelopathic compounds found in aqueous extracts, on the one hand and the variation in concentrations of other .Give concentration of 30% extract reeds boiled increase in productivity for the control treatments. This results agree within (Einhellig and Leather 1988; Alsaadawi and Dayan, 2009) Which refers to including gresidues' of sunflower, can beused as a potential means to control weeds and enhance crop production using different strategies such as using plant extract, plant residues as a cover and mulch, crop rotation, crop mixture and intercropping practices Chemical analyses using HPLC indicated the presence of several phenolic acids ina water extract of the residues from plants genotypes. These phenolic acids are known to inhibit ion uptake, chlorophyll biosynthesis, cell membrane stability, protein and hormone biosynthesis (Rice 1984) and cell division, and change the ultra-structural components of cells (Rizvi and Rizvi, 1992)). These results are consistent with the sentiments Thus, the results of chemical analysis showed additional evidence that sunflower residue scontain allelopathic agents. Thes these results are consistent with the sentiments (Rajendra, 2017) shows that plants has great allelopathy potential to organize the growth of crops through secretion of allele chemicals which should. Highly suppressive genotypes (Coupon and Sin-Altheeb) in terms of weed suppression were confirmed by the high concentration of total phenolic compounds in these genotypes compared with the others. A possible suppressive effect of secondary metabolites other than phenolic could not be excluded. Several researchers have indicated that terpenoids and flavanoids isolated from sunflower have considerable suppressive ability against plants (Dayan and Duke 2009).They reported inhibition in the germination rate and final germination and flooring parameters of lentil, chickpea, and wheat with different plant part extract soft different broad and narrow leaf weeds. Chickpea seeds treated with the E. helioscopia leaf extract had the lowest germination, which is supported by the findings of (Oudhia, 2001 and Veenapani, 2004).They recorded the lowest germination of wheat and rice with the leaf extracts of 9 different weeds. Furthermore, 100% inhibition of the seed germination of lentil with the leaf extract of E. Helioscopia could be due to a more toxic effect of allelo chemicals on the lentil seed than on other crops (Deka, 2004). On the basis of these results we can propose that E. heliscopia phytotoxic has bio molecules in its organs in various concentrations; therefore it is necessary to keep this weed under check at the emergence stage so that its allelopathic based crop growth suppression may be avoided. The differential allelopathic potential of sunflower genotypes suggested the possible use of highly allelopathic cultivars for managing weeds through root exudation and/or residue incorporation, thereby enhancing crop production according to this results we can recommend that, because of what the extracts of plants reeds in lower concentration(30%) of the increase in productivity rate per acre

so we recommend using this concentration in the fields and the need to follow some of the processes that would reduce harmful allelopathic influences removed from some small the leaves of aquatic plants fields surrounding, a similar procedure studies to explain the impact of the secondary allelopathic compounds of in Separately from each other in other rice plant cultivar growth parameters and other plants .

4. CONCLUSION

The *E. heliscopia* phytotoxic has bio molecules in its organs in various concentrations; therefore it is necessary to keep this weed under check at the emergence stage so that its allelopathic based crop growth suppression may be avoided.

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