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The Weed Flora of some Crop Fields in Al- Oylia region, Al-Marj, Libya

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النباتات البرية التي تنمو داخل وحول بعض حقول الخضروات في منطقة العويلية - المرج - ليبيا

الملخص:

في الدراسة الحالية تم تسجيل النباتات البرية التي تنمو داخل وحول الحقول المزروعة بمحاصيل الخيار، الفلفل، الطماطم، الخس، والبصل اثناء فصل النمو في منطقة العويلية بالمرج، ليبيا في هذه الدراسة لم يتم تسجيل اي نوع من النباتات البرية تنمو داخل الحقول الزراعية المدروسة بينما تم تسجيل 41 نوع من النباتات الزهرية تتبع 16 عائلة تنمو على حدود تلك الحقول. وقد وجد اكبر عدد من الانواع النباتية تابع للعائلة النجيلية (11) نوع والعائلة الصليبية (6) انواع والعائلة المركبة (4) انواع . *Aegilopos ventricosa, Centaurea Cyrenaica* اكثر الانواع النباتية تكرارا، وكثافة، فقد سجلا تكرارا مطلقا 50 و 29.2 % على التوالي وكثافة مطلقة 1.59 و1.79 على التوالي. اما الانواع النباتية *Bromus rubens, Echium humile* قد سجلوا كثافة عالية وتكرار مطلقا يتراوح ما بين 7.5 و20.8% وكثافة مطلقة بين1.12-1.16 . ستة انواع كانوا اقل الانواع النباتية تكرارا والكثافة تتراوح بين0.61 -1.92% وسجلوا تكرارا مطلقا 8.33 % وكثافة مطلقة تتراوح من 0.16 – 50 وقد بينت هذه الدراسة سيادة الانواع النباتية البرية التي على حدود الحقول المزروعة عن داخلها وهذا ربما يكون ناتج عن حرث الارض وازالة النباتات البرية من الحقول المزروعة.

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Abstract

The present study aims to record weeds plants within growing fields of Cucumber, Pepper, Tomato, Lettuce and Onion in Al- Oylia region ,Al-Marj ,Libya. A total number of 41 weed species 16 angiospermic families were found as a rudreal weeds. Maximum number of species (11) belongs to the family Poacea**e** (Graminaceae) followed by Cruciferea (Brasicaceae)(6) and Asteraceae (Composit**)** (4) **.***Aegilopos ventricosa*, *Centaurea Cyrenaica* , were found to be the most frequently occurring weed with relative frequency (RF) 3.75 and 6.42% respectively , absolute frequency,(AF) of 29.2 and 50% respectively,(AD)1.54and 1.75 respectively, and they recorded in most Eight studied fields showing 75% prevalence. Nine species namely *Allium roseum, Amaranthus retroflexus,Asphodelus tenuifolius, Avena sativa, Bromus rigidus,Phalaris minor,Phalaris canariensis, Rapistrum rugosum,* and *Urtica dioica* showed 50% prevalence with absolute frequency (AF) ranging from 16.7–33.3% ,and relative frequency (RF) from 2.14–4.27%, and(AD) ranging from0.08-0.83 . The lest frequently occurring specieswith (AF) 8.33% and(AD) from 0.16-50 include six species. According to the frequency, three dominant weed species were found to be *Aegilopos ventricosa, Allium roseum and Sinapis alba* . Generally,the results in the present study showdominance of the ruderal over the agrestal weeds which may be due to ploughing and cleaning of agricultural soil.

Key words: weeds, Al- Oylia ,Al-Marj, Crops,Libya.

Introduction

Weeds are the plants, which grow where they are not wanted. Weeds differ from other plants in being more adaptive and having peculiar characteristics that make them more competitive (Dangwal *et al*., 2010). Agriculture plays a crucial role in the economy of Libya, so that weed surveys are useful for determining the occurrence and importance of weed species in crop production systems, Documenting the kinds of weed species and its relative distribution facilitates the establishment of priorities for research and extension services. Weeds are the plants, which grow where they are not wanted. Weeds represent one of the greatest limiting factors to efficient crop production. They Weeds cause greater economic losses on agricultural lands than all other pests combined (Kremer and Kennedy 1996).

Potentially serious new weeds are often overlooked until they are widely naturalized and having harmful impact on agricultural production and environment (Waterhouse 2003). These weeds effectively compete with the crop for nutrients ,water, space and reduce the yield ranging from 12 to 51 % (Rao and Singh, 1997; Mukharjee and Singh,2005; Halder and Patra, 2007). Weeds also serve as reservoir for plant pathogens that may cause significant loss in crop production. They are non-indigenous plants that can invade or negatively alternative plant communities (Muhammad *et al*., 2009).

They may also support populations of non-native animals and microbes and hybridize with native species subsequently altering the gene pools (Mahanta *et al*., 2007). The invasive weeds disturb the structure and composition of the native vegetation and as result a create pressure on the food chain and web of the ecosystem (Pysek and Richardson, 2007; Bais *et al*., 2003; Pimentel *et al*., 2000). The aim of this study was to record weeds plants growing as agrestal and rudreal during growing season of some cultivated crops during growing season of some cultivated crops in Al- Oylia region ,Al-Marj, Libya .

Materials and methods

Study area

Al- Oylia is located in the north east of Al-marj plain (**Fig. 1**). It is about of 20 km east of the New Al-marj city. Al- Marj area is located on the southern coast of the Mediterranean Sea in the province of Cyrenaica(Newport and Haddor 1963). Astronomical site extends between latitudes 33º and 31ºN and longitudes 20.30º-21.30ºE. It depends on ground water of 350-200 m deep as the chief source of the potable water (Alshamikh 2009).the study area is characterized by a Mediterranean climate, with cool rainy winter and hot dry summer (El-Tantawi 2005).). The lowest mean value of minimum air temperature varies between 5.5 ºC in January and 18.5 ºC in August. The highest mean value of maximum air temperature varies between 20.5 ºC in January and 38.3 ºC in May. The relative humidity varies between 53% in June and 75.2% in January. The Mean annual precipitation is270.3 mm. and most of the rain falls during winter while summer is virtually dry. according the meteorological data from Al-Marj city station.

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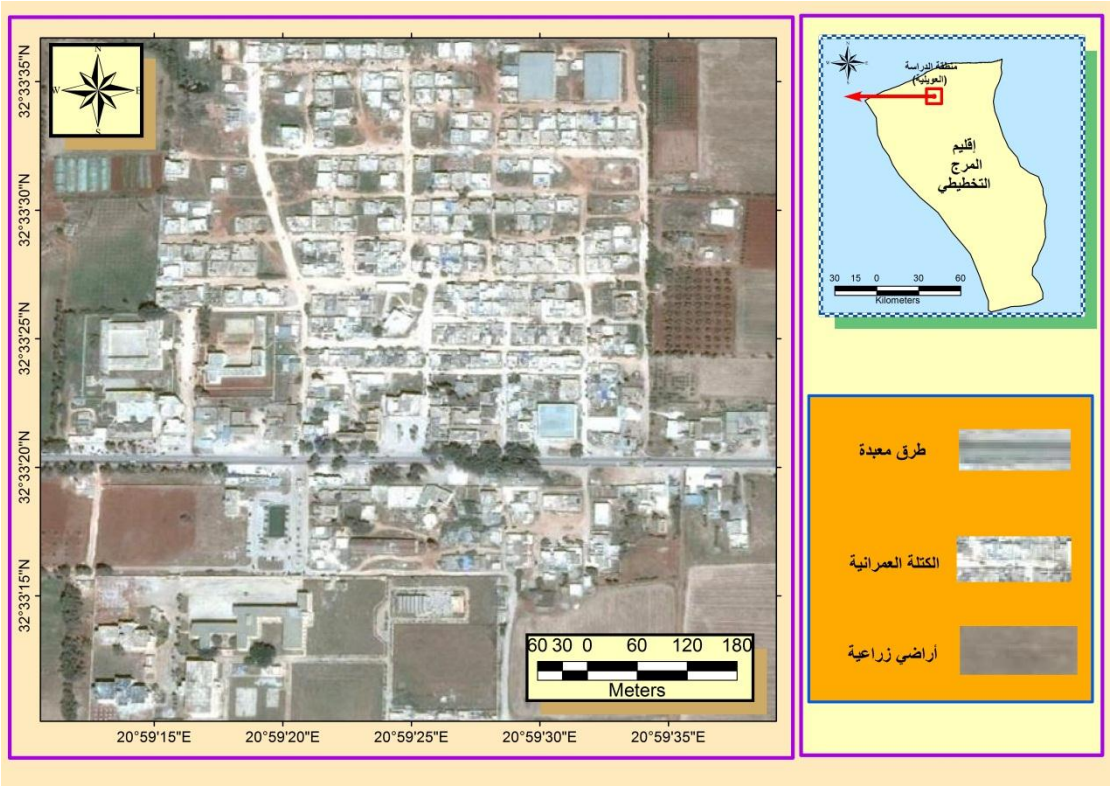

Fig. 1: A map showing the location of Al- Oylia region**.**

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Field Surveys

Field surveys of different crops growing in Al- Oylia region were conducted during the growing season of 2015-2016. Eight sites were selected to study weed distribution, each site was divided into 4 stands (a total of 24 stands). Sampling was randomly done using 1×1 m^2 quadrat. According to Riaz *et al*., (2007). The collected material was pressed, dried using blotting papers at room temperature, and identified with the help of available literature, and compared with authenticated specimens in regional herbaria. Voucher specimens were deposited in the Botany department ,AL-marj branch, University Benghazi. The data regarding prevalence, absolute, relative frequency, absolute and relative density of weeds were calculated by applying the following formulas; percentage of Prevalence = (number of sites in which a specie occurs/Total number of sites) x 100, percentage of Absolute Frequency =(number of quadrates in which a specie occurs/Total number of quadrates) x 100, percentage of Relative Frequency = (Absolute frequency value of a species/Total absolute frequency for all species) x 100, percentage of Absolute density = total number of individual of a species in all quadrates/Total number of quadrates and percentage of Relative density = (Absolute density value of a species/Total absolute density for all species) x 100.

Results and discussion

Weeds management in cultivated lands involve the use of many techniques and strategies, all with the goal of achieving weed control and maximal crop yields. Ideally, growers would like to achieve a level of zero weeds on their farms. In practice, this may not be achievable, but any reduction in weeds and in the amount of weed seed or perennial prop gules reaching the soil will make subsequent weed control. For weeds to grow, they must have access of water, nutrients, and light (Bowman 1997).

In the present study, 41 weeds species belonging to 16 angiospermic families were found as a rudreal weeds in cultivated crops including; Cucumber, Pepper, Tomato, Lettuce and Onion. Maximum number of species (11) belongs to the family Poaceae (Graminaceae) followed by Cruciferea (6) and Asteraceae (Composit) (4) were recorded. As shown in (Table 1), *Aegilopos ventricosa*, *Centaurea Cyrenaica* , were found to be the most frequently occurring weed with relative frequency (RF) from 3.75–6.42% , absolute frequency,(AF) of 29.2-50% and they recorded in most Eight studied fields showing 75% prevalence. Nine species namely *Allium roseum,Amaranthus retroflexus,Asphodelus tenuifolius, Avena sativa, Bromus rigidus,Phalaris minor,Phalaris canariensis, Rapistrum rugosum,* and *Urtica dioica* showed 50% prevalence with absolute frequency (AF) from 16.7–33.3% and relative frequency (RF) from 2.14–4.27% .

Elevene species namely *Anagallis arvensis, Anthemis secundiramea,Avena sterilis,avena fatua,Diplotaxis muralis, Malva egyptia,Plantago albicans,Reseda alba,Sinapis alba,Sinapis flexuosa,* and *Sinapis parviflora* exhibited 37.5% prevalence with absolute frequency (AF) from 12.5–33.3% and relative frequency (RF) from 1.60–4.27%.

Table 1. Prevalence(P%), Absolute frequency(AF%), Relative frequency(RF%); Absolute density(AD), Relative density(RD%) of weeds in growing fields of Cucumber, Pepper, Tomato, Lettuce and Onion in Al- Oylia region ,Al-Marj, Libya .

Nineteen species showed a low prevalence from 12.5–25% which are; *Conyza bonariensis, Echium humile, Heliotropium europaeum, Lolium rigidum, Malva parviflora, Malva sylvestris , Papaver hybridum, Polygonum aviculare, Polygonum equisetiforme, Sonchus oleraceus,* and *Urtica pilullifera* The previous recorded weeds which recorded as a ruderal may be in the future will become the aggressive weeds in the cultivated crops due to their high reproductive potential, fast growth rate, allelopathic nature causing inhibiting of the root length, shoot length, and weight of cultivated crops (Dagar *et al*., 1976; Hussain *et al*., 1992; Navie *et al.*, 1996; Singh *et al*., 2005; Batish *et al.*, 2007). InIndia and Pakistan, *Rumex dentatus* L. is also of major concern in various crops of economic importance including wheat, since it is a highly competitive weed and can cause drastic yield reduction (Chhokar *et al.* 2007; Anjum and Bajwa 2007; Mehmood *et al.*, 2007). So that infestation weeds distribution within crops fields in studying area will give more information about quality and yield losses in crop production systems.

The previous and aforementioned important findings seem to point to the following recommendation:

1- The further studies may also be done to check allelopatic effects of various weed species recorded on agricultural crops.

2-It will also be useful in suggesting suitable weed control recommendation for this region.

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Species	**Family**	**P (%)**	**AF (%)**	**RF (%)**	**AD**	**RD (%)**
Aegilopos ventricosa Tausch	Gramineae	75	50	6.42	1.54	5.92
Allium roseum L	Alliaceae	50	33.3	4.27	0.79	3.04
Amaranthus retroflexus L	Amaranthaceae	50	25	3.21	0.83	3.19
Anagallis arvensis L	Primulaceae	37.5	12.5	1.60	0.45	1.73
Anthemis secundiramea Biv	Compositae	37.5	12.5	1.60	0.41	1.57
Asphodelus micropus Salzm&Viv	Liliaceae	6.25	25	3.21	0.54	2.07
Asphodelus tenuifolius Cav	Liliaceae	50	20.8	2.67	0.83	3.19
Avena sterilis L	Gramineae	37.5	29.2	3.75	0.91	3.50
Avena fatua L	Gramineae	37.5	29.2	3.75	0.75	2.88
Avena sativa L	Gramineae	50	20.8	2.67	0.08	0.31
Brachypodium distachyum (L) p.Beauv.	Gramineae	25	25	3.21	0.87	3.34
Brassica tournefortii Gouan	Cruciferae	6.25	20.8	2.67	0.70	2.69
Bromus dandrus Roth	Gramineae	6.25	29.2	3.75	1.08	4.15
Bromus rigidus Roth	Gramineae	50	16.7	2.14	0.66	2.54
Bromus rubens L	Gramineae	62.5	7.5	0.96	1.12	4.31
Centaurea Cyrenaica Biguiont	Compositae	75	29.2	3.75	1.79	3.04
Chenopodium murale L	Chenopodiaceae	25	20.8	2.67	0.87	3.34
Convolvulus arvensis L	Convolvulaceae	6.25	29.2	3.75	0.95	3.65
Convolvulus humilus Jaeq	Convolvulaceae	25	12.5	1.60	0.37	1.42
Conyza bonariensis L	Compositae	25	12.5	1.60	0.37	1.42
Diplotaxis muralis (L.) Dc.	Cruciferae	37.5	12.5	1.60	0.37	1.42
Echium humile Desf	Boraginaceae	25	20.8	2.67	1.16	4.46
Heliotropium europaeum L	Boraginaceae	25	20.8	2.67	0.54	2.07
Lolium rigidum Gaud	Gramineae	25	8.33	1.07	0.45	1.73
Malva parviflora L	Malvaceae	12.5	12.5	1.60	0.45	1.73
Malva egyptia L	Malvaceae	37.5	12.5	1.60	0.70	2.69
Malva sylvestris L	Malvaceae	25	8.33	1.07	0.50	1.92

Papaver hybridum L	Papaveraceae	25	8.33	1.07	0.16	0.61
Phalaris minor (L)Retz	Graminea	50	16.7	2.14	0.54	2.07
Phalaris canariensis L	Graminea	50	16.7	2.14	0.41	1.57
Plantago albicans L	Plantaginaceae	37.5	12.5	1.60	0.37	1.42
Polygonum aviculare L	Polygonaceae	25	8.33	1.07	0.33	1.27
Polygonum equisetiforme S.et.SM	Polygonaceae	25	12.5	1.60	0.33	1.27
Rapistrum rugosum (L)ALL.	Cruciferae	50	20.8	2.67	0.37	1.42
Reseda alba L	Resedaceae	37.5	12.5	1.60	0.50	1.92
Sinapis alba L	Cruciferae	37.5	33.3	4.27	0.91	3.50
*Sinapis flexuosa (*Poilet)Lam	Cruciferae	37.5	25	3.21	0.91	3.50
Sinapis parviflora L	Cruciferae	37.5	16.7	2.14	0.58	2.23
Sonchus oleraceus L	Compositae	25	8.33	1.07	0.45	1.73
Urtica dioica L	Urticaceae	50	20.8	2.67	0.75	1.42
Urtica pilullifera L	Urticaceae	25	8.33	1.07	0.29	1.11

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