J. Plant Production, Mansoura Univ., Vol. 6 (12): 2003 - 2018,2015

ECOLOGICAL STUDY ON WEED FLORA GROWING IN THE ORCHARDS OF NEW DAMIETTA

Serag, M.S.; A.A. Khedr, S. H. Rabei and A. G. Elkomy
Botany Department, Faculty of Science, Damietta University
Corresponding author's e-mail: mamdouhserag054@gmail.com

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ABSTRACT

A survey was made to record the most of common weeds in the study area as well as the dominant, associated and rare species. Five sites were selected for this survey, random sample of weeds, fixing and making herbarium sheets for these weeds and deposited them in Herbarium of Botany Department, Faculty of Science, Damietta University. Furthermore, the characteristics of the soil were these weeds growing in the orchards of new Damietta were analyzed.

The most habitat types in the study area were namely, orchards, sandy fertile cultivated lands, banks of irrigation canals, reclaimed lands and waste lands.

60 wed species related to 23 families most of them are annuals, some hemicrytophytes and few perennials. The recorded species were formed monocots and dicots, with Poaceae(13 species) was the most represented family followed by Asteraceae(10 species). Chorological analysis of the recorded species indicated that the Mediterranean weed species extending into the Euro-Siberian territory attained higher occurrence in the study area as compared to those species with Saharo indian extension.

Shannon and Simpson diversity index of site П was the most diverse site while the least diverse was site Ш. It's mean that there variety of species in site П compared with the rest of sites so, thus means that this site is a suitable field for growing a high no. of species.

The most important soil variables controlling the distribution and richness of weed species were: soil texture, porosity, water-holding capacity, organic carbon, conductivity, calcium carbonates, chlorides and potassium, sodium and calcium cat ions. Soil pH, water holding capacity, calcium carbonates and soil bicarbonates as the best set of predict or variables of the weed species distribution in the study area.

The obtained results will be useful for the determination of weeds of national significance. This approach was used to focus on the key species and make an extensive research on them. Most of these weeds remain significant problem at orchards and field crops. Results will be useful for optimum management of the noxious weeds in orchards.

INTRODUCTION

Plants are the basis of life on earth (Boulos, 1995). They provide nourishment and other essential living requirements to almost all forms of life, including man, birds and insects. The tremendous diversity of life on the planet is largely dependent on the diversity of the plant species, which sustain it. If the plants are lost, a huge proportion of the world's other living organisms will disappear too. Plants are food, clothes, fuel and energy resource (*Boulos*, 2005).

Weeds represent a highly specific and biologically important component of their environments. Their persistence is remarkable in view of

the efforts to eliminate them, and warrants greater attention (Radosevich and Holt1984). No question that weeds negatively impact human endeavors, both in agricultural and non-agricultural environments.

In Egypt, Rafea *et al.* (1994) developed computer methodology for agricultural expert systems based on Knowledge Analysis and Design Structuring (KADS) to be used in the production of some field crops e.g., tomato, citrus and wheat. These systems focus at helping producers through providing simplified software computer programs equipped with the needed scientific basic information and requirements including: best soil conditions; irrigation and hoeing rates; pest and plant disease identification and weed identification and control.

The importance of the expert systems technology for Egypt is beyond doubt because expert systems can help in developing process by transferring knowledge from highly qualified scientists and engineers to technical personnel who have less expertise. During the construction of these systems, the baseline agricultural information related to the different crops and soil are fielded. In this context, the ecological aspects of the weeds associated with the orchards could be used as UN input for these systems. (Abd El-Ghani and El-Sawaf, 2005)

Weeds of Egypt differ from season to season because of their ecological requirements. Results of several earlier studies (Abd El-Ghani and Amer, 1990; Abd El-Ghani and El-Bakry, 1992) revealed that weeds can be grouped into 3 main categories according to their seasonal performance: winter weeds, which are more restricted to the cooler months; summer weeds, which are more restricted to the warmer months of the year; and all-year weeds, which are present and biologically active throughout the year. The all-year weeds, however, can be differentiated into all-year weeds with winter affinity (fare better during winter, i.e. with more abundant populations and more vigorous growth in winter) and all-year weeds with summer affinity (fare better during summer). Winter weeds represented the main bulk of the recorded species within each crop.

Weeds compete with crops for space, nutrients, water and light. Smaller, slower growing seedlings are more susceptible than those that are larger and more vigorous. By contrast broad beans produce large seedlings and suffer far fewer effects other than during periods of water shortage at the crucial time when the pods are filling out. Transplanted crops raised in sterile soil or potting compost gain a head start over germinating weeds.

Weeds compete with productive crops or pasture, ultimately converting productive land into unusable scrub. Weeds can be poisonous, distasteful, produce burrs, thorns or otherwise interfere with the use and management of desirable plants by contaminating harvests or interfering with livestock (Boulos and El Hadidi, 1994).

An increased understanding in the biology and ecology of weeds is needed to optimize their management. Research on weed control with bio1ogical agents and natural products should be conducted with emphasis on optimizing performance in the field environment (Hess, 1994).

Harold (1994) suggested that if weed science is to become a full partner in utilizing the concepts of Integrated Pest Management (IPM), there

are at least five research areas that must be significantly strengthened including biology/ecology of' weeds, crop/weed interactions, economic thresholds for weeds, Alternative weed control methodology and information delivery systems.

Many studies dealing with the weed flora of Egypt were concerned mainly with the description of the floristic composition of chorological analysis rather than considering the relations of the weed communities with other environmental variables and agricultural practices. In other parts of the world several studies described the effects of one or few economic factors on weed biology and ecology e.g., Catizone (1979), Mahn (1984), Mohler and Liebman (1987), and Sheng et al. (1994). Knowledge of the interrelationships between the environmental conditions, agricultural practices and floristic composition of the weed communities would help in proposing future integrated weed control strategies.

Many studies investigated the weed flora of orchards. Among of these are: kosinova (1975), Abd El-Ghani and Amer (1990), Abd El-Ghani and El-Bakry (1992), Zahran and Willis (1992), Abd El-Ghani (1998), El-Kady *et al*. (1999), El-Fahar *et al* (2002), Turki and Sheded (2000), Omar (2001), Shaheen (2002), Mashaly and Awad (2003), Boulos L. (2005), El-Halawany *et al*. (2010) and Abd El-Ghani (2013).

The present study has two objectives: a) to identify the most common weeds growing in the orchards of New Damietta. b) To analyze the soil where these weeds grow.

MATERIALS AND METHODS

Study area

Damietta Province is located in the downstream part of the Damietta branch of the River Nile at 31^{o} 25' 10" north to 31^{o} 48' 54" east N-32^{o} 00' longitude to the north east of the Nile Delta region of Egypt (Figure 1). The coast of Damietta Governate extends from El-Deeba village (about 20 km from Port-said) to Gamasa at west along the Mediterranean Sea for about 42 Km. This province is bounded by Lake Manzala at the east, Mediterranean sea from the north and El-Dakahlia Governate from the west and the south. The total average area of Damietta Province is about 1029 Km^2 and the total agricultural area is about 115892 feddans (Mashaly, 2001). (Fig1)

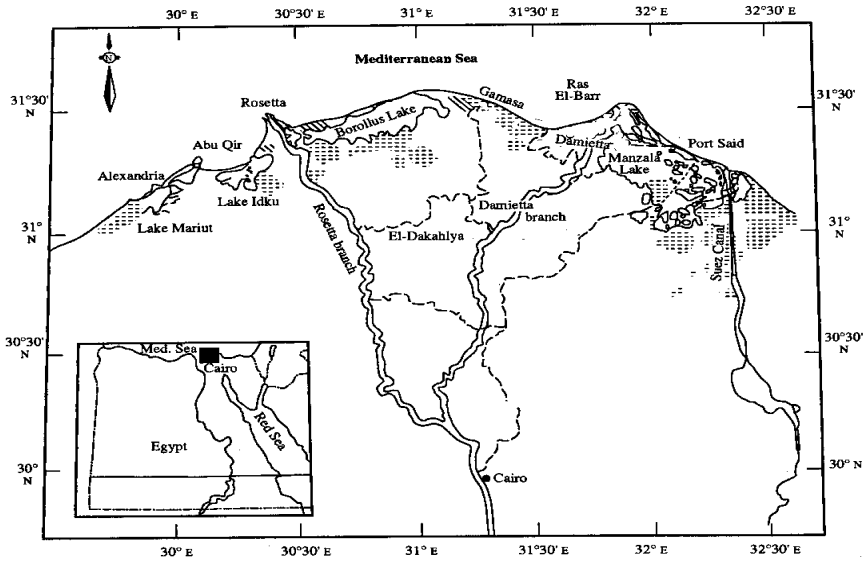

Fig 1. Map showing location of New Damietta in the North Eastern of the Nile Delta.

Fig (2): Map showing location of the study area (the orchards of New Damietta), (source: Google earth during May, 2014)

This place is situated in Damietta, Lower Egypt, Egypt; its geographical coordinates are 31° 25' 10" North, 31° 48' 54".

Climate

Meteorological data from Damietta station showed that maximal values of air temperature were recorded in summer months (May–October) ranging between 26.7° C and 32.7° C. On the other hand, mean minimal values were recorded in winter months (November–April). Records ranged between 14.5° C and12.7° C. Rainfall is scanty, unpredicted, and variable in both space and time. Annual averages ranged among 12mm in January, 27 mm in march,

and 12 mm in May. It is seasonal and the main bulk of rain falls in winter and spring (October–April). Summer is practically rainless. Values of relative humidity were less in winter months than summer months (Table 1).

Table (1): Climatic data along the study area during 2012 at Damietta, R.H = Relative Humidity, ETo= Evapo-transpiration. (*Abou Moustafa, 2012).*

Month / Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min. Temp. (^{0}C)	8.5	6	9.2	12.7	16.7	19.6	21.3	22.5	20.6	17.2	14.5	11.2
Max.Temp. (^{0}C)	18.4	27	20.5	26.1	26.7	30.2	31.2	32.7	31.7	29.9	25.5	20.4
R. H. %	84	80	78	75	73	73	77	79	75	75	79	77
Wind speed (m/s)	4.5	5.7	6.3	6.3	6	5.9	4.7	4.4	4.4	4.3	4.3	4
Mean Rainfall (mm/day)	12	trace	27	trace	12	trace	trace	trace	trace	trace	trace	Trace
ETo (mm/day)	1.5	2.3	2.5	4.2	4.6	6.6	6.1	5.2	4.8	3.9	2.3	1.8

Field Study

An extensive survey was carried out and the common weeds growing in 5 sites in the Orchards of New Damietta. Floristic analysis was made for the obtained data.

Herbarium Work

Voucher specimens of the weeds plants were collected, identified and deposited in the Herbarium of the Botany Department, Faculty of Science, Damietta University. Identification and nomenclature of the plants were following Täckholm (1974) and *Boulos* (2005).

Diversity and Richness

A diversity index is a mathematical measure of species diversity in a given community Based on the species richness (the number of species present) and species abundance (the number of individuals per species). The more species you have, the more diverse the area. Shannon index is an information statistic index, which means it assumes all species are represented in a sample and that they are randomly sampled. Simpson index is a dominance index because it gives more weight to common or dominant species. In this case, a few rare species with only a few representatives will not affect the diversity (*Pielou, 1975*).

Laboratory Analyses

In each site a composite sample (0-25 cm) were collected, the samples were mixed and air dried, then passed through a 2-mm sieve to be ready for physical and chemical analysis. Soil texture was determined by sieve method (Jackson, 1962), and the hydrometer method (Palmer and Troeh, 1995).The pH of soil extracts was measured using a pH meter model 800. Conductivity (µmhos/cm) of soil extracts was measured at 20 °C using a digital conductivity meter YSI Model 35.A Known volumes of soil extracts were titrated against 1/35.5 $AgNO_3$ using 5 % potassium chromate indicator (Jackson, 1962). Calcium carbonates were determined according to Jackson (1962(. Carbonates and bicarbonates were determined in soil extract by

titration against 0.1N HCl using phenolphthalein and Methyl orange as indicator respectively (Piper, 1947).

The organic carbon was determined by titration as described by Walkely and Black's rapid titration method as mentioned by Piper (1947).

Potassium, sodium and calcium of the soil extracts were measured by using flame photometer Jen way P 7 (Allen *et al*., 1974).

Micro khjeldahl method which depend on complete digestion of samples of soil by H_2SO_4 using hot plate till no further darkening occur, cooled, few drops of H_2O_2 added, heated again till colorless solution appears. The sample was distilled in steam distillation apparatus after adding an appropriate amount of 40% NaOH to neutralize the excess of H_2SO_4, liberated ammonia was adsorbed in 2% boric acid, then titrated against 0.005N H_2SO_4 using mixture indicator (8 bromo cresol green: 1 methyl red), bromo cresol green (0.1 g dissolved in 100 ml of 95% ethanol), methyl red (0.1g dissolved in 100 ml of 95% ethanol), (1 ml of 0.005 H_2SO_4 = 0.07 mg N_2). Total nitrogen was expressed as mg/ g air dry soil (Hawk et al, 1947).

Total phosphorus was determined by using 0.15 g of oven dried soil was weighted and placed in 125 ml Erlenmeyr flask with 50 ml distilled water and 5 g of potassium per sulphate, flasks were covered and the mixture was digested in the autoclave for 30 minute at 121ºC, cooled, filtered through a GF/C filter and the filtrate was transferred quantitatively to an Erlenmeyr flask. Drops of phenol phthaline as indicator used adjust to pink with 1N of NaOH, bring back to colorless with one drop of strong acid solution. The filtrate was rinsed to 100ml by distilled water, orthophosphate was measured by using ascorbic acid technique, 35 ml of diluted sample was mixed with 1ml of mixture reagent (ammonium hepta-molybdate 9.5% + 9N H_2SO_4), then 1ml of reluctant was added (ascorbic acid 0.1757%), the absorbance measured at wavelength 720nm.

RESULTS

An extensive survey of the orchards of New Damietta showed the most common weeds in the different habitats. These were namely: irrigation canal banks, orchards, cultivated with date palm trees and guava, sandy fertile cultivated lands, cultivated with vegetables like tomato, reclaimed lands, cultivated with guava and finally waste lands. Five sites were selected representing these habitats.

There is only one dominant species in each site and associated species were recorded, the sites will briefly describe in the following:

Site (I): The soil is sandy saline, date palm grooves is cultivated by guava. Spaces between date palm 3m are cultivated by guava. The most common weeds plants is halophytes are namely: *Sueda vera* (dominant), associated with *Lambarda (Inula), Phragmites, Conyza.*

Site (II): The soil is sandy clay, guava and on margins date palm. The most common weeds plants are namely *Aster squematous, Plantago major* (individually), *Cynadon dactylon* (the dominant), associated with *Pluchea, Aster, Phyla nodiflora, Imprata cylindrica , cichikorum*.

Site (III): The soil is sandy clay, mango and date palm on margins. *Sonchus olerachus* is the dominant species and the associated species are *Melilotus, Malva, Lipidium, Amaranthus, Echinoclona*, and Presence of *Cyprus rotundas* as a single species.
Site (IV): The soil is sandy, only guava is cultivated. *Cynadon dactylon* is the dominant species, the associated species are *Digiteria, Pluchea, Plantago, Euphorpia peplus*, The presence of *Aster* is rare.
Site (V): The soil is sandy, only guava is cultivated with some vegetables. *Lipidum* is a dominant associated with *Sonchus, Plantago, Euphorpia, Cynadon dactylon*, the presence of *Malva* as a single.

Table(2) :Mean values of five replicates ± Standard deviation and total number of species.

Site	I	II	III	IV	V
Mean (M) ±SD	30.67±4.93	26±10.82	33.33±11.02	29.33±5.69	33±3.46
Total no. of species(N)	60				

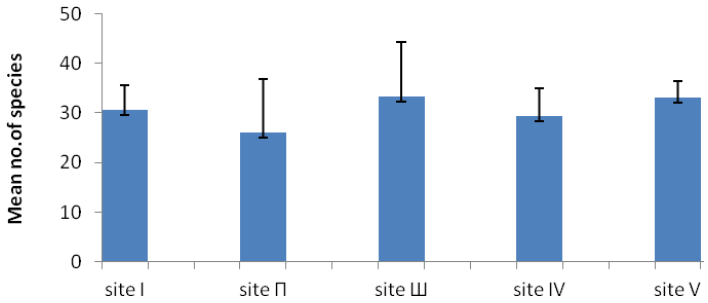

Fig 3: Showing the different mean values of species and the standard deviation of the sites.

In the Shannon index (H), p is the proportion (n/N) of individuals of one particular species found (n) divided by the total number of individuals found (N), Ln is the natural log, Σ is the sum of the calculations, and s is the number of species.

In the Simpson index (D), p is the proportion (n/N) of individuals of one particular species found (n) divided by the total number of individuals found (N), Σ is still the sum of the calculations, and s is the number of species.

Table 3: *Shannon index (H), Simpson index (D)* for the sites.

Site	H	D
I	1.0154	1.2544
II	1.0054	1.5915
III	0.9172	1.0067
IV	1.0306	1.3605
V	0.9802	1.0939

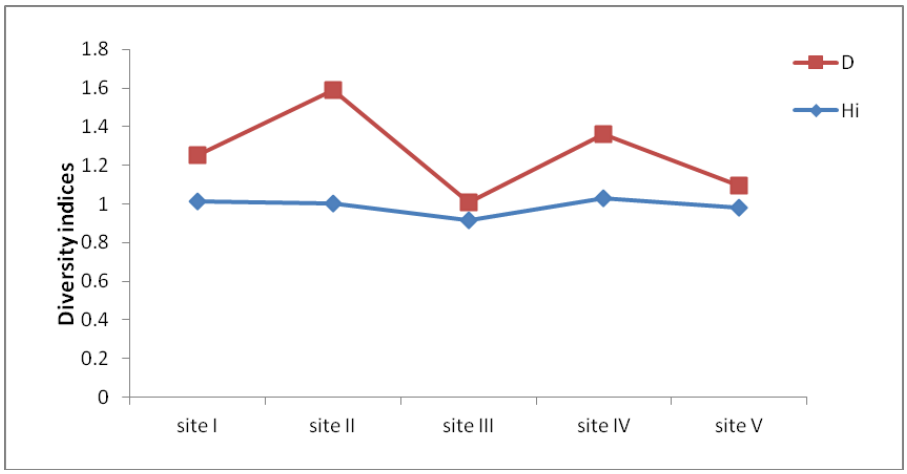

Fig 4: Showing the relation between Diversity Indices in the different sites of the study area.

Chorological analysis revealed that the widely distributed species belonging to cosmopolitan, palaeo tropical, and pantropical chorotypes constituted about 39.3% of the recorded flora. Pure Mediterranean species were very poorly represented, while bi regional and tri regional Mediterranean chorotypes constituted 28%.Saharo-Arabian chorotypes, either pure or penetrated into other regions, constituted 32%. Ubiquitous, species with wide amplitude were *Cynodon dactylon* and *Sonchus oleraceus*. Species richness varied from one crop to another.

Table (4): Weeds growing in the study area according to their life form, habitat and chorotype of each species.

Family	*Species*	Life form	Habitat	Chorotype
Amaranthaceae	*Alternanthera sessilis*	Annual	Humid habitats	Irano- -Med Turanian
	Amaranthus viridis	Annual	Cultivated areas	Plurireginalbor
Apiaceae	*Ammi majus*	Annual	Cultivated areas	Mediterranean
	Apium graveolens	Annual	Humid habitats	Plurireginalbor
	Apium Leptophyllum	Annual	Cultivated areas	-Euro-Siberian Med
	Apium nodiflorum	Hemicryptophyte	Humid habitats	Plurireginalbor
Asclepiadaceae	*Cynanchum acutum*	Phanerophyte	Humid habitats	Irano- -Med Turanian
Asteraceae	*Bidens pilosa*	Annual	Humid habitats	-Euro-Siberian Med
	Cichorium pumilum.	Annual	Humid habitats	Irano- -Med Turanian
	Conyza bonariensis	Annual	Cultivated areas	-Euro-Siberian Med
	Eclipta alba	Annual	Humid habitats	-Euro-Siberian Med
	Limbarda crithmoides	Chamaephyte	Salty habitats	Mediterranean
	Pluchea dioscoridis	Phanerophyte	Humid habitats	Saharo-Arabian
	Pseudognaphlium luteo-album	Hemicryptophyte	Humid habitats	mediterranean
	Sonchus oleraceus	Annual	Cultivated areas	Euro-Siberian - Med
	Symphyotrichum squamatum	Annual	Humid habitats	Euro- - Med Siberian
	Xanthium spinosum	Annual	Cultivated area	Plurireginalbor
Boraginaceae	*Symphytum officinale*	Hemicryptophyte	Humid habitats	-Euro-Siberian Med
Brassicaceae	*Coronopus didymus*	Annual	Humid habitats	Plurireginalbor
	Lepidium virginicum	Annual	Humid habitats	Mediterranean
Caryophyllaceae	*Spergularia marina*	Hemicryptophyte	Salty habitats	Euro-Siberian - Med
	Vaccaria hispanica	Annual	Cultivated areas	Mediterranean
Chenopodiaceae	*Atriplex portulacoides*	Chamaephyte	Salty habitats	Euro-Siberian - Med
	Bassia indica	Annual	Humid habitats	Saharo-Arabian
	Chenopodium album	Annual	Humid habitats	Plurireginalbor
	Chenopodium ficifolium	Annual	Humid habitats	Mediterranean
	Chenopodium murale	Annual	Humid habitats	Plurireginalbor
	Chenopodium opulifolium	Annual	Humid habitats	-Euro-Siberian Med
	Suaeda vera	Chamaephyte	Salty habitats	Euro-Siberian - Med
Cyperaceae	*Cyperus rotundus*	Geophyte	Humid habitats	-Euro-Siberian Med
Euphorbiaceae	*Euphorbia peplus*	Annual	Humid habitats	Euro-Siberian - Med
Fabaceae	*Lathyrus odoratus*	Annual	Humid habitats	-Euro-Siberian Med
	Lotus halophilus	Annual	Humid habitats	Mediterranean
	Medicago sativa	Hemicryptophyte	Humid habitats	Euro-Siberian - Med
	Vicia sativa	Annual	Humid habitats	Mediterranean

Continue Table (4): Weeds growing in the study area according to their life form, habitat and chorotype of each species.

Family	*Species*	Life form	Habitat	Chorotype
Malvaceae	*Malva parviflora*	Annual	Humid habitats	Irano- -Med Turanian
Oxalidaceae	*Oxalis corniculata*	Annual	Cultivated areas	Plurireginalbor
Plantaginaceae	*Plantago major*	Annual	Humid habitats	Euro-Siberian - Med
Poaceae	*Arundo donax*	Phanerophyte	Humid habitats	Irano- -Med Turanian
	Cenchrus echinatus	Annual	Humid habitats	-Euro-Siberian Med
	Cynodon dactylon	،Chamaephyte	Humid habitats	Plurireginalbor
	Dactyloctenium aegyptium	Annual	Cultivated areas	-Euro-Siberian Med
	Digitaria sanguinalis	Annual	Cultivated areas	Plurireginalbor
	Echinochloa stagnina	Annual	Humid habitats	-Euro-Siberian Med
	Imperata cylindrica	Hemicryptophyte	Humid habitats	-Med SaharoArabian
	Lolium temulentum	Annual	Cultivated areas	-Euro-Siberian Med
	Panicum repens	Chamaephyte	Humid habitats	-Euro-Siberian Med
	Phalaris minor	Annual	Humid habitats	Irano- -Med Turanian
	Phragmites australis	Hemicryptophyte ،	Salty habitats	: Plurireginalbor
	Polypogon monspeliensis	Annual	Humid habitats	-Euro-Siberian Med
	Setaria viridis	Annual	Cultivated areas	-Euro-Siberian Med
Polygonaceae	*Rumex dentatus*	Annual	Humid habitats	-Euro-Siberian Med
	Persicaria decipiens	Hemicryptophyte	Humid habitats	Plurireginalbor
Portulacaceae	*Portulaca oleracea*	Annual	Cultivated areas	Plurireginalbor
Primulaceae	*Anagallis arvensis*	Annual	Humid habitats	-Euro-Siberian Med
Ranunculaceae	*Ranunculus sceleratus*	Annual	Humid habitats	-Euro-Siberian Med
Scrophulariaceae	*Veronica anagallis*	Hemicryptophyte	Humid habitats	Plurireginalbor
Tamaricaceae	*Tamarix nilotica*	Tree	Salty habitats	Saharo-Arabian
Urticaceae	*Urtica urens*	Annual	Humid habitats	Euro- -Med Siberian
Verbenaceae	*Phyla nodiflora*	Hemicryptophyte	Humid habitats	Euro-Siberian - Med

Floristic Analysis

According to the floristic composition of the sites we selected, the dominant species are poaceae, asteraceae and chenopodiaceae respectively, these species found their suitable circumstances to live.

Poaceae had 13 species with 22%. After that, 10 species are belonging to Asteraceae with 17%. Chenopodiaceae had 7 species with 12%. There are two families which had 4 species for each with equal 7% these are Apiaceae and Fabaceae. Also, 4 families everyone had 2 species with 3%, there are

Amarantheceae, Brassicaeae, Caryophyllaceae and Polygonaceae. The rest of families had only one species with only 2% for each one. (Fig 5)

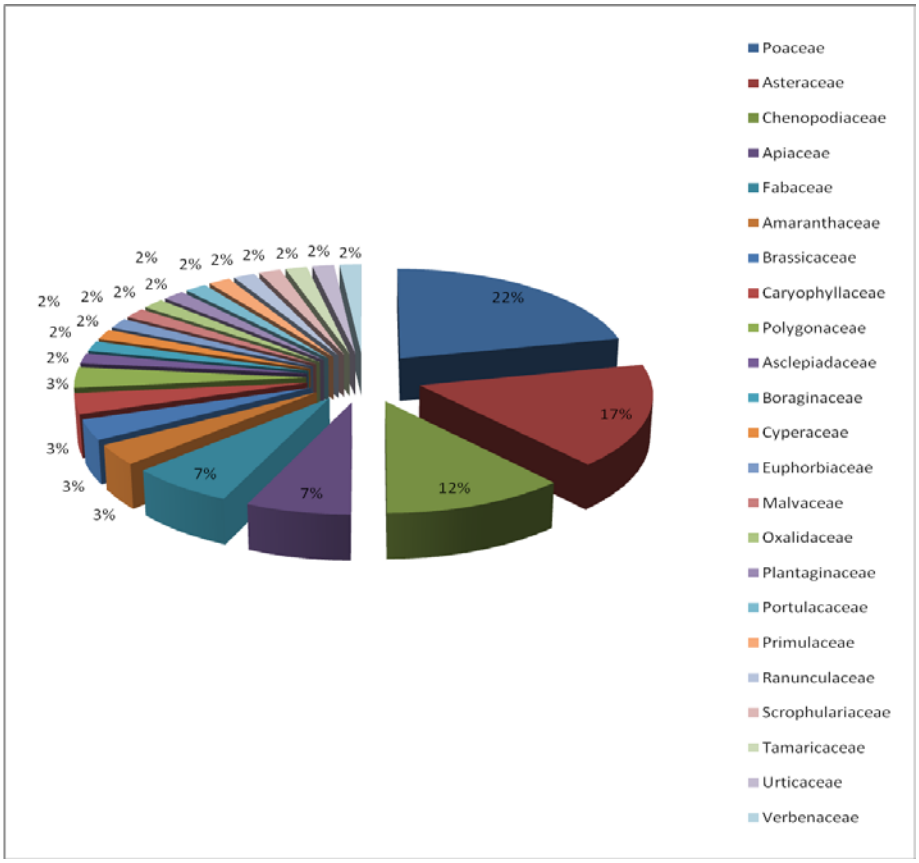

Fig. (5) Pie Structure of recorded families in the study area

Chorological analysis of the weed flora associated with the field crops in the study area indicated that the Mediterranean floristic element attained the maximum representation.Among 23 recorded families the dominant family of the area is Poaceae with 13 species followed by Asteraceae with 10 species. Family Chenopodiaceae are third in this ranking with 7 species each. Apiaceae and Fabaceae stands at fourth place with 4 species. Amaranthaceae, Brassicaceae, Caryophyllaceae, Polygonaceae have 2 species each. Asclepiadaceae, Boraginaceae, Cyperaceae, Euphorbiaceae, Malvaceae, Oxalidaceae, Plantaginaceae, Portulacaceae, Primulaceae, Ranunculaceae, Scrophulariaceae, Tamaricaceae, Urticaceae, Verbenaceae have only 1 species each (Table 5)

Table (5); Floristic composition of the study Area.

Family	No. of Species	% of presence
Poaceae	١٣	٢١.٦٧
Asteraceae	١٠	١٦.٦٧
Chenopodiaceae	٧	١١.٦٧
Apiaceae	٤	٦.٦٧
Fabaceae	٤	٦.٦٧
Amaranthaceae	٢	٣.٣٣
Brassicaceae	٢	٣.٣٣
Caryophyllaceae	٢	٣.٣٣
Polygonaceae	٢	٣.٣٣
Asclepiadaceae	١	١.٦٧
Boraginaceae	١	١.٦٧
Cyperaceae	١	١.٦٧
Euphorbiaceae	١	١.٦٧
Malvaceae	١	١.٦٧
Oxalidaceae	١	١.٦٧
Plantaginaceae	١	١.٦٧
Portulacaceae	١	١.٦٧
Primulaceae	١	١.٦٧
Ranunculaceae	١	١.٦٧
Scrophulariaceae	١	١.٦٧
Tamaricaceae	١	١.٦٧
Urticaceae	١	١.٦٧
Verbenaceae	١	١.٦٧
Total	٦٠	

Relationship between soil variables and vegetation groups are represented below in figures, the mean values of soil variables of five sites are represented. The soil texture in all sites is formed mainly of coarse fraction (sand) and partly fine fractions (silt& clay). It is clear that the percentages of sand, silt, clay, $CaCO_3$, EC, soil porosity and water-holding capacity are most effective soil variables which affected in dominance and presence of families showing in the figure (1). Poaceae is the dominant (22%), followed by Asteraceae (17%) and Chenopodiaceae (12%)

Soil properties of Selected Orchards Sites

These figures show the different parameters of the physical and chemical study done on the study area.

Soil analysis indicated that the soil variables in both winter and summer seasons are widely affect on the distribution and species abundance of weed flora in the study orchards. The most important soil variables controlling the distribution and richness of weed species are: soil texture, porosity, water-holding capacity, organic carbon, electrical conductivity, calcium carbonate, chlorides and potassium, sodium and calcium cat ions. The lowest mean values of soil porosity were attained in site IV. The lowest values of PH and conductivity are found in site П. Calcium carbonate content attained the highest mean in site IV and the lowest mean in site П. The organic carbon content attained the highest mean value (0.6%) in site IV and the lowest mean value (0.5%) in site Ш. The lowest values of (K^+) and (Ca^{+2}) are

attained in site П (9.8ppm and 2.8ppm) while the highest values are in site IV (20.7ppm and 5.4ppm). Sodium (Na^+) gives the same value in both site I and Ш (6ppm), while its highest value is in site IV (11ppm). The lowest value of chloride is found in site П (0.05) while the highest value is (0.2) in site V. Nitrogen and phosphors (N_2 and P) are attained the lowest values in site Ш (0.2% and 0.8%) while the highest values are in site4 (0.8% and 5.1%). (Table 6)

Table 6. Physical and Chemical properties of soil samples:

Item	Site I	Site П	Site Ш	Site IV	Site V
PH	8.55	8.2	8.44	8.38	8.56
Conductivity (µmhos/cm)	276	117	196	207	268
Calcium Carbonates (%)	15	10	11	17.5	14
Organic Carbon (%)	0.55	0.57	0.5	0.6	0.53
K^+ (ppm)	12.6	9.8	10.4	20.7	15.6
Na^+ (ppm)	6.2	6.6	6.1	10.2	6.3
Ca^{++} (ppm)	3.1	2.8	3.1	5.4	3.8
Chlorides (%)	0.1	0.05	0.1	0.2	0.2
Total Nitrogen(mg/g drywt)	0.4	0.5	0.3	0.8	0.4
Total Phosphorus (mg/g drywt)	1.7	3.8	0.7	5.1	1.2

DISCUSSION

Plants serve several critical functions in the biosphere. They regulate the flow of numerous biogeochemical cycles; it is also of great importance in local and global energy balances. Second, plants strongly affect soil characteristics, including soil volume, chemistry and texture. Third, they serve as wildlife habitat and the energy source for the bulk of animal.

Plants are also critically important to the world economy in the use of fossil fuel as an energy sources. Perhaps most importantly, they are primary source of oxygen in the atmosphere, enabling the aerobic metabolism systems to evolve and persist. Vegetation is important to humans, who have direct contact with plants for food, wood, fuel, shelter, and medicine. Weeds represent a biologically important component of their environments (Mashaly and Awad, 2003). Their persistence is remarkable in view of the efforts to eliminate them, and warrants greater attention (Radosvich and holt, 1984).

Crop losses from the weed growth constitute a major problem to economy of many agricultural communities. Vegetation of the agro-ecosystem of the reclaimed lands consisted mainly of the weed species growing in the crops of the old cultivated lands. This suggests that land reclamation entails weed species replacing natural plant weeds. Therefore, the reclaimed areas can be considered as a transitional phase of the succession process of the old cultivated lands (Abd El-Ghani, 2013).

The wide distribution of some weeds in this investigation may be interpreted as ubiquitous species. Species with wide amplitude (e.g., *Cynodon dactylon* and S*onchus oleraceus*) are often caused by phenotypic plasticity and heterogeneity (Shaltout *et al*, 1992).

Weeds extend the harmful effects slowly, steadily and inconspicuously and the effect is almost unchangeable (Prashant *et al*, 2009**)**.

Sixty plant species belongs to twenty three families; this number represented most of weeds in the orchards of new Damietta. The most represented families were Poaceae, asteraceae, chenopodiaceae, *Apiaceae* and Fabaceae. *Poaceae is the dominant family of the area followed by asteraceae.*

Twenty two species used as the treatment of common diseases. Twenty four species are used as food. Nineteen species are used as fodder for animals and thirty four species used for industry, ornamental and furniture.

By making a survey for the plants which found in different five orchards, we found that the variation in soil variables and type of plants, weeds differ in distribution according to their ability to grow under these conditions; most of these weeds are annuals.

Understanding habitats, chorotypes and life forms of these weeds, we can prevent their growth to help farmers and prevent the huge lost in yield.

Based on the obtained results, it could be concluded that the orchards of New Damietta are rich in weeds. Some noxious weeds invade these orchards. Further studies are urgent needed to study these weeds for credible management.

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دراسة بيئية على فلورا الحشائش النامية ببساتين الفواكه بدمياط الجديدة

ممدوح سالم سراج ، عبد الحميدعبد الفتاح خضر ، سامي ربيع و أحمد جمال الكومي
قسم النبات- كليه العلوم-جامعه دمياط

يختص البحث بدراسة بيئية على فلورا الحشائش النامية ببساتين الفواكه بدمياط الجديدة وقد تم تجميع النباتات بعد دراسة حقلية ميدانية و عمل نماذج معشبية حفظت بمعشبة قسم النبات - كليه العلوم - جامعه دمياط

تضمن البحث قائمة تشمل على٦٠ نوعا نباتيا ينتمون الى ٢٣ فصيلة يمثل هذا العدد معظم انواع الحشائش بحدائق الفاكهة بمنطقة دمياط الجديدة وقد لوحظ من خلال الدراسة ان نباتات العائلة النجيلية هي السائدة بينما تليها نباتات العائلة المركبة.

وبعمل حصر للنباتات الموجودة في خمس مواقع مختلفة تبين ان نتيجة الاختلاف في خصائص التربة ونوعية النباتات المنزرعة اختلفت الحشائش حسب قدرة النبات على التأقلم مع البيئة المحيطة وتبين ايضا ان معظم هذه النباتات هي نباتات موسمية تختلف من فصل الى اخر.

ومن خلال معرفة هذه الأنواع وأوقات ظهورها والبيئة المناسبة لنموها يمكن مكافحتها بالطرق المناسبة التي تفيد المزارعين وتساهم بشكل كبير في تجنب اضرار هذه النباتات على نباتات الفاكهة.

والنتائج المتحصل عليها تفيد فى الادارة ومكافحة هذه النباتات التى تسبب خسائر مادية كبيرة ببساتين الفاكهة بدمياط الجديدة.