A COMPARATIVE STUDY ON THE KINDS OF WEEDS OF PALM PLANTATIONS IN TABUK AND AL-QASSIM REGIONS IN SAUDI ARABIA

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ABSTRACT

This study was aimed to investigate weeds kind in palm plantations. Date palm is the most chief economic crop in most countries of the Arabian Peninsula. Many factors, such as the presence of weeds, may cause a huge loss in the production of dates. Despite the severe damage caused by the presence of some weeds in agroecosystems, many weeds have many medicinal and economic uses. A total of 62 species were listed in palm Plantations in Tabuk and Al-Qassim Regions. A total of 51 species were listed in Tabuk Region (The number of unique species in the Tabuk Region reached 32 that not recorded in Al-Qassim Region. Also, 19 species were recorded in both of Tabuk and Al-Qassim Regions). A total of 30 weeds were listed in Al-Qassim Region (The number of unique species in the Al-Qassim Region reached 11 that not recorded in the Tabuk Region. In addition to, 19 species were recorded in both of Tabuk and Al-Qassim Regions). Zygophyllaceae was the most common family, the majority life span was annuals and the most common life form was therophyte in both Tabuk and Al-Qassim Regions. Data management and classification were achieved using PCORD (TWINSPAN and DCA analyses).

Keywords: Economic crops, Production losses, Agroecosystems.

دراسة مقارنة انواع الأدغال في مزارع النخيل بمنطقة تبوك والقصيم في المملكة العربية السعودية

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المستخلص

الغرض من البحث الكشف عن أنواع الأدغال في مزارع النخيل ، يعتبر نخيل التمر من أهم المحاصيل الاقتصادية في معظم دول شبه الجزيرة العربية. قد تتسبب عوامل كثيرة ، مثل وجود الأدغال ، في خسارة كبيرة في إنتاج التمور. على الرغم من الأضرار الجسيمة التي يسببها وجود بعض الأدغال في النظم الزراعية البيئية ، فإن العديد من الأدغال لها استعمالات طبية واقتصادية عديدة. تم تسجيل 62 نوعاً في مزارع النخيل بمنطقة تبوك والقصيم. تم إدراج 51 نوعاً في منطقة تبوك (بلغ عدد الأنواع الفريدة في منطقة تبوك 32 نوعاً لم تسجل في منطقة القصيم ، كما تم تسجيل 19 نوعاً في منطقتي تبوك والقصيم). من ناحية أخرى تم إدراج ما مجموعه 30 دغلاً في منطقة القصيم (بلغ عدد الأنواع الفريدة في منطقة القصيم 11 نوعاً لم تسجل في منطقة تبوك ، إضافة إلى تسجيل 19 نوعاً في كلا المنطقتين. منطقتي تبوك والقصيم). كانت الفصيلة القديسية هي الأسرة الأكثر شيوعًا ، وكانت معظم فترات حياتها حولية ، وكان أكثر أشكال الحياة شيوعًا هو نبات الحرور في كل من منطقتي تبوك والقصيم. تم تحقيق إدارة البيانات وتصنيفها باستخدام PCORD وتحليلات TWINSPAN و.DCA

الكلمات المفتاحية: المحاصيل الاقتصادية ،فقدان الانتاج، النظم الزراعية، نبات الحرور

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INTRODUCTION

Date palm is one of the most important plants used in traditional medicine, as well as in modern medicine (3). Arab countries are famous for the presence of date palm, especially Saudi Arabia, this country has more than 25 million palm trees. Dates production in Saudi Arabia started more than 10,000 years ago (20, 21). Saudi Arabia ranked third countries that produce dates (37). The presence of weeds may lead to a large loss in the production of dates. Weeds are plants that appear in undesirable locations (61). Weeds are one of the components of agroecosystems. The number of weeds is up to 30,000 species (19). Many weeds caused huge losses in crop yield ranged from 19 % to 56 % (4). Many weeds have allopathic efficiency (46, 62). The presence of weeds leads to the consumption of nutrients, water, and light, which leads to less availability of crops (60). The presences of weeds lead to reduce germination of crop seeds (40). Many factors control the appearance of weeds in agroecosystems, such as crop nature, irrigation methods, climate, humidity availability, soil tillage, as well as the use of fertilizers and herbicides (5, 27, 38). The amount of loss in crop production resulting from the presence of weeds is greater than the amount of loss resulting from the presence of pest (4). Weed control methods include many strategies as seeds selection, adopting modern agriculture methods, and using appropriate and effective herbicides. The use of the hand hoeing weed control method has shown that it is the most effective method in addition to, reducing the harmful effect of using herbicides (22).

Adeux (4), considered weeds are harmful but, not all weeds. Many weeds have medicinal and economic benefits (6, 17, 33). Weeds presence has become a big agriculture problem in the latter two decades in Saudi Arabia (8, 52, 54, 59). Several studies investigated the weed flora of some agroecosystems in many countries as in Chine (36). As well as in Egypt, El-Saied *et al.,* El-Saied and Bedair (34, 32), studied the weed flora in a different area of Egypt. Soliman *et al.,* (58), studied the flora and weed-crop interaction in Egypt. Also, other studies have investigated the weed flora in Saudi Arabia as (1, 50), studied the floristic diversity in the Northern border part of Saudi Arabia. Rayan *et al.,* (54) studied some of agroecosystems in Arar Region. Gazer (39), studied the weed flora in palm orchards in Al-Qassim Region. Gomaa (41), investigated the diversity of weed in palm and olive orchards in Al-Jouf Region. Others (30), studied the weed flora in Al-Qassim Region. Several researches (10, 11, 12), studied the weed flora in Tabuk Region, Gomaa (42), studied weed in citrus Farms in Al-Jouf Region and author (9), studied the weeds that found in olive and palm orchards in Al-Jouf Region. Several resources (50, 51) studied some species of *Plantago* and the floristic diversity of Wadi Ar'ar, KSA. Recently, authors (1, 2) studied the plant diversity assessment of Wadi Al-Hilali and the genetic characterization of Genus *Tephrosia,* Northern Border region, KSA. Many authors studies the weed control and Herbicides, (7) confirmed the integration among cultivars, herbicides, and high crop density to improve the studied characters, (55) used new herbicides (Chevalier WG and Atlantis OD) with low active ingredients in order to reduce environmental issues, as well as control weed plants. (14) concluded that all used herbicides have reduced the weed density and decreased weed dry matter weight in varying proportions depending on the nature of the chemical composition of the herbicide treatment compared with weedy treatment. However, studies and research on weed communities in Saudi Arabia are still insufficient (18). So, this study aims to compare the types of weeds found in date palm farms in the Al-Qassim and Tabuk Regions, Saudi Arabia.

MATERIALS AND METHODS

Study area: Tabuk Region is situated in the northwest of The Kingdom of Saudi Arabia with 146,072 km^2 total area. Tabuk Region is set between lat. 24° 34' 48" & 29° 59' 30" N. and long. 34° 34’ 18" & 39° 59' 5" E. The altitude reaches 768 meters a.s.l. Tabuk bounded by Jordan to the north, Medina to the south, Hail and Al-Jouf Region to the east, Red Sea and Gulf of Aqaba to the west. Al-Qassim is set in the central portion of Saharo-Arabian floristic area (16). Al-Qassim Region

is situated in the central north of KSA with 73,000 km^2 total area. Al-Qassim Region is set between lat. 24° 25' & 27° 15' N and long. 41° 30' & 44° 45' E. The altitude reaches 740 meters a.s.l. Al-Qassim bounded by Hail to the north, Riyadh to the south, Eastern Province to the east, Medina to the west. Arc GIS was used to create a map of the studied area. The different species of weeds that present in date palm farms in Tabuk and Al-Qassim Regions in Saudi Arabia are listed in the period from January to July 2019. In Tabuk Region, five stands were chosen (western, central, northern, southern, and eastern Tabuk Region). In each stand, five farms were selected. For each farm, five quadrates were chosen, each quadrate with an area 10×10 = 100 m^2. Also, in Al-Qassim Region, five stands were chosen (western, central, northern, southern, and eastern Al-Qassim Region). In each stand, five farms were selected. For each farm, five quadrates were chosen, each quadrate with an area 10×10 = 100 m^2. All weed species in each stand were identified according to (23 -26), (28) and (13). Life forms of weeds were identified after (53) and (43) and the chorology of weeds was identified after (29). PC-ORD program was used to perform statistical analyses; Two Way Indicator Species Analysis (TWINSPAN), as well as Detrended Correspondence Analysis (DCA) (48).

RESULTS AND DISCUSSION

A total of 62 weeds were listed in palm Farms in Tabuk and Al-Qassim Regions. A total of 51 weeds related to 23 families were listed in Tabuk Region. On the other hand, a total of 30 weed species related to 17 families were listed in Al-Qassim Region. In Tabuk Region, Zygophyllaceae, Asteraceae, and Fabaceae were the most frequent families with eight species, seven species, and five species, respectively. Bothe of Chenopodiacea and Plantaginacae were having four species each. Brssicaceae and Poaceae were having three species each. Caryophyllaceae was having two species. A total of 15 families were having a single species each. In Al-Qassim Region Zygophyllaceae was the most common family with four species. Asteraceae, Chenopodiacea, Plantaginacae, and Poaceae were having three species each. Aizoaceae and Borginaceae were having two species each. On the other hand, ten families were having a single species each (Table 1).

Table 1. List of weed species that recorded in Tabuk and Al-Qassim Regions

Family	Plant species	Life span	Life form	Chorology	Al-Qassim Region	Tabuk Region
Amaranthaceae	*Amaranthus albus* L.	A	Th	American	+	-
Aizoaceae	*Aizoon canariensis* L.**	P	H	SA-SI + S-Z	+	+
	Zaleya pentandra (L.) Jeffrey	A	Th	S-Z	+	-
Apiaceae	*Anisosciadium lanatum* Boiss.**	A	Th	IR-TR+SA-SI	+	+
Asteraceae	*Atractylis carduus* Forssk.	P	Ch	SA-SI	-	+
	Ifloga spicata (Forssk.) Sch.Bip.	A	Th	SA-SI	-	+
	Launea capitata (Spreng.) Dandy**	A	Th	SA-SI	+	+
	Picris abyssinica Sch.Bip	P	Ch	Tropical	+	-
	Pulicaria undulata (L.) C.A.Mey.**	P	Ch	SA-SI +S–Z	+	+
	Senecio glaucus L.	A	Th	IR–TR+SA-SI	-	+
	Sonchus oleraceus L.	A	Th	COSM	-	+
Borginaceae	*Arnebia hispidissima* (Lehm.)DC.	A	Th	SA-SI+S-Z	-	+
	Heliotropium aegyptiacum Lehm.	A	Th	SA-SI+S-Z	+	-
	Heliotropium bacciferum Forssk.	P	Ch	SA-SI+S-Z	+	-
Brssicaceae	*Diplotaxis harra* Forsk.	P	H	IR-TR+SA-SI	-	+
	Zilla spinosa L.	P	Ch	ME+IR-TR+EU-SI+SA-SI	-	+
	Brassica tournefortii Guan.**	A	Th	ME+SA-SI	+	+
	Eremobium aegyptiacum Spreng.	A	Th	SA-SI	-	+
Caryophyllaceae	*Paronychia arabica* L.	A	Th	ME+IR-TR+SA-SI	-	+
	Spergula fallax (Lowe) E. H. L. Krause	A	Th	COSM	+	-
Capparaceae	*Cleome amblyocarpa* Barratte & Murb.	A	Th	SA-SI + S-Z	-	+
Chenopodiacea	*Bassia muricata* (L.) Asch.	A	Th	IR-TR+SA-SI	-	+
	Chenopodium murale L.**	A	Th	COSM	+	+
	Haloxylon salicornicum (Moq.) Bunge ex Boiss.**	P	Ch	S-Z	+	+
	Salsola imbricata Forssk.	P	Ph	S-Z	-	+
	Sueda vermiculata Forssk. ex J.F. Gmel.	P	Ch	SA-SI	+	-
	Traganum nudatum Delile	P	Ch	SA-SI	-	+
Convolvulaceae	*Convolvulus arvensis* L.	P	G	PAL	-	+
Cucurbitaceae	*Citrullus colocynthis* (L.) Schrad.	P	H	ME+IR-TR+SA-SI+S-Z	-	+
Euphorbiaceae	*Euphorbia granulate* Forsk.	A	Th	SA + S-Z	-	+
Fabaceae	*Astragalus tribuloides* Delile.	A	Th	IR-TR+SA-SI	-	+
	Astragalus hauarensis Boiss.	A	Th	IR-TR	-	+
	Astragalus spinosus Forssk.	P	Ch	IR-TR+SA-SI	-	+
	Medicago laciniata (L.) Mill.	A	Th	SA-SI	-	+
	Trigonella stellata Forssk.	A	Th	IR-TR+SA-SI	+	-
Geraniaceae	*Monsonia nivea* Decne.	P	Ch	IR-TR+SA-SI+SZ	-	+
Gisekiaceae	*Gisekia pharnaceoides* L.	A	Th	SA-SI+S-Z	-	+
Liliaceae	*Asphodellus fisulosus* L.	P	G	ME	+	-
Malvaceae	*Malva parviflora* L.**	A	Th	PAN	+	+
Neuradaceae	*Neurada procumbens* L.	A	Th	COSM	-	+
Plantaginacae	*Plantago amplexicaulis* Cav.**	A	Th	IR-TR+SA-SI	+	
	Plantago boissieri Hausskn. & Bornm.**	A	Th	IR-TR+SA-SI	+	+

	***Plantago ciliata* Desf.**	**A**	**Th**	**SA-SI**	**-**	**+**
	***Plantago lanceolata* L.**	**A**	**Th**	**ME+IR-TR+SA-SI**	**-**	**+**
	***Plantago ovata* Forssk.**	**A**	**Th**	**IR-TR+SA-SI**	**+**	**-**
Poaceae	***Cynodon dactylon* (L.) Pers.****	**P**	**G**	**PAN**	**+**	**+**
	Schismus barbatus* (L.) Thell.*	**A**	**Th**	**IR-TR+ME+ SA-SI**	**+**	**+**
	Polypogon monspeliensis* (L.) Desf.*	**A**	**Th**	**SA-SI +ME+ IR-TR**	**+**	**+**
Polygonaceae	***Emex spinosa* (L.) Campd.****	**A**	**Th**	**PAN**	**+**	**+**
Portulacaceae	***Portulaca oleracea* L.****	**A**	**Th**	**ME + SA-SI**	**+**	**+**
Resedaceae	***Oligomeris linifolia* (Vahl ex Hornem.) J.F.Macbr.****	**A**	**Th**	**ME + SA + S-Z**	**+**	**+**
	***Reseda decursiva* Forssk.**	**A**	**Th**	**SA-SI**	**-**	**+**
Urticaceae	***Forsskalea tenacissima* L.**	**P**	**H**	**SA-SI+S-Z**	**-**	**+**
Zygophyllaceae	***Fagonia arabica* L.**	**P**	**Ch**	**SA-SI**	**-**	**+**
	***Fagonia bruguieri* DC.**	**P**	**H**	**IR-TR+SA-SI**	**-**	**+**
	Fagonia glutinosa* Delile.*	**P**	**H**	**SA-SI**	**+**	**+**
	***Fagonia mollis* Delile.**	**P**	**Ch**	**SA-SI**	**-**	**+**
	***Fagonia indica* Burm. f.**	**P**	**Ch**	**SA-SI**	**-**	**+**
	***Seetzenia lanata* (Willd.) Bullock**	**A**	**Th**	**IR-TR+SA-SI+SZ**	**-**	**+**
	Tribulus terrestris* L.*	**A**	**Th**	**IR-TR+ER–SR+SZ**	**+**	**+**
	Zygophyllum simplex* L.*	**A**	**Th**	**SA-SI +S–Z**	**+**	**+**
	***Zygophyllum coccineum* L.**	**P**	**Ch**	**SA-SI+S–Z**	**+**	**-**
Total	**62**				**30**	**51**

(Life span: A = Annual and P = Perennial. Life form: Th = Therophyte, Ch = Chamaephyte, H = Hemicryptophyte, G = Geophyte and P = Phanerophyte. Chorology: COSM = Cosmopolitan, ER–SR = Euro–Siberian, IR–TR = Irano–Turanian, ME = Mediterranean, PAL = Paleotropical, PAN = Pantropical, SA–SI =Saharo–Sindian, S–Z = Sudano–Zambesian. + = Present and - = Absent. ** = species that recorded in both Tabuk and Al-Qassim).

A total of 19 weed were recorded at both Tabuk and Al-Qassim Region (*Aizoon canariensis, Anisosciadium lanatum, Launea capitata, Pulicaria undulata, Brassica tournefortii, Chenopodium murale, Haloxylon salicornicum, Malva parviflora, Plantago amplexicaulis, Plantago boissieri, Cynodon dactylon, Schismus barbatus, Polypogon monspeliensis, Emex spinosa, Portulaca oleracea, Oligomeris linifolia, Fagonia glutinosa, Tribulus terrestris* and *Zygophyllum simplex*). A total of 32 weed were listed only in Tabuk Region and did not recorded at Al-Qassim Region *(Atractylis carduus, Ifloga spicata, Senecio glaucus, Sonchus oleraceus, Arnebia hispidissima, Diplotaxis harra, Zilla spinosa, Eremobium aegyptiacum, Paronychia arabica, Cleome amblyocarpa, Bassia muricata, Salsola imbricata, Traganum nudatum, Convolvulus arvensis, Citrullus colocynthis, Euphorbia granulate, Astragalus tribuloides, Astragalus hauarensis, Astragalus spinosus, Medicago laciniata, Monsonia nivea, Gisekia pharnaceoides, Neurada procumbens, Plantago ciliata, Plantago lanceolata, Reseda decursiva, Forsskalea tenacissima, Fagonia arabica, Fagonia bruguieri, Fagonia mollis, Fagonia indica* and *Seetzenia lanata).* A total of 11 species were recorded only in Al-Qassim Region and not recorded in Tabuk Region (*Amaranthus albus, Zaleya pentandra, Picris abyssinica, Heliotropium aegyptiacum, Heliotropium bacciferum, Spergula fallax, Sueda vermiculata, Trigonella stellata, Asphodellus fisulosus, Plantago ovata* and *Zygophyllum coccineum*). The majority life span was annuals with 30 and 20 species in Tabuk and Al-Qassim Region, respectively. While, perennials species were represented by 21 and 10 species at Tabuk and Al-Qassim Region, respectively (Tables 1, 2)

Table 2. Number of species belonging to life span in Tabuk and Al-Qassim Regions

life span	No. of species in Tabuk Region	No. of species in Al-Qassim Region
Annual	30	20
Perennial	21	10
Total	51	30

Therophyte the most common life form were recorded in Tabuk and Al-Qassim Region with 30 and 20 species, respectively. Chamaephytes were represented by 12 species at Tabuk and 6 species in Al-Qassim. Hemicryptophyte was represented by 5 species at Tabuk and 2 species in Al-Qassim. Geophytes were represented by 3 species at Tabuk and 2 species at Al-Qassim. Phanerophyte was represented by a single species at Tabuk (*Salsola imbricata*) (Tables 1, 3).

Table 3. Number of species according to their life forms in Tabuk and Al-Qassim Regions

Life form	No. of species in Tabuk Region	No. of species in Al-Qassim Region
Therophyte	30	20
Chamaephyte	12	6
Hemicryptophyte	5	2
Geophyte	3	2
Phanerophyte	1	0
Total	51	30

According to phytogeographical point, the recorded weeds were categorized into pluriregional, biregional, or monoregional. In Tabuk Region 14 species belonging to monoregional were recorded. Biregional and pluriregional were represented by 21 and 7 species. In Al-Qassim Region 7 species related to monoregional were listed. While, biregional and pluriregional were represented by 13 and 4 species, respectively (Tables 1, 4).

Table 4. Number of species belonging to chorology in Tabuk and Al-Qassim Regions

Chorology	No. of species in Tabuk Region	No. of species in Al-Qassim Region
Monoregional		
SA-SI	11	3
S-Z	1	2
ME	1	1
IR-TR	1	0
American	0	1
Subtotal	14	7
Biregionals		
IR-TR+SA-SI	10	5
ME+SA-SI	2	2
SA-SI+S–Z	9	6
Subtotal	21	13
Pleuriregionals		
ME+IR-TR+SA-SI	4	2
ER–SR+IR-TR+ S-Z	1	1
SA-SI+IR-TR+ S-Z	1	0
SA-SI + S-Z +ME	0	1
ME+ ER–SR +IR-TR+SA-SI	1	0
Subtotal	7	4
World wide		
Tropical	1	1
PAN	3	3
PAL	1	0
COSM	4	2
Subtotal	9	6

Total	**51**	**30**

In Tabuk Region, Saharo–Sindian phytochoria were represented by 11 species, Saharo–Sindian–Irano–Turanian phytochoria were having 10 species, Sudano–Zambesian–Saharo–Sindian phytochoria was represented by 9 species, Cosmopolitan and Saharo–Sindian–Mediterranean–Irano–Turanian phytochoria were having 4 species each, pantropical species was having 3 species, Saharo–Sindian–Mediterranean phytochoria was having 2 species. Mediterranean, Euro–Siberian Irano–Turanian–Sudano–Zambesian, Irano–Turanian–Saharo–Sindian–Sudano–Zambesian, Mediterranean–Irano–Turanian–Euro–Siberian–Saharo–Sindian, palaeotropical, Sudano–Zambesian, tropical and Irano–Turanian regions were having a single species each (Tables 1, 4). In Al-Qassim Region, Saharo–Sindian–Sudano–Zambesian region was having 6 species, Irano–Turanian–Saharo–Sindian region was having 5 species, Saharo–Sindian and pantropical regions having 3 species each, cosmopolitan, Mediterranean–Irano–Turanian–Saharo–Sindian, Mediterranean–Saharo–Sindian and Sudano–Zambesian regions were having 2 species each, Euro–Siberian–Irano–Turanian–Saharo–Sindian, Mediterranean, tropical, American and Sudano–Zambesian–Mediterranean–Saharo–Sindianregions were having a single species each (Tables 1, 4). TWINSPAN analysis was divided the studied stands into two groups at the first level. The first group (negative group) includes six stands (central Tabuk, central Al-Qassim, northern Al-Qassim, southern Al-Qassim, eastern Al-Qassim, and western Al-Qassim). On the other hand, the second group (positive group) includes four stands (northern Tabuk, southern Tabuk, eastern Tabuk, and western Tabuk) and the indicator species for this group is *Zilla spinosa*. At the second level negative group was divided into two groups. The first group includes two stands (central Al-Qassim and southern Al-Qassim), while the second group includes four stands (central Tabuk, northern Al-Qassim, eastern Al-Qassim, and western Al-Qassim) and the indicator species for this group is *Anisosciadium lanatum*. The positive group was divided into two groups. The first group includes three stands (northern Tabuk, southern Tabuk, and western Tabuk) and the second group includes a single stand (eastern Tabuk) the indicator species for this group is *Arnebia hispidissima*. DCA analysis explained that the studied stands were separated into two main groups. The first group includes Tabuk stands and it has many distinct plant species as *Fagonia bruguieri, Astragalus spinosus, Ifloga spicata, Diplotaxis harra, Seetzenia lanata, Eremobium aegyptiacum, Arnebia hispidissima, Plantago ciliata, Fagonia indica, Sonchus oleraceus, Paronychia arabica, Citrullus colocynthis, Neurada procumbens, Salsola imbricata, Fagonia arabica, Zygophyllum simplex, Launea capitata, Chenopodium murale, Zilla spinosa, Atractylis carduus, Gisekia pharnaceoides, Medicago laciniata, Senecio glaucus, Monsonia nivea, Convolvulus arvensis, Bassia muricata, Reseda decursiva, Fagonia glutinosa, Cleome amblyocarpa* and *Astragalus hauarensis.* On the other hand, the second group includes Al-Qassim stands and it has many distinct plant species as *Asphodellus fisulosus, Haloxylon salicornicum, Zygophyllum coccineum, Brassica tournefortii, Trigonella stellata* and *Plantago boissieri*. A total of 62 weeds were recorded in palm plantations in Al-Qassim and Tabuk Regions. A total of 51 species related to 23 families were listed in Tabuk Region. A total of 30 species related to 17 families were listed in Al-Qassim Region. Zygophyllaceae and Asteraceae were the most common families in Tabuk and Al-Qassim Regions. These results correspond to (10), who has counted weeds in olive orchards in Tabuk Region. On the other hand, Poaceae was the most common family in palm and olive farms in Al-Jouf Region, Saudi Arabia (9, 42). The numbers of weeds were listed in palm plantations in this research (51 species) is greater than the number of species were listed in olive plantations in the same region (10). On the other hand, a total of 30 species related to 17 families were listed in Al-Qassim Region. The weed flora in Saudi Arabia as (1, 50), studied the floristic diversity in the Northern border part of Saudi Arabia. Rayan *et al.,* (54) studied some of agroecosystems in Arar Region. (39), was

recorded 55 weed species in the palm farms of central of KSA. (41), was recorded 71 weed species in olive and palm plantations in Al-Jouf Region, Saudi Arabia. Gomaa (42) was recorded 33 weed species in citrus plantations in Al-Jouf Region, KSA. Alhaithloul (9), was recorded 53 weed species in palm and olive plantations in Al-Jouf Region, KSA. It should be listed that the diversity of weeds is less in the fields that are tilled annually (47). Excessive use of herbicides determines the diversity, as well as the abundance of weeds within agroecosystems (57). Also, the excessive use of herbicides causes the appearance of weeds that are more resistant to herbicides (45). The majority life span was annuals and the most common life form was therophytes in palm farms in both Tabuk and Al-Qassim Regions. This result is consistent with (9, 10, 11, 12, 15, 30, 31, 41, 42,49), who studied the floristic composition in many Regions of KSA. In addition to, the dominance of therophytes in different arable lands was documented in other previous studies (50, 57) and could be credited to the small life cycles that permit them to survive with the unstable environments of the agroecosystems habitats (35). As well as, therophytes give more of its resources to build the reproductive structures (44). Also, therophytes form flowers early in their life cycle (56). Also, therophytes can formation the seeds without having to a visiting pollinator (21). On the other hand, the majority life span was perennials with 29 species, while annuals species were represented by 26 in date palm plantations in the Central Region of KSA (34). TWINSPAN and DCA analyses showed the studied stands were divided into environmentally similar groups based on the indicator species for Tabuk Al-Qassim Regions.

CONCLUSIONS

A total of 62 weeds were listed in palm plantations in Al-Qassim and Tabuk Regions. A total of 51 weeds related to 23 families were listed in Tabuk Region. On the other hand, a total of 30 species related to 17 families were listed in Al-Qassim Region. A total of 19 species were recorded in both Tabuk and Al-Qassim Region. A total of 32 species were listed only in Tabuk Region and not recorded in Al-Qassim Region. A total of 11 species were listed only in Al-Qassim Region and not recorded in Tabuk Region. The most common life span was annuals and therophyte the most common life form in palm farms in Tabuk and Al-Qassim Regions. TWINSPAN and DCA analyses were used to divide the studied stands into groups depending on the indicator species for each group. The necessity of surveying weeds in farms in various regions, identifying harmful weed species, and using appropriate strategies to control these weeds. The uses of useful weed species in many medicinal and economic fields.

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