Isolation, Identification and Pathogenicity of Seed borne fungi of some barley cultivars

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Abstract:

One hundred seeds were tested for each cultivars according to ISTA technique and using agar plate method. The pathogenicity test was conducted to study the effect of 6 fungal pathogen on pre and post emergence damping off and survival damping off seedling by inoculation of soil .Seven fungal genera *Alternaria,Aureobasidium, Cladosporium, Drechslera, Penicillium , Rhizoctonia* and *Stemphylium* were isolated from Barley seeds from Hawler governorate at season 2006. The *Alternaria* isolated at highest occurrence percentage (%75.2),while the *Stemphylium* isolated record the lowest incidence percentage (%0.1).Six fungal genera *Alternaria, Aureobasidium, Cladosporium , Drechslera, Rhizoctonia* and *Stemphylium* were isolated from Barley seeds at the season of 2007. The results obtained that the control significantly increases pre- emergence damping off seedlings after 10 days of sowing of seeds, the mean value was (1.08) as compared with fungal pathogen treatment which decreases their plant mean values obtained for *Alternaria,Aureobasidium, Curvularia, Drecslera, Stemphylium* and *Rhizoctonia* were recoded respectively .The ICARDA cultivar significantly affected which increased the post damping off seedlings their value was (3.0476) as compare with other cultivars. The results indicate that survival significantly increased their values were 7.833 as compared with control 8.916.

Keywords: Barley, Seed health testing, Fungi

I. Introduction:

Barley (*Hordeum vulgare* L.) like most of the economically important crops, is prone to diseases. Considering its world-wide production and average annual production of 40.998 tonnes, Area 336.801/ Donum and Yield 121.72 kg/ Donum in Kurdistan region [1] due resources have been allotted to tackle disease problems. Barley is an annual cereal grain, which for serves as a major animal feed crop, with smaller Amounts used for malting and in health food. It is a member of the grass family poaceae. In 2005, barley ranked fourth in quality produced and in area of cultivation of cereal crops in the world (560000 km^2). Barley is descended from wild barley (*Hordeum spontaneous*). Both forms are diploid as wild barley is inter fertile with domesticated barley, the two forms are often treated as one species, *H.vulgare*, divided into subspecies spontaneous (wild) and subspecies vulgare (domesticated). The main difference between the two forms is the brittle rachis of former, which enables seed dispersal in the wild.Net blotch, an important disease of

barley, has been the focus of attention for many years. Yield losses due to this disease have been estimated to range from 10-40% [2] and 100% damage have also been reported [3].

Plants are constantly confronted with a wide variety of potential pathogens within their environment including bacteria, fungi, viruses and nematodes . Roots and shoots of all plants come into intimate contact with plant pathogens. Each pathogen has evolved a specific way to invade plants .Some species directly penetrate surface layers by using mechanical pressure or enzymatic attack. Others pass through natural openings (e.g., stomata or lenticels). A third group invades only tissue that has been previously wounded. Once inside the plant, three main attack strategies are deployed to utilize the host plant as a substrate: necrotrophy , in which the plant cells are killed; biotrophy, in which the plant all remain alive; and hemibio-trophy , in which the pathogen initially keeps cells alive but kills them at later stages of the infection. Nevertheless in nature the develop-pment of disease is more the exception than the rule and resist-ance the normality, for example less than 10% of the 100,000 known fungal species are able to colonise plants, and an even smaller fractions are able to cause disease [4].

The seed borne pathogens may cause seed abortion, seed rot, scleroticsation or stromatisation of seed, seed necrosis, reduction or elimination of germination capacity as well as seedling damage resulting in the development of disease at later stages of plant growth by systemic or local infections. Seed infections may occur systemically as in tomato wilt where the pathogen moves from root up to the seed through vessels. The infection may also occur through pericarp of the seed as in the species of *Cercospora* and *Colletotricum*; through bracts as in *Ustilago avenae*; through flower and fruit stalk as in *Colleotricum lini*. contamination of seeds occur as in smuts of sorghum *Sphaecelotheca sorghi* and many other diseases at the time of *Alternaria,Fusarium, Drechslera* and *Stemphylium* may be transmitted in the form of spores on the seed surface as also many downy mildew fungi may contaminate the seed surface by their oospores [5].

II. Materials and Methods:

A. Sample collection:

Thirty samples of barley seeds were collected from different location in Kurdistan (Hawler, Sulaimani and Duhok governorates) which including (Acsad.14 ,Zanbaka ,Acsad.2,Icarda,T.E.A,Acsad.9.2006),(Acsad.14,Zanbaka,R2,7/4,Tadmor, Icarda.2007),(Arivat.10R2, Acsad.14 R2,Amal.2R3,Bipa-9R3,Alkheir.R1. 2007),(Acsad.12,Zanbaka.R1, Acsad .r1,Zanbaka.R2,Acsad.R2.2006),(Tadmor-Rohol mazu -rkal3,Acsad .14, Arta-3-arar-hspont19,Zanbaka, Rbho –Zanbaka-3-er-apm-Lignee -3.2006), (Acsad. 12,Acsad.8,Iba-99, Acsad.99 –Bipa ,Eba.2007) respectively during 2006-2007 seasons. the seeds were grown during 2005-2007 obtain from Agriculture research centre . The samples directly placed and labelled in bags and transferred immediately to the laboratory where stored in cool place for further investigation.

B. Seed Health Testing :

Seed health testing for seed borne fungi was carried out following the rules of

international seed testing association[6]were used for the detection and isolation of seed borne fungi of barley by using agar plate method [7]. In agar plate method potato dextrose agar (PDA) was used which prepared by dissolving 39gm of PDA powder in 1L distil water and autoclaved at 121^0C,1.5bar pressure for 15 minute, and adding streptomycin sulphate(50 ppm)streptomycin sulphate antibiotic for prevention bacterial growth. Ten seeds were distributed on 9cm Petri dish totalling one hundred per each treatment(5replicate).The seeds were surface sterilized with 1% sodium hypochlorite for 3 minute and thoroughly washed in sterilized distil water before plating them on PDA [8].The plates were then incubated at 25 ± 2^0 C and after 7 days were examined [7], the seed borne fungi which grew out from the seeds on to the medium in the form fungal colonies were sub cultured and microscopic characteristics of each fungal growth were studied leading to the identification of fungi up to the genera level.

C. Identification:

All plates were incubated for 48h and then observed daily for the presence of colonies. Colonies with macroscopic characteristics visual examined and observed microsco-pically by using clear lacto phenol stain. For final morphological studies ,slide culture were prepared and the microscopic examination of slide cultures was performed by using bright field and phase microscopy (4x objective) as described by [9,10, 11,12].

D. Pathogenicity test:

The field experiment was conducted at tobacco agriculture research centre (Koya) in 25^{th} Feb . 2008. Seed borne fungi used in the pathogenicity tests: CRD experiment was used with 96 experiment unit (8 seed cultivar 4 fungal species 3 replicate) as following Fungal genera (*Alternaria,Curvularia,Stymphlium, Dreschslera , Aureobasidium , and Rhizoctonia*) were tested for their pathogenic effects on barley seeds and seedlings. Eight barley cultivars were used for pathogenicity test (Arta,Tadmor,Arivate,IEba,ICARDA moroc , Zanbaka strain, Alkheir and Acsad 14).

E. Soil inoculation:

168 pots (23cm) filled with sandy soil were used , each pot was filled with 3kg sterilized soil(the soil was autoclaved at121^0C,1.5bar for 15min). Three replicates were used for each treatment. The pots were inoculate with the fungal inoculums 7day age ,half Petri dish for each pot, [13].The pots leaved for 4 days with irrigation to prepare moist condition, ten seeds were distributed for each pots after surface sterilized with 1% sodium hypochlorite and washed by distil water. The pre emergence and post emergence seedling recorded after 7 days of the planting.

III. Results and Discussions:

A. Isolation of seed borne fungi from cultivars of barley seeds in Hawler governorate:

From five barley cultivars six genera of fungi were isolated and identified in (Hawler governorate) at the season 2006. Of these *Alternaria* , *Aureobasidium and Cladosporium* were found to be predominant. The occurrence of each fungi was recorded in term of frequency number and mean as shown in table (I).The genus *Alternaria* was the most frequently isolated pathogen ,their frequency number reach to(61) and mean to (6.1) , but the genus *Aureobasidium* record the frequency number (15) and mean (1.5), while the genus *Cladosporium* record the frequency number 2 and mean 0.2 for H1andAcsad-14 respectively. And *Alternaria,Aspergillus,Aureoba-sidium, Cladosporium, Cuvularia, Drechslera ,Mucor,Rhizoctonia.*and *Stemphyllium* were isolated and identified in Hawler governorate at 2007 season .Of these *Alternaria, Aureobasidium* and *Cladosporium* were found to be predominant. *Aureobasidium* was the most frequently isolated pathogen, their frequency 7 and mean 0.7 were obtained , the genus *Cladosporium* their frequency reach to 4, and mean to 0.4 , while *Alternaria, Rhizoctonia* and *Stemphylium* obtain the frequency number 2 and mean 0.2, while *Aspergillus* and *Drechslera* have the minimum value of frequency number1and mean 0.1for Acsad-14-strain respectively .

B. Percentage of fungi isolated from barley seeds at 2006 and 2007:

Fig. (1) shows seven fungal genera isolated from Barley seeds which were (*Alternaria* , *Aureob-asidium,Cladosporium ,Drechslera, Penicillium, Rhizoctonia* and *Stemphylium*) respectively from Hawler governorate at 2006. *Alternaria* isolated at highest occurrence percentage(%75.2),while the *Stemphylium* isolated record the lowest incidence percentage (%0.1) and the incidence percentage for *Cladosporium* ,%2.5, *Rhizoctonia,* %1.8 and *Aureobasidium* % 1.2 were recoded from (H1and Acsad-14) cultivar respectively. Seven fungal genera isolated from Barley seeds were *Alternaria* , *Aureobasidium ,Cladosporium* and *Drechslera,Rhizoctonia* , *Penicillium* ,and *Stemphylium* respectively , *Alternaria* isolated record the highest incidence percentage (%68.5) , while the *Stemphylium* , *Penicillium* , *Drechslera* (%1.1) isolated record the lowest incidence percentage and the incidence percentage for (%4.5) *Cladosporium,*(%9) *Rhizoctonia* ,and (%14.6) *Aureobasidium* were obtained H2 and Acsad-2 cultivar respectively.

Table.I: Seed borne fungi isolated from cultivars of barley seeds from Hawler governorate at season 2006.

Cultivars / Fungi	Barley cultivars									
	Acsad-14		Acsad-2		ICARDA. T.E.A		Acsad-8		Local check strain	
	Frequency	Mean (±SD)	Frequency	Mean (±SD)	Frequency	Mean (±SD)	Frequency	Mean (±SD)	Frequency	Mean (±SD)
Alternaria	61	6.1 (±2.42)	61	6.1 (±2.424)	22	2.2 (±1.033)	45	4.5 (±1.65)	55	5.5 (±2.915)
Cladosporium	2	0.2 (±0.422)	4	0.4 (±0.699)	1	0.1 (±0.316)	2	0.2 (±0.422)	6	0.6 (±0.843)
Rhizoctonia	2	0.2 (±0.422)	8	0.8 (±1.033)	--	--	3	0.3 (±0.483)	2	0.2 (±0.422)
Aureobasidium	15	1.5 (±1.179)	13	1.3 (±0.675)	4	0.4 (±0.516)	11	1.1 (±1.37)	9	0.9 (±0.994)
Penicillium	---	-- --	1	0.1 (±0.316)	--	-- --	--	-- --	--	-- --
Stemphyllium	1	0.1 (±0.316)	1	0.1 (±0.316)	--	-- --	1	0.1 (±0.316)	1	0.1 (±0.316)
Aspergillus	---	-- --	1	0.1 (±0.316)	1	0.1 (±0.316)	--	-- --	--	-- --
Mucor	---	-- --	--	-- --	--	-- --	--	-- --	1	0.1 (±0.316)

Five fungal genera isolated from Barley seeds were *Alternaria, Aureobasidium* ,

Cladosporium , *Rhizoctonia and Stemphylium* respectively, the *Alternaria* isolated record the highest occurrence percentage (% 72.6) , while the *Stemphylium* isolated at lowest occurrence percentage (%1.6) and (%17.7) for *Aureobasidium* (%4.8) for *Rhizoctonia* and (%3.2) for *Cladosporium* isolated were obtained from (H4 and Acsad-9) cultivar respectively.

Table.II: Seed borne fungi isolated from cultivars of barley seeds in Hawler governorate at season 2007.

Cultivars / Fungi	Barley cultivars									
	Acsad-14-stain		Zanbaka.R1		Zanbaka-R2. 7/4		Tadmor-R3-9/4		Moroc-R3. 10/4	
	Frequency	Mean (±SD)	Frequency	Mean (±SD)	Frequency	Mean (±SD)	Frequency	Mean (±SD)	Frequency	Mean (±SD)
Alternaria	2	0.2 (±0.422)	2	0.2 (±0.422)	3	0.3 (±0.483)	5	0.5 (±0.707)	36	3.6 (±1.354)
Cladosporium	4	0.4 (±0.516)	--	--	1	0.1 (±0.316)	2	0.2 (±0.42)	5	0.5 (±0.527)
Rhizoctonia	2	0.2 (±0.422)	3	0.3 (±0.483)	1	0.1 (±0.316)	1	0.1 (±0.316)	4	0.4 (±0.699)
Aureobasidium	7	0.7 (±0.823)	1	0.1 (±0.316)	--	--	1	0.1 (±0.316)	7	0.7 (±0.949)
Drechslera	1	0.1 (±0.316)	--	--	1	0.1 (±0.316)	--	--	--	--
Stemphylium	2	0.2 (±0.422)	--	--	--	--	--	--	3	0.3 (±0.675)
Aspergillus	1	0.1 (±0.316)	9	0.9 (±0.876)	13	1.3 (±1.059)	1	0.1 (±0.316)	5	0.5 (±0.527)
Mucor	--	--	3	0.3 (±0.483)	--	--	3	0.3 (±0.483)	0	0
Curvularia	--	--	--	--	--	--	--	--	1	0.1 (±0.316)

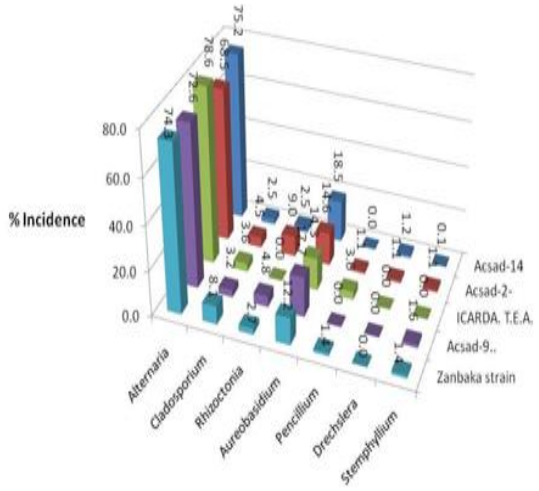

Fig.1 Seed borne fungi isolated from cultivars Hawler governorate at season 2006.

Fig. (2) shows six fungal genera which were (*Alternaria* , *Aureob-asidium* , *Cladosporium* ,*Drechslera* , *Rhizoctonia* and *Stemphylium*) isolated from Barley seeds respectively , the *Aureobasidium* isolated record the highest occur-ence percentage (%38.9),while the *Drechslera* isolated record the lowest occurrence percentage (%5.6), (%22.2) for *Cladosporium* and *Alternaria* , *Rhizoctonia* and *Stemphylium* isolated record (% 11.1) from (H1and Acsad-14-stain) cultivar respectively.

Six fungal genera were *Alternaria,Aspergillus,Aureobasidium,Curvularia* , *Mucor* and *Rhizoctonia* isolated from Barley seeds respect-tively at season 2007**.**

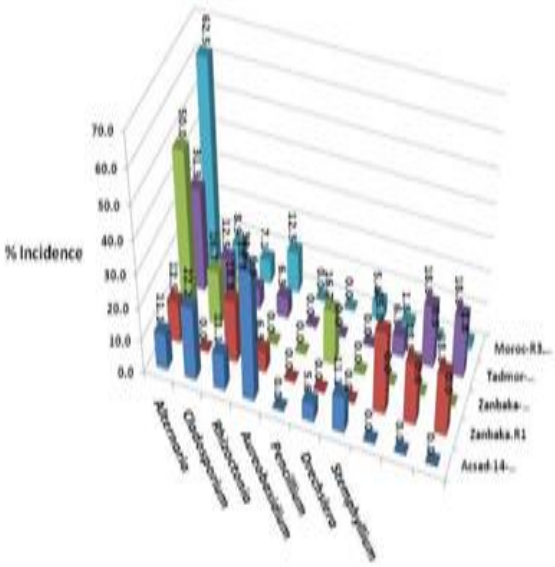

Fig.2 Seed borne fungi isolated from cultivars Hawler governorate at season 2007.

C. Pathogenicity test.

A soil inoculation test , pathogenic potentialities of certain fungi isolated from barley seeds were tested on their respective host in soil inoculation test, the fungi tested were *Alternaria,Aureobasidium, Curvularia ,Drecslera,,Rhizoctonia* & *Stemphylium* for the pre emergence damping off seedlings. The data obtained in table (III) were statically analysed by use of analyses of variance (ANOVA) method.

The results obtained that the control significantly increases pre- emergence damping off seedlings after 10 days of sowing of seeds, the mean value was (1.08) as compared with fungal pathogen treatment which decreases their plant mean values obtained for *Alternaria ,Aureobasidium,Curvularia,Drecslera, Stemphylium* and *Rhizoctonia* were recoded respectively.

Table (III) indicates that the effect of 6 fungal pathogen (*Alternaria ,Aureobasidium,Curvularia ,Drechslera , Stemphylium* and *Rhizoctonia*) by inoculation of pot soil which plant were planted . The results obtained that the control significantly decreases post-emergence damping off seedlings after 30 days of sowing of seeds, the mean value was (0.79) as compared with fungal pathogen treatment which increases their plant mean values obtained for *Alternaria, Curvularia, Stemphylium, Drecslera, Aureobasidium* and *Rhizoctonia* were recoded respectively.

D. Effect of seed borne fungi on pre and post-emergence damping off seedling Barley cultivars:

Table (IV) show the effect of six fungal soil inoculation on 8 barley cultivars (Arta -3.,Tadmor, Arivate, Eba, ICARDA,Zanbaka, Alkheir *and* Acsad-14) . The results obtained that the ICARDA cultivar significantly increases pre-emergence damping off seedlings after 10 days of sowing of seeds the mean value was (3.52) as compared with other barley cultivars which increases their plant mean values obtained for Arta-3., Tadmor, Arivate, Eba, Zanbaka, Alkheir *and* Acsad-14 cultivars respectively.

Table.III: Effect of seed borne fungi on pre and post- emergence damping off barley cultivar seedling .

Fungi	Pre emergence damping off-seedlings		Post emergence damping off seedlings	
	Mean	± Std. Error	Mean	± Std. Error
Control	1.08*	± 0.17	0.79*	± 0.21
Alternaria	2.37	± 0.26	2.25	± 0.36
Curvularia	2.33	± 0.24	1.79	± 0.34
Stemphlium	2.29	± 0.25	1.95	± 0.25
Drechslera	2.66	± 0.26	1.58	± 0.26
Aureobasidium	2.16	± 0.30	1.70	± 0.33
Rhizoctonai	2.29	± 0.33	1.87	± 0.33
LSD P= 0.05	0.016		0.05	

X 10 seed / pot , ***** significant at P≤0.05 level.

The effect of six fungal soil inoculation on 8 barley cultivars (Arta- ,Tadmor , Arivate , Eba , ICARDA,Zanbaka ,Alkheir and Acsad -14) by soil inoculation with (*Alternaria,Aureobasidium,Curvularia, Drecslera, Stemphylium* and *Rhizoctonia*) of pot soil which plant were germinated. The results obtained show that the ICARDA cultivar significantly increases post-emergence damping off seedlings after 30 days of sowing of seeds.

Table (V) shows the effect of 6 fungal pathogen (*Aureobasidium ,Alternaria,,Curvularia,Drecslera,Stemphylium* and *Rhizoctonia*).The results obtained that the control significantly increases survival plant after 30 days of sowing seeds the mean value was (8.91) as compared with fungal pathogen treatment which increases their survival plant mean values obtained for *Alternaria ,Curvularia,Stemphylium,Drecslera,Aureobasidium* and *Rhizoctonia* .

Table.IV: Effect of fungi on pre and post-emergence damping-off eight barley cultivars seedlings.

Barley Cultivars	Pre-emergence damping off –seedlings		Post-emergence damping off–seedlings	
	Mean	± Std. Error	Mean	± Std. Error
Arta-3	2.04	± 0.24	1.42	± 0.31
Tadmor	1.80	± 0.25	1.28	± 0.33
Arivate	2.38	± 0.20	1.80	± 0.24
Eba	1.80	± 0.24	1.38	± 0.36
ICARDA	3.52*	± 0.39	3.04*	± 0.40
Zanbaka	2.42	± 0.28	2.04	± 0.31
Alkheir	1.71	± 0.28	1.28	± 0.30
Acsad-14	1.66	± 0.22	1.38	± 0.25
LSD P=0.05	0.01		0.001	

X 10 seed / pot , ***** significance at P≤0.05 level.

E. Effect of seed borne fungi on Survival plant :

The effect of 6 fungal pathogen (*Aureobasidium,Alternaria,Drecslera,Curvularia, Stemphylium* ,and *Rhizoctonia*) by inoculation of pot soil which plant were germinated .The results obtained that the control significantly increases survival plant after 60 days of sowing of seeds, the mean value was (9.24) as compared with fungal pathogen treatment which increases their post emergence plant mean values obtained for *Alternaria,Curvularia, Stemphylium, Drecslera,Aureobasidium.&Rhizoctonia* were obtained respectively .

Table (VI) shows The effect of six fungal soil inoculation on 8 barley cultivars (Arta-3.,Tadmor, Arivate, ,ICARDA,Zanbaka, Alkheir Eba and Acsad-14).The results indicated the ICARDA cultivar significantly decreases survival of plants the mean value was (6.47) as compared with other barley cultivars which increases their survival plant mean values obtained for Arta-3., Tadmor , Arivate,Eba , Zanbaka , Alkheir and Acsad-14 cultivars respectively.

The effect of six fungal (soil inoculation) on 8 barley cultivars (Arta-3,Tadmor,Arivate,Eba,ICARDA,Zanbaka,Alkheir and Acsad -14) by soil inoculation with *Alternaria ,Aureobasidium,Curvularia,Drecslera , Stemphylium* and *Rhizoctonia* of pot soil which plant were germinated .The results(Table VI) indicated that the ICARDA cultivar significantly decreases survival plant after 30 days(March) of sowing of seeds the mean value was 6.95 as compared with other barley cultivars .

Table.V: Effect of seed borne fungi on Survival barley plants after 30 and 60 day of sowing.

Fungi	Survival plant 30day		Survival plant 60day	
	Mean	± Std. Error	Mean	± Std. Error
Control	8.91*	± 0.16	9.24*	± 0.21
Alternaria	7.62	± 0.26	7.75	± 0.36
Curvularia	7.66	± 0.24	8.20	± 0.34
Stemphlium	7.70	± 0.25	8.04	± 0.25
Drechslera	7.33	± 0.26	8.41	± 0.26
Aureobasidium	7.83	± 0.30	8.29	± 0.33
Rhizoctonai	7.70	± 0.34	8.04	± 0.33
LSD P=0.05	0.012		0.05	

***** significance at P≤0.05 level.

Table.VI: Effect of soil inoculation with seed borne fungi on survival plant of eight barley cultivars after 30 and 60 days of sowing.

Fungi	Survival plant 30day		Survival plant 60day	
	Mean	± Std. Error	Mean	± Std. Error
Control	8.91*	± 0.16	9.24*	± 0.21
Alternaria	7.62	± 0.26	7.75	± 0.36
Curvularia	7.66	± 0.24	8.20	± 0.34
Stemphilium	7.70	± 0.25	8.04	± 0.25
Drechslera	7.33	± 0.26	8.41	± 0.26
Aureobasidium	7.83	± 0.30	8.29	± 0.33
Rhizoctonai	7.70	± 0.34	8.04	± 0.33
LSD P= 0.05	0.012		0.05	

****** significance at P≤0.05 level.

Discussion:

A. Seed health: isolation and occurrence percentage.

The occurrence of saprophytes suggests that invasion of the seed by a fungi may occur independently of parasitism.The frequency of invasion by a particular fungi was possibly determined by amount of inoculum in the seed environment.

The seed borne pathogens cause different types of damages which are not always recognized by users, such as seed death, seedling blight and plant abnormalities, poor quality seeds carry a higher number of seed borne fungal pathogens than good quality seeds which contain few seed borne fungal pathogens[14].Once harmful fungi, pathogenic as well as toxigenic, have been listed, it is important to define for each of them the methods to be used for their detection and identification [7].

Intensive seed health testing showed that type and number of fungi recorded from barley seeds which were collected from different location of Hawler.Seed borne fungi included (*Alternaria, Cladosporium, Rhizoctonia,Aureobasidium, Penicillium,Drechslera,Stemphyllium,Aspergillus, Mucor* and *Curvularia*).In the present study the *Alternaria* were found to be dominant among the fungal isolated from all barley seeds which were tested for seed health. Similar results were recorded by [15]. [13]Who isolated *Alternaria, Cladosporium* and *Stemphylium* from dianthus in Taiwan.[16] studied the occurrence of seed borne fungi of barley, corn, sorghum and wheat stored under different temperature and moisture level examined. The *Alternaria, Aspergillus candidus* , *A. niger,A.sulphurous* , *Cladosporium herbarium* , *Curvularia lunata, Drechslera tetramera* and *Penicillium sp*. were recorded . The present results are accordance with those obtained by several articles from seed borne fungi [17,18].This variation might be due to different fungal requirements for nutrients growth factors, or partly due to the suppression of fast growing species of *Aspergillus*, *Penicillium* and because dead embryos provide nourishment for slow developing fungi and also suppression of seed facilitates detection of seed borne mycoflora, analyses of the economic losses due to seed borne pathogens involved consideration of impact on the seed production and distribution industry .As shown in tables I&II and fig.1 & 2).

B. Pathogenicity test:

Pre, post emergence damping off seedling and survival plant. Six fungal pathogens (*Alternaria, Curvularia,Stemphyllium,Drechslera,Aspergillus, Aureobasidium,* and *Rhizoctonia*) were tested and the results indicated that the effect significantly increase the fungal pathogens on pre-emergence damping-off seedlings

with soil infestation, the results showed in table (III) ,and the most barley cultivar significantly affected was ICARDA with compared with other cultivars ,the results emphasized in table (IV) .This may be due to nourishment of fungal pathogen on seeds (nourish-hment on endosperm which embryo depended to growth and germinate). The same trends found with survival plant after 30 and 60 days of sowing the results indicate that the effect significantly increase of fungal pathogens survived plant with soil infestation, the results showed in table (V), and the most barley cultivar significantly affected was ICARDA with compared with other cultivars, the results emphasized in table (VI), this may be due to the ability of some important seed borne fungi to move from seed to different plant part, however the variation might be due to different fungal requirement for nutrients factors or may be due to that the ICARDA cultivar more susceptible to pathogenic fungi than the other cultivars, the similar results obtained on peanut by [13] .

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