



FACULTY OF AGRICULTURE

Minia J. of Agric. Res. & Develop.
Vol. (32) No. 1 pp 65-82, 2012

DISEASES AFFECTING FOLIARS AND FRUITIS OF GRAPEVINE UNDER FIELD CONDITIONS OF MINIA GOVERNORATE

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Received 16 Jan. 2012

Accepted 19 Feb. 2012

ABSTRACT

Severity of the diseases during 2009 and 2010 growing seasons, which expressed as area under disease progress curve (AUDPC), attacked grape foliars was varied with viticulture regions, grape variety and age of grape plants. Older plants were more affected by the diseases than the younger ones and grapes grown in newly reclaimed area such as Shousha, El-Edwa and Abou-Qurkas were more affected than those grown in the Nile Valley. Die back, fruit rot, leaf spot/blight and rot brenner diseases occurred wherever grape grown. Die back disease gave the highest AUDPC (130) in Shousha with Roomy variety while the least AUDPC (14) was recorded in Abou-Qurkas and Matay regions of Superior var up to 10 years. Downy and powdery mildews occurred by low values of AUDPC. As for fruit rot, all tested grape varieties of either less or up 10 years old were attacked. Rot brenner disease symptoms were observed throughout the certain viticulture regions tested for all varieties. The highest AUDPC value (560) was occurred in Shousha with Roomy var. while the least AUDPC (14) was recorded in viticulture regions of Beni-Mazar and Matay under Superior var. cultivated area. Regarding leaf spot/blight, the highest AUDPC values were obtained among all evaluated diseases. The highest value of AUDPC (160) was recorded in El-Edwa region with Roomy var. while var. Superior showed the least AUDPC (140) under Samalout condition with less than 10 years old plants.

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Bacterium *Erwinia carotovora* was associated with only fruit rot disease by various frequencies according to varieties. The least frequency for *E. carotovora* was obtained (4 %) from rotted fruits of Flame var. while rotted fruits of Superior var. gave the highest frequency (11%) in this respect the bacterium *Pseudomonas syringae* pv. *syringae* was associated with both die back and leaf spot/blight diseases. The highest frequency for *P. syringae* pv. *syringae* was recorded (24%) with spotted/blighted leaves of Superior var. and the least frequency was expressed (4%) by spotted/blighted leaves of Flame var. Fungus *Botryodiplodia theobromae* gave the highest frequency (92%) with died back samples of Roomy var. followed by Flame's (86% frequency). The fungus *Plasmopara viticola* was found by 100% frequency with downy mildew disease. Similarly *Uncinula necator* showed 100% frequency with powdery mildewed grapes.

Five fungal species i.e., *Alternaria sp*, *Aspergillus niger*, *Botrytis cinerea*, *Penicillium sp.* and *Pseudopezicula sp.* were implicated with rotted fruits and *Botrytis cinerea* was the predominant that showed 64% frequency with rotted fruits of Flame var. followed by 60% frequency with Roomy's one while it revealed the lowest frequency (40%) with rotted fruits of Superior var. Leaf spot/blight disease(s) was/were attributed to six fungal species e.g., *Alternaria alternata*, *Aspergillus sp*, *B. cinerea*, *Helminthosporium sp*, *Nigrospora sp* and *Pseudopezicula sp.* Among these species, *A. alternata* provided the highest frequency (40%) with spotted/blighted leaves of Rommy var. followed by 32% frequency with Flame's *Nigrospora sp.* appeared 22% frequency with spotted/blighted leaves of Flame var. followed by 14% frequency with Roomy's *Helminthosporium sp.* showed 16% frequency with spotted/blighted leaves of Roomy var. and provided 12% frequency with spotted/blighted leaves of either Flame or Superior varieties.

INTRODUCTION

Grapevine is the most widely planted fruit crop in the world. It's considered as a crop plant of many uses (Pearson and Goheen, 1998). Yield losses of grapevine under Minia conditions resulted in a decrease of the grapevine cultivated area. The effects of diseases on grape production are found throughout the records of viticulture. Diseases affect production, harvesting, processing, marketing and

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consumption, reduce quality and yield and increase the costs of production and harvesting. Diseases debilitate and kill vines and destroy vineyards not only locally but also over large areas and regions (Odile *et al.*, 2006). They have rendered some land unfit for viticulture (Pearson and Goheen, 1994 and Haleen *et al.*, 2003). However, several diseases attack grapes were reported such as powdery mildew (Sall, 1980 and Eichmann, and Hückelhoven, 2008), downy mildew (Langcake and Lovell, 1980 and Diez *et al.*, 2008), Botrytis bunch rot and blight (Hill *et al.*, 1986), Black rot (Jermini and Gesser, 1996 and Su-Lin *et al.*, 2004), dead arm (Larignon *et al.*, 2001), anthracnose (Agrios, 2000), rot brenner (Korf *et al.*, 1986), leaf spot/blight (Reddy, 1993, Kanna and Chandra, 1997; Leavitt and Munneke, 1987 and Ahmed *et al.*, 1993) and die back (El-Goorani and Malegi, 1992 and Philips, 1998). In the last few years grape growers decreased grapevine cultivated area due to yield losses. Thus, the present work was undertaken to survey the diseases affecting viticulture regions in Minia governorate and to isolate the microorganisms that implicated with grapevine diseases.

MATERIALS AND METHODS

1-Survey the diseases influenced grapevine foliars and fruits

Foliar and fruit diseases (Fig 1) associated with vineyard of *Vitis vinifera* L. var. Flame, Roomy and Superior at six viticulture regions i.e., Abou-Qurkas, Beni-Mazar, El-Edwa, Matay, Samalout and Shousha were surveyed during 2009 and 2010 growing seasons. Vineyards selected were of age less than 10 years and up to 10 years old. Each vineyard was inspected monthly from May to September 2009 and 2010. At all dates, diseases were assessed in each vineyard at 5 sampling sites. The exact location of sampling sites was determined with a vineyard map. The five sampling sites were designed, one of each of the four sides plus one in the middle of the vineyard. Sampling sites were located at least 10 m from the edge of the vineyard. At each sampling site, 12 to 20 canes were chosen randomly and collected in a dry paper bags and transported to the laboratory where they were examined with 2 days of collection. Each

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cane was inspected, and the number of infected canes was recorded. These data were used to calculate disease incidence (the frequency of infected canes) for each sampling site, from which the vineyard average was calculated.

Disease assessment:

Disease index was assayed using scale of 0-5 where:
 0 = no symptoms 1 = 1-9% 2 = 10-24% 3 = 25-49% 4 = 50-74% and
 5 = 75-100% of the leaf area were infected. For each replicate a disease severity index (DSI) similar to those describe by Lui *et al.* (1990) and was calculated as follows:

$$DSI = \frac{\sum d}{d_{max} \times n} \times 100$$

Where **d** is the disease index on each plant, **dmax** is the maximum disease index possible and **n** is the total number of plants examined in each replicate. Data for each disease were converted to area under the disease progress curve values (AUDPC) by using the following equation according to Pandey *et al.* (1989), Kathleen and Peter (2004) and Jeger and Viljanen-Rollinson (2000)

$$AUDPC = D^{1/2}(Y_1 + YK)Y_2 + \dots + YK - 1$$

Where **D**=days between readings

Y₁=first diseases severity recording **YK**=last diseases severity recording

2- Frequency of microorganisms associated with grapevine diseases:

Diseased samples were grouped and subjected to isolation and identification tests. Samples were washed by running tap water, surface disinfected by emersing in 1% sodium hypochlorite solution for 3 min then rinsed 3 times with sterilized distilled water. Small portions lie between diseased and healthy tissues were taken and Petri dishes placed onto containing potato dextrose ager medium (PDA). Inoculated plates were incubated at 22°C for 10 days. Plates were examined daily for fungal or bacterial growth; the appeared colonies were purified and then kept in slant tubes at 10°C until use for identification trails. Fungi were identified according to Booth (1971), Barnett and Hunter (1998), Punithalingam (1976), Korf *et al.* (1986)

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and Rotem (1994). The isolated bacteria were identified as described by Holt (1977) and Klement *et al.* (1990) using the methods of Stapp (1961) and Klement *et al.* (1990). Downy and powdery mildews, pathogens were directly examined using light microscope.

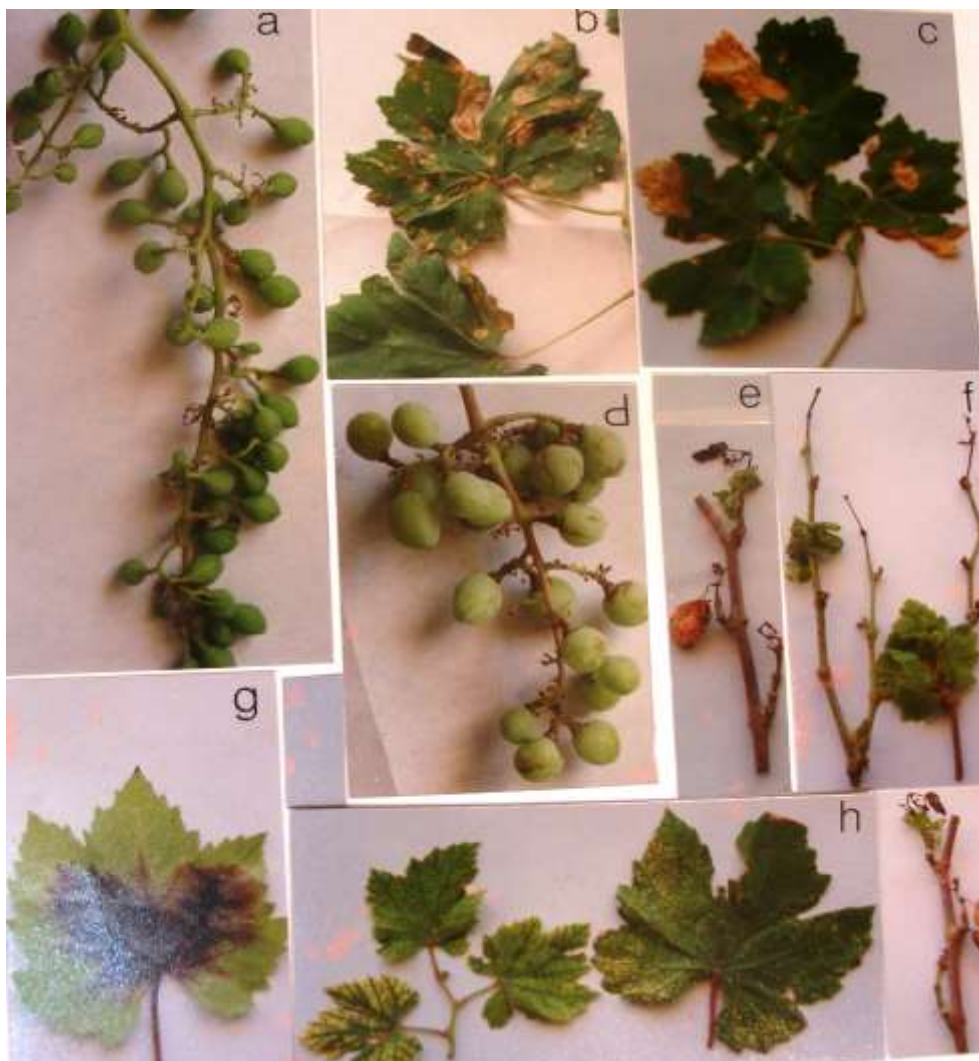


Fig 1. Symptoms of rot Brenner (a and b), leaf blight (c and g), die back (e,f and i) and nutrient deficiency (h) on grapevines (*Vitis vinifera* L. var. Roomy)

RESULTS

During 2009 and 2010 growing season a survey results (Tables 1, 2 and 3) showed various distributions of different grapevine diseases depended on viticulture regions, grapevine varieties and plant age. The highest area under the disease progress curve (AUDPC) value was pronounced in Shousha region with grapevine Roomy variety (2630) followed by Flame one (2130). The least AUDPC value (328) was recorded in Samalout viticulture of Superior variety. Generally, plants that less than 10 years old provided lower AUDPC values than those up to 10 years old. Data indicated that plants of grapevine Roomy variety were most attacked by the diseases while plants of Superior variety were the least susceptible in this respect. Die back, fruit rot, leaf spot/blight and rot brenner diseases occurred wherever grapevine grown and older plants were more affected than the younger one.

Table 1: AUDPC* values of diseases affecting grapevine Flame variety of less than 10 and up to 10 years old grown at various region belong to Minia governorate

Diseases	Viticulture region and age (< 10 and > 10 years)											
	Abo-Qurkas		Bani-Mazar		El-Edwa		Matay		Samalout		Shousha	
	<10	>10	<10	>10	<10	>10	<10	>10	<10	>10	<10	>10
Die back	0.0	174	0.0	442	474	640	0.0	174	ND**	ND	690	ND
Downy mildew	0.0	0.0	0.0	0.0	210	0.0	167	0.0	ND	ND	0.0	ND
Fruit rot	109	162	194	208	198	210	147	100	ND	ND	220	ND
Leaf spot/Blight	240	320	430	532	680	740	220	320	ND	ND	700	ND
Powdery mildew	0.0	104	0.0	146	0.0	0.0	0.0	0.0	ND	ND	0.0	ND
Rot brenner	164	320	124	184	346	420	164	172	ND	ND	460	ND
Total	563	1130	748	1491	1908	2010	698	816	ND	ND	2130	ND

*AUDPC= area under disease development curve values were calculated as means of 2009 and 2010 growing seasons. ** Not detected

Die back disease gave the highest AUDPC (2630) in Shousha with Roomy variety while the least AUDPC (328) were recorded in Abou-Qurkas and Matay regions of Superior var. up to 10 years old. All viticulture regions of Roomy var. cultivation gave die back

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symptoms while the younger plants (less than 10 years old) of Flame var. grown at Abou-Qurkas, Beni-Mazar and Matay did not show die back symptoms. Plants of Superior var. less than 10 years old were not affected by die back under Abou-Qurkas, Beni-Mazar, Matay and Samalout conditions.

Downy mildew disease occurred by low AUDPC values in grapevine that less than 10 years old at El-Edwa and Matay viticulture regions of Roomy and Flame var. but not with Superior one.

Table 4: AUDPC* values of diseases affecting grapevine Roomy variety of less than 10 and up to 10 years old grown at various region belong to Minia governorate

Diseases	Viticulture region and age (< 10 and > 10 years)											
	Abo-Qurkas		Bani-Mazar		El-Edwa		Matay		Samalout		Shousha	
	<10	>10	<10	>10	<10	>10	<10	>10	<10	>10	<10	>10
Die back	240	400	362	048	630	ND	210	230	170	210	830	ND
Downy mildew	00	00	00	00	174	ND	104	00	00	00	00	ND
Fruit rot	184	180	210	230	100	ND	102	138	120	132	300	ND
Leaf spot/Blight	420	482	020	700	860	ND	300	430	240	310	820	ND
Powdery mildew	00	170	00	102	00	ND	00	164	00	148	00	ND
Rot breunner	170	390	174	160	424	ND	174	188	174	220	060	ND
Total	1014	1670	1266	1840	2313	ND	1108	1220	680	1020	2630	ND

*AUDPC= area under disease development curve values were calculated as means of 2009 and 2010 growing seasons. ** Not detected

As for fruit rot, all tested grapevine varieties either less pr up to 10 years old were attacked and the highest AUDPC (300) was found by Roomy var. at Shousha region while the least AUDPC (14) was pronounced under Matay and Samalout condition by Superior var.

Regarding leaf spot/blight, the highest AUDPC values were obtained for all evaluated diseases. The highest value of AUDPC (860) was recorded in El-Edwa region with Roomy var. while var. Superior showed the least AUDPC (140) under Samalout condition with plants that less than 10 years old.

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Concerning powdery mildew, only plants up to 10 years old of Roomy variety showed powdery mildew symptoms but with low AUDPC values at Abou-Qurkas, Beni-Mazar, Matay, and Samalout. Plants of Flame variety showed powdery mildew symptoms in Abou-Qurkas and Matay regions only. Data showed that neither downy or powdery mildew appeared on grapevine Superior plants grown in the tested regions.

Table 3: AUDPC* values of diseases affecting grapevine Superior variety of less than 10 and up to 10 years old grown at various region belong to Minia governorate

Diseases	Viticulture region and age (< 10 and > 10 years)											
	Abo-Qurkas		Bani-Mazar		El-Edwa		Matay		Samalout		Shousha	
	<10	>10	<10	>10	<10	>10	<10	>10	<10	>10	<10	>10
Die back	0.0	84	0.0	174	ND**	ND	0.0	84	0.0	ND	350	ND
Downy mildew	0.0	0.0	0.0	0.0	ND	ND	0.0	0.0	0.0	ND	0.0	ND
Fruit rot	104	124	138	160	ND	ND	84	110	84	ND	140	ND
Leaf spot/Blight	210	270	380	494	ND	ND	198	284	140	ND	620	ND
Powdery mildew	0.0	0.0	0.0	0.0	ND	ND	0.0	0.0	0.0	ND	0.0	ND
Rot breunner	80	164	110	84	ND	ND	84	98	104	ND	310	ND
Total	339	640	620	912	ND	ND	366	576	328	ND	1420	ND

*AUDPC= area under disease development curve values were calculated as means of 2009 and 2010 growing seasons. ** Not detected

Root rot was not recorded on either Flame or Superior varieties under the tested conditions while it was found with plants of Roomy var. by the lowest AUDPC values (78-70) at El-Edwa, Matay and Shousha.

Rot Brenner disease symptoms were observed on all tested varieties throughout the certain viticulture regions. The highest AUDPC value (260) occurred in Shousha with Roomy var. while the least AUDPC (84) was recorded in viticulture regions of Beni-Mazar and Matay under Superior var. cultivated area.

As for frequency of microorganisms associated with the diseases affected grapevines, fungi were more predominant than bacteria (Table 4). Bacteria were implicated with die back, fruit rot and leaf

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spot/blight diseases. The bacterium *Erwinia carotovora* was associated with only fruit rot disease by various frequencies according to varieties. The least frequency for *E. carotovora* was obtained (٤%) from rooted fruits of Flame var. while rooted fruits of Superior var. gave the highest frequency (١٨%) in this respect. The bacterium *Pseudomonas syringae* pv. *syringae* was recorded (٢٤%) with spotted/blighted leaves of Superior var. and the least frequency was expressed (٤%) by spotted/blighted leaves of Flame var.

Table ٤: Frequency of microorganism associated with the diseases affected grapevine varieties grown under Minia conditions.

Microorganism	Varieties and diseases											
	Flame				Roomy				Superior			
	Die back	Fruit Rot	Leaf spot	Rot Brenner	Die back	Fruit Rot	Leaf spot	Rot Brenner	Die back	Fruit Rot	Leaf spot	Rot Brenner
<i>Alternaria alternata</i>			٣٢				٤٠			٨	٢٨	
<i>Alternaria sp</i>		٦	٤							٤	٢	
<i>Aspergillus niger</i>		٦				٨				٦		
<i>Aspergillus ap</i>						٤				٢		
<i>Botryodiplodia theobromae</i>	٨٦*				٩٢				٧٢			
<i>Botrytis cinerea</i>		٦٤	١٤			٦٠	١٠			٤٠	٢٠	
<i>Erwinia carotovora</i>		٤				١٢				١٨		
<i>Helminthosporium sp</i>			١٢				١٦				١٢	
<i>Nigrosporium sp</i>			٢٢				١٤				٨	
<i>Penicillium sp</i>		٨				٨				١٠		
<i>Pseudomonas syringae</i>	١٠		٤		٨		١٠		٢٤		٢٢	
<i>Pseudomezicula sp</i>		٨	١٠	١٠٠		٦	٤	٩٠		٨	٦	٩٢
Others	٤	٤	٢			٢	٦	١٠	٤	٤	٢	٨
Total	١٠٠	١٠٠	١٠٠	١٠٠	١٠٠	١٠٠	١٠٠	١٠٠	١٠٠	١٠٠	١٠٠	١٠٠

*Data are means of two growing seasons ٢٠٠٩ and ٢٠١٠.

The fungus *Botryodiplodia theobromae* gave the highest frequency (٩٢%) with died back samples of Roomy var. followed by Flame's (٨٦% frequency). The fungus *plasmopara viticola* was found

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by 100% frequency with downy mildew disease. Similarly *Uncinula necator* showed 100% frequency with powdery mildewed grapes. Five fungal species i.e. *Alternaria* sp., *Aspergillus niger*, *Botrytis cinerea*, *Penicillium* sp. and *Pseudopezicula* sp. were implicated with rotted fruits. *Botrytis cinerea* was the predominant in this respect that showed 64% frequency with rotted fruits of Flame var. followed by 70% frequency with Roomy's one while it revealed the lowest frequency (40%) with rotted fruits of Superior var.

Data indicated that leaf spot/blight disease(s) was/were attributed to six fungal species e.g., *Alternaria alternata*, *A. sp.*, *B.cinerea*, *Helminthosporium* sp., *Nigrospora* sp. and *Pseudopezicula* sp. Among these species, *A. alternata* provided the highest frequency (40%) with spotted/blighted leaves of Roomy var. followed by 32% frequency with Flame's. *Nigrospora* sp. appeared 22% frequency with spotted/blighted leaf of Flame var. followed by 14% frequency with Roomy's. *Helminthosporium* sp. showed 16% frequency with spotted/blighted leaves of Roomy var. and provided 12% frequency with spotted/blighted leaves of either Flame or Superior varieties.

DISCUSSION

The survey data indicated that areas cultivated with grapevine throughout Minia districts suffer from several diseases. Severity of the diseases attacked grapes, which expressed as area under disease progress curve (Ronis and Semaškienė 2011). AUDPC was varied with viticulture regions, grape variety and age of grape plants. Older plants were more affected than the younger ones and grapes that grown in the newly reclaimed area such as Shousha, El-Edwa and Abou-Qurkas were more affected than those grown in the Nile Valley. Dieback, fruit rot, leaf spot/blight and rot brenner diseases occurred wherever grape were grown.

Die back disease gave the highest AUDPC (130) in Shousha with Roomy variety while the least AUDPC (14) was recorded in Abou-Qurkas and Matay Regions of Superior var. up to 10 years old. Downy and powdery mildews occurred by low value of AUDPC may

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be due to the extensive use of the specific fungicides against the two diseases but not against the rest ones.

As for fruit rot, all tested grape varieties of either less or up 10 years old were attacked and the highest AUDPC (300) was found on Roomy var. at Shousha region while the least AUDPC (82) was recorded at Matay and Samalout regions by Superior var.

Rot brenner disease symptoms were observed on all tested varieties throughout the certain viticulture regions. The highest AUDPC value (260) was occurred in Shousha with Roomy var. while the least AUDPC (82) was recorded in viticulture regions. This study could suggest that rot brenner disease was firstly recorded under Minia condition if not under Egypt ones.

Regarding leaf spot/blight, the highest AUDPC values were obtained on all evaluated disease. The highest AUDPC (860) was recorded in El-Edwa region with Roomy var. while var. Superior showed the least AUDPC (120) under Samalout condition with plants less than 10 years old. The present results indicated that type of soil, water regime, nutrition state, and grape varieties may play an important role with the distribution of diseases affecting grapes like other plant species (Bell, 1989; Ahmed *et al.* 1993; Biggs *et al.* 1994; Gadoury *et al.* 1994; El-Ganieny *et al.* 1997; Gad El-hak *et al.* 1997; Abdou *et al.* 1999 and Galal *et al.* 2000)

As for frequency of microorganisms associated with the diseases affected grapes, fungi were more predominant than bacteria. Bacteria were implicated with die back, fruit rot and leaf spot/blight diseases. The bacterium *Erwinia carotovora* was associated with only fruit rot disease by various frequency according to varieties. The least frequency for *E. carotovora* was obtained (2%) from rotted fruits of Flame var. while rotted fruits of superior var. gave the highest frequency (18%) in this respect. Data are consistent with those reported by Dye (1969) who described the bacterium *E. carotovora* as a grape berry rotting pathogen.

The bacterium *Pseudomonas syringae* pv. *syringae* was associated with both die back and leaf spot/blight diseases. The highest frequency for *P. syringae* pv. *syringae* was recorded (92%) with

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spotted/blighted leaves of Superior var. and the least frequency was expressed (4%) by spotted/blighted leaves of Flame var. This bacterium was reported as casual agent of several diseases for many plant species (Legard and Schwartz, 1987; Lelliot and Stead, 1987; El-Sadek *et al.* 1992 and Galal, 1999).

The fungus *Botryodiplodia theobromae* gave the highest frequency (92%) with dried back samples of roomy var. followed by flame's (86% frequency) similarly as described by El-Goorani and Maleigi (1972). The fungus *Plasmopara viticola* was found by 100% frequency with downy mildew disease. Similarly *Uncinula necator* fungus showed 100% frequency with powdery mildewed grapes.

Five fungal species i.e., *Alternaria alternata*, *Aspergillus* sp., *B. cinerea*, *Helminthosporium* sp., *Nigrospora* sp. and *Pseudopezicula* sp. were implicated with rotted fruits. *B. cinerea* was the predominant in this respect showing 64% frequency with rotted fruits of Flame var. followed by 60% frequency with Roomy's one while it revealed the lowest frequency (4%) with rotted of Superior var.

Leaf spot/blight disease(s) was/were attributed to six fungal species e.g., *Alternaria alternata*, *Aspergillus* sp., *B. cinerea*, *Helminthosporium* sp., *Nigrospora* sp. and *Pseudopezicula* sp. Among these species, *A. alternata* provided the highest frequency (40%) with spotted/blighted leaves of Roomy var. followed by 32% frequency with Flame's. *Nigrospora* sp. appeared 22% frequency with spotted/blighted leaves of Flame var. followed by 14% frequency with Roomy's *Helminthosporium* sp. showed 16% frequency with spotted/blighted leaves of either Flame or Superior varieties. Reddy (1973) reported that *Helminthosporium rostratum* could infect grapevine leaves causing leaf spot syndromes. Also, *Drechestra papendofii*, *Sphaceloma amplinom* and *Alternaria vitis* were recorded as leaf spotting fungi (Kanna and Chandra, 1977 and Suhag *et al.*, 1983).

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الأمراض التي تصيب المجموع الخضري وثمار العنب تحت الظروف الحقلية بمراكز المنيا

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اختلفت شدة الإصابة (التي قدرت علي أساس قيم منحني تطور المرض) علي أوراق وثمار العنب باختلاف مناطق الزراعة والأصناف وعمر النباتات وذلك في موسمي ٢٠٠٩-٢٠١٠. وبصفة عامة كانت النباتات الكبيرة في العمر (أكبر من ١٠ سنوات) أكثر إصابة عن النباتات الصغيرة (أقل من ١٠ سنوات) كما كانت النباتات النامية في الاراضي الحديثة الاستصلاح مثل منطقة شوشة والعدوة وابوقرقاص أكثر إصابة من النباتات النامية في مناطق وادي النيل مثل منطقة مطاي ويني مزار وأظهر مرض الموت الرجعي أعلى قيم لمنحني تطور المرض (٨٣٠) في منطقة شوشة علي الصنف رومي وكانت أقل شدة إصابة (٨٤) في منطقة أبو قرقاص ومطاي مع صنف العنب سوبريور للنباتات أكبر من عشر سنوات وسجلت النتائج وجود مرضي البياض الزغبي والدقيقي ولكن بشدة إصابة منخفضة.

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وأظهرت النتائج وجود عفن ثمار علي جميع أصناف العنب المختبرة بأعمارها المختلفة وسجلت أعلى شدة إصابة على صنف العنب رومي بمنطقة شوشة وأقل شدة إصابة في منطقتي مطاي وسمالوط على الصنف سوبريور وسجلت الدراسة أعراض مرض Rot brenner في مناطق زراعة العنب المختبرة وعلي كل الأصناف وكانت أعلى شدة إصابة علي الصنف رومي بمنطقة شوشة (٥٦٠) وأقل شدة إصابة (٨٤) وجدت علي المناطق المزروعة بالصنف سوبريور في مطاي وبنو مزار. وسجلت النتائج أعلى شدة إصابة لتبقع ولفحة أوراق العنب (٨٦٠) بمنطقة شوشة للصنف رومي وأظهر الصنف سوبريور أقل شدة إصابة (١٤٠) بمنطقة سمالوط مع النباتات الأقل من عشر سنوات عمراً.

تم عزل بكتيريا *Erwinia carotovora* من الثمار المتعفنة بنسب تكرر متباينة وفقاً للأصناف المختبرة حيث كانت أقل تكراراً (٤%) للصنف فلام بينما الثمار المتعفنة للصنف سوبريور أعطت أعلى تكرر (١٨%) وأوضح النتائج وجود البكتريا *Pseudomonas syringae* الطراز الممرض سيرنجي مصاحبة لأمراض الموت الرجعي وتبقع ولفحة أمراض العنب وتم الحصول علي أعلى تكرر لهذة البكتريا (٢٤%) مع تبقع/لفحة أوراق الصنف سوبريور وأقل تكرر (٤%) تبقع/لفحة أوراق الصنف فلام.

أوضحت النتائج أن الفطر *Botryodiplodia theobromae* هو الأكثر تكرر (٩٢%) مع عينات الموت الرجعي للصنف رومي تبعة (٨٦%) عينات الصنف فلام. الفطر *Plasmopara viticola* والفطر *Uncinula necator* اظهرا (١٠٠%) تكرر مع أمراض البياض الزغبي والبياض الدقيقي علي التوالي. وسجلت الدراسة خمس فطريات مصاحبة لعفن الثمار وكان الفطر *Botrytis cinerea* هو الأكثر تكراراً (٦٤%) مع الثمار المتعفنة للصنف فلام ثم (٦٠%) مع ثمار الصنف رومي و(٤٠%) مع الصنف سوبريور. كما بينت الدراسة ان تبقع/لفحة أوراق العنب مصاحب لها ست فطريات وكان الفطر *Alternaria sp* هو الأكثر تكراراً (٤٠%) مع صنف رومي و (٣٢%) مع الصنف فلام وسجل الفطر *Nigrospora sp* (٢٢%) مع الصنف فلام و(١٤%) مع الصنف رومي بينما سجل الفطر *Helminthosporium sp* (١٦%) مع الصنف رومي و(١٢%) مع صنف فلام وسوبريور.

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