



Universal Xalqaro Ilmiy Jurnal

Jurnalning bosh sahifasi: <https://universaljurnal.uz>

Universal International Scientific Journal

e-ISSN: [3060-4540 \(online\)](https://doi.org/10.3060/4540)

Year: 2024 Issue: 1 Volume: 7

Published: 3.10.2024 <https://universaljurnal.uz>

International indexes

GOOGLE SCHOLAR

CROSSREF (OAK BAZA)

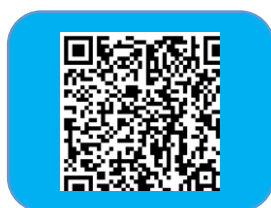
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ANALYSIS OF THE SPREAD OF MICROBIOLOGICAL DISEASES ON GRAPE PLANTS IN THE SYRDARYA REGION

Abstract: The article presents the results of a study carried out in the farm "Nodir-Ravshanbek-Bunyed" in Gulistan district of Syrdarya region. Grape varieties with different disease resistance - Toifi, Charos, Black Chilgi, Huseini, Mercedes and Rizamat ota - were selected as the object. The prevalence and development of pathogenic microorganisms were studied.

Key words: *Plasmopara viticola*, *Uncinula necator*, *Botrytis cinerea*, *Gloeosporium ampelophagum*.

Annotatsiya: Maqolada Sirdaryo viloyati Guliston tumani "Nodir-Ravshanbek-Bunyod" fermer xo'jaligida olib borilgan tadqiqot natijalari keltirilgan. Obekt sifatida kasalliklarga chidamliligi turli xil bo'lgan uzum navlari - Toifi, Charos, Qora chilgi, Husayni, Mercedes hamda Rizamat ota tanlab olindi. Ularda kasallik qo'zg'atuvchi mikroorganizmlarning tarqalish hamda rivojlanish darajasi o'rganilgan.

Kalit so'zlar: *Plasmopara viticola*, *Uncinula necator*, *Botrytis cinerea*, *Gloeosporium ampelophagum*.

Аннотация: В статье представлены результаты исследования, проведенного в фермерском хозяйстве «Нодир-Равшанбек-Бунед» Гулистанского района Сырдарьинской области. В качестве объекта были выбраны сорта винограда с различной устойчивостью к болезням - Тоифи, Чарос, Черный Чилги, Хусейни, Мерседес и Ризамат ота. Изучены распространенность и развитие патогенных микроорганизмов.

Ключевые слова: *Plasmopara viticola*, *Uncinula necator*, *Botrytis cinerea*, *Gloeosporium ampelophagum*.

Language: English

Citation: Turabekova, D. ANALYSIS OF THE SPREAD OF MICROBIOLOGICAL DISEASES ON GRAPE PLANTS IN THE SYRDARYA REGION. Universal International Scientific Journal, 1(7), 21–27. Retrieved from <https://universaljournal.uz/index.php/jurnal/article/view/1154>

Doi: <https://doi.org/10.5281/zenodo.13981485>

Introduction. One of the main conditions for the further development of viticulture, which is an important branch of agriculture in our republic, and for increasing the quantity and quality of the grape harvest, is to protect the vines from harmful organisms, including diseases. Vines have several dozen infectious diseases caused by fungi, bacteria, viruses, phytoplasmas and nematodes. They can destroy a large part of the crop [6].

The control measures start with choosing a place for creating a vineyard, planting healthy seedlings, and the activity of protecting the growing vine is organized on the basis of monitoring the spread and development of diseases during the season and analyzing their results [8].

Currently, the following microbiological diseases of vines are widespread in Uzbekistan: mildew, oidium, anthracnose, cercosporiosis, gray rot, cypress necrosis, phyllostictosis, phomosis, cladosporiosis, bacterial cancer, etc. [9]. In all areas where grapes are grown in the Russian Federation, every year there are mildew, oidium, gray rot of the vine, grozdevaya listovvertka, thrips, vinogradnyy zuden, as well as spider mite, phylloxera leaf form, etc. occurs [1].

In order to prevent these diseases, scientific work is constantly being carried out. In particular, according to the research of N.A.Yakushina, the grape varieties Podarok Magaracha, Pervenets Magaracha, Bianka, Suruchensky Bely, Ovidiopolsky, Oleshkovsky are resistant to mildew and oidium [10], and Chardonnay, Cabernet Sauvignon, Aligote, Merlot, Sauvignon Zelenyi, Rkatsiteli, Saperavi, Bastardo Magarachsky and Riesling are resistant to mildew and oidium [1].

Among the 10 types of pathogenic fungi listed in V.A.Volodin's dissertation, the most common are: *Phomopsis viticola* - up to 76.3%, *Alternaria alternate* - up to 56.7%, *Cladosporium herbarum* - up to 50.1%, *Trichotecium roseum* - 43.1% %, *Botrytis cinerea* -30.0% [4]. L.Gierland M. Fischer reported for the first time about the following fungi found in the South Palatine area of Germany: *Botryosphaeria sarmentorum*, *Cadophora malorum*, *Cadophora novieboraci*, *Collophora africana*, *Collophora hispanica*, *Cytospora chrysosperma*, *Diaporthe foeniculina*, *Dothiorella iberica*, and *Phaeoacremonium angustius*. *Diplodia seriata*, *Diplodia mutila*, *Dothiorella iberica*, *Cytospora chrysosperma*, and *Dothiorella*

iberica were studied from March to September [11].

Epiphytotic dangerous diseases of major importance in the complex of diseases causing great damage to grape crops are mildew (*Plasmopara viticola* Berl. Et Toni) and oidium (*Uncinula necator* Berk.) [5].

Downy mildew is caused by *Plasmopara viticola* Berl. et Toni belonging to the group of false mealy fungi. This is the strongest seasonal disease that causes significant damage in most grapevine growing zones [7]. Rex and other scientists observed that downy mildew formed a veil on the leaf surface in July-September for 4 years [17]. The period of development was selected in favorable weather and when symptoms appeared. Evaluation was performed according to HIV indicator 452 (HIV 2009) [16]. Colonies of *Plasmopara viticola* are mainly formed in the tips of the leaves, in the parts where dew accumulates [2].

Oidium (powdery mildew) is the second most widespread and damaging seasonal disease and occurs in all grape-growing zones. The spread of the causative fungus *Uncinula necator* occurs at a temperature of 5-6°C and a relative humidity of 15-20% [7]. When studying the growth and development of oidium on White Muscat by E.S. Galkina and others, damage was observed on leaves and fruits from weak (0.2%) to strong (46%). In the Rkatseli variant, disease symptoms are weak (0.2-1.3%) and moderate (11-22.5%) in the leaves; It is weakly (0.2-1.3%) and strongly (49.2-55.3%) developed in fruits [5].

Symptomatic differences between *Phaeoacremonium* and *Cadophora* spp as well as *Phaeoacremonium* min and *Cadophora luteo-olivacea*, common in developed

countries including Canada, have been extensively studied [14]. Research by Cornell University plant pathologist Donald Reddick was the first to study dead stem disease syndrome in grapevines in North America [12]. In 2010, *Botrytis* infestation area and yields were significantly lower in Italian vineyards [5]. Research has shown that removal of infected leaves is very effective in controlling *Botrytis* (Percival et al. (1994) [20], Intrieri et al. (2008) [18], Molitor et al. (2011) [13], Palliotti et al. (2011) [19].

MATERIALS AND METHODS

Experiments were conducted at the farm "Nodir-Ravshanbek-Bunyod", Gulistan district, Syrdarya region. Grape varieties with different resistance to diseases were selected as objects: Taifi, Charos, Black Chilgi, Husaini, Mercedes and Rizamat.

Intensity or degree of plant disease (qualitative indicator of disease manifestation) Vlasova E.A. and were determined based on the scales developed by others. These scales determine the degree of disease development [3].

0 score – there are no symptoms of the disease;

1 score – 10% developed symptoms;

2 score – 11-25% developed symptoms;

3 score – 26-50% developed symptoms;

4 score – 51-75% developed symptoms;

5 score – above 75%.

The prevalence rate was determined based on the following formula:

$$P = n / N \times 100$$

Here:

P – spread of disease

n – infected plants

N – total plants under investigation.

The level of disease development was determined based on the following formula:

Here:

- R – disease progression (in % or points);
- the number of infected plants (a) the corresponding score or percentage of disease (b);
- N- total plants under investigation.

RESULTS OBTAINED AND THEIR ANALYSIS

Dates were recorded during the examination of morbidity. Disease prevalence and disease level were checked before spraying drugs and after 7 days, a total of 6 times. The results showed that the 4 most prevalent diseases in the farm were Mildew, Oidium, Gray rot and Anthracnose.

Table 2.

The degree of contamination of vines in "Nadir-Ravshanbek-Bunyod" farm with Mildew, Oidium, Gray rot and Anthracnose.

№	Total examined plants (N)	Infected plants on a point scale							Disease Prevalence (P)%	Corresponding score or disease percentage of the number of infected plants $\Sigma(a \times b)$	Disease development (R)
		0	1	2	3	4	5	Total (n)			
1	220	80	76	43	21			140	63,6	225	1,02
2	220	129	56	23	12			91	41,4	138	0,63
3	220	139	47	29	5			81	36,8	120	0,54
4	220	160	36	24				60	27,3	84	0,38
5	220	123	57	22	18	10		107	48,6	195	0,88
6	220	140	43	21	11	5		80	36,6	138	0,62

As can be seen from the table, the experiment was carried out on the farm 6 times in one season. The first experiment was carried out in the second decade of April with 220 varieties - Taifi (26 bushes), Charos (30 bushes), Blacka Chiligi (24 bushes), Husaini (60 bushes), Mercedes (40 bushes), and Rizamat ota (40 bushes) damage was observed on a scale of 1 point in each bush, 2 points in 43 bushes and an average of 3 points in 21 bushes.

The experiment was carried out in this way. Damage was more observed in spring and autumn due to humidity, and less due to dry and hot summer months.

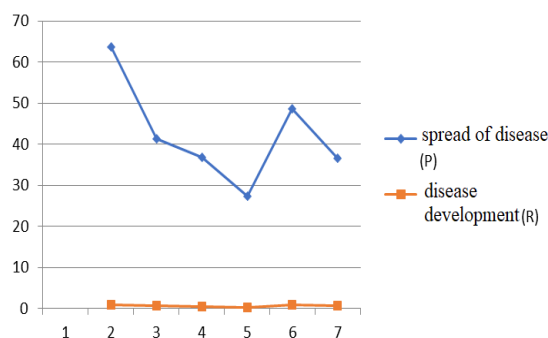


Figure 1. A diagrammatic view of the distribution and development of the vine Mildew, Oidium, Gray Rot and Anthracnose in the "Nadir-Ravshanbek-Bunyod" farm.

As can be seen from the picture, in the first decade of July, i.e. in the 4th inspection, the results showed the lowest. This is definitely due to high air temperature and low humidity.

Experiments showed that out of the 6 tested varieties, Husayni variety had more microbiological diseases. Mildew pathogen

Plasmopara viticola was found to be more common than other pathogens.

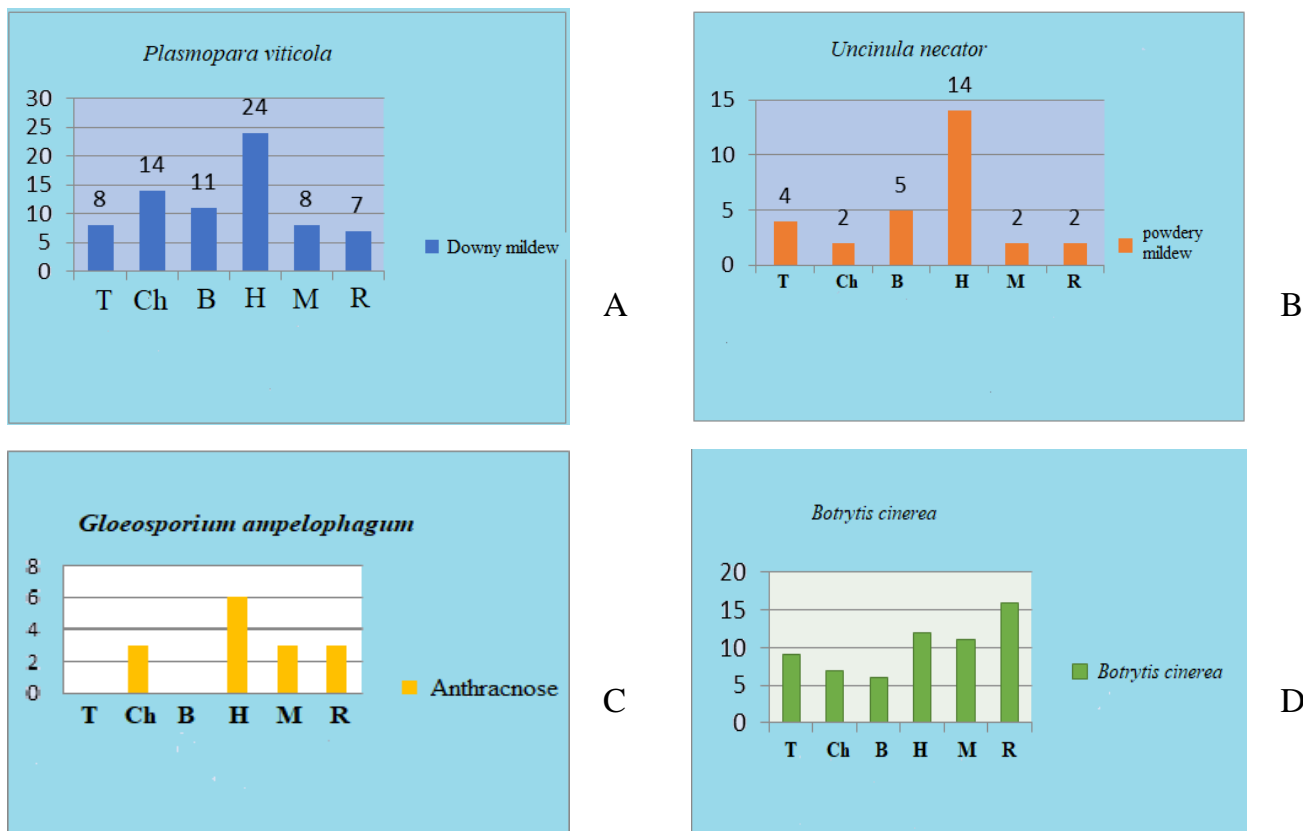


Figure 2. Diagram of infestation with (A) Downy mildew, (B) Powdery mildew, (C) Gray Rot and (D) Anthracnose in different cultivars of grapewine.

Here: T-Taifi, Ch-Charos, B-Black Chilgi, H-Husaini, M-Mercedes, R-Rizamat.

In laboratory conditions, leaves infected with *Uncinula necator* and *Plasmopara viticola* were observed under a microscope.

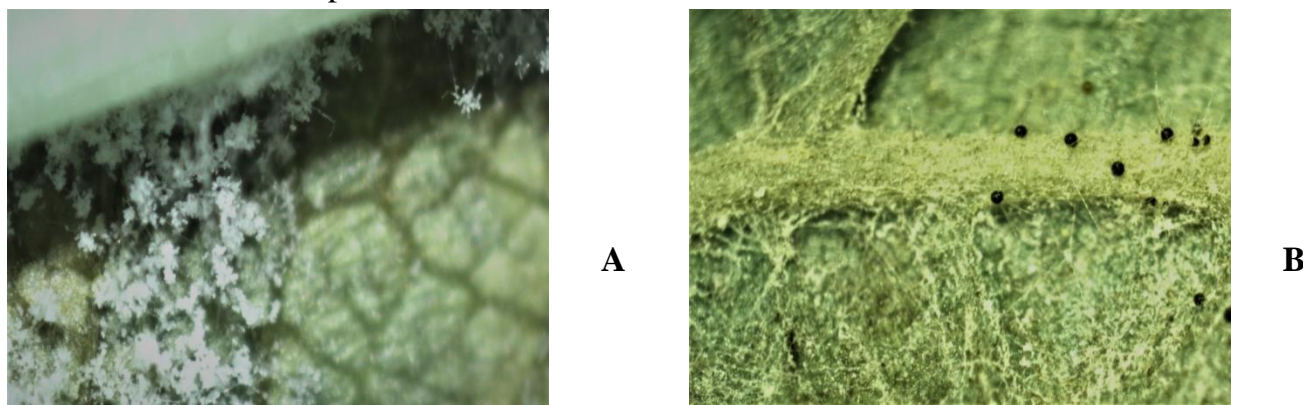


Figure 3. Microscopic view of (A) *Plasmopara viticola* and (B) *Uncinula necator* (200x).

CONCLUSION

1. At present, microbiological pathogens of grapes pose a serious threat in Uzbekistan. Therefore, studying the level of

spread and development of the disease will greatly help to estimate the quality and quantity of the crop.

2. The conducted research showed that 63.6% of the microorganisms studied in

the grapevine were damaged by the second decade of April due to insufficient temperature and humidity. In the first decade of July, due to extremely high temperature and lack of moisture, the damage showed the lowest level, i.e. 27.3%.

3. The conducted researches showed that among the 6 tested varieties, the

Husayni variety was more affected by microbiological diseases in terms of percentage. *Plasmopara viticola* - 32.3%, *Uncinula necator* - 13.2%, *Botrytis cinerea* - 25.9%, and *Gloeosporium ampelophagum* are the least common - 6.8%.

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