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V.S. Salimov, Dr. Agr. Sci., ass. prof,

G.Y. Ibayeva, research,

H.R. Nuraddinova, leading research

Scientific Research Institute for Viticulture and Wine-making
Baku, Azerbaijan

e-mail: gunelvlizad47@gmail.com

RESEARCH ON THE PHYTOPATHOLOGICAL PROPERTIES OF INDIGENOUS AND INTRODUCED GRAPE VARIETIES

Referring to the literature data of world and national scientists, information on many dangerous fungal diseases of grapes, including development, biology, pest diagnosis, and control measures, is important from the point of view of agronomic measures. The article studies the evaluation of indigenous and introduced grape varieties on the scale of resistance to diseases. Observations on 22 varieties of downy mildew, disease from major vineyard diseases reported disease resistance on leaves and foliage. Studies were conducted on Danaburnu, Gara Urza, Gyozal uzum, Gara Pishraz, Moldova, Ichkimar, Tuya tish, Muscat of Italia, etc. Observations show that the resistance of native cultivars to the pest compared to introduced cultivars was influenced by the thickness of the peel, its sparseness, and the firmness of the stem to the peel.

Keywords: resistance, mildew, introduced grape variety, fungal diseases.

Introduction. The most common fungal diseases in vineyards are oidium, mildew, anthracnose, gray rot, and dead bush; viral diseases are short-rot, leaf scab, concussion, etc. In recent years in vineyards (in 16 countries, including Turkey), necrosis of eyes, leaf spots, discoloration of wood, and local and continuous signs of vine trunk desiccation have become more frequent. Control of stem diseases (Esca, Gangrene, Blackleg, Bacterial Canker, etc.) requires a number of phytosanitary measures [1].

The most dangerous pests that grape growers have to deal with are phylloxera, lobesia botrana, and cicada. There have been a number of changes in the dynamics of diseases and pests that we observe in Azerbaijan (Absheron). For example, fungal diseases such as oidium and mildew show slightly different symptoms. At the moment, in addition to the traditional yellow, oily spots of false powdery mildew, uncharacteristic spots have been observed on the leaves [2]. Combined with the ineffectiveness of agronomic measures aimed at preventing it, the damage caused by *Platysmoparum viticola* forces the frequent use of fungicides, making viticulture the agrarian field that uses the most intensive amount of plant protection products. The pathogen infects all green parts of the plant causing extensive losses in grape yield. Repeated use of fungicides negatively affects the farm budget and human health and leads to the selection of resistance to fungicides. Losses caused by *P. viticola*, together with the inefficiency of agrotechnical measures to prevent its spread, force the frequent use of fungicides, turning viticulture into agriculture using the most intensive amounts of plant protection products. For these reasons, the cultivation of grape varieties resistant to pathogens is one of the most urgent strategies to reduce the impact of plant defenses and, at the same time, ensure product quality [3].

Phytosanitary protection should be the basis of integrated, ecological, or organic agricultural production. If the objective is to reduce the number of phytosanitary measures and thus reduce the toxicological load on the agrocenosis while at the same time ensuring the economic aspects and profitability of the viticulture profession, it is necessary to introduce a decision-making process regarding the application of phytosanitary tools with accurate, up-to-date, and complete information.

Currently, one of the methods of obtaining high-quality planting material is the biotechnological method of meristems culture with further micropropagation, which allows not only to improve health, but also to rapidly multiply valuable varieties and forms of grapes, which makes it possible to maximize the intensification of the nursery process.

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The *Lobesia botrana* is a serious pest that damages vineyards in zones with hot and dry climates. So far, only 3 generations have been observed in Azerbaijan, but due to global climate change, its 4th generation has appeared, and winegrowers should take this into account.

Resistance is the ability of a plant to resist the effects of a potential pathogen. Each plant is attacked by up to 100 different species of fungi, bacteria, viruses, and nematodes. Some of the plants affected by a pathogen become resistant to it by activating their genes against pathogen signaling as a result of infection. The plant also responds similarly to abiotic stressors. The main challenges facing viticultural scientists are to develop grape varieties that are resistant to many diseases and pests.

Materials and Methods: According to the OIV classification of the International Grape and Wine Organization, the persistence of the disease is rated according to 5 (five) grades: 1 point - very persistent; 3 points - non-permanent; 5 points - moderately persistent (tolerant); 7 points – persistent; 9 points are considered very persistent. Resistance of grape varieties and forms of grapes to diseases and pests one of the main indicators and is considered one of the most important parameters in their evaluation. Assessment of the degree of infection of grape varieties by the main fungal diseases (mildew, oidium, gray rot, etc.) and pests (cutworm, mealybug, etc.) in natural conditions on a 5-point scale based on the methodology shown by Shikhlinisky (1, 2, 3).

If the degree of disease infection of green vegetative and generative organs of grapes is 5%, high resistance or immunity is 9 points; if infection is 5-25%, resistance is 7 points; if infection is 25–50%, 5 points are tolerant or tolerant; if infection is 50–75%, 3 points are unstable; if symptoms of infection or disease are more than 75%, they are very strong; and 1 point is very unstable [1, 4, 5]. The percentage of disease development is calculated using the following formula (1):

$$P = \frac{1n_1 + 2n_2 + 3n_3 + 4n_4 + 5n_5}{\sum_n 5} 100\% \quad (1)$$

P – Disease progression percentage

n1...n5 – number of ribs, leaves, teeth, crossed with corresponding points;

n – The sum of vines, leaves, stems, bunches;

5 – The highest rate of infection.

Results and Discussions: During the study, the resistance of different grape varieties to Mildew diseases was investigated. The results are reflected in Table 1.

The table shows that they differed from the four introduced grape varieties: the Moldova, Dekabrsky, Dnestrovsky rozovy, and Doina 7 points (continuous) due to resistance to mildew diseases. Leaves of the grape varieties the Moldova, Dekabrsky and Doina showed resistance to mildew, their clusters were relatively resistant (5 points). Although the leaves of the grape variety Tuya showed relative resistance (5 points) to downy mildew, the bunch showed susceptibility (3 points), i.e, up to 50% of the bunch were infected with the disease.

The Cardinal, Ganca gara uzum are sensitive to both leaves and bunch infection (3 points), Muscat of Italia is sensitive to grape leaf infection (3 points), very sensitive to bunch infection (1 point), Chahri Typhoon is sensitive to grape variety leaf infection (3 points), and relatively resistant (5 points) to bunch infection (3 points).

Development of mildew on leaves an bunches		
Varieties	On a leaf	In a bunch
Indigenous grape varieties		
Dana burnu	5	5
Gonushumame	3	3
Gara Urza	3	3
Gara Grape	3	3
Gara Khatyny	5	5
Gyozal uzum	5	5
Ganca gara uzum	3	3
Gelshan	5	5
Khalbasar	5	5
Ag Pishraz	3	3
Gara Pishraz	5	5
Introduced grape varieties		
Moldova	7	5
Dekabrsky	7	5
Dnestrovsky rozovy	7	7
Ichkimar	5	5
Kulzhinski	5	5
Prentable	5	5
Tuya tishi	5	3
Muscat of Italia	3	1
Cardinal	3	3
Doina	7	5
Chahri Typhoon	3	5

According to the observations made, we have come to the following conclusion. Introduced grape varieties are relatively resistant to false powdery mildew compared to native grape varieties. Thus, Moldova, Dekabrsky, Dnestrovsky rozovy, Doina, Ichkimar, Kulzhinsky, etc., are relatively resistant to false powdery mildew. The varieties showed resistance to these fungal diseases (7 points). The conducted research proves that although the development of fungal diseases depends on external environmental conditions (temperature, humidity), an important role is played by the structure of the mouth apparatus on the leaves of the plant, leaf pubescence, and structure of the covering tissues in their infection.

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*В.С. Салимов, д-р с.-г. наук, асоційован. проф., Г.Ю. Ібасва, науков. співр.,
Х.Р. Нурраддінова, провідн. дослідник*
Науково-Дослідний Інститут Виноградарства і Виноробства,
м. Баку, Азербайджан

ДОСЛІДЖЕННЯ ФІТОПАТОЛОГІЧНИХ ВЛАСТИВОСТЕЙ АВОХТОННИХ ТА ІНТРОДУКОВАНИХ СОРТІВ ВІНОГРАДУ

З огляду на літературні дані світових та вітчизняних вчених, інформація про багато небезпечних грибкових хвороб винограду, включаючи розвиток, біологію, діагностику шкідників та заходи боротьби з ними, є важливою з точки зору агротехнічних заходів. У статті досліджено оцінку автохтонних та інтродукованих сортів винограду за шкалою стійкості до хвороб. Спостереження за 22 сортами до несправжньої борошнистої роси, основних хвороб виноградників показали стійкість до хвороб на листках. Дослідження проводились на сортах Данабурну, Гара Урза, Гьозал узум, Гара Пішраз, Молдова, Ічкімар, Туя тіш, Мускат Італія та ін. Спостереження показують, що на стійкість місцевих сортів до шкідника, порівняно з інтродукованими, впливала товщина шкірки, різрідженість і міцність кріплення плодоніжки до шкірки.

Ключові слова: стійкість, мілдью, інтродукований сорт винограду, грибкові захворювання.