1.68 to 1.88 t/ha, depending on the applied preparation. Favorable weather conditions during the years of the study ensured effective pollination and optimal crop formation.

It was established that pre-sowing seed treatment with Bionorma Nitrogen and Bionorma Phosphorus had a positive effect on yield levels, with the most pronounced response recorded in the 'Volodar' variety, where yield increases amounted to 26.1–31.6%. The results obtained will be used in further studies aimed at enhancing the phytoremediation potential of buckwheat and improving the efficiency of its utilization.

The results of the study demonstrated that pre-sowing seed treatment with the biological preparations Bionorma Nitrogen and Bionorma Phosphorus had a positive effect on buckwheat productivity across the studied varieties. The most pronounced response was observed in the 'Volodar' variety, which showed the highest yield levels and the greatest yield increase compared with the control.

Yield performance varied depending on the variety and the applied biological preparation, indicating varietal specificity in response to biological seed treatments. Favorable weather conditions during the years of research contributed to effective pollination, proper crop development, and optimal yield formation.

Overall, the use of biological pre-sowing seed treatments can be considered an effective and environmentally friendly approach to increasing buckwheat productivity. The obtained results provide a scientific basis for further research aimed at enhancing the phytoremediation potential of buckwheat and improving the efficiency of its use in sustainable and organic farming systems.

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IN VITRO INTRODUCTION OF SELECTED GRAPEVINE (*VITIS VINIFERA* L.) GENOTYPES FOR GERMPLASM CONSERVATION AND RAPID PROPAGATION

Grapevine (*Vitis vinifera* L.) represents one of the most economically and culturally important perennial crops worldwide. Modern viticulture faces increasing challenges associated with climate change, emerging pathogens, genetic erosion of traditional cultivars, and the need for sustainable production systems. The preservation of valuable genotypes, including both wine varieties and rootstocks with specific adaptive traits, is therefore of critical importance. Conventional field conservation is often limited by environmental risks, pathogen pressure, and high maintenance costs. In this context, plant tissue culture techniques, particularly *in vitro* cultivation, offer a reliable alternative for the safe conservation, rapid propagation, and distribution of high-quality, pathogen-free planting material.

In vitro methods enable not only clonal propagation but also the establishment of genetic resource collections under controlled conditions, minimizing the risk of genotype loss due to abiotic stress or disease outbreaks. Furthermore, these techniques are essential for supporting breeding programs, facilitating the exchange of plant material, and enabling long-term conservation strategies such as slow-growth storage or cryopreservation. Despite its advantages, successful *in vitro* establishment of grapevine remains genotype-dependent and technically demanding, particularly in the stages of explant sterilization and initial culture establishment.

The aim of this study was to optimize a protocol for an effective introduction, sterilization, and subsequent multiplication of selected grapevine genotypes under *in vitro* conditions. The work focused on both wine cultivars and interspecific rootstocks, representing a diverse genetic background and varying physiological responses to *in vitro* culture.

The experimental plant material included economically important cultivars of *Vitis vinifera*, namely 'Riesling', 'Kerner', 'Dornfelder', and 'Grüner Veltliner', as well as a range of interspecific rootstocks such as '1103 Paulsen', '5C' (Teleki 5C), 'SO4' (Sélection Oppenheim 4), '125 AA' (Kober 125 AA), '110 Richter', '3309 Couderc', 'Kober 5BB', 'Börner', 'Fercal', 'Binova', and 'LE-K/1'. All listed genotypes were successfully introduced into *in vitro* culture, demonstrating the robustness of the developed methodology across genetically diverse material.

Dormant canes were collected during winter pruning, representing a physiologically stable and contamination-reduced source of explants. Nodal segments were prepared and subjected to a multistep surface sterilization procedure based on sodium hypochlorite solution combined with a surfactant to enhance disinfection efficiency. Following sterilization, explants were rinsed repeatedly with sterile distilled water to eliminate residual disinfectants and reduce phytotoxic effects.

The explants were cultivated on a nutrient medium derived from the formulation of Quoirin and

Lepoivre (1977), supplemented with sucrose as a carbon source, agar as a gelling agent, and plant growth regulators, specifically 6-benzylaminopurine (BAP) and indole-3-acetic acid (IAA), to stimulate shoot proliferation. The pH of the medium was adjusted to 5.5 prior to sterilization. Cultures were maintained under controlled environmental conditions, with a temperature of 25°C, a 16-hour photoperiod, and photosynthetic photon flux density of 150 µmol/m^2/s^1, ensuring optimal growth and development of explants.

Successful establishment of aseptic cultures was achieved across all tested genotypes, with visible shoot regeneration occurring within three weeks of cultivation. Multiplication was carried out using multi-nodal stem segments, which proved significantly more effective than single-node explants due to their higher regenerative capacity. The growth dynamics were influenced by both genotype and culture conditions, with some rootstocks exhibiting faster shoot proliferation compared to traditional cultivars.

The results confirm that careful optimization of sterilization procedures, medium composition, and environmental conditions are essential for successful establishment and propagation of grapevine *in vitro*. The optimized protocol enables efficient introduction and multiplication of diverse grapevine genotypes, including wine varieties and rootstocks, while minimizing contamination and physiological stress.

In conclusion, the presented methodology provides a practical and reproducible approach for the *in vitro* propagation and conservation of grapevine genetic resources. Its application contributes to safeguarding valuable genetic material, supporting breeding and research activities, and enhancing the sustainability and resilience of viticulture under changing environmental conditions.

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MORPHOLOGICAL CHARACTERISTICS OF THE MICROMYCETE *DIAPORTHE CAULIVORA* (ATHOW & CALDWELL) SANTOS ET AL.

Soybean (*Glycine max* (L.) Merr.) is one of the main legume crops in the world and in Ukraine. At the same time, its productivity is largely limited by damage by phytopathogenic fungi, among which representatives of the genus *Diaporthe* occupy an important place. In particular, the fungus *Diaporthe caulivora* (Athow & Caldwell) Santos et al. (*Diaporthe phaseolorum* var. *caulivora* Athow & Caldwell) is the causative agent of soybean stem canker, which causes necrosis of the stems with the appearance of dark brown spots on them, yellowing and wilting of the leaves. This leads to a decrease in plant yield and seed quality. Despite a significant number of studies conducted abroad, the issue of morphological identification of this pathogen in Ukrainian conditions remains relevant.

The aim of the study was to investigate the morphological features of the fungus *Diaporthe caulivora* in laboratory conditions.

The study was conducted in the problematic research laboratory «Mycology and Phytopathology» of National University of Life and Environmental Sciences of Ukraine. Pure cultures of the pathogen were obtained by isolation from affected tissues of soybean stems with subsequent cultivation. Potato glucose agar (PGA) was used to grow the fungus. Morphological studies were carried out using a light microscope using an ocular screw micrometer MOV-1-15^x. Measurements were performed on previously prepared micropreparations with subsequent statistical processing of the obtained data.

During the study, it was found that *D. caulivora* forms a well-developed septate mycelium, which has a white color, over time acquires a darker shade, from grayish to olive.

Pycnidia are formed in the affected tissues of the plant and on the nutrient medium. They had a spherical shape, dark in color. Their diameter varied within 162–201 µm. *α*-conidia were also found – colorless, ellipsoidal or oval in shape. Their size was 6,5–8,5 × 1,9–3,3 µm. *β*-conidia, 19,5–23,5 µm long and 0,8–1,2 µm wide, were also observed.

Thus, the fungus *D. caulivora* is characterized by typical morphological features, including the formation of pycnidia and pycnospores. Their shape and size generally correspond to the literature data, but are variable under different conditions. The results obtained confirm the feasibility of using morphological analysis as an important stage of preliminary identification of phytopathogens of the genus *Diaporthe* on soybean plants.