RESOLUTION OIV-VITI 655-2021

OIV RECOMMENDATIONS ABOUT VALUATION AND IMPORTANCE OF MICROBIAL BIODIVERSITY IN A SUSTAINABLE VITIVINICULTURE CONTEXT

THE GENERAL ASSEMBLY

ON THE PROPOSAL of the Commission I Viticulture and the Expert group "Sustainable Development and Climate Change",

IN VIEW of the OIV Strategic Plan 2020-2024, in particular on its Axis 1 "Promote sustainable vitiviniculture" and its subsections: A) Consider and respond to the challenge of climate change; B) Characterize and evaluate sustainable production methods and principles; and F) Take into account the sustainability of viticultural terroirs,

CONSIDERING Resolution VITI 1/2002 on preservation of Biodiversity,

CONSIDERING Resolution VITI 1/2003 on coordination of priority themes in viticulture and that established genetic diversity and more generally biodiversity as crucial importance,

CONSIDERING Resolution OIV-CST 518-2016 on the general principles of sustainable viticulture its principle n. 2: « Sustainable vitiviniculture respects the environment » with focus on parts concerning biodiversity conservation,

CONSIDERING Resolution OIV/VITI 333/2010 where biodiversity is recognized as an essential feature of terroir,

CONSIDERING the OIV collective expertise document "Functional biodiversity in the vineyard" of 2018,

CONSIDERING the common interest for developing soil monitoring methodologies and metrics (as highlighted by the FAO on its document of 2019: 'A literature review of Monitoring and Evaluation (M&E) frameworks for Climate-Smart Agriculture'

CONSIDERING the general principles of the Nagoya Protocol specially in the point (a) of article 8 'Create conditions to promote and encourage research contributing to biodiversity conservation and sustainable use'.

RECOGNISES:

- Microorganisms participate in the majority of soil biogeochemical process,

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playing crucial roles in nutrient cycling and maintenance of soil fertility.

- Microorganisms are potentially early indicators of the influence of external factors in the overall biodiversity of the vineyard.
- Plants interact with their associated microorganisms to give rise to a biological ensemble called “holobiont” and microbial community of the rhizosphere can influence a large number of functional traits of the plant.
- Vineyard management and plant protection strategies change soil and grape microbiomes which in turn affect the composition of the wines.
- Certain microbial species are listed among those responsible for a wide range of plant pests and diseases affecting grapevine health, in particular those associated with some forms of grapevine decline.
- The grape and grapevine microbiota show biogeographical patterns, although considerable study and validation of relevance to specific geographies and production systems are required. In addition, some characteristics of the wine may be related to the composition of the regional grapevine-associated microbial community.
- Biological diversity indices, traditionally used in ecology sciences, are key indicators for determining and monitoring the composition, structure and function of the microbial biodiversity of vineyards.
- The resistance and resilience of microbial ecosystems in the vineyard (i.e. soil, rhizosphere, phyllosphere), determined by their biodiversity features, are measurable indicators of the biological sustainability of a vineyard. Culture-independent techniques based on DNA Sequencing technologies (also referred to as "Next-Generation Sequencing", NGS), are sensitive and emerging methodologies for characterising the microbial biodiversity of the vineyard.

RECOMMENDS:

a. To the Member States:

- To promote and encourage the development of policies for quantitative and qualitative valuation of microbial abundance and its biodiversity in the vineyard, its use as an indicator of functional biodiversity, biological sustainability and as a

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measurable value of the effect and impact of vitiviniculture practices and management systems.

b. To the scientific community:

- The study of the diversity of biogeographical patterns and validation of relevance to specific geographies and production systems.
- The study of microbial populations in vineyards and their role in the health and functioning of soils as well as in the production and quality of vitivinicultural products.
- The use of harmonized monitoring methodologies for the study of microbial diversity in relation to different types of soil, management techniques and age of the vineyards.
- The study of the effect of different vitivinicultural systems on composition and functioning of the soil microbiome.
- The use of culture-independent methodologies (i.e. technologies based on next-generation sequencing (NGS) or high-throughput cultivation approaches, culturomics) in microbiology surveys, at a local, regional and global scale, for studying the microbial biodiversity in vineyards and to preserve as isolates some relevant taxa (i.e. vine pathogens, biocontrol agents, among others) in microbial culture collections.
- To promote technical-scientific interactions and to bring together the skills between microbiologists, ecologists and physiologists of the vine to enhance the role and importance of the microbial biodiversity of the vineyard system.
- More specifically, the study and development of a critical review with practical implications about the role and importance of the vineyard microbiota in a global vitiviniculture context, including the concepts and content in the following five points:

    i. The study of the interactions between the vineyard microbiota, the inputs of chemical nutrient and defense products applied at the phyllosphere and soil level,

    ii. A detailed list of known microbial species involved in grapevine diseases and grape rots, those well-established as biocontrol agents or with other positive effects (depollution, fertility, carbon cycle, others), as well as those impacting the performance of winemaking

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processes.

iii. A diagram of known soil microbial processes with a focus in the role of microorganisms in nutrient/mineral elements cycling and mobilization.

iv. Considering the available scientific information of micro-biodiversity in vineyards, drawing up a list of microbial diversity indices and the evaluation of the possibility to establish global figures (mean values, upper and lower limits) for these indices, to be used as reference values for guiding future local studies on the microbial diversity of vineyards.

v. The development of an inventory of validated analytical methods in order to support the use of culture-independent methodologies in the study of vineyard's microbiota.

- To review and update the 5 points described above every three years according to the publication of new relevant scientific works on the importance of microbial biodiversity for viticulture.

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