EUROPEAN COLLABORATION FOR THE GRAPEVINE PHENOTYPIC DIVERSITY EXPLOITATION

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INTRODUCTION – Common limits for phenotyping are costs in terms of equipment, specialized researchers, and time. Moreover, phenotyping requires specific methods in relation to the studied traits, and each method is generally designed to highlight very specific characteristics of the singular trait. Thus, the obtained results are not easily comparable between different institutions. However the data sharing is clearly the most powerful approach to limit the costs and efforts optimizing the obtained results in term of number of studied accessions. It should be stressed that funds are another great limit in research, especially in East countries, where the most interesting cultivar variability is preserved.

AIMS AND SCOPES – The main purpose of this work is the establishment of a phenotyping network able to produce comparable data among the Pan-European grapevine collections.

MATERIALS AND METHODS – Two protocols were proposed: one for phenology and, the other, for eno-carpological traits. Data were recorded in two consecutive vintages: 2012 and 2013.
Concerning phenology, the extended BBCH scale (universal and flexible) was adapted to our objects by moving it into a chrono-phenological scale. Then, a cubic curve was selected for modelling the phenological courses. Thus, computing for each accession specific coefficients, it was possible to obtain the relative phenograms. Considering the different site climatic conditions, it was possible to spatialize the results, obtaining reference phenological maps.
Concerning eno-carpological traits, the attention was focused on characteristics with a clear impact on the production quality, such as berry morphology (weight, diameters, number of seeds …) and composition (sugar, titratable acidity, anthocyanin and phenolic contents …). The protocol was organized to concatenate the data acquisition, with the objective to generate new derived variables. The methods were selected to be easily reproduced in all the involved collections, without the necessity of expensive facilities.

RESULTS AND DISCUSSIONS – The first year of dataset was used to evaluate the methods. Two publications are already available confirming the protocols quality. Concerning phenology, both the variability between accessions grown into the same collection and the phenological shifts between the reference varieties cultivated in different areas were highlighted by the protocol. Matching climatic and phenological information of reference cultivars, phenophases maps were obtained.
The performances obtained by the eno-carpological protocol were satisfactory both in a global point of view and in a singular collection evaluation.
The project obtained an impressive participation, considering the volunteer contribution without any material funding to cover the work costs. Twenty-four institutions collaborate to the data collection. 1724 accessions were evaluated: 931 (583 in 2012 and 348 in 2013) for phenology and 793 (424 in 2012 and 369 in 2013) for eno-carpological descriptions.

CONCLUSIONS AND POSSIBLE APPLICATIONS – The protocol sharing allows the data comparison among different grapevine collections. The possible future application for this dataset could be related to scientific studies of genetic associations. Moreover, the improved knowledge of minor and neglected cultivars could have a direct impact on the industrial production, giving information concerning new varieties for future introduction in viticultural areas.