Benefit of bilateral project between Serbia and France to improve the expertise in histological analysis of tomato pericarp exposed to different irrigation techniques

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BENEFIT OF BILATERAL PROJECT BETWEEN SERBIA AND FRANCE TO IMPROVE THE EXPERTISE IN HISTOLOGICAL ANALYSIS OF TOMATO PERICARP EXPOSED TO DIFFERENT IRRIGATION TECHIQUES

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Histological and cytological properties of tissues in fleshy fruits largely impact the overall quality traits, such as size and composition. Previous qualitative and quantitative studies of histological and cytological fruit properties have been mainly performed in separate approaches, as they request different techniques (McAtee et al., 2009). Approach which combines different methods to assess both quantitative and qualitative histological and cytological traits has been rarely performed on fleshy fruit. The bilateral project between Serbia and France (2012-2013, Pavle Savic) aimed to bring together several teams with complementary expertise and technical means for evaluating the effects of contrasted irrigation practices on tomato fruit, with the emphasis on its anatomical and cytological background. French partners from INRA (National Institute of Agronomic Research) in Bordeaux and Avignon, world recognized experts in the cytological and histological aspects of tomato fruit growth regulation, provided a technical platform of cytology and image analysis as well as the expertise and skills for the histological and cytological study. The French partners mainly focus on the interactions between genetic and environmental factors, the study of early development and the build-up of quality traits for tomato fruits. At the Faculty of Agriculture, research focuses on the effects of different irrigation treatments on cultivated plants, especially tomato. This collaboration allowed an original investigation of the effects of water deficit on the histological and cytological properties during tomato fruit development. During the project, Serbian young researchers spent more than 10 weeks in INRA France and had the chance to improve their skills and knowledge thanks to the expertise and experience of dr. Bertin in cytological analysis of tomato fruit pericarp, while detailed cytological analysis of cell size and shape was supervised by dr. Cheniclet. This project was useful for scientific teams of both sides. This collaboration resulted in a better understanding of the effects of different irrigation treatments on the processes of division and differentiation in fruit pericarp during ageing. It also permitted to compare different quantitative and qualitative cytological techniques. The project resulted in joint publications and it will be followed by further scientific collaboration among partners. This bilateral project was beneficial especially to the Serbian PhD students, who expanded their international experience and broaden their expertises especially in the field of cytological and image analysis. The scientific benefits of the

project are reflected in the fact that obtained results will represent a significant part of a PhD thesis in progress and they will also be implementated in a national project. On a longer term, the joint research will benefit to tomato growers and breeders and help them to adjust their practices and improve tomato yield under sustainable irrigation conditions.

Keywords: *histology, cytology, image analysis, water deficit, tomato growth, bilateral project*