Object: Statement of the supervisor on the application for the dissertation defense of M.Sc. Alba Esteban Hernandiz

"Characterizing the mode of action of small molecule-based biostimulants"

As supervisor of the doctoral thesis of M.Sc. Alba Esteban Hernandiz and close scientific collaborator of her, I would like to express my support for her application to defend her dissertation. M.Sc Alba Esteban Hernandiz fulfills all the requirements imposed by the Study Regulations. Indeed, she completed all the credits needed for applying to defend her dissertation. She also realized one stay at the department of Ciencias de la Vida y de la Tierra of the Institute of Natural products and agrobiology (IPNA) located in San Cristobal de la Laguna (Tenerife, Spain), whose leader is Dr. Andrés A. Borges Rodríguez. She also passed the state doctoral exam in December, and most importantly, she signed seven publications in journals with impact factors. She is the last author of work published in *Agricultural Water Management* (IF2020: 4.72) because she developed the project, performed the experiments, and wrote the article. Besides, she is co-author of additional four publications in journals with impact factors, such as *Frontiers in Plant Science, The Plant Journal, Remote sensing* or *Agronomy,* and first authorship of additional two research articles; one published in *Plants* and another one under revision in *Frontier in Plant Science.*

The dissertation of M.Sc. Alba Esteban Hernandiz is entirely written in English and consists of seven sections, including results, conclusions, and future perspectives. In the introduction section, she presents the state-of-the-art on the topic. She summarized the results and conclusion of the most representative articles included as appendices in the following sections. The thesis is focused on characterizing polyamines, which are natural compounds in the plant, as small molecules-based biostimulants to improve plant growth, stress tolerance, and yield in different plant species., M.Sc. Alba Esteban Hernandiz dealt with multidisciplinary techniques, including image analysis, plant physiology, metabolomics, and mathematics, to fulfill the aim of her thesis. I believe that the thesis presented by M.Sc. Alba Esteban Hernandiz is of excellent quality.

During her PhD study, M.Sc. Alba Esteban Hernandiz showed a lot of enthusiasm and dedication to her work and science in general, with an analytical mind and pleasant personality. She learned how to be independent in her work and work in-group. She used much energy learning new methods that were useful to realize her PhD study and bring it to a high level. Therefore, she has an actual multidisciplinary formation joining plant physiology, metabolomics, and plant phenotyping. She also improved her skills in writing scientific research articles, now able to write the manuscripts independently.

Overall, I believe that M.Sc. Alba Esteban Hernandiz has shown the ability to use a wide range of technics with the high degree of skill expected for a thesis candidate. In conclusion, I would say that M.Sc. Alba Esteban Hernandiz has all characteristics that make a great, real scientist; team worker and interest, curiosity, and enthusiasm for science, skills, and knowledge. Therefore, I sincerely support M.Sc. Alba Esteban Hernandiz to present her dissertation for Ph.D. defense.

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