Response to Reviewer 2 Comments

Point 1: The title reflects the content of work. An abstract is concise and factual. Describes the main issues raised in the manuscript. Authors stated in lines 26-27 „…plant can be significantly affected by the environmental conditions, such as light availability or temperature [2,3].” The quoted work of Stawicki et al. (2015) investigated also water deficit influence on organ separation, thus „drought stress” should be added. In lines 30-32 Authors written „The abscission physiology has been divided by different authors into four main phases (from phase 1 to 4) or stages (from stage A to D) [4-8]. The descriptions in parenthesis do not contain substantive content, they should be deleted because, in the next sentence, the Authors put emphasis on the individual stages of abscission.

Response 1: Both changes suggested by the Reviewer were made.

Point 2: I suggest to clarify the title of the second chapter, it is not very informative. I propose „The role of ethylene in the functioning of the abscission zone ". The crucial role of IAA-ET balance in organ shedding has been pointed out many times. However, the detailed mechanism of both hormones during abscission processes remains poorly understood. Authors pay attention to the connection between polar auxin transport and sensitivity of AZ cells to ET, but it cannot be ignored that this regulation also includes de novo biosynthesis of phytohormones in the place of action. Auxin can stimulate the production of ET and, consequently, enhance abscission in cotton and bean (Abeles and Rubinstein 1964, Morgan and Hall 1964). Moreover, Kućko et al. (2019) proved by cytochemical analyzes, that the changing level of IAA above and below flowers AZ in yellow lupine had a positive effect on ET biosynthesis genes (LIACS, LICO) and localization of ET precursor – ACC exclusively in AZ area.

Response 2: we agree with the reviewer’s comment on the complexity of the interplay between ethylene and auxin during abscission. We have added a brief comment on this aspect raising the interest on the fact that the auxin-ethylene cross-talk in abscission still needs further clarification. However, we did not want to comment on the auxin-induced up-regulation of ethylene genes in detail since this is a large topic already discussed at several levels (fruit ripening, Arabidopsis cell elongation, etc.). We preferred instead to briefly comment on the putative dual role played by auxin during the early and late phases of organ abscission. We hope that this decision will be acceptable for the reviewer.

Point 3: Authors stated in lines 102-104 „However, this view has been recently reconsidered on the basis of the functional characterization of ida hortologs from different species (such as litchi and citrus) that appear to be ET inducible similarly to the Arabidopsis ida gene specifically regulated in AZs of floral organs [8, 26, 30]”. Recently, Wilmowicz et al (2018) observed that ET increased expression of IDA homolog in flower AZ fragments isolated from Lupinus luteus.

Response 3: This was intended not to be an exhaustive list, however we understand the reviewer’s point and we have slightly changed the sentence and added the reference Wilmowicz et al (2018) as follows: “…. ida hortologs from different species (e.g. such as litchi, citrus and lupinus) that appear to be ethylene inducible…”
Point 4: Collectively, Authors raised an issue of abscission in model plants (*Arabidopsis* and tomato) and one crop species (apple). Giving the fact, that there are also several papers concerning phytohormonal control of abscission events in the other crops, e.g. litchi, mango, lupine, oil palm Authors should also take into account all these results. Especially in the context of global climate changes that can affect the AZ activity and yielding of many species. All these results are of most importance since can provide molecular markers for selection of varieties characterized by higher stress tolerance. Furthermore, in order to verify the hypothesis that IDA-HSL mechanism is conservative in agronomic species (Authors also stated), in my opinion, all results concerning identification and regulation of the elements of that pathway shouldn’t be omitted (suggested below).

Response 4: We understand the reviewer’s comment however, as already mentioned, there are already reviews available dealing in detail with the precise regulatory aspects of abscission. Indeed, our aim was to provide an opinion paper highlighting the findings that we thought could be more relevant. For this reason, the list of references is not exhaustive, and we have decided to focus only on some publications. Even though the list mentioned by the reviewer is relevant, is however out of the scope of a short opinion review on ethylene’s role in abscission as we have conceived it in agreement with the editor.

Point 5: Please re-examine the „References” carefully because there are mistakes, e.g.: „Crosstalk between environmental stresses and plant metabolism during reproductive organ abscission” should be „Cross-talk between environmental stresses and plant metabolism during reproductive organ abscission”

Response 5: References were carefully checked, and the suggested correction was made. New references were added as suggested.