

Review report

Overall, this research article represents an interesting “**UV-B irradiation promotes anthocyanin biosynthesis in the leaves of *Lycium ruthenicum* Murray**”. Contains a relatively short introduction. I suggest authors increase its length. Overall, the manuscript is interesting and well-structured. Moreover, the Materials and methods & results are clearly described making the manuscript understandable for readers. In order to improve the present study, Minor revision has to be done and some essential modifications have to be fixed before it proceeds, and decisive action can be taken. In addition, the study needs some editing on some minor grammatical issues. And follow the paper guideline. All the comments, remarks and suggestions are given below.

Abstract.

- 1:** The findings are well-summarized, but the implications of the study could be expanded. How do these findings contribute to the broader field of molecular biology or agricultural science?
- 2:** Ensure consistent use of scientific names throughout the paper. For example, "*Lycium ruthenicum* Murray" is used in some parts, while "*L. ruthenicum* Murr." is used in others. Standardize this for clarity
- 3:** The role of the protein interaction network is mentioned briefly. Could you clarify how this network analysis contributes to understanding UV-B signal transduction?

Introduction:

- 4:** The introduction mentions a lack of systematic research on anthocyanin synthesis in *L. ruthenicum* Murr. under UV-B irradiation. This gap could be emphasized more strongly to underscore the novelty and necessity of the study. Can you elaborate more on why this gap is critical?
- 5:** Have other studies explored UV-B effects on similar plants? How does your approach differ from or build upon these studies?
- 6:** Author should describe the (COP1 and HY5) in introduction.

Results:

Lines 141-144: You noted that anthocyanin content peaked at 1 day and then decreased with longer UV-B exposure. Do you have any hypotheses or explanations for this pattern? How might prolonged UV-B exposure affect anthocyanin degradation or synthesis?

Lines 174-175: The mention of enriched pathways includes some repetition ("Other enriched pathways include phenylpropanoid metabolism, flavonoid metabolism, and hormone signal transduction."). Consider revising to avoid redundancy.

Lines 178-183: The expression of UVR8 and COP1 genes showed different patterns. What might account for the initial decrease and subsequent increase in COP1 expression? Are there known feedback mechanisms or regulatory processes that could explain this?

Lines 203-219: The results highlight the significant increase in WRKY transcription factors. Could you discuss the potential functional roles of these WRKY transcription factors in UV-B response and anthocyanin synthesis?