Reviewer 2:

The paper titled “Quantitative Trait Locus Mapping of Marsh spot Disease Resistance in Cranberry Common Bean (*Phaseolus vulgaris* L.)” presented a well-elaborated research. The authors performed a genetic mapping for the marsh spot resistance in Cranberry common bean by using138 recombinant inbred lines. Of which, 21 quantitative trait loci (QTL) associated with marsh spot resistance were identified, and 17 Mn-deficiency related candidate genes co-located within six QTL. Generally, I believe that the Author(s) provided solid theoretical foundations for the analysis using appropriate approaches. But there are still some errors need to be revised in the article, and my main concerns are listed as following:

Answer:

Thanks for the positive comments. Considering the concern of the length of the genetic map from another reviewer, we have taken the suggestion and re-generated a much shorter genetic map and re-performed QTL mapping based on the new genetic map. Not surprisingly, highly similar results were obtained. Although we have updated some tables and figures, the major results and conclusion have no changes.

Point 1: Is there conclusive evidence that the marsh spots are caused by manganese (Mn) deficiency and not other elements during seed development? If it is, the authors should provide more reliable references or robust experiments to confirm it.

Answer:

Thanks for the suggestion. We have added one paragraph (line 77-85) to introduce some studies of causal factor of marsh spot.

It has been reported that Mn deficiency is associated with marsh spot in peas. We have a review paper published in “Jia et al. (2021) Marsh Spot Disease and Its Causal Factor, Manganese Deficiency in Plants: A Historical and Prospective Review. Agricultural Sciences, 12, 928-948”. In our another study (Jia, B.; Conner, R.L.; Khan, N.; Hou, A.; Xia, X.; You, F.M. Inheritance of marsh spot disease resistance in cranberry common bean (*Phaseolus vulgaris* L.). Crop J 2021, 10, (2), 456-467.), we reported an indirect evidence supporting the association of Mn deficiency with marsh spot in common bean. We tested Mn concentration in the soil of the experimental fields used for marsh spot evaluation from 2015-2019. The Mn concentrations in the soil of the fields in the first three years (2015 - 2017) were much higher than those in the last two year (2018 - 2019); correspondingly, significantly lower MSRI and MSI in first three years than in the last two years were also observed.

Point 2: the zinc transporter (ZIP) coding gene Phvul.005G048900 and the cation efflux (CAX) family protein-coding gene Phvul.005G049300 were considered two important Mn transporter genes. The author should provide accurate reference information in introduction.

Answer:

Thanks for suggestion. We have added sentences to describe some putative candidate gene information in Introduction in line 86-100.

Point 3: What's the difference between Dry common bean and Cranberry Common Bean?

Answer:

Thanks for the question. To avoid any ambiguousness, we removed the word “dry” in the first line of Introduction and abstract. Based on the use of the common bean, we call common bean dry bean if seeds are the final product, otherwise green bean if used as vegetable.

However, Cranberry common bean is a market class of dry beans with color patterns on seed coat showing in the following image.



Point 4: The “195SNPs” should change to “195 SNPs” in line 97. And mistakes same as this should be changed in line 98,105,130 and so on.

Answer:

Thanks, carefully checked and corrected.

Point 5: All of the tables in your paper should be changed to the standard three-line table.

Answer:

Thanks for correction. We have carefully reformatted all tables including supplementary tables.

Point 6: The quotation of database should be traced back to articles in which uploaded it. Please check on your reference format carefully and modify it.

Answer:

Thanks for the suggestion. We have carefully check all references and citations.

Point 7: The “thus” is recommended to change to “eventually” in line 552.

Answer:

Corrected. Thanks.