Reviewer Report

Title: **High quality assembly of the reference genome for scarlet sage, Salvia splendens, an economically important ornamental plant**

Version: **Original Submission**   **Date:** 2/22/2018

Reviewer name: **Stephen Tsui**

Reviewer Comments to Author:

This manuscript described the construction of genome sequence and annotation for Salvia splendens Ker-Gawler. A hybrid approach using PacBio Single-Molecule Real-Time (SMRT) and Illumina HiSeq sequencing platforms was employed. Finally, a genome of 808Mb and 54,008 protein-coding genes were reported. The genome should be pretty completed because 1) the genome size is already bigger than the k-mer estimated genome size; 2) supported by BUSCO results and 3) satisfactory N50 and contig / scaffold number. However, this is not the first species of the same genus and more functional information should be included to improve the novelty and usefulness of this piece of work. Otherwise, this will be only another genome sequence deposited in the database.Comments and suggestions:1. As mentioned in the introduction, many species of this genus are extensively used for culinary purposes, essential oil production and Chinese herbal remedies. Therefore, it is expected that the active ingredients of the plant responsible for its biological and therapeutic functions should be quite well known. If the metabolic pathways responsible for the production of these ingredients could be dissected, the information reported could be more useful for researchers working on this plant species.2. Regarding the transcriptome analysis, results had been generated using tissues obtained from roots, shoots, leaves, calyxes and corollas. For gene discovery, mixing all the datasets to generate the transcript set is reasonable. However, to highlight the therapeutic value of particular part(s) of the plant, differential expression analysis and gene clustering would be expected. 3. Since the genomes of Salvia miltiorrhiza (Zhang et al. and Xu et al.) and Mentha longifolia have been published, a more detailed analysis about differences between Salvia splendens and the other two plants should be conducted, so as to highlight the importance of Salvia splendens. Moreover, the functional significance of such differences should be extensively explored and discussed. Finally, certain experiments should be done if necessary.

Level of Interest

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