

## **Reviewer Report**

**Title:** "Morphometric analysis of Passiflora leaves: the relationship between landmarks of the vasculature and elliptical Fourier descriptors of the blade"

**Version:** Original Submission    **Date:** 9/15/2016

**Reviewer name:** Christopher Jiggins

### **Reviewer Comments to Author:**

This paper assesses leaf shape variation in Passiflora using two different morphometric methods. I will say from the start that I am not an expert in these techniques and am not in a position to review the methods or statistics in this paper, so my comments are somewhat superficial and the paper should also be reviewed by a morphometrics/statistical expert.

Background: I'd like to see a bit more justification for the study- Is this aimed at developing automated methods for species identification, or quantifying ecological communities and their diversity of leaf shape? Or is it purely an assessment of the methods for shape quantification (Passiflora have such dramatic shape variation it should be an easy test case?)

The analysis considers 'species' and developmental stage 'heteroblasty' separately and as independent factors. However I think this is the wrong approach because the plasticity of leaves is highly species dependent - so in analysing plasticity, species should be included in the model, such that the interaction of stage and species is considered. It is not really surprising that when considered independently, leaf position is not a very good predictor of leaf shape because the developmental process is different in each species. Or alternatively the leaf position analysis could be conducted on each species separately, if the data are sufficient.

It is interesting that more juvenile leaves show less species-specificity as detected in the dataset - anecdotally I have noticed the same thing.

Discussion: Are there any ecological implications of this work? Are the species sympatric, or where do they come from. I'd be interested to know about disparity in leaf shape among sympatric species, and whether this might be greater than expected by chance, as would perhaps be predicted by the Heliconius coevolution hypothesis. It would be interesting to think further about which ecological questions could be addressed with these methods

Page 3 Line 21 Refer to recent paper on shape learning

Dell'aglio, D. D., Losada, M. E. & Jiggins, C. D. Butterfly Learning and the Diversification of Plant Leaf Shape. *Front. Ecol. Evol.* 4, 81 (2016).

### **Level of Interest**

Please indicate how interesting you found the manuscript: An article whose findings are important to those with closely related research interests

### **Quality of Written English**

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