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Habitation - Clément Lafon Placette

Dear Professor Tomas,

You asked me to provide an overall assessment of the viability of Clément Lafon Placette's research direction, the quality of his individual papers and his potential for further research. This I have done below.

Clément Lafon Placette has a rising profile of key papers and an h index of 15 (google citations, Jan 2022), which is good for a scientist whose first publication was in 2010. The number of citations on his papers shows a rising international influence. In 2013, he published the first of his papers in the general area of sexual conflict in plants, the area in which he is now thriving. It is clear that his choice to move to this area was strategically good, as Placette is obviously a fast-rising star. He shows much promise and it is clear he has excellent productivity and vision. He has had tremendous success in publishing in top journals, revealing an ambitious scientist who can compete at the highest international levels. Indeed, Placette has an exemplary record of key original papers in the excellent, highly competitive journals, including Nature Plants, New Phytologist, PNAS, PLoS Genetics. There are also several very good reviews too, which will, I am sure, be influential. For example, his paper in Current Opinions in Plant Biology (2014) already has 114 citations.

Placette begins his research in the area of plant sexual conflict through his studies on endosperm failure and the role of endosperm genome dosage (EBN) on endosperm structure and function and seed viability. He presents some very interesting hypotheses (as outlined in Figure 10 and 11 of his thesis) to explain why EBN affects endosperm development and seed fecundity. The insights he gained now leads led him to ask question about how EBN impacts evolutionary processes (speciation), breeding systems (inbreeders/outbreeders), sexual conflict (paternal and maternal genome conflicts), and interploidy crossing (diploids/polyploids). He is clearly making major contributions in addressing these questions, exploiting different species, accessions, and plant breeding systems, especially in the plant family Brassicaceae and the genera *Arabidopsis* and *Capsella*.

Since this EBN work he has diversified and developed his thoughts still further, to present data which he interprets as evidence of sexual selection, coevolution and runaway selection in plants. Some of this is controversial, but the ideas are extremely interesting and the approach a clever adaptation of a vast literature that is already in existence in animals. He now wants to asks "Do they [plant reproductive processes] substantially shape the evolution of sexual traits, genes & genomes in plants? Does this have a general impact on plant evolution and the emergence of new species? Finally, does the diversity of sexual strategies found in plants affect sexual selection and conflict? Or vice versa?" These are very interesting questions and Placette is addressing them using state of the art

approaches in genetics and genomics. I expect many further significant publications will emerge.

There can be no doubt that Placette has found a very interesting niche in which he is thriving, a niche which is likely to be fruitful long into the future. The work is thought provoking and provides a very interesting framework to consider the huge array of plant characters related to flower morphology (including dioecy/monoecy/hermaphroditism) and seed fecundity. In his work, Placette is attempting to reframe long standing questions about plant speciation and divergence in the light of sexual selection. I am sure that Placette has a bright future ahead of him and I recommend him for the promotion in which he seeks.

Yours sincerely,

Professor Andrew Leitch