

**Evaluation of the habilitation thesis of Dr. Clément Lafon Placette entitled "*Sexual selection, sexual conflict and mating systems: the triumvirate ruling over plant (reproduction) evolution*".**

Dr. Lafon Placette submitted a thesis based on 14 papers submitted and/or published in leading journals such as *New Phytologist*, *Evolution*, and *Molecular Evolution*. The thesis summarizes the applicant's work during the last eight years, from the time of his postdoctoral stay (2014) in Uppsala (with Prof. C. Köhler) to his independent research at Charles University.

The main part of the habilitation thesis is an introduction to aspects that determine or influence the reproduction of flowering plants. The introduction is divided into two main chapters, namely Part I on hybrid seed lethality and Part II on the role of sexual selection in plant reproduction. These two parts, as far as I understand, roughly correspond to Dr. Lafon Placette's previous and current research interests. The introductory part is written in an authoritative style; it is engaging and accessible to readers who are not familiar with all aspects of sexual conflict, hybrid seed lethality, and related aspects. The author provides sufficient insight into previous accomplishments in the field, makes balanced references to his own contributions, presents current research in his group, and acknowledges the participation of his students. I appreciate that the author points out open questions and directions for future research throughout the thesis; what needs to be done is then also summarized in the final chapter entitled Conclusions and future works.

Here I list some questions that came to my mind while reviewing the thesis:

- (1) I noticed that the entire introductory section and associated research papers deal only with flowering plants. What do we now know about hybrid seed lethality and sexual selection in gymnosperm reproduction?
- (2) Lafon Placette's research is largely based on Brassicaceae model systems (*Arabidopsis* spp., *Capsella* spp.) and crosses between diploid and tetraploid species/cytotypes. What is known about the dosage (im)balance between paternal and maternal genomes in hexaploids and higher ploidies?
- (3) To what extent can hybrid seed lethality can be circumvented by apomixis?
- (4) The author discusses the role of sexual selection in the reproduction of selfing hermaphroditic plants, including the transition from outcrossing to selfing. Is sexual selection in flowering plants related in any way to the number of generations and the different mutation rates in annual (ephemeral) vs perennial plants?

In his habilitation thesis, Lafon Placette shows that he is one of the leaders in the field of genetic and epigenetic controls of plant reproduction, with several important achievements and observations. Through the thesis and, more importantly, through his published work, Dr. Lafon Placette has clearly demonstrated that he is also an experienced teacher and supervisor.

The submitted thesis is a collection of original research papers and reviews that demonstrate Dr. Lafon Placette's scientific maturity, long-term research focus, and educational activities. **Given the high quality of Dr. Lafon Placette's work, I have no hesitation in recommending his habilitation for defense.**

**Prof. Mgr. Martin A. Lysák, Ph.D., DSc.**

Central European Institute of Technology (CEITEC) and Faculty of Science  
Masaryk University  
Brno, Czech Republic

E-mail [martin.lysak@ceitec.muni.cz](mailto:martin.lysak@ceitec.muni.cz)  
<http://www.plantcytogenomics.org/>