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Pyrrolizidine alkaloid variation in *Jacobaea* hybrids : influence on resistance against generalist and specialist insect herbivores

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Stellingen

Behorende bij het proefschrift van Dandan Cheng

*Pyrrolizidine alkaloid variation in Jacobaea hybrids:
Influence on resistance against generalist and specialist insect herbivores*

1. The patterns of pyrrolizidine alkaloid (PA) are so diverse and flexible in *Jacobaea* hybrid plants that one may question the concept of chemotypes. (this thesis)
2. The effects of defense compounds are different for different herbivores: therefore the pressure from multiple herbivores may drive the evolution of chemical diversity of defense compounds. (van der Meijden, 1996; Macel, 2005, this thesis)
3. Hybridization provides the raw material for phenotypic novelty and hybrids are good study systems for ecological and evolutionary research. (Rieseberg et al, 1999; Orians, 2000, Kirk et al, 2005; this thesis)
4. The PA free bases are less effective as defense compounds than their corresponding *N*-oxides. (Leiss et al, 2009; this thesis, Chapter 4-5)
5. To cope with the complexity of plant defense, the use of a combination of research methods such as *in vitro* and *in vivo* experiments is needed in the study of the functions of secondary metabolites in plant defense.
6. Secondary metabolites keep the world green
7. Statistics can reveal the most interesting and inspiring possibilities from experiments and data; however, they are not a 100 % guarantee for arriving at the correct conclusions.
8. Insight in plant-herbivore interactions is important for our understanding of the distribution patterns of plants. (van der Putten et al. 2010)
9. A clear research proposal and a regular schedule for appointments with the supervisors are essential for the management of a PhD student project.
10. If we are willing to learn, difficult things will become easy. If we don't, easy things will be difficult. (inspired by a Chinese saying)

[April, 18, 2012]