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

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I was born in Xishui County, Hubei Province in China on 21, May 1978, which was the 15th day of the 4th month in that year according to traditional Chinese calendar. I started my undergraduate study at Central China Normal University in Wuhan in 1996 and got my B.Sc. in biology in June, 2000. After that, I did my Master of Botany at the same university and graduated in June 2003.

I have been appointed at a permanent position as a teacher and researcher at the Biological Department, School of Environmental Studies, China University of Geosciences (CUG) in Wuhan from July 2003. During my work in CUG, I taught plant biology and ecology.

From when I was a master student, I was involved in a number of projects related to the survey of flora and vegetation in several areas in China with the reference of remote sensing (RS) images.

In June 2007, I was awarded a scholarship by the China Scholarship Council (CSC) of the Ministry of Education for a PhD study at Leiden University. In October 2007 I came to the Netherlands and started my PhD study at the section Plant Ecology (PE) from the Institute of Biology Leiden (IBL).

My research in Leiden resulted in 5 published articles and this thesis.

Dandan Cheng werd geboren in Xishui, Hubei in China, op 21 mei 1978. Dat was de 15^e dag van de 4^e maand in dat jaar volgens de Chinese kalender. Zij begon haar studie aan de Central China Normal University in Wuhan en behaalde haar bachelordiploma biologie in juni 2000. Daarna volgde zij een masteropleiding in botanie aan dezelfde universiteit en behaalde haar masterdiploma in juni 2003.

Aansluitend werd Dandan benoemd op een permanente positie als docent en onderzoeker op het Biological Department, School of Environmental Studies, China University of Geosciences (CUG) in Wuhan vanaf juli 2003. Tijdens haar werk aan de CUG doceerde zij plantenbiologie en ecologie. Vanaf haar masterstudie was Dandan betrokken bij verschillende projecten waarin vegetatie studies werden gekoppeld aan remote sensing (RS) technieken.

In juni 2007 werd haar een beurs toegekend door de China Scholarship Council (CSC) van het ministerie van onderwijs voor promotieonderzoek aan de Universiteit Leiden. In oktober 2007 kwam Dandan naar Nederland en begon haar promotieonderzoek bij de onderzoek groep Plantenecologie, van het Instituut voor Biologie Leiden (IBL).

Tijdens haar promotieonderzoek bestudeerde Dandan pyrrolizidine alkaloiden (PAs) in hybride *Jacobaea* planten en hun rol in plantenresistentie tegen herbivoren. Haar onderzoek heeft geresulteerd in vijf artikelen in wetenschappelijke tijdschriften en dit proefschrift.

Publication List

- Cheng D, Kirk H, Mulder PPJ, Vrieling K, Klinkhamer PGL (2011). Pyrrolizidine alkaloid variation in shoots and roots of segregating hybrids between *Jacobaea vulgaris* and *Jacobaea aquatica*. *New Phytologist* 192(4): 1010-1023.
- Cheng D, Kirk H, Vrieling K, Mulder PPJ, Klinkhamer PGL (2011). The relationship between structurally different pyrrolizidine alkaloids and western flower thrips resistance in F₂ hybrids of *Jacobaea vulgaris* and *Jacobaea aquatica*. *Journal of Chemical Ecology* 37(10): 1071-1080.
- Cheng D, Vrieling K, Klinkhamer PGL (2011). The effect of hybridization on secondary metabolites and herbivore resistance: implications for the evolution of chemical diversity in plants. *Phytochemistry Reviews* 10(1): 107-117.
- Joosten L, Cheng D, Mulder PPJ, Vrieling K, van Veen JA, Klinkhamer PGL (2011). The genotype dependent presence of pyrrolizidine alkaloids as tertiary amine in *Jacobaea vulgaris*. *Phytochemistry* 72: 214-222.
- Kirk H, Cheng D, Choi Y, Vrieling K, Klinkhamer P (2011). Transgressive segregation of primary and secondary metabolites in F₂ hybrids between *Jacobaea aquatica* and *J. vulgaris*. *Metabolomics*. 10.1007/s11306-011-0301-8.

Conference and Workshop

- Dandan Cheng, Eddy van der Meijden, Patrick P.J. Mulder, Klaas Vrieling, Peter G.L. Klinkhamer. Cinnabar moths uses pyrrolizidine alkaloid composition and concentration as a cue for oviposition (poster presentation). The 14th Symposium on Insect-Plant Interactions. 13 – 18, August, 2011, Wageningen, The Netherlands.
- Dandan Cheng, Klaas Vrieling, Patrick P.J. Mulder, Peter G.L. Klinkhamer. Pyrrolizidine alkaloids and the thrips resistance in *Jacobaea* Hybrids (15's oral presentation). The 5th plant-insect interaction workshop. 11, November, 2010, Wageningen, The Netherlands
- Dandan Cheng, Klaas Vrieling, Patrick P.J. Mulder, Peter G.L. Klinkhamer. Pyrrolizidine alkaloids and the thrips resistance in *Jacobaea* Hybrids (15's oral presentation). The 21st Netherland Entomological Day. 18, December, 2009, Ede, The Netherlands
- The 3rd workshop of Metabolomics basic and applications to plant sciences. 12 -16, April, 2010, Leiden, The Netherlands

