



Impact Summary Report

SUPERGEN Small Grant, Longhurst & Jiang, Cranfield University

The SUPERGEN Small Grant was awarded to the Cranfield team to support research activities to address elemental emissions when treating contaminated biomass using thermochemical processes. The grant supported a joint experimental programme with key research institutions in China, i.e. Chinese Academy of Sciences (CAS) and Southeast University (SEU). This has led to significant research outputs and directly resulted four peer-reviewed journal publications and oral presentations at key international conferences as summarised below:

Journal publications

1. Duan, L., Chen, J., **Jiang, Y.**, Li, X., Longhurst, P. and Lei, M. (2016) Experimental and kinetic study of thermal decomposition behaviour of phytoremediation derived *Pteris vittata*. *Journal of Thermal Analysis and Calorimetry*. doi:10.1007/s10973-016-6032-3 **(IF=1.781)**
2. **Jiang, Y.**, Ameh, A., Lei, M., Duan, L. and Longhurst, P. (2016) Solid-gaseous Phase Transformation of Elemental Contaminants during the Gasification of Biomass, *Science of the Total Environment* **(IF= 3.976)**
3. **Jiang, Y.**, Lei, M., Duan, L. and Longhurst, P. (2015) Integrating Phytoremediation with Biomass Valorisation and Critical Element Recovery: A UK Contaminated Land Perspective. *Biomass and Bioenergy*, 83, 328-339. **(IF= 3.249)**
4. Duan, L., **Jiang, Y.**, Longhurst, P., Lei, M. (2017) Experimental and kinetic study of thermal decomposition behaviour of phytoremediation derived *Pteris vittata*, *Journal of Applied and Analytical Pyrolysis*
<http://dx.doi.org/10.1016/j.jaap.2017.01.013> **(IF= 3.912)**

Conference Presentations

1. Oral Presentation, (2016) Integrating Phytoremediation with Biomass Valorisation and Critical Element Recovery. CleanUp India Conference, Coimbatore, India. **(Best presentation Award)**
2. Oral Presentation, (2016) Experimental and thermal kinetic study of thermochemical conversion parameters affecting thermal behaviour of phytoremediation derived *Pteris Vittata* biomass. 13th International Phytotechnologies Conference, Hangzhou, China.
3. Oral Presentation, (2016) LCA of Willow Cultivation on Contaminated Land and the Subsequent Biomass to Energy Conversion. 13th International Phytotechnologies Conference, Hangzhou, China
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In addition to the publications, the small grant supported a successful collaboration with the international partners and strengthened the consortium. This has resulted a successful application to Newton Fund UK-China PhD Placement Programme to support a PhD student exchange from CAS to Cranfield working on a similar research topic.

The link with SEU established through the Small Grant enable a recently bid to the RAEng UK-China Industry Academia Partnership Programme ('Promoting Collaborative Research and Development on Green and Sustainable Remediation for Contaminated and Marginal Land Reuse in China' Submitted on 23/01/2017, Value: £35K).

The research topic supported by the Small Grant has maximised Cranfield team's research capabilities and visibility in this area. This results in further work with wider international collaborators including University of Pernambuco, Brazil in a successful bid to the EPSRC Global Challenges ODA funding ('UK-Brazil joint programme on the development of thermochemical conversion technologies for metal-rich biomass derived from ultramafic soil'. Value: £28.6K).