Behavioral ecology and genetics of native/invasive termite reproductives (*Reticulitermes*)

Advisor (HDR): **Anne-Geneviève Bagnères** bagneres@univ-tours.fr
Co- Advisor (non HDR): **Christophe Lucas** christophe.lucas@univ-tours.fr
Lab: IRBI, University of Tours (France), UMR CNRS 7261 - Team Chemical Ecology and Evolution of Social Insects, http://irbi.univ-tours.fr

***Abstract**: Termites are urban xylophagous organized in complex animal societies with a great economic importance and a threat for cultural heritage. Their social organization is unique with biological specificity mainly based on their reproductive caste. Indeed, subterranean termites present 3 types of reproductives developed from 3 different pathways with morphological and physiological specificity (alate, brachypterous or apterous). (1) Alate sexuals disperse every year and produce new colonies; (2) brachypterous neotenics stay in the nest and enforced colonial reproduction; (3) apterous neotenics developed from worker are able to form new colonies through budding. These different types of reproductives and their numbers within colonies are inferred to the invasive success of those termite species.*

Objectives: Comparing the different types of reproductives in their ecology, chemistry and behavior and determine the impact of chosen gene candidates on their behaviors.

(1) **Behavioral specificity and colonization strategies of the different types of reproductives**
(2) **Impact of the environmental factors on the production of the 3 types of reproductives**
(3) **Functional analysis of candidate genes on reproduction strategies**

Biological models: Two termite species and three populations with different social structure:

- *Reticulitermes flavipes* : **native** population in the USA with **a few** reproductives
- *R. flavipes* : **invasive** population in France with **several** reproductives
- *R. grassei* : **native** population in France with **a few** reproductives

Two ***collaborations*** are set up during this thesis with an American and a German lab with possible journey.

Candidate profile: This position requires strong background in behavioral ecology of insects and good skills in molecular biology. We are looking for a highly motivated candidate interested by behavioral observations with fieldtrips and lab work. Knowledge in chemical ecology and/or biostatistics will be appreciated. Methods used will be **behavioral ecology** to understand interactions between reproductives; **chemical ecology** to describe environmental factors that influence the production of the reproductives; and **behavioral genetics** to identify the role of target candidate genes on reproduction strategies.

Selection procedure: Application forms with detailed *curriculum vitae* (diploma and grades), a motivation letter (max. 1 page), a copy of the master diploma and addresses of 2 potential referees must be sent by email to Anne-Geneviève Bagnères and Christophe Lucas before May 29th, 2013 included. Interview may be setup on demand. The selection criteria will be the excellence of the curriculum vitae and the adequacy between the professional project of the candidate and the thesis subject. Candidates will be short listed before the 10th of June. Candidates will be evaluated and classified by a commission after an individual interview by the Doctoral School on June 28th, 2013. The selected candidate will obtain the funding of a full PhD grant for three years.

Ecole Doctorale : Santé, Sciences Biologiques et Chimie du Vivant (SSBCV)