



## Proposition de stage de Master 2<sup>ème</sup> année Année universitaire 2012-2013

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### **Est-ce que la recherche de nourriture par des prédateurs généralistes est affectée par la qualité des proies?**

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**Contexte :** Foraging for finite prey resources is costly for predators. Efficient patterns of search have great impact on individual fitness and would be selected (Reynolds 2008). The carabid beetle, *Pterostichus melanarius*, is an important predator of a variety of invertebrates (Bohan et al. 2001) and weed seeds (Bohan et al. 2011), and in laboratory experimentation the patterns of foraging displayed by *P. melanarius* conform to « Levy Flight ». Levy Flight patterns have been shown to result in highly efficient search patterns, particularly where behavioural modification to the search pattern is present. In Guy et al. (2008) it was shown that individual *P. melanarius* have behaviours for avoiding other *P. melanarius* that lead to highly efficient searching. In essence, because *P. melanarius* individuals avoid one another they do not search for prey in areas already searched by conspecific individuals. We propose to extend this work to look at the effect of prey quality on searching. We ask whether prey quality modifies searching through changes in Levy Flight patterns. This could indicate whether prey quality manifests directly as an effect on *P. melanarius* fitness, because individuals are less well fed, or fitness depression effects may be ameliorated by different search patterns.

**Objectifs du stage:** The stagiaire will conduct video experiments to examine the movement patterns of *P. melanarius* individuals that have been fed different weed seeds species, of differing quality, *ad libitum*. The experimental protocols will closely follow those developed for Armsworth et al. (2005) and Guy et al. (2008). The video data will be encoded in Ethovision XT and analysed by the student using standard parametric statistics (GLMs and ANOVA) in R. The *P. melanarius* will be sampled in the field and maintained on a standard diet until required. One week prior to the experiments, the diet of the test animals will be switched to an experimental diet of a particular weed seed species or a mixed diet or a no diet (starvation) control.

### **Références**

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Ecology, 48, 888–898. Guy, A., Bohan, D.A., Powers, S.J. & Reynolds, A.M. (2008) Avoidance of conspecific odour by carabid beetles: a mechanism for the emergence of scale-free searching patterns. *Animal Behaviour*, 76, 585–591. Reynolds A.M. 2008. How many animals do the Levy walk? *Ecology* 89, 2347-2351.