

---

# Black locust (*Robinia pseudoacacia*) effects on above- and belowground ecosystem compartments in Northern France

Corentin Abgrall\*<sup>1</sup>

<sup>1</sup>Ecodiv URA/EA 1293 IRSTEA – Université de Rouen Normandie, Université de Rouen Normandie – France

## Abstract

Invasive alien species, such as Black Locust (*Robinia pseudoacacia* L., Fabaceae), are a source of increasing concern among anthropogenic global changes. *R. pseudoacacia* is a tree of North American origin frequently encountered in European forests. While favored by economic actor, notably for its high wood quality, negative environmental effects have been documented such as on native plant communities (Vilà et al., 2011), nutrient cycling (Pereira et al., 2011) and arthropod abundance (Buchholz et al., 2015). Here we attempted to assess results in a different context and provide new data on other compartments of soil ecosystems. We sampled and measured native vegetation, soil, soil fauna and habitat structure in pure *R. pseudoacacia* plots, pure native plots (*Quercus petraea* and *Castanea sativa*) and mixed plots within 6 forests in north-western France. We observed differences in habitat structure (higher canopy openness and stem density) and environmental physico-chemical properties (higher nitrogen content, especially of nitrates). We found no congruent differences in leaf litter decomposition rates or soil microbial respiration. Microbial and fungal biomass showed important differences in some forests, but not all. We also showed important differences in plant community structure, both taxonomically and functionally, between invaded and uninvaded plots. Mesofauna communities (Collembola and Acari) were also affected, generally but not always positively, by *R. pseudoacacia*. *R. pseudoacacia* presence, especially in monospecific plots. Macrofauna species richness also tended increased in *R. pseudoacacia* plots while abundance tended to decrease although this was strongly dependent on which native species was considered as a control. Overall, we showed some overarching effects of *R. pseudoacacia* on some taxa or particular variables (Nitrogen, for instance). Invasive species clearly modified above and belowground compartments although several additional effects were more contextual and dependent on site and control (tree species) type.

---

\*Speaker