The habitat value of power line rights-of-way for wild bees in rural woody landscapes

Violette Le Féon*[1], Héloïse Blanchard[3,2], David Martinière[3,4], Mickaël Henry[1], Bernard Vaissière[1], and Denis François[3]

[1]Abeilles et Environnement (AE) – Institut national de la recherche agronomique (INRA) : UR406 – Site Agroparc, F-84914 Avignon, cedex 9, France

[3]Environnement, Aménagement, Sécurité et Eco-conception (IFSTTAR/AME/EASE) – IFSTTAR – Centre de Nantes - Route de Bouaye - 44344 Bouguenais Cedex, France

[2]Université Joseph Fourier, UFR de Chimie et de Biologie – UFR de Chimie et de Biologie – 470 rue de la Chimie, 38400 Saint-Martin-D'Hères, France

[4]Muséum national d'histoire naturelle (MNHN) – Muséum National d'Histoire Naturelle (MNHN) – 57, rue Cuvier - 75231 Paris Cedex 05, France

Abstract

In wooded areas, the opening and maintenance of power line rights-of-way (ROWs) require regular clearings that can have negative effects on forest species through the fragmentation of continuous forest habitats. Indeed, to ensure transport of electricity, the vegetation must be maintained low. However, this also creates conditions that may be suitable to species associated with open habitats. The value of these areas for biodiversity has rarely been studied, especially for insect pollinators. Yet, the opportunity to maintain suitable pollinator habitats is an important issue due to their vital role in pollinating many crops and wild plants.
We assessed the value of power line ROWs as habitat for wild bees by comparing bee assemblages in ROWS with those found in neighbouring typical bee habitats, i.e. semi-natural grasslands. We also surveyed the availability of food and nesting resources to understand the drivers of bee abundance, species richness and assemblage composition in ROWs.

The study was carried out in 2015 in central France (45○5' N, 1○1' E), in 31 ROW sites and 25 grassland sites. Bee abundance and species richness were higher in ROW sites than in grassland ones. We also identified key environmental factors affecting bee assemblages in ROWs. The cover and species richness of flowering plants and the availability of nesting sites positively affected bee species richness and abundance. On the contrary, shrub cover (especially ferns) negatively affected bee species richness and abundance.
Overall, our study indicates that power line ROWs can constitute valuable habitats for bee conservation in woody landscapes.

Keywords: bees, flowering plants, linear infrastructure, grasslands, ecological traits, species richness

*Speaker