Position open for a Research Scientist (10 months)

at the Université libre de Bruxelles, Bruxelles, Belgium.

**Influence of the distribution, extent and fragmentation of pine stands in Europe on the distribution and abundance of *Monochamus* spp., the vectors of *Bursaphelenchus xylophilus*.**

Description of the work

The pine wood nematode (PWN), *Bursaphelenchus xylophilus*, originating from North America, has invaded Asia (Japan, China, Korea) in the early 20th century, and Europe (Portugal, Spain) at the very beginning of this century. Whilst it is harmless on its native hosts (*Pinus* spp.) in North America, it kills Asian and European *Pinus* species. Its vectors are various longhorn species (Coleoptera, Cerambycidae) of the genus *Monochamus*. Following European Union (EU) plant health regulation, EU member states must monitor the PWN on their territory by direct samplings from pine trees and by trapping the vectors and checking them for the nematode. Pheromone trap networks (generally "*Crosstrap*" traps (Econex), "*Galloprotect Pack*" lures (SEDQ) releasing monochamol (2-undecyloxy-1-ethanol), ipsenol (2-methyl-6-methylene-7-octen-4-ol), 2-methyl-3-buten-1-ol and α-pinene) have been deployed for several years in many European countries (BE; CZ.; DE; DK; ES; FI; FR; HR; IT; NL; PT; SE; SI; SK; …). Strikingly, a 3-years trapping campaign in Belgium, with ca 90 traps each year, yielded only 6 *M. galloprovincialis* et 1 *M. sartor,* suggesting that, for reasons yet to be understood, the vectors are rare or just transient in the country. The present project aims at understanding the reasons of this absence or scarcity.

The trapping data (positive and negative, and georeferenced) from the different trapping networks in Europe will be assembled and analysed with regard to the distribution of pine trees in Europe as provided by the maps established by the Joint Research Center (JRC) of the European Commission (*European Atlas of Forest Tree Species*) at a 1 km² spatial resolution. This mapping will be locally brought to an even finer resolution, in Belgium and around the country, using the available national forest inventories. The distribution of catches will be matched with different characteristics of the local pine coverage: species, extent, fragmentation, connectivity. Our results will be matched with recent phylogeographical analyzes, which highlight the existence of distinct populations in delimited territories and which discuss the influence of the size and density of pine stands on the dispersal of *Monochamus galloprovincialis*.

The expected result is the definition of a local probability of presence of *Monochamus* spp. in the European conifer forests and, therefore, the improvement of the existing pine wood nematode surveillance and warning plans, for example by assigning different priorities to controls at national entry points and forest locations.

The study would start early in 2019 and last ten months.

Eligible profiles

The candidates must have a Master or PhD degree in biological sciences, agricultural sciences or ecology, with good demonstrated skills in spatial statistics and geographic information systems. An experience in R will be an asset. The candidates are also expected to be fluent in spoken and written English.

Applications and enquiries

Application letters and CVs to be sent to Profs. Jean-Claude Grégoire and Marius Gilbert

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Deadline for applications

31 January 2019