DESCRIPTION FOR THE GENERAL PUBLIC

The pine sawyer *Monochamus galloprovincialis* belongs to beetles with elongated slim body and long antenna. In Europe, two subspecies of the pine sawyer occur: *M. g.* ssp. *galloprovincialis* – in western and south-western part, and *M. g.* ssp. *pistor* – in the remaining part. As the common name indicates, the pine sawyer develops on pine trees. The larvae live under the bark and in the wood. The life of adult insects splits into two periods: (i) from the emergence of sexually immature beetles to their maturation feeding on shoots of host trees, and (ii) after feeding and maturing, when the individuals are ready for mating and females search for sites suitable for oviposition. The pine sawyer usually attacks the trees weakened by different factors such as fires, winds and drought, so it is not considered to be a serious pest. However, its importance has increased since it became a vector of the invasive tree-killing pine wood nematode *Bursaphelenchus xylophilus* introduced to Europe in 1999. The nematode spread over Portugal and Spain, from where it likely can migrate to the remaining part of the continent. It is transmitted to new trees mostly by sexually immature beetles during their maturation feeding.

Mature beetles use chemical signals to find mates for copulation and host trees suitable for mating and oviposition. The aggregation pheromone produced by males serves for attracting conspecifics. After mating, females of the pine sawyer search for suitable oviposition sites, and those of subspecies *M. g.* ssp. *galloprovincialis* respond to α-pinene emitted by host pine trees and to the pheromones produced by bark beetles belonging to the genus *Ips*, which indicate the weakened trees. All these compounds and the aggregation pheromone of pine sawyer constitute the "Galloprotect" attractant which was developed and patented in Spain and currently is used in Europe for attracting sexually mature pine sawyers to pheromone traps. The attractant appeared less effective in central and eastern Europe (e.g. Poland and Ukraine) than in western Europe (e.g. Spain and France). The differences observed can be related to: (i) the occurrence of two different subspecies of the pine sawyer in these regions, (ii) different species composition of pine forests in the western part (mostly *P. halepensis* and *P. pinaster*) and in other parts of Europe (mostly *P. sylvestris*), and (iii) respective differences in structures of bark beetles communities (e.g., prevalence of *Ips* or non-*Ips* genus), producing different chemicals to which the pine sawyers adapted in the process of co-evolution.

Little is known on cues used by immature pine sawyers while searching for food necessary for their sexual maturation and by the mature beetles of the subspecies *M. g.* ssp. *pistor*, which is the potential vector of the nematode in central and eastern parts of Europe. **Therefore, we decided to explain the olfactory and visual communication in sexually immature and mature beetles of *M. g.* ssp. *pistor* occurring in central and eastern Europe.**

Our project will extend the basic scientific knowledge in chemical ecology, analytical chemistry, insect biology and insect behaviour within the scope of (i) chemical stimulation of sexually immature *M.g.* ssp. *pistor* beetles while searching for trees suitable for the maturation feeding; (ii) chemical stimulation of sexually mature *M.g.* ssp. *pistor* beetles, which, in contrast to *M.g.* ssp. *galloprovincialis*, occur in the forests dominated by Scots pines with specific co-existing fauna under the more continental climate; (iii) colour stimulation of *M.g.* ssp. *pistor* beetles while searching for tree crowns for feeding and tree trunks for oviposition.

The scientific results of the project may serve as a basis for developing effective tools for detecting and monitoring the pine wood nematode – a dangerous pest killing pine trees – in central and eastern Europe, by capturing its vector, the pine sawyer beetles.