



## Identifying the presence of Flathead Oak Borer (*Coroebus undatus* F.) in Cork Oak (*Quercus suber* L.)

### Introduction

This project had as its main objectives the development of strategies to detect, monitor, and control the attacks of *Coroebus undatus* F.. Based on monitorization works developed by this project a guide to identify the specie and its presence was created.

The larvae of this specie has a thin white body with ten segments, no legs and can be found in the phellogen (meristem that gives rise to periderm), where it feeds and creates the galleries. This species can attack many different broadleaf trees, such as *Quercus* spp. (Oaks), *Fagus sylvatica* L. (European beech), *Castanea sativa* M. (Chestnut) and *Corylus avellana* L. (Common hazel). The life cycle is not yet fully understood, since part of its life is spent under the bark. It is suggested the life cycle takes two years to complete, but in favour conditions it may only take one. After reaching adulthood the females lay, generally, a single egg in the cork fissures, between May and July. Two or one year are spent under the bark in the larvae stage. When reaching maturity in the spring, they drill a hole in the cork to pupate. After 15 to 30 days the adults leaves the tree in the end of Spring/ beginning of Summer, living between two to three weeks in this life stage.

Clear signs of the presence of this pest can only be found after the debarking of the tree. Galleries in the belly (the part of the cork that is turn to the tree) are clearly visible. From the outside, the back of the cork, scars may be seen, however these scars are from previous attacks and can't give any information if the insect is currently attacking the tree. The galleries can measure up to 2 meters in length, are arranged horizontally and vertically, and usually some crossing points are present. The width of the gallery, first is 1 to 2 mm growing as the larvae also grows, reaching 5 to 6 mm.

The presence of galleries in the phellogen results in a higher adhesion of the cork to the tree, which complicates the extraction process in some cases breaking the cork boards, ripping the phellogen, and scaring the meristematic tissue for a lifetime. These open wounds increase the tree susceptibility to be colonized by other biotic threats, such was wood borers.

Some commonly possible visible signs and symptoms of the pest attack were tested, to check their truthfulness. White spots in the bark, made from exudated compounds, may be related to the presence of the pest however it does not have statistical significance to be used with accuracy. This symptom is also correlated with other biotic and abiotic effects. Woodpecker holes can be related to the presence of insects

in the tree however it does not give any information about which specie or its quantity. The bad vigour of the tree, defoliated crown or dried leaves, are not a visible sign since the negative impacts of this pest are not pronounced, only if the tree is under very bad conditions. One other sign, the presence of a “straw” (“palhinha”) in the bark, little pupa shell, was believe for many years and by many to be a sign of the pest presence. This sign is not from *C. undatus* but from a moth specie. A very similar insect is the black-banded oak borer (*Coroebus florentinus* H.), but its larvae feed on new branches, so it may only impact cork production indirectly by reducing the plant vigour not affecting the quality of the cork directly. "

## Lessons learned

This work made clear what are the damage, sign and symptoms expected from this insect presence, before and after the attacks. Clarifying some common knowledge forest workers and landowners previously had about this specie.

Before debarking the tree, it's very hard to know if the tree is being attacked or not. Some technics were tested, and the results are the following. An acoustic detection tool was used as a non-destructive method, however the results showed a low success. The reason for this was, that in field trials very low noise or no noise at all was detected by the tool, the suggested explanation was the tiny size of the larvae and its low activity in conjunction with the great soundproof qualities of the cork.

The other method tested was sampling the cork. This method is still the one that gives the best results. The distribution and quantity of the insects in the tree was found to be higher above the height of 50 cm. Other observations, even though without statistical significance, were higher presence of the insect in the parts of the trunk turned to south. This technic is the one suggested to be used to monitor the presence and intensity of attack in the forest.



Figure 1. Photograph of a larvae of *Coroebus undatus*.

## For further information contact

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The information presented in this factsheet was developed by the FOREST4EU partner, drawing on the innovations and knowledge generated by the indicated operational group with their explicit authorization.

## Further information

<https://www.unac.pt/index.php/id-i/grupos-operacionais-accao-1-1-pdr2020/undercork>





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