

European Union Cohesion Policy Programme for 2021–2027, Activity 1.1.1.9 "Post-doctoral Research" of the Specific Objective 1.1.1 "Strengthening research and innovative capacities and introduction of advanced technologies in the common R&D system" of the research application No 1.1.1.9/LZP/1/24/047

*"Mycobiome of insect pests of Scots pine *Phaenops cyanea* and *Pissodes* spp."*

Method for collecting *Phaenops cyanea* (F.) (Col., Buprestidae) samples

Optimal timing and conditions for adult collection

The most suitable period for collecting adult *Phaenops cyanea* is June, when newly emerged beetles exit the bark. Adults can be located beneath thick, transitional bark layers (Figure 1a) or embedded within the bark itself, where they overwinter between bark plates while moving outward from the cambium (Figure 1b).

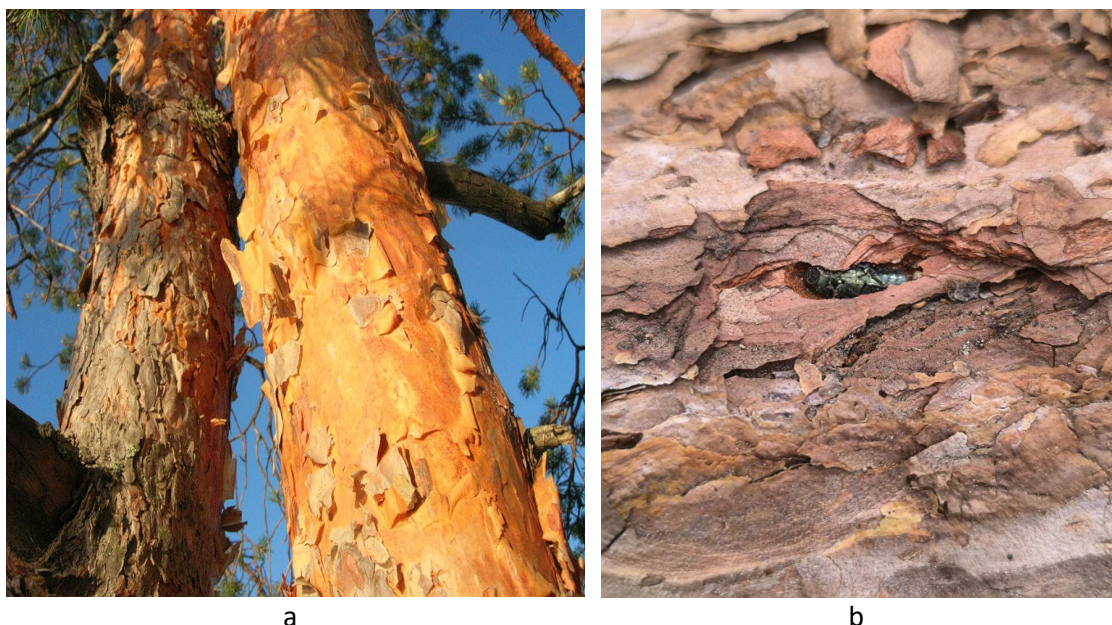


Figure 1.

- a – Section of trunk with thick transitional bark, most suitable for collecting adult *P. cyanea*
b – Adult *Phaenops cyanea* individuals during overwintering

Phaenops cyanea is a heliophilous species that preferentially colonizes wind-fallen trees, clear-cut areas, and sunny forest edges. Clear-cuts containing residual pine material, particularly trees felled during the preceding year, as well as seed trees, offer ideal habitats for this species (Figure 2).



Figure 2. One of the possible locations for collecting *P. cyanea* — a clear-cut with fallen seed pines

Collection techniques

Bark from fallen trees can be removed using a knife or axe to expose and collect adult beetles. Additionally, wood samples exhibiting blue-stain symptoms may be taken from these trees to support microbiome analyses.

In areas affected by root-rot (*Heterobasidion* spp.), *P. cyanea* adults and larvae are commonly found on recently dead or declining trees. By carefully lifting bark with an axe, larvae can be examined and collected (Figure 3). Such trees are typically located within existing root-rot infection zones. Sample acquisition may be performed using an entomological net or other standard collection methods.



Figure 3. In areas affected by root-rot, *P. cyanea* can be collected while simultaneously inspecting tree trunks

Use of pheromone and sticky traps

Attempts to attract *P. cyanea* using pheromones remain experimental (Sowińska, 2006), and no routine applications in forest management have been reported.

Sticky-film traps, however, have demonstrated high efficiency according to published studies (Sowińska, 2006). These traps should be deployed from mid-May to mid-August on the sun-exposed sides of trees along clear-cut boundaries or on retained seed trees. The method is ineffective in mature forest stands, including those affected by root-rot. Sticky bands must be wide (50 cm to 1 m) to maximize capture success.

Trap catches have revealed a high diversity of buprestid species inhabiting pine, birch, and oak. Although some individuals cannot be morphologically identified due to adhesion to the sticky surface (Figure 4), molecular genetic methods enable reliable species determination from such material.



Figure 4. Collecting *P. cyanea* using sticky-film screens

Larval collection and preservation

From July to September, sampling focused primarily on larval collection. Larvae were placed in 1.5- or 2-mL plastic tubes filled with 70% ethanol. All samples were stored at -20°C prior to subsequent laboratory analyses.