

## Trees as a habitat

Trees can host a very large scale of species. These are thousands of species of invertebrates, fungi, lichens, and even vertebrates. As saproxylic species we consider organisms that are bound to wood tissues or trees by their life cycle – either for nutrition or as their habitat. And these organisms do not love our forests and orchards to be too tidy. For many of them the presence of veteran trees or various stumps, branches, and pieces of fallen wood, is essential.

This manual introduces you to the overview of main representatives or common insects bound to the environment of dead wood, decaying trees, or their parts.

vegetation or absence of dead wood (convenient species are absent, as well as the phase of wood decomposition on site). In alleys this is represented by chopping of the veteran trees. The overall change of environment also plays an important role too. (The change in water regime, climate change, acid rains).

In general, insects wane as they do not have where to live. The use of chemicals along with climate change can cause a big problem however, changes in the landscape and the way we use it are the main cause of the decreasing number of species. Insects specialized on boring the elms and junipers are disappearing due to the decrease of these woody plants, while other species lack thick decomposing logs of any trees. Some species have enough wood, but only under specific circumstances. For example, there is no lack of young healthy maples, yet the longhorn beetle *Ropalopus ungaricus* that lives on maples is endangered as it needs well sunlit trees that are rare. Similar to beetles of the *Acmaeoderae* genus which develop in dry branches of oaks. We have plenty of those and most beetles from oak branches are not endangered. As this species use to mate on blossoms and they do not like to fly for long distances: therefore, they need branches of solitary oaks growing in blooming meadows or in steppes. Such habitats are rare and that is why both of these species are critically endangered.

## The function of the invertebrates in wood decomposition

Saproxylic insects are not the same as wood destroying insects. The former group also includes species feeding on fungi, carrion eaters, predators but also species capable of attacking live trees.

These organisms are essential for nutrient cycles. At first, they disrupt the bark and open a path for fungi, bacteria and other organisms. They decay wood, bark, and fruiting bodies of fungi. By this, they also spread diverse species of fungi, mites and roundworms which help for further decomposition of wood. Supported by symbiotic microorganisms in their bodies, they decay hardly decomposable wooden tissues. Last but not least they turn wooden tissue into soil full of nutrients ready to support other trees to growth.

Saproxylic organisms represent a very important indicator of biodiversity and are essential to preserve it.

## Saproxylic species are threatened

In contrast to wood-destroying insects, the life cycles of saproxylic species are much longer. The negative changes will take place almost immediately while the positive ones are slower. The abundance of these saproxylic is often affected by the loss or fragmentation of their original habitats (e.g. due to deforestation) or just an overall lack of habitats. In forests, this is caused by the change in age structure of

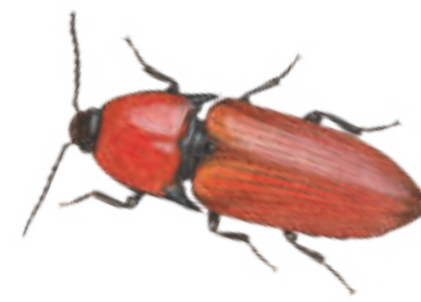
## Species of visitors changes over time

Many saproxylic species are found also on healthy trees; however, the real feast starts with decreasing vitality of these trees. The tree can die either suddenly or gradually dying off where decomposition starts while the tree is still alive. This can last even for centuries. The longer it takes, the richer the spectrum of saproxylic complex these trees host. The larger the trunk and harder the wood, the longer it takes. Such trees so-called veterans contain living wood, shortly dead wood, as well as wood partly or compyearsely decayed. Therefore, veteran trees offer the most attractive microhabitats and provide a home for a rich spectrum of saproxylic organisms.

The most valuable biotopes are, quite paradoxically, old, sturdy, dying trees with a number of cracks, hollows and crevices under the bark that provide numerous microhabitats for trunk rot. Every such tree compyearsely decomposes after some time and its inhabitants can survive only in case they have enough options nearby to move.

It should be in our interest to protect old tree trunks, preserve their parts and at least some pieces leave lying on the ground as they are. Great value are the groups of dying-off trees on the edges of restored forest areas. Even though the creation of microhabitats can be supported by proper interventions, the most valuable is wood degrading in its natural way. An old hollow tree inhabited by a wide spectrum of organisms simply worth waiting for.

## COLEOPTERA



### rusty click beetle

*Elater ferrugineus*

Inhabits light deciduous forests, parks, orchards, and alleys. Adults live hidden. The larvae are typical wireworms with a solid and long body. They inhabit the hollows of broadleaved trees where they prey on hermit- or jewel-beetles and rose chafers. The time of the larvae development depends on both the quantity and the quality of food. One veteran tree with a suitable hollow can provide a habitat for the species for decades.

[V-VIII] ↔ 17–24 mm ↓ 3–6 years

4 highly endangered



### willow long-horned beetle

*Saperda similis*

In Bohemia and Moravia, in lower altitudes on willows usually in quarries, dumps, on slopes, roadsides and other uncultivated places. Larvae develop in thinner living branches. They throw the crushed material out. The round exit holes often overgrow by bark.

[V-VII] ↔ 15–22 mm ↓ 2–3 years

4 threatened on the Red List



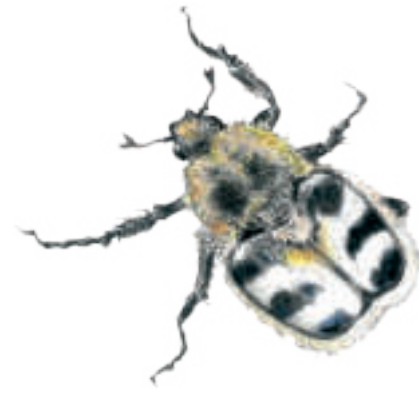
### big rose chafer

*Protaetia aeuriginosa*

Occurs mainly warm margins of well-preserved oak forests mainly in southern Moravia and in central and eastern Bohemia. Larvae live in the decayed material inside hollows in oak trunks and thick branches of oaks as well as they can be found in poplars, chestnut trees, or fruit trees. Stronger populations survive mainly in parks and alleys.

[V-IX] ↔ 22–28 mm ↓ 2–3 years

4 endangered species on the Red List



### Eurasian bee beetle

*Trichius fasciatus*

The colourful relative of rose chafers resembles the bumblebee. It's got a typically hairy body. It inhabits forest margins and shrubberies. Larvae live in small hollows, and adults sit often on blossoms.

[VI-VIII] ↔ 9–12 mm ↓ 2–3 years

4 endangered species



### cherry jewel beetle

*Anthaxia candens*

One of the most beautiful beetles of Czech nature. Adults have unmistakable vivid colouring with metallic glow. Quite common in warmer areas of the Czech Republic. It is bound to cherry orchards with old trees. It develops under the bark in well-sunlit trunks and thicker branches of old cherry trees. Their presence can be detected due to oval exit holes.

[V-IV] ↔ 7–12 mm ↓ 2 years

3 vulnerable species on the Red List



### alder jewel beetle

*Dicerca alni*

This species occurs usually in southern Moravia in flood plains of big rivers. It develops mainly in alder trees and can also be found on lindens and hazel trees. The larvae live in dead, dry and still hard wood of sunlit thick branches and trunks. Adult beetles hatch in high summer and spend winter under the bark. They can be seen outside early in April. Their exit holes are oval, most commonly on the southern well sunny side of the tree.

[V-VIII] ↔ 9–15 mm ↓ 2 years

4 endangered species of the Red List



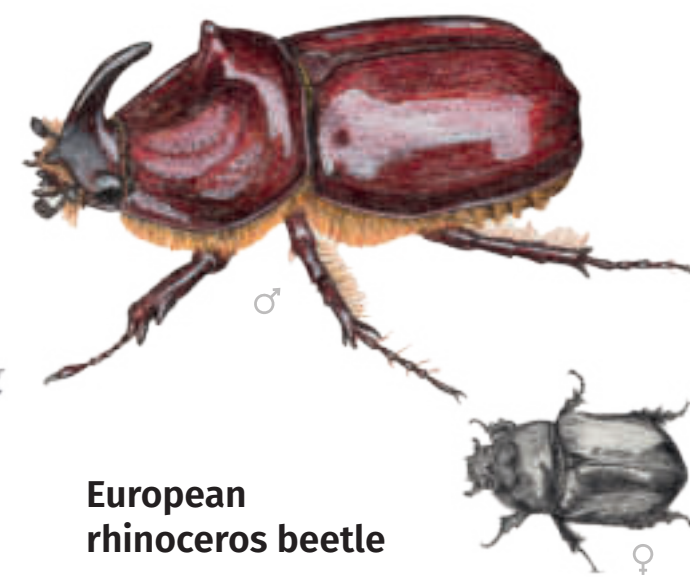
### hermit beetle

*Osmoderma barnabita*

This species looks for old trees with hollows with abundance of decayed material: mainly oaks, linden and willows. Adult males have a characteristic musky smell. Their presence in wood can be detected by droppings or larvae: large larvae reaching up to 7-8 centimetres before pupping. Adults fly only for a few hundred meters; 2 kilometres are the maximum. During adverse seasons, the beetle does not leave the hollow at all.

[V-IX] ↔ do 30 mm ↓ 3–4 years

5 vulnerable species on the Red List



### European rhinoceros beetle

*Oryctes nasicornis*

Larvae of rhinoceros beetles grow up to 65 mm long. They develop in wood in advanced stages of decay most commonly in hollows, decaying stumps, or in sawdust and in composts. Adults come out of pupae in spring. Males have horns of various lengths and lifted carapax. Females have a mere hump instead of a horn. Some solitary wasps (e.g. *Megascolia maculata*) parasites on rhinoceros beetle larvae.

[V-VIII] ↔ 20–43 mm ↓ 2–3 years

4 near threatened species with declining quantities



### European stag beetle

*Lucanus cervus*

The larvae live in the ground by the roots of stumps and old broadleaved trees or fallen tree trunks. Rarely they use paths with wood chip surface or heaps of sawdust as alternative habitat. Czechia the species is mainly bound to sunlit old oaks, and coppices. Both the quality and the quantity of larvae's food affect the size of the beetles. Adults feed on sap from injured trees. Adult males live only for 2-3 weeks, females for 1-2 months. The larvae are popular titbits for wild boars.

[V-VIII] ↔ 40–90 mm ↓ 3–5 years

4 endangered species



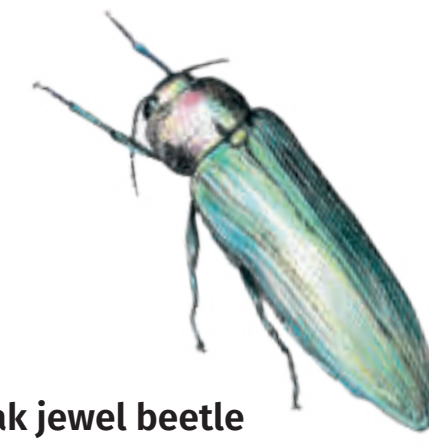
### lesser stag beetle

*Dorcus parallelipipedus*

An abundant species in the Czech Republic. It commonly occurs in urban parks and alleys, gardens and orchards, in warmer areas in places with enough old wood for its development. The wood should be damp, slightly softened and infected by fungi.

[IV-VIII] ↔ 19–32 mm ↓ 2–3 years

1 abundant



### oak jewel beetle

*Eurythya quercus*

One of the rarest and most beautiful beetles in Czechia. The larvae develop in bare, dry, hard and sunlit wood of old oaks. It can be the bare wood of both dead or alive trees. Their presence is detected due to exit holes on the bare wood of trunks and thick branches.

[IV-VIII] ↔ 14–22 mm ↓ 4 years

5 critically endangered



### red flat bark beetle

*Cucujus cinnaberinus*

Until recently, a very rare beetle, now very common. Adults have typically cinnabar red and distinctively flat bodies. Its predatory larvae live under the loosened bark of dead trees. It prefers poplars and willow trees but is able to live practically on any tree including conifers. It depends more on humidity and degree of phloem decomposition than the type of wood. The larvae are flat, dark yellow with well noticeable legs.

[IV-V] ↔ 11–15 mm ↓ 2 years

4 highly endangered



# WOODBORING INSECTS

## IDENTIFICATION MANUAL

### red-brown longhorn beetle

*Stictoleptura rubra*

Common in late summer in medium and higher altitudes. Females are compyearsely red; males have black thoraxes and yellow elytra. Larvae bore deep into dead, fungi infected conifer wood. Adults occur on blossoms, where they mate and feed on pollen. Like most longhorn beetles, they make squeaky noises when stressed.

[VI-IX] ↔ 10–20 mm ↓ 2–3 years

1 plentiful



### WOODBORING INSECTS – Identification Manual

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### Společně pro zelenou Evropu



Středočeský kraj



## HYMENOPTERA



### European orchard bee

*Osmia cornuta*

This species of the mason bee is an important fruit tree pollinator. A solitary bee nests in holes or in stems. It separates cells with clay partitions. It doesn't have a bound to the place where it was hatched but roams freely in the landscape.

[III-IX] ↔ 10–15 mm ⬇️ 1 year

1 common, mainly in southern Moravia, endangered on the Red List



### vioyears carpenter bee

*Xylocopa violacea*

The bumblebee-like black bee with blue gleam is the biggest solitary bee in our country. Adults bite up to 30 cm long tunnels in dead wood, where they nest. The larvae are fed by a mixture of nectar and pollen. Females have a sting for protection against the people. They can live in the same tree repeatedly for several generations.

[III-X] ↔ 25–28 mm ⬇️ 1 year

2 abundant from lowlands to foothills



### three-banded Mason wasp

*Ancistrocerus trifasciatus*

These predatory wasps are a unique biological protection against pests. They are a remarkable builder of mud shelters – it coats its nesting cavities with a layer of mud. This species is also a skilful predator of snout beetle larvae.

[V-IX] ↔ 7–12 mm ⬇️ ½–1 year

1 abundant



### potter wasp

*Symmorphus murarius*

Females build nests for their larvae in all kinds of cavities, often in abandoned tunnels of wood boring insects in dead tree trunks or in hollow reed stems. They bring paralyzed larvae of diverse leaf beetles as food supply for their own larvae.

[V-IX] ↔ 9–17 mm ⬇️ 1 year

1 quite common



### braconid wasp

*Iphiaulax impostor*

Females seek out larvae of diverse longhorn beetle species developing under the bark of tree branches for laying eggs into them. In the last stage, the larvae leaves its host and pupates.

[V-IX] ↔ 8–9 mm ⬇️ 1 year

1 abundant



### crown wasp

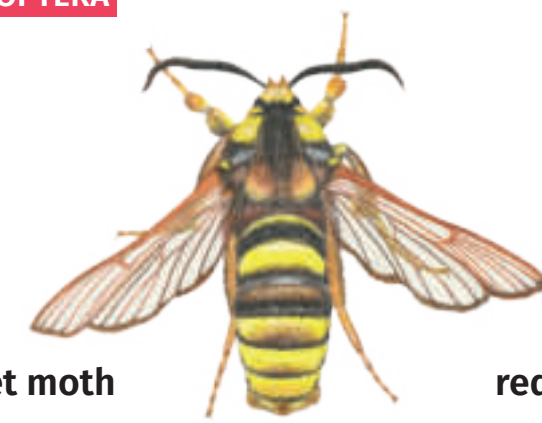
*Stephanus serrator*

Females lay their eggs into the larvae of beetles, mainly on recently dead trees that have not yet been infected by fungi. They attack mainly the larvae of jewel beetles and longhorn beetles or sometimes snout beetles. Adults can sometimes hatch even from fresh wooden products.

[V-IX] ↔ up to 25 mm ⬇️ 1 year

1 common

## LEPIDOPTERA



### hornet moth

*Sesia apiformis*

Our largest clearwing moth with noticeable hornet camouflage (mimicry), reflected in its unique morphology but also its manner of moving and flying. Some clearwing moths even make buzzing sounds like the hymenoptera they mimic. Clearwing moth caterpillars live in the roots and lower parts of stems of plants, under the bark and in the wood of bushes and trees. The stubby caterpillars are more similar to beetle larvae than butterfly caterpillars. They grow up to 25 mm long.

[V-VIII] ↔ 20–29 mm ⬇️ 2–4 years

1 quite common



### red-belted clearwing

*Aegeria myopaeformis*

A species specialised on fruit mainly apple trees, less often pear-, cherry- and rowan-trees or hawthorns. The red-belted clearwing often lays eggs into cancerous spots on the trunks and trees. The caterpillars bite out twisty often connected tunnels under the tree bark, less often they do so in the pulp of annual growth. Their presence can be detected by the droppings that older caterpillars push out of their tunnels.

[VI-VI] ↔ 14–23 mm ⬇️ 2–4 years

1 abundant



### concealer moth

*Harpella forficella*

This moth inhabits deciduous and mixed coniferous forests from lowlands to mountains. It usually flies at dusk. The caterpillars live in decayed wood of broadleaved trees in the stumps and fallen trunks. It feeds on fungi and wood. The caterpillars are found from summer to spring (they spend winter in wood) and they pupate in spring in their tunnels.

[VI-IX] ↔ 8–10 mm ⬇️ 2 years

1 abundant



### red underwing

*Catocala nupta*

Night species of moth inhabiting older broadleaved and mixed coniferous forests. Commonly appears in alleys and parks. The caterpillars make a cocoon of leaves before pupating.

[VI-X] ↔ 35–38 mm ⬇️ 1 year

1 quite abundant



### giant wood wasp

*Urocerus gigas*

A common inhabitant of spruce and pine trees. Along laying eggs, they infects the wood by spores of fungi (*Amylostereum chalybeatis*), that help the insect to disrupt the wood surrounding the egg and to prepare the basis for the nutrition of the larvae, who are incapable of digesting cellulose and consume the hyphae of the fungi.

[V-VII] ↔ 15–40 mm ⬇️ 2–6 years

1 common



### ruby-tailed wasp

*Chrysis ignita*

The most abundant species of the cuckoo wasps group – nesting parasites of other hymenoptera. They lay their eggs into other species' nests and the young larvae consume the larvae of their hosts – mainly bees and wasps. The type of the host also affects the life strategy of cuckoo wasps and appearance of their offspring.

[IV-VIII] ↔ 4–13 mm ⬇️ ½–1 year

1 common



### big-headed digger wasp

*Ectemnius dives*

A species of a predatory wasp with a noticeably large head and remarkable mandibles with which it bites out nests for larvae in wood. It mainly hunts for hover flies by paralysing it with its sting. By its prey they feed their larvae. By its prey they feed on their larvae.

[V-IX] ↔ 7–11 mm ⬇️ 1 year

1 abundant



### ichneumon wasp

*Therion circumflexum*

Females of this species lay eggs into caterpillars of larger butterfly species. While they continue in their own development and pupate successfully, young adult wasps come out of the host pupa.

[V-IX] ↔ do 25 mm ⬇️ 1 year

1 abundant



### jet black ant

*Lasius fuliginosus*

They build huge anthills most commonly in hollows by tree bases. By scarce nesting options they also opt for ground or masonry. In their nests they prepare crushed wood for the *Cladosporium myrmecephalum* fungi, which rely on the care of this ant species. The fibres of the fungi, which partly serves as food for the ants, also provide solidity for their constructions.

[V-IX] ↔ 3–6 mm ⬇️ up to 8 years

1 common



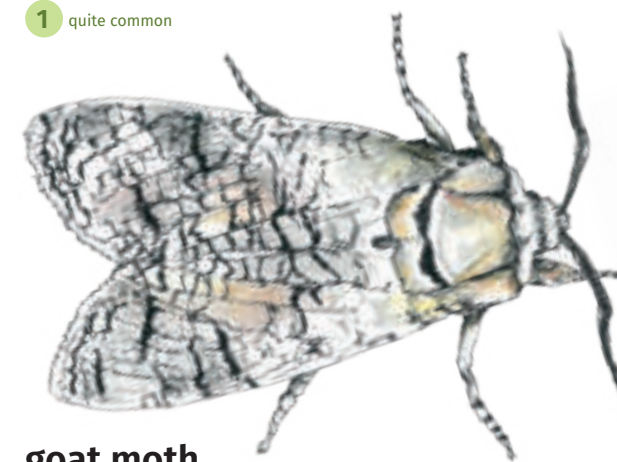
### brown-black carpenter ant

*Camponotus ligniperda*

One of our biggest ants, they have both day- and night-time activity. They only attack weakened wood when building their nests. They help decompose mostly dead wood of conifers infected with brown rot. These ants can live for up to 13 years.

[V-IX] ↔ 14–17 mm ⬇️ up to 10 years

1 common



### goat moth

*Zeuzera cossus*

One of our biggest moths. Noticeably big, dark red caterpillars grow up to 12 cm long and damage the branches and trunks of broadleaved trees with a diameter under 10 cm. They attack healthy trees. By higher abundance, small openings with sawdust and droppings become visible on the surface. In oaks, their tunnels have a typically woody vinegar smell. The damage caused by goat moths is similar to bore holes made by longhorn beetles, except for the sawdust falling out of them. Adult males do not feed.

[V-VIII] ↔ 30–40 mm ⬇️ 3 years

1 common species



### leopard moth

*Zeuzera pyrina*

Waxy yellow caterpillars of this species develop in thinner branches of fruit trees where they bore out tunnels thick as a pencil and up to 35 cm long. The exit holes are camouflaged by sawdust and web. Caterpillars during their development often change the place of bore.

[VI-VIII] ↔ 25–38 mm ⬇️ 2–3 years

1 common species

## HOW TO WORK WITH THE MANUAL?

The species in this brochure follow commonly used systematics taking in account the number of representatives in individual groups. For better orientation pictograms provide description and main characteristics for each species.

[I-XII] → Season of occurrence of adults

↔ → Body length of adults

⬇️ → Length of life (the life cycle duration)

0 → Level of threat

## Editorial note

This manual is not primarily intended for specialists in the field; it aims to provide swift orientation and basic information and trivia on our most common species of wood boring insects in old trees.

## Tips for further reading

You will find tips for further reading at [starestromy.cz/literatura](http://starestromy.cz/literatura)

