

# Practical guide for quick differentiation of adult Agrilini from other Coleoptera and especially Buprestidae species

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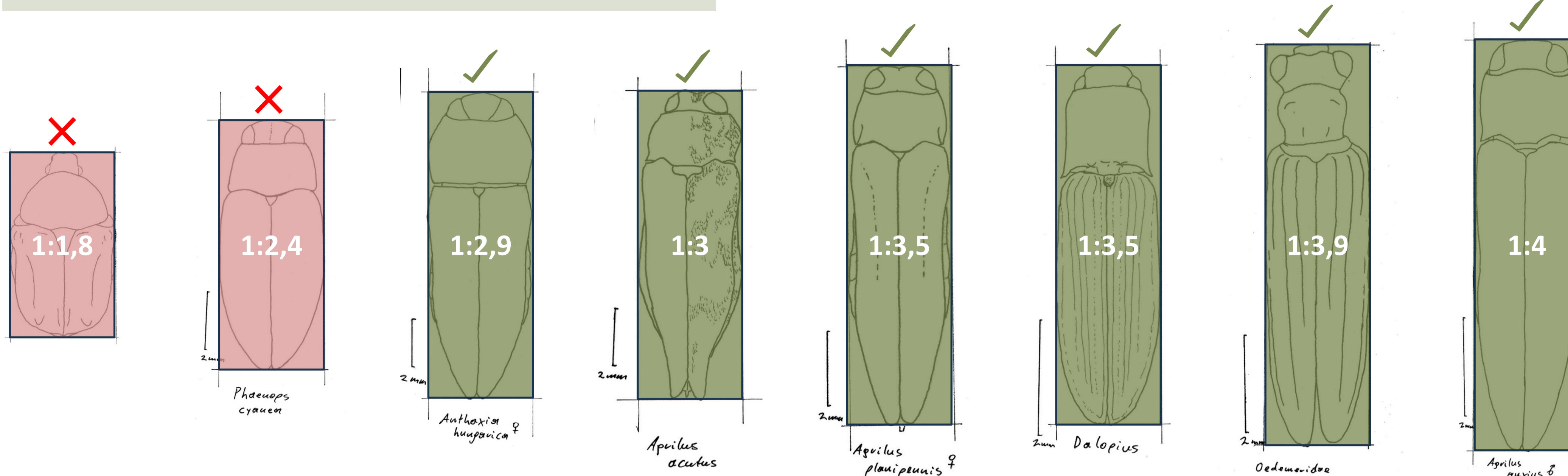
## Abstract

Members of the genus *Agrilus* are often difficult to distinguish from other beetle species in the field. Plant protection and forestry services in Austria have requested practical assistance to support their survey activities through a simple identification guide for *Agrilus planipennis* (Emerald ash borer, EAB) and *Agrilus anxius* (Bronze birch borer, BBB). While the final determination of *Agrilus* species in this context will remain the task of an official diagnostic laboratory, such first assessments will be useful in surveillance from responding to citizen findings to checking traps (particularly sticky traps). The aim was to produce a clear guide that enables people with limited entomological knowledge to assess whether an insect belongs to Agrilini in three steps or not.

## Method

In the field, rapid classification into families or groups is often achieved through the complex analysis of cognitive perceptions in conjunction with empirical experience. In doing so, several factors are visually assessed simultaneously and immediately compared with the information stored in the determinant memory. In the first step, the outlines of *Agrilus* and of potential field misidentifications – those frequently encountered in the field and those found in trap catches – were drawn. The aspect ratios were determined and the groups subsequently compiled. Photographs were taken of the differently coloured elytra of the species *A. planipennis*, *A. anxius* and *A. bilineatus*, which are target organisms in the survey programmes. With these pictures a colour variation gradient was created. For the third step of the classification, factors were compiled that are helpful for a more detailed identification and separation from Agrilini.

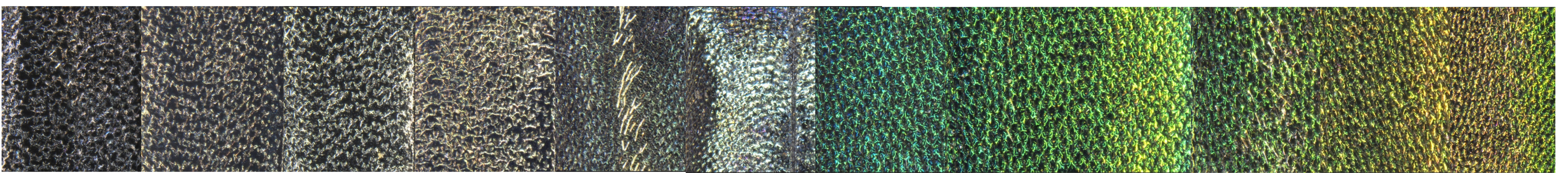
## 1 Width-to-length ratio



To provide a simple method for distinguishing *Agrilus* beetles from other species, native and non-native species, as well as quarantine pests, were specifically taken into account. The range of species covered, enables the rapid identification of potentially dangerous *Agrilus* species in the field and in the laboratory. Suspicious specimens must always be verified by a qualified laboratory.

Bodies of *Agrilus* species generally have a width-to-length ratio of approximately 1:3 to 1:4. Other Buprestidae spp usually show a width-to-length ratio lower than 1:3. However, some families of beetles that may be similar in coloration can show the same width-to-length ratio as *Agrilus*.

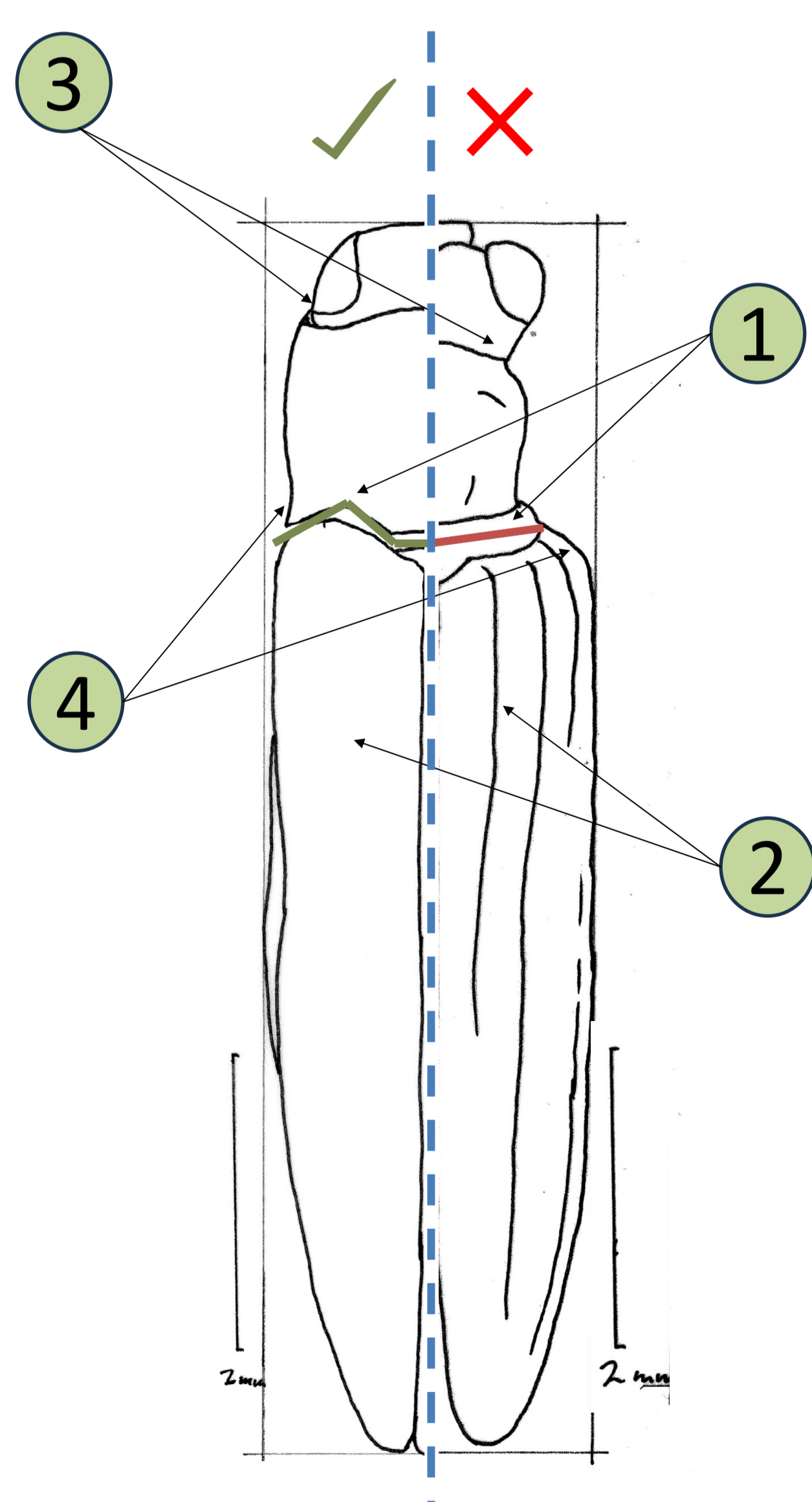
## 2 Colours of elytra



Different wing covers of *Agrilus anxius*, *A. bilineatus* and *A. planipennis*—which are quarantine and target species—and *A. graminis*—a native non-target species—exhibit different coloration from blackish – bronze to blue, green and golden gloss. It is also important to note that the structure and degree of gloss varies between individual specimens.

In this stage every non-metallic gloss winged Beetle gets sorted out. So that the Focus further on is on lancet dark or coloured beetles as shown only. Together with the following few factors reached out in the next step, it is possible to get a high probability to identify Agrilini.

## 3 Additional factors



### Key factors for easy classification

- 1 The posterior margin of the Pronotum is clearly angled on both sides of the scutellum.
- 2 Elytra without stitch patterns and ribs, sometimes with white or yellow haired fields.
- 3 Head drawn tightly back towards the pronotum, not constricted.
- 4 Pronotum as wide as elytral width.
- 5 Connection between the pronotum and the abdomen, without a lateral visible joint.
- 6 Colour of legs should be the same as lateral coloration of the beetle.
- 7 Antenna are reaching posterior end of Pronotum in maximum.

- without prior knowledge easy to recognize
- ▲ based on prior knowledge

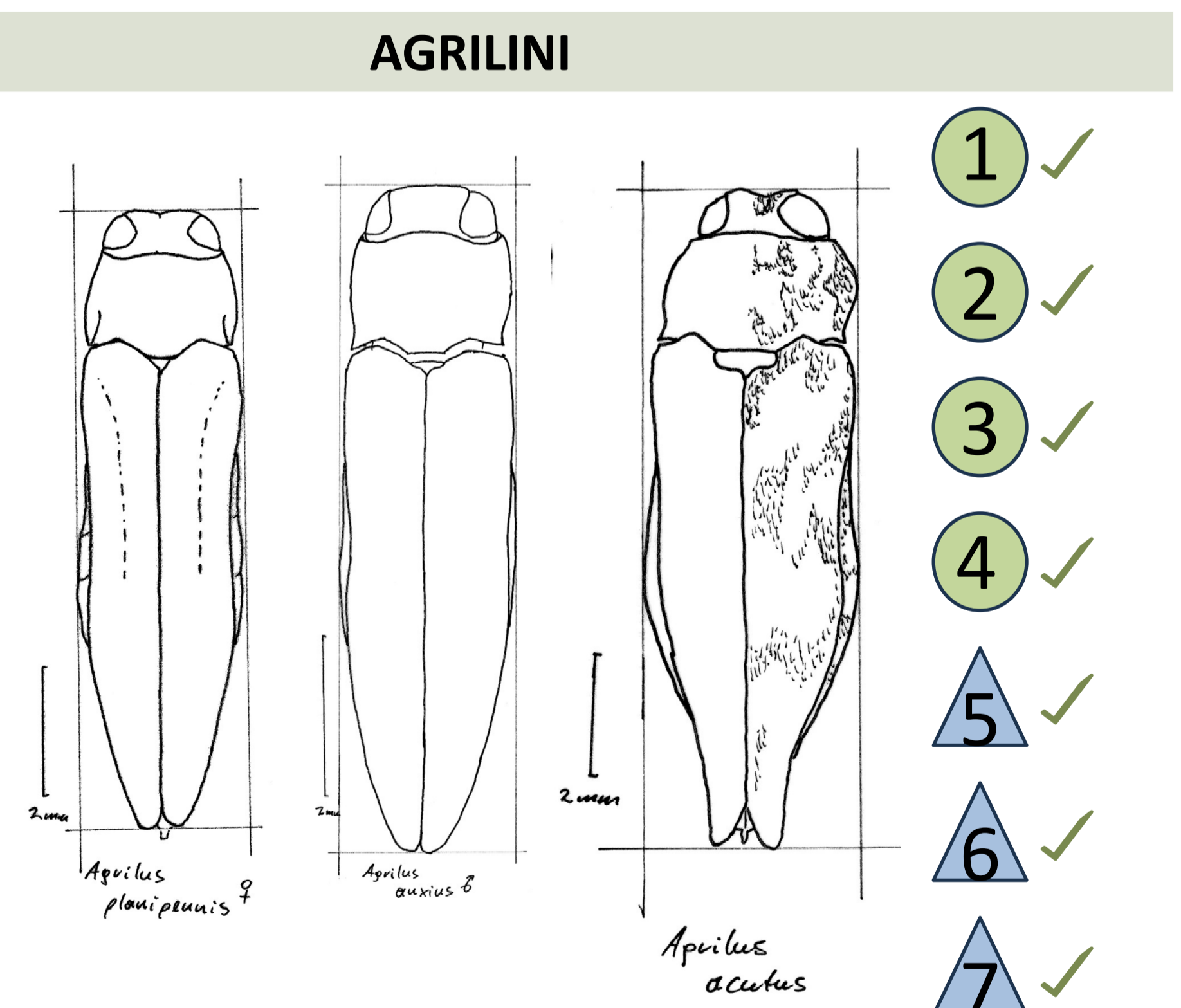
Comparison of *Agrilus* and Oedemeridae with nearly the same width-to-length ratio and green colour, but clearly different expressions in characters.

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### Target species

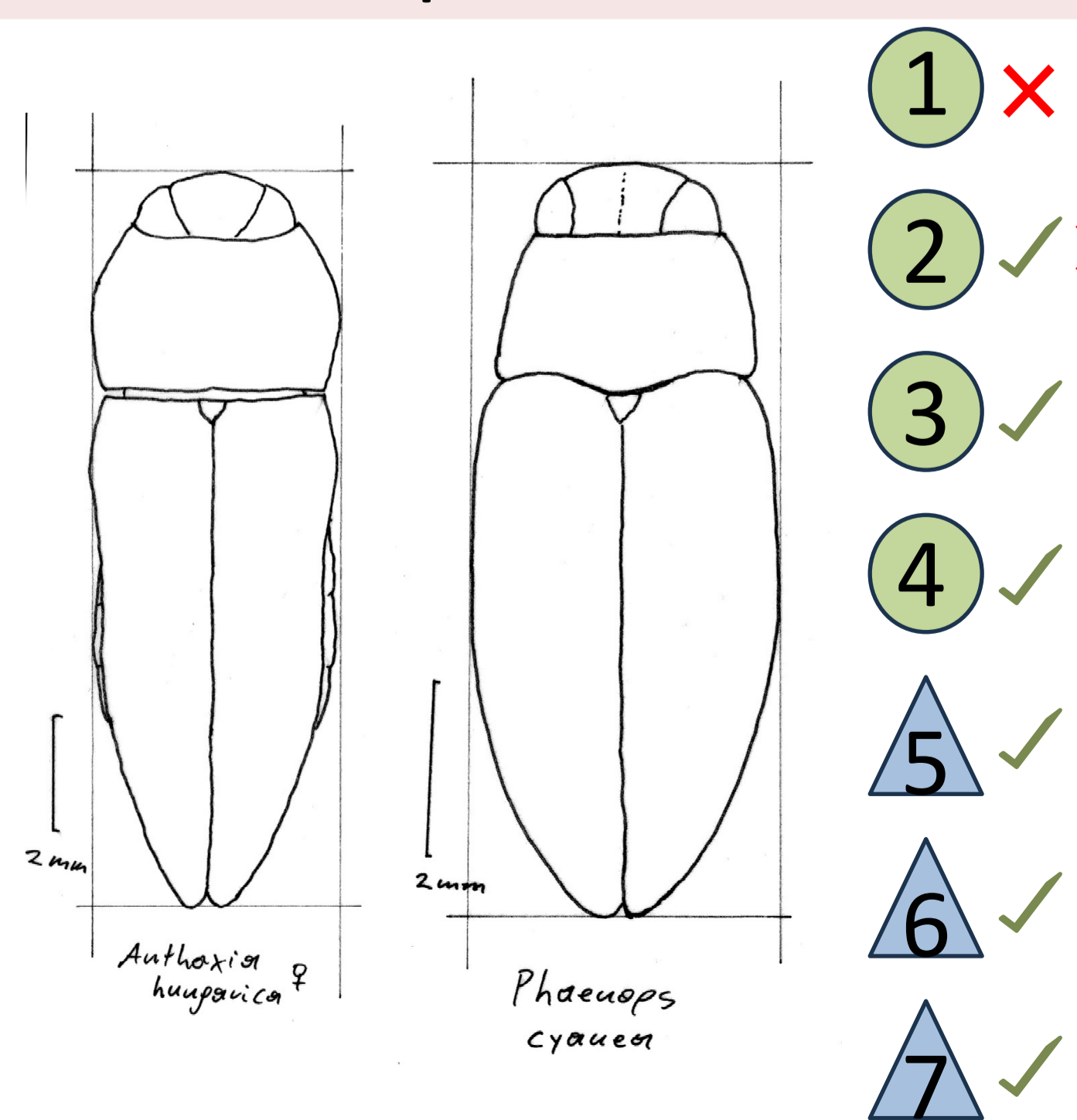
Beetles that were eliminated in the first stage can again be distinguished by combination of characters which provides additional certainty to sort out nontarget specimens.

The drawings from l.t.r. show *Agrilus planipennis*, *A. anxius* and *A. acutus*. They all are not native to Europe but show the typical morphological features of target species belonging to Agrilini in the family Buprestidae.



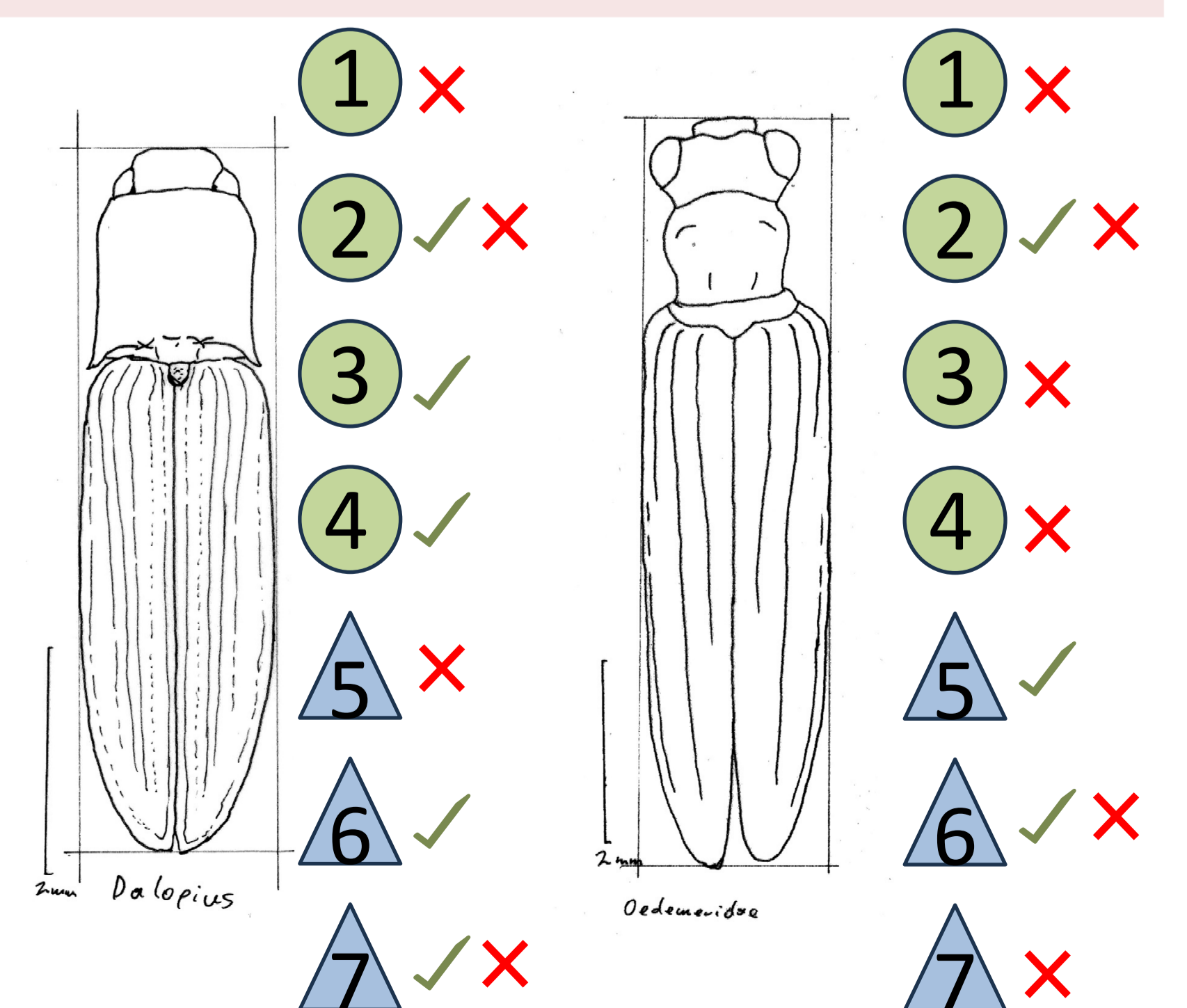
### Nontarget species

#### other Buprestidae



Outline of *Anthaxia hungarica* (left) and *Phaeops cyanea* (right)

#### Other families with similar ratio and colour



From l.t.r. a typical Elateridae: *Dalopius* sp. and the body shape of *Oedemeridae*.