

Amphotis marginata (Fabricius, 1781) (Coleoptera, Nitidulidae) new to Norway with notes on the species habitat

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The sap beetle *Amphotis marginata* (Fabricius, 1781) is reported for the first time from Norway. One specimen was found 1 September 2014 at **BØ**, Lier: Østre Nøste. The specimen was found sitting on an oak branch lying on the ground besides an old, hollow oak harbouring a large population of the ant *Lasius fuliginosus* (Latreille, 1798). The species biology and distribution is briefly discussed. The situation of hollow broadleaved trees in Norway is shortly reviewed to highlight the endangered future situation for *A. marginata* and its fellow species depended on this declining habitat.

Key words: Coleoptera, Nitidulidae, *Amphotis marginata*, Norway.

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Introduction

The sap beetles (Nitidulidae) constitutes a fairly numerous family, represented with 79 species in Norway. Most species in this family are sap-feeders, fungivores or granivorous, while a few species have a more specialised feeding strategy. The members of the family are typically slow moving, small to medium sized, flat and broad bodied and coloured yellow to black, with a few species being metallic green or blue.

The record

The sap beetle *Amphotis marginata* (Fabricius, 1781) is reported for the first time from Norway. One specimen was found 1 September 2014 at **BØ**, Lier: Østre Nøste. The specimen was found sitting on the underside of an oak branch lying on the ground besides an old, hollow oak in Ekelyparken (Figure 2), close to the city of Drammen. The hollow oak harboured a large population of the

ant *Lasius fuliginosus* (Latreille, 1798), and the ants were also numerous present on the ground around the oak tree. The beetle was found during a registration of hollow oaks in Buskerud County (Olberg 2015).

Ecology and distribution

Amphotis marginata (Figure 1) is a fairly large species, measuring 4–5.5 mm. It is a characteristic species, easily recognized from all other Northern European species. The genus contains three European species, of which only *A. marginata* has a wide distribution, found from southern Sweden, Denmark and southern parts of the British Isles in the north, through most of Europe west to Portugal and east to Russia and Turkey. In Sweden *A. marginata* is known from some southern provinces, reaching northwest to Västergötland, leaving a distributional gap up to the Norwegian border.

A. marginata is a myrmecophilous species,



FIGURE 1. *Amphotis marginata* (Fabricius, 1781). Photo: Kim Abel.

and the adult beetles have evolved a life in relationship with the ant *Lasius fuliginosus*. Laboratory experiments have shown that *Amphotis* species locates the nests and the trail of its host by recognizing host-specific odours and the trail pheromones laid down by the ants (Hölldobler 1968). The beetles use tactile cues (antennation) to mimic the ants' usual begging behaviour and if the ant is fooled it will solicit regurgitation of a liquid food drop offered to the beetle (Hölldobler & Wilson 1990). *A. marginata* is quite flat and formed like a shield, covering the beetles' appendages, with the edges of the beetles' chitin body flattened and hard. This gives the beetle a physical protection against aggressive ants. If an ant tries to attack it, it is very hard to grab a hold of or even turn around. According to Lengerken (1941) development of *A. marginata* has also been recorded in galls with *Biorhiza pallida* (Olivier, 1791) (Hymenoptera, Cynipidae) on oak. This might though be wrong and caused by a misidentification of the related species *Soronina grisea* (Linnaeus, 1758), a species often found in



FIGURE 2. The hollow oak in Ekelyparken where *Amphotis marginata* (Fabricius, 1781) was found. Photo: Stefan Olberg.

these galls (Klausnitzer 1990, personal obs.). *A. marginata* is also reported from tree wounds with outflowing sap (Lundberg & Ehnström 1999).

Lasius fuliginosus make their nests in dead wood, preferably in hollow deciduous trees. In Norway the ant is not rare at warm locations in the lowland in south-eastern parts of the country, and *A. marginata* could therefore potentially be distributed along the coast from the Swedish border south-west to Vest-Agder. The limiting distributional factors to *Amphotis marginata* in Norway are probably favourable local temperatures and an unknown, but probably fairly high density of host ant colonies in an area. This combination obviously limits the beetles' actual

distribution, since areas with assemblages of old, hollow broadleaved trees are few and far between.

Hollow broadleaved trees and threatened beetles in Norway

In the last decade some projects have had a focus on beetles and other insects connected to hollow oaks in Norway (e.g. Ødegaard *et al.* 2009, Sverdrup-Thygeson *et al.* 2011, Olberg *et al.* 2013, Olberg & Gammelmo 2014, 2015). These projects have investigated a total of about 120 of the oldest oak trees in Norway as well as some of the potentially most interesting old oak locations in the country, in both forested and in agricultural landscapes. Some 15 beetle species new to Norway have been found on these projects and our knowledge of hollow-oak species have increased considerably. But still there is so much we don't know about the beetle communities dependent on hollow oaks in Norway. Quite many of the rare beetle species encountered in these projects have only been found on one or a few localities. Although some areas and some localities have proved to contain a considerable number of rare and red listed species, and must therefore be regarded as hot spot areas for species connected to hollow oaks/broadleaved trees, there is still a wide distributional range in where the rare species have turned up (Sverdrup-Thygeson *et al.* 2011, Olberg 2013). The various hollow oak species have different demands concerning dead wood qualities, state of the wood mould, presence of certain fungi, degree of moisture, thermal limitations, etc. Therefore a tree can only harbour species that find the right qualities in or on the tree that meet with the species demands for survival and development. But first such species have to manage to disperse to that tree. The beetle species' restricted dispersal ability combined with considerable distances between suitable host-trees, has led to a disrupted distribution of the hollow oak species, not only in Norway but also in the rest of Europe (Ranius *et al.* 2011). As a result, the beetle species suffers from habitat fragmentations and ends up with marginally sized populations, often restricted to a few localities

(Ranius 2002, Ødegaard *et al.* 2009).

The number of hollow oaks and other broadleaved trees in Norway are most probably still decreasing, but we do not know for sure (Sverdrup-Thygeson *et al.* 2010). The situation in parts of Sweden is better documented. In Sweden the estimated number of old, hollow oak trees (trees exceeding 4 m in circumference at breast height) are around 25000, and the estimated annual decrease of such trees lies between 0.5 and 1 % (Naturvårdsverket 2004). There are no indications that the situation in Norway is any better (Sverdrup-Thygeson *et al.* 2010). When it usually takes 200–300 years before an oak develop a cavity, and maybe another 50–100 years to become a hollow tree with lots of mould, the future situation for beetles dependent on hollow broadleaved trees don't look too bright.

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