# New records of *Cleopomiarus distinctus* Boheman, 1845 (Coleoptera, Curculionidae) and *Stricticollis tobias* Marseul, 1879 (Coleoptera, Anthicidae) from Norway

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Two new beetle species for Norway were recorded from field surveys in power-line clearings located in predominantly forested areas in Southeastern Norway; *Cleopomiarus distinctus* Boheman, 1845 (Curculionidae), and *Stricticollis tobias* Marseul, 1879 (Anthicidae). A total of 81 specimens of the weevil *C. distinctus*, were found across four sites in Buskerud over the course of three years (2013–2015). *C. distinctus* has never been recorded in Scandinavia previously. Three specimens of the ant-like flower beetle *S. tobias*, were found at two sites in Hedmark in 2015. *S. tobias* has a wide distribution in other Nordic countries and has been recognized as a "doorstep-species" to Norway from Sweden. The biology of the two species are presented and the potential distribution of the species are discussed.

Key words: Coleoptera, Curculionidae, *Cleoponmiarus distinctus*, Anthicidae, *Stricticollis tobias*, Southeastern Norway, New records, Power-line clearings.

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## Introduction

In forested landscapes, the early successional stages generated by the maintenance clearing below power-lines potentially provide valuable habitats for a wide range of taxa (Wojcik and Buchmann 2012). Several studies have investigated insect communities, such as butterflies (Berg *et al.* 2016), bees (Sydenham *et al.* 2016, Wagner *et al.* 2014) and bumblebees (Hill & Bartomeus 2016) related to the floral communities in power-line clearings. However, the beetle communities in these open habitats have received less attention. According to Artsdatabanken (2018), beetles constitute one of the largest insect orders in Norway, with more than 3600 species, distributed across 95 families. However, species registrations from forests are poorly represented in Norwegian databases (i.e. Artsdatabanken 2018), which also influences the red list status of many species (Henriksen & Hilmo 2015). Approximately 45% of the 800 beetles in the Norwegian Red List are associated with forest (Ødegaard *et al.* 2015), and the majority of these are associated with dead wood, but many species are also associated with specific flower resources. The power-line clearings provide both dead wood from maintenance clearing that are conducted every 5–10 years, to prevent the regrowth of trees from interfering with the electric lines, and from fallen dead trees at the edge of the clearings. Additionally, the open clearings provide an increased diversity of flower resources

(Steinert *et al.* 2018), and a better microclimate for many insects due to altered light availability and temperature (Muscolo *et al.* 2014).

## Methods

Insects were sampled using flight-interception traps at 19 sites during a large-scale field experiment within the main power-line grid in southeast Norway. The 19 sites were located between latitudes 59.33°–61.12°N and longitudes 08.95°–11.36°E (WGS84) at 48–536 masl (Figure 1). The sites were mainly located in forested areas, consisting of the main tree species, Norway spruce (*Picea abies* (L.) Karst.), Scots pine (*Pinus sylvestris* L.) and birch (*Betula spp.*). The beetle specimens were collected below power-lines in three 30 m x 60 m plots [corridor width], at least 20 m apart, where the vegetation was either; (1) cut and left to decay, (2) cut and removed, or (3) uncut (Figure 1). Within each treatment plot, three flight-interception traps (window traps) were set out immediately after snowmelt in 2013, 2014 and 2015 (Figure 2). The traps were emptied 4-5 times during each field season. All beetles were sorted and identified to species by Sindre Ligaard.

## Results

In total, we recorded and identified 89,694 individual beetle specimens from 65 different families from the complete study period (Table 1). We caught 28,473 individuals of beetles representing 850 species in 2013, 30,302 individuals representing 856 species in 2014, and 30,921 individuals representing 912 species in 2015. The species turnover was high between the years, thus in total we found 1191 species over all the years. We found two new species to Norway, within the family of Anthicidae and Curculionidae. The Anthicidae was found in three different traps in July in 2015 and the Curculionidae was found in more than 15 traps from May to August over the three-year period.

## The species

ANTHICIDAE

***Stricticollis tobias* Marseul, 1879**

**HES**, Løten: Slettmoen [N 60.865843˚, E 11.266329˚ ±10m; 325 m.a.s.l.] (EIS 55), July 2015 1 ex. Window trap, det. Sindre Ligaard, coll. S. Ligaard; Brenneriroa [N 60.822940˚, E 11.283085˚ ±10m; 225 m.a.s.l.] (EIS 46), July 2015 2 ex. Window trap, det. Sindre Ligaard, coll. S. Ligaard

**Biology and distribution**. *S. tobias* (Figure 3) is mostly found on warmer grounds, like sandy ruderal areas and it prefers open, sunny microhabitats (Telnov 2010, Wikars 2014). The species has been reported to thrive in urban landscapes and is often found on rubbish dumps, compost heaps, or on sea shores (Telnov 2010, Artportalen 2018). The adults are reported to be active from June to October and both adults and larvae are saprophagous (Telnov 2010). *S. tobias* has a cosmopolitan distribution (Telnov 2010), and is widely distributed in Asia and North America (Ødegaard *et al.* 2018). There are about 50 species and subspecies within the genus *Stricticollis*, of which 38 occur in the Palearctic region. According to Artskart (2018a), ten species from the Anthicidae are registered in Norway, however this is the first species registered from the genus *Stricticollis*. Three species of the Anthicidae are listed as vulnerable and one of them as endangered (Artskart 2018a). A key and description of *S. tobias* can be found in Eltorkey *et al.* (2005).

CURCULIONIDAE

***Cleopomiarus distinctus* Boheman, 1845**

**BØ**, Ringerike: Sokna [N 60.276864˚, E 11.266329˚ ±10m; 258 m.a.s.l.] (EIS 35), June/ July/August 2014 27 ex.; and July/August 2015 3 ex. Window trap, det. Sindre Ligaard, coll. S. Ligaard; Skjerpåsen [N 60.159492˚, E 10.341340˚ ±10m; 121 m.a.s.l.] (EIS 36), July/ August 2015 2 ex. Window trap, det: Sindre Ligaard, coll. S. Ligaard; **BV**, Flå: Gulsvik, Trommald [N 60.374567˚, E 9.648504˚ ±10m; 231 m.a.s.l.] (EIS

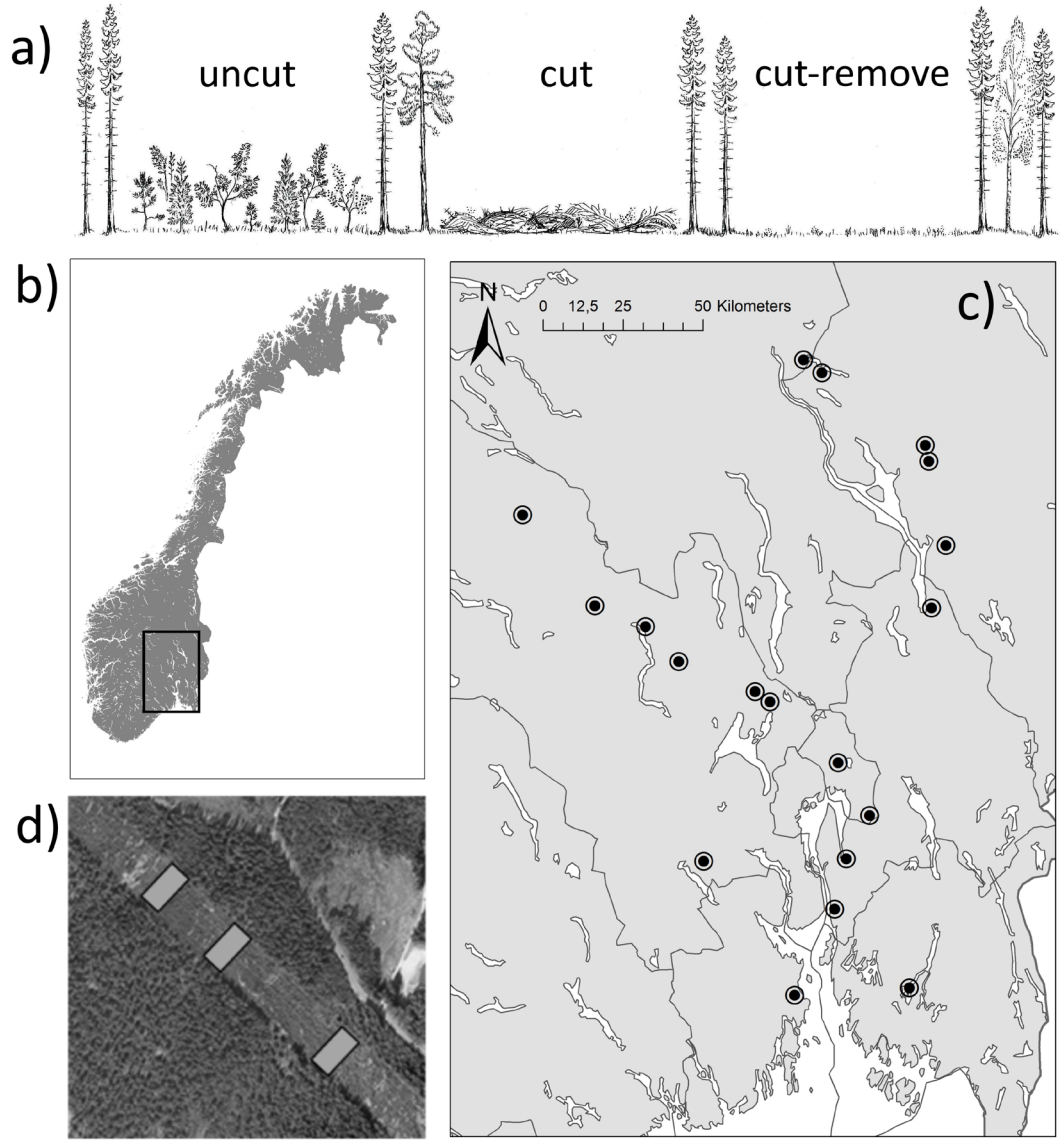


**FIGURE 1**. Schematic illustration of the experimental set up (**a**) and geographic distribution of the 19 study sites (**b,c**). Aerial photograph of one site with the three treatment plots (**d**). Three flight-interception traps were set out within each treatment plot, in total there were nine traps per site that were active from snowmelt until the end of the season. The traps were emptied once a month from May to August, in 2013, 2014, and 2015.

35), June/July 2014 3 ex.; July 2015 1 ex. Window trap, det. Sindre Ligaard, coll. S. Ligaard; Austvoll [N 60.436067˚, E 9.354057˚ ±10m; 183 m.a.s.l.] (EIS 35), May 2013 6 ex.; June/July 2014 45 ex.; July/August 2015 12 ex. Window trap, det: Sindre Ligaard, coll. S. Ligaard

**Biology and distribution**. *C. distinctus* (Figures 4-5) has been reported to thrive in dry and warm localities and in sunlit slopes, such as in meadows, fields, road verges and cleared forests, but also in thickets and on boulders (Caldara & Legalov 2016). The species is phytophagous and mainly forages on species of bluebells (*Campanula*). It has been reported to live and forage on: *C. glomerata*, *C. trachelium*, *C. rapunculus* (rare in Norway), *C. latifolia*





**FIGURES 2–5**. **2**. A flight-interception trap (window trap) used in the study. The container was filled with green propylene glycol and a drop of detergent. **3**. *Stricticollis tobias* ♂, one of the ant-like flower beetles (Anthicidae), with a pair of characteristic round pale spots on the elytra, Length 3.00–4.50 mm (Telnov 2010). Photo: A. Staverløkk, NINA. **4**. *Cleopomiarus distinctus*, ♂ to the left, and ♀ to the right (length of 2.2–3.2 mm). The male rostrum is long, but even longer in the female. It is a variable species, particularly there is variation in the length of the rostrum (mainly in the females), the density of the elytral scales, in addition to variation in the color of the dorsal vestiture, which can be whitish grey to light brown (Caldara & Legalov 2016). The female is usually larger than the male. Photo: Arnstein Staverløkk, NINA. **5**. The male genitalia, *C. distinctus*. Photo: A. Staverløkk, NINA.

**TABLE 1**. Species richness and abundance of the beetle families (Coleoptera) collected in 2013, 2014 and 2015. The complete species list can be retrieved from GBIF (GBIF 2018, Steinert 2018).

| | Species richness | | | Abundance | | |
|---|---|---|---|---|---|---|
| **Family** | **2013** | **2014** | **2015** | **2013** | **2014** | **2015** |
| ADERIDAE | 1 | 0 | 2 | 1 | 0 | 2 |
| ANOBIIDAE | 9 | 8 | 8 | 28 | 37 | 70 |
| ANTHICIDAE | 0 | 0 | 1 | 0 | 0 | 3 |
| ANTHRIBIDAE | 4 | 6 | 6 | 27 | 60 | 39 |
| APIONIDAE | 3 | 6 | 10 | 8 | 23 | 39 |
| ATTELABIDAE | 2 | 6 | 5 | 6 | 15 | 37 |
| BUPRESTIDAE | 7 | 7 | 4 | 163 | 143 | 202 |
| BYRRHIDAE | 0 | 2 | 1 | 0 | 8 | 2 |
| BYTURIDAE | 2 | 2 | 2 | 78 | 357 | 296 |
| CANTHARIDAE | 21 | 20 | 22 | 267 | 228 | 430 |
| CARABIDAE | 35 | 41 | 48 | 194 | 230 | 308 |
| CERAMBYCIDAE | 25 | 18 | 18 | 769 | 717 | 913 |
| CERYLONIDAE | 3 | 3 | 3 | 298 | 245 | 168 |
| CHRYSOMELIDAE | 18 | 22 | 31 | 168 | 414 | 481 |
| CIIDAE | 12 | 17 | 18 | 876 | 644 | 851 |
| CLAMBIDAE | 3 | 2 | 2 | 8 | 6 | 6 |
| CLERIDAE | 3 | 3 | 2 | 17 | 6 | 4 |
| COCCINELLIDAE | 13 | 15 | 21 | 157 | 401 | 427 |
| CORYLOPHIDAE | 2 | 1 | 1 | 19 | 12 | 28 |
| CRYPTOPHAGIDAE | 33 | 30 | 33 | 582 | 415 | 472 |
| CUCUJIDAE | 1 | 0 | 0 | 2 | 0 | 0 |
| CURCULIONIDAE | 69 | 81 | 86 | 2830 | 2331 | 1756 |
| DASCILLIDAE | 1 | 0 | 0 | 1 | 0 | 0 |
| DERMESTIDAE | 2 | 3 | 4 | 7 | 6 | 26 |
| DYTISCIDAE | 5 | 4 | 4 | 20 | 9 | 9 |
| ELATERIDAE | 22 | 26 | 26 | 3667 | 3903 | 3952 |
| ELMIDAE | 0 | 3 | 1 | 0 | 6 | 2 |
| ENDOMYCHIDAE | 2 | 2 | 0 | 5 | 5 | 0 |
| EROTYLIDAE | 4 | 4 | 4 | 64 | 124 | 91 |
| EUCNEMIDAE | 5 | 5 | 5 | 20 | 29 | 32 |
| HISTERIDAE | 7 | 6 | 3 | 48 | 36 | 13 |
| HYDRAENIDAE | 0 | 2 | 3 | 0 | 2 | 26 |
| HYDROPHILIDAE | 14 | 14 | 15 | 166 | 173 | 103 |
| KATERETIDAE | 3 | 2 | 3 | 14 | 26 | 7 |

**TABLE 1**. *Continued*.

| | Species richness | | | Abundance | | |
|---|---|---|---|---|---|---|
| **Family** | **2013** | **2014** | **2015** | **2013** | **2014** | **2015** |
| LAMPYRIDAE | 1 | 1 | 1 | 1 | 2 | 4 |
| LATRIIDAE | 21 | 23 | 25 | 949 | 1254 | 1209 |
| LEIODIDAE | 30 | 33 | 38 | 1014 | 1319 | 984 |
| LUCANIDAE | 2 | 1 | 1 | 22 | 8 | 15 |
| LYCIDAE | 4 | 4 | 4 | 67 | 103 | 98 |
| LYMEXYLIDAE | 1 | 1 | 2 | 62 | 35 | 6 |
| MELANDRYIDAE | 5 | 6 | 5 | 8 | 57 | 161 |
| MELYRIDAE | 5 | 5 | 7 | 1802 | 3279 | 4145 |
| MONOTOMIDAE | 7 | 7 | 9 | 116 | 294 | 140 |
| MORDELLIDAE | 8 | 8 | 7 | 1461 | 1213 | 1058 |
| MYCETOPHAGIDAE | 1 | 1 | 0 | 5 | 13 | 0 |
| NEMONYCHIDAE | 0 | 0 | 1 | 0 | 0 | 1 |
| NITIDULIDAE | 32 | 38 | 40 | 673 | 786 | 840 |
| OEDEMERIDAE | 6 | 5 | 5 | 135 | 187 | 151 |
| PHALACRIDAE | 0 | 1 | 2 | 0 | 2 | 3 |
| PTILIIDAE | 15 | 14 | 16 | 1249 | 634 | 1137 |
| PYROCHROIDAE | 1 | 1 | 1 | 39 | 36 | 1 |
| SALPINGIDAE | 3 | 5 | 4 | 44 | 32 | 44 |
| SCARABAEIDAE | 16 | 15 | 14 | 475 | 603 | 682 |
| SCIRTIDAE | 5 | 5 | 4 | 65 | 126 | 139 |
| SCRAPTIIDAE | 6 | 4 | 7 | 273 | 522 | 578 |
| SCYDMAENIDAE | 8 | 10 | 8 | 55 | 99 | 92 |
| SILPHIDAE | 6 | 5 | 5 | 257 | 216 | 116 |
| SILVANIDAE | 4 | 3 | 3 | 72 | 27 | 29 |
| SPHAERITIDAE | 1 | 0 | 1 | 3 | 0 | 2 |
| SPHINDIDAE | 2 | 2 | 2 | 79 | 161 | 226 |
| STAPHYLINIDAE | 317 | 289 | 298 | 8887 | 8414 | 7907 |
| TENEBRIONIDAE | 5 | 3 | 4 | 77 | 198 | 13 |
| TETRATOMIDAE | 1 | 0 | 1 | 6 | 0 | 1 |
| THROSCIDAE | 2 | 2 | 2 | 20 | 44 | 25 |
| TROGOSSITIDAE | 2 | 1 | 1 | 10 | 2 | 3 |
| ZOPHERIDAE | 2 | 2 | 2 | 37 | 25 | 316 |
| **Sum total** | **850** | **856** | **912** | **28473** | **30302** | **30921** |

and *C. persicifolia* (Caldara & Legalov 2016). The larvae feed on seed bags and seeds. Other species within the *Cleopomiarus* genus also feed on *Campanulaceae* (Caldara & Legalov 2016). However, *C. distinctus* and other congeneric species may live on refugee plants when their host plants are not available, eating flowers of for example *Fragaria* and *Ranunculus* (Caldara & Legalov 2016). There is only one other species, *C. graminis*, from the genus *Cleopomiarus* registered in Norway, labeled with category LC (Least concern) (Red list 2015). *C. distinctus* is a small and variable beetle, closely related to numerous species, including *C. graminis* (Vahtera & Muona 2006). *C. distinctus* is not previously recorded in Sweden or Denmark, but there are records from Estonia, Finland, Italy, Poland and Slovakia (GBIF 2018). The species is apparently widely distributed from France and Northern Italy through the central and eastern parts of Europe to The Caucasus, Siberia and China (Caldara & Legalov 2016).

## Discussion

We found almost 1200 beetle species in the power-line clearings, but only two of them were new to Norway. The material was collected in forested areas, in less attractive locations for collectors, which implies that the new species may previously have been overlooked. Nevertheless, according to the literature it seems like the species may have been introduced recently. The majority of specimens were collected where the vegetation was recently cut. We collected our material in forested areas using flight-interception traps, thus the material was dominated by flying species and therefore generally exclude the ground dwelling species.

*S. tobias* has been reported from open, sunny microhabitats, in accordance with the conditions in power-line clearings. Even if we only found few specimens of *S. tobias*, we may assume an establishment of this species in Norway based on previous evaluation of the species (Ødegaard *et al.* 2018). In Sweden, *S. tobias* is widely distributed throughout the country and is registered as a common and reproducing species (code LC, Least concern). There are also a few occurrences in Southwestern parts of Sweden, in counties that are bordering Norway, close to our study area (Artfakta 2018). The species has been recognized as a "doorstep species" to Norway from Sweden and it is a species with a great dispersal capability (Artfakta 2018). Consequently, it has been expected to be established over large parts of Southeastern Norway in the near future (Ødegaard *et al.* 2018). In addition, one individual of *S. tobias* was recently sampled at VE, Horten: Knutsrød (UTM: 32V 6587414 581678) using malaise traps, operated 16.VII–4.VIII.2018, by Helene Lind Jensen, Jan Schreiber and Stefan Olberg (pers. comm. and det. by Anonymous reviewer). This observation gives additional evidence for the establishment of a stable population of *S. tobias* in Norway.

The habitat preference of *C. distinctus* also agrees with the open, sunny habitats found in power-line clearings. Within the weevil genus *Cleopomiarus* there are many morphologically similar species, all breeding on Campanula plants (Vahtera & Muona 2006). In Norway, *C. graminis* is the only established weevil from this genus (Artskart 2018b). *C. distinctus* was found to be morphologically distinct from other Fennoscandian species, but morphologically and phylogenetically similar to *C. graminis* (Vahtera & Muona 2006). Because of the intraspecific morphological variation, it can be difficult to separate from congeneric species, which may have influenced the identification of this species. Due to the substantial records from several sites (May-August), in three subsequent years, *C. distinctus* seems to be well established in Norway (Buskerud and Ringerike). This is not surprising considering the species distribution in other parts of the world with similar climate. In addition, plant species within *Campanula*, *Fragaria* and *Ranunculus* are widely distributed in Norway. However, we can only speculate on how the species have managed to enter Norway. It is not yet registered in our neighboring countries, except for Finland, potentially due to the difficulties of distinguishing this species from its close relatives. Additionally, it is more likely that the species has entered Norway from the south or from accidental import with one of the host plants. We did not record *Campanula* in any of the sites

where we found *C. distinctus*, but there were large amounts of *Fragaria* and *Ranunculus*.

This material is a contribution to the knowledge of Norwegian species in forested landscapes, which also shows the value of open canopy habitats created by the maintenance clearing in the power-line clearings. The complete species list will be available from GBIF (see Steinert 2018).

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