

# Qualitative and Quantitative Records of Insects Feeding on Hazel Leaves (*Corylus avellana* L.)

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## Abstract

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The present inventory of leaf-eating insects on hazel at Andersby ängsbackar in central Sweden is a descriptive complement to a study into the energy flow through some insect populations. The insects determined are distributed as follows: Homoptera Aphidina 1, Coleoptera 7 and Lepidoptera 20. However, the list is not complete and at least two undetermined species of Hymenoptera Symphyta could for example be added to the list. Some estimates of the population level in 1969 and 1971 are given together with some estimates of hazel parameters.

## Introduction

This inventory is based on observations made at an IBP/PT research site, Andersby ängsbackar, situated about 40 km north of Uppsala in central Sweden. It was made in connection with an investigation into the energy flow through populations of *Phytodecta pallidus* L. (Col. Chrysomelidae) and *Operophtera brumata* L. (Lep. Geometridae) feeding on hazel (*Corylus avellana* L.) leaves. The intention here is to give the species composition of insects feeding on hazel leaves and to give some estimates of the abundance. As the study was focused on the energy flow and not on a thorough inventory the presented list cannot be considered to be complete.

Tab. 1. Estimated number of insects feeding on hazel leaves at Andersby ängsbackar on June 23—24, 1969. Mean number per sq.m with standard error in brackets.

| Species  | Sub-area:    |             |               |             |              |
|--|--------------|-------------|---------------|-------------|--------------|
|  | I            | II          | III           | I+II        | I+II+III     |
| <i>P. pallidus</i> . . . . .                               | 5.37 (1.13)  | 0.74 (0.60) | 0             | 4.48 (1.05) | 3.59 (0.72)  |
| <i>P. argentatus</i> (imago) . . .                         | 0.62 (0.11)  | 0.13 (0.04) | 0.05 (0.05)   | 0.53 (0.10) | 0.43 (0.07)  |
| <i>Cerostoma</i> spp. . . . .                              | 0.55 (0.35)  | 0.24 (0.03) | 0.01 (0.009)  | 0.49 (0.28) | 0.39 (0.28)  |
| <i>C. hübnerella</i> and<br><i>C. phryanella</i> . . . . . | 2.05 (0.49)  | 1.17 (0.18) | 0.14 (0.05)   | 1.88 (0.40) | 1.53 (0.32)  |
| <i>Pandemis</i> spp. . . . .                               | 0.07 (0.03)  | 0.02 (0.02) | 0.002 (0.002) | 0.06 (0.02) | 0.05 (0.02)  |
| <i>Cacoecia</i> spp. . . . .                               | 0.08 (0.07)  | 0.12 (0.03) | 0.02 (0.01)   | 0.09 (0.06) | 0.07 (0.04)  |
| <i>Epinotia</i> spp. . . . .                               | 0.15 (0.10)  | 0.07 (0.02) | 0.005 (0.004) | 0.13 (0.08) | 0.11 (0.06)  |
| <i>P. avellanella</i> . . . . .                            | 0.15 (0.15)  | 0.28 (0.17) | 0.02 (0.007)  | 0.18 (0.12) | 0.14 (0.10)  |
| <i>C. trapezina</i> . . . . .                              | 0.22 (0.13)  | 0.08 (0.05) | 0.006 (0.005) | 0.19 (0.10) | 0.16 (0.08)  |
| <i>O. brumata</i> . . . . .                                | 0.05 (0.008) | 0.05 (0.02) | 0             | 0.05 (0.01) | 0.04 (0.003) |

Tab. 2. Estimated number of hazel stems, number of leaves, standing crop of leaves and leaf area index (LAI) at Andersby ängsbackar on June 23—24, 1969. Mean value per sq.m with standard error in brackets.

| Sub-area                                    | I             | II            | III          | I+II         | I+II+III     |
|---|---------------|---------------|--------------|--------------|--------------|
| stems/m <sup>2</sup> . . . . .              | 0.49 ( 0.012) | 0.30 ( 0.027) | 0.05 (0.008) | 0.45 ( 0.02) | 0.38 ( 0.02) |
| leaves/m <sup>2</sup> . . . . .             | 618 (41)      | 562 (74)      | 74 (4.2)     | 607 (36)     | 501 (29)     |
| g dw/m <sup>2</sup> . . . . .               | 38.5 ( 1.43)  | 33.6 ( 6.35)  | 4.2 (0.22)   | 37.5 ( 1.68) | 30.9 ( 1.34) |
| LAI (m <sup>2</sup> /m <sup>2</sup> ) . . . | 1.14 ( 0.05)  | 0.84 ( 0.16)  | 0.09 (0.01)  | 1.08 ( 0.08) | 0.88 ( 0.04) |

The observations were made during 1968—1971. The population estimates are derived from one sampling on June 23—24 in 1969 and one on June 10—12 in 1971.

### Study area

The study area which is about 16 hectares in extent, is a deciduous woodland. It has been divided into three sub-areas. Sub-area I is a dense forest mainly of oak (*Quercus robur* L.), birch (*Betula pendula* Roth) and hazel. Sub-area II consists of a mosaic of oak, birch and hazel on moraine hillocks and open areas with meadow vegetation on clay. Sub-area III has a sparse tree and bush vegetation with oak, birch and some isolated hazel. A detailed description of the vegetation in the area is given by Larsson (1971).

### Methods

In 1969 the sampling of insects feeding on hazel leaves was conducted in sub-areas I—III. Two plots measuring 50×50 m were chosen at random in each sub-area. A random sample of ten hazel stems was taken

from each plot. The stems were carefully cut directly into large polythene bags and transported to the laboratory where the leaves and shoots were examined for insects. The sampling procedure and further treatments of hazel leaves are described in Axelsson et al. (1972). In 1971 the sampling was carried out in sub-areas I and II. Thirty plots measuring 2×2 m were chosen at random and every hazel stem growing in the plots was cut down, transported and examined in the same way as in 1969.

Many species could not be identified in the larval stage and it was thus necessary to rear larvae into imagines in the laboratory. The non-normality of the primary data has been disregarded and the variance has been estimated without any transformation.

### Synopsis of the species

#### Homoptera Aphidina

Three aphid species were found on hazel leaves. One of these, *Myzocallis coryli* (Gze.) is known to feed on hazel. The other two species, *Uroleucon sonchi* (L.) and *Euceraphis punctipennis* Zett., can be regarded as occasional visitors.

| Family        | Species                            | Larva | Adult |
|---------------|------------------------------------|-------|-------|
| Chrysomelidae | <i>Phytodecta pallidus</i> L.      | +     | +     |
|               | <i>Polydrosus mollis</i> Strøm     |       | +     |
| Curculionidae | <i>P. undatus</i> Fabr.            |       | +     |
|               | <i>Strophosomus rufipes</i> Steph. |       | +     |
|               | <i>Apoderus coryli</i> L.          | +     |       |
|               | <i>Deporaus betulae</i> L.         | +     |       |
|               | <i>Phyllobius argentatus</i> L.    |       | +     |

Tab. 3. Estimated number of insect larvae feeding on hazel leaves at Andersby ängsbackar on June 10—12, 1971. Mean number per sq.m with standard error in brackets.

| Group            | Area: I+II  |
|------------------|-------------|
| Chrysomelidae    | 4.18 (2.35) |
| Bombyces         | 0.02 (0.01) |
| Noctuidae        | 0.28 (0.19) |
| Geometridae      | 0.25 (0.13) |
| Microlepidoptera | 1.23 (0.63) |
| Symphyla         | 0.10 (0.08) |

### Coleoptera

The species which have been observed feeding on hazel leaves during larval or adult stage (+), are listed at the bottom of p. 113.

### Lepidoptera

The determinations in the following list are based on larvae found feeding on hazel leaves and reared in cultures into imagines.

| Family          | Species                              |
|-----------------|--------------------------------------|
| Hyponomeutidae  | <i>Cerostoma radiatellum</i> Don.    |
|                 | <i>C. parenthesellum</i> L.          |
| Gelechiidae     | <i>Chelaria hübnereella</i> Don.     |
|                 | <i>Chimacche phryanella</i> Hübn.    |
|                 | <i>Tachyptilia populella</i> Cl.     |
|                 | <i>Psoricoptera gibbosella</i> Z.    |
|                 | <i>Pandemis heparana</i> Schiff.     |
| Tortricidae     | <i>P. ribeana</i> Hb.                |
|                 | <i>Cacoecia reticulana</i> Hb.       |
|                 | <i>C. xylosteana</i> L.              |
|                 | <i>C. lecheana</i> L.                |
|                 | <i>Epinotia corticana</i> Hb.        |
| Coleophoridae   | <i>Coleophora flavipennella</i> H.-S |
| Lithocolletidae | <i>Parornix avellanella</i> SH.      |
| Lasiocampidae   | <i>Poecilocampa populi</i> L.        |
| Noctuidae       | <i>Cosmia trapezina</i> L.           |
| Geometridae     | <i>Operophtera brumata</i> L.        |
|                 | <i>Oporinia autumnata</i> Bkh.       |
|                 | <i>O. dilatata</i> Schiff.           |
|                 | <i>Erannis defoliaria</i> Cl.        |

Two species, *Brephos* sp. and *Poecilopsis* sp. (Geometridae), might be added to the list based on determinations of larvae. One larva of *Operophtera fagata* Scharfenb. (Geometridae) was found on hazel leaves, but its development was not successful and it can

be assumed that the larva had dropped from the birch canopy. Numerous pupae of *Tortrix viridana* L. (Tortricidae) were also found on hazel leaves. The larvae had probably descended from the oak canopy in order to pupate.

### Hymenoptera Symphyta

No species have been identified. Cultures of the larvae failed, but judging from found larvae at least two separate species feed on hazel leaves.

### Population estimates

Population estimates of different species at Andersby in 1969 are presented in Tab. 1. The estimates are given as mean numbers per sq.m. Some hazel data are given in Tab. 2 to enable comparison with the insect abundance. In Tab. 3 estimates are given on different insect groups in subarea I and II in 1971. On this occasion a separation into different species was only partially made. Approximately 73 per cent of the Microlepidoptera belonged to *C. hübnereella* and *C. phryanella*. All chrysomelid larvae belonged to *P. pallidus*.

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### References

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