

## The existence of two species of *Euceraphis* (Homoptera: Aphididae) on birch in Western Europe, and a key to European and North American species of the genus

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**ABSTRACT.** Aphids formerly regarded as *Euceraphis punctipennis* (Zetterstedt) are distinguished as two species, *E.punctipennis* and *E.betulae* (Koch), on the basis of cytological and morphological differences. *E.punctipennis* is primarily associated with *Betula pubescens* Ehrh., and *E.betulae* with *B.pendula* Roth. Seasonal variations in morphometrics, pigmentation and development of wax glands in the two species are described and compared. A key to European and North American species of *Euceraphis* is provided.

### Introduction

The commonest aphids on birch (*Betula* spp.) in Western Europe belong to the genus *Euceraphis* Walker. In this genus, the adults of all morphs, except the ovipara, are alate. There is considerable variation in the colour and general appearance of these aphids, especially in the extent of sclerotic pigmentation of the abdomen and the development of wax, but this variation is thought to be mainly seasonal, and hitherto only one species has been recognized, for which the earliest name is *Aphis punctipennis* Zetterstedt 1828.

Cytogenetic studies (Blackman, 1976) have revealed that there are two distinct species of *Euceraphis* in southern England. Nuclei of somatic cells of one species have two pairs of autosomes, whereas those of the other have only a single autosome pair. The two species also show differences in their mode of spermatogenesis. The present paper examines the morphological differences between the two species, paying particular attention to the problem of seasonal variation.

### Nomenclature

The name *Euceraphis punctipennis* (Zetter-

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stedt) has been applied to the common birch aphid in Europe since the discovery of Zetterstedt's types by Wahlgren (1939). Previously, *nigritarsis* (Heyden) was most widely used. Linnaeus' name *betulae* was misapplied to *punctipennis* by Walker (1870) and subsequent workers, and the plenary powers had to be invoked to validate *punctipennis* as the type species of *Euceraphis* (Hille Ris Lambers & Stroyan, 1960). It has not been possible to compare aphids of known karyotype with the type specimens, but on the basis of Wahlgren's description the species with a single autosome pair appears to be Zetterstedt's *punctipennis*. Heyden's (1837) description of *nigritarsis* is sufficiently detailed about the pigmentation of the antennae and legs, and the relative proportions of the antennal segments, to make it fairly certain that his aphid also is the species with a single autosome pair.

Koch (1855) described and illustrated *Callipterus betulae*, which has been synonymized with *E.punctipennis*. Koch's description and figure agree well with the species with two pairs of autosomes. The name *Euceraphis betulae* (Koch) is therefore allocated to this species.

Shinji (1927) studied the cytogenetics of an aphid which he variously called *E.betuli-cola* Kalt., *E.betulaecolens* Kalt. and *E.betulae* Kalt. in different places in the same work, but which was evidently *E.betulae* (Koch), as

