

Cytological and morphological differences within Palaeartic *Glyphina* (Homoptera: Aphididae), and their taxonomic significance

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ABSTRACT. Karyotype variation within the genus *Glyphina* in Europe is described and correlated with morphological differences. *G.pseudoschrankiana* sp.nov., on *Betula pubescens* in Europe and Japan, is separated from *G.schrankiana* Börner, on *Alnus* spp. in northern and central Europe, on the basis of differences in karyotype and morphology. *G.jacutensis* Mordvilko is synonymized with *G.schrankiana*. A key is provided to Palaeartic members of the genus.

Introduction

Glyphina is a small genus of birch- and alder-feeding aphids, with four species currently recognized: two in Europe and Asia, and two in North America. The two European species, *G.betulae* (L.) and *G.schrankiana* Börner, were thought to be difficult to tell apart until Szelegiewicz (1982) pointed out that the problem of distinguishing between them had been compounded by the supposition that each species was confined to a particular plant genus. According to Szelegiewicz, the apterous viviparae of *G.betulae* live only on *Betula* spp., and have a warty (denticulate) ornamentation of the dorsal cuticle, whereas those of *G.schrankiana* live on *Alnus* spp. but can also occur on *Betula pubescens*, and have a dorsal ornamentation composed of short wrinkles or incomplete reticulations. Szelegiewicz also noted that *G.betulae* has fewer and shorter hairs on the antennae and abdominal tergites than *G.schrankiana*, and its alatae have fewer secondary rhinaria on the third antennal segment.

Blackman (1980) noted a difference in chromosome number in European *Glyphina*. A

population from *Betula* in Britain had $2n(\text{male})=55$, whereas Kuznetsova & Shaposhnikov (1973) had reported $2n(\text{female})=10$ for samples from both *Betula* and *Alnus* in the U.S.S.R. The aphids karyotyped as $2n=55$ ran to *G.betulae* in Szelegiewicz's key, and it therefore seemed likely that both the $2n=10$ samples examined by Kuznetsova & Shaposhnikov were *G.schrankiana*.

With the acquisition and karyotyping of more samples, however, it has become apparent that the situation is more complex, both cytologically and taxonomically.

Karyotypes

Four different karyotypes have now been found in European *Glyphina* (Fig. 1).

$2n(\text{female})=8$. Two populations, one from *Alnus incana* in Rumania (coll. A. Czylok, June 1984), and the other from *A.glutinosa* in Lithuania (coll. R. Rakauskas, May 1986), were found to have $2n=8$ in female somatic cells (Fig. 1a). In prophase and prometaphase cells there often appeared to be two additional, dot-like chromosomes (Fig. 1b). This is because the X chromosomes have subterminal nucleolar organizing regions (NORs), and a terminal fragment

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