

The strawberry aphid complex, *Chaetosiphon (Pentatrichopus) spp.* (Hemiptera: Aphididae): taxonomic significance of variations in karyotype, chaetotaxy and morphology

R. L. BLACKMAN and V. F. EASTOP

Department of Entomology, British Museum (Natural History), Cromwell Road, London, SW7 5BD, UK

B. D. FRAZER and D. A. RAWORTH

Agriculture Canada, Research Station, 6660 N.W. Marine Drive, Vancouver, BC V6T 1X2, Canada

Abstract

Holocyclic populations of aphids of the *Chaetosiphon (Pentatrichopus) fragaefolii* (Cockerell) group from *Fragaria* in British Columbia were found to have a homozygous $2n = 12$ female karyotype, whereas samples from predominantly anholocyclic populations in Oregon, California, England and New Zealand have 13, 14, 15 or 17 chromosomes showing various degrees of structural heterozygosity. The 17-chromosome form is a morphologically recognizable taxon, *C. jacobi* Hille Ris Lambers. The other karyotypes apparently represent a series of parthenogenetic lineages derived from the $2n = 12$ holocyclic form and carrying one, two or three autosome dissociations. The North American populations showed no correlation between karyotype and the number of submarginal setae, a character previously used in attempts to differentiate taxa within this species complex in western North America. Submarginal setal number varied greatly within and between clones and tended to increase in successive generations from the fundatrix, confirming that this character varies both genetically and seasonally and has little taxonomic value. Populations of the *fragaefolii* group from *Rosa* spp. in North America have a shorter rostrum than those from *Fragaria*. The name *C. thomasi* Hille Ris Lambers is assigned to this rose-feeding species, which is holocyclic on *R. rugosa* in British Columbia and colonizes *Potentilla* spp. (but apparently not *P. anserina*) as alternative hosts. Old World populations on *Fragaria*, presumably originating from North America, have longer siphunculi than North American populations of *fragaefolii* and few or no submarginal setae; these differences are probably due to founder effects. Both Old and New World populations of *fragaefolii* use *P. anserina* as an alternative host-plant.

Introduction

Aphids of *Chaetosiphon* subgenus *Pentatrichopus* are important as vectors of strawberry viruses in many parts of the world. Distinct species of this group occur on *Rosa* and *Potentilla*, but the complex of species associated with *Fragaria* is a long-standing taxonomic problem, particularly in North America where four strawberry-feeding species are recognized (Schaefers, 1960). *C. minor* (Forbes) in eastern North America, and *C. jacobi* Hille Ris Lambers in the west, are reasonably distinct forms found only on *Fragaria* species, but the other two nominal taxa, *fragaefolii* (Cockerell) and *thomasi* Hille Ris

