



Native aphids of New Zealand—diversity and host associations

TEULON D.A.J.¹, STUFKENS M.A.W.¹, DRAYTON G.M.¹, MAW H.E.L.², SCOTT I.A.W.¹, BULMAN S.R.¹,
CARVER M.³, VON DOHLEN C.D.⁴, EASTOP V.F.⁵ & FOOTTIT R.G.²

¹The New Zealand Institute for Plant and Food Research Limited, Private Bag 4704, Christchurch, New Zealand.

²National Environmental Health Program, Invertebrate Biodiversity, Agriculture and Agri-Food Canada, K. W. Neatby Bldg., 960 Carling Ave, Ottawa, K1A0C6 ON, Canada

³8 Holmes Crescent, Campbell, ACT 2612, Australia

⁴Department of Biology, Utah State University, Logan, Utah, 84322, USA

⁵Deceased

Abstract

At least 15 species of aphids are now recognised as New Zealand natives and most of these are very likely to be endemic. Most native aphids belong in the subfamily Aphidinae (Aphidini), with a possible single species in Aphidinae-Macrosiphini, at least two in Neophyllaphidinae and one in Taiwanaphidinae. With one exception, native aphids are restricted to a single host plant genus, and these hosts are from 13 genera and 12 plant families in the Pinales and Angiospermae—Eudicotyledonae, suggesting that the aphids are a remnant fauna. No known native aphids have host plants from the Pteridophyta or Angiospermae—Monocotyledonae, with the possible exception of two possibly native species extracted from native tussock grassland turfs. Most host plant genera have some degree of Gondwanan distribution, but only two indigenous species are found on large forest trees and only one host is deciduous. Native aphids have been recorded from sea level to the subalpine zone, reflecting their host plant distributions. Sexual reproduction, followed by several parthenogenetic generations on the same host plant, appears to be the norm for most species. Eggs appear to be used for surviving winter conditions in some species and summer conditions in others. Native aphid distribution and abundance varies with five species considered to be scarce, one species localised, two species sparse and three relatively common based on current knowledge.

Key words: New Zealand, native aphid, fauna, distribution, biology, taxonomy, Aphididae

Introduction

Knowledge of the 120 or more species of adventive aphids in New Zealand is incomplete (MacFarlane *et al.* 2010), but these exotic species have received considerably more attention (Cottier 1953, Scott 1984, Teulon & Stufkens 2002) than the native aphid fauna. The first native aphids recorded in New Zealand, *Aphis coprosmae* Laing ex Tillyard and *Neophyllaphis totarae* Cottier, have been known from the 1920s (Miller 1925, Tillyard 1926). However, there was speculation that New Zealand harboured no indigenous species, because *N. totarae* was initially thought to be *N. podocarpi* Takahashi (1920) from Japan, and Cottier (1953) considered that *A. coprosmae* would eventually be found to be introduced. Both species were eventually confirmed as native, and Cottier (1953) described three further such species. An additional species was described by Sunde (1987) but as late as 1994 it was still considered that there were only seven native aphid species in New Zealand (Farrell & Stufkens 1994).

Resurgence of interest in New Zealand native aphids was provided by the 1997 visit of VF Eastop to Plant & Food Research (PFR) (formally Crop & Food Research), Lincoln, New Zealand. He provided information on several undescribed specimens in the Natural History Museum, London, collected from New Zealand. Similar information was also supplied to PFR researchers by M Carver from the Australian National Insect Collection, Canberra at about the same time. Two new New Zealand native aphids were described (Carver 2000, Eastop 2001) and knowledge on several undescribed species was collated by PFR researchers and their collaborators. Some of