

Key to the New Zealand species of *Psyllaephagus* Ashmead (Hymenoptera: Encyrtidae) with descriptions of three new species and a new record of the psyllid hyperparasitoid *Coccidoctonus psyllae* Riek (Hymenoptera: Encyrtidae)

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Abstract This paper records seven species of wasps in the genus *Psyllaephagus* (Hymenoptera: Encyrtidae) from New Zealand. All of these species are primary parasitoids of psyllids (Hemiptera: Psylloidea). Two are species previously described from New Zealand: *P. acaciae* Noyes and *P. pilosus* Noyes. Two are described Australian species which have established recently: *P. bliteus* Riek and *P. gemitus* Riek. Three new species are described here, from New Zealand: *P. breviramus* sp. nov., *P. cornwallensis* sp. nov. and *P. richardhenryi* sp. nov. All species are probably Australian in origin. A key to all seven *Psyllaephagus* species known from New Zealand is provided. An earlier first record of the Australian psyllid hyperparasitoid *Coccidoctonus psyllae* Riek (Hymenoptera: Encyrtidae), previously first recorded from New Zealand in 2006, is noted.

Key words Australia, *Eucalyptus*, Homotomidae, lerp, Psyllidae.

INTRODUCTION

Psyllaephagus Ashmead is a cosmopolitan genus containing around 230 valid described species worldwide (Noyes 2002). According to Noyes and Hanson (1996) around 20 species are known from the New World, around 60 are known from the Palearctic and 22 from Africa. The Oriental fauna is poorly known. However, the genus appears to be extremely speciose in Australia: about 110 described species are reported (Noyes & Hanson 1996), but the total fauna may be as many as 1000 species (Noyes & Hayat 1984; Noyes & Hanson 1996).

Where their biology is known, most species of *Psyllaephagus* are primary parasitoids of psyllids (Hemiptera: Psyllidae), although a few hosts in other psyllid families have been recorded, most notably Triozidae (Noyes 2002). Riek (1962a) recorded several species as psyllid hyperparasitoids via other *Psyllaephagus* species. Several species have been used in classical biological control programs. *Psyllaephagus pilosus* Noyes from Australia was introduced into California very successfully against the blue gum psyllid, *Ctenarytaina eucalypti* (Maskell) (Dahlsten *et al.* 1998), and into Wales (UK) against the same pest (Hodkinson 1994). *Psyllaephagus bliteus* Riek, also from Australia, was introduced into California against the red gum psyllid, *Glycaspis brimblecombei* Moore (Daane *et al.* 2005). *Psyllaephagus yaseeni* Noyes has been introduced into several countries against *Heteropsylla*

cubana Crawford, and is reportedly at least partially responsible for effective control of this psyllid in some countries (Noyes & Hanson 1996).

In New Zealand, a number of Australian eucalyptus psyllid species have established over the past two decades, including *Cardiaspina fiscella* Taylor (brown lace lerp), *Creiis lituratus* (Froggatt), *Cryptoneossa triangula* Taylor, *Ctenarytaina spatulata* Taylor, *Eucalyptolyma maideni* Froggatt and *Glycaspis granulata* (Froggatt) (Withers 2001). Some of these psyllids are serious pests on several eucalypt species, but no biological control introductions against any of these species have been made. In late 1999, an application to import *Psyllaephagus gemitus* Riek into containment for testing as a bio-control agent against brown lace lerp had just been approved by the Environmental Risk Management Authority when the wasp was found to have established here, presumably accidentally (Withers & Bain 2000; Withers 2001). In 2000, lerp populations appeared to have decreased in Northland wherever *P. gemitus* was present and tree recovery was noticeable (Withers & Bain 2000; Withers 2001).

Seven species of *Psyllaephagus* are recorded here from New Zealand. Noyes (1988) recorded three species: *P. acaciae* Noyes, *P. pilosus* and 'sp. A', known only from a single male. Noyes considered these three species to be native to Australia, though not known from that country, and presumably accidentally introduced into New Zealand. Withers (2001) recorded two recently established Australian species, *P. bliteus* and *P. gemitus*. Three new species are described here from New Zealand: *P. breviramus* sp. nov. (sp. A of Noyes), *P. cornwallensis* sp. nov. and *P. richardhenryi* sp. nov.; these species are

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also probably native to Australian and have been accidentally introduced into New Zealand. At least some of these parasitoid species are likely to be (or to become) important in the regulation of psyllid populations in natural and modified systems.

The aim of this paper is to describe the three undescribed *Psyllaephagus* species and to provide a key for all known species from New Zealand in order to facilitate research on the ecology of psyllids and their parasitoids, and on psyllid control.

Recent rearings of these primary parasitoids also recovered the Australian psyllid hyperparasitoid *Coccidoctonus psyllae* Riek (Hymenoptera: Encyrtidae) in New Zealand for the first time, although subsequently a specimen collected some 4 years earlier was found in the National Forest Insect Collection, Rotorua, New Zealand (FRNZ) collection.

MATERIALS AND METHODS

Most specimens were mounted on points and examined using a Leica MZ12 binocular microscope at up to 100× magnification. Specimens examined with a compound microscope were cleared in 10% KOH (except wings) and mounted on microscope slides in Hoyer's solution.

Specimens for this study were reared from psyllid-infested leaves collected at three sites in Auckland and placed in large brown paper bags within plastic bags to retain moisture. Parasitoids and psyllids continued to emerge from the leaves for 3–6 weeks after the leaves were picked. The only psyllid species present on the *Ficus* leaves was *Mycopsylla fici* (Tryon) (Homotomidae). However, the *Eucalyptus* leaves were often infested with more than one species of psyllid (up to four species, with three species on a leaf relatively commonly). Consequently the biological information given on these specimen labels is expressed as an association rather than as a definitive host record, except where the host record is unequivocal.

Specimens are listed by geographical area, following the system of area codes proposed by Crosby *et al.* (1976). This system subdivides the New Zealand mainland and offshore islands into 37 areas and defines two-letter codes for each. Sculpture terms are taken from Harris (1979).

Institutions:

ANIC: Australian National Insect Collection, Canberra, Australia

FRNZ: National Forest Insect Collection, Rotorua, New Zealand

NZAC: New Zealand Arthropod Collection, Auckland, New Zealand

Genus *Psyllaephagus* Ashmead

Type species: *Encyrtus pachypsyllae* Howard, by original designation.

Diagnostic characters: (after Noyes & Hayat 1984; Noyes 1988; Noyes & Hanson 1996). 1–2 mm long; head and mesosoma bright metallic green or blue-green; occipital margin

rounded; mandible with 1 (usually) or 2 teeth and a broad truncation; axillae touching; mesopleuron not expanded posteriorly; marginal vein punctiform to slightly longer than broad, postmarginal vein well developed, linea calva not interrupted. Females: antennae with 6 funicular segments, club 3-segmented; hypopygium not extending more than 2/3 length of the gaster; ovipositor hidden to well exerted. Males: antennae with 6 funicular segments, branched or unbranched; club unsegmented.

Note that there are exceptions to each of these character states within the genus.

Key to *Psyllaephagus* species known to occur in New Zealand

- 1 Fore coxa dark..... 2
Fore coxa pale or yellow..... 4
- 2 Hind tibia and femur yellow; male antenna branched (F1 with short branch, F2–F5 with long branches)..... *P. gemitus*
Hind tibia and femur dark; male antenna unbranched (Figs 4,6)..... 3
- 3 Middle tibia entirely or almost entirely yellow; dorsum of thorax covered in pale brown setae..... *P. acaciae*
Middle tibia entirely or almost entirely dark; dorsum of thorax covered in translucent setae..... *P. pilosus*
- 4 Scape of female yellow with wide dark upper medial band; club of male obliquely truncate (Fig. 6)..... *P. richardhenryi* sp. nov.
Scape of female not banded as above; club of male not conspicuously obliquely truncate (Figs 2,4)..... 5
- 5 Scape mostly or entirely yellow; conspicuous dark infumate patch under stigmal vein (Fig. 8); male F3 with a short branch (Fig. 2).... *P. breviramis* sp. nov.
Scape dark; wing either hyaline or without conspicuous brown infumate patch under stigmal vein (Fig. 9); male antenna unbranched (Fig. 4)..... 6
- 6 Scape of female not expanded, wing hyaline; male flagellar segments 1–4 very short, anelliform..... *P. bliteus*
Scape of female expanded (Fig. 3), wing uniformly and slightly infumate (Fig. 9); male flagellar segments 1–4 not anelliform (Fig. 4)..... *cornwallensis* sp. nov.

CHECKLIST OF TAXA

Family Encyrtidae

Subfamily Encyrtinae

Tribe Trechnitini

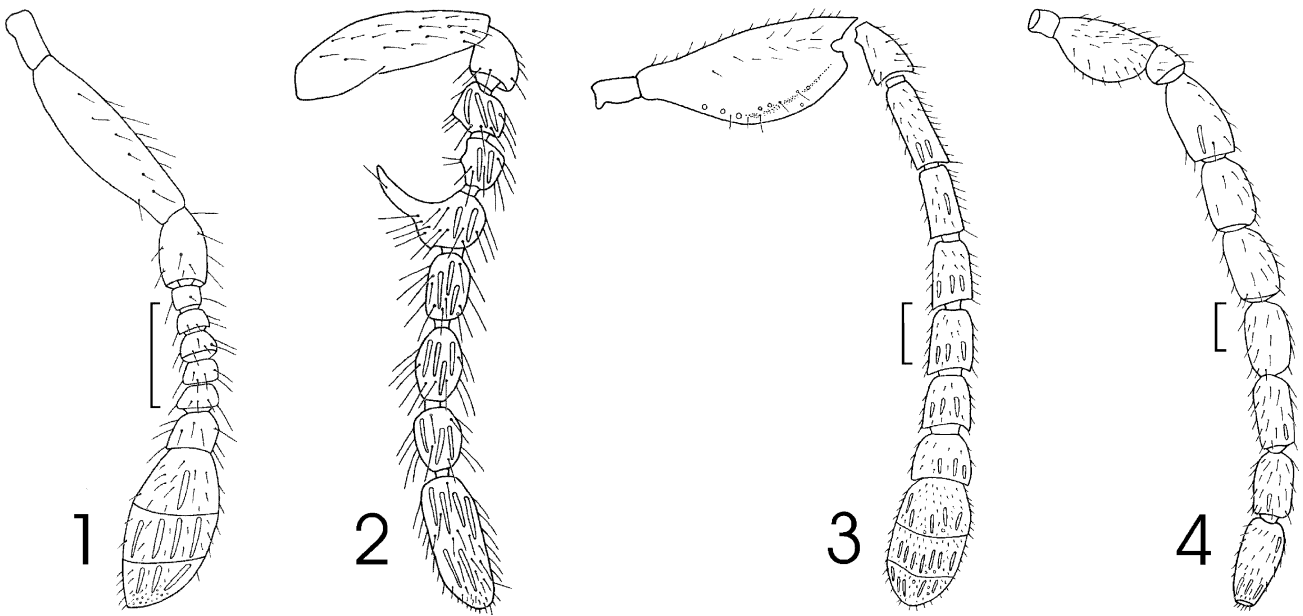
Subtribe Metaprionomitina

Genus *Psyllaephagus* Ashmead

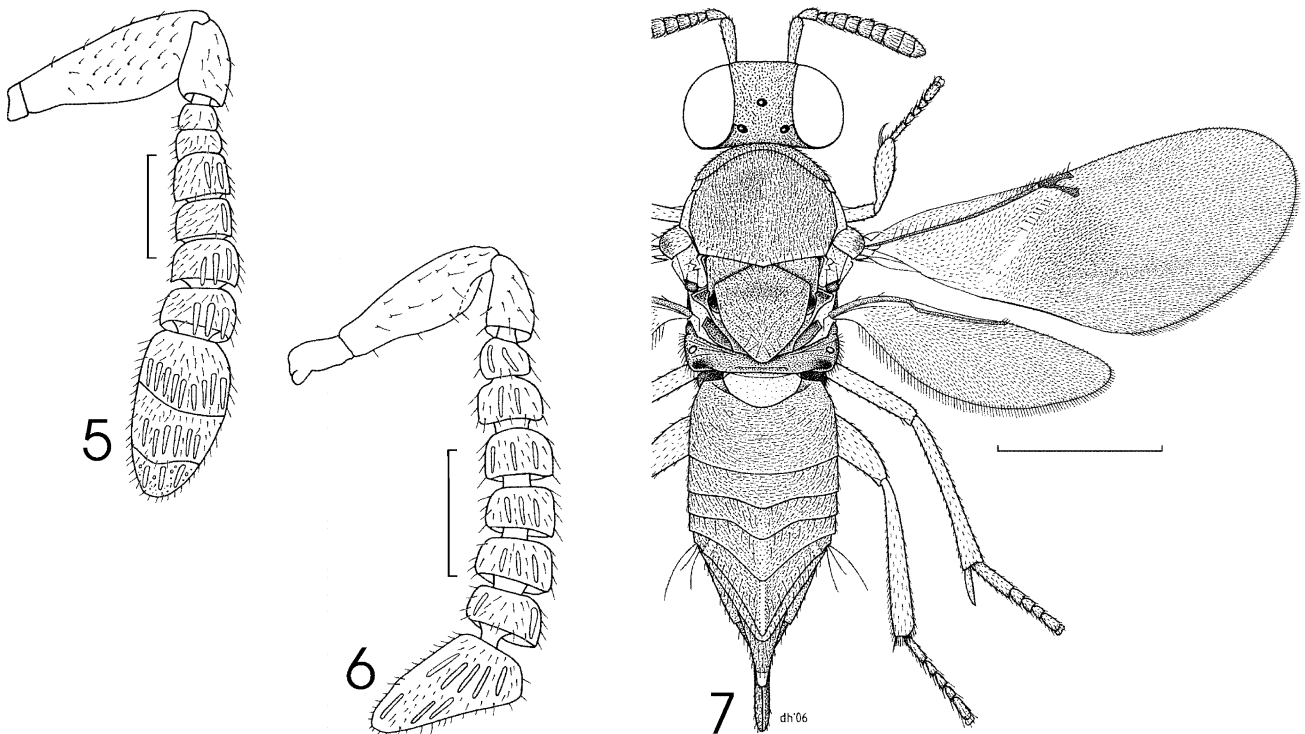
Psyllaephagus acaciae Noyes, 1988: 103

Psyllaephagus bliteus Riek, 1962a: 722

Psyllaephagus quadricyclus Riek, 1962a: 751 (syn. Daane *et al.* 2005)



Figs 1–4. 1 *Psyllaephagus breviramus* sp. nov., antenna of female. Scale bar = 0.1 mm. 2 *Psyllaephagus breviramus* sp. nov., antenna of male. After Noyes (1988). 3 *Psyllaephagus cornwallensis* sp. nov., antenna of female. Scale bar = 0.1 mm. 4 *Psyllaephagus cornwallensis* sp. nov., antenna of male. Scale bar = 0.1 mm.



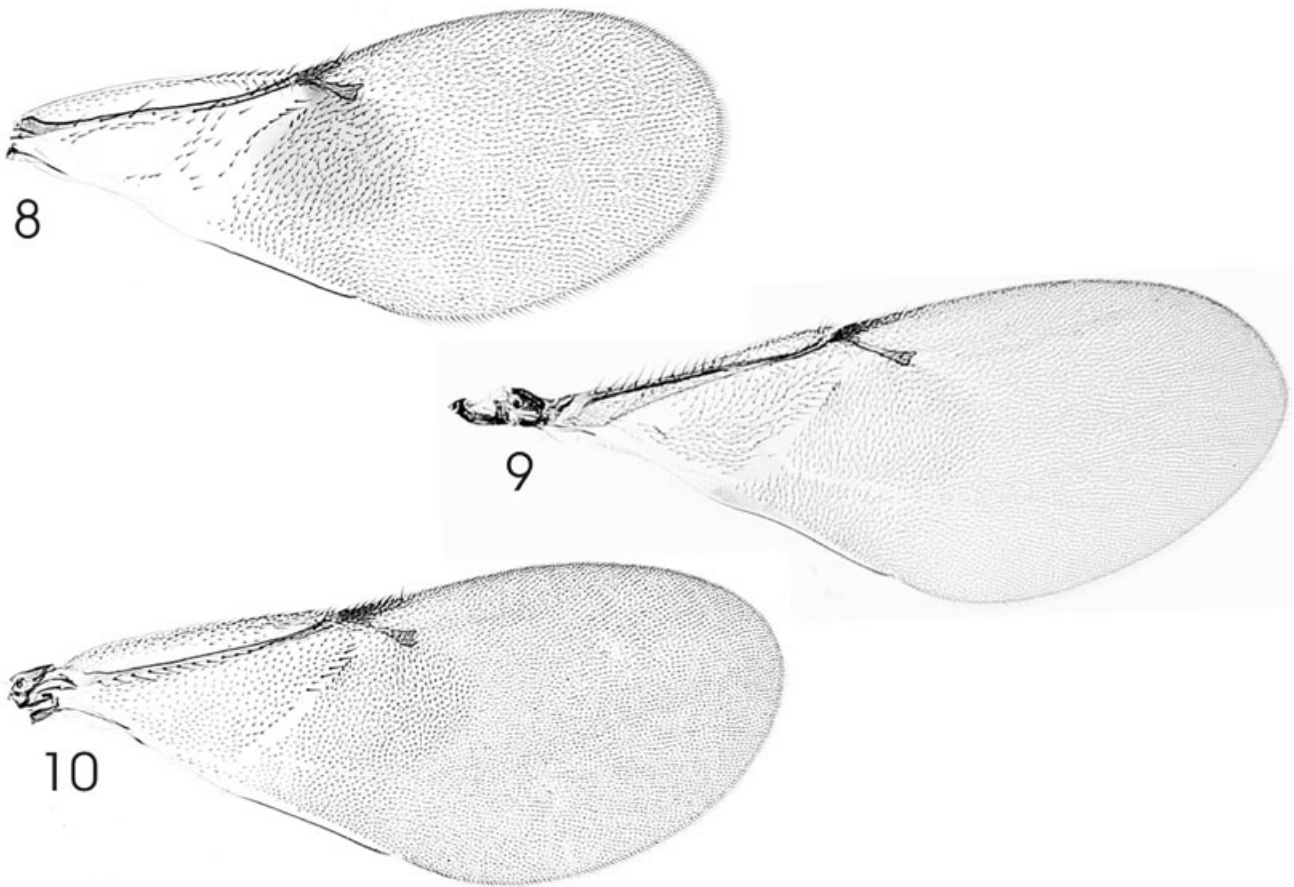
Figs 5–7. *Psyllaephagus richardhenryi* sp. nov. 5 Antenna of female. Scale bar = 0.1 mm. 6 Antenna of male. Scale bar = 0.1 mm. 7 *Psyllaephagus richardhenryi* sp. nov., habitus. Scale bar = 0.5 mm.

Psyllaephagus breviramus sp. nov.
Psyllaephagus cornwallensis sp. nov.
Psyllaephagus gemitus Riek, 1962a: 755
Psyllaephagus pilosus Noyes, 1988: 105
Psyllaephagus richardhenryi sp. nov.

SYSTEMATICS

Psyllaephagus breviramus sp. nov. (Figs 1,2,8)

Psyllaephagus Ashmead sp. A of Noyes (Noyes 1988: p. 106).



Figs 8–10. Forewings of females. **8** *Psyllaephagus breviramus* sp. nov. Length = 1.44 mm. **9** *Psyllaephagus cornwallensis* sp. nov. Length = 2.34 mm. **10** *Psyllaephagus richardhenryi* sp. nov. Length = 1.56 mm.

Holotype: female. Label details: ‘NEW ZEALAND WN/Tararua Ra/Dundas Ridge/1430 m/6 Feb 1985’ and ‘B. A. Holloway/sweeping/at tarns’ and ‘NZAC04017615’ and ‘*Psyllaephagus breviramus*/Berry/HOLOTYPE ♀’ (NZAC).

Paratype: 1 male (NZAC04017606), KA, Seddon, EW Valentine, 4 Mar 1971, swept from lucerne (NZAC).

Female

Colour. Body dark metallic green with purple highlights. Antennae yellow-brown. Mandibles yellow. Fore coxae yellow, mid and hind coxae dark metallic green. Fore and mid legs yellow-brown except for distal tarsal segment(s) and claws; hind legs dark except tibiae with medial yellow-brown band and tarsal segments 1–3 yellow brown. Prepectus and tegulae dark. Forewing mostly hyaline, with small infumate patch immediately below stigmal vein, grading into larger palely infumate area directly under vein. Ovipositor sheaths brown. Setae on head pale, on body brown.

Head more or less square; frontovortex broader than width of 1 eye; vertex finely reticulate, overlaid with regularly spaced shallow punctuations. Hind ocelli separated by approximately the diameter of 4 ocelli. Face sparsely setose; eyes setose, setae very short. Antennal toruli inserted well below ocular line; scrobes converging at mid ocular level. Scape about 4× longer than maximum width; antennal seg-

ments F1–F5 slightly broader than long, F6 more or less quadrate; club 3-segmented, ovoid with slightly truncate apex (Fig. 1). Clypeal margin concave. Mandibles obscured.

Mesoscutum about equal to scutellum in length; covered in short brown, regularly spaced setae. Mesoscutum and scutellum imbricate; axillae less strongly sculptured. Mid tibial spur about as long as T1, spines inconspicuous. Metasoma collapsed. Ovipositor guides short, not heavy.

Forewing (Fig. 8). Length 1.44 mm. Basal cell mostly bare, with only 2 complete lines of setae basad linea calva. Marginal vein only slightly shorter than postmarginal vein; postmarginal vein around 0.6× length of stigmal vein; most of wing surface hyaline, with small infumate patch immediately below stigmal vein, grading into larger palely infumate area directly under vein.

Male

Differs from female in the following character states: colour same as female excepting antennae: scape yellow, pedicel and flagellum yellow-brown. Legs yellow except for tarsal claws and hind tibiae basally and hind tarsal segment 5 brown. Antennal scape about 3× maximum width; F3 with a short branch (slightly longer than maximum length of segment), club entire (Fig. 2).

Material examined. Types only.

Biology. Not known. According to Noyes (1988), the modified male antenna, probably important in courtship behaviour, suggests a relationship with Australian species (e.g. *P. arctatus* Riek and *P. uncinatus* Riek) which parasitise the nymphs of psylloids on eucalypts.

Etymology. The name refers to the short branch on the male antennal funicle, from the Latin *brevis* (short) and *ramus* (branch).

***Psyllaephagus cornwallensis* sp. nov. (Figs 3,4,9)**

Holotype: female. Label details: 'NEW ZEALAND AK/Cornwall Park/13 Jan 2006/JA Berry' and 'reared ex *Mycopsylla fici* on/*Ficus macrophylla*' and 'NZAC04017651' and 'Psyllaephagus/cornwallensis/Berry/HOLOTYPE ♀' (NZAC).

Paratypes: (15 females, 3 males; NZAC). 10 females (NZAC04017635, NZAC04017647 (ANIC), NZAC04017605, NZAC04017627 (ANIC), NZAC04017636, NZAC04017655, NZAC04017639, NZAC04017633, NZAC04017614, NZAC04017611), 1 male (NZAC04017642), Auckland (AK), Cornwall Park, 13 Jan 2006, JA Berry, associated with *M. fici* on *Ficus macrophylla*. 1 female, NZAC04017617, AK, Cornwall Park, 30 Jan 2006, JA Berry, reared ex *M. fici* on *F. macrophylla*. 4 females (NZAC04017489, NZAC04017487, NZAC04017481, NZAC04017472), 2 males (NZAC04017478, NZAC04017459 (ANIC)), AK, One Tree Hill domain, 1 Jue 2000, JA Berry, ex psylloids on Moreton Bay fig. NZAC, except where otherwise indicated.

Female

Colour. Head and thorax dark metallic green; propodeum dark brown/black; metasoma dark brown/black with slight metallic green lustre. Antennal scape and pedicel dark brown/black band; funicular segments mostly dark brown dorsally, ventrally yellow distally. Mandibles dark, palps yellow. Fore coxae yellow, mid coxae basally metallic green, distally yellow, hind coxae metallic green. All legs yellow excepting tarsal segments darker, claws dark brown and dorsal surface of mid and hind tibiae brown. Prepectus clear, except basally; tegulae yellow. Wings slightly infumate. Ovipositor sheaths dark, yellow at tip; ovipositor yellow. Setae on head silvery, on body pale.

Head more or less square; frontovertex about 0.5× width of 1 eye; vertex finely punctuate/reticulate, overlaid with regularly spaced shallow punctuations. Hind ocelli separated by approximately the diameter of 1 ocellus. Face covered in silvery setae, longer and denser in lower half and between antennal toruli; eyes bare. Antennal toruli inserted below ocular line; scrobes converging at mid ocular level; scape broadened (length around 2.2× maximum width), outer aspect smooth and concave with a thin, almost lamellate edge, inner aspect convex and sculptured; F1 longest (around 3× longer than wide), F2–F4 longer than wide and F5–F6 near to quadrate; club ovoid, 3-segmented (Fig. 3). Clypeal margin concave, smooth. Mandible with 1 tooth and a blunt truncation, an oblique carina along middle from base to apex.

Mesoscutum slightly longer than scutellum; covered in short pale, regularly spaced setae. Mesoscutum and scutellum

imbricate/reticulate. Mid tibial spur slightly shorter than T1, spines conspicuous. Metasoma elongate, tergites reticulate, smooth at apices; T1 slightly longer than other tergites; margin of T5 extended medially. Cerci with 2 mid length and 1 longer setae. Hypopygium reaching only about half way along gaster; ovipositor guides heavy, densely setose.

Forewing (Fig. 9). Length of illustrated specimen 2.34 mm. Basal cell mostly bare in basal third. Marginal vein only slightly longer than wide, around 1/3 length of postmarginal vein; postmarginal vein around 0.8× length of stigmal vein; most of wing surface slightly infumate.

Male

Differs from female in the following character states: colour same as female excepting antennae: scape yellow, apically brown on dorsal surface only; pedicel and flagellum mainly yellow ventrally, medium brown dorsally. Antennal scape shorter than that of female, length approximately equal to maximum width; flagellum filiform; club entire (Fig. 4). Frontovertex wider than that of female, about equal to 1 eye diameter; hind ocelli separated by more than 1 diameter; sculpture more rugulose and without scattered punctuations.

Material examined. Type series only.

Biology. Reared from *M. fici* (Tryon) (fig psyllid or Moreton Bay fig sucker) (Hemiptera: Homotomidae) on Moreton Bay fig (*F. macrophylla*). Singh (1996) described 2 species of *Psyllaephagus* parasitising *Mycopsylla* sp. in India: *P. mycopsyllus* and *P. aizawlensis*.

Comments. JS Noyes (pers. comm. 1999) comments that this species is close to *P. mercurius* (Girault), but there are significant differences in leg colouration and in relative proportions of the antennal segments.

Heavy infestations of the psyllid *M. fici* can be damaging to the sole hosts, Moreton Bay figs, robbing trees of nutrients, and causing leaf yellowing and defoliation. In New Zealand the status of fig trees is equivocal as several species have naturalised with the arrival of their associated fig wasps (agaonids) (Gardner & Early 1996). However in some Australian parks and gardens Moreton Bay figs are important landscape trees, many having historical significance as well as amenity value. *Psyllaephagus cornwallensis* may be important in controlling *M. fici* and thus reducing damage to host trees. Newman (2004) investigated the biology of *M. fici* on Moreton Bay figs in Australia and reared 1 undescribed species of *Psyllaephagus* from the psyllid (A Newman pers. comm. 2006). Specimens from Newman's (2004) study have not been compared with *P. cornwallensis* n. sp., so whether they are conspecific remains to be determined.

Etymology. *Psyllaephagus cornwallensis* is named for its type locality, Cornwall Park in Auckland.

***Psyllaephagus richardhenryi* sp. nov. (Figs 5–7,10)**

Holotype: female. Label details: 'NEW ZEALAND AK/Mangere/Geo. Bolt Mem. Drive/10–24 Feb 2006/JA Berry' and 'reared ex *Eucalyptus*/leaves infested mainly/with

Creis lituratus' and 'NZAC04021090' and 'Psyllaephagus richardhenryi/Berry/HOLOTYPE ♀' (NZAC).

Paratypes: (26 females, 24 males; NZAC). 2 females (NZAC04017484 (ANIC), NZAC04017493), 1 male (NZAC04017453), AK, Mangere, George Bolt Mem. Dr., 1 Jul 2002, JA Berry, ex *Eucalyptus* leaves infested with *C. lituratus* & *Anoeconeossa communis*. 1 female (NZAC04017444), AK, Auckland airport, 25–26 Jun 2002, P Dale, assoc. with *C. lituratus*. 1 female (NZAC04017447), AK, Mangere, Tom Pearce Dr, George Bolt Dr, 25–26 Jun 2002, P Dale, assoc. with *A. communis*. 1 female (NZAC04017490), AK, Mangere, Tom Pearce Dr, George Bolt Dr, 25–26 Jun 2002, P Dale, dissected ex *A. communis*. 3 males (NZAC04017468, NZAC04017441, NZAC04017471), AK, Mangere, George Bolt Mem. Dr., 1 Jul 2002, JA Berry, ex *Eucalyptus* leaves infested with *C. lituratus* & *A. communis*. 3 females (NZAC04021057, NZAC04008830, NZAC04011379), 4 males (NZAC04021072, NZAC04021060, NZAC04021089, NZAC04021082), AK, Mangere, Geo. Bolt Mem. Dr., 10–24 Feb 2006, JA Berry, reared ex *Eucalyptus* leaves infested mainly with *C. fiscella*. 7 females (NZAC04021081, NZAC04021111, NZAC04021090, NZAC04021048, NZAC04021065, NZAC04021098, NZAC04021095), 6 males (NZAC04021087 (ANIC), NZAC04021112, NZAC04021080, NZAC04021056, NZAC04021071, NZAC04021068), AK, Mangere, Geo. Bolt Mem. Dr., 10–24 Feb 2006, JA Berry, reared ex *Eucalyptus* leaves infested mainly with *C. lituratus*. 6 females (NZAC04021107 (ANIC), NZAC04021103, NZAC04021051, NZAC04021084, NZAC04021069, NZAC04011112), 3 males (NZAC04021085, NZAC04021054, NZAC04021063), AK, Mangere, Geo. Bolt Mem. Dr., 10–24 Feb 2006, JA Berry, reared ex *Eucalyptus* leaves infested mainly with lerps. 1 male (NZAC04021106), AK, Mangere, Geo. Bolt Mem. Dr., 10–24 Feb 2006, JA Berry, reared ex *Eucalyptus* leaves infested with lerps, mainly *G. granulata*. 3 females (NZAC04021076, NZAC04021079, NZAC04021070), AK, Mangere, Geo. Bolt Mem. Dr., 10–24 Feb 2006, JA Berry, reared ex *Eucalyptus* leaves infested with *C. lituratus* and *G. granulata*. 2 females (NZAC04021077, NZAC04011109), 3 males (NZAC04021059 (ANIC), NZAC04021092, NZAC04021100), AK, Mangere, Geo. Bolt Mem. Dr., 10–24 Feb 2006, JA Berry, reared ex *Eucalyptus* leaves infested with lerps mainly *C. lituratus*. 1 female (NZAC04021050), 2 males (NZAC04021086, NZAC04021083), AK, Mt Albert, 20 Mar 2006, JA Berry, reared ex *Eucalyptus* leaves infested mainly with *C. fiscella*. 1 male (NZAC04021094), AK, Mt Albert, 29 Mar 2006, JA Berry, reared ex *Eucalyptus* leaves infested with lerps including *Cardiaspina* & ?*Anoeconeossa* (mummies mounted). NZAC, except where otherwise indicated.

Female (Fig. 7)

Colour. Head and thorax metallic green; propodeum dark brown/black; metasoma dark brown/black with slight metallic green lustre, except metallic green basally. Antennal toruli yellow; scapes basally and distally yellow with broad upper medial dark band; pedicel dark basally and yellow distally; F1 and F2 brown, other flagellar segments distally yellow; except-

ing ventral surfaces which are yellow. Mandibles dark, palps yellow. Fore coxae yellow, mid coxae basally metallic green, distally yellow, hind coxae metallic green. All legs yellow excepting tarsal segments darker, claws dark brown. Prepectus pale yellow, except basally; tegulae yellow, dark apically. Wings hyaline, slightly heavier setae under stigmal vein giving appearance of slight infumation. Ovipositor sheaths dark, ovipositor yellow. Setae on body silvery.

Head broader than high; frontovertex slightly narrower than width of 1 eye; vertex rather coarsely rugulose/punctate. Face covered in silvery setae, longer and denser in lower half and between antennal toruli; eyes covered in very short setae. Antennal toruli inserted below ocular line, elongate triangular in shape and conspicuously yellow; scrobes converging at mid ocular level; scape slightly broadened (length around 3× maximum width); F1 and F2 short, transverse, F3–F5 more or less quadrate, F6 transverse; club ovoid, 3-segmented, with distal segment short (Fig. 5). Clypeal margin concave, smooth. Mandible with 1 tooth and a blunt truncation.

Mesoscutum as long as or slightly longer than scutellum; densely covered in short silvery setae. Mesoscutum and scutellum sculptured similarly to head but less coarsely, sculpture obscured by setae; axillae relatively smooth.

Metasoma elongate, tergites imbricate; T1 longest; margins of T3–T6 extended medially; cerci with 2 mid length and 1 longer setae. Hypopygium almost reaching base of gaster; ovipositor relatively long, exerted well past end of gaster.

Forewing (Figs 7,10). Length of illustrated specimen 1.56 mm. Basal cell almost entirely setose; setae short. Marginal vein not punctiform, about 0.8× length of postmarginal vein; postmarginal vein around 0.9× length of stigmal vein; slightly heavier setae under stigmal vein giving appearance of slight infumation.

Male

Differs from female in the following characters: colour same as female excepting antennae: scape completely yellow, flagellar segments yellow ventrally, slightly darkened dorsally, especially club. Antennal scape shorter and broader than that of female, length around 2.5× maximum width; funicular segments all broader than long; club entire, conspicuously obliquely truncate (Fig. 6). Forewing length 1.35 mm.

Material examined. Type series only.

Biology. Host data: Non-emerged specimens of *P. richardhenryi* were dissected from nymphs of *A. communis* Taylor (a free-living psyllid; identification by Pam Dale). *Psyllaephagus richardhenryi* also has been reared from leaves infested with the lerps of *C. lituratus*, *G. granulata* and *C. fiscella* (brown lace lerp).

Etymology. *Psyllaephagus richardhenryi* is named in honour of Richard Henry, a pioneering New Zealand conservationist and the first ranger in Fiordland.

An earlier first record of *C. psyllae* (Riek) (Hymenoptera: Encyrtidae) from New Zealand

The psyllid hyperparasitoid *C. psyllae* (Riek) was recorded from New Zealand for the first time by Berry (2006) from

specimens collected from reared psyllids in early 2006, in Mangere, AK, and later from several localities around greater Auckland. Subsequently one female specimen was found in FRNZ, collected in Mt Maunganui (Bay of Plenty), in October 2001. This specimen now represents the earliest known record of *C. psyllae* in New Zealand. It was reared from *C. fiscella* on *Eucalyptus botryoides*.

In its native Australia, *C. psyllae* has been reared as a common hyperparasitoid of the primary parasitoids of several lerp-forming psyllids, including *C. fiscella* (Riek 1962b; Campbell 1992). The primary parasitoids of the psyllids recorded by these authors were 'species of . . . *Psyllaephagus*' and '*P. gemitus* and others', respectively. In New Zealand, I recently reared *C. psyllae* from *C. fiscella* along with *P. gemitus* and also *P. richardhenryi*.

This species can be distinguished from its parasitoid hosts, *Psyllaephagus* species, by the wing venation (postmarginal vein reaching apex of stigmal vein) and by the substantially longer ovipositor (1.2–1.5× length of hind femur).

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