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SHORT NOTE

New host record for *Ornithomya variegata* (Diptera: Hippoboscidae) in New Zealand with a review of previous records in Australasia

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Parasites often affect the life history traits and evolution of their hosts (Price 1980; Møller *et al.* 1990) and may have detrimental effects on the growth (Powlesland 1977; Saino *et al.* 1998; Fitze *et al.* 2004), reproduction (Fitze *et al.* 2004; Martinez-de la Puente *et al.* 2011), fecundity (Møller 1993; Martin *et al.* 2001) and survival of hosts (Browns *et al.* 1995; Fitze *et al.* 2004).

In New Zealand, ectoparasites have been broadly documented on terrestrial mammals (Tenquist & Charleston 1981; Tenquist & Charleston 2001) and birds (Bishop & Heath 1998). The distribution and relationships with different host species have been reported for some ectoparasites of New Zealand birds such as chewing lice (Phthiraptera: Amblycera and Ischnocera*)* (Pilgrim & Palma 1982; Palma 1999) and fleas (Siphonaptera) (Smit 1979; Pilgrim 1980). However, such information is lacking for many other families of ectoparasites, including louse flies (Diptera: Hippoboscidae; Murray *et al.* 1990). Our knowledge of New Zealand louse flies is based on only few reports (Maa 1986; Bishop & Heather 1998; Heather 2010; Berggren 2005; Galloway 2005; Amiot & Palma 2013) and there is little information on the relationship between these flies and host species. Here we report a new host record for *Ornithomya variegate* Bigot, 1885, on the North Island subspecies of the New Zealand fantail (*Rhipidura fuliginosa placabilis*). We also review host relationships and discussed on habitat and host preference of *Ornithomya variegata.*

This study was conducted during the post-breeding season of New Zealand fantail (February to May) in 2012. Sampling was carried out at 2 remnant forests (WGS84, -36.3677640, 174.8487908, 1.49 ha; -36.3720273, 174.8376945, 58.07 ha) in Tawharanui Regional Park. Birds were captured using mist nets placed from ground level to 3 m. Every bird captured was visually examined for the presence of louse flies. New Zealand fantails were banded for individual identification. The number of louse flies and their positions were noted before they were removed using forceps and fixed in 70% ethanol. Louse flies were identified using Maa (1963; 1966; 1986). Measurements were obtained using Image J.

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Table 1. List of host associated to *Ornithomya variegata* (Dipteria : Hippoboscidae), with their habitat preference and morphological characteristics. Source for status as a host species: 1, Green & Munday (1971); 2, Maa (1986); 3, Amiot & Palma (2013); 4, Bishop & Heath (1998). Habitat: F = Forest, O = Open habitat; size is based on body length and mass of male specimens. Source for habitat preference and body size: 1, *birdsinbackyards.net*; 2, Magrath *et al.* (2000); 3, *nzonline.org.nz*.

Host family	Host species	Source for host status	Status	Habitat	Mean size (cm)	Mean mass (g)	Source for habitat & size
Australia & Tasmania							
Acanthizidae	Brown thornbill (*Acanthiza pusilla*)	2	native	O	10	7	1
	White-browed scrubwren (*Sericornis frontalis*)	2	native	F/O	12	12	1,2
Meliphagidae	New Holland honeyeater (*Phylidonyris novaehollandiae*)	2	native	F/O	18	20	1
	Eastern spinebill (*Acanthorrhynchus tenuirostris*)	1	native	F	11	16	1
Pachycephalidae	Golden whistler *(Pachycephala pectoralis)*	2	native	F/O	17	25	1
Petroicidae	Dusky robin *(Melanodryas vittata*)	2	native	F/O	15	27	1
	Scarlet robin *(Petroica multicolor)*	2	native	F/O	13	13	1
New Zealand							
Acanthizidae	Grey warbler *(Gerygone igata)*	2	native	F	11	6	3
Callaeidae	Saddleback (*Philesturnus carunculatus*)	2	native	F	25	80	3
Emberizidae	Yellowhammer *(Emberiza citrinella)*	2	introduced	O	16	30	3
Fringillidae	Chaffinch *(Fringilla coelebs)*	2	introduced	O	14.5	14.5	3
	Goldfinch *(Carduelis carduelis)*	2	introduced	F/O	12	15	3
Mohouidae	Whitehead *(Mohoua albicilla)*	2	native	F/O	15	16.5	3
Petroicidae	New Zealand robin *(Petroica australis)*	2,3	native	F	18	35	3
	North Island robin *(Petroica a. longipes)*	4	native	F	18	35	3
	North Island tomtit *(Petroica macrocephala toitoi)*	2	native	F/O	13	11	3
Prunellidae	Dunnock *(Prunella modularis)*	2	introduced	F	14	21	3
Turdidae	Song thrush *(Turdus philomelos)*	2	introduced	O	22	70	3
Rhipiduridae	North Island fantail *(Rhipidura fuliginosa placabilis)*	This study	native	F/O	16	8	3
Zosteropidae	Silvereye *(Zosterops lateralis)*	2	native	F/O	12	13	3

Among 22 fantails captured, 4 fantails were infected with louse flies (prevalence = 3.6%). The louse flies were found only on male fantails although similar number of males (N = 10) and females (N = 12) were examined. In 3 of 4 cases, only 1 louse-fly per bird was recorded and 1 adult male fantail carried 2 louse-flies (average 1.25 flies per bird). Most of the louse flies were located on the abdomen and flank regions of the birds (Fig.1). Flies were 4.7 to 5.6 mm in total length.

This is the first report of *O. variegata* sp (Bigot, 1885) on the North Island subspecies of the New Zealand fantail and in the Family Rhipiduridae. This discovery represents also the lowest latitude of *Ornithomya variegata* distribution in New Zealand. Only 1 or 2 louse flies were observed per bird, but

considering the high mobility of this ectoparasite, we cannot confidently estimate their abundance as some louse flies may have jumped off the fantail hosts during netting or remained undetected during our visual examination. Nevertheless, this new record confirms the low host specificity of *O.variegata.* Indeed, it has been recorded on 20 species of birds across Australasia (belonging to 12 families), 14 of which (including 8 native species) were infested in New Zealand (see Table 1). The polyxenous character of *Ornithomya* has also been observed in Britain (Hutson 1984) and in the Czech Republic (Sychra *et al.* 2008). Some families, such as Petroicidae and Acanthizidae, contain species that have been recorded as hosts in both Australia-Tasmania and New Zealand. The distribution of other families (*e.g.*, Rhipiduridae, Meliphagidae) across these 2 areas may help to identify other potential host of *O. variegata* from which it has not yet been recorded (*e.g.*, tui [*Prosthemadera novaeseelandiae*] in New Zealand or willie-wagtail [*Rhipidura leucophys*] in Australia).

Research in Britain has shown that the distribution of species in this genus is influenced by habitat, thus *O. chloropus* are found on wide range of birds in open or upland areas, while *O. fringillina* or *O. avicularia* are mostly recorded in host species that inhabit more enclosed vegetation (Hutson 1984). Based on its host's ecological niche in Australasia (see Table 1), *O. variegata* presents no obvious habitat specificity in contrast to the European species of the genus. Indeed, *O. variegata* can be found in a wide range of habitats, from open habitats with hosts such as dusky robin (*Melanodryas vittata*), European goldfinch (*Carduelis carduelis*), and chaffinch (*Fringilla coelebs*), to forest habitats with hosts such as brown thornbill (*Acanthiza pusilla*), saddlebacks (*Philesturnus carunculatus*), and whitehead (*Mohoua albicilla*). The host records of *O. variegata* showed also preference on medium-sized (*e.g.*, saddleback) to smaller passerines (*e.g.*, brown thornbill), ranging between 10 and 25 cm and weighing < 80 g. The generalist characteristics of *O. variegata* may favour future parasitism of related and unrelated hosts across Australasia. Consequently, further study on its prevalence in the Australasian avifauna, its hosts, and its geographical and seasonal distribution is needed.

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Fig. 1. Dorsal view of the ectoparasite *Ornithomya variegata*. (photo: Luca Bütikofer).

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