

***Empidadelpha nr. propria* (Diptera: Empididae) on the Auckland Islands**

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Introduction

The genus *Empidadelpha* Collin, 1928 (Empididae: Empidinae) is comprised of only three described species in New Zealand: *Empidadelpha torrentalis* (Miller, 1923), *E. propria* Collin, 1928 and *E. pokekeao* Kerr & Tweed, 2021. An additional species, *E. sobrina* Collin, 1933, is known from Southern Chile and anecdotal evidence points to other as yet undescribed species in Chile and Australia.

In a revision of NZ *Adipsomyia*, Sinclair (2011, p. 34) drew attention to evidence of the genus *Empidadelpha* on the Auckland Islands. In his words, “...Hutton (1902) recorded a species of *Empis* Meigen from the Auckland Islands, but unfortunately the specimen could not be located in the Canterbury Museum. A second specimen, *Empis smithii* Hutton, was identified and collected by G.V. Hudson during the Canterbury Expedition, 1907 (Lamb 1909; Harrison 1955; Gressitt & Wise 1971). In a subsequent analysis of the Diptera of the southern islands, Harrison (1976) did not include this record. This specimen is present in the Canterbury Museum and is a species of *Empidadelpha* Collin (see Macfarlane & Andrew 2001, p. 48). I examined a photograph of the specimen (S. Pollard *pers. comm.* 2010) and can confirm this identification.”



Figure 1. *Empidadelpha* nr. *propria*, male. Canterbury Museum specimen CMNZ 2007.209.29. Lower left image shows the original condition of the specimen prior to recent cleaning and photography.

During the preparation of a recent review of the genus *Empidadelpha*, our examination of dry Empididae collections in NZ revealed numerous specimens of *Empidadelpha propria*, several examples of *E. torrentalis*, and two specimens of *E. pokekeao* (Kerr & Tweed 2021). The Auckland Islands

Empidadelpha, discussed by Sinclair above, was also examined and its identification confirmed (by DSK). However, the specimen was in such poor condition as to be virtually unrecognizable (Figure 1) and was omitted from a previous review by Kerr & Tweed (2021). Subsequently, another *Empidadelpha* specimen was located at Canterbury Museum (CMNZ a female, labelled as above, and also in poor condition), and two additional *Empidadelpha* specimens, a male and a female, in the dry empidid collection at Otago Museum (OMNZ). These specimens were also labelled as having been collected on the Auckland Islands and both specimens are in good condition (Figures 2-5). Unfortunately, as in the case of the CMNZ specimens, they were mislabeled, in this case as *Hilara smithii* Hutton, and remained unnoticed until now. Here we redress this omission and provide firm evidence of the presence of *Empidadelpha* on the Auckland Islands. It is likely that the specimens are *E. propria* or a closely related novel species (ie., *Empidadelpha* nr. *propria*).

Material examined

Male: OMNZ accession # IV87640; Label #1: ‘Hilara Meigen 1822’; Label #2: ‘smithii Hutton 1901’; Label #3: ‘Auck. Is. 12’; Label #4: ‘Fulton coll F1’.

Female: OMNZ accession # IV87641; Label #1: ‘Hilara Meigen 1822’; Label #2: ‘smithii Hutton 1901’; Label #3: ‘Auck. Is. 12’; Label #4: ‘Fulton coll F1’.

Male: CMNZ accession # 2007.209.29; Label #1 (typed): Auckland Is., C.P.I. Sub-Ant. Exped. 1907; Label #2 (handwritten): *Empis smithii* Hutt, det. Hudson; Label #3 (handwritten): *Empidadelpha* n. sp., det. RP Macfarlane.

Female: CMNZ accession # 2007.209.84; Label #1 (typed): Auckland Is., C.P.I. Sub-Ant. Exped. 1907; Label #2 (handwritten): *Empis smithii* Hutt, det. Hudson.

Diagnosis

All four specimens exhibit features consistent with genus *Empidadelphina*, namely: strongly up-curved palpi; a long proboscis and long antennae; scutellum with two pairs of strong setae; laterotergite strongly setulose; two pronounced setae on antepnotum; broad wings with well-developed anal lobe; typical wing venation (see Kerr & Tweed 2021); a long costal bristle near the wing base; costa ending at or beyond R₅; subcostal vein evanescent; vein R₁ of constant thickness; forelegs with slender first tarsomere and without raptorial adaptations; tibiae densely covered with numerous strong black bristles.

Detailed descriptions of OMNZ specimens

Male (Figure 2): body length (excluding antennae) 6.8 mm.

Head: globose, uniformly greyish-brown in colour; antenna approximately equal to length of fore femur; scape and pedicel grey-brown and bristly, postpedicel black, sparsely pubescent with a short stylus; pair of strong divergent ocellar bristles and patch of very short setae at the back of the ocellar triangle; numerous short stout bristles arranged in two broad rows on occiput, uppermost bristles rather long; proboscis long; palps strongly upcurved and yellowish-brown in colour. **Thorax:** background grey-brown with a pair of narrow dark stripes medially and, laterad to these, another pair of interrupted, dark stripes; pleura concolourous with thoracic dorsum; thoracic chaetotaxy damaged/obscured by pin but generally similar to *E. propria* Collin 1928 and *E. pokekeao* Kerr & Tweed 2021; laterotergite with two long, strong bristles and several short bristles at their base (Figure 3); halteres yellowish with large ovate knobs. **Abdomen:** cylindrical and slightly tapering at terminus; all tergites uniformly grey-brown and sparsely setulose, hind margins narrowly yellow-brown, each with 8–10 long backwards-projecting black bristles; sternites greyish-yellow; terminal segments dark grey with short setae, especially at tips. **Wings:** yellowish-grey hyaline with brown veins; base of wing with strong costal bristle; costa ending at M₁ (Figure 3). **Legs:** Coxae grey-brown, remaining segments

uniformly yellowish-brown (both hind legs broken off at the tibiae); leg chaetotaxy as described for *E. propria* (Collin 1928).

Female (Figures 4 and 5): all external physical characteristics as for male except as follows; body length (excluding antennae) 6.0 mm; costa thinning beyond R₅ before reaching M₁. Both antennae broken at the pedicel.



Figure 2. *Empidadelpha* nr. *propria*, male. (OMNZ IV87640)

Discussion

The specimen descriptions above almost precisely match the original description of *Empidadelpha propria* (Collin 1928), so much so that we are confident the Auckland Islands specimens at OMNZ are *E. propria* or a closely related new species (*Empidadelpha* nr. *propria*). The only notable physical differences are body lengths which are 58% (male) and 43% (female) greater than average body lengths obtained for mainland NZ specimens (see Table 2 in Kerr & Tweed 2021). In addition, the male specimen exhibits enlarged, *torrentalis*-like epandria. The CMNZ

specimens, which may have been captured alongside the OMNZ specimens, are also larger (male 6.15 mm; female 5.5 mm) than typical mainland *E. propria*, and the male likewise exhibits enlarged *torrentalis*-like epandria. However, a close relationship to *E. torrentalis* is unlikely as *torrentalis* has an overall tawny yellow body, markedly shorter and bicoloured antennae, and distinctive acrostichal bristles (lacking in *E. propria* and these Auckland Islands specimens; Miller 1923, Kerr & Tweed 2021).



Figure 3. Male wing and thorax showing strongly setulose laterotergite.



Figure 4. *Empidadelpha* nr. *propria*, female. (OMNZ IV87641).

Empidadelpha propria is widespread and common on mainland New Zealand (Kerr & Tweed 2021). The presence of *E. propria* or a closely related species on the southern islands should come as no surprise; of approximately 100 dipteran species (in 30 families) documented on the Auckland Islands, at least 35 are also seen on mainland New Zealand (the number may be closer to 60, but many records lack validation). Given the original misidentification of *Empis smithii* / *Hilara smithii* on the Auckland Islands, *Empidadelpha* is therefore to date the only confirmed empidid genus common to both the Auckland Islands and mainland NZ. There are reportedly other Empidinae (tribe Hilarini) present on the Auckland Islands, but these have yet to be formally documented (D. Bickel, personal communication).

With regard to provenance of the OMNZ specimens, it is certain that they were collected on the Auckland Islands during the 1907 Canterbury Philosophical Institute Sub-Antarctic Expedition. Otago Museum's Annual Report 1908 states, "Part VII: Summary of Acquisitions: ... a small collection of moths, flies, and beetles from the Auckland Islands, presented by Mr. G.V. Hudson". The handwritten register of the zoological

accessioned items indicates “No.: A08.197; Date: August 1908; Name: *Empis smithii*; Locality: Auckland Isl.; Remarks: G.V. Hudson”. Curatorial identification labels in the box state “*Hilara* Meigen 1822” and “*smithii* Hutton 1901”. The specimen pin labels say “Auck. Is.12” and “Fulton coll F1”. What the numbers refer to on these pin labels remains a mystery. John Fulton (1827–1899) and his son Sydney Wroughton Fulton (1852–1915) were both early New Zealand entomologists who donated considerable numbers of specimens to OMNZ (Harris 2007). Dr. Robert V. Fulton (1865–1924; John Fulton’s nephew) was invited but declined to participate in the 1907 C.P.I. Expedition (Godley 1979). R.V. Fulton was also a regular contributor to OMNZ collections. It seems that Hudson returned with the specimens and one of the Fultons incorporated them into an existing collection, with labels added by curators at some later date (circa 1975; A.C. Harris, personal communication).

The OMNZ and CMNZ specimens are historically valuable and important in extending the known biogeographical range of genus *Empidadelpha*. Additional sampling, fine structural (e.g. genitalic dissection) and molecular sequencing studies are needed to resolve questions of specific identity. The enlarged male epandria, in particular, suggest that *Empidadelpha* nr. *propria* is an altogether new species. Further sampling will also show whether increased body size is a consistent feature for *Empidadelpha* on the Auckland Islands. Although dipteran wing reduction is common on the southern islands (Macfarlane & Andrew 2001), all four of the current specimens are fully winged and may simply represent heavier morphotypes which thrive well in a stormy, wind-swept environment.

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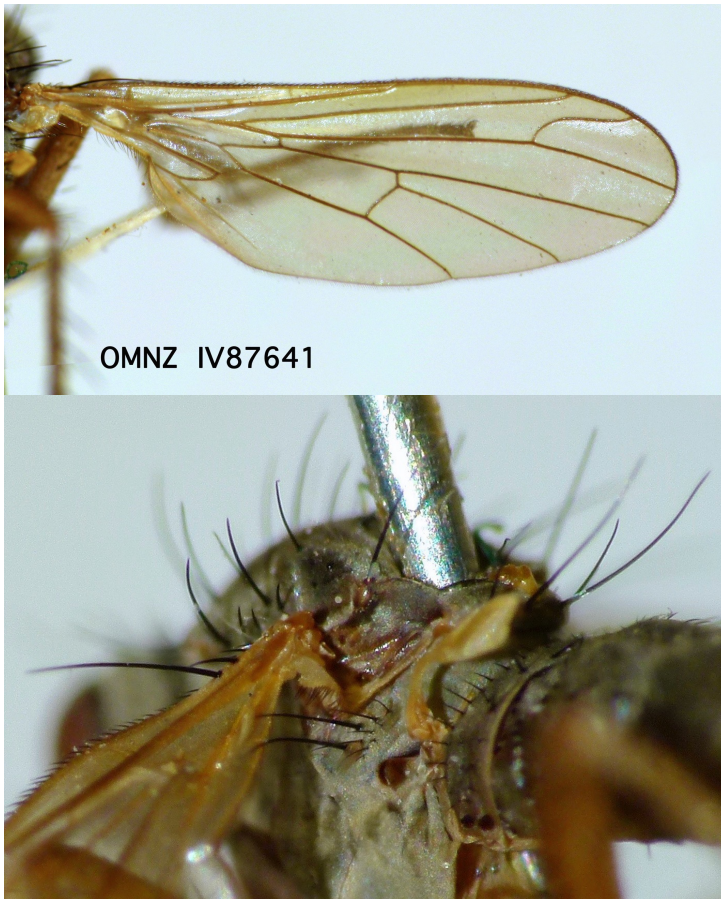


Figure 5. Female wing and thorax with strongly setulose laterotergite.

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