

Empididae INFORMATION SHEET

Classification

Subphylum:	Insecta
Class:	Diptera
Order:	Empidoidea
Suborder:	Empididae
Family:	Chydoridae
Genus:	unknown
Common name:	dagger fly

Two species of adult Empididae have been recorded from the island (and were also collected in sticky traps during the 2010-11 Campbell Island Bicentennial Expedition). The larvae of two different Empididae species were found in the freshwater samples from the 2010-11 Expedition, and it is possible that these are the larvae of the two described adult species.

Distinguishing Features

Unidentified larva Type A (Fig. 1)

- Body golden-brown, gut visible through body wall as a dark stripe; body length up to 6.5 mm.
- Eight pairs of prolegs present; prolegs longer than broad, the posterior pair longest.

Unidentified larva Type B (Fig. 2)

- Body yellow-grey (paler than Type A); body length of only specimen 6.7 mm.
- Eight pairs of prolegs present; other than the posterior pair they are about as long as broad (and thus shorter than in Type A).

Unidentified pupa (Fig. 3)

- Body golden-brown with a prominent pair of dark, downwardly-directed caudal hooks; body length 4.3 mm.
- Dorsum of segment 8 with two strong sub-median, and two sub-lateral spines on each side.

Comments

Two species of Empidoidea have been recorded (as adults) from Campbell Island and have been placed in separate families in some recent classifications (Sinclair, 2000; Sinclair, 2011). Other authors still treat one of these families (Brachystomatidae) as a subfamily



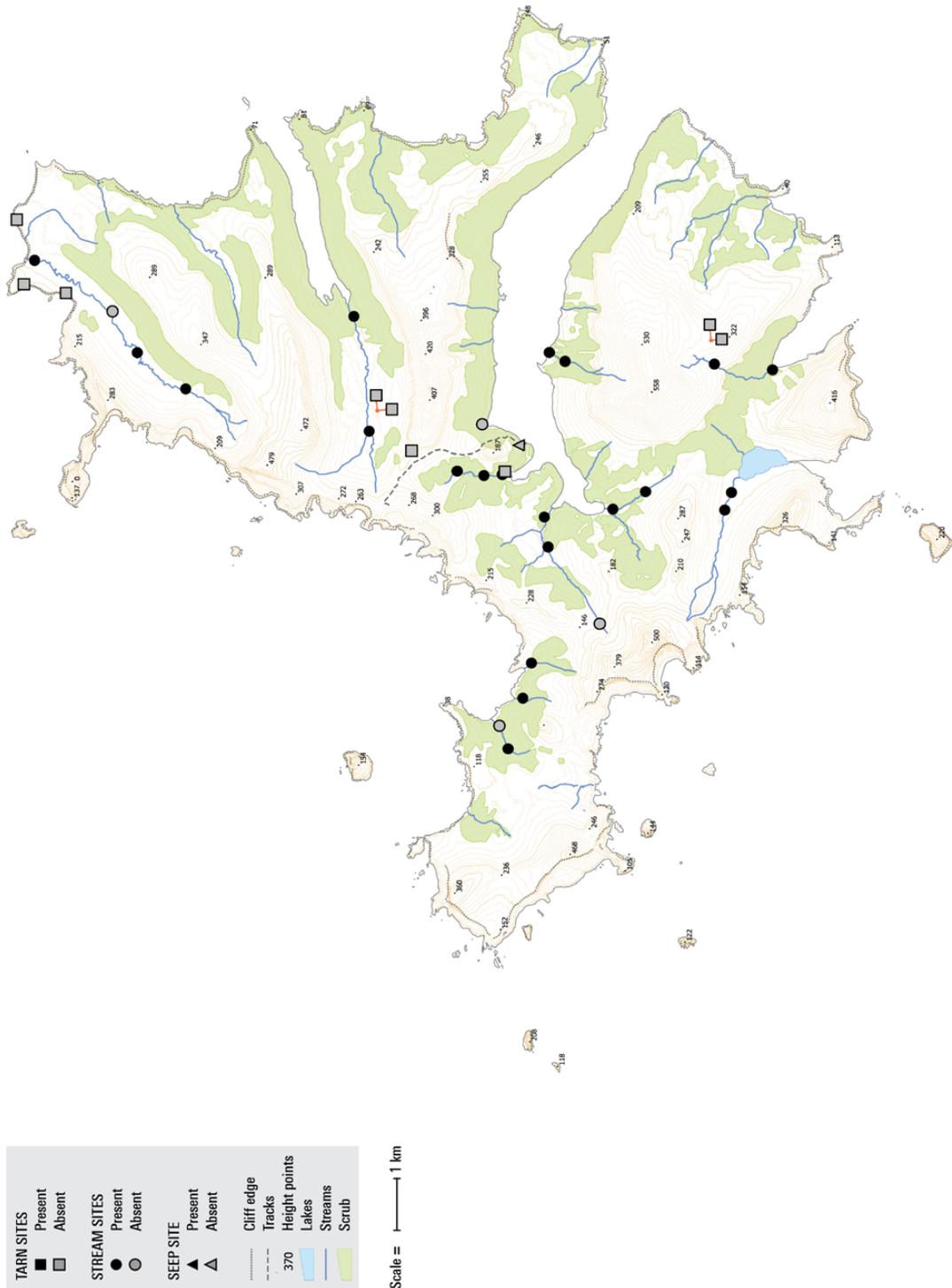
(Brachystomatinae) of Empididae. The two species are: *Clinocera gressitti* Smith (Empididae: Clinocerinae) and *Adipsomyia stigmata* (Smith) (Brachystomatidae: Trichopezinae).

Dumbleton (1966) described an aquatic larva and pupa from Campbell Island and suggested they could be those of *C. gressitti*. Both Type A and Type B larvae (above) are very similar to Dumbleton's figure of *C. gressitti* and key to *Clinocera* in Merritt *et al.* (2008). The posterior end of the Type A larva appears to be the more similar to Dumbleton's specimen, but this is difficult to confirm as his drawing is rather diagrammatic. The pupa (as in Fig. 3 above) fits Dumbleton's description but is shorter (4.3 mm cf. 6.0 mm).

Biogeographic Information

Presence/absence on streams, tarns, and a seepage sampled on Campbell Island.

Distribution map based on surveys undertaken by EOS Ecology during the 2010–11 Campbell Island Bicentennial Expedition (www.campbellisland.org.nz). Distribution data © EOS Ecology, 2013.



New Zealand Transverse Mercator
 New Zealand Geodetic 2000
 Created on: 3 December 2013
 Created by: Kirsty Brennan

Empididae Distribution
CAMPBELL ISLAND
 December 2010–February 2011

Produced by: EOS Ecology
 Project name: Campbell Island Bicentennial Expedition
 Project no.: 06033-EOS01
 Project lead: Shelley McMurtrie
www.eosecology.co.nz



Original Description

Clinocera gressitti (subfamily: Clinoceridae)

Smith (1964): Larvae not described

The following is a direct excerpt from Dumbleton (1966) of Empididae larva and pupa description that may be *C. gressitti*:

Larva

Length 4.5-5.5 mm. Similar in colour and form to *C. tantula* but integument smooth. [*Chelifera tanula* Collin. Larva. Colour pale yellowish-white. Body elongate, widest about mid-length, cephalic end tapered, caudal end sub-truncate.] Apneustic [closed tracheal system; no open spiracles].

Thorax. Dorsum of prothorax without transverse ridge at mid-length, not strongly sclerotised, without pits. Each thoracic segment with one 4-branched seta on each side at mid-length of the venter but without dorsal or pleural setae.

Abdomen. All abdominal segments without dorsal, pleural, or ventral setae. Paired abdominal prolegs present on venter of abdominal segments 1-7. Eighth segment with a long postero-lateral dorsal process on each side, each bearing 4 long simple apical hairs; median process more ventral in position, little longer than the lateral process, shortly bifurcate apically, each lobe with 2 long simple apical hairs; anal prolegs longer than those preceding.

Pupa

Length 6.0mm. Colour light yellowish-brown. Integument smooth. Without obvious long hairs.

Head. A few very short hairs on the frons and dorsad of the base of the antennal sheaths which are dark, parallel-sided, rounded apically and widened basally.

Thorax. Prothoracic spiracles on short conical processes, anterolaterally. Mesothorax with a median sutural line, surface transversely ridged in posterior 2/3, a pair of very short paramedian setae about mid-length. Meta-thorax without setae or sculpture.

Abdomen. Spiracles small, circular, at mid-length of pleura on segments 1-7. First segment with a transverse row of spines at mid-length of dorsum. Dorsa of segments 2-7 with a continuous anterior row of very fine spinules and a posterior row of alternating larger and smaller spines. On segments 3-7 both rows are continued across the pleuron and venter. Dorsum of eighth (caudal) segment with a faint anterior row of spinules; the posterior row, behind mid-length, represented by 2 sub-median and 2 sub-lateral spines on each side; ventrally with 2 long tapering caudal hooks, directed vertically downward, each with a small dorsal spine on its base.

Described from a pupa collected with the larva described above. The moulted skin of the last-instar larva, which still adhered to the pupa, was identical with that of the mature larva.

Adipsomyia stigmosa (subfamily: Clinoceridae)

Smith (1964): Larvae not described

Empidadelpha stigmosa (subfamily: Clinoceridae)

Smith (1964): Larvae not described

References & Further Reading

- Dumbleton, L.J. 1966. Immature stages of two aquatic Empididae (Dipt.). *New Zealand Journal of Science* 9: 565–568.
- Merritt, R.W., Cummins, K.W. & Berg, M.B. (eds) 2008. Introduction to the Aquatic Insects of North America (4th edition). Kendall/Hunt, Dubuque, Iowa.
- Sinclair, B.J. 2000. Revision of the genus *Clinocera* Meigen from Australia and New Zealand (Diptera: Empididae: Clinocerinae). *Invertebrate Taxonomy* 14 (3): 347–361.
- Sinclair, B.J. 2011. Revision of the New Zealand genus *Adipsomyia* (Diptera: Empidoidea: Brachystomatidae: Trichopezinae), with key to local empidoid family and selected genus groups. *New Zealand Entomologist* 34: 30-36.
- Smith, K.G.V. 1964. Diptera : Empididae. In *Insects of Campbell Island*. *Pacific Insects Monograph* 7: 325–8.

How to Cite this Information Sheet

- McMurtrie, S.A., Sinton, A.M.R., & Winterbourn, M.J. 2014. Lucid Identification Key to Campbell Island Freshwater Invertebrates: Empididae information sheet. EOS Ecology, Christchurch, New Zealand.

ACKNOWLEDGEMENTS – The creation of the Lucid Key and information sheets were supported by the TFBIS (Terrestrial and Freshwater Biodiversity Information System) Fund administered by the Department of Conservation (TFBIS Contract No. 278), and by EOS Ecology. Invertebrate specimens were collected by EOS Ecology during the 2010–11 Campbell Island Bicentennial Expedition (CIBE), made possible by the 50th South Trust. Thanks to Rod Macfarlane for his assistance and contribution to this information sheet.

