Gall Midges (Cecidomyiidae) on Coprosma (Rubiaceae) in New Zealand

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Abstract

The genus Coprosma is predominantly a New Zealand group with outliers in S. America, the Pacific and Malaysia. In New Zealand there are many species, varieties and hybrids and midge galls occur on many species. However, no gall mudge apparently has hitherto been recorded on this genus from New Zealand or indeed elsewhere.

One of us (K.P.L.) was successful in rearing a few gall midges during 1950 from two types of galls on Coprosma—a stem swelling and a bud-rosette. The purpose of this paper is to put on record description of these galls and their associated gall midges.

1. The stem gall on C. crassifolia (Fig. 1).

The galls on the stems were collected at Bethell’s Beach, West Coast, Auckland, on 13th August, 1950, by R. Close on C. crassifolia Colenso. They may be described as fusiform stem swellings, 29 mm. long and 10 mm. wide (means of five specimens). Their surface is smooth or irregularly swollen and without exit holes until mature. Each gall is polychalamos; the red-coloured gall mudge larvae, each possessing a brown sternal spatula, live in separate tunnels. Three male and four female midges that were predominantly black in appearance emerged between 29th September and 3rd October, 1950.

Subsequent examination (H.F.B.) revealed that this mudge belongs to the Asphondylarvae,* falling in Felt’s Key to the Gall Midges (1925) to the genus Kiefferia Mik. The only described species of this genus is K. pimpinellae F. Loew, the European Carrot Gall Midge, whose larva has a unidentate or hastiform sternal spatula and lives solitarily in the swollen fruit of carrot, parsnip and other Umbelliferous plants. The female of the Coprosma mudge, however, does not fully agree with K. pimpinellae as regards the structure of the circumfila on the flagellar segments. In this respect it seems to resemble more closely the description of the genus Placochela Rübsamen. The larvae of both species in this genus, P. nigripes F. Loew and P. lagustri Rübsamen live in the closed blossom of Sambucus nigra and S. ebulus and Ligustrum vulgare respectively. Unfortunately this genus is not yet sufficiently well represented in the Barnes collection for an adequate comparison to be made. On account of the above and other slight morphological discrepancies and also the entirely different type of plant reaction to infestation (i.e., the gall), it may eventually be necessary to erect a new genus for this New Zealand species. In the meantime it seems advisable to describe the species in the genus Kiefferia, contrasting it with K. pimpinellae which is well represented in the collection.

* With this record there remains only one tribe, Lasiopterariae, of the Cecidomyiidae to be discovered in New Zealand (see Barnes (1937) "Check List of the Cecidomyiidae of New Zealand")

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*Kiefferia coprosmae* sp. n.

**Male.** Length, about 3 mm. Antennae, 2 + 12, slightly shorter than the thorax and abdomen; flagellar segments cylindrical with short necks, ornamented with long setae and conspicuous stout tortuous elevated anastomosing circumfila; first and second flagellar segments partially fused; 1st flagellar segment with a length nearly four times as long as its diameter and with a short transverse neck; 3rd flagellar segment with about the same diameter but only about three-quarters as long as the 1st, neck just transverse; neck of 4th about as long as wide; 10th with a length about three times as long as its diameter, neck slightly longer than wide; 12th about three times as long as its diameter, no terminal elongation. (In *K. pimpinellae* the 1st flagellar segment is not noticeably so much longer than the 3rd.) Palpi: proximal segment short, almost quadrate; second about twice as long as wide; third narrower and longer, nearly four times as long as wide; distal segment slightly longer, about the same width. Thorax dark brown, pleurae lighter. Abdomen: dark brown dorsally and ventrally, same colour as pleurae laterally; thickly covered with dark scales and hairs. Wings: covered with scale-like hairs giving them a distinctly dark appearance (in *K. pimpinellae* the wings are not nearly so densely covered and the hairs are not scale-like); 3rd vein reaching margin at tip of wing; 5th vein branched. Legs: brown, with dark scales and hairs; claws moderately curved, simple, empodium about as long as claws. Genitalia very similar in structure to those of *K. pimpinellae* but much larger and the basal clasp segment is waisted and narrower: basal clasp segment long and narrow, with slight heavily chitinised waist, thickly clothed with long hairs that are shorter and more numerous on the distal prolongation beyond the insertion of the distal clasp segment, the latter subapical, its length about the width of basal clasp segment, rather broad, ending in a heavily chitinised almost pectinate ridge; dorsal lamella wide, deeply incised, forming two lobes that are narrowly rounded distally; ventral lamella about as long as dorsal lamella and extending about half the length of style, with a wide, shallow, U-shaped emargination; style large, stout, reaching to insertion of distal clasp segment.

**Holotype:** Cecid. 7245 (in the Barnes collection, England)

**Paratypes:** Cecid. 7243 (in the Barnes collection, England)

Cecid. 8721 (in the collection of the Plant Diseases Division, Department of Scientific and Industrial Research, New Zealand)

**Female.** Length, about 4 mm. Antennae: 2 + 12, flagellar segments cylindrical with short transverse necks, gradually decreasing in length; the terminal four segments rather suddenly shortened, the 9th flagellar segment being only slightly longer than wide, the 10th almost quadrate, the 11th slightly wider than long and the 12th almost globular; each segment with long setae, the circumfila indistinct and faint, not nearly so conspicuous as in *K. pimpinellae* Palpi about as in male. Wings much more thickly clothed with scale-like hairs than in the male. Legs thickly covered with dark scales and hairs. Ovipositor terminating in two minute lamellae that are almost as wide as long. Otherwise about as in male.

**Allotype:** Cecid. 7246 (in the Barnes collection, England)

**Paratypes:** Cecid 7247 (in the Barnes collection, England).
Fig. 1.—Stem galls of *Kiefferia coprosmae* sp. n. on *Coprosma crassifolia* Colenso, Bethell's Beach, West Coast, Auckland, 1950. (Photograph by S. A. Rumsey).

Fig. 2.—Bud-rosette galls of *Oligotrophus coprosmae* sp. n. on *Coprosma arborea* T. Kirk., Titirangi, Auckland, New Zealand, September, 1950. (Photograph by S. A. Rumsey.)
Ceeid. 7244 (in the collection of the Plant Diseases Division, Department of Scientific and Industrial Research, New Zealand).

One other female: D.74 (in the collection of the Plant Diseases Division, Department of Scientific and Industrial Research, New Zealand).

Habitat: fusiform woody plurilocular galls on the smaller branches of Coprosma crassifolia Colenso.

Type locality: Bethell's Beach, West Coast, Auckland, New Zealand (coll. R. Close).

2. The bud-rosette gall on C. arborea (Fig. 2).

The bud-rosette galls were collected at Titirangi, Auckland, on 3rd September, 1950, by E. Bray on C. arborea T. Kirk. The gall is composed of a compact mass of buds, each with a rosette of small leaves surrounding the pupal chambers of the midges. A typical gall was 25 mm. in diameter, 25 mm. long and surrounding \( \frac{3}{4} \) of the stem. Two males and one female midge emerged on 5th and 12th September, 1950.

The classification of this midge was at first very puzzling. Using Felt's Key (1925) it clearly fell into the Dasyneurariae because of its toothed claws. But the structure of the lower lamella on the male genitalia and the general shape of the flagellar segments in both sexes were strongly reminiscent of certain genera in his Oligotropharinae. However, a comparison of this Coprosma bud-rosette midge with specimens of Oligotrophus oleariae Maskell\(^1\) and Dryomyia shawiae Anderson\(^2\) immediately revealed its true affinities. Incidentally it should be mentioned that neither O. oleariae nor D. shawiae fall strictly within the limitations of their respective genera as exemplified by European and U.S.A. species.

It has been decided to describe the Coprosma bud-rosette midge as a new species in the genus Oligotrophus because of its great similarity to O. oleariae. It may, however, became necessary to reconsider the generic placements of these three species (this new Coprosma midge, O. oleariae and D. shawiae) when the New Zealand gall midge fauna is better known.

**Oligotrophus coprosmae** sp. n.

**Male.** Length, about 2 mm. Antennae slightly shorter than the abdomen; 2 + 12; each flagellar segment bottle-shaped, consisting of a cylindrical basal portion with a distinct neck and bearing a basal whorl of setae with numerous longer setae irregularly arranged more distally, these are more numerous on one side of the node than on the other; the circumfila apparently as in O. oleariae but perhaps not quite so closely applied; first and second flagellar segment partially fused just as in O. oleariae; the basal portion of the flagellar segments longer in proportion to their width than in O. oleariae and with longer narrower necks. Palpi with 4 segments (O. oleariae has 3) with long hairs and a few scales; basal segment about quadrate; second about twice as long as broad; third slightly longer; fourth slightly shorter. Thorax chiefly pale brown. Wings hyaline; costa and subcosta with a few scales only, markedly fewer than in O. oleariae; 3rd vein joining margin at apex; 5th vein forked, the branches not reaching the anal margin of the wing. Legs with scales and hairs; claws each with distinct but

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1. The Olearia Bud Gall Midge (see Anderson, 1935a).
2. The Olearia Leaf-blistet Midge (see Anderson, 1935b).
faint tooth, empodium about as long as the claws. Abdomen pale, apparently without scales (this is in marked contrast to *O. oleariae*). Genitalia: basal clasp segment moderately long with long setae; distal clasp segment strongly developed, pubescent, with a few hairs, proportionally longer than in *O. oleariae*; both dorsal and ventral lamellae very similar to those of *O. oleariae*; dorsal lamella well developed, deeply emarginate, each lobe roundly triangular; ventral lamella about the same width throughout its length, extending slightly beyond the dorsal lamella, pubescent, entire and truncate; harpes almost lamelliform, longer and wider than in *O. oleariae*; style comparatively short.

**Holotype:** Cecid. 7249 (in the Barnes collection, England).

**Paratype:** Cecid. 7248 (returned to the collection of the Plant Diseases Division, Department of Scientific and Industrial Research, New Zealand).

**Female.** Length, nearly 3 mm. Antennae about half the length of the abdomen; 2 + 12; flagellar segments with short transverse necks, circumfila not quite applied; 2nd flagellar segment about two and a-half times as long as broad; 3rd flagellar segment just over twice as long as broad; 10th flagellar segment about twice as long as broad. Palpi with 4 segments, about as in male; distal segment slightly shorter than third. Abdomen without scales. Ovipositor typical pocket-shaped (not partially divided into lateral lamellar lobes as in *O. oleariae*), with small ventral lamella, moderately extensile. Otherwise about as in male.

**Allotype:** Cecid. 7250 (in the Barnes collection, England).

**Habitat:** bud-rosette galls on *C. arborea* T. Kirk.

**Type locality:** Titirangi, Auckland, New Zealand (coll. E. Bray)

3. The bud-rosette gall on *C. crassifolia*.

In addition to the stem gall, R. Close also found and collected on 13th August, 1950 at Bethell's Beach, West Coast, Auckland, some bud-rosette galls on *C. crassifolia* Colenso. These galls were very similar in appearance to those found on *C. arborea* at Titirangi on 3rd September, 1950. Three female midges emerged on 4th September, 1950. Although they appear to be the same species as those reared from *C. arborea* and just described as *Oligotrophus coprosmae*, one cannot be certain about this since no males were reared. However, under the circumstances they can be regarded as additional specimens of *O. coprosmae*. Two specimens, Cecid. 7251 and Cecid 7252, have been retained in the Barnes collection and one, Cecid. 7253, has been returned to the collection of the Plant Diseases Division.

4. Larvae associated with the bed-rosette gall on *C. arborea*.

Two minute larvae (Cecid. 8719 and 8720 in the Barnes collection) were extracted from these galls on 10th September, 1950, but examination indicates that in all probability they were feeding on some rust or mould and were thus fortuitously associated with *O. coprosmae*.

**References**

