

Survey of native bees (Hymenoptera: Colletidae and Halictidae) in the Mackenzie Basin

P. QUINN

51 Murray Place, Lake Tekapo, South Canterbury, New Zealand

Abstract

This paper records the presence of 10 native bee species in the Mackenzie Basin, South Canterbury. In the family Colletidae 6 species of *Leioproctus* and 2 *Hylaeus* were found, and in the family Halictidae 2 species of *Lasioglossum* were found. Nests were located for 5 species (3 *Leioproctus* species, 1 *Hylaeus* species, and 1 *Lasioglossum* species).

Keywords: Hymenoptera; Colletidae; Halictidae; *Leioproctus*; *Hylaeus*; *Lasioglossum*; occurrence on flowers, nest sites; Mackenzie Basin.

INTRODUCTION

The Mackenzie Basin in South Canterbury is bounded to the east by the Two Thumb, Rollesby, and Dalgety Ranges, to the west by Lake Ohau and the Ohau River, to the south by Lake Benmore and Tara Hills, and to the north by the Southern Alps and Mt Cook National Park. Within these confines the Basin floor extends over about 5000 hectares, and ranges in altitude from 300 m to 1200 m. About one-fifth is lakes, rivers, rock, snow, or ice, and the remainder is tussock grassland. Much of the grassland has been modified by burning, overgrazing, and the introduction of grasses, weeds, and trees.

From 1976 to 1980 native bees were searched for and collected throughout the Basin. Notes were taken on bee abundance, occurrence on flowers, and, if found, characteristics of nest sites. Captured bees were pinned, and representatives were identified by Dr B. Donovan, Entomology Division, DSIR, Lincoln.

Two families of bees are native to New Zealand (Donovan 1980)—Colletidae and Halictidae. The genera and number of species per family taken in this survey were: Colletidae—*Leioproctus*, 6, and *Hylaeus*, 2; Halictidae—*Lasioglossum*, 2. Nests of 5 species were located—3 *Leioproctus*, 1 *Hylaeus*, and 1 *Lasioglossum*.

Species of *Leioproctus* are from 6-10 mm long and densely hairy. Females carry pollen in scopae on the hind legs. *Hylaeus* are 3-6 mm long, with very few hairs. Both sexes have prominent yellow markings on the face, and females carry pollen internally. *Lasioglossum* sp. are small and moderately hairy and range in length from 4-5 mm. Pollen is carried in scopae by females. Males have yellow mandibles.

In the following account the numbered species correspond to those in a forthcoming revision by Dr B. J. Donovan.

BEE SPECIES

Leioproctus fulvescens

This is perhaps the most easily recognizable species. Adults of both sexes, which are 10 mm long, are clothed in dark orange-brown hairs in early summer, which fade to light yellow as the summer progresses. The other 5 *Leioproctus* species are smaller, except for the female of *L. vestitus*, and are mostly black.

Adults of *L. fulvescens* fly from November to March. During this time it is by far the most common species. Nests can be found in any area with suitable soils and a sunny aspect. Soils in which bees nest range from sandy loam on river banks and terrace lands to light gravelly moraine. As most of the Basin floor consists of these types of deposits, vast areas are suitable for bee nests. On 6.5 km of little-used unsealed road I estimated that during the height of the nesting season there were 840 000 nests.

Females forage mainly on Compositae (Asteraceae), both native and introduced. In order of preference the native Compositae are: *Gentiana corymbifera* (snow gentian), *Raoulia* sp., and some of the white flowered hebes such as *Hebe alpina*.

The introduced *Hieracium praealtum* (king devil hawkweed) and *H. pilosella* (mouse-ear hawkweed) have spread rapidly through the Mackenzie Basin. *L. fulvescens* is taking full advantage of this new food source, and indeed may be assisting the spread of these weeds by acting as a pollinator. Other introduced Compositae which have long been present and which have presumably long been foraged upon by *L. fulvescens*, are *Archillea millefolium* (Yarrow) and *Cirsium vulgare* (scotch thistle). Many bees also forage upon the introduced *Hypericum perforatum* (St John wort) and *Rosa* sp. (standard rose, silverweed).

Leioproctus sp. 4

This is a small stocky thickset species. Adults of both sexes are 6 mm long, and the integument is shiny black. Dense white hairs on the anterior of each abdominal

segment form white bands. Adults fly from mid-November to early March and forage exclusively on *Raoulia* sp. (scabweed). Nests have not been found.

Leioproctus maritimus

This species is similar in size to *Leioproctus* sp. 4. Adults fly from mid-November to January. They seem to prefer to visit *Raoulia* sp., but are also found visiting Compositae occasionally. Nest sites have not been found.

Leioproctus vestitus

Females are 10 mm in length and are jet black and sparsely clothed with white hair, while the males are 8 mm long and have a coppery glow to their abdomens. Both sexes fly from late-November until early February and they forage on *Hebe alpina*, *Craspedia* sp., *Raoulia* sp., *A. millefolium*, *Trifolium repens* (white clover), and even parsnip *Pastinaca sativa*.

Nest sites are usually sandy loam slopes or mounds with a northerly aspect.

Leioproctus sp. 5

A shiny jet black bee. Females are 9 mm long and are shiny black with white hair denser on the posterior margin of the abdominal segments forming distinct bands. The male is 8 mm long and is slimmer with a slight coppery glow to the abdomen. Both sexes can be found flying from mid-December till mid-February visiting *G. corymbifera*, *Raoulia* sp., *A. millefolium*, *H. perforatum*, *Rosa* sp., and also Compositae. No nest sites have been found but they should be similar to *L. vestitus*.

Leioproctus sp. 6

This species is more common than the *Leioproctus* sp. 5. Adults of both sexes are 8 mm long. The female is dull black on the head and thorax but the abdomen is shiny black. White hair is fawn tinged on edges of the thorax, abdominal tip, and legs. The male is similar except that the head and thorax are shiny black. Flowers visited from December to February are *A. millefolium*, *G. corymbifera*, *Echium vulgare* (Vipers bugloss), and several Compositae.

Lasioglossum sordidum

This is the second-most common of the native bee species. It is found over most of the Basin and is the first native bee to be seen in the spring. Adults fly from early October till mid-March. The female is 5 mm long and is dull black on the head and thorax, and dark brown to fawn on the abdomen with a thin scattering of white hairs throughout. Pollen is carried in scopae on the hind legs and also under the abdomen. The male is 4.5 mm long and is dull black on the head and thorax, but shiny black through dark brown to fawn on the abdomen. Yellow mandibles, a small yellow spot below the wing articulations, yellow lower parts of the legs, and yellow brown antennae make males more conspicuous than females. They can be found flying over flowering plants likely to be visited by the females. Anything yellow or orange will be investigated and they have been taken from *Raoulia*, *Ranunculus lyallii* (Mount Cook lily), *R. lappaceus* (grassland buttercup), *R. godleyanus* (Godley buttercup), most Compositae including *Cirsium vulgare* (scotch thistle), *Gentiana* sp. *Verbascum thapsus* (flannel plant), and *E. vulgare*. Nest sites are widespread through the Mackenzie Basin especially the more sandy loam areas. In this species the females over winter, and the male is not found flying till mid-January.

Lasioglossum sp. 1

This species is closely related to *L. sordidum* but the females at 5 mm long and the males at 4 mm long are slightly smaller. They differ from *L. sordidum* in that they have

an iridescent green metallic sheen on the head and thorax. Pollen is carried also on the posterior sides of the thorax. It is found over most of the Basin from late October to mid-March, although not in association with as many plants as *L. sordidum*. They can be found visiting *Raoulia* sp., Compositae (including *A. millefolium*), and *R. lappaceus*.

Hylaeus capitosus

This is a native bee of wasp-like appearance, and perhaps the casual observer will not recognise it as a bee. They are far from common in the Basin. The female is 6 mm long and the male is 5 mm long. Both are shiny black and sparsely haired, and both have their own distinctive yellow markings on the face and yellow spots below the wing articulations. The female has yellow spots on the throax. They fly from late-December through to late February although they can be seen earlier if the weather is warm. However, their appearance is generally regulated by what plants are flowering at the time. They visit most Compositae, especially *A. millefolium* and *Linaria purpurea* (purple linaria), *Lupinus polyphyllus* (Russell's lupin), *R. partinella* (silverweed), and also mustard and *P. sativa*. Nests have not been found in native plants as yet, but they have been discovered nesting in the hollow stems of the previous summer's *L. purpurea* and *L. polyphyllus*, both of which are introduced plants. The lupin was introduced to the Basin 30-40 years ago.

Hylaeus sp. 2

This is the smallest of the native bees in the Basin. Females are 4 mm and males 3 mm long. It is similar in form and markings to *H. capitosus* (except that both sexes have yellow markings on the legs). They fly from late December to late January and can be found visiting *G. corymbifera* and *A. millefolium*, and also *R. partinella*. No nests have been found, I expect they will be located in plant material similar to that nested in by *H. capitosus*.

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REFERENCE

- DONOVAN, B. J. 1980. Interactions between native and introduced bees in New Zealand. *New Zealand journal of ecology* 3: 104-116.