Bombus villarricaensis, a new Garden bumblebee from Southern Chile (Hymenoptera: Apidae)

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Abstract: A new bumblebee species of the subgenus *Megabombus* is described from the Chilean Lake District. The type series consists of 74 queens, 36 workers and a single male. Queens show a tendency to melanism as has also been observed for the European *B. hortorum* and *B. ruderatus*. *B. villarricaensis* is both morphologically and in colouration close to those species but a number of differences are enumerated. The very considerable geographic separation from the known Garden bumblebees would also support specific ranking.

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Introduction

It is generally assumed in the literature that *Bombus dahlbomii* (Guérin) is the only bumblebee species occurring below 38° south in Latin America, *Bombus bellicosus* (Smith) having been taken in Eastern Argentina only down to that latitude (Holmberg, 1879; Franklin, 1913; Herbst, 1917; Claude-Joseph, 1926; Milliron, 1973). *Bombus dahlbomii* is a striking fulvous coloured species with the largest queens in the Western Hemisphere. It has been reported to fly as far south as Tierra del Fuego. The author has collected queens on the Argentine side of the Andes (S. Junin de los Andes, S. Carlos de Bariloche) and in Chile, from the latitude of Santiago de Chile down to the isle of Chiloé. It was therefore quite a surprise to take a queen of a dark bumblebee, looking like a European Garden bumblebee, in the town of Villarrica in the Chilean Lake District in the late afternoon of 13th November 1990. In the following days it appeared that this bumblebee was quite common in the area between roughly 38° and 40.5° south but not to be observed to the north and the south of this area in Chile. Neither did the author notice it on the Argentine side of the Andes at this latitude. Around Lake Villarrica it seems even abundant and vastly outnumbered *Bombus dahlbomii* at that time – only one in ten to twenty queens observed being a *B. dahlbomii*.

Bombus villarricaensis spec. nov.

Type material

Holotype: ♂: Pucon, Chile 21.xi.1990 on *Echium vulgare* L. Paratypes: 48 ♀ and 20 ☿: Villarrica 13-23.xi.1990; 11 ♀ and 6 ☿: Pucon 21-22.xi.1990; 7 ♀ and 9 ☿: Futrono 20.xi.1990; 2 ♀ and 1 ☿: 25 km north of Temuco 24.xi.1990; 3 ♀: Panguipulli 23.xi.1990; 1 ♀: Lanco 13.xi.1990; 2 ♀: 9 km south of Victoria 24.xi.1990.

The holotype ♂, 4 ♀ similar to those illustrated in fig. 2 and 2 ☿ are deposited in the Zoological Museum, Amsterdam, Department of Entomology. The other paratypes are in the author's collection.

Description

Male (holotype) (fig. 1): length c. 14 mm, distance between tegular margins (Te) 4.5 mm. Malar space a little less than 1½ times the distal width, thus markedly shorter than in *B. hortorum* and *B. ruderatus* where it is nearly twice as long, twice the length of the third antennal segment A3. Hind tibia with only a few bristles – hardly exceeding the distal decumbent hairs of the margin. Fringes of hind tibia of irregular length, the longest about equal to the greatest width of the segment. Genitalia as in *B. hortorum* and *B. ruderatus* except that the foot-like apex of the volsella is perhaps a little more slender and slightly longer. Lateral depressions of gonocoxite occupy about the same area as in *B. ruderatus* but are well defined as in *B. hortorum* where the depression is about twice as long.

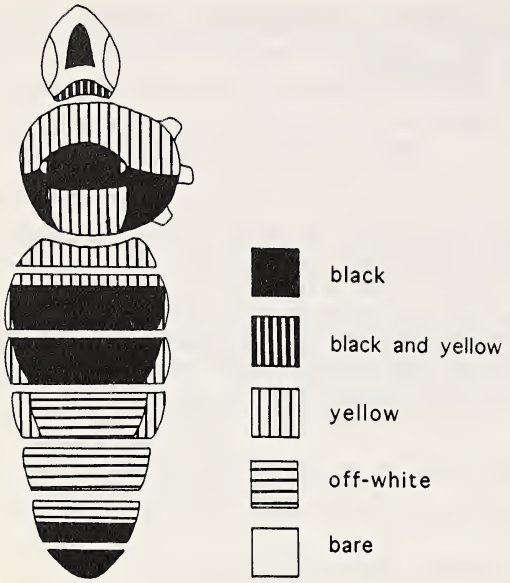

Fig. 1. Colour pattern of the holotype male of *Bombus villarricaensis* spec. nov.

Colour pattern: Pile of vertex with a mixture of black and yellow hairs. Collar with black hairs interspersed posteriorly extending all the way down to the episternum and scutellum yellow, notum otherwise black. First tergite (T1) yellow, T2 black with basally and laterally some yellow hairs, T3 black with yellowish-white hairs laterally, T4 whitish, yellowish laterally, T5 drab white, T6 basally yellowish-white, distally black, T7 black. Legs mainly black but trochanters yellow and tibial fringes mainly ferruginous. Fringes on sternites off-white.

Queen: Length c. 24 mm, distance between tegular margins (Te): average 8.1 mm (range 7.4-8.5 mm). Malar space a little less than 1½ times the distal width, almost twice the length of A3 and somewhat longer than in *B. hortorum* and *B. ruderatus*: average 1.34 mm (range 1.2-1.5 mm). Disc of elongated clypeus fairly evenly covered with punctures – finer in the middle and coarse elsewhere especially near the labrum. Labral furrow shallow, not as well defined as in *B. hortorum*, smaller in width than the labral width. Labral tubercles angled. Supra-orbital line just above lateral ocelli. Body robust, coat fairly short on the pronotum but rather shaggy on metasoma.

Colour pattern: Notum black except for a yellow collar extending to adjacent margin of episternum where black hairs are intermixed and the crescent-shaped posterior part of scutellum. T1 yellow with some black hairs centrally, T2 black with only a few yellow hairs basally, T3 white laterally but black in the middle also distally thus producing a black crescent, T4 and T5 white with interspersed black hairs, T6 black. Fringes on sternites yellowish. Coat otherwise black. Legs black, some corbicula hairs with ferruginous tips. Wings feebly infuscate.

Worker: Length c. 14 mm, distance between tegular margins 5.1 mm. Not much variation in size was observed. Workers are structurally similar to the queens except that there is a preponderance of coarse punctures on the clypeus.

Colour variation: The queen described was selected as probably representing the most typical colouring in view of the fact that the workers collected show this colouration preponderantly.

Some queens are lighter in that there is no black pile on T4 and T5, while others are more blackish. In fact, there is a tendency to melanism in the queens and the series taken shows a complete range to almost entirely black specimens (fig. 2). First the yellow on pronotum and scutellum decreases – the interalar band becoming a black circle; the yellow on T1 also diminishes. This process continues and finally the white pubescence on the metasoma is almost entirely substituted by black pile. Similar melanism has been described for *B. hortorum* in Scandinavia (Løken, 1973: 127-131) and for *B. ruderatus* in Great Britain (Sladen, 1912a; Prŷs-Jones, 1987). In the latter case intermediate forms seem rare.

There is less colour variation in the workers than in the queens. No blackish specimens were seen. Løken (1973: 131), on the contrary, observed the same frequency of melanism in *B. hortorum* queens and workers from Norway.

Fig. 2. Photograph of four *Bombus villarricaensis* spec. nov. queens showing gradual development of melanism.

Some workers show decreasing size of the yellow bands on the notum and T1. A few of the 36 workers show yellowish-white hairs on the lateral distal parts of T3 and T4.

Discussion

As the paucity of males was simply due to the time of collecting: early spring in Southern Chile, the single male taken is selected as the holotype because its genitalia clearly prove that the species belongs to the subgenus *Megabombus* (*Hortobombus*) and is, as the colouration indicates already, a Garden bumblebee. There is no doubt that this male is in fact of the same species because not only was it taken together with queens and workers, described here, but also the yellowish pile laterally on T3 and T4 characteristically occurs in some workers as well.

This new species seems to be restricted to a fairly limited area in the Chilean Lake District. It is probably for this reason that it has not been collected earlier. The occurrence of melanism may be related to the particular climate in that region being cool and moist (Milliron, 1971).

The queens seem to be quite sturdy being on the wing from the early morning until just before sunset. They are not deterred by wind and moderate rain. This has also been observed for *B. dahlbomii* (Claude-Joseph, 1926).

This species appears to be polylectic having been taken on *Rhododendron*, *Echium*, *Fuchsia*, *Rubus*, *Sarothamnus*, *Trifolium repens* L., etc.

No representative of the subgenus *Megabombus* has so far been reported from the Western Hemisphere. Richards (1968) gives Europe to China and Japan and the species arranged under this subgenus by P. H. Williams (in litt.) are indeed all from that area.

Although *B. ruderatus* has been artificially introduced into New Zealand (Sladen, 1912b) there are no reports of similar introductions in the past with regard to South America. Although Sladen noticed some slight deviations in New Zealand's *B. ruderatus* 27 years after their introduction, and was interested to see whether they would 'become accentuated as times goes on', the differences in the case of *B. villarricaensis* seem too large to warrant development from an introduced species. The single holotype male also shows morphological differences in the shorter malar space and the size of the well-defined depression of the gonocoxite. *Bombus villarricaensis* is therefore here considered a separate species also on the ground of its enormous geographical distance from other species in the subgenus *Megabombus*.

Etymology

The name given to the new species derives from the still active volcano Villarrica dominating the lake and the town of the same name.

Acknowledgement

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