

Scientific Note

Observation of *Megachile saulcyi* (Guérin-Méneville, 1844) (Hymenoptera: Megachilidae) using plastic for nest construction in Chile

Observación de *Megachile saulcyi* (Guérin-Méneville, 1844) (Hymenoptera: Megachilidae) utilizando plástico para la construcción de nidos en Chile

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Abstract. *Megachile saulcyi* (Guérin-Méneville, 1844) is reported for first time cutting pieces from a plastic bag that are used for the construction of its nest, this being the first record of a bee performing this activity in Chile. The growing problem of solitary bees that use plastic for the construction of cells for their nest is analyzed as well as the consequences that they can originate in the survival of their populations.

Key words: Behaviour; *Dasymegachile*; pollution; solitary bees.

Resumen. Se reporta por primera vez a *Megachile saulcyi* (Guérin-Méneville, 1844) cortando trozos de una bolsa de plástico que son utilizados para la construcción de su nido, siendo este el primer registro de una abeja en Chile que realiza esta actividad. Se discute la creciente problemática de las abejas solitarias que utilizan este material para la construcción de celdas para sus nidos y las consecuencias que puede ocasionar en la supervivencia de sus poblaciones.

Palabras clave: Abejas solitarias; comportamiento; contaminación; *Dasymegachile*.

The expansion of human activities generates numerous types of waste which can affect the behavior of wildlife, "forcing" various organisms to interact with these materials, affecting directly or indirectly the dynamics of their populations (Lowry *et al.* 2013; Grubisic *et al.* 2018; Delphia *et al.* 2019; Malizia and Monmany-Garzia 2019). In the case of native bees, there is a recent record of the use of plastic materials for nest building (Allasino *et al.* 2019), the problems generated by this practice can range from vulnerability to parasite attack to complete offspring mortality (McIvor and Moore 2013; Wilson *et al.* 2020). The bees of the genus *Megachile* Latreille use a great variety of materials for the construction of their nests, such as stones, leaves, flower petals, mud and, recently known, the use of plastics from bags, wrappings, and objects such as flags (Klostermeyer and Gerber 1969; Michener 2000; Allasino *et al.* 2019; Wilson *et al.* 2020). In

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this present note, *Megachile saulcyi* (Guérin-Méneville, 1844), is reported cutting plastic from disposable bags in Putaendo, Valparaíso region, Chile.

During field work in the locality of La Mostaza, 24 km from the city of Putaendo, Valparaíso region, Chile (-32.453073 S, -70.691622 W), a warm zone (27 °C) dominated by sclerophyllous forest and secondary vegetation (Fig. 1), generally visited for camping activities (Gajardo 1994; Luebert and Pliscoff 2006). On Saturday, February 27th, 2021, two photographs were taken of a *Megachile saulcyi* specimen cutting pieces from a plastic bag (Figs. 2A, 2B), which was part of the waste generated by visitors. Then, in another fieldwork on Tuesday, March 9th, in the same place, two bees were observed in the same site, cutting another plastic bag (Figs. 2C, 2D). The bees were not collected, and its nest could not be monitored, but they were identified from the photographs as *Megachile* (*Dasymegachile*) *saulcyi* (Guérin-Méneville, 1844). It is unknown if the bees used this material to cover completely the nest or if it only has occupied a part of it, as the bag had few bite marks. It is even possible that it was at the beginning of the nest building process.



Figure 1. Site where *Megachile saulcyi* was found in central Chile. / Sitio donde se encontró a *Megachile saulcyi* en Chile central.

This is the first time that this behavior has been cited for a megachilid in Chile. Other megachilids have been found using plastic materials for their nests, for example: *Megachile campanulae* (Robertson, 1903) and *Megachile rotundata* (Fabricius, 1787) in Canada (McIvor and Moore 2013). Likewise, with other bees such as, the *Tetragonula hockingsi* (Cockerell, 1929), has been reported using fresh paint, probably for making nests (Medler 1996), and *Hylaeus ruficeps kalamundae* (Cockerell, 1915) nesting in polystyrene (Pendergast 2019). The bees of the genus *Megachile* has a greatest importance in the specific pollination in plants of the Fabaceae and Asteraceae family, also, they are important in the pollination of crops as canola and alfalfa (Klostermeyer and Gerber 1969; Michener 2000; Scott-Dupree *et al.* 2009; Pitts-Singer and Cane 2011). It is known that the use of these materials has repercussions on the development of bees, since the plastic prevents the flow of moisture and temperature in the cells, which causes the mortality of the offspring (Stephen and Every 1970).

The use of plastics by bees is another proof of the adaptation that they are experiencing due to the increase of these polluting materials in natural spaces, unfortunately this adaptation could generate an unwanted descent in the populations of wild bees. In order to generate strategies of conservation, it is necessary to have a better view of this worrying situation and for this to be possible, we urge people to carry out more studies and to describe observations like these.

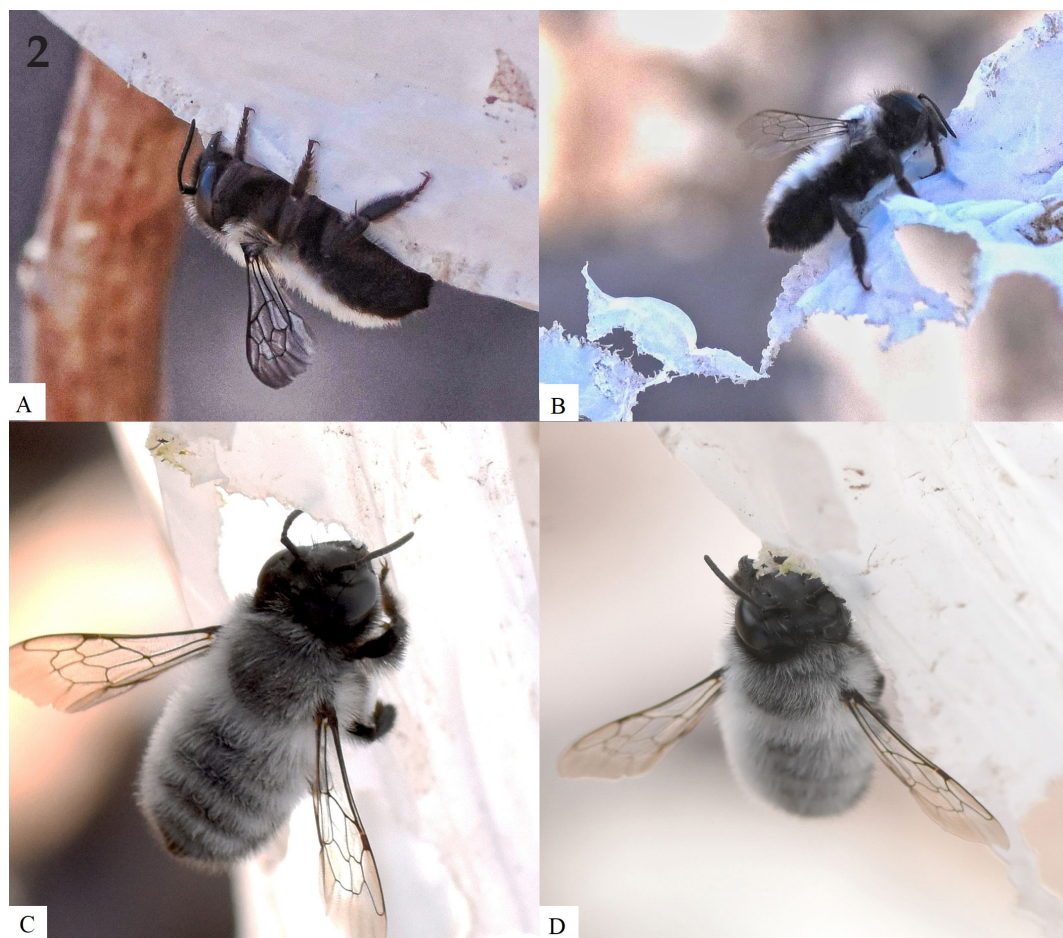


Figure 2. A-D. *Megachile saulcyi* cutting the plastic bag. / *Megachile saulcyi* cortando la bolsa de plástico.

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