

AN OUTLINE OF A SOLITARY RESIN BEE

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INTRODUCTION:

The Megachilidae family includes a sizable group of solitary bees known as resin bees. The giant resin bee, *Megachile sculpturalis* (Smith), is a large resin bee that is native to eastern Asia and is an adventive, non-native, and typically unestablished species—it is found in the different countries in the world. Resin bees are technically mason bees, and like other mason bees, they construct their nests out of materials they gather from their surroundings. Mason bees, which gather sand or tiny stones, may be more well-known to us, but resin bees, as the name suggests, collect resin. They obtain the resin they use from the stems, buds, and bark of many different plants, particularly conifers. These bees can be found on various plants, although they usually choose plants brought in from their original region. *Megachile*

sculpturalis has been noted to harm nearby plants when gathering pollen or nectar, rendering them unsuitable to subsequent bee visitors. In contrast to sap, plant resins contain primarily water, and are frequently glossy and insoluble in water. Resins are often combustible, sticky, come in vivid red, yellow, and brown hues, and have a variety of useful complex organic chemicals for bees. A ball of exudate is gathered by resin bees and carried to their nests in their mandibles. These bees nest in the long, narrow crevices of hollow reeds, insect burrows, or even soda straws, just like other Megachilidae bees. The nest cavity is lined with resin, which is also used to construct walls between adjacent egg chambers or cells.

MORPHOMETRIC DESCRIPTION:

From the conventional suspects of European honeybees and native bumblebees, these bees can be easily distinguished. They are big to start with. Particularly the dwarf females more prevalent pollinators, resembling carpenter bees in size (genus *Xylocopa*). Giant resin bees have lengthy, cylindrical, ridged abdomens in contrast to carpenter bees, which have rounded, shiny, hairless abdomens. A brilliant yellow "mustache" located just above their mandibles helps differentiate males, which are only two-thirds the size of females. *Megachile sculpturalis* possesses wings that are smoky in colour and have black markings close to the edges. Their wings are frequently kept in a V form on their back when they are at rest. The male's abdomen has a flat edge, whereas the female's is more pointed. This bee has a large, cylindrical body that is usually coloured black and yellow-brown. The head has dark setae and a yellow-brown colour (insect hairs). The thorax and the initial part of the abdomen both have these golden hairs.



BEHAVIOUR AND BIOLOGY:

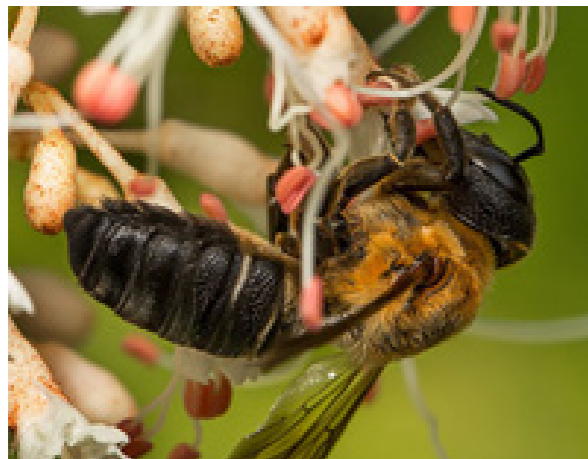
Giant resin bees do not dwell in colonies as social bees do. Instead, they are a solitary, cavity-dwelling species like other bees in the Megachilidae family. After mating, the males pass away quickly, allowing the females to locate a nesting location and raise a brood. Females like to nest

in tree holes but lack the limbs necessary to do so. Instead, they rely on the bore holes that cavity-excavating bees like carpenter bees and beetle larvae leave behind. It is well known that these bees nest in tunnels. They build their nests in small grooves in tree cavities, cracks, fallen logs, and other debris that other bee species occasionally use. The increasingly common "bee hotels" constructed for solitary

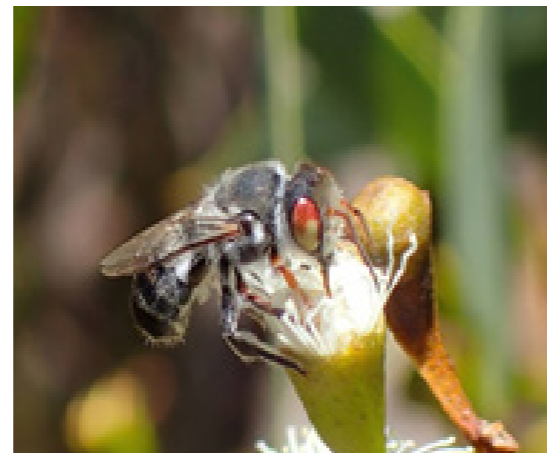
bees like mason and leafcutter bees are also utilized by giant resin bees. A female will lay an egg after locating a cavity that is the right size and will fill it with nectar and pollen. She gathers sticky resin (thus the common name) from trees and uses it to make cell walls to divide each egg. Then the female uses a mixture of wood chips, mud, or resin to seal the cell. After the first cell is shut, the mother bee will

repeat the process and place a second egg within a different brood cell. In each nest, the female can build up to ten cells. Larvae stay in their own cells after emerging and eat the pollen pellets that are given to them. All winter long, they will eat this food. The adults will emerge in the early summer after the larvae pupate in the spring. Additionally, many males of this species vigorously guard their mating grounds on plants, which can prevent local species from using flowers. Homeowners who dislike carpenter bees' arduous boring may find this to their satisfaction, but in the long run, it may be a factor in the decline of an essential specialized pollinator. There is evidence that they may outcompete native insects that live in cavities for nesting sites. For instance, experts have seen enormous resin bees kill carpenter bees after immobilizing them with copious amounts of sticky glue and occupying their meticulously crafted nests.

Few important species of Resin Bees used as pollinator



Megachile sculpturalis



Megachile aurifrons



Megachile campanulae

IMPACT ON POLLINATION:

Although the giant resin bees are scary due to their size, they are generally harmless. Since not notably harmful or beneficial effects of this bee's existence have been identified thus far, its overall environmental impact has been deemed benign. The giant resin bee has been seen to make puncture wounds on the petals of two different kinds of flowers, the Japanese pagoda flower and the everlasting pea. This serves as a valid visual cue for scientists researching the plants that the enormous resin bee visits. They are known to pollinate up to 43 different plant species in the US, and they do show a preference for pollinating plants that are native to that habitat.

CONCLUSION:

Resin bees cannot chew through the wood; therefore, it does not cause structural damage and does not require severe chemical control; however, if management is needed, it is advised to change the species' habitat, including locating and destroying their nests. In order to prevent *Xylocopa* spp. from creating cavities where the resin bee can later live, this can be accomplished mainly through painting wood or filling the holes with putty, which will force the female resin bee to go on in search of different nesting locations.

