

## Bee Nesting

In the wild, most wood- and tunnel-nesting bees seek out abandoned beetle burrows in dead trees or limbs in which to construct their nests. This is true of many leafcutter bees (genus *Megachile*), which demonstrate amazing architectural abilities in their nest-building enterprises. The female will use her jaws to cut leaves or petals into precise shapes and sizes to fully line, partition and seal her nests. Gardeners will often notice that perfect circles have been clipped from their rose leaves, a favorite nest material for many leafcutter bees.



*Female leafcutter bee entering her nearly completed wood tunnel nest. Photo by Celeste Ets-Hokin.*

Others who make their nests in wood tunnels include mason bees (genus *Osmia*), which will typically use mud they collect from their environment (or create with their saliva) to construct the partitions in their nest and to seal the entrance. Some mason bees substitute leaf pulp or resin as a construction material in place of mud. Carder bees (genus *Anthidium*) will also found their nests in pre-existing wood tunnels, the female using her teeth to “card” the hairy fibers of plants to use as a nesting material. A horizontal section of a carder bee nest looks as though it has been stuffed with cotton balls.



*Photo by Mace Vaughan, The Xerces Society.*

Mason bees construct the partitions, and seal the entrance of their tunnel nests with mud collected from their environment. Rather than using old beetle burrows, some tunnel-nesting species, including some mason bees and small carpenter bees (genus *Ceratina*), will chew out the soft pith of dried stems from plants such as blackberry, sumac or elderberry to make their nests. Still other tunnel-nesters may use the already hollow stems of plants and reeds. As consummate opportunists, however, many tunnel-nesting solitary bees, notably leafcutter, mason and carder bees, will readily found their nests in suitable man-made structures. The nail holes in fence posts, the nooks and crannies in old walls and even the occasional hose or section of pipe are utilized by these species. For this reason it is relatively easy for gardeners and growers to provide tunnel-nesting bees with alternative nest sites by placing wood block nests or hollow stem bundles around their property.



*Wood tunnel nest block constructed of bundled teasel stems housed in a wooden frame.  
Photo by Matthew Shepherd, The Xerces Society.*

Irrespective of the site or materials used in construction, the tunnel nest of a solitary bee will consist of a series of partitioned brood cells, each containing the egg of a single offspring. The number of cells in a given nest will vary with species, but is usually in the neighborhood of five to ten. The completed nests are then sealed at the entrance with whatever material the bee favors to use in its construction. Since she has no further contact with a nest once she completes it, the solitary female bee must seal the entrance in order to protect the developing offspring from weather, parasites and other insects.

Large carpenter bees (genus *Xylocopa*) excavate their own tunnels in solid or rotten wood which, in the wild, is often a dead branch. To the dismay of some homeowners, many carpenter bees will also readily nest in structures built with softwoods such as pine or redwood. The female has powerful jaws which she uses to bore a nest entrance and then one or more tunnels running along the grain of the wood. Though well equipped for the task, it may take a female carpenter bee up to six days to burrow just one inch into solid wood! And her formidable engineering skills extend beyond the completion of her tunnel. By scraping down fibers from the sides of a wood tunnel, she creates a sort of particle board substance to construct the partitions between her brood cells. Newly mated females will sometimes economize by re-using the nests of previous generations, first clearing out the debris from old brood cells and often extending the tunnels.



*Carpenter bee nest in a yucca stem, showing linear array of partitioned brood cells. Photo by Rollin Coville.*

The nest entrances of carpenter bees are not sealed, as the female egg-layer remains with the nest until the emergence of her offspring. This open-door policy also serves the over-wintering community of large carpenter bees which consists of one or two generations of adult bees, some of whom must leave the nest periodically to forage.