From the Washington Post: http://www.washingtonpost.com/wp-srv/special/metro/urban-jungle/winter-2011/index.html?media=11

March 15, 2011

Polyester bees: Born in a plastic bag

The early March sun warms exposed soil, triggering the emergence of male **polyester bees**, which swarm the ground, waiting for females to dig to the surface. The half-inch bees -- also known as plasterer bees -- mate while rolling on the ground or while flying, joined to each other in midair.

Unlike social honeybees, polyester bees are solitary. After mating, males fly off to finish their short lives sipping from freshly opened tree blooms. Each female works alone on her own nest, a foot-and-a-half-deep tunnel as wide as a pencil, dug straight down into the ground. Eggs are laid in pockets, or brood cells, dug into the sides of the tunnel.

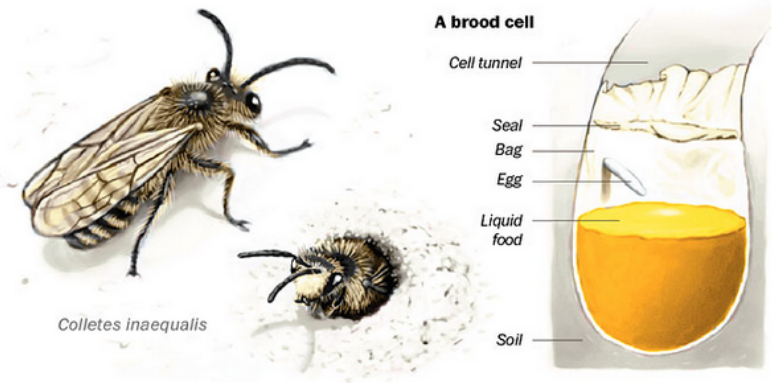
Every night, the female digs out a new brood cell and lines the cell with polyester secreted from her abdomen. "She spreads it on the cell wall with her paintbrush-shaped tongue," says Suzanne W.T. Batra, a retired USDA entomologist, who began studying solitary bees in the 1960s.

A still-unknown agent -- maybe something in the bee's saliva -- reacts with the polyester, causing it to harden into a flexible waterproof plastic resembling cellophane."

"During the day, the female collects nectar and pollen and packs it into the cell along with some glandular material. She lays an egg, suspended over the food, and seals the cell with more polyester. "Closes it like a zip-lock bag," says Batra. The bee plugs the cell entrance with soil, packing it down with the tip of her abdomen before starting to dig another cell.

Some people might be alarmed to find polyester bees swarming the grounds of their property.

Fear not, says Batra. "The bees rarely sting. You'd have to sit on one to get it to sting you." Her advice: "Wait a month and they'll go away on their own." By mid-April, any remaining bees will be limping about on tattered wings. They won't be seen again until larvae go through metamorphosis and emerge late next winter.



A native alternative to honeybees

North America has 4,000 species of bees. Many lead solitary lives similar to that of the polyester bee. "Some are much better pollinators than honeybees," says Batra, "and native bees aren't affected by the parasites and diseases that are killing honeybees."

But modern agriculture, with its vast fields, pesticides and scarce natural areas, doesn't encourage fertilization by native bees. "You would need undisturbed areas nearby," says Batra, "so that the bees could nest and fly out to the fields to pollinate."

Bee plastic

Unlike some synthetic plastics, bee plastic is biodegradable. Batra tested that by burying a bunch of brood-cell linings, which disintegrated after five years.

A research group at Olin College of Engineering has been studying polyester bee plastic for several years: "Bio-plastics are only in the early stages of development," says student researcher Shannon Taylor. "Our goal is to understand [bee plastic] well enough to create something similar ourselves."