

The results of a small study of the mining bee, *Macrotera opuntiae* (Hymenoptera: Andrenidae) on Boulder County Open Space

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During the weekend of June 22-23, 2013 I was alerted to the possibility that the “bee that mines in stone”, *Macrotera opuntiae* (previously known as *Perdita opuntiae*), was likely seen on the Boulder County Open Space property that sits east of 79th St. along the north side of Rt. 52 (Figure 1). On the morning of June 24, 2013 I ventured out to look for myself. I saw at least a dozen *M. opuntiae*, both males and females, at cactus (*Opuntia*) flowers. I photographed the habitat (Figure 2) and took some rather poor quality photos of the bees (Figure 3). I was extremely careful where I walked as I realize this is a very fragile and uncommon habitat.

The cactus were well beyond peak bloom and probably only had a few days left, especially near the exposed turtleback rock outcroppings where the bees nests. That afternoon, I inquired about obtaining a permit to collect several voucher specimens from this locality. I am unaware of any previous specimens or records documenting *M. opuntiae* from this parcel of Boulder County Open Space property. A Special Collection Permit was issued to me on June 26, 2013 to collect the mining bee, *M. opuntiae*, at Hillside Estates and Monarch Park. I very much appreciate the speed with which the permit was issued as the cactus flowers were waning.

I returned to the site to find the cactus nearly done blooming. I collected three *M. opuntiae* (one male and two females) and saw a few additional individuals. One of the specimens (UCMC 0114006) has been prepared and deposited in the Entomology Collections at the University of Colorado Museum of Natural History. A lateral view of this specimen has been photographed using our high resolution imaging system. The file is 250MB and can be sent to you if you wish. A thumbnail is included in this report (Figure 4). We would be more than happy to provide additional views of Museum specimens to Boulder County Open Space if this would be beneficial to you.

The other two specimens (one male and one female) are being prepared for transfer to Dr. Bryan Danforth at Cornell University where DNA from these specimens will be used in higher level bee systematics research. While photographs can document the existence of the bee at a given locality, the use of DNA in research makes specimens particularly important. These bees will provide valuable data on a group of bees that is not easily obtained, yet holds an interesting position from a phylogenetic standpoint. A copy of the collecting permit will accompany the specimens.

M. optunia is a fascinating little bee, originally described from White Rocks. It collects pollen only from cactus flowers and nests only in the white turtleback outcroppings. Despite being somewhat colorful, these small bees (6-7 mm) are easily overlooked. They burrow deep down into the stamens of the cactus flowers. They forage for a limited part of the day, only 4-5 hours maximum (between 9:30 am and 2:00 pm), and only fly for 10-14 days each year while the cactus are in bloom. This little bee tells a great story, though.

It is a species I had suggested be added to the ERE species of special concern when Mac Kobza and Tim Shafer asked me to review that list in April of 2013. I do not think the bee is particularly rare, but it is dependent on a very specialized habitat for nesting. That makes it very vulnerable, and I think it needs some special consideration.

As I ventured carefully out into their habitat, I was struck by the amount of broken glass among the rocks. It looked as though people had been shooting up bottles out there. On one level, I found this to be really sad, however, this bee provides a wonderful avenue to help protect this fragile rock formation. Something as unobtrusive as a split rail fence along the open side of the path near the rocks with a sign saying vulnerable or critical habitat would be great. I would be more than happy to work with the Boulder County Open Space staff to develop some educational materials to enlighten the human visitors of this area about this little bee who calls the rock outcroppings home.



Figure 1. A map of the area where the mining bee, *Macrotera opuntiae*, was found.



Figure 2. The nesting area of the mining bee, *Macrotera opuntiae*.



Figure 3. A female mining bee, *Macrotera opuntiae*, laden with pollen in an *Opuntia* flower.



Figure 4. The female mining bee, *Macrotera opuntiae* (UCMC 0114006) that is vouchered in the Entomology Collections at the University of Colorado Museum of Natural History in Boulder, Colorado.